Repairs & Refurbishment Works
Sprowston Town Council
Former Viking Pub, Tills Road, Norwich NR6 7QZ

BIDWELLS

SPECIFICATION & SCHEDULE OF WORK

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1.0 Preliminaries

Section 1 - Preliminaries

Issue:

Staus:

Revision:

Issued By: Bidwells

Job Number: JB62449

Date: 17-10-2023

Contents

A10
Project particulars

Clauses

110 The Project

1. Name: The Viking Centre
2. Nature: Repair & Refurbishment
3. Location: Tills Road, Norwich, NR5 7QZ
4. Timescale for construction work: TBC

120 Employer (client)

1. Name: Sprowston Town Council
2. Address: Council Office, Recreation Ground Rd, Norwich NR7 8EW
3. Contact: Guy Ranaweera
4. Telephone: 01603 408063
5. Email: GuyRanaweera@sprowston-tc.gov.uk

130 Principal contractor (CDM)

1. Name: TBC
2. Address: TBC
3. Contact: TBC
4. Telephone: TBC
5. Email: TBC

140 Contract administrator

1. Name: Bidwells LLP
2. Address: 16 Upper King Street, Norwich, NR3 1HA
3. Contact: Jason Menezes
4. Telephone: 07787151492
5. Email: Jason.menezes@bidwells.co.uk

150 Principal designer

1. Name: Bidwells LLP
2. Address: 16 Upper King Street, Norwich, NR3 1HA
3. Contact: Christopher Driscoll
4. Telephone: 07976581200
5. Email: Christopher.driscoll@bidwells.co.uk

160 Architect

1. Name: Paul Robinson Partnership
2. Address: 6 Octagon Business Park, Hospital Road, Little Plumbstead, Norwich, NR13 5FH
3. Contact: Steve Lucas
4. Telephone: 016030397057

5. Email: Sl@prparchitecture.com

170 Structural Engineer

1. Name: John Plumber Partnership
2. Address: 62-64 Thorpe Road, Norwich, Norfolk, NR7 0HF
3. Telephone: 01603717893
4. Email: infor@johnplumberpartnership.co.uk

175 Mechanical Engineer

1. Name: Building Services Consultants
2. Address: 300 Peachman Way, Norwich NR7 0LB
3. Telephone:
4. Email: ben.ling@bwlconsulting.net

178 Electrical Engineer

1. Name: Building Services Consultants
2. Address: 300 Peachman Way, Norwich NR7 0LB
3. Telephone:
4. Email: ben.ling@bwlconsulting.net

Ω End of Section

A11
Tender and contract documents

Clauses

110 Tender Drawings

1. The tender drawings are: 8341,B01 - Existing Site Layout Plan
   8341,B02 - Existing Building Plan
   8341,B03 - Existing Elevations
   8341,B04A - Existing Building Demolition Plan
   8341,B05C - Proposed Site Layout Plan
   8341,B06A - Proposed Ground and Basement Floor Plan
   8341,B07A - Proposed First Floor Plan
   8341,B08A - Proposed Elevations
   8341,B09A - Proposed Fire Plan
   8341,B10A - Ground Floor Wall Specification
   8341,B11A - First Floor Wall Specification
   8341,B12A - Reflected Ceiling Plans
   8341,B13A - Ground Floor M&E Services Plan
   8341,B14A - First Floor M&E Services Plan
   8341,B15A - Proposed Finishes Plans
   8341,B16A - Proposed WC Details
   8341,B17A - Proposed Tea Point Details
   8341,B18 - Door Schedule
   8341,B19 - Ironmongery Schedule
   8341,B20A - Window Schedule
   8341,B23A - Proposed Sections A-A & B-B

120 Contract drawings

1. The contract drawings: The same as the tender drawings.

160 Pre-construction information

1. Format: The pre-construction information is described in these Preliminaries in section A34. It refers to information given elsewhere in the Preliminaries, specification, drawings and associated documents.

170 Fire Statement

1. Location: See section B05 'Whole project fire safety'

Ω End of Section

A12
The site/ existing buildings

Clauses

110 The site

1. Description: The subject property is a detached two storey building which is currently unoccupied.

   Externally the property has a pitched roof with dormer windows and a tiled covering. Elevations comprise facing brickwork with single glazed timber fixed and casement windows.

   Internally the building has a combination of painted plastered and plasterboard ceilings, painted plastered walls, with all floor coverings stripped back to core.

   The building benefits from mains supply water, electricity and gas.

120 Existing buildings on/ adjacent to the site

1. Description: Commercial and residential buildings

140 Existing utilities and services

1. Drawings: (Information shown is indicative only): 8341,B01 - Existing Site Layout Plan.
2. Other information: None

170 Site investigation

1. Report: Included in the tender documents.

180 Health and safety file

1. Availability for inspection: The health and safety file for the site/ building may be seen by appointment during normal office hours at: Bidwells LLP, 16 Upper King Street, Norwich, NR3 1HA.
2. Other documents: Pre construction information pack appended to the main specification document.
3. Arrangements for inspection: Via the Contract Administrator

200 Access to the site

1. Description: The site is accessed via Tills road.
2. Access for inspections: Provide access at reasonable times for both on-site and off-site work.

210 Parking

1. Restrictions on parking of the Contractor's and employees' vehicles: Parking available at the front of the property.

220 Use of the site

1. General: Do not use the site for any purpose other than carrying out the Works.

240 Health and safety hazards

1. General: The nature and condition of the site/ building cannot be fully and certainly ascertained before it is opened up. However, the following hazards are or may be present:

1.1. Please refer to the pre construction information pack appended to the main specification documentation.

2. Information: The accuracy and sufficiency of this information is not guaranteed. Ascertain if any additional information is required to ensure the safety of all persons and the works.
3. Site staff: Draw to the attention of all personnel working on the site the nature of any possible contamination and the need to take appropriate precautionary measures.

250 Site visit

1. Assessment: Ascertain the nature of the site, access thereto and all local conditions and restrictions likely to affect the execution of the Works.
2. Arrangements for visit: Via the Contract Administrator

Ω End of Section

A13
Description of the work

Clauses

110 Preparatory work by others

1. Details: N/A
2. Timescale: N/A

120 The works

1. Description: The works comprise of the following:

External Repairs

- Build new steel framed extension
- Replace fencing
- Remove redundant lean to structures to rear
- Drainage repairs
- Re surface front car park
- Replace concrete entrance ramp and handrails
- Scaffold
- Repairs to tiled roofs and replace defective facias
- Rebuild 1No dormer and overhaul the other 3 No dormers
- Refelt bay roof
- Repoint chimney
- Replace rainwater goods and downpipes
- Replace all windows
- PV Panels on roof

Internal Works

- WC refurbishments
- Strip out commercial kitchen and extraction and make good
- Floor repairs and finishes
- Provide new heating system to GF and FF
- Overhaul exsiting electrics, provide additional sockets and lighting and strip out redundant electrics
- Redecorate
- Reconfigure internal partitions

130 Work by others concurrent with the Contract

1. Description: N/A

140 Completion work by others

1. Description: Strip out works have been compleated.

Ω End of Section

A20
JCT intermediate building contract with contractor's design (ICD)

Clauses

Intermediate building contract with contractor's design (ICD)

- The Contract: JCT Intermediate Building Contract with Contractor's Design 2016 Edition.
- Requirement: Allow for the obligations, liabilities and services described.

The recitals

First - The Works

- Comprise: Repair and refurbishment as described in section A13.
- Location: Tills Road, Norwich, NR5 7QZ

Second - Contractor's designed portion

- The Works include the design and construction of
  - The design and specification of all mechanical & electrical works from part of the 'Contractors Design Portion' under The JCT Intermediate Building Contract with Contractors Design portion 2016.
  - All mechanical and electrical works are to be designed & completed in accordance with all relevant and currently statutory requirements, regulations, British Guidance and in line with best practices.
  - Contractors to provide all required mechanical and & electrical design, construction issue & as built drawings throughout the project as required.
  - Contractor to provide all required mechanical & electrical material, data sheets, operation maintenance manuals and all warranties and guaranties for compilation within the Health & Safety file throughout the project as required and upon practical completion of the works as part of the formal handover process.

Third - Contract drawings

- The Contract Drawings: As listed in clause A11/120.

Fourth - Other documents supplied by the Employer

- Comprise: The Specification Of Works comprising:

1.0 Preliminaries

2.0 Materials & Workmanship

3.0 Schedule of Works

4.0 M&E Specification

5.0 Structural Engineer Specification

6.0 Final Cost Summary

7.0 Basic Trade Rates

8.0 Form of Tender

9.0 Tender Submission Checklist

Appendix 1 - Drawings
Appendix 2 - Product Data Sheets
Appendix 3 - Pre-Construction Information

- Named person: The whole of the text referring to a named person as a subcontractor will not be deleted.

Fifth A - Pricing by the Contractor

- Option A will apply: Option B will be deleted.
- Priced document: Within Option A the following words will be deleted:
  - Bills of Quantities.
- Priced Activity Schedule: The words ‘and has provided the Employer with a priced schedule of activities annexed to this Contract (the Activity Schedule)’ will not be deleted.

Ninth - Information release schedule

- The Ninth Recital will be deleted.

Eleventh - Division of the works into sections

- The Eleventh Recital will not be deleted.

Articles

3 - Architect/ Contract Administrator

- Architect/ Contract Administrator: See clause A10/140.

4 - Quantity Surveyor

- Quantity Surveyor: See clause A10/160.

5 - Principal Designer

- Principal designer: See clause A10/150.

6 - Principal Contractor

- Principal contractor: See clause A10/130.

9 - Legal proceedings

- Amendments: N/A

Contract particulars

Fourth Recital - Employer's Requirements

- Comprise: The Employer's Requirements for the Contractor's Design Portion of works are set out within "Section 3 - Schedule of Works" of the main specification document.

Sixth Recital - Contractor's Proposals/ CDP Analysis

- Comprise: TO BE COMPLETED BY CONTRACTOR
- Specific Requirements: Contractor to provide to and seek approval from the Contract Administrator prior to commencing work on site.

Eighth Recital and Clause 4.6 - Construction industry scheme

- Employer at Base Date is a 'contractor' for the purposes of the CIS.

Tenth Recital - CDM Regulations

- The project is not notifiable.

Twelfth Recital - Framework Agreement

- Framework agreement: Does not apply
- Details
  - Date: N/A
  - Title: N/A
  - Parties: N/A

Thirteenth Recital and Schedule 5 - Supplemental provisions

- Collaborative working: Supplemental Provision 1 applies.
- Health and safety: Supplemental Provision 2 applies.
- Cost savings and value improvements: Supplemental Provision 3 applies.
- Sustainable development and environmental considerations: Supplemental Provision 4 applies.
- Performance indicators and monitoring: Supplemental Provision 5 does not apply.
- Notification and negotiation of disputes: Supplemental Provision 6 applies.
- Where Supplemental Provision 6 applies, the respective nominees of the parties are
  - Employer's nominee: BIDWELLS LLP
  - Contractor's nominee: TO BE COMPLETED BY CONTRACTOR. Or such replacement as each party may notify to the other from time to time.

Article 8 - Arbitration

- Article 8 and clauses 9.3 to 9.8 (arbitration) do not apply.

Clause 1.1 - Base Date

- Base Date: Monday 17th October 2023

Clause 1.1 - BIM Protocol

- BIM Protocol (where applicable): N/A

Clause 1.1 - Date for completion of the Works

- Date for completion of the Works (where completion by sections does not apply): TBC

Clause 1.7 - Addresses for service of notices

- Employer

- Address: Council Office, Recreation Ground Rd, Norwich NR7 8EW
- Fax number: N/A

- Contractor
  - Address: TO BE COMPLETED BY CONTRACTOR
  - Fax Number: TO BE COMPLETED BY CONTRACTOR

Clause 2.4 - Date of possession of the site

- Date of Possession of the site: TBC

Clause 2.5 - Deferment of possession of the site

- Clause 2.5 does not apply.
- Where clause 2.5 applies, maximum period of deferment (if less than six weeks) is N/A.

Clause 2.23.2 - Liquidated Damages

- Damages: At the rate of £1000.00 (One Thousand Pounds) per week.

Clause 2.30 - Rectification period

- Period: Twelve months from the date of practical completion of the Works.

Clause 2.34.3 - Contractor's designed portion

- Limit of Contractor's liability for loss of use: unlimited

Clause 4.3 and 4.9 - Fluctuations Provision

- Fluctuations provision: no Fluctuations Provision applies
- Where schedule 4 applies, percentage addition (paragraph 12): N/A

Clause 4.7 - Advance payment and advance payment bond

- Advance payment: Clause 4.7 does not apply.

Clause 4.8.1 - Interim payments - Interim Valuation Dates

- The first Interim Valuation Date is: one month after the "Date of Possession, and thereafter the same date in each month or the nearest Business Day in that month.

Clause 4.9.1 - Interim payments - percentage of value

- Not achieved practical completion: Where the works, or those works in a section, have not achieved practical completion, the percentage of total value in respect of the works that have not achieved practical completion is 95%.
- Completed works: Where the works, or those works in a section, have achieved practical completion, the percentage in respect of the completed works is 97.5%.

Clause 4.10.4 - Listed items - uniquely identified

- The Contract Particulars item for clause 4.10.4 will be deleted.

4.10.5 - Listed items - not uniquely identified

- Listed items: The Contract Particulars entry for Clause 4.10.5 will be deleted.

Clause 6.4.1 - Contractor's Public Liability Insurance: Injury to persons or property

- Insurance cover for any one occurrence or series of occurrences arising out of one event: Ten Million Pounds (£10,000,000.00)

Clause 6.7 and Schedule 1 - Works Insurance - insurance options

- Schedule 1: Insurance option C applies.
- Percentage to cover professional fees: 15 per cent.
- If option A applies, annual renewal date (as supplied by the Contractor): TO BE COMPLETED BY CONTRACTOR
- Where Insurance Option C applies, Paragraph C1: applies

Clause 6.10 and Schedule 1 - Terrorism cover

- Details of the required cover
  - N/A.

Clause 6.15 - Joint Fire Code

- Joint Fire Code: Applies.
- Application: State whether the insurer under Insurance Option A, B or C (paragraph C.2) has specified that the Works are a 'Large Project': No.

Clause 6.18 - Joint Fire Code - amendments/ revisions

- Joint Fire Code - Amendments/ revisions: The cost, if any, of compliance with amendments or revisions to the Joint Fire Code shall be borne by the Contractor.

Clause 6.19 - Contractor's Design Portion - Professional Indemnity Insurance

- Level of cover: Amount of indemnity required:
  - relates to claims or series of claims arising out of one even;
  - and is £ 5,000,000.00 (Five Million Pounds).
- Cover for pollution and contamination claims: Is not required
- Expiry of required period of CDP Professional Indemnity Insurance: 12 years

Clause 7.2.2 - Guarantee from the Contractor's parent company

- Guarantee: TBC
  - Parent company's name and registration number: TO BE COMPLETED BY CONTRACTOR
  - The required form of guarantee is set out in: TBC

Clause 7.3 - Collateral warranties

- Details: As set out in the following documents: JCT SCWa/E 2016 - Electrical Sub-Contractor .
- JCT SCWa/E 2016 - Mechanical Sub-Contractor
- JCT SCWa/E 2016 - Window Sub-Contractor

Clause 8.9.2 - Period of suspension (termination by Contractor)

- Period of suspension: Two months

Clauses 8.11.1.1 to 8.11.1.5 - Period of suspension (termination by either Party)

- Period of suspension: Two months

Clause 9.2.1 - Adjudication

- The Adjudicator is: Royal Institution of Chartered Surveyors.
- Nominating body - where no Adjudicator is named or where the named Adjudicator is unwilling or unable to act (whenever that is established): The Royal Institution of Chartered Surveyors

Clause 9.4.1 - Arbitration

- Appointor of Arbitrator (and of any replacement): President or a Vice President of the Royal Institution of Chartered Surveyors.

The conditions - No Amendments

Section 1: Definitions and Interpretation - No Amendments

Section 2: Carrying out the Works - No Amendments

Section 3: Control of the Works

3.7 - Named subcontractors

- General: The work listed below and described in the contract documents is to be executed by the following persons who are hereby named as subcontractors as provided in Intermediate Building Contract clause 3.7. (For each such person, a completed Form of Tender and Agreement ICSub/Nam, together with the numbered documents referred to therein, is included with the main contract tender documents).
  - Work to be executed: TBC
  - Named person: TBC
- Agreement: The JCT Form of Agreement ICSub/Nam/E will be used.
- Subcontractor's drawings, etc. to be prepared during the course of the contract
  - TBC.
- Allow for attendance: As described in ICSub/NAM.

Section 4: Payment - No Amendments

Section 5: Variations - No Amendments

Section 6: Injury, Damage and Insurance - No Amendments

Section 7: Assignment and Collateral Warranties - No Amendments

Section 8: Termination - No Amendments

Section 9: Settlement of Disputes - No Amendments

Execution

Execution

- The contract: Will be executed as a deed.

Ω End of Section

A30
Tendering/ subletting/ supply

Main contract tendering

110 Scope

1. General: These conditions are supplementary to those stated in the Invitation to Tender and on the form of tender.

145 Tendering procedure

1. General: In accordance with the principles of: In accordance with NBS Guide to Tendering for Construction Projects..
2. Arithmetical errors: Pricing document is dominant.

160 Exclusions

1. Inability to tender: Immediately inform if any parts of the work as defined in the tender documents cannot be tendered.
2. Relevant parts of the work: Define those parts, stating reasons for the inability to tender.

170 Acceptance of tender

1. Acceptance: No guarantee is offered that any tender will be recommended for acceptance or be accepted, or that reasons for non acceptance will be given.
2. Costs: No liability is accepted for any cost incurred in the preparation of any tender.

190 Period of validity

1. Period: After submission or lodgement, keep tender open for consideration (unless previously withdrawn) for not less than six months.
2. Date for possession/ commencement: See section A20.

Pricing/ submission of documents

210 Preliminaries in the specification

1. Measurement rules: Preliminaries/ General Conditions must not be relied on as having been prepared in accordance with RICS NRM.

220 Pricing of preliminaries

1. Abbreviations: The following have been used:
2. F = Fixed charge item.
   - 2.1. PI: Provisional Item
   - 2.2. PS: Provisional Sum
   - 2.3. PQ: Provisional Quanitity

250 Priced documents

1. Alterations: Do not alter or qualify the priced documents without written consent. Tenders containing unauthorised alterations or qualifications may be rejected.
2. Measurements: Where not stated, ascertain from the drawings.

3. Deemed included: Costs relating to items, which are not priced, will be deemed to have been included elsewhere in the tender.
4. Submit: With tender

300 Quantities in the priced document

1. Quantities: Where included in the priced document, these have been prepared in accordance with NRM2.

310 Tender

1. General: Tenders must include for all work shown or described in the tender documents as a whole or clearly apparent as being necessary for the complete and proper execution of the Works.

360 Priced activity schedule

1. Submit: With tender

440 Schedule of rates

1. Schedule of rates (unpriced): Included with the tender documents. The contractor may insert additional items.
2. Fully priced copy
   2.1. Submittal date: WIth Tender

480 Programme

1. Programme of work: Prepare a summary showing the sequence and timing of the principal parts of the Works and periods for planning and design. Itemize any work which is excluded.
2. Submit: With tender

490 Information release schedule

1. Compatibility with programme: At the same time as submitting the proposed programme or summary, confirm that it is compatible with the Information Release Schedule.
2. Alternative proposals: If any part of the programme is not compatible with the Schedule submit alternative proposals and reasons for varying the times for release of information.

500 Tender stage method statements

1. Method statements: Prepare, describing how and when the following is to be carried out:
   1.1. The whole of the works in accordance with the main specification documen.
2. Statements: Submit with the tender.

510 Alternative method tenders

1. General: In addition to and at the same time as tendering for the Works as defined in the tender documents, alternative methods of construction/ installation may be submitted for consideration. Alternatives, which would involve significant changes to other work, may not be considered.
2. Alternative tenders: Such alternatives will be deemed to be alternative tenders and each must include a complete and precise statement of the effects on cost and programme.
3. Safety method statement: Carry out a health and safety risk assessment for each alternative and where appropriate provide a safety method statement suitable for incorporation in the Health and Safety Plan.

4. Full technical data: Submit for each alternative together with details of any consequential amendments to the design and/ or construction of other parts of the Works.
5. Submit: With tender

515 Alternative time tenders

1. General: In addition to and at the same time as tendering based upon the date or period specified in section A20, an alternative tender based upon a different date for completion or period may be submitted.
2. Date for completion: If any such tender is accepted the date for completion inserted in the Contract will be the date stated in the alternative tender or determined from the period stated in the alternative tender.

520 Design documents

1. Scope: Include the following in the Contractor's Proposals:
   1.1. Design drawings: As required in accordance with the 'Employer's Requirements' as detailed in Section A20.
   1.2. Technical information: As required in accordance with the 'Employer's Requirements' as detailed in Section A20.
2. Submit: With tender.

530 Substitute products

1. Details: If products of different manufacture to those specified are proposed, submit details with the tender giving reasons for each proposed substitution. Substitutions, which have not been notified at tender stage, may not be considered.
2. Compliance: Substitutions accepted will be subject to the verification requirements of clause A31/200.

540 Quality control resources

1. Statement: Describe the organisation and resources to control the quality of the Works, including the work of subcontractors.
2. QA staff: Identify in the statement the number and type of staff responsible for quality control, with details of their qualifications and duties.
3. Submit: With the Tender

550 Health and safety information

1. Content: Describe the organization and resources to safeguard the health and safety of operatives, including those of subcontractors, and of any person whom the Works may affect.
2. Include
   2.1. A copy of the health and safety policy document, including risk assessment procedures.
   2.2. Accident and sickness records for the past five years.
   2.3. Records of previous Health and Safety Executive enforcement action.
   2.4. Records of training and training policy.
   2.5. The number and type of staff responsible for health and safety on this project with details of their qualifications and duties.
3. Submit: With the Tender

570 Outline construction phase health and safety plan

1. Content: Submit the following information within one week of request:

1.1. Method statements on how risks from hazards identified in the pre-construction information and other hazards identified by the contractor will be addressed.
1.2. Details of the management structure and responsibilities.
1.3. Arrangements for issuing health and safety directions.
1.4. Procedures for informing other contractors and employees of health and safety hazards.
1.5. Selection procedures for ensuring competency of other contractors, the self-employed and designers.
1.6. Procedures for communications between the project team, other contractors and site operatives.
1.7. Arrangements for cooperation and coordination between contractors.
1.8. Procedures for carrying out risk assessment and for managing and controlling the risk.
1.9. Emergency procedures including those for fire prevention and escape.
1.10. Arrangements for ensuring that all accidents, illness and dangerous occurrences are recorded.
1.11. Arrangements for welfare facilities.
1.12. Procedures for ensuring that all persons on site have received relevant health and safety information and training.
1.13. Arrangements for consulting with and taking the views of people on site.
1.14. Arrangements for preparing site rules and drawing them to the attention of those affected and ensuring their compliance.
1.15. Monitoring procedures to ensure compliance with site rules, selection and management procedures, health and safety standards and statutory requirements.
1.16. Review procedures to obtain feedback.

590 Site Waste Management Plan

1. Details: TBC
   1.1. Reference: TBC
   1.2. Status: TBC
   1.3. Format: TBC
2. Development
   2.1. Responsibility: TBC
   2.2. Content: TBC
   2.3. Submittal date: TBC

599 Freedom of Information Act

1. Records: Retain, make available for inspection and supply on request information reasonably required to allow response to requests made under the provisions of the Freedom of Information Act.
2. Determination: Submit requests received. Do not supply information to anyone other than the project participants without express written permission.
3. Confidentiality: Maintain at all times.

Subletting/ supply

630 Domestic subcontracts

1. General: Comply with the Construction Industry Board ‘Code of Practice for the selection of subcontractors’.

2. Details: Provide details of all subcontractors and the work for which they will be responsible.
3. Submit: With tender

635 Supply chain agreements

1. General: All consultants, subcontractors and suppliers possibly involved in the tasks listed must agree to the principles of collaborative working.
2. Agreements in place: N/A
3. Proposed agreements: Provide details of all subcontractors/ suppliers who will be entering into framework agreements to undertake the tasks listed.
4. Submittal date:

640 'Listed' domestic subcontractors

1. General: The work listed below and described in the Contract Documents must be carried out by persons identified in a list as provided for in clause A30/645:
   1.1. The work: N/A
   1.2. Enter into a contract with one of the following:
2. N/A.

645 'Listed' domestic subcontractors

1. General: Contract Documents provide that certain work must be carried out by a person of the Contractor's choice selected from a list of not less than three persons given therein.
2. The selected person: Will become a subcontractor as provided for in the Contract Condition for Subletting.
3. Additions to lists
   3.1. The Employer or Employer's representative may, but only with the consent of the Contractor which shall not be unreasonably withheld, add additional person(s) to the list at any time prior to the execution of a binding subcontract agreement.
   3.2. The Contractor may, but only with consent, which will not be unreasonably withheld, add additional persons to the list and must, if requested, submit (in an approved form) evidence of the suitability of such additional person(s). Wherever possible, submissions for addition of person(s) must be made, and consent obtained, before return of the tender. When any submission for addition of person(s) is made with the tender the consequences, if any, to the tender price compared to the use of the listed persons are to be made clear or the tender will be treated as qualified.
4. Shortage of names: If at any time prior to execution of a binding subcontract agreement less than three persons named in the list (including any persons added as provided above) are able and willing to carry out the relevant work, give notice without delay. The Employer will then forthwith add the names of other persons as provided above so that the list comprises not less than three such persons, or confirm that no names will be added. If the Employer fails to do either within one week of the Contractor's notification the Contractor, who may subcontract in accordance with the Contract, must carry out the work.
5. Agreement: Before the start of work to which the list relates enter into a binding subcontract agreement and confirm that this has been done, giving the name of the selected subcontractor.

Ω End of Section

A31
Provision, content and use of documents

Definitions and interpretations

110 Definitions

1. Meaning: Terms, derived terms and synonyms used in the preliminaries/ general conditions and specification are as stated here or in the appropriate referenced document.

120 Communication

1. Definition: Includes advise, inform, submit, give notice, instruct, agree, confirm, seek, provide or obtain information, consent or instructions, or make arrangements.
2. Format: In writing to the person named in clause A10/140 unless specified otherwise.
3. Response: Do not proceed until response has been received.

130 Products

1. Definition: Materials, both manufactured and naturally occurring, and goods, including components, equipment and accessories, intended for the permanent incorporation in the Works.
2. Includes: Goods, plant, materials, site materials and things for incorporation into the Works.

135 Site equipment

1. Definition: Apparatus, appliances, machinery, vehicles or things of whatsoever nature required in or about the construction for the execution and completion of the Works but not materials or other things intended to form or forming part of the Permanent Works.
2. Includes: Construction appliances, vehicles, consumables, tools, temporary works, scaffolding, cabins and other site facilities.
3. Excludes: Products and equipment or anything intended to form or forming part of the permanent works.

140 Drawings

1. Definitions: To BSRIA BG 6, 'A design framework for building services: Design activities and drawing definitions'.
2. CAD data: In accordance with ISO 19650.

145 Contractor's choice

1. Meaning: Selection delegated to the Contractor, but liability to remain with the specifier.

150 Contractor's Design

1. Meaning: Design to be carried out or completed by the Contractor and supported by appropriate contractual arrangements, to correspond with specified requirements.

155 Submit proposals

1. Meaning: Submit information in response to specified requirements.

160 Terms used in specification

1. Remove: Disconnect, dismantle as necessary and take out the designated products or work and associated accessories, fixings, supports, linings and bedding materials. Dispose of unwanted

materials. Excludes removal and disposal of associated pipework, wiring, ductwork or other services.

2. Remediate: Action or measures taken to lessen, clean up, remove or mitigate the existence of hazardous materials; in accordance with standards, or requirements as may be set out by statutes, rules, regulations or specification.
3. Fix: Receive, unload, handle, store, protect, place and fasten in position; dispose of waste and surplus packaging. To include all labour, materials and site equipment for that purpose.
4. Supply and fix: As above, but including supply of products, components or systems to be fixed, together with everything necessary for their fixing. All products, components or systems are to be supplied and fixed unless stated otherwise.
5. Keep for reuse: Do not damage designated products or work. Clean off bedding and jointing materials. Stack neatly, protect adequately and store until required by the employer/ purchaser, or until required for use in the works as instructed.
6. Keep for recycling: As 'keep for reuse', but relates to a naturally occurring material rather than a manufactured product.
7. Make good: Execute local remedial work to designated work. Make secure, sound and neat. Excludes redecoration and/ or replacement.
8. Replace: Supply and fix new products matching those removed. Execute work to match original new state of that removed.
9. Repair: Execute remedial work to restore something to its original working state. Make secure, sound and neat. Excludes redecoration and/ or replacement.
10. Refix: Fix removed products.
11. Ease: Adjust moving parts of designated products, or work to achieve free movement and good fit in open and closed positions.
12. Match existing: Provide products and work of the same appearance and features as the original, excluding ageing and weathering. Make joints between existing and new work as inconspicuous as possible.
13. System: Equipment, accessories, controls, supports and ancillary items (including installation) necessary for that section of the work to function.

170 Manufacturer and product reference

1. Definition: When used in this combination:
   1.1. Manufacturer: the person or legal entity under whose name or trademark the particular product, component or system is marketed
   1.2. Product reference: the proprietary brand name and/ or identifier by which the particular product, component or system is described.
2. Currency: References are to the particular product as specified in the manufacturer's technical literature current on the date of the invitation to tender.

200 Substitution of products

1. Products: If an alternative product to that specified is proposed, obtain approval before ordering the product.
2. Reasons: Submit reasons for the proposed substitution.
3. Documentation: Submit relevant information, including:
   3.1. manufacturer and product reference;
   3.2. cost;
   3.3. availability;
   3.4. relevant standards;

3.5. performance;
3.6. function;
3.7. compatibility of accessories;
3.8. proposed revisions to drawings and specification;
3.9. compatibility with adjacent work;
3.10. appearance;
3.11. copy of warranty/ guarantee.

4. Alterations to adjacent work: If needed, advise scope, nature and cost.
5. Manufacturers' guarantees: If substitution is accepted, submit before ordering products.

210 Cross references

1. Accuracy: Check remainder of the annotation or item description against the terminology used in the section or clause referred to.
2. Related terminology: Where a numerical cross reference is not given, the relevant sections and clauses of the specification will apply.
3. Relevant clauses: Clauses in the referred to specification section dealing with general matters, ancillary products and execution also apply.
4. Discrepancy or ambiguity: Before proceeding, obtain clarification or instructions.

220 Referenced documents

1. Conflicts: Specification prevails over referenced documents.

230 Equivalent products

1. Inadvertent omission: Wherever products are specified by proprietary name the phrase 'or equivalent' is to be deemed included.

240 Substitution of standards

1. Specification to British Standard or European Standard: Substitution may be proposed complying with a grade or category within a national standard of another Member State of the European Community or an international standard recognised in the UK.
2. Before ordering: Submit notification of all such substitutions.
3. Documentary evidence: Submit for verification when requested as detailed in clause A31/200. Any submitted foreign language documents must be accompanied by certified translations into English.

250 Currency of documents and information

1. Currency: References to published documents are to the editions, including amendments and revisions, current on the date of the Invitation to Tender.

260 Sizes

1. General dimensions: Products are specified by their co-ordinating sizes.
2. Timber: Cross section dimensions shown on drawings are:
   2.1. Target sizes as defined in BS EN 336 for structural softwood and hardwood sections.
   2.2. Finished sizes for non-structural softwood or hardwood sawn and further processed sections.

Documents provided on behalf of employer

410 Additional copies of drawings/ documents

1. Additional copies: Issued free of charge.

440 Dimensions

1. Scaled dimensions: Do not rely on.

450 Measured quantities

1. Ordering products and constructing the Works: The accuracy and sufficiency of the measured quantities is not guaranteed.
2. Precedence: The specification and drawings shall override the measured quantities.

460 The specification

1. Coordination: All sections must be read in conjunction with Main Contract Preliminaries/ General conditions.

Documents provided by contractor/ subcontractors/ suppliers

510 Design and production information

1. Master programme: Make reasonable allowance for completing design/ production information, submission (including information relevant to the CDM Regulations), comment, inspection, amendment, resubmission and reinspection.
2. Design/ production information: Submit two copies, one could be returned with comments and this will be deemed to be a direction, notice or instruction under the Contract. Ensure that any necessary amendments are made without delay and resubmit unless it is confirmed that it is not required.
3. Contractor's changes to Employer's Requirements: Support request for substitution or variation with all relevant information.
4. Employer's amendments to Employer's Requirements: If considered to involve a variation, which has not already been acknowledged as a variation, notify without delay (maximum period 7 days), and do not proceed until instructed. Claims for extra cost, if made after it has been carried out, may not be allowed.
5. Final version of design/ production information: Submit two copies.

550 Named subcontractors: Design and production information

1. General: Certain Subcontractors are/ will be required to provide design/ production information during the contract as described in the Conditions of Contract, clause 3.7.
2. Master programme: Make reasonable allowance, based on information in section A30, for completing design/ production information, checking, submission (including information relevant to the CDM Regulations), comment, inspection, amendment, resubmission and reinspection.
3. Information from Subcontractors
   - 3.1. Obtain in time to meet the programme and in accordance with NAM/T where applicable.
   - 3.2. Check dimensions are correct, account is taken of all related work, and construction is practicable. Note any comments on one copy of the design/ production information, then submit with the required number of additional unmarked copies. Such checking will not relieve the CA or the Subcontractors of their respective responsibilities for design, co-ordination and documentation.
4. Inspection and comments: One copy will be marked and returned to Contractor. This will not relieve the Subcontractors of their responsibility for design and documentation. Ensure that any

necessary amendments are made without delay and resubmit unless it is confirmed that it is not required.

5. Final version of information: Distribute copies to all affected Subcontractors and others and keep one copy on site.
6. Submit two copies.

600 Contractor's Design information

1. General: Complete the design and detailing of parts of the Works as specified.
2. Provide
   2.1. Production information based on the drawings, specification and other information.
   2.2. Liaison to ensure coordination of the work with related building elements and services.
3. Master programme: Make reasonable allowance for completing design/ production information, submission (including information relevant to the CDM Regulations), comment, inspection, amendment, resubmission and reinspection.
4. Information required: In accordance with Section A20
   4.1. Format: Hard copy/Electronic
   4.2. Number of copies: Two
5. Submit: Within one week of request.

610 Production information

1. Contractor/ Domestic subcontractor provide: As required throughout the course of the works.
2. Submit
   2.1. For comment and make any necessary amendments.
   2.2. Sufficient copies of final version for distribution to all affected parties.

620 As-built drawings and information

1. Contractor designed work: Provide drawings/ information:
   1.1. In accordance with Section A20.
2. Submit: At least two weeks before date for completion.

630 Technical literature

1. Information: Keep on site for reference by all supervisory personnel:
   1.1. Manufacturers' current literature relating to all products to be used in the Works.
   1.2. Relevant British, EN or ISO Standards.

640 Maintenance instructions and guarantees

1. Components and equipment: Obtain or retain copies, register with manufacturer and hand over on or before completion of the Works.
2. Information location: In Building Manual.
3. Emergency call out services: Provide telephone numbers for use after completion. Extent of cover: twenty four hours seven days a week.

650 Energy rating calculation

1. Calculation documentation
   1.1. Number of copies: Two
   1.2. Deliver to: Energy Performance Certificate Assessor and also lodge in the Building Manual.

Document/ data interchange - No Amendments

Ω End of Section

A32
Management of the works

Generally

110 Supervision

1. General: Accept responsibility for coordination, supervision and administration of the Works, including subcontracts.
2. Coordination: Arrange and monitor a programme with each subcontractor, supplier, local authority and statutory undertaker, and obtain and supply information as necessary for coordination of the work.

115 Considerate Constructors Scheme

1. Registration: Before starting work, register the site and pay the appropriate fee.
2. Contact
   - 2.1. Address: Considerate Constructors Scheme Office, PO Box 75, Great Amwell, Ware, Hertfordshire, SG12 0YX.
   - 2.2. Tel: 01920 485959.
   - 2.3. Fax: 01920 485958.
   - 2.4. Free phone: 0800 7831423.
   - 2.5. Web: www.ccscheme.org.uk.
   - 2.6. E mail: enquiries@ccscheme.org.uk.
3. Standard: Comply with the scheme's Code of Considerate Practice.
   - 3.1. Minimum compliance level: Refer to Local Authority for guidance

117 Constructing Better Health scheme

1. Membership: Register and submit evidence of registration.
2. Contact
   - 2.1. Constructing Better Health, B&CE Building, Manor Royal, Crawley, West Sussex RH10 9QP.
   - 2.2. Tel: 0845 873 7726
   - 2.3. Email: info@cbhscheme.co.uk
   - 2.4. Website: www.cbhscheme.co.uk

118 Vehicle safety requirements

1. Vehicle equipment: Ensure that all vehicles have the following:
   - 1.1. Audible alert to other road users to the planned movement of the vehicle when the vehicle's indicators are in operation.
   - 1.2. Prominent signage at the rear of the vehicle to warn cyclists of the dangers of passing the vehicle on the inside.
   - 1.3. Properly adjusted class VI mirror/s or Fresnel lens to eliminate the near side blind spot.
   - 1.4. Side under run guards.
2. Driver training
   - 2.1. Drivers must be trained on vulnerable road user safety through an approved course and hold a current valid Certificate of Competence.
   - 2.2. Drivers must have a valid driving licence and be legally able to drive the vehicle.

3. Scheme membership: Submit evidence of registration with and accreditation to the Fleet Operator Recognition Scheme (FORS)
4. Level of accreditation: Gold
5. Submittal date: Before commencement of operations on site

120 Insurance

1. Documentary evidence: Before starting work on site submit details, and/ or policies and receipts for the insurances required by the Conditions of Contract.

130 Insurance claims

1. Notice: If any event occurs which may give rise to any claim or proceeding in respect of loss or damage to the Works or injury or damage to persons or property arising out of the Works, immediately give notice to the employer/ client, the person administering the Contract on their behalf and the Insurers.
2. Failure to notify: Indemnify the employer/ client against any loss, which may be caused by failure to give such notice.

140 Climatic conditions

1. Information: Record accurately and retain:
    1.1. Daily maximum and minimum air temperatures (including overnight).
    1.2. Delays due to adverse weather, including description of the weather, types of work affected and number of hours lost.

150 Ownership

1. Alteration/ clearance work: Materials arising become the property of the Contractor except where otherwise stated. Remove from site as work proceeds.

Programme/ progress

210 Programme

1. Master programme: When requested and before starting work on site, submit in an approved form a master programme for the works, which must include details of:
    1.1. Design, production information and proposals provided by the contractor/ subcontractors/ suppliers, including inspection and checking (see section A31).
    1.2. Planning and mobilization by the contractor.
    1.3. Earliest and latest start and finish dates for each activity and identification of all critical activities.
    1.4. Running in, adjustment, commissioning and testing of all engineering services and installations
    1.5. Work resulting from instructions issued in regard to the expenditure of provisional sums (see section A54)
    1.6. Work by or on behalf of the employer and concurrent with the contract (see section A50). The nature and scope of which, the relationship with preceding and following work and any relevant limitations are suitably defined in the contract documents.
2. Exclusions: Where and to the extent that the programme implications for work which is not so defined are impossible to assess, exclude it and confirm this when submitting the programme.
3. Submit: two copies

230 Submission of programme

1. Further information: Submission of the programme will not relieve the Contractor of the responsibility to advise of the need for further drawings or details or instructions in accordance with the Contract.

240 Notice of commencement of work

1. Part of the work: Commencement on site
2. Notice period (minimum): one week

250 Monitoring

1. Progress: Record on a copy of the programme kept on site.
2. Avoiding delays: If any circumstances arise which may affect the progress of the Works submit proposals or take other action as appropriate to minimize any delay and to recover any lost time.
3. Key Performance Indicators
   - 3.1. Details: As required
   - 3.2. Performance: Record progress against each KPI.
   - 3.3. Corrective action: If performance falls below target, submit proposals as soon as possible.

260 Site meetings

1. General: Site meetings will be held to review progress and other matters arising from administration of the Contract.
2. Frequency: Every two weeks
3. Location: TBC
4. Accommodation: Ensure availability at the time of such meetings.
5. Attendees: Attend meetings and inform subcontractors and suppliers when their presence is required.
6. Chairperson (who will also take and distribute minutes): Contract Administrator

265 Contractor's progress report

1. General: Submit a progress report at least two days before the site meeting.
2. Content: Notwithstanding the Contractor's obligations under the Contract the report must include:
   - 2.1. A progress statement by reference to the master programme for the Works.
   - 2.2. Details of any matters materially affecting the regular progress of the Works.
   - 2.3. Subcontractors' and suppliers' progress reports.
   - 2.4. Any requirements for further drawings or details or instructions to fulfil any obligations under the Conditions of Contract.

270 Contractor’s site meetings

1. General: Hold meetings with appropriate subcontractors and suppliers shortly before main site meetings to facilitate accurate reporting of progress.

280 Photographs

1. Number of locations: As required by the CA
2. Frequency of intervals: Fortnightly
3. Image format: Digital
4. Number of images from each location: As required by the CA

5. Other requirements: None

285 Partial possession by Employer

1. Clause 2.25 of Conditions of Contract: Ensure all necessary access, services and other associated facilities are also complete.

290 Notice of completion

1. Requirement: Give notice of the anticipated dates of completion of the whole or parts of the Works.
2. Associated works: Ensure necessary access, services and facilities are complete.
3. Period of notice (minimum): Two weeks

310 Extensions of time

1. Notice: When a notice of the cause of any delay or likely delay in the progress of the works is given under the contract, written notice must also be given of all other causes which apply concurrently.
2. Details: As soon as possible submit:
    2.1. Relevant particulars of the expected effects, if appropriate, related to the concurrent causes.
    2.2. An estimate of the extent, if any, of the expected delay in the completion of the Works beyond the date for completion.
    2.3. All other relevant information required.

Control of cost

410 Cash flow forecast

1. Submission: Before starting work on site, submit a forecast showing the gross valuation of the Works at the date of each Interim Certificate throughout the Contract period. Base on the programme for the Works.

420 Removal/ replacement of existing work

1. Extent and location: Agree before commencement.
2. Execution: Carry out in ways that minimize the extent of work.

430 Proposed instructions

1. Estimates: If a proposed instruction requests an estimate of cost, submit without delay, and in any case within seven days.
2. Include
    2.1. A detailed breakdown of the cost, including any allowance for direct loss and expense.
    2.2. Details of any additional resources required.
    2.3. Details of any adjustments to be made to the programme for the Works.
    2.4. Any other information as is reasonably necessary to fully assess the implications of issuing such an instruction.
3. Inability to comply: Inform immediately if it is not possible to comply with any of the above requirements.

440 Measurement

1. Covered work: Give notice before covering work required to be measured.

450 Daywork vouchers

1. Before commencing work: Give reasonable notice to person countersigning daywork vouchers.
2. Content: Before delivery each voucher must be:
   2.1. Referenced to the instruction under which the work is authorised.
   2.2. Signed by the Contractor's person in charge as evidence that the operatives' names, the time daily spent by each and the equipment and products employed are correct.
3. Submit: By the end of the week in which the work has been executed.

470 Products not incorporated into the Works

1. Ownership: At the time of each valuation, supply details of those products not incorporated into the Works which are subject to any reservation of title inconsistent with passing of property as required by the Conditions of Contract, together with their respective values.
2. Evidence: When requested, provide evidence of freedom of reservation of title.

475 Listed products stored off site

1. Evidence of Title: Submit reasonable proof that the property in 'listed items' is vested in the Contractor.
2. Include for products purchased from a supplier
   2.1. A copy of the contract of sale and a written statement from the supplier that any conditions of the sale relating to the passing of property have been fulfilled and the products are not subject to any encumbrance or charge.
3. Include for products purchased from a supplier by a subcontractor or manufactured or assembled by any subcontractor
   3.1. Copies of the subcontract with the subcontractor and a written statement from the subcontractor that any conditions relating to the passing of property have been fulfilled.

480 Labour and equipment returns

1. Records: Provide for verification at the beginning of each week in respect of each of the previous seven days.
2. Records must show
   2.1. The number and description of craftsmen, labourers and other persons directly or indirectly employed on or in connection with the Works or Services, including those employed by subcontractors.
   2.2. The number, type and capacity of all mechanical, electrical and power-operated equipment employed in connection with the Works or Services

Ω End of Section

A33
Quality standards/ control

Standards of products and executions

110 Incomplete documentation

1. General: Where and to the extent that products or work are not fully documented, they are to be:
   1.1. Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
   1.2. Suitable for the purposes stated or reasonably to be inferred from the project documents.
2. Contract documents: Omissions or errors in description and/ or quantity shall not vitiate the Contract nor release the Contractor from any obligations or liabilities under the Contract.

120 Workmanship skills

1. Operatives: Appropriately skilled and experienced for the type and quality of work.
2. Registration: With Construction Skills Certification Scheme.
3. Verification: When requested, operatives must produce evidence of skills/ qualifications.

130 Quality of products

1. Generally: New. (Proposals for recycled products may be considered).
2. Supply of each product: From the same source or manufacturer.
3. Whole quantity of each product required to complete the Works: Consistent kind, size, quality and overall appearance.
4. Tolerances: Where critical, measure a sufficient quantity to determine compliance.
5. Deterioration: Prevent. Order in suitable quantities to a programme and use in appropriate sequence.

135 Quality of execution

1. Generally: Fix, apply, install or lay products securely, accurately, plumb, neatly and in alignment.
2. Colour batching: Do not use different colour batches where they can be seen together.
3. Dimensions: Check on-site dimensions.
4. Finished work: Not defective, e.g. not damaged, disfigured, dirty, faulty, or out of tolerance.
5. Location and fixing of products: Adjust joints open to view so they are even and regular.

140 Evidence of Compliance

1. Proprietary products: Retain on site evidence that the proprietary product specified has been supplied.
2. Performance specification: Submit evidence of compliance, including test reports indicating:
   2.1. Properties tested.
   2.2. Pass/ fail criteria.
   2.3. Test methods and procedures.
   2.4. Test results.
   2.5. Identity of testing agency.
   2.6. Test dates and times.
   2.7. Identities of witnesses.

2.8. Analysis of results.

150 Inspections

1. Products and executions: Inspection or any other action must not be taken as approval unless confirmed in writing referring to:
   1.1. Date of inspection.
   1.2. Part of the work inspected.
   1.3. Respects or characteristics which are approved.
   1.4. Extent and purpose of the approval.
   1.5. Any associated conditions.

160 Related work

1. Details: Provide all trades with necessary details of related types of work. Before starting each new type or section of work ensure previous related work is:
   1.1. Appropriately complete.
   1.2. In accordance with the project documents.
   1.3. To a suitable standard.
   1.4. In a suitable condition to receive the new work.
2. Preparatory work: Ensure all necessary preparatory work has been carried out.

170 Manufacturer's recommendations/ instructions

1. General: Comply with manufacturer's printed recommendations and instructions current on the date of the Invitation to tender.
2. Exceptions: Submit details of changes to recommendations or instructions.
3. Execution: Use ancillary products and accessories supplied or recommended by main product manufacturer.
4. Products: Comply with limitations, recommendations and requirements of relevant valid certificates.

180 Water for the works

1. Mains supply: Clean and uncontaminated.
2. Other: Do not use until:
   2.1. Evidence of suitability is provided.
   2.2. Tested to BS EN 1008 if instructed.

Samples/ approvals

210 Samples

1. Products or executions: Comply with all other specification requirements and in respect of the stated or implied characteristics either:
   1.1. To an express approval.
   1.2. To match a sample expressly approved as a standard for the purpose.

220 Approval of products

1. Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
2. Approval: Relates to a sample of the product and not to the product as used in the Works. Do not confirm orders or use the product until approval of the sample has been obtained.

3. Complying sample: Retain in good, clean condition on site. Remove when no longer required.

230 Approval of execution

1. Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
2. Approval: Relates to the stated characteristics of the sample. (If approval of the finished work as a whole is required this is specified separately). Do not conceal, or proceed with affected work until compliance with requirements is confirmed.
3. Complying sample: Retain in good, clean condition on site. Remove when no longer required.

Accuracy/ setting out generally

320 Setting out

1. General: Submit details of methods and equipment to be used in setting out the Works.
2. Levels and dimensions: Check and record the results on a copy of drawings. Notify discrepancies and obtain instructions before proceeding.
3. Inform: When complete and before commencing construction.

330 Appearance and fit

1. Tolerances and dimensions: If likely to be critical to execution or difficult to achieve, as early as possible either:
   1.1. Submit proposals; or
   1.2. Arrange for inspection of appearance of relevant aspects of partially finished work.
2. General tolerances (maximum): To BS 5606, tables 1 and 2.

340 Critical dimensions

1. Critical dimensions: Set out and construct the Works to ensure compliance with the tolerances stated.
2. Location: Detailed on drawings (Refer to A20 for list of drawings).

350 Levels of structural floors

1. Maximum tolerances for designed levels to be
   1.1. Floors to be self-finished, and floors to receive sheet or tile finishes directly bedded in adhesive: +/- 10 mm.
   1.2. Floors to receive dry board/ panel construction with little or no tolerance on thickness: +/- 10 mm.
   1.3. Floors to receive mastic asphalt flooring/ underlays directly: +/- 10 mm.
   1.4. Floors to receive mastic asphalt flooring/ underlays laid on mastic asphalt levelling coat(s): +/- 15 mm.
   1.5. Floors to receive fully bonded screeds/ toppings/ beds: +/- 15 mm.
   1.6. Floors to receive unbonded or floating screeds/ beds: +/- 20 mm.

360 Record drawings

1. Site setting out drawing: Record details of all grid lines, setting-out stations, benchmarks and profiles. Retain on site throughout the Contract and hand over on completion.

Services generally

410 Services regulations

1. New or existing services: Comply with the Byelaws or Regulations of the relevant Statutory Authority.

420 Water regulations/ byelaws notification

1. Requirements: Notify Water Undertaker of any work carried out to (or which affects) new or existing services and submit any required plans, diagrams and details.
2. Consent: Allow adequate time to receive Undertaker's consent before starting work. Inform immediately if consent is withheld or is granted subject to significant conditions.

430 Water regulations/ byelaws contractor's certificate

1. On completion of the work: Submit (copy where also required to the Water Undertaker) a certificate including:
    1.1. The address of the premises.
    1.2. A brief description of the new installation and/ or work carried out to an existing installation.
    1.3. The Contractor's name and address.
    1.4. A statement that the installation complies with the relevant Water Regulations or Byelaws.
    1.5. The name and signature of the individual responsible for checking compliance.
    1.6. The date on which the installation was checked.

435 Electrical installation certificate

1. Submit: When relevant electrical work is completed.
2. Original certificate: To be lodged in the Building Manual.

440 Gas, oil and solid fuel appliance installation certificate

1. Before the completion date stated in the Contract: Submit a certificate stating:
    1.1. The address of the premises.
    1.2. A brief description of the new installation and/ or work carried out to an existing installation.
    1.3. Any special recommendations or instructions for the safe use and operation of appliances and flues.
    1.4. The Contractor's name and address.
    1.5. A statement that the installation complies with the appropriate safety, installation and use regulations.
    1.6. The name, qualification and signature of the competent person responsible for checking compliance.
    1.7. The date on which the installation was checked.
2. Certificate location: Health and Safety File & Building Manual

445 Service runs

1. General: Provide adequate space and support for services, including unobstructed routes and fixings.
2. Ducts, chases and holes: Form during construction rather than cut.
3. Coordination with other works: Submit details of locations, types/ methods of fixing of services to fabric and identification of runs and fittings.

450 Mechanical and electrical services

1. Final tests and commissioning: Carry out so that services are in full working order at completion of the Works.
2. Building Regulations notice: Copy to be lodged in the Building Manual.

Supervision/ inspection/ defective work

510 Supervision

1. General: In addition to the constant management and supervision of the Works provided by the Contractor's person in charge, all significant types of work must be under the close control of competent trade supervisors to ensure maintenance of satisfactory quality and progress.
2. Evidence: Submit, including details of the person proposed, their relevant skills training and knowledge; practical experience; qualifications; membership or registration with professional bodies; employment history, work related assessments and management structure.
3. Submittal date: One week before start on site
4. Replacement: Give maximum possible notice before changing person in charge or site agent.

520 Coordination of engineering services

1. Suitability: Site organisation staff must include one or more persons with appropriate knowledge and experience of mechanical and electrical engineering services to ensure compatibility between engineering and the Works generally.
2. Evidence: Submit when requested CVs or other documentary evidence relating to the staff concerned.

530 Overtime working

1. Notice: Prior to overtime being worked, submit details of times, types and locations of work to be done.
   1.1. Minimum period of notice: One week
2. Concealed work: If executed during overtime for which notice has not been given, it may be required to be opened up for inspection and reinstated at the Contractor's expense.

540 Defects in existing work

1. Undocumented defects: When discovered, immediately give notice. Do not proceed with affected related work until response has been received.
2. Documented remedial work: Do not execute work which may:
   2.1. Hinder access to defective products or work; or
   2.2. Be rendered abortive by remedial work.

550 Access for inspection

1. Removal: Before removing scaffolding or other facilities for access, give notice of not less than one week.

560 Tests and inspections

1. Timing: Agree and record dates and times of tests and inspections to enable all affected parties to be represented.
2. Confirmation: One working day prior to each such test or inspection. If sample or test is not ready, agree a new date and time.
3. Records: Submit a copy of test certificates and retain copies on site.

580 Continuity of thermal insulation

1. Record and report: Confirm that work to new, renovated or upgraded thermal elements has been carried out to conform to specification. Include:
    1.1. The address of the premises.
    1.2. The Contractor's name and address.
    1.3. The name, qualification and signature of the competent person responsible for checking compliance.
    1.4. The date on which the installation was checked.
2. Submit: Before completion of the Works.
3. Copy: To be lodged in the building manual.

590 Resistance to passage of sound

1. Method: Pre-completion testing & robust standard details
2. Compliance: Submit results of testing
    2.1. Copies: Incorporate in the Building Manual.

595 Energy performance certificate

1. Assessment: Undertaken by a member of an approved accreditation scheme. Submit details of scheme name and evidence of qualifications when requested.
    1.1. Building Type: Non-dwelling
    1.2. Method: Contractor's choice
2. Format
    2.1. Certificate: To be incorporated in the Building Manual.
    2.2. Report: To be provided to the CA
3. Submit: Before the date for completion stated in the contract

610 Proposals for rectification of defective products/ executions

1. Proposals: Immediately any work or product is known, or appears, to be not in accordance with the Contract, submit proposals for opening up, inspection, testing, making good, adjustment of the Contract Sum, or removal and re-execution.
2. Acceptability: Such proposals may be unacceptable and contrary instructions may be issued.

620 Measures to establish acceptability

1. General: Wherever inspection or testing shows that the work, materials or goods are not in accordance with the contract and measures (e.g. testing, opening up, experimental making good) are taken to help in establishing whether or not the work is acceptable, such measures:
    1.1. Will be at the expense of the Contractor.
    1.2. Will not be considered as grounds for revision of the completion date.

630 Quality control

1. Procedures: Establish and maintain to ensure that the Works, including the work of subcontractors, comply with specified requirements.
2. Records: Maintain full records, keep copies on site for inspection, and submit copies on request.
3. Content of records
    3.1. Identification of the element, item, batch or lot including location in the Works.
    3.2. Nature and dates of inspections, tests and approvals.

3.3. Nature and extent of nonconforming work found.

3.4. Details of corrective action.

Work at or after completion

710 Work before completion

1. General: Make good all damage consequent upon the Works.
2. Temporary markings, coverings and protective wrappings: Remove unless otherwise instructed.
3. Cleaning: Clean the Works thoroughly inside and out, including all accessible ducts and voids. Remove all splashes, deposits, efflorescence, rubbish and surplus materials.
4. Cleaning materials and methods: As recommended by manufacturers of products being cleaned, and must not damage or disfigure other materials or construction.
5. COSHH dated data sheets: Obtain for all materials used for cleaning and ensure they are used only as recommended by their manufacturers.
6. Minor faults: Touch up in newly painted work, carefully matching colour and brushing out edges. Repaint badly marked areas back to suitable breaks or junctions.
7. Moving parts of new work: Adjust, ease and lubricate as necessary to ensure easy and efficient operation, including doors, windows, drawers, ironmongery, appliances, valves and controls.

720 Security at completion

1. General: Leave the Works secure with, where appropriate, all accesses closed and locked.
2. Keys: Account for and adequately label all keys, and hand over together with an itemized schedule, retaining duplicate schedule signed as a receipt.

730 Making good defects

1. Remedial work: Arrange access with Contract Administrator.
2. Rectification: Give reasonable notice for access to the various parts of the Works.
3. Completion: Notify when remedial works have been completed.

Ω End of Section

A34
Security/ safety/ protection

Security, health and safety

110 Pre-construction information

1. Location: Integral with the project Preliminaries, including but not restricted to the following sections:
    1.1. Description of project: Sections A10 and A11.
    1.2. Client's consideration and management requirements: Sections A12, A13 and A36.
    1.3. Environmental restrictions and on-site risks: Section A12, A35 and A34.
    1.4. Significant design and construction hazards: Section A34.
    1.5. The health and safety file: Section A37.

120 Execution hazards

1. Common hazards: Not listed. Control by good management and site practice.
2. Significant hazards: The design of the project includes the following:
    2.1. Hazard: Please refer to the pre-construction information pack appended to the main specification of works.
    2.2. Precautions assumed: Please refer to the pre-construction information pack appended to the main specification of works.
    2.3. Specification reference: Please refer to the pre-construction information pack appended to the main specification of works.
    2.4. Drawing reference: Please refer to the pre-construction information pack appended to the main specification of works.

130 Product hazards

1. Hazardous substances: Site personnel levels must not exceed occupational exposure standards and maximum exposure limits stated in the current version of HSE document EH40: 'Workplace Exposure Limits'.
2. Common hazards: Not listed. Control by good management and site practice.
3. Significant hazards: Specified construction materials include the following:
    3.1. Hazard: Please refer to the pre-construction information pack appended to the main specification of works.
    3.2. Material: Please refer to the pre-construction information pack appended to the main specification of works.
    3.3. Specification reference: Please refer to the pre-construction information pack appended to the main specification of works.

140 Construction phase health and safety plan

1. Submission: Present to the employer/ client no later than 1 week prior to works commencing on site.
2. Confirmation: Do not start construction work until the employer has confirmed in writing that the construction phase health and safety plan includes the procedures and arrangements required by the CDM Regulations.
3. Content: Develop the plan from, and draw on, the outline construction phase health and safety plan, clause A30/570, and the pre-tender health and safety plan/ pre-construction information.

150 Security

1. Protection: Safeguard the site, the Works, products, materials, and any existing buildings affected by the Works from damage and theft.
2. Access: Take all reasonable precautions to prevent unauthorized access to the site, the Works and adjoining property.
3. Special requirements: N/A

160 Stability

1. Responsibility: Maintain the stability and structural integrity of the works and adjacent structures during the contract.
2. Design loads: Obtain details, support as necessary and prevent overloading.

180 Access control

1. Controlled areas: None
2. Control type: N/A
3. Authorised persons: Submit a list of the names of all persons requiring access together with any other related information reasonably required.
4. Return of credentials: When requested or on completion of the work to which the controlled area relates.

190 Occupier's rules and regulations

1. Compliance: Conform to the occupier's rules and regulations affecting the site.
2. Copies
   2.1. Location: on site.
   2.2. Arrangements for inspection: Via the CA

200 Mobile telephones and portable electronic equipment

1. Restrictions on use
   1.1. No use of mobiles for personal use allowed on site.

210 Safety provisions for site visits

1. Safety: Submit details in advance of safety provisions and procedures (including those relating to materials, which may be deleterious), which will require their compliance when visiting the site.
2. Protective clothing and/ or equipment: Provide and maintain on site for visitors to the-site.

220 Working precautions/ restrictions

1. Hazardous areas: Operatives must take precautions as follows:
   1.1. Work area: Please refer to the pre-construction information pack appended to the main specification of works.
   1.2. Precautions: Please refer to the pre-construction information pack appended to the main specification of works.
2. Permit to work: Operatives must comply with procedures in the following areas:
   2.1. Work area: Please refer to the pre-construction information pack appended to the main specification of works.
   2.2. Procedures: Please refer to the pre-construction information pack appended to the main specification of works.

Protect against the following

310 Explosives

1. Use: Not permitted.

320 Noise consent by local authority

1. Consent: Granted by the local authority under Part III of the Control of Pollution Act relating to the works providing the following conditions are met:
   1.1. All noisy works are to be in line with the Local Authority's noisy works hours policy.

340 Pollution

1. Prevention: Protect the site, the works and the general environment (including the atmosphere, land, streams and waterways) against pollution.
2. Contamination: If pollution occurs, report immediately, including to the appropriate authorities, and provide relevant information.

350 Pesticides

1. Use: Not permitted.

360 Nuisance

1. Duty: Prevent nuisance from smoke, dust, rubbish, vermin and other causes.
2. Surface water: Prevent hazardous build-up on-site, in excavations and to surrounding areas and roads.

370 Asbestos containing materials

1. Duty: Report immediately any suspected materials discovered during execution of the works.
   1.1. Do not disturb.
   1.2. Agree methods for safe removal or encapsulation.

371 Dangerous or hazardous substances

1. Duty: Report immediately suspected materials discovered during execution of the works.
   1.1. Do not disturb.
   1.2. Agree methods for safe removal or remediation.

380 Fire prevention

1. Duty: Prevent personal injury or death, and damage to the Works or other property from fire.
2. Standard: Comply with Joint Code of Practice 'Fire Prevention on Construction Sites', published by Construction Industry Publications and The Fire Protection Association (The 'Joint Fire Code').

390 Smoking on-site

1. Smoking on-site: Not permitted.

400 Burning on-site

1. Burning on-site: Not permitted.

410 Moisture

1. Wetness or dampness: Prevent, where this may cause damage to the Works.

2. Drying out: Control humidity and the application of heat to prevent:
   2.1. Blistering and failure of adhesion.
   2.2. Damage due to trapped moisture.
   2.3. Excessive movement.

420 Infected timber/ Contaminated materials

1. Removal: Where instructed to remove material affected by fungal/ insect attack from the building, minimize the risk of infecting other parts of the building.
2. Testing: carry out and keep records of appropriate tests to demonstrate that hazards presented by concentrations of airborne particles, toxins and other microorganisms are within acceptable levels.

430 Waste

1. Waste: Includes rubbish, debris, spoil, containers and packaging, and surplus material requiring disposal.
2. Requirement: Minimize production and prevent accumulation of waste. Keep the site and works clean and tidy. Clean out voids and cavities in the construction before closing.
3. Disposal: Collect and store in suitable containers. Remove from site and dispose of in a safe and competent manner, as approved and directed by the waste regulation authority.
4. Recyclable material: Sort and dispose of at a materials recycling facility approved by the waste regulation authority.
5. Documentation: Retain on-site.

440 Electromagnetic interference

1. Duty: Prevent excessive electromagnetic disturbance to apparatus outside the site.

450 Laser equipment

1. Construction laser equipment: Install, use and store in accordance with BS EN 60825-1 and the manufacturer's instructions.
2. Class 1 or Class 2 laser equipment: Ensure laser beam is not set at eye level and is terminated at the end of its useful path.
3. Class 3R and Class 3B laser equipment: Do not use without approval and subject to submission of a method statement on its safe use.

460 Powder actuated fixing systems

1. Use: Not permitted.

470 Invasive species

1. General: Prevent the spread of species (e.g. plants or animals) that may adversely affect the site or works economically, environmentally or ecologically.
2. Special precautions:
3. Duty: Report immediately any suspected invasive species discovered during execution of the works.
   3.1. Do not disturb.
   3.2. Agree methods for safe eradication or removal.

Protect the following

510 Existing services

1. Confirmation: Notify all service authorities, statutory undertakers and/ or adjacent owners of proposed works not less than one week before commencing site operations.
2. Identification: Before starting work, check and mark positions of utilities/ services. Where positions are not shown on drawings obtain relevant details from service authorities, statutory undertakers or other owners.
3. Work adjacent to services
   - 3.1. Comply with service authority's/ statutory undertaker's recommendations.
   - 3.2. Adequately protect, and prevent damage to services: Do not interfere with their operation without consent of service authorities/ statutory undertakers or other owners.
4. Identifying services
   - 4.1. Below ground: Use signboards, giving type and depth;
   - 4.2. Overhead: Use headroom markers.
5. Damage to services: If any results from execution of the Works:
   - 5.1. Immediately give notice and notify appropriate service authority/ statutory undertaker.
   - 5.2. Make arrangements for the work to be made good without delay to the satisfaction of service authority/ statutory undertaker or other owner as appropriate.
   - 5.3. Any measures taken to deal with an emergency will not affect the extent of the Contractor's liability.
6. Marker tapes or protective covers: Replace, if disturbed during site operations, to service authority's/ statutory undertakers recommendations.

520 Roads and footpaths

1. Duty: Maintain roads and footpaths within and adjacent to the site and keep clear of mud and debris.
2. Damage caused by site traffic or otherwise consequent upon the Works: Make good to the satisfaction of the Employer, Local Authority or other owner.

530 Existing topsoil/ subsoil

1. Duty: Prevent over compaction of existing topsoil and subsoil in those areas which may be damaged by construction traffic, parking of vehicles, temporary site accommodation or storage of materials and which will require reinstatement prior to completion of the Works.
2. Protection: Before starting work submit proposals for protective measures.

540 Retained trees/ shrubs/ grassed areas

1. Protection: Preserve and prevent damage, except those not required.
2. Replacement: Mature trees and shrubs if uprooted, destroyed, or damaged beyond reasonable chance of survival in their original shape, as a consequence of the Contractor's negligence, must be replaced with those of a similar type and age at the Contractor's expense.

550 Retained trees

1. Protected area: Unless agreed otherwise, do not:
   - 1.1. Dump spoil or rubbish, excavate or disturb topsoil, park vehicles or plant, store materials or place temporary accommodation within the root protection area.
   - 1.2. Sever roots exceeding 25 mm in diameter. If unintentionally severed, give notice and seek advice.

1.3. Change level of ground within an area 3 m beyond branch spread.

560 Existing features

1. Protection: Prevent damage to existing buildings, fences, gates, walls, roads, paved areas and other site features, which are to remain in position during execution of the Works.
2. Special requirements: N/A

570 Existing work

1. Protection: Prevent damage to existing work, structures or other property during the course of the work.
2. Removal: Minimum amount necessary.
3. Replacement work: To match existing.

580 Building interiors

1. Protection: Prevent damage from exposure to the environment, including weather, flora, fauna, and other causes of material degradation during the course of the work.

600 Existing furniture, fittings and equipment

1. Protection: Prevent damage or move as necessary to enable the Works to be executed. Reinstate in original positions.
2. Extent: Before work in each room starts, the following will be removed:

   2.1. …….

610 Especially valuable/ vulnerable items

1. Protection: Ensure provision and maintenance of special protective measures to prevent damage to the following:

   1.1. N/A.
2. Method statement: Submit within one week of request describing special protection to be provided.

620 Adjoining property

1. Agreement: Access to and/ or use of the following has been agreed with adjacent owners:

   1.1. Obtain as necessary from other owners if requiring.
2. Permission: Obtain as necessary from other owners if requiring to erect scaffolding on or otherwise use adjoining property.

625 Adjoining property restrictions

1. Precautions

   1.1. Prevent trespass of workpeople and take precautions to prevent damage to adjoining property.

   1.2. Pay all charges.

   1.3. Remove and make good on completion or when directed.
2. Damage: Bear cost of repairing damage arising from execution of the Works.

630 Existing structures

1. Duty: Check proposed methods of work for effects on adjacent structures inside and outside the site boundary.

2. Supports: During execution of the Works:
   2.1. Provide and maintain all incidental shoring, strutting, needling and other supports as may be necessary to preserve stability of existing structures on the site or adjoining that may be endangered or affected by the Works.
   2.2. Do not remove until new work is strong enough to support existing structure.
   2.3. Prevent overstressing of completed work when removing supports.
3. Adjacent structures: Monitor and immediately report excessive movement.
4. Standard: Comply with BS 5975 and BS EN 12812.

640 Materials for recycling/ reuse

1. Duty: Sort and prevent damage to stated products or materials, clean off bedding and jointing materials and other contaminants.
2. Storage: Stack neatly and protect until required by the Employer or for use in the Works as instructed.

Ω End of Section

A35
Specific limitations on method/ sequence/ timing

Clauses

110 Scope

1. General: The limitations described in this section are supplementary to limitations described or implicit in information given in other sections or on the drawings.

120 Design constraints

1. Details: None at prsent

130 Method/ sequence of work

1. Specific Limitations: Include the following in the programme:
   1.1. To be agreed..

140 Scaffolding

1. Scaffolding: Make available to subcontractors and others at all times.

160 Use or disposal of materials

1. Specific limitations: N/A

170 Working Hours

1. Specific limitations: In line with the Local Authority Noisy Working Hours policy.

180 Completion in sections or in parts

1. General: Where the Employer is to take possession of any Section or part of the Works and such Section or part will, after its practical completion, depend for its adequate functioning on work located elsewhere on the site: Complete such other work in time to permit such possession to take place.
2. Remainder of the Works: During execution, ensure that completed Sections or parts of the Works have continuous and adequate provision of services, fire precautions, means of escape and safe access.

Ω End of Section

A36
Facilities/ temporary work/ services

Generally

110 Spoil heaps, temporary works and services

1. Location: Give notice and details of intended siting.
2. Maintenance: Alter, adapt and move as necessary. Remove when no longer required and make good.

Accommodation

210 Room for meetings

1. Facilities: Provide suitable temporary accommodation for site meetings, adequately heated and lit. The room may be part of the Contractor's own site offices.
2. Furniture and Equipment: Provide table and chairs for 12 people.

220 Site Accommodation

1. Purpose: Sufficient to facilitate the works
2. Facilities: Provide and obtain approval of suitable lockable temporary accommodation and facilities as follows:
   - 2.1. Status: May be part of the contractor's own accommodation
   - 2.2. Location: To be agreed.
   - 2.3. Floor area: As required to carry out the works.
   - 2.4. Furniture and equipment: As required to carry out the works.
   - 2.5. Temperature control: As required to carry out the works.
   - 2.6. Lighting: As required to carry out the works.
   - 2.7. Services: As required to carry out the works.
   - 2.8. Sanitary facilities: As required to carry out the works.
   - 2.9. Consumables: As required to carry out the works.
   - 2.10. Attendance: As required to carry out the works.

230 Temporary accommodation

1. Accommodation made available by the Employer: The following may be used for the duration of the Contract without charge provided that:
   - 1.1. It is used solely for the purposes of carrying out the Works.
   - 1.2. The use to which it is put does not involve undue risk of damage.
   - 1.3. Any temporary adaptations are approved by or on behalf of the Employer before being carried out.
   - 1.4. It is vacated on completion of the Works or determination of the Contract.
   - 1.5. When vacated, its condition is at least equivalent to its condition at the start of the Contract.
2. Description: As required to carry out the works.
3. Available services and facilities: As required to carry out the works.

260 Sanitary accommodation

1. Requirement: Provide sanitary accommodation for the Employer/ Purchaser, and other members of the consultant team, either separate or shared with the Contractor's supervisory staff. Maintain in clean condition and provide all consumables.

280 Accommodation Use/ Location

1. Restrictions
    1.1. Location on site.
    1.2. Timing: At all times during the course as required.

290 Parking

1. Provide and maintain exclusively for use by Employer's representatives: Outside main entrance

Temporary works

310 Roads

1. Permanent roads, hard standings and footpaths on the site: The following may be used, subject to clause A34/520:
    1.1. Details: Existing roads and hard surfaces
    1.2. Restrictions on use: None.
    1.3. Protective or remedial measures: None.

320 Temporary works

1. Employer's specific requirements: Provide: TBC.

340 Name boards/ advertisements

1. Name boards/ advertisements: Not permitted.

Services and facilities

410 Lighting

1. Finishing work and inspection: Provide temporary lighting, the intensity and direction of which closely resembles that delivered by the permanent installation.

420 Lighting and power

1. Supply: Electricity from the existing mains may be used for the Works as follows:
    1.1. Metering: Free of charge
    1.2. Point of supply: As existing on site.
    1.3. Available capacity: As existing on site.
    1.4. Frequency: 50 Hz.
    1.5. Phase: As existing on site.
    1.6. Current: Alternating.
2. Continuity: No responsibility will be accepted for the consequences of failure or restriction in supply.

425 Gas

1. Supply: The existing mains may be used for the Works as follows:

1.1. Metering: Free of charge
1.2. Source: As existing on site.
1.3. Location of supply point: As existing on site.
1.4. Conditions/ Restrictions: As existing on site.

2. Continuity: No liability will be accepted for the consequences of failure or restriction in supply.

430 Water

1. Supply: The existing mains may be used for the Works as follows:
   1.1. Metering: Free of charge
   1.2. Source: As existing on site.
   1.3. Location of supply point: As existing on site.
   1.4. Conditions/ Restrictions: As existing on site.
2. Continuity: No responsibility will be accepted for the consequences of failure or restriction in supply.

440 Telephones

1. Temporary on site telephone: Provide as soon as practicable after the start on site for joint use by the Contractor and Subcontractors and pay all charges.
2. Responses: Make arrangements (e.g. an external bell) to ensure that incoming calls are answered promptly.

440 Mobile telephones

1. Direct communication: As soon as practicable after the start on site:
   1.1. provide the Contractor's person in charge with a mobile telephone.
   1.2. pay all charges reasonably incurred.

470 E-mail and internet facility

1. General: As soon as practicable after the start on site provide a suitable e-mail facility on site, with a separate dedicated telephone line, for the use of the Contractor, Subcontractors and other members of the project team.
2. Use on behalf of Employer: Allow for the cost of a reasonable number of transmissions made by other members of the project team.
3. Peripherals: None.

530 Beneficial use of installed systems

1. The following permanent systems may be used for the Works: Heating, Supply, Disposal, Mechanical, Electrical Communications
2. Details: As existing on site.

540 Meter readings

1. Charges for service supplies: Where to be apportioned ensure that:
   1.1. Meter readings are taken by relevant authority at possession and/ or completion as appropriate.
   1.2. Copies of readings are supplied to interested parties.

550 Thermometers

1. General: Provide on site and maintain in accurate condition a maximum and minimum thermometer for measuring atmospheric shade temperature, in an approved location.

560 Surveying Equipment

1. General: Provide on site and maintain in accurate condition: As required to carry out the works..

570 Personal protective equipment

1. General: Provide for the sole use of other members of the project team, in sizes to be specified:
   1.1. Safety helmets to BS EN 397, neither damaged nor time-expired. Number required: 12
   1.2. High-visibility waistcoats to BS EN ISO 20471 Class 2. Number required: 12.
   1.3. Safety boots with steel insole and toecap to BS EN ISO 20345. Pairs required: 12
   1.4. Disposable respirators to BS EN 149.FFP1S.
   1.5. Eye protection to BS EN ISO 16321-1 and BS EN ISO 16321-3.
   1.6. Ear protection - muffs to BS EN 352-1, plugs to BS EN 352-2
   1.7. Hand protection - to BS EN 388, 407, 420 or 511, as appropriate.

Ω End of Section

A37
Operation/ maintenance of the finished works

Generally

110 The building manual

1. Purpose: The manual is to be a comprehensive information source and guide for owners and users of the completed works. It should provide an overview of the main design principles and describe key components and systems to enable proper understanding, efficient and safe operation and maintenance.
2. Scope
   - 2.1. Part 1: General: content as clause 120.
   - 2.2. Part 2: Fabric: content as clause 130.
   - 2.3. Part 3: Services: content as clause 140.
   - 2.4. Part 4: The Health and Safety File: content as clause 150.
   - 2.5. Part 5: Building User Guide: content as clause 151.
3. Responsibility: The building manual is to be produced by the Contractor and must be complete no later than 2 weeks before practical compleation.
4. Information provided by others: Details: N/A.
5. Compilation
   - 5.1. Prepare all information for contractor designed or performance specified work including as-built drawings.
   - 5.2. Obtain or prepare all other information to be included in the manual.
6. Reviewing the manual: Submit a complete draft. Amend in the light of any comments and resubmit. Do not proceed with production of the final copies until authorized.
7. Final copies of the manual
   - 7.1. Number of copies: Two
   - 7.2. Format: Hard copy and electronic
   - 7.3. Latest date for submission: 2 weeks before the date for completion stated in the contract.
8. As-built drawings and schedules
   - 8.1. Number of copies: Two
   - 8.2. Format: Hard copy and electronic

115 The Health and Safety File

1. Responsibility: the contractor
2. Content: Obtain and provide the following information: as required by the CDM regulations.
3. Format: Hard copy and electronic
4. Delivery to: Contract Administrator By (date): 1 week after practical compleation.

120 Content of the building manual part 1: General

1. Content: Obtain and Provide the following, including all relevant details not included in other parts of the manual:
2. Index: list the constituent parts of the manual, together with their location in the document.
3. The Works
   - 3.1. Description of the buildings and facilities.

3.2. Ownership and tenancy, where relevant
3.3. Health and Safety information – other than that specifically required by the Construction (Design and Management) Regulations.

4. The Contract
   4.1. Names and addresses and contact details of all significant consultants, contractors, subcontractors, suppliers and manufacturers.
   4.2. Overall design criteria.
   4.3. Environmental performance requirements
   4.4. Relevant authorities, consents and approvals.
   4.5. Third party certification, such as those made by "competent" persons in accordance with the Building Regulations
5. Operational requirements and constraints of a general nature
   5.1. Maintenance contracts and contractors.
   5.2. Fire safety strategy for the buildings and the site. Include drawings showing emergency escape and fire appliance routes, fire resisting doors location of emergency alarm and fire fighting systems, services, shut off valves switches, etc.
   5.3. Emergency procedures and contact details in case of emergency.
   5.4. Other specific requirements: None.
6. Description and location of other key documents.
7. Timescale for completion: 1 week after practical compleation

130 Content of the building manual part 2: Building fabric

1. Content: Obtain and Provide the following, including all relevant details not included in other parts of the manual:
2. Detailed design criteria, including
   2.1. Floor and roof loadings.
   2.2. Durability of individual components and elements.
   2.3. Loading restrictions.
   2.4. Insulation values.
   2.5. Fire ratings.
   2.6. Other relevant performance requirements.
3. Construction of the building
   3.1. A detailed description of methods and materials used.
   3.2. As-built drawings recording the construction, together with an index.
   3.3. Information and guidance concerning repair, renovation or demolition/ deconstruction.
4. Periodic building maintenance guide chart.
5. Inspection reports.
6. Manufacturer's instructions index, including relevant COSHH data sheets and recommendations for cleaning, repair and maintenance of components.
7. Fixtures, fittings and components schedule and index.
8. Guarantees, warranties and maintenance agreements – obtain from manufacturers, suppliers and subcontractors.
9. Test certificates and reports required in the specification or in accordance with legislation, including
   9.1. Air permeability.

9.2. Resistance to passage of sound.
9.3. Continuity of insulation.
9.4. Electricity and Gas safety.

10. Other specific requirements: None
11. Timescale for completion: 1 week after practical compleation

140 Content of the building manual part 3: Building services

1. Content: Obtain and Provide the following, including all relevant details not included in other parts of the manual:
2. Detailed design criteria and description of the systems, including
   2.1. Services capacity, loadings and restrictions
   2.2. Services instructions.
   2.3. Services log sheets.
   2.4. Manufacturers' instruction manuals and leaflets index.
   2.5. Fixtures, fittings and component schedule index.
3. Detailed description of methods and materials used.
4. As-built drawings for each system recording the construction, together with an index, including
   4.1. Diagrammatic drawings indicating principal items of plant, equipment and fittings
   4.2. Record drawings showing overall installation
   4.3. Schedules of plant, equipment, valves, etc. describing location, design performance and unique identification cross referenced to the record drawings.
   4.4. Identification of services – a legend for colour coded services.
5. Product details, including for each item of plant and equipment
   5.1. Name, address and contact details of the manufacturer.
   5.2. Catalogue number or reference
   5.3. Manufacturer's technical literature, including detailed operating and maintenance instructions.
   5.4. Information and guidance concerning dismantling, repair, renovation or decommissioning.
6. Operation: A description of the operation of each system, including:
   6.1. Starting up, operation and shutting down
   6.2. Control sequences
   6.3. Procedures for seasonal changeover
   6.4. Procedures for diagnostics, troubleshooting and faultfinding.
7. Guarantees, warranties and maintenance agreements – obtain from manufacturers, suppliers and subcontractors.
8. Commissioning records and test certificates list for each item of plant, equipment, valves, etc. used in the installations – including
   8.1. Electrical circuit tests.
   8.2. Corrosion tests.
   8.3. Type tests.
   8.4. Work tests.
   8.5. Start and commissioning tests.
9. Equipment settings: Schedules of fixed and variable equipment settings established during commissioning.

10. Preventative maintenance: Recommendations for frequency and procedures to be adopted to ensure efficient operation of the systems
11. Lubrication: Schedules of all lubricated items
12. Consumables: A list of all consumable items and their source.
13. Spares: A list of recommended spares to be kept in stock, being those items subject to wear and tear or deterioration and which may involve an extended delivery time when replacements are required.
14. Emergency procedures for all systems, significant items of plant and equipment.
15. Annual maintenance summary chart.
16. Other specific requirements: None
17. Timescale for completion: 1 week after practical compleation

150 Content of the building manual part 4: the Health and Safety File

1. Content: obtain and provide the following, including all relevant details not included in other parts of the manual, including:
    1.1. residual hazards and how they have been dealt with
    1.2. hazardous materials used
    1.3. information regarding the removal or dismantling of installed plant and equipment
    1.4. health and safety information about equipment provided for cleaning or maintaining the structure;
    1.5. the nature, location and markings of significant services,
    1.6. information and as-built drawings of the structure, its plant and equipment
2. Information prepared by others: Details: As required.
3. Timescale for completion: 1 week after practical compleation
4. Submit to: Contract administrator

151 Content of the building manual part 5: the building user guide

1. Content: Obtain and provide the following:
    1.1. Building services information.
    1.2. Emergency information.
    1.3. Energy & environmental strategy.
    1.4. Water use.
    1.5. Transport facilities.
    1.6. Materials & waste policy.
    1.7. Re-fit/ re-arrangement considerations.
    1.8. Reporting provision.
    1.9. Training.
    1.10. Links & references.
2. Other specific requirements: None
3. Timescale for completion: 1 week after practical compleation

160 Presentation of building manual

1. Format: A4 size, plastics covered, loose leaf, four ring binders with hard covers, each indexed, divided and appropriately cover titled.

2. Selected drawings needed to illustrate or locate items mentioned in the Manual: Where larger than A4, to be folded and accommodated in the binders so that they may be unfolded without being detached from the rings.
3. As-built drawings: The main sets may form annexes to the Manual.

190 Maintenance service

1. Scope: Provide a comprehensive maintenance service for the following items of plant and equipment. Include all planned preventative maintenance, as set out within the maintenance schedule, and replacement of all consumable items.
2. Terms: As required
3. Commencement: From the date of practical compleation
4. Duration: 12 months defect rectification period.

220 Training

1. Objective: Before Completion, explain and demonstrate to designated maintenance staff the purpose, function and operation of the installations including items and procedures listed in the Building Manual.
2. Level of training As required .
3. Time allowance: Include a minimum of three days.

230 Spare parts

1. General: Before Completion submit a priced schedule of spare parts that the Contractor recommends should be obtained and kept in stock for maintenance of the services installations.
2. Content: Include in the priced schedule for:
   2.1. Manufacturers' current prices, including packaging and delivery to site.
   2.2. Checking receipts, marking and numbering in accordance with the schedule of spare parts.
   2.3. Referencing to the plant and equipment list in Part 3 of the Building Manual.
   2.4. Painting, greasing, etc. and packing to prevent deterioration during storage.
3. Latest date for submission: Three weeks before completion

250 Tools

1. General: Provide tools and portable indicating instruments for the operation and maintenance of all services plant and equipment (except any installed under Named Subcontracts) together with suitable means of identifying, storing and securing.
2. Quantity: Two complete sets.
3. Time of submission: At completion.

Ω End of Section

A40
Contractor's general cost items: management and staff

Clauses

110 Management and staff

1. Cost-significant items: CONTRACTOR TO PRICE HERE:

Ω End of Section

A41
Contractor's general cost items: site accommodation

Clauses

110 Site accommodation

1. Details: Site accommodation required or made/ not made available by the Employer: See section A36.
2. Cost significant items: CONTRACTOR TO PRICE HERE:

Ω End of Section

A42
Contractor's general cost items: services and facilities

Clauses

110 Services and facilities

1. Details: Services or facilities required or made/ not made available by the Employer: See section A36.
2. Cost significant items: CONTRACTOR TO PRICE HERE:

Ω End of Section

A43
Contractor's general cost items: mechanical plant

Clauses

110 Mechanical plant

1. Cost significant items: CONTRACTOR TO PRICE HERE:

Ω End of Section

A44
Contractor's general cost items: temporary works

Clauses

110 Temporary works

1. Details: Temporary works required or made/ not made available by the Employer: See section A36.
2. Cost significant items: CONTRACTOR TO PRICE HERE:

Ω End of Section

A50
Work/ products by/ on behalf of the employer

Clauses

110 Work by/ on behalf of employer

1. Title: N/A
2. Description of work: N/A
3. Carried out by: N/A
4. Attendance: Allow for the following additional to those reasonably required by the conditions of contract:- N/A.

120 Products provided by/ on behalf of employer

1. General: Details of such products are given in the work sections, for fixing as part of the contract. Use for no other purpose than the Works.
2. Handling: Accept delivery, check against receipts and take into appropriate storage.
3. Surplus products: Keep safe and obtain instructions.

Ω End of Section

A53
Work by statutory authorities/ undertakers

Clauses

110 Work by Local Authority

1. Item: None.
2. Description of work: N/A
3. Provisional Sum: Include N/A.
4. Allow for general attendance.

120 Work by statutory undertakers

1. Item: None.
2. Description of work: N/A
3. Provisional Sum: Include N/A.
4. Allow for general attendance.

Ω End of Section

A54
Provisional work/ items

Clauses

110 Provisional sums for defined work, for use with SMM7/ NRM2

1. Item: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.
2. Description of work: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.
3. Provisional Sums: Include As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
4. Allow for general attendance.

210 Provisional sums for undefined work, for use with SMM7/ NRM2

1. Item: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.
2. Description of work: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.
3. Provisional Sums: Include As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
4. Allow for general attendance.

310 Work where compliance with SMM7/ NRM2 is not required

1. Item: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.
2. Description of work: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.
3. Provisional Sums: Include As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
4. Allow for general attendance.

310 Provisional sums for work by specialist subcontractors

1. Item: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.
2. Description of work: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.
3. Provisional Sums: Include As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
4. Add for profit: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works.%.
5. Allow for the following special attendance
   5.1. As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
6. Allow for general attendance.

590 Contingencies

1. Provisional sum: Include: TBC.

Ω End of Section

A55
Dayworks

Clauses

110 Labour

1. Provisional sum: Include prime cost of labour incurred before the Final Completion Date: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
    1.1. Percentage adjustment: Add to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
2. Provisional sum: Include prime cost of labour incurred after the Final Completion Date: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
    2.1. Percentage adjustment: Add to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.

120 Products

1. Provisional sum: Include prime cost incurred at any time during the Contract As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
    1.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.

130 Equipment

1. Provisional sum: Include prime cost of plant (equipment) incurred before the Final Completion Date: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
    1.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
2. Provisional sum: Include prime cost of plant (equipment) incurred after the Final Completion Date: As per 'Section 3 - Schedule of Works' set out within the main Specification of Works..
    2.1. Percentage adjustment to cover incidental costs, overheads and profit TO BE COMPLETED BY CONTRACTOR%.
3. Plant (equipment) costs: Rates set out in the Schedule of Basic Plant Charges published by the RICS current at the Date of Tender.

140 Specialist trades

1. Include Provisional Sums for dayworks within the province of:
2. RICS/ Electrical Contractors' Association: Prime cost of labour: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    2.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
3. Prime cost of materials and goods: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    3.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
4. Prime cost of plant: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    4.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.

5. RICS/ Building Engineering Services Association: Prime cost of labour: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    5.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
6. Prime cost of materials and goods: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    6.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
7. Prime cost of plant: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    7.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
8. RICS/ National Association of Plumbing, Heating and Mechanical Services contractors: Prime cost of labour: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    8.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
9. Prime cost of materials and goods: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    9.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
10. Prime cost of plant: The sum of £ As per 'Section 5 - Schedule of Rate' set out within the main Specification of Works.
    10.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.

Ω End of Section

A56
Advance procurement

Clauses

110 Fixing

1. Scope: Items procured in advance do not include for Main Contractor's receiving, unloading, handling, storing, returning packing, hoisting into position and fixing, which must be allowed for in the appropriate work section.

120 Planting

1. Scope: Items for plants and trees do not include for planting, maintenance and guarantee, which should be allowed for in the appropriate work section.

130 Advance procurement

1. Item: None.
    1.1. Description of the work: N/A
    1.2. Supplied by: N/A
2. PC sum
    2.1. Include: N/A
    2.2. Main Contractor's profit: Add N/A%.

Ω End of Section

2.0 Materials & Workmanship

Section 2 - Matericals & Workmanship

Issue:

Staus:

Revision:

Issued By: Bidwells

Job Number: JB62449

Date: 16-10-2023

Contents

B05
Whole project fire safety

Clauses

120 Fire safety strategy

1. Objective: Life safety and property protection
2. Building Regulations compliance approach: Guidance and probisions in English Building Regulations Approved Document B
3. Design parameters
   - 3.1. Supplementary information provided: None
   - 3.2. Additional considerations: None
4. Roles/ responsibilities/ competencies: Fire strategy forms part of the contractors responsibility
5. Documentation required: *Detailed record of fire safety strategy and fire protection measures in accordance with BS 7974*

Ω End of Section

B50
General structural requirements

Tendering

10 Information to be provided with tender

1. Description: New Build Extension
2. Submit the following
   - 2.1. Drawings: Not required
   - 2.2. Calculations: Not required
   - 2.3. Technical information: Not required
   - 2.4. Proposals: Describe and give reasons for any proposals for:
   - 2.5. Additional support or other changes to the supporting structure.
   - 2.6. Changes to the specification.
   - 2.7. Changes to the adjacent building fabric.
   - 2.8. Quality plan: Provide details of the experience of personnel/ subcontractor proposed for the execution of this work
   - 2.9. Builders work, special provisions and special attendance by others: Confirm that full provision has been made in the tender price

15 Information to be provided at time of tender

1. Description: Structural engineers report and calculations
2. Submit the following
   - 2.1. Technical information: Certification demonstrating compliance with specification of proposed incorporated products and finishes
   - 2.2. Proposals: Describe and give reasons for any proposals for:
     - 2.2.1. Additional support or other changes to the supporting structure.
     - 2.2.2. Changes to the specification.
     - 2.2.3. Changes to the adjacent building fabric.

General

120 Structural work

1. Designated codes of practice: Generally to the Eurocodes appropriate to the nature of the structure to BS EN 1990
2. Design working life: Category 4 to BS EN 1990
3. Completed structure generally: To comply with the requirements of the designated codes of practice and the standards referenced therein. Deflections and other structural movements at serviceability limit state to be compatible with requirements of the building fabric, movement joints and weathertightness.
4. Special requirements: None

130 Contractor's design

1. Engineer responsible for overall stability of structure: John Plumber Partnership
2. Design supervision/ checking levels: To BS EN 1990, Table B4, level DSL2
3. Design requirements: None additional

4. Design quality control: To BS EN ISO 9001
5. Maintenance: Make provision for and submit details of requirements to ensure the safety and serviceability of the structure, including:
    5.1. Critical parts that should be regularly inspected, with recommendations for the frequency of inspection.
    5.2. Elements susceptible to corrosion, mechanical wear or fatigue that may need to be reconstructed or replaced during the design working life of the structure.
    5.3. Means of safe access for maintenance and repair.

150 Ground investigation report

1. Requirement: Confirm acceptance of geotechnical proposals as appropriate for the particular ground conditions or submit alternative proposals, accepting full responsibility for them
2. Datum for borehole logs: As site datum
3. Obstructions and voids: None known

Performance

220 Exposure to fire

1. Building purpose group: Community hall with first floor office and basement.
    1.1. Height of top floor above ground: 2420mm
    1.2. Depth of lowest basement: 2560mm
2. Loadbearing capacity, integrity and insulation: Demonstrate adequacy of the structure to BS EN 1991-1-2.
    2.1. Criteria: Combined resistance of surrounding structure, kitchen & bathroom pod to suit purpose and location within the building
3. Reaction to fire of structural elements: To Building Regulations.
    3.1. Requirements (minimum): To suit purpose and location on/ within the building; submit proposals

250 Limits on movement generated by construction

1. Definition of critical values
    1.1. Threshold value: The value beyond which further movement will be of significant concern.
    1.2. Action value: The value at which execution must cease.
2. Precautions: Take as follows if movements reach critical values:
    2.1. Threshold: Review situation, assess possible causes and submit proposals to ensure that action values are not exceeded.
    2.2. Action: Stop work, report and revise working procedures to prevent further movements.

260 Lateral movement of embedded retaining walls during excavation and construction

1. Action values: As per Structural Engineering Calculations and details
2. Trigger values: 75% of action values
3. Timing: As required

270 Limits on ground movement

1. Description: Throughout the works
2. Location of survey points: As per Structural Engineering Calculations and details

3. Movement of survey points must not exceed
    3.1. Settlement
        3.1.1. Action values: As per Structural Engineering Calculations and details
        3.1.2. Threshold values: 65% of action values
    3.2. Lateral displacement
        3.2.1. Action values: As per Structural Engineering Calculations and details
        3.2.2. Threshold values: 65% of action values
4. Timing: As Required

280 Settlement of existing structures

1. Location: Any part of the structure
2. Action values: As per Structural Engineering Calculations and details
3. Threshold values: 65% of action values

290 Lateral displacement of existing structures

1. Location: Any part of the structure
2. Action values: As per Structural Engineering Calculations and details
3. Threshold values: 65% of action values

300 Vibration of existing structures

1. Measurement procedure: As per Structural Engineering Calculations and details
    1.1. Location of vibration transducers: Submit proposals
2. Action values: As per Structural Engineering Calculations and details
3. Threshold values: As per Structural Engineering Calculations and details

310 Damage to existing structures and services

1. Permissible damage criteria
    1.1. Structures: No damage permitted
    1.2. Services: No damage permitted

320 Loads/ actions

1. Generally: Specified loads/ actions are characteristic values unless otherwise described.

330 Design loads

1. Description: FOR CONNECTIONS IN STRUCTURAL STEELWORK
2. Source: Select worst condition from computer printout provided by employer's engineer

340 Permanent and imposed loads

1. Description: FOR FLOOR, FOR GROUND FLOOR & FOR ROOF
2. Standard: To BS EN 1991-1-1.
3. Permanent loads not discernable from drawings: None
4. Imposed loads
    4.1. Generally: As per Structural Engineering Calculations and details
    4.2. Exceptions: None
5. Local imposed loads: As per Structural Engineering Calculations and details

6. Allowance for future changes: As per Structural Engineering Calculations and details

360 Loading for mechanical and electrical services

1. Generally: As per Structural Engineering Calculations and details
2. Locally: None
3. Heavy equipment: As per Structural Engineering Calculations and details
4. Allowance for future changes: None

370 Loading for relocatable partitions

1. Location: As per Structural Engineering Calculations and details
2. Standard: As for moveable partitions to BS EN 1991-1-1.
3. Partition self weight (maximum): As per BS EN 1991-1-1

380 Loads in roof and ceiling voids

1. Standard: To BS EN 1991-1-1.
2. Access: Required
3. Special requirements: None
4. Service loads: As clause 360

390 Imposed loads on parapets and barriers

1. Description: As per Structural Engineering Calculations and details
2. Standard: To BS EN 1991-1-1.
3. Horizontal loading: As per BS EN 1991-1-1
   3.1. Height of application: As Standard
4. Vertical loading: Not applicable
5. Location of posts: Submit proposals

400 Actions on non-loadbearing

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Permanent/ dead loads: Self weight and fixtures as detailed on the service drawings.
3. Imposed horizontal loads
   3.1. Generally: As required
   3.2. Locally: As per BS EN 1991-1-1
   3.3. Other imposed loads: None
4. Wind actions: As per clause 450 & 470

420 Snow loads

1. Standard: To BS EN 1991-1-3.
2. Normal maximum: As per Structural Engineering Calculations and details & Tender drawings
3. Local drifting
   3.1. Location: Whole building
   3.2. Snow shape: As per Structural Engineering Calculations and details & Tender drawings
   3.3. Maximum load: As per Structural Engineering Calculations and details & Tender drawings
   3.4. Drift length (ls): As per Structural Engineering Calculations and details & Tender drawings

430 Snow loads – contractor determined

1. Standard: To BS EN 1991-1-3.
2. Features affecting loads: None in addition to those shown on drawings

440 Ice loads/ actions

1. Standard: To BS EN 1993-3-1.

450 Wind pressures

1. Description: All element of the building and landcape
2. Standard: To BS EN 1991-1-4.
3. Pressure on external surface: As per Structural Engineering Calculations and details & Tender drawings
4. Pressure on internal surface: Not applicable

460 Wind loads/ actions

1. Description: Whole building
2. Standard: To BS EN 1991-1-4.
3. Criteria: Peak velocity pressure
   3.1. Wind direction and value: As per Structural Engineering Calculations and details & Tender drawings
4. External pressure coefficient: Appropriate to element under consideration.
5. Internal pressure coefficient
   5.1. Normal: The more critical of As per Structural Engineering Calculations and details & Tender drawings.
   5.2. Accidental: As per Structural Engineering Calculations and details & Tender drawings
6. Features affecting loads: None other than those shown on drawings
7. Special requirements: As per Structural Engineering Calculations and details & Tender drawings

470 Wind loads/ actions – contractor determined

1. Description: All building external surfaces
2. Standard: To BS EN 1991-1-4.
   2.1. Factors and coefficients: Appropriate to location, exposure, altitude, building shape and size, and taking account of existing and known future adjacent and/ or attached buildings.
3. Shelter from upwind obstacles: As Standard
4. Normal design condition of doors and windows: Closed
5. Features affecting loads: None other than those shown on drawings
6. Special requirements: None

480 Wind loads/ actions – additional requirements for facade retention

1. Standard: To BS EN 1991-1-4.
2. Seasonal factor (Cseason): 1
3. Condition of openings in facade: All openings blocked
4. Working wind speed
   4.1. Definition: The wind speed at which site activities that could cause impact with the facade/ retention structure will cease.

4.2. Magnitude: Submit proposals

4.3. Use: Defines maximum wind loads to be used in load combinations including accidental actions.

490 Thermal actions

1. Standard: To BS EN 1991-1-5.
2. Design parameters
   2.1. Internal operating temperatures: As Standard
   2.2. Initial temperature: Consider in design
3. Movement joints: Confirm adequacy of location and joint details or submit proposals for amendments
   3.1. Continuity: Make provision for movement in all elements bridging a joint and ensure continuity of joint through structure and finishes.

500 Impact forces

1. Description: CAUSED BY ROAD VEHICLES
2. Standard: To BS EN 1991-1-7.
3. Application: Columns to the North and West walls
4. Category: Parking for cars
   4.1. Type of impact: Hard
   4.2. Details: To Standard

510 Accidental loading of facade/ facade retention structure

1. Requirement: Either impose restrictions on movement of site plant, cranes, etc. or allow for impact loads

520 Foundation– loads

1. Description: ON STRIPS
2. Foundation layout: As per Tender Drawings
3. Vertical loads: As per Tender Drawings
   3.1. Eccentricity of applied load: Permanent load is concentric to the foundation, centroid of the imposed load acts 150 mm from the foundation centre line towards the inside of the building
4. Horizontal loads: As per Tender Drawings

530 Earth retaining loads

1. Description: All retaining walls
2. Standard: To BS EN 1997-1 & To BS 8002
3. Serviceability limit state
   3.1. Horizontal load: As per Tender drawings
   3.2. Vertical load: As per Tender drawings
4. Ultimate limit state
   4.1. Horizontal load: As per Tender drawings
   4.2. Vertical load: As per Tender drawings

560 Diaphragm action

1. Description: Floors & Roof

2. Requirement: Floor/ roof is required to act as a diaphragm to transmit horizontal forces from the external walls to shear walls/ frames.
3. Horizontal force
   3.1. Wind load: As clause 470
   3.2. Other loads: Earth retaining load as clause 540

Execution

700 Execution generally

1. Standard: Report conflict between specification and the designated codes of practice and the standards referenced therein before ordering affected materials or executing affected work.
2. Inspection levels: To BS EN 1990, Table B5, level IL2.
   2.1. Special requirements: None
3. Quality control: To BS EN ISO 9001
4. Tolerances: Notwithstanding tolerances specified elsewhere, do not exceed requirements for compliance with the designated code.

705 Connections and anchorages

1. End and edge distances and spacing (minimum): Unless otherwise specified or detailed, as required by the designated code of practice for fixings/ anchorages carrying maximum load.
2. Report locations where
   2.1. Type and number of fixings cannot be accommodated.
   2.2. Size or position of members prevents correct positioning.

710 Geotechnical work

1. Geotechnical design report: Keep a copy on site during the execution of the geotechnical work.
2. Requirements for testing and monitoring: As specified
3. Assumed ground conditions: As geotechnical design report

720 Stability during execution

1. Permanent bracing system: As per the Tender drawings
   1.1. Vertical: Masonry walls
   1.2. Horizontal: Composite action floors
2. Temporary bracing/ restraints: Provide as necessary until permanent bracing system is complete and sufficiently mature to carry loads and all connections have been made to the permanent system.
   2.1. Special requirements: Provide temporary support for proprietary structural components to at least the standard required by the manufacturer
3. Design loads: Structure has been designed for the completed state.
   3.1. Magnitude: Request details as necessary
4. Before loading structure: Take into account:
   4.1. Reduction in strength due to immaturity of elements.
   4.2. Reduction in loadbearing capacity due to partial completion of continuous elements.

730 Restrictions on use of ground surface behind earth retaining structures

1. Surcharge loading (maximum): Restrict loading on upper ground surface behind structure as geotechnical design report.

1.1. Extent of restriction: As geotechnical design report

740 Condition survey of existing buildings and structures

1. Application: Main building
2. Before starting work: Survey structure. Record and take photographs of damaged or defective areas.
   2.1. Items to be recorded: Location, extent and magnitude of cracks, spalling, indications of movement, previous repairs, modifications and other irregularities of the fabric.
   2.2. Additional investigations: Look for presence of hazardous materials & Look for bonding timbers built into external walls
3. Information supplied: None
4. Report: Submit for comment.
   4.1. Include recommendations: For repair or monitoring of defects that could adversely affect structural adequacy of facade while temporally supported

750 Monitoring of ground conditions during construction

1. Purpose: To identify differences between actual ground conditions and those assumed in the design.
2. Requirements: As detailed in the geotechnical design report.
   2.1. Sampling and testing: As section C11
3. Inspect and record: Sequence, nature and soil types revealed in excavations and formations.
4. Immediately notify: Variations from the assumed ground conditions or shortfall in test requirements.
5. Special requirements: None

760 Monitoring of existing buildings/ structures

1. Application: Main building
2. Requirement: Visually inspect buildings/ structures for signs of movement, cracking or other indications of distress.
3. Period of inspection: Commence at start of works on site and continue until project compleation
4. Frequency of inspection: As required
5. Record: Date and time of inspections.
6. Action: If movement cracking or other signs of distress are noted Stop work, investigate and report back to CA.

770 Movement monitoring

1. Description: Main building
2. Application: Facade and facade retention structures described in section C30
3. Survey points: Agree number and location of survey points and record initial positions to enable monitoring of:
   3.1. Movements: All forms of movement
4. Method: sumbit method statment
   4.1. Accuracy of reading: ± 0.5 mm
5. Special requirements: None

780 Crack monitoring of existing buildings/ structures

1. Application: Main building
2. Survey points: Agree number and location of survey points, record initial readings and mark and date extent of cracks.
3. Method of measuring crack widths: Submit method statement
4. New or extending cracks: Mark extent and record date. Report and make proposals for additional monitoring points.

790 Frequency of monitoring

1. Description: EXISTING STRUCTURES
2. Initial readings: Agree and record as soon as responsibility is assumed for the retention structure and facade, compare results with readings taken by the advance works contractor, investigate anomalies and report.
3. Frequency of readings: Weekly
4. Increase frequency of readings if
   - 4.1. Movements accelerate.
   - 4.2. Trend of movements changes unexpectedly.
5. Additional readings
   - 5.1. A single set: Immediately following an unexpected event that could have affected the movements, impact on facade or supporting structure, unauthorized or significant authorized amendment of retention structure.
   - 5.2. Increase frequency of readings: Daily until two consecutive sets of readings are stable and consistent when survey points are first established and again when retention structure is complete
6. Period of monitoring: Until end of contract

Completion

900 Geotechnical records

1. Submit
   - 1.1. Details and results of monitoring.
   - 1.2. Details and purpose of any changes to the geotechnical work.
2. Timing: Within 3 days of the completion of the foundations
3. Special requirements: Update geotechnical design report and submit for inclusion in the Building Manual

Ω End of Section

C10
Site survey

Surveys

115 Preliminary survey

1. Description: Whole site
2. Qualifications of survey author: Member of the Royal Institution of Chartered Surveyors (RICS)
3. Area to be surveyed: Whole site
4. Objectives
   - 4.1. Visible or suspected hazards: Record general positions/ forms of visible/ suspected hazards, including Suspected asbestos-containing materials, Unstable ground and Unstable structures.
   - 4.2. Designation of areas within/ adjacent to site: Record boundaries/ type of designation within, or adjacent to, the site, including None.
   - 4.3. Protected habitats/ species outside designated areas: Record general positions of sightings or evidence of species including Suspected protected European/ UK animal species & Suspected protected European/ UK plant species.
5. Methodology
   - 5.1. Specific requirements: Do not use intrusive survey techniques. Avoid disturbing natural features or wildlife.
   - 5.2. Permissible survey techniques: Desk study & Site reconnaissance
6. Reference data: The following information is provided: Tender Drawings & Photographs.
7. Preliminary survey report: Submit.
   - 7.1. Timing: Within two weeks of completion of survey work

125 Site survey

1. Description: TOPOGRAPHIC
2. Qualifications of survey author: Suitably qualified land surveyor
3. Area to be surveyed: As per Site Layout Drawing
4. Site datum: Contractor's choice
5. Objectives
   - 5.1. General: Establish/ record positions, dimensions and levels including Outlines of structures within provisional site boundary.
   - 5.2. Features: Record positions, dimensions and levels including Access covers, Drainage manhole covers and invert levels, Fences, Gullies, Kerbs, Service poles and pylons, Walling and wall head height, .
6. Methodology: Do not use intrusive survey techniques. Avoid disturbing natural features or wildlife.
   - 6.1. Permissible survey techniques: Global Positioning System (GPS)
7. Control points: Establish and record measuring stations/ targets to facilitate future remeasuring.
   - 7.1. Standards: To BS 5964-1 and -2.
     - 7.1.1. Type: Submit proposals
8. Dimensional accuracy
   - 8.1. Angular: Submit proposals
   - 8.2. Horizontal: Submit proposals

8.3. Vertical: Submit proposals

9. Source data for reference/ verification: The following information is provided: Preliminary survey report.
10. Site survey report: Submit.
    10.1. Timing: Within four weeks of completion of survey work

165 Invasive species survey

1. Description: SCOPING
2. Qualifications of survey author: A member of the Institute of Environmental Assessment
3. Area to be surveyed: Whole site
    3.1. Existing conservation status/ designation: None
4. Objectives
    4.1. Designated areas: Identify and record boundaries of designated areas within or adjacent to site.
    4.2. Survey scope: Identify non-native species for removal
        4.2.1. Species: Not yet determined
        4.2.2. Methodology: In accordance with CIEEM 'Guidelines for Ecological Impact Assessment'.
    4.3. Permissible survey techniques: Desk study, Direct measurement, Field meters, Site reconnaissance
    4.4. Timing: As directed by ecologist
5. Source data provided for reference/ verification: Baseline Ecological Assessment report
6. Invasive species survey report: Submit.
    6.1. Timing: Submit proposals

Survey techniques

210 Desk study

1. Description: Whole site
2. General: Carry out a study of available information.
    2.1. Scope of study: Obtain and identify all available current Statutory Authority, Statutory Undertaker and Ordnance Survey information regarding the site.
    2.2. Features to be included: All above ground features, and underground services. Identify the locations of all benchmarks and permanent ground markers.
    2.3. Specific requirements as to method: None

215 Site reconnaissance

1. Description: Whole site
2. Standard: To BS 5930, Annex E.
3. Scope of study: As required
4. Specific requirements as to method: Do not use intrusive survey techniques. Avoid disturbing natural features or wildlife

225 Direct measurement surveying

1. Description: Whole site
2. Features to be included: As required

3. Specific requirements as to method: None

245 Global Positioning System (GPS)

1. Features to be included: Whole site
2. Specific requirements as to method: None

280 Photogrammetry

1. Features to be included: Whole site
2. Specific requirements as to method: None

410 Bench marks

1. Unrecorded bench marks and other survey information: Give notice when found and notify Ordnance Survey.

420 Unforeseen hazards

1. Unrecorded hazards and hazardous materials: Give notice when found. Do not disturb.

430 Survey instruments

1. Equipment calibration: In accordance with manufacturer's recommendations.
2. Site use calibration: To relevant parts of BS 7334-1, -3, -4, -5 and -8.
3. Calibration: Use only persons accredited by the United Kingdom Accreditation Service (UKAS).
4. Calibration compliance: Submit evidence prior to use.

440 Protection

1. Protect the following: None

Completion

910 Documentation – paper

1. Description: - FOR ALL SURVEYS
2. General format: Comb bound, size A4, clear cover sheet
   2.1. Front cover design: Submit proposals
3. Charts/ diagrams/ tabulated data: Integrated
4. Photographs: Prints in appendix in clear pockets, fully labelled
   4.1. Size: A4
   4.2. Granularity: Camera output 12 million pixels (minimum), ISO 100 (maximum), prints from TIFF or RAW format
   4.3. Post camera modification: Not permitted
5. Drawings: As appendices, fold out
   5.1. Size: A3
   5.2. Scale: As required

915 Documentation – electronic

1. Description: - FOR ALL SURVEYS
2. Storage medium: None, submit files electronically
3. File naming: Use descriptive long filenames

4. File types
   4.1. Text files: Adobe portable document format (.pdf)
   4.2. Charts: Adobe portable document format (.pdf)
   4.3. Diagrams: Adobe portable document format (.pdf)
   4.4. Tabulated data: Adobe portable document format (.pdf)
5. Photographs: Adobe portable document format (.pdf)
   5.1. Granularity of original images: Camera output 12 million pixels (minimum), ISO 100 (maximum) Submit proposals
6. BIM model: Revit version 2023
7. Drawings: AutoCAD version 2023
   7.1. Parameters
      7.1.1. Layers: Submit proposals
      7.1.2. Printable area size: A3
      7.1.3. Scale at selected size: Submit proposals

925 Preliminary survey report

1. Format: Electronic
2. Report content: Hazards encountered, Designated area boundaries and types and Habitats/ species identified
3. Document sections: Executive summary, Introduction, Main report, Summary and conclusions, Appendices
   3.1. Charts/ diagrams/ tabulated data: Required
   3.2. Photographs: Required
   3.3. Drawings: Required
4. Audiovisual presentation: Not required
5. Other requirements: Submit proposals

935 Site survey report

1. Format: Electronic
2. Report content: Building outlines, Major features inside and adjacent to the site, Site boundaries and Subsurface plots and interpretation
3. Document sections: Executive summary, Introduction, Main report, Summary and conclusions, Appendices
   3.1. Charts/ diagrams/ tabulated data: Required
   3.2. Photographs: Required
   3.3. Drawings: Required
4. BIM model: Revit version 2023
5. Audiovisual presentation: Not required
6. Other requirements: None

955 Ecological survey report

1. Description: FOR BASELINE ECOLOGICAL ASSESSMENT
2. Format: Electronic
3. Report content
   3.1. Ecological survey results: Field survey results

3.2. Interpretation: Not required
3.3. Recommendations: Further survey required and reasons given, Remediation strategy

4. Document sections: Executive summary, Introduction, Main report, Interpretation and recommendations and Appendices
   4.1. Charts/ diagrams/ tabulated data: Required
   4.2. Photographs: Required
   4.3. Drawings: Required
5. Audiovisual presentation: Not required
6. Other requirements: None

975 Invasive species survey report

1. Description: Whoel site
2. Format: Electronic
3. Report content
   3.1. Survey results: Field survey results
   3.2. Interpretation: Assess connectivity of habitats of invasive species, Invasive species risk assessment
   3.3. Recommendations: Remediation strategy
4. Document sections: Executive summary, Introduction, Main report, Interpretation and recommendations and Appendices
   4.1. Charts/ diagrams/ tabulated data: Required
   4.2. Photographs: Required
   4.3. Drawings: Required
5. Audiovisual presentation: Not required
6. Other requirements: None

Ω End of Section

C11
Site investigation

General requirements

110 Extent of investigation

1. Location: Whole site
2. Scope
   2.1. Desk study: Not required.
   2.2. Exploratory holes: Boreholes to locate and identify soil types to a depth of 1.5 metres below existing ground level
3. Geophysical tests: Not required
4. Instrumentation: Submit proposals
5. Reports
   5.1. Type: Factual and interpretive reports
   5.2. Other requirements: Submit recommendations for further investigation, special studies and remedial work
6. Objectives: Assess suitability of site for redevelopment

112 Monitoring of ground conditions during construction

1. Purpose: To identify differences between actual ground conditions and those assumed in design.
2. Assumed ground conditions: As geotechnical report
3. Inspect and record: Sequence and soil types revealed in sides of excavations and nature of soil in formations.
4. Other requirements: None
5. Actions: Report ground conditions revealed. If these differ from conditions assumed, await instructions before constructing ground supported/ supporting structures.

120 Preliminary work by others

1. Site preparation: None

125 Geology and ground conditions

1. Source: Not applicable
   1.1. Summary: Not applicable
      1.1.1. Report: None available
2. Disclaimer: Information has been inferred from sources listed, but no assurance is given regarding its accuracy.

130 Background information sources

1. Subject: Not applicable
   1.1. Source: Not applicable
   1.2. Contact: Not known
   1.3. Report: None available

140 Access to the site

1. Details: Via the Contarct Administrator
2. Contact: As per section A12

150 Public safety

1. Protection of the public and occupiers of adjoining property: Erect temporary fences, hoardings, footpaths, warning lights, etc. before starting work.
2. Means of escape from adjoining property in the event of fire: Maintain for the duration of the Works.
3. Specific hazards which may be encountered: None

160 Site safety

1. Excavations and boreholes: Support sides and keep free from ground and surface water.
2. Protection: Submit proposals

170 Survey instruments

1. Equipment calibration: In accordance with manufacturer's recommendations.
2. Site use calibration: To BS 7334-1, -3, -4, -5 and -8.
3. Calibration: Use only persons accredited by the United Kingdom Accreditation Service (UKAS).
4. Calibration compliance: Submit evidence prior to use.
5. Documentation: In accordance with BS 5964-1

180 Competence

1. Skill and experience: Appropriate for the type of work.
    1.1. Evidence: Submit prior to commencement.

190 Protection

1. Protect the following: None

Investigation

205 Presentation of data and information

1. Requirements: Borehole locations plotted on CAD drawing indicating bearings, elevation, diameter, depth and reference code
2. Photographs: Required of existing foundations revealed in the investigation and Required for pits and trenches

220 Site reconnaissance

1. Examine available information, carry out a study and submit a report to include the following:
2. Scope of study: As desk study recommendations
3. Features to be included: All above ground features, All underground services, Topography
4. Specific requirements as to method: Submit evidence on request

230 Detailed examination/ Special study

1. Examine available information, carry out a study and submit a report to include the following:

2. Scope of study: Asbestos survey, Environmental impact assessment, Land survey, 1:200 scale, Structural survey of existing buildings,
3. Features to be included: All above ground features, All underground services, Topography
4. Specific requirements as to method: Submit evidence on request

240 Ground investigation

1. Description: - FOR DESIGN OF STRIP FOUNDATIONS
2. Requirement: Determine the soil profile, physical and chemical nature of the soils and the necessary design parameters.
3. Standard: UK Specification for ground investigation (SFGI) published by the Institution of Civil Engineers Site Investigation Steering Group
   3.1. Definitions: None, other than those included in the standard
4. Amendments to standard: None
   4.1. Substitutions for reference documents: None
5. Method
   5.1. Exploratory holes: Submit proposals
   5.2. Field testing: Submit proposals
   5.3. Sampling: Submit proposals
      5.3.1. Quality class of samples: To suit requirements for testing
   5.4. Monitoring: None
   5.5. Laboratory testing: Submit proposals
   5.6. Reporting: Factual report

246 Tolerance on position of exploratory holes

1. Location
   1.1. Distance from design position (maximum): Generally as SFGI, clause 3.19, but faces of pits adjacent to proposed building face to be within .5 m of design position
   1.2. Recorded position (maximum): As SFGI, clause 3.14
2. Recorded ground elevation: As SFGI, clause 3.15
3. Other requirements: None

248 Quality of ground investigation

1. Management system: To BS EN ISO 9001, BS EN ISO 14001 and BS OHSAS 18001
2. Professional attendance: Not applicable
3. Accreditation of drillers: British Drilling Association accredited driller with appropriate endorsements for the work being undertaken and Holding a current blue skilled (land drilling) card issued under the Construction Skills Certification Scheme (CSCS)

250 Trial pits, trenches and shafts

1. Purpose: Visual examination and sampling from ground level
2. Standard: In accordance with BS 5930
3. Locations: Submit proposals
4. Full depth: 1.5 m
5. Minimum trench width: 1.0 m
6. Plan dimensions: 1.0 m diameter

7. Protection: Contractor's choice
8. Backfill material: As dug material
9. Reinstatement: As existing

265 Inspection pits

1. Purpose: To determine the existence of buried services.
2. Pit dimensions: The minimum necessary for the described purpose.
3. Method of excavation: Hand operated power tools
4. Backfill material: As dug material
5. Reinstatement: As existing

267 Substructure inspection pits

1. Purpose: To determine the dimensions and formation level of existing substructures and the nature of the soil on which they are bearing.
2. Pit dimensions: The minimum necessary for the described purpose.
3. Method of excavation: Mechanical excavation is permitted to a level 500 mm above the presumed foundation formation level; hand dig thereafter
   3.1. Precautions: Do not excavate lower than the substructure formation level
4. Backfill material: Designated cement-bound concrete to a level 150 mm above the substructure formation; compacted, as dug material above
5. Reinstatement: As existing
6. Record: Dimensions of visible face of substructure; level of substructure formation; sequence of strata visible in sides of pit; level at which soil samples were taken.

Field tests

275 Information

1. General: For each test record, supply the following:
   1.1. Project name and reference.
   1.2. Date and time of test.
   1.3. Weather conditions.
   1.4. Soil type and description
   1.5. Location and details of sample, including exploratory hole number and position, depth, ground level, water level.
2. In situ photographs: Required
3. Feature encountered: Provide description and state depth of drains, foundations or structures, services.

290 Permeability tests

1. Standard: Carry out and report in accordance with BS EN ISO 22475-1.
2. Test/ method: Contractor's choice
   2.1. Locations: At each standpipe

300 Geophysical tests

1. Standard: Carry out and report in accordance with BS 7022 and BS EN ISO 22475-1.

2. Purpose: To determine changes in groundwater conditions across the site, location of voids, buried foundations and services, location of buried channels.
3. Test/ method: Contractor's choice
   3.1. Locations: At every test pit
4. Test report: Include interpretation of test results, clearly identifying any areas of uncertainty.
   4.1. Format: Digital
   4.2. Timing: Within 5 days of completing tests

Sampling

320 Soil and groundwater sampling

1. Standard: To BS 10175 and BS EN ISO 22475-1
2. Type: Block soil samples, Groundwater samples
   2.1. Locations: Submit proposals
   2.2. Frequency: Submit proposals
3. Protection: Do not expose samples to high temperatures, direct heat or sunlight.
4. Contamination: Prevent before and during analysis.
5. Consistency: Ensure samples are typical of the zone from which they have been taken.
6. Handling: Transport and store at an approved location. Retain for a period of 28 days after submission of the approved final report or as directed.
7. Other requirements: None

324 Special sampling in pits and trenches

1. Generally: As SFGI, clause 7.6.11.
2. Location: Inspection pits
   2.1. Additional samples: Not required

325 Block sampling

1. Method: Remove remoulded soil from the sampling spot and cut sample by hand or with handheld saw.
2. Size (minimum): As required
3. Protection: Prevent contact with extraneous water and protect from effects of sunshine, frost and winds. Cover sample immediately after cutting, and seal to prevent loss of water.
4. Record: Sample location, orientation, depth below ground level, face of pit from which sample was cut and weather conditions when sample was obtained.

340 Groundwater monitoring

1. Description: Generally
2. Required measurements: Groundwater levels
3. Equipment: Contractor's choice
   3.1. Length of standpipe: Not applicable
4. Installation
   4.1. Standard: As SFGI, Appendix I
   4.2. Method: Driven
   4.3. Location: As required
   4.4. Cap details: Not applicable

5. Monitoring period: While contractor is on site
6. Frequency of reading: Daily while contractor is on site, thereafter, weekly
7. Records: Record time, date and details of installation, readings, and time and date of each reading.
8. Other requirements: None

Laboratory tests

370 Interpretative report

1. Standards: In accordance with BS EN 1997-1 and BS EN 1997-2.
2. Scope: All known land and water contaminants
3. Features to be included: All above ground and below ground features.
4. Evaluation criteria: Contamination levels to be assessed against trigger values published by the Interdepartmental Committee for Redevelopment of Contaminated Land (ICRCL)
5. Specific requirements as to method: As BS EN 1997-2
6. Specific limitations on presentation: None
7. Preliminary Report: Required

380 Factual report

1. Scope: All known land and water contaminants
2. Features to be included: All above ground and below ground features.
3. Specific requirements as to method: As BS EN 1997-2
4. Specific limitations on presentation: None
5. Preliminary report: Required

Ω End of Section

C20
Demolition

General requirements

110 Desk study/ survey

1. Scope: Before starting deconstruction/ demolition work, examine available information, and carry out a survey of: The whole building.
2. Report and method statements: Submit, describing:
   - 2.1. Form, condition and details of the structure or structures, the site, and the surrounding area.
     - 2.1.1. Extent: As survey boundary drawing
   - 2.2. Type, location and condition of features of historical, archaeological, geological or ecological importance.
   - 2.3. Type, location and condition of adjoining or surrounding premises that might be adversely affected by removal of the structure or structures, or by noise, vibration and dust generated during deconstruction or demolition.
   - 2.4. Identity and location of services above and below ground, including those required for the contractor's use, and arrangements for their disconnection and removal.
   - 2.5. Form and location of flammable, toxic or hazardous materials, including lead-based paint, and proposed methods for their removal and disposal.
   - 2.6. Form and location of materials identified for reuse or recycling, and proposed methods for removal and temporary storage.
   - 2.7. Proposed programme of work, including sequence and methods of deconstruction or demolition.
   - 2.8. Details of specific pre-weakening required.
   - 2.9. Arrangements for protection of personnel and the general public, including exclusion of unauthorized persons.
   - 2.10. Arrangements for control of site transport and traffic.
   - 2.11. Special requirements: Disposal methods for gypsum-based products, Results of tests to determine the precise nature of hazardous materials, Site waste management plan development and proposals
3. Format of report: Digital

120 Extent of deconstruction/ demolition

1. General: Subject to retention requirements specified elsewhere, deconstruct/ demolish structures down to Upper level of ground floor slab.

130 Groundworks

1. Old foundations, slabs and the like: Break out in locations and to the extents stated.
2. Contaminated material: Remove and dispose of contaminated material to appropriate site
3. Removal of deleterious material: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil
4. Ancillary items: Backfill voids to level of surrounding site

150 Features to be retained

1. General: Keep in place and protect the following: Boundary walls.

Services affected by deconstruction and demolition

210 Services regulations

1. Work carried out to or affecting new and/ or existing services: Carry out in accordance with the by-laws and regulations of the relevant statutory authority

220 Location and marking of services

1. Services affected by deconstruction/ demolition work: Locate and mark positions
2. Mains services marking: Arrange with the appropriate authorities for services to be located and marked
   2.1. Marking standard: In accordance with Street Works UK publication 'Guidance on the Positioning and Colour Coding of Underground Utilities' Apparatus'.

230 Services disconnection arranged by contractor

1. General: Arrange with the appropriate authorities and responsible private organizations for disconnection of services, and removal of fittings and equipment owned by those authorities prior to starting deconstruction or demolition

232 Services disconnection arranged by employer and contractor

1. Responsibility: The employer will arrange with the appropriate authorities and responsible private organizations for disconnection of services, and removal of fittings and equipment owned by those authorities prior to deconstruction or demolition, as follows: Termination of gas supply at boundary meter chamber; removal of meters..
2. Timing: Do not start deconstruction or demolition until disconnections are completed.

250 Live foul and surface water drains

1. Drains and associated manholes, inspection chambers, gullies, vent pipes and fittings: Protect and maintain normal flow during deconstruction or demolition & Make good any damage arising from deconstruction or demolition work & Leave clean and in working order at completion of deconstruction or demolition work
2. Other requirements: None

270 Services to be retained

1. Damage to services: Give notice, and notify relevant service authorities and/ or owner/ occupier regarding damage arising from deconstruction or demolition
2. Repairs to services: Complete as directed, and to the satisfaction of the service authority or owner

Deconstruction and demolition work

310 Workmanship

1. Standard: Demolish structures in accordance with BS 6187.
2. Operatives
   2.1. Appropriately skilled and experienced for the type of work.
   2.2. Holding, or in training to obtain, relevant Construction Skills certification of competence.
3. Site staff responsible for supervision and control of work: Experienced in the assessment of risks involved and methods of deconstruction and demolition to be used.

320 Gas and vapour risks

1. Precautions: Prevent fire or explosion caused by gas and vapour from tanks, pipes, etc.

330 Dust control

1. General: Minimize airborne dust by periodically spraying deconstruction and demolition works with an appropriate wetting agent. Keep public roadways and footpaths clear of mud and debris
2. Lead dust: Submit method statement for control, containment and clean-up regimes.

340 Health hazards

1. Precautions: Protect site operatives and general public from hazards associated with vibration, dangerous fumes and dust arising during the course of the works.

350 Adjoining property

1. Temporary support and protection: Provide. Maintain and alter, as necessary as work proceeds. Do not leave unnecessary or unstable projections.
2. Defects: Report immediately on discovery.
3. Damage: Minimize disturbance. Repair promptly to ensure safety, stability, weather protection and security.
4. Support to foundations: Do not disturb.

360 Structures to be retained

1. Extent: As per Tender drawings
2. Parts which are to be kept in place: Protect. Give notice and notify service authority or owner of damage arising from the execution of the works.
3. Interface between retained structures and deconstruction or demolition: Cut away and strip out with care to minimize the amount of making good needed

370 Partly demolished structures

1. General: Leave in a stable condition, with adequate temporary support at each stage to prevent risk of uncontrolled collapse. Make secure outside working hours.
2. Temporary works: Prevent overloading due to debris.
3. Access: Prevent access by unauthorized persons.

380 Dangerous openings

1. General: Provide guarding at all times, including outside of working hours. Illuminate during hours of darkness.
2. Access: Prevent access by unauthorized persons.

390 Asbestos-containing materials – known occurrences

1. General: Materials containing asbestos are known to be present in: as per Refurbishment & demolition report .
2. Removal: By contractor licensed by the Health and Safety Executive, and prior to other works starting in these locations
3. Timing: Before other works start in these locations

391 Asbestos-containing materials – unknown occurrences

1. Discovery: Give notice immediately of suspected asbestos-containing materials when discovered during deconstruction and demolition work. Avoid disturbing such materials.
2. Removal: Submit statutory risk assessments and details of proposed methods for safe removal.

410 Unforeseen hazards

1. Discovery: Give notice immediately when hazards such as unrecorded voids, tanks, chemicals, are discovered during deconstruction or demolition.
2. Removal: Submit details of proposed methods for filling, removal, etc.

450 Site condition at completion

1. Debris: Clear away and leave the site in a clean, tidy and secure condition.

Materials arising

510 Contractor's property

1. Components and materials arising from the deconstruction and demolition work: Property of the contractor, except for designated items which remain the property of the employer
2. Action: Remove from site as work proceeds, where not to be reused or recycled for site use

520 Recycled materials

1. Materials arising from deconstruction and demolition work: Can be recycled or reused elsewhere in the project, subject to compliance with the appropriate specification and in accordance with any site waste management plan.
2. Evidence of compliance: Submit full details and supporting documentation.
   2.1. Verification: Allow adequate time in programme for verification of compliance.

Ω End of Section

C40
Cleaning masonry/ concrete

General/ preparation

110 Scope of work

1. As per the schedule of works.

120 Related repair and remedial works

1. Work to be carried out before cleaning work: Remove vegetation
2. Work to be carried out after cleaning work: Grouting/ filling to cracks in concrete, as section C42, Pointing to cracks and joints in masonry, as section C41, Pointing to cracks in masonry, as section C41 and Pointing to joints in masonry, as section C41

142 Removal of fittings

1. Timing: Before commencement of cleaning work
2. Disturbance to surfaces: Minimize.
3. Items for disposal: As per the shedule of works
4. Items to be kept for reuse: None

160 Protection

1. Surfaces not designated for cleaning: Prevent damage, including marking and staining.
2. Openings: Prevent ingress of water, cleaning agents and detritus.
   2.1. Vents and grilles: Seek instructions before sealing up.
3. Temporary mechanical fastenings
   3.1. In masonry: Locate in joints.
   3.2. In other surfaces: Seek instructions.
4. Additional protection: As per the schedule of works

175 Control and disposal of wash water and detritus

1. Disposal: Safely. Obtain approvals from relevant Authority.
2. Control of wash water: Collect and divert to prevent ingress and damage to building fabric and adjacent areas.
3. Above and below ground drainage systems: Keep free from detritus and maintain normal operation.

180 Cold weather

1. Cleaning procedures using water: Do not use when air temperature is at or below 5°C. Protect damp surfaces from frost.
2. Chemical cleaning agents: Do not use when surface temperatures are below those recommended by manufacturer.

190 Cleaning generally

1. Timing: Works may not start on site until all necessary approvals are received from the local planning authority and from Historic England/ Historic Environment Scotland or Cadw Historic Monuments Wales, as appropriate

2. Operatives: Appropriately trained and experienced for each type of cleaning work.
   2.1. Evidence of training: Submit on request.
3. Control of cleaning: Confine cleaning processes and materials to designated areas. Prevent wind drift.
4. Detritus: Remove regularly. Dispose of safely.
5. Monitoring
   5.1. Frequently check results of cleaning compared to approved trial samples. If results established by trials are not achieved, seek instructions.
   5.2. Works to be inspected and approved in accordance with the requirements of the local planning authority.
6. Modifications to cleaning methods and materials: Seek instructions.

215 Record of cleaning works

1. Written report: Record cleaning methods and procedures used for each type of surface and deposit.
   1.1. Content: Relevant attributes of cleaning methods used including:
      1.1.1.Equipment and settings.
      1.1.2.Dwell times.
      1.1.3.Number of applications.
      1.1.4.Ambient temperatures.
2. Additional documentation: Survey before cleaning: Photogrammetric records of each elevation
3. Submission: At completion of cleaning works.

Products/ equipment

300 Compatibility of chemical products

1. Products: Compatible and produced by the same manufacturer.

312 Surface biocides

1. Types: Registered by the Health and Safety Executive (HSE) and listed on the HSE website under non-agricultural pesticides.
2. Compatibility with surface: Free from staining or other harmful effects.

322 Abrasive cleaning equipment

1. Manufacturer/ Supplier: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Nozzle types: Contractor's choice
3. Abrasives: Contractor's choice

332 Water spray (mounted nozzles)

1. Equipment
   1.1. Spray/ Nozzle types: Contractor's choice
   1.2. Nozzles: Position and direction adjustable, relative to surfaces and profiles.
   1.3. Controls: Contractor's choice

342 Pressurized water cleaning equipment

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Operational pressure: Contractor's choice
3. Nozzles: Contractor's choice

352 Steam cleaning equipment

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice

362 Chemical agents

1. Description: As per the schedule of works
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

372 Plain poultices

1. Description: As per the schedule of works
2. Poulticing medium manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Softening agent: Deionized water.

Application

412 Removal of loosely adhered deposits

1. Timing: Before commencement of other cleaning methods.
2. Surfaces: Prevent damage, including abrasion.

422 Biocide application

1. Preparation: Remove loose growths
2. Surfaces: Prevent damage, including abrasion.
3. Biocide treatment: Appropriate solutions to kill growths and inhibit further growths.
    3.1. Dead growths: Remove.

432 Tooling

1. Tooling of surfaces: Not permitted

442 Abrasive blocks

1. Types: Suitable grades of carborundum or gritstone.
2. Application: Lubricate with water. Remove detritus.
3. Abrasive power tools: Prohibited.

452 Abrasives cleaning

1. Surfaces: Minimize abrasion.
    1.1. Ingrained deposits: Seek instructions.

2. Equipment settings (including nozzle type and distance from surface): Adjust regularly to achieve optimum cleaning performance for each surface.
3. Detritus: Remove with clean water.

462 Water spray cleaning (mounted nozzles)

1. Surfaces: Minimize water run-off. Prevent damage.
2. Adjustment of washing cycle and nozzle positions: Regularly to achieve optimum cleaning performance.

472 Pressurized water cleaning

1. Surfaces: Prevent damage, including abrasion.
2. Equipment settings (including nozzle type and distance from surface): Adjust regularly to achieve optimum cleaning performance for each surface.

482 Steam cleaning

1. Surfaces: Prevent damage, including abrasion.
2. Equipment settings (including nozzle type and distance from surface): Adjust regularly to achieve optimum cleaning performance for each surface.

495 Testing ph values for chemical cleaning

1. pH indicator: To distinguish pH values between 1-14.
2. Testing before cleaning
   2.1. Clean rinsing water, wetted surfaces and joints: Test for pH. Record as 'control' values.
3. Testing after water rinsing and neutralization
   3.1. Wetted surfaces and joints: Record pH values.
   3.2. Acceptance criteria: Seek instructions

500 Chemical cleaning

1. Surfaces: Prevent damage, including discolouration, bleaching and efflorescence.
2. Product variables (including concentrations, dwell times and number of applications): Adjust for each surface to achieve optimum cleaning performance.
3. Application: To wetted surfaces.
   3.1. Drying out: Prevent unless recommended otherwise by cleaning product manufacturer.
4. Removal of chemicals and neutralization: As recommended by product manufacturer, including rinsing with clean water.
   4.1. Additional treatment: Where water rinsing is insufficient to neutralize surface, apply compatible neutralizing agent.
   4.2. Surfaces and joints: Minimize absorption of chemicals. Prevent damage, including abrasion.

515 Plain poulticing

1. Surfaces: Prevent damage, including abrasion.
2. Application: To wetted surfaces. Maintain contact with surfaces as poultice dries out.
3. Poultice reinforcement: Contractor's choice
4. Drying: Prevent excessively rapid or localized drying out.
5. Spent poultice material: Do not reuse.

Ω End of Section

C41
Repairing/ renovating/ conserving masonry

Generally/ preparation

110 Scope of work

1. Schedule: As per the schedule of works
2. Records of masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.
3. Identification of masonry units to be removed, replaced or repaired: Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced. Transcribe markings to drawings/ photographs.

120 Site inspection

1. Purpose: To confirm type and extent of repair/ renovation/ conservation work shown on drawings and described in survey reports and schedules of work.
2. Parties involved: Contract administrator, Contractor's representative, Structural engineer
3. Timing: At least 2 working days before starting each section of work
4. Instructions issued during inspection: Confirm in writing, with drawings and schedules as required, before commencing work

125 Removal of fittings/ fixtures

1. Items to be removed, and reinstated on completion of repair work: As per the schedule of works
    1.1. Identification: Attach labels or otherwise mark items using durable, non-permanent means, to identify location and describe refixing instructions, where applicable.
    1.2. Treatment following removal: As per the schedule of works
    1.3. Storage: Protect against damage, and store until required.
        1.3.1. Storage location: On-site
    1.4. Reinstatement: Refit in original locations using original installation methods.
2. Items unsuitable or not required for reuse: As per the schedule of works
    2.1. Disposal: Obtain instructions
3. Masonry fabric and surfaces: Do not damage during removal and replacement of fittings/ fixtures.

130 Removal of plant growths from masonry

1. Plants, root systems and associated soil/ debris: Carefully remove from joints, voids and facework.
2. Removal of roots: Where growths cannot be removed completely without disturbing masonry seek instructions.
3. Unwanted plants close to masonry: Where removal of root system is not possible or desirable, cut through stem as close to the ground as possible. Remove bark from stump and apply herbicide paste. Leave stump to wither.

140 Record of work

1. General: Record work carried out to masonry clearly and accurately using written descriptions, sketches, drawings and photographs, as necessary.
2. Specific records: Photographs
3. Documentation: Submit on completion of the work.

3.1. Number of sets: One

Workmanship generally

150 Power tools

1. Usage for removal of mortar: Permitted only with prior approval

155 Putlog scaffolding

1. Usage: Not permitted

160 Protection of masonry units and masonry

1. Masonry units: Prevent overstressing during transit, storage, handling and fixing. Store on level bearers clear of the ground, separated with resilient spacers. Protect from adverse weather and keep dry. Prevent soiling, chipping and contamination. Lift units at designed lifting points, where provided.
2. Masonry: Prevent damage, particularly to arrises, projecting features and delicate, friable surfaces. Prevent mortar/ grout splashes and other staining and marking on facework. Protect using suitable nonstaining slats, boards, tarpaulins, etc. Remove protection on completion of the work.

165 Structural stability

1. General: Maintain stability of masonry. Report defects, including signs of movement that are exposed or become apparent during the removal of masonry units.

170 Disturbance to retained masonry

1. Retained masonry in the vicinity of repair works: Disturb as little as possible.
2. Existing retained masonry: Do not cut or adjust to accommodate new or reused units.
3. Retained loose masonry units and those vulnerable to movement during repair works: Prop or wedge so as to be firmly and correctly positioned.

180 Workmanship

1. Skill and experience of site operatives: Appropriate for types of work on which they are employed.
   1.1. Documentary evidence: Submit on request.

185 Adverse weather

1. General: Do not use frozen materials or lay masonry units on frozen surfaces.
2. Air temperature: Do not bed masonry units or repoint:
   2.1. In cement gauged mortars when ambient air temperature is at or below 3°C and falling or unless it is at least 1°C and rising, unless mortar has a minimum temperature of 4°C when laid and the masonry is adequately protected.
   2.2. In hydraulic lime:sand mortars when ambient air temperature is at or below 5°C and falling or unless it is at least 3°C and rising.
   2.3. In nonhydraulic lime:sand mortars in cold weather, unless approval is given.
3. Temperature of the work: Maintain above freezing until mortar has fully set.
4. Rain, snow and dew: Protect masonry by covering during precipitation, and at all times when work is not proceeding.
5. Hot conditions and drying winds: Prevent masonry from drying out rapidly.
6. New mortar damaged by frost: Rake out and replace.

Materials/ production/ accessories

210 Advance registration

1. Material registered in advance by the Employer: Obtain from the supplier named in Preliminaries section A56.
    1.1. Ordering: Supersede the Employer's registration and take over responsibility by an order to the supplier covering price, supply and delivery to suit the progress of the work.

215 Material samples

1. Representative samples of designated materials: Submit before placing orders.
    1.1. Designated materials: Sands for mortar repairs
2. Retention of samples: Unless instructed otherwise, retain samples on-site for reference. Protect from damage and contamination.

220 Recording profiles

1. Profiles: Take measurements from existing masonry units, as instructed, to allow accurate matching of replacements.
2. Recording in situ: If there are no suitable joints to allow use of inserts, seek instructions.
3. Drawings and templates: Prepare as necessary. Templates must be clearly and indelibly marked to identify use and location.

230 Inspection of drawings, templates, casts, etc.

1. Timing: Before starting production of masonry units associated with the following items: As per the schedule of works.
2. Period of notice (minimum): One week

240 Stone

1. Standard: To BS EN 771-6
2. Supplier: Contractors choice
3. Type: As per the schedule of works
4. Quality: Free from vents, cracks, fissures, discolouration, or other defects that may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with shop drawings prepared by the supplier.
5. Finish: As per the schedule of works

245 Replacement stone units

1. Sizes and profiles: To match existing masonry. Maintain existing joint widths.
2. Sinkings for fixings, joggles and lifting devices: Accurately aligned and positioned in relation to existing masonry.
3. Marking: Mark each block/ dressing clearly and indelibly on a concealed face to indicate the natural bed and position in the finished work.

250 Stone orientation

1. Orientation of natural bed
    1.1. In plain walling: Horizontal.
    1.2. In projecting stones and copings: Vertical and perpendicular to wall face.
    1.3. In arches: Perpendicular to line of thrust.

255 Ashlar blocks/ Dressings

1. Cutting and dressing stone: To true and regular surfaces, free from hollow or rough areas.

258 Existing templates

1. General: Templates for replacement stones are available for making copy templates.

260 Bricks

1. Standard: To BS EN 771-1.
2. Manufacturer: Contractor's choice
   2.1. Product reference: To match existing
3. Size: To mathc existing
4. Special shapes: As per the schedule of works
5. Recycled content: 10% (minimum) to BS EN ISO 14021

265 Salvaged and second hand bricks

1. Source: Existing bricks reversed
2. Condition
   2.1. Free from matter such as mortar, plaster, paint, bituminous materials and organic growths.
   2.2. Sound, clean and reasonably free from cracks and chipped arrises.

280 Proprietary fixings

1. Description: As per the schedule of works
2. Standard: To BS EN 1090-1
3. Manufacturer: Contractor's choice
   3.1. Product reference: To match existing
4. Material: Steel to European Standard indicated in BS EN 1090-2
5. Size: As required

281 Fixings

1. Description: As per th schedule fo works
2. Type: Submit proposals.
3. Material: Steel to European Standard indicated in BS EN 1090-2
4. Size, strength and number: As necessary to resist loads likely to occur during the life of the building, and to prevent lateral displacement or pulling apart of the construction.

285 Bed joint reinforcement to masonry

1. Description: As per th schedule fo works
2. Standard: To BS EN 845-3
3. Manufacturer: Contractor's choice
   3.1. Product reference: To mathc existing
4. Material: Galvanized steel
5. Width: Approximately 40-50 mm less in width than wall or leaf.
6. Laying: On an even bed of mortar in a continuous strip with 225 mm laps at joints and full laps at angles. Keep back 20 mm from face of external work, 12 mm back from face of internal work and finish mortar joint to normal thickness.

Dismantling/ rebuilding

310 Dismantling masonry for reuse

1. Masonry units to be reused: Remove carefully and in one piece.
   1.1. Treatment: Clean off old mortar, organic growths and dirt, and leave units in a suitable condition for rebuilding.
   1.2. Identification: Mark each unit clearly and indelibly on a concealed face, indicating its original position in the construction. Transcribe makings to drawings/ photographs.

320 Rebuilding

1. Description: As per th schedule fo works
2. Replacement materials: Bricks, as clause 260
3. Mortar: As section Z21.
   3.1. Standard: BS EN 998-2
   3.2. Mix: Mix proportions: For a specified designation select a mix from the following:
   Designation (i) (BS EN 998-2 M12 equivalent)
   1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (Portland cement:sand and air entraining additive).
   Designation (ii) (BS EN 998-2 class M6 equivalent)
   1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:3-4 (Portland cement:sand and air entraining additive).
   Designation (iii) (BS EN 998-2 class M4 equivalent)
   1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
   1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:5-6 (Portland cement:sand and air entraining additive).
   Designation (iv) (BS EN 998-2 class M2 equivalent)
   1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
   1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:7-8 (Portland cement:sand and air entraining additive).
   3.3. Sand source/ type: To match existing
4. Fixings: Cramps and dowels, as clause 281
5. Rebuilding: To match previous face and joint lines, joint widths and bonding. Adequately bonded to retained work/ backing masonry, as appropriate.
6. Joint surfaces: Dampen, as necessary, to control suction.
7. Laying masonry units: On a full bed of mortar; perpend joints filled.
8. Exposed faces: Remove mortar and grout splashes immediately.
9. Joints: To match existing
10. Other requirements: None

Replacements and insertions

330 Preparation for replacement masonry

1. Defective material: Carefully remove to the extent agreed. Do not disturb, damage or mark adjacent retained masonry.
2. Existing metal fixings, frame members, etc.: Report when exposed.
3. Redundant metal fixings: Remove.
4. Recesses: Remove projections and loose material; leave joint surfaces in a suitable condition to receive replacement units. Protect from adverse weather if units are not to be placed immediately.

340 Replacement of stone

1. Description: As per the schedule of works
2. Stone: To match existing
3. Bedding depths: To match existing
4. Mortar: As section Z21.
   - 4.1. Standard: BS EN 998-2
   - 4.2. Mix: 1:3:12 white cement:lime:sand
   - 4.3. Sand source/ type: To match existing
5. Fixings: To match existing
6. Joints: To match existing
7. Other requirements: None

365 Replacement of bricks

1. Description: As per the schedule of works
2. Bricks: Clay as clause 260
3. Mortar: As section Z21.
   - 3.1. Standard: BS EN 998-2
   - 3.2. Mix: Mix proportions: For a specified designation select a mix from the following:
     Designation (i) (BS EN 998-2 M12 equivalent)
     1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
     1:3 (Portland cement:sand and air entraining additive).
     Designation (ii) (BS EN 998-2 class M6 equivalent)
     1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
     1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
     1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
     1:3-4 (Portland cement:sand and air entraining additive).
     Designation (iii) (BS EN 998-2 class M4 equivalent)
     1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
     1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
     1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
     1:5-6 (Portland cement:sand and air entraining additive).
     Designation (iv) (BS EN 998-2 class M2 equivalent)
     1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
     1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
     1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other

than lime and air entraining additive).
1:7-8 (Portland cement:sand and air entraining additive).

3.3. Sand source/ type: Well graded crushed stone to approval

4. Fixings: As required to match existing
5. Joints: To match existing
6. Other requirements: None

385 Laying replacement masonry units

1. Exposed faces of new material: Keep to agreed face lines.
2. Faces, angles and features: Align accurately. Set out carefully to ensure satisfactory junctions with existing masonry and maintain existing joint widths.
3. Joint surfaces: Dampen to control suction as necessary.
4. Laying units: On a full bed of mortar, all joints filled.
5. Exposed faces: Keep clear of mortar and grout.

390 Grouting joints

1. Grout mix: Nonhydraulic lime with pozzolanic admixture; mix subject to site trials
2. Joints that cannot be fully filled with bedding mortar: Grout thoroughly around replacement masonry units.
3. Grouting: Keep grout back from exposed face to allow for the depth of pointing, using an approved temporary sealing material. Prevent grout staining exposed face.

395 Installing stone inserts

1. Pockets to receive inserts
   1.1. Cut out accurately. Undercut sides of pocket where necessary to provide space for bonding material.
   1.2. Adjust depth so that insert stands proud of existing stone for finishing in situ.
   1.3. Clean out thoroughly.
2. Inserts: Cut to the smallest rectangular shape necessary to replace the defective area and provide a firm seating. Install accurately and securely.
   2.1. Exposed faces: Keep clear of bonding material.
3. Existing joint widths: Maintain. Do not bridge joints.

405 Bonded dowels

1. Description: As per the schedule of works
2. Standard: To BS EN 1090-1
3. Dowels: Steel to European Standard indicated in BS EN 1090-2
4. Adhesive: Epoxy resin
5. Holes for dowels: Suitably sized and accurately aligned in masonry background and in rear of replacement/ insert stone; clean and dry.
6. Other requirements: Do not use adhesive to bond stones at joints unless instructed.

410 Corroded metal fixings

1. Removal: Cut out carefully, causing the least possible disturbance to surrounding masonry. Remove associated rust debris.
2. Replacement: Compatible fixings as clause 280 & 281.

420 Temporary distance pieces for joints in ashlar stonework

1. Material: Lead or stainless steel.
2. Removal: When mortar/ grout is sufficiently strong to take loading without compression.

Tooling/ dressing stone in situ

450 Weathering ledges at joints

1. Locations: Where stones project or are recessed.
2. Requirement: Carefully weather the ledge, to approval.
3. Method: Suitably graded carborundum blocks or tooling as appropriate.

455 Descaling stone

1. Requirement: Carefully remove loose scaling and powdering from stones to the extent agreed.
2. Method: Suitable bristle brushes or carborundum blocks. Do not use wire brushes.

458 Redressing stone

1. Requirement: Carefully dress back stones to the extent agreed.
2. Method: Suitably graded carborundum blocks or tooling as appropriate.

Mortar repairs

510 Preparation for mortar repairs

1. Repair area: Scribe area of masonry to be removed using straight horizontal and vertical lines parallel to joints. Where repair area abuts joints, maintain existing joint widths and do not bridge joints.
2. Decayed masonry: Cut back carefully to a minimum depth of 20 mm to a sound background. Where the depth of removal exceeds 50 mm, seek instructions.
3. Precautions: Do not weaken masonry by removing excessive material. Do not damage adjacent masonry.
4. Top and vertical reveals of repair area: Undercut.

515 Reinforcement for mortar repairs

1. Material: Austenitic stainless steel, phosphor bronze or copper alloy wire, 3 mm diameter.
2. Armatures: Form to suit profiles of mortar repair and provide effective reinforcement.
3. Cover to reinforcement: Not less than 18 mm.
4. Installation: Drill holes into background to receive reinforcement, and bond firmly with a suitable epoxy resin.

520 Mortar repairs

1. Description: As per the schedule of works
2. Undercoats: As section Z21.
   2.1. Standard: BS EN 998-2
   2.2. Mix: Mix proportions: For a specified designation select a mix from the following:
   Designation (i) (BS EN 998-2 M12 equivalent)
   1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (Portland cement:sand and air entraining additive).
   Designation (ii) (BS EN 998-2 class M6 equivalent)

1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:3-4 (Portland cement:sand and air entraining additive).
Designation (iii) (BS EN 998-2 class M4 equivalent)
1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:5-6 (Portland cement:sand and air entraining additive).
Designation (iv) (BS EN 998-2 class M2 equivalent)
1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:7-8 (Portland cement:sand and air entraining additive).

2.3. Sand source/ type: Fine sand to approval

2.4. Building up: In layers where necessary, each layer not exceeding 12 mm.

3. Finishing coat: To match approved samples.

3.1. Standard: BS EN 998-2

3.2. Mix: Mix proportions: For a specified designation select a mix from the following:
Designation (i) (BS EN 998-2 M12 equivalent)
1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
1:3 (Portland cement:sand and air entraining additive).
Designation (ii) (BS EN 998-2 class M6 equivalent)
1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:3-4 (Portland cement:sand and air entraining additive).
Designation (iii) (BS EN 998-2 class M4 equivalent)
1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:5-6 (Portland cement:sand and air entraining additive).
Designation (iv) (BS EN 998-2 class M2 equivalent)
1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:7-8 (Portland cement:sand and air entraining additive).

3.3. Sand source/ type: Fine sand to approval

3.4. Finished thickness: To match existing

3.5. Finish: To match existing

4. Reinforcement: Not required

540 Applying mortar

1. Surfaces to receive mortar: Clean, and free from dust and debris. Dampen to control suction.
2. Applying coats: Build up in layers to specified thickness. Apply mortar firmly, ensuring good adhesion with no voids. Form a mechanical key to undercoats by combing or scratching to produce evenly spaced lines.
3. Allow each layer to achieve an initial set before applying subsequent coats. Prevent each layer from drying out rapidly by covering immediately with plastics sheeting and/ or dampening intermittently with clean water.
4. Finishing mortar coat: Form accurately to required planes/ profiles, and finish flush with adjacent masonry.
5. Protection: Protect completed repairs from adverse weather until mortar has set.

550 Scraped finish to mortar repairs

1. Procedure: Finish final coat of repair mortar proud of existing masonry face. When mortar is set, but not too hard, scrape back to required face line using fine saw blade or other suitable means, to achieve required finish.

555 Float finish to mortar repairs

1. Procedure: Use a wood float and/ or a felt faced float to give an even overall texture. Do not use steel floats.

Crack repairs/ ties/ reinforcement

610 Mortar repair of cracks

1. Description: As per schedule of works
2. Mortar: As section Z21.
   2.1. Standard: BS EN 998-2
   2.2. Mix: Mix proportions: For a specified designation select a mix from the following:
   Designation (i) (BS EN 998-2 M12 equivalent)
   1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (Portland cement:sand and air entraining additive).
   Designation (ii) (BS EN 998-2 class M6 equivalent)
   1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:3-4 (Portland cement:sand and air entraining additive).
   Designation (iii) (BS EN 998-2 class M4 equivalent)
   1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
   1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:5-6 (Portland cement:sand and air entraining additive).
   Designation (iv) (BS EN 998-2 class M2 equivalent)
   1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
   1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:7-8 (Portland cement:sand and air entraining additive).

2.3. Sand source/ type: To match existing

3. Preparation: Clean out cracks to remove debris, dust and dirt. Dampen recesses, as necessary, to control suction.
4. Applying mortar: Press well into cracks so that they are fully filled. Ensure that mortar does not encroach upon exposed faces. Finish mortar flush with masonry face.
5. Other requirements: None

620 Resin injection repair of cracks

1. Description: As per schedule of works
2. Resin injection system
   2.1. Manufacturer: Contractor's choice
      2.1.1. Product reference: Contractors choice
3. Preparation: Clean out cracks to remove debris, dust and dirt. Secure loose masonry units.
4. Exposed faces: Keep clean and free from stains.
5. Resin application: Use methods recommended by system manufacturer to fully bond masonry.
6. Completion: After resin has cured, remove temporary crack plugging material and protective coatings.
7. Pointing to cracks and injection holes: Compatible filler recommended by resin manufacturer, colour match to approval

650 Lateral restraint ties

1. Description: As per the schedule of works
2. Existing construction
   2.1. Wall type/ thickness: As per the schedule of works
   2.2. Joist size/ spacing: As per the schedule of works
3. Preparation
   3.1. Before inserting each tie, ensure that there are no service pipes, electrical cables or other obstruction in its path.
   3.2. Remove dust and debris from holes through masonry.
4. Tie system
   4.1. Standard: To BS EN 1090-1
   4.2. Manufacturer: Contractor's choice
      4.2.1. Product reference: Contractors choice
5. Tie spacing
   5.1. Joists parallel to wall: Maximum 200x50. centres, through the sides of 400. joists.
   5.2. Joists at right angles to wall: As per the schedule of works
6. Tie Installation: Insert ties accurately and securely, and as near as practicable to mid depth of joists.
7. Making good: As per the schedule of works

655 Site testing of lateral restraint ties

1. Minimum pull out loads of tie fixings into joists
   1.1. Fixings into sides of joists: As per the schedule of works
   1.2. Fixings into ends of joists: As per the schedule of works
   1.3. Fixings into solid blocking between joists: As per the schedule of works

2. Testing
    2.1. Notice: Give adequate notice of testing.
    2.2. Initial tests: At commencement of tie installation, test the first three ties.
    2.3. Subsequent tests: Apply test to every third tie.
    2.4. Test failures: Report, and seek instructions.
3. Load testing equipment: Capacity of 0-15 kN, a current calibration test certificate and an adaptor to suit the type of tie.
4. Test results: Submit on completion of satisfactory testing.

665 Lateral restraint straps

1. Description: As per the schdedule of works
2. Existing construction
    2.1. Wall type/ thickness: Solid wall, one brick thick
    2.2. Joist/ rafter/ tie size/ spacing: Floor joists nominal 200 x 65 mm at 450 mm centres
3. Restraint straps
    3.1. Standard: To BS EN 1090-1
    3.2. Manufacturer: Contractor's choice
        3.2.1. Product reference: Contractors choice
    3.3. Material/ type: Steel to European Standard indicated in BS EN 1090-2
    3.4. Cross section size (minimum): 30 x 5 mm.
    3.5. Length (minimum): As per the schedule of works
    3.6. Cranked end
        3.6.1. Length (minimum): As per the schedule of works
4. Fixing straps to timber
    4.1. To joists/ rafters/ ties parallel to wall: One fastener in each joist/ rafter/ tie and minimum two fasteners in each strut.
        4.1.1. Strap centres (maximum): 400
    4.2. To joist/ rafters/ ties at right angles to wall: As per the schedule of works
    4.3. Fasteners: As per the schedule of works
5. Fixing straps to masonry: Cranked end to be in tight contact with masonry.
    5.1. Fasteners: Stainless steel expansion anchors, Agrément certified
6. Strutting: Where suitable strutting does not exist, fix solid struts of minimum 38 mm thick softwood and not less than three quarters of depth of joist/ rafter/ tie. Outer joists/ rafter/ tie to be blocked solidly to walls.
7. Notching: Notch joists so that straps fit flush with surface. Do not notch rafters/ ties.

675 Joint reinforcement

1. Description: As per the schedule of works
2. Existing construction: Cavity wall with brick outer leaf
3. Joint width: 10 ± 2 mm
4. Reinforcement system
    4.1. Standard: To BS EN 1090-1
    4.2. Manufacturer: Contractor's choice
        4.2.1. Product reference: Contractors choice

4.3. Type: As per the schedule of works

5. Grout: Not required
6. Installation: Remove existing mortar without damaging adjacent masonry or widening joints. Form recess to depth recommended by reinforcement manufacturer. Remove dust and debris. Install reinforcement using methods recommended by manufacturer.
7. Joints: Repoint, as clause 820.

690 Making good to injection and insertion holes

1. Preparation: Clean out holes thoroughly.
2. Repair mortar: To match existing masonry units/ joints in colour and texture. Fill holes and finish mortar neatly and flush with surrounding masonry.
3. Finished appearance: Obtain approval for first 5 holes before completing the remainder.

692 Making good to tie and dowel insertion holes using core drilled plugs

1. Plugs: Cut plug from masonry face before drilling hole for each tie/ dowel. Where resulting plug is unusable, prepare plug from matching material.

   1.1. Plug diameter: Smallest practicable.
2. Holes: Clean.
3. Method of securing plug: A spot of epoxy resin and nonhydraulic lime:sand mortar
4. Joints: Fine and flush.
5. Finished appearance: Obtain approval for first 5 holes before completing remainder.

Grouting rubble filled cores

710 Preparation for grouting

1. Grouting holes: Drill in joints at horizontal and vertical centres to suit coursing and to achieve an effective distribution of grout so that, on completion, all voids in masonry are filled.
2. Maximum height of each grout pour: Regulate to prevent disruption to masonry.
3. Open joints in masonry: Seal with an approved temporary material to prevent leaking of grout. Leave weep holes every two or three courses to assist in flushing out dust and debris, and to prove effectiveness of grouting. Locate temporary seal back from facework to allow for specified repointing. Seek instructions if repointing precedes grouting.

712 Flushing out

1. Timing: Before grouting.
2. Requirement: Flush out core of masonry walls using clean water delivered under moderate pressure through grouting holes.

720 Hand grouting

1. Description: As per the schedule of works
2. Grout mix: As per the schedule of works
3. Method: Direct grout into open joints using clay cups formed against masonry surface. Pour grout to refusal; allow to set; break off excess mortar and brush down masonry face.

740 Application of grouting

1. Grouting: Continuous operation during each lift. Allow grout to set before commencing subsequent lifts.

2. Monitoring: Monitor grouting carefully and continuously at each delivery point (flow and delivery pressure), and at adjacent/ opposite wall faces, to ensure that there is an effective distribution of grout with no leaking, staining, or disruption to the masonry.
3. Temporary seals: Remove on completion of grouting and leave joints in a suitable condition for repointing.

Pointing/ repointing

810 Preparation for repointing

1. Existing mortar: Working from top of wall downwards, remove mortar carefully, without damaging adjacent masonry or widening joints, to a minimum depth of 30 mm.
   1.1. Loose or friable mortar: Seek instructions when mortar beyond specified recess depth is loose or friable and/ or if cavities are found.
2. Raked joints: Remove dust and debris.

820 Pointing

1. Description: As per the schedule of works
2. Preparation of joints: Rake out existing mortar
3. Mortar: As section Z21.
   3.1. Standard: BS EN 998-2
   3.2. Mix: Mix proportions: For a specified designation select a mix from the following:
   Designation (i) (BS EN 998-2 M12 equivalent)
   1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (Portland cement:sand and air entraining additive).
   Designation (ii) (BS EN 998-2 class M6 equivalent)
   1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:3-4 (Portland cement:sand and air entraining additive).
   Designation (iii) (BS EN 998-2 class M4 equivalent)
   1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
   1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:5-6 (Portland cement:sand and air entraining additive).
   Designation (iv) (BS EN 998-2 class M2 equivalent)
   1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
   1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:7-8 (Portland cement:sand and air entraining additive).
   3.3. Sand source/ type: Crushed stone fine pointing sand to approval
4. Joint profile/ finish: Recessed back from weathered arrises to retain original joint widths. Brushed finish, as clause 860
5. Other requirements: Grout deep voids, as clause 720

840 Pointing with tools/ Irons

1. General: Press mortar well into joints using pointing tools/ irons that fit into the joints, so that they are fully filled.
2. Face of masonry: Keep clear of mortar. Use suitable temporary adhesive tape on each side of joints where necessary. Finish joints neatly.

850 Pointing with injection mortar

1. General: Inject mortar into joints so that they are fully filled with no voids.
2. Face of masonry: Keep clear of mortar. Finish joints neatly.

860 Brushed finish to joints

1. Timing: After initial mortar set has taken place remove laitance and excess fines by brushing, to give a coarse texture. Do not compact mortar.

Ω End of Section

C42
Repairing/ renovating/ conserving concrete

General

105 Information required with tender

1. Details of repair system including manufacturer and product references; data sheets; third party product certification.

110 Survey report

1. None.

140 Coordination of temporary works

1. Standard: To BS 5975.
2. Falsework coordinator: Appoint a suitably qualified and experienced person.
3. Responsibilities: In addition to those listed in BS 5975, clause 6.3.1.3, to ensure that:
   - 3.1. Relevant requirements for temporary supports, whether known at the outset or discovered in the course of the repair works, are fully considered.
   - 3.2. Removal of concrete/ reinforcement is only undertaken when it is safe to do so and temporary supports are in place.
4. Period of appointment: From commencement of Contract until completion of repair works.

150 Concrete replacement repairs

1. Description: As per schedule of owrks
2. Location: As per Tender drawings
3. Concrete removal
   - 3.1. Extent: As clause 640
   - 3.2. Limitations on removal: As per Tender drawings
   - 3.3. Method: Submit proposals
4. Reinforcement replacement
   - 4.1. Extent: As per Tender drawings
   - 4.2. Jointing: Submit proposals
5. Reinforcement treatment: Active pigment coating or barrier coating
6. Concrete replacement: Submit proposals
7. Finish: To match existing
8. Other requirements: Abseiling to carry out repairs not permitted

155 Crack repairs

1. Description: As per schedule of works
2. Location: As per schedule of works
3. Crack types/ widths: As survey report
4. Primary function: As per schedule of works
5. Grouting material: As per schedule of works
6. Application method: Submit proposals
   - 6.1. Finish: To match existing

7. Other requirements: None

165 Protective coatings

1. Description: As per the schedule of works
2. Location: As per thr schedule of works
3. Additional treatment to concrete substrate: Submit proposals
4. Coating material: Proprietary; anti-carbonation
5. Other requirements: None

Products

305 Proprietary repair systems

1. Products: Compatible and supplied by the same manufacturer as part of a total repair system.

310 Repair mortar

1. Type: As per the schedule of works
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

315 Protective coating to reinforcement

1. Type: As per the schedule of works
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

320 Levelling/ smoothing coats

1. Type: As per the schedule of works
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

330 Proprietary self-compacting concrete for recasting

1. Type: As per the schedule of works
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

335 Proprietary concrete for small area repairs

1. Type: As per the schedule of works
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

340 Crack/ void sealing grouts

1. Type: As per the schedule of works
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

345 Protective coatings for concrete

1. Type: As per the schedule of works
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Colour: As per Tender drawings

360 Reinforcement generally

1. Standards
   1.1. Steel: To BS 4449; BS 4482; BS 4483.
   1.2. Stainless steel: To BS 6744.
2. Strength grades: Subject to site investigation
3. Cutting and bending: To BS 8666.
4. Suppliers: Firms holding a valid certificate of approval issued under a product certification scheme operated by a third party certification body with appropriate Category 2 accreditation from the United Kingdom Accreditation Service (UKAS).

365 Reinforcement couplers

1. Type: As per the schedule of works
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Protective coating: As for reinforcement

Execution

605 Execution generally

1. Standard: To BS EN 1504-10.
2. Operatives' skill and experience: Appropriate for the types of preparation and application.
   2.1. Evidence: Submit on request.

610 Quality control during application of repair system

1. Tests/ Observations: Submit proposals
   1.1. Frequency: For each batch of concrete replacement material
   1.2. Criteria: As BS EN 1504-10 clause A.9.2.

615 Quality control on completed hardened repair system

1. Tests/ Observations: Submit proposals
   1.1. Frequency: As BS EN 1504-10, table 4.
   1.2. Criteria: Not less than that for existing concrete

625 Removal of fittings/ attachments

1. Extent: The area of repair and any fittings/ attachments that could impede or be damaged by access.
2. Removal methods: Minimize damage to concrete/ reinforcement and to fittings/ attachments that are to be retained for reuse.
3. Items for disposal: As per the schedule of works

4. Items for refixing after completion of repair work: As per the schedule of works
   4.1. Storage: Prevent damage.
5. Other requirements: None

630 Cleaning concrete surfaces

1. Extent: To reveal surface condition and aid investigation work. Minimize disruption to concrete surfaces and materials. Leave no harmful residual cleaning agents.
2. Methods: Submit proposals

635 Temporary supports/ propping

1. Standard: To BS 5975 & To BS EN 12812
2. General: Prevent damage and overstressing to any part of structure during repairs.
3. Bearings for temporary supports/ propping: Suitable to carry loads throughout repair operations.
4. Location/ Extent of propping: As per the schedule of works

640 Extent of concrete removal for reinforcement treatment/ replacement

1. Generally: The minimum necessary to allow treatment/ replacement, and to achieve thorough compaction of replacement material.
2. Edges of retained concrete: No undercutting or feather edges. Maintain edge angle within 90-135° or, where replacement material is spray applied, 110-135°.
   2.1. Cutting: Prevent damage to reinforcement.
3. Removal of carbonated/ contaminated concrete: As per the schedule of works
4. Gap to expose full profile of bar: The greater of 15 mm or the maximum aggregate size of the repair material plus 5 mm
5. Length of continuous uncorroded reinforcement to be exposed (minimum): 50 mm or, where reinforcement is to be replaced, 50 mm beyond the end of lap or joint.

645 Cleaning reinforcement

1. Standard of cleaning: As per the schedule of works

650 Adding/ replacing reinforcement generally

1. Cleaning existing reinforcement: Sufficient to assess degree of section loss.
2. Removing reinforcement sections: Minimize disruption to retained reinforcement, retained concrete and bond between the two.
3. Cutting reinforcement
   3.1. Cold worked reinforcement: Saw cut or shear.
   3.2. Hot rolled reinforcement when using welded or mechanical joints: Grind back burnt ends of reinforcement a minimum of 2 mm.
4. Condition of new reinforcement: Free from corrosive pitting, loose mills cale, loose rust and contaminants which may adversely affect the reinforcement, the concrete replacement material, or bond between the two.
5. Compatibility of metals in contact: Select to prevent bimetallic corrosion.

652 Lapping replacement/ additional reinforcement with existing

1. Bar size (minimum): Unless indicated otherwise:
   1.1. Replacement bar: Size to match bar being replaced.
   1.2. Additional reinforcement: The lesser of:

1.2.1. the existing bar size, or

1.2.2. a bar with a cross-sectional area at least equal to the

1.2.3. maximum loss of cross-section of the existing bar plus As per the schedule of works.

2. Standard lap length/ reinforcement bond type: As per the schedule of works
   2.1. Lap length factor: As BS EN 1992-1-1, clause 8.7.2
3. Lap length between the uncorroded length of existing bar and the new bar (minimum): Unless agreed otherwise, equal to standard lap length for new bar times the lap length factor.
   3.1. Situations where minimum lap lengths cannot be achieved: Submit proposals.
4. Situations where there are reasons to believe that the existing bar is not fully stressed: Submit reason and proposal.
5. Tying wire: 16 gauge and compatible with reinforcement.
   5.1. Ends of tying wire: Prevent intrusion into the cover. Remove loose ends.

655 Welding new reinforcement to existing

1. Standard: To BS EN ISO 17660-1 and -2 and BS EN 1992-1-1, clause 3.2.5.
2. Joint type: As per the schedule of works
   2.1. Details: As per the schedule of works
3. Written welding procedures: Required
4. Nature of existing reinforcement: Check. Submit proposals for welding procedure if cold worked reinforcement is to be welded.

660 Preparation of concrete substrates

1. Soundness: Remove loose or otherwise defective material and repair significant cracks and gaps.
2. Preparation
   2.1. Roughening for key: As per the schedule of works
   2.2. Wetting of substrate: As recommendations of replacement material manufacturer
3. Condition immediately before placing replacement material
   3.1. Cleanliness: Free from loose material, with no debris, tying wire clippings, and other matter that could adversely affect bond.
   3.2. Surface condition: As recommendations of concrete replacement material manufacturer

665 Formwork for recasting

1. Generally: Accurately and robustly constructed to produce finished concrete to the required dimensions.
   1.1. Formed surfaces: Free from twist and bow.
   1.2. Intersections, lines and angles: Square, plumb and true.
2. Joints in forms: Secure forms tight against existing concrete. Prevent loss of grout and formation of steps.

670 Grouting cracks/ voids

1. Substrates: Clean. Keep free of detritus.
2. Pressure: Minimum necessary to fill cracks completely. Leave no voids and prevent disruption to structure.

675 Curing concrete/ mortar

1. Requirement: Keep surface layers of concrete/ mortar moist throughout curing period, including perimeters and abutments, by either restricting evaporation or continuously wetting surfaces of concrete/ mortar.
    1.1. Surfaces covered by formwork: Retain formwork in position and, where necessary to satisfy curing period, cover surfaces immediately after striking.
    1.2. Top surfaces: If covering is removed for finishing operations, replace it immediately afterwards

Completion

710 Record of location/ extent of repairs

1. Repair record forms
    1.1. Content: Unique repair reference number for cross-referencing to record drawings; details of repair including dimensions and explanatory sketches; agreements and special requirements.
    1.2. Copies: Two
    1.3. Source of record forms: Contractor's standard
2. Record drawings: Required on marked up contract drawings

Ω End of Section

C45
Damp-proof course renewal/ insertion

To be read with preliminaries/ general conditions.

110 Precontract survey

1. General: A survey has been carried out and the report is available for inspection.
2. Survey limitations: None

115 Survey and report

1. Survey generally
   1.1. Purpose: To confirm presence and extent of rising damp and suitability of walls for treatment by the proposed dpc system.
   1.2. Timing: Before starting dpc installation work carry out survey and submit survey report.
   1.3. Location of drilled samples: Submit proposals.
2. Survey report content
   2.1. Extent of rising damp: Determine using methods recommended in the Property Care Association 'Code of practice for the investigation and control of dampness in buildings', 4 'Inspections'.
   2.2. Proposals: Submit levels and positions of horizontal and vertical dpcs.
   2.3. Associated work: Nature and extent of repair and/ or replacement work required to ensure an effective dpc.
   2.4. Limitations: Identify areas where a full survey could not be carried out.
   2.5. Other information: Any considered relevant.

135 Associated work

1. Work shown to be necessary by the survey: Carry out as part of main contract works

140 Before dpc installation

1. Positions of dpcs not shown on drawings: Submit proposals.
2. Internal finishes: Remove only sufficient to expose the proposed line of dpc.
3. Fungal or beetle attack to timber sections: Report occurrences.

150 Removal of external render

1. Extent of removal (maximum): 100 mm above proposed dpc level.

165 Repointing of walls

1. Location: On line of proposed dpc.
2. Timing: Before installation of chemical injection dpcs.
3. Mortar: As section Z21.
   3.1. Mix: As per the schedule of works

210 Chemical injection dpc system

1. System: Agrément-certified.
   1.1. Product type: As per the schedule of works

2. Installation: In accordance with BS 6576 by a firm approved by the dpc system manufacturer

230 Physical insertion dpc system

1. System/ Installer: As per the schedule of works
2. Joint cutting: Prevent structural damage.
3. Installation: Form a continuous barrier to rising damp.
4. Dpc material: Polyethylene to BS 6515
5. Dpc width: To extend the full width of wall and finish:
   5.1. Externally: As per the schedule of works
   5.2. Internally: To lap 150 mm (minimum) with dpm
6. Bedding mortar: As section Z21.
   6.1. Mix: As recommended by the dpc installer
   6.2. Pointing: To match existing
7. Other requirements: None

250 Making good to exposed injection holes

1. Mortar mix: A type recommended by the chemical injection dpc system manufacturer to match existing masonry in colour and texture.
   1.1. Installation: Fully fill holes. Finish neatly and flush.
2. Approval of appearance: Obtain or first few holes before completing the remainder.

251 Making good to exposed injection holes

1. Sealing holes: Use plastics plugs, colour matched to masonry.
2. Installation: Fit securely and neatly.

260 Guarantee

1. Type: Insured protection. Administered by an independent insurance protection company.
   1.1. Guarantee period from completion of installation (minimum): 20 years
2. Documentation: Provide certificates/ guarantees at completion of installation.

Ω End of Section

C46
Cavity wall tie renewal/ insertion

General requirements

100 Precontract survey of existing cavity walls

1. A survey has been carried out and the work is identified in the Schedule of Work.

105 Survey of existing cavity walls

1. Timing: Before starting remedial work covered in this section.
2. Purpose: To confirm nature and extent of remedial work to wall ties.
3. Survey report: Submit, stating:
   - 3.1. Form of construction, materials used and condition of walls.
   - 3.2. Thicknesses of internal and external leaves.
   - 3.3. Widths of cavities.
   - 3.4. Nature and extent of remedial work including requirements for additional ties at, e.g. sloping verges, movement joints and openings.
   - 3.5. Schedule of services, fixtures and finishes requiring removal to facilitate renewal of wall ties.
   - 3.6. Any other information considered relevant.

110 Inserting cavity wall ties

1. Description: As per the schedule of works
2. Existing cavity wall construction: As per Tender drawings
   - 2.1. External leaf: 102 mm clay common brick
   - 2.2. Internal leaf: 150 mm lightweight concrete block
   - 2.3. Cavity width: As per Tender drawings
3. Existing ties: As per Tender drawings
   - 3.1. Treatment: Retain
4. Remedial cavity wall ties
   - 4.1. Type: As per Tender drawings
   - 4.2. Manufacturer: Contractor's choice
     - 4.2.1. Product reference: Contractor's choice
   - 4.3. Diameter: Manufacturer's standard
   - 4.4. Length: Site measurement
   - 4.5. Proof load testing: Initial and installation testing required

General requirements

220 Samples for repairs to external leaf

1. Obtain approval for the following before completing the remainder: Repointing cracked joints. Sample location to approval.

Preparation/ installation

310 Initial site testing of proof loads for wall ties

1. Timing: Before commencing wall tie installation.
2. Tensile proof loads of wall tie fixings
   - 2.1. General: Do not test wall ties until they have been installed for the appropriate periods recommended by the wall tie manufacturer.
   - 2.2. Locations: Submit proposals.
   - 2.3. Testing: Give adequate notice.
   - 2.4. Separate tests (minimum frequency)
     - 2.4.1. Internal leaf: Three tests
     - 2.4.2. External leaf: Three tests
   - 2.5. Proof loads for internal and external leaves
     - 2.5.1. (minimum): As per Tender drawings
   - 2.6. Test failures: Obtain instructions.
   - 2.7. Completion of satisfactory testing: Submit results.

315 Proof load testing of wall ties during installation

1. Timing: During installation and before making the external leaf connections.
2. Tensile proof loads of wall tie fixings
   - 2.1. General: Do not test wall ties until they have been installed for the appropriate periods recommended by the wall tie manufacturer.
   - 2.2. Testing: Give adequate notice.
   - 2.3. Proof load test frequency (minimum)
     - 2.3.1. Number of ties: 21-250
     - 2.3.2. Minimum test rate: 10%
     - 2.3.3. Allowable failure rate of tested ties: 5%
     - 2.3.4. Locations: Obtain instructions for the first 20 ties and thereafter test randomly
   - 2.4. Proof loads for internal leaf (minimum): As per Tender drawings
   - 2.5. Test failures
     - 2.5.1. First sample set failure rate exceeds 10%: Repeat the proof test on a further sample set.
     - 2.5.2. Combined failure rate of both sample sets exceeds 10%: Obtain instructions.
     - 2.5.3. Ties that fail proof load test: Replace in suitably adjacent location and retest.
   - 2.6. Completion of satisfactory testing: Submit results.

330 Installation of wall ties generally

1. Masonry
   - 1.1. Stable at all times during wall tie installation.
   - 1.2. Formation of holes: Minimize.
   - 1.3. Cavities: Clear and free from debris.
   - 1.4. Fixing holes: Clean.
2. Wall ties
   - 2.1. Installation: Accurately and securely.

2.2. Drips: Centred on cavity.
2.3. Expansion anchor fixings: Set to the correct torque.
2.4. Bonded fixings: Thoroughly grouted.
3. Facework: Keep clean.

340 Positioning of wall ties

1. Spacing of wall ties: As per Tender drawings
2. Additional ties
   2.1. Reveals of unbonded openings and edges (including gables and movement joints): As per Tender drawings
   2.2. Cavities with insulation batts: As per Tender drawings

345 Positioning of wall ties for masonry cladding to timber frame

1. General: Secure into timber studs/ frame members.
2. Spacing of wall ties: As per Tender drawings
3. Additional ties: As per Tender drawings

350 Removing masonry units for reuse

1. Removal of units: In one piece. Clean and set aside for reuse.
2. Units unsuitable for reuse: Obtain instructions.
3. Adjacent masonry
   3.1. Joints: Do not damage or widen.
   3.2. Old mortar: Remove.
   3.3. Cavities: Keep clean.

355 Removing masonry units

1. Adjacent masonry
   1.1. Joints: Do not damage or widen.
   1.2. Old mortar: Remove.
   1.3. Cavities: Keep clean.

360 Core drilling masonry with rendered finish

1. Drilling: Carefully and accurately to provide access to existing ties.

365 Removal of existing wall ties from internal leaf

1. Wall ties: Remove carefully and completely.
2. Internal leaf/ finishes: Minimize disturbance.

368 Removal of existing wall ties from external leaf

1. Wall ties
   1.1. Flexible wire ties: Crop or bend down against face of internal leaf.
   1.2. Rigid ties: Crop against face of internal leaf.
2. Internal leaf/ finishes: Do not disturb.

370 Making good of cavity wall insulation

1. Cavities: Clear of dirt and debris.
2. New insulation: To match existing
   2.1. Thickness: To match existing.
   2.2. Installation: Secure. No gaps.

380 Replacing masonry units

1. Masonry units: As per Tender drawings
2. Mortar: As section Z21.
   2.1. Mix: To match existing for strength, colour and texture
3. Mortar joints: Control suction. Lay units on full bed and fully fill vertical joints.
   3.1. Profile: Finish neatly to match existing
4. Cavities: Keep clean.

390 Isolating wall ties in external leaf

1. Isolating sleeve system
   1.1. Manufacturer: Contractor's choice
      1.1.1. Product reference: Contractor's choice
2. Installation
   2.1. Wall tie: End free from mortar, dust and debris.
   2.2. Sleeve: Fit accurately.
   2.3. Front edge of sleeve: Recess 20 mm (minimum) from face of masonry.
3. Mortar: As section Z21.
   3.1. Mix: To match existing for strength, colour and texture
4. Joints: Control suction. Fully fill with mortar.
   4.1. Profile: Finished neatly to match existing.
5. Facework: Keep clean.

Completion

400 Making good of insertion/ inspection holes in external leaf

1. Mortar mixes: To approval.
   1.1. Colour and texture: To match existing masonry units/ joints.
2. Insertion/ Inspection holes: Clean and fully filled with repair mortar.
   2.1. Finish: Neat and flush.

410 Making good of external render

1. Patches generally
   1.1. Edges: Undercut.
   1.2. Surfaces: Free from dust and debris.
2. Insertion/ Inspection holes: Clean and fully filled.
3. Render coat mix: To match existing for strength, colour and texture
   3.1. Coats: Control suction. Apply firmly.
   3.2. Finish: Flush with existing render and with matching finish.

420 Retouching decorative finishes to external leaf

1. Repairs: Carefully retouch using compatible paint to blend with existing surrounding finish.

430 Repointing cracked joints

1. Extent of repointing: To joints with cracks wider than 1.5mm.
2. Joints
   2.1. Existing mortar: Remove carefully. Do not damage adjacent masonry or widen joints.
   2.2. Recess to receive pointing: Neat and square, minimum depth twice joint thickness. Remove dust and debris.
3. Mortar: As section Z21.
   3.1. Mix: To match existing for strength, colour and texture
4. Repointing: Control suction. Fully fill joints with mortar.
   4.1. Profile: Finish neatly to match existing adjacent joints.
5. Facework: Keep clean.

440 Documentation

1. Submit
   1.1. Statement of quality control checks.
   1.2. Guarantee certificate.

Ω End of Section

C51
Repairing/ renovating/ conserving timber

General

110 Inspection

1. Purpose: To confirm nature and extent of repair/ renovation/ conservation work shown on drawings, and described in survey reports and schedules of work.
2. Parties involved: Contract administrator, Structural engineer, Contractor's representative
3. Timing: At least 2 days before starting each section of work
4. Instructions issued during inspection: Confirm in writing, with drawings and schedules as required, before commencing work

130 Opening up

1. Purpose: To reveal previously concealed areas of structure or fabric not recorded during initial surveys.
2. Extent: To be agreed
3. Timing: Give notice before starting opening up.
   3.1. Period of notice: At least two working days
4. Retained building structure/ fabric: Do not damage or destabilize.

150 Timber procurement

1. Timber (including timber for wood-based products): Obtained from well-managed forests and/ or plantations in accordance with:
   1.1. The laws governing forest management in the producer country or countries.
   1.2. International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
2. Documentation: Provide either in accordance with the chain of custody certification scheme requirements:
   2.1. documentary evidence (that has been or can be independently verified) regarding the provenance of all timber supplied; or
   2.2. evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.
3. Chain of Custody Certification scheme: In accordance with UK Government Timber Procurement Policy (UKTPP) i.e. FSC, GiB or PEFC
   3.1. Other evidence: None

160 Timber supplier

1. Supplier: Submit proposals

Structural repairs/ alterations

210 Timber section strengthening – internal reinforcement

1. Reinforcement
   1.1. Type: As per Structural Engineering Calculations and details & Tender drawings
   1.2. Number/ size: As per Structural Engineering Calculations and details & Tender drawings
   1.3. Spacers: Submit proposals

2. Slots in existing members
    2.1. Location: As per Structural Engineering Calculations and details & Tender drawings
    2.2. Size: As per Structural Engineering Calculations and details & Tender drawings
3. Grout: Epoxy resin

220 Timber section repair – internal reinforcement

1. Defective timber: Cut out
2. Reinforcement
    2.1. Type: As per Structural Engineering Calculations and details & Tender drawings
    2.2. Number/ size: As per Structural Engineering Calculations and details & Tender drawings
    2.3. Spacers: Submit proposals
3. Slots in existing members
    3.1. Location: As per Structural Engineering Calculations and details & Tender drawings
    3.2. Size: As per Structural Engineering Calculations and details & Tender drawings
4. Replacement timber: Softwood/Hardwood to match existing
    4.1. Sectional profiles of mating surfaces: To match cut ends of existing timber.
    4.2. Holes/ slots for reinforcement
        4.2.1. Location: To suit slots in existing member
        4.2.2. Size: As per Tender drawings
5. Grout: Epoxy resin

230 Member strengthening – external reinforcement

1. Reinforcement: As per Structural Engineering Calculations and details & Tender drawings
    1.1. Size: As per Tender drawings
2. Fixing to existing timber: As per Tender drawings

240 End repairs – lap

1. Defective timber: Cut out
2. Lap member: As per Structural Engineering Calculations and details & Tender drawings
    2.1. Size: As per Structural Engineering Calculations and details & Tender drawings
3. Fixing to existing timber: As per Structural Engineering Calculations and details & Tender drawings

250 Timber section repairs – external splice

1. Defective timber: Cut out to clean, regular profile.
2. Replacement timber: Softwood/Hardwood to match existing
3. Splice plates
    3.1. Material: As per Structural Engineering Calculations and details & Tender drawings
    3.2. Size: As per Structural Engineering Calculations and details & Tender drawings
4. Fixing to existing timber: As per Structural Engineering Calculations and details & Tender drawings

260 Joint strengthening – planar intersections

1. Gusset plates
    1.1. Material: As per Structural Engineering Calculations and details & Tender drawings

1.2. Size: As per Structural Engineering Calculations and details & Tender drawings

2. Fixing to timber: As detailed

270 Joint strengthening – rectangular intersections

1. Cleats: Carbon steel angles
   1.1. Size: As per Tender drawings
2. Fixing to timber: As per Tender drawings

Products

310 Structural softwood (graded direct to strength class)

1. Description: As per the schedule of works
2. Strength class to BS EN 338: As per Tender drawings
3. Treatment
   3.1. Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C8
      3.1.1. Design service life: 30 years
   3.2. Fire-retardant treatment: As per Tender drawings
4. Moisture content (maximum) at time of installation: 16%
5. Other requirements: Wane not permitted

320 Structural softwood (strength class not specified)

1. Description: As per the schedule of works
2. Species: As per the schedule of works
3. Grading standard: To the appropriate BS EN 14081-1 compliant standard.
   3.1. Grade: GS to BS 4978
4. Treatment
   4.1. Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C8
      4.1.1. Design service life: 30 years
   4.2. Fire-retardant treatment: As per the schedule of works
5. Moisture content (maximum) at time of installation: As per the schedule of works
6. Other requirements: None

330 Structural hardwood (graded direct to strength class)

1. Description: As per the schedule of works
2. Strength class to BS EN 338: As per the Tender drawings
3. Surface finish: Planed all round
4. Treatment
   4.1. Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood
      4.1.1. Design service life: 30 years
   4.2. Fire-retardant treatment: As per the Tender drawings
5. Moisture content (maximum) at time of installation: As supplied
6. Other requirements: None

340 Structural hardwood (strength class not specified)

1. Description: As per the schedule of works
2. Species: As per the Tender drawings
3. Grading standard: To the appropriate BS EN 14081-1 compliant standard.
   - 3.1. Grade
     - 3.1.1. Temperate hardwoods: As per the Tender drawings
     - 3.1.2. Tropical hardwoods: As per the Tender drawings
4. Surface finish: Planed all round
5. Treatment
   - 5.1. Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C8
     - 5.1.1. Design service life: 30 years
   - 5.2. Fire-retardant treatment: As per the Tender drawings
6. Moisture content (maximum) at time of installation: As per the Tender drawings
7. Other requirements: None

350 Ungraded softwood

1. Description: As per the schdule of works
2. Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
3. Surface finish: Planed all round
4. Treatment
   - 4.1. Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C8
     - 4.1.1. Design service life: 30 years
   - 4.2. Fire-retardant treatment: As per the Tender drawings

360 Softwood for joinery repairs

1. Description: As per the schedule of works
2. Species: As per the Tender drawings
3. Quality: Generally to BS EN 942; free from decay and insect attack (except pinhole borers).
   - 3.1. Appearance class: Class As per the Tender drawings.
4. Treatment: As per the Tender drawings
5. Moisture content on delivery: 6-10%

370 Hardwood for joinery repairs

1. Description: As per the schedule of works
2. Species: As per the Tender drawings
3. Quality: Generally to BS EN 942; free from decay and insect attack (except pinhole borers).
   - 3.1. Appearance class: Class As per the Tender drawings.
4. Treatment: As per the Tender drawings
5. Moisture content on delivery: 6-10%

390 Non-structural plywood

1. Description: As per the schedule of works
2. Standard: To an approved national standard.
3. Thickness: As per the Tender drawings
4. Appearance class to BS EN 635: As per the Tender drawings
5. Bond quality to BS EN 314-2: Class 1
6. Finish: Sanded & Unsanded
7. Edges: Square
8. Treatment
   - 8.1. Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C11
     - 8.1.1. Design service life: 20 years
   - 8.2. Fire-retardant treatment: None required

410 Carbon steel sections and plates

1. Description: As per the schedule of works
2. Standard: To BS EN 10025-2.
3. Grade: S355JR
   - 3.1. Options: None
4. Source: Obtain steel from a source accredited to a national or internationally accepted quality standard.
5. Protection
   - 5.1. Generally: As per the Tender drawings
   - 5.2. Ends built into external walls: As per the Tender drawings

430 Proprietary framing anchors and cleats

1. Manufacturer: As per the Tender drawings
   - 1.1. Product reference: As per the Tender drawings
2. Material/ finish: As per the Tender drawings
3. Fasteners: Galvanized or sherardized nails, size as recommended by product manufacturer.

440 Carbon steel bolt assemblies

1. Description: As per the schedule of works
2. Bolts: To BS 4190.
   - 2.1. Designation: As per Structural Engineering Calculations and details & Tender drawings
   - 2.2. Finish as delivered: As per Structural Engineering Calculations and details & Tender drawings
3. Nuts and washers: Material, grades and finishes to suit bolts.
   - 3.1. Washer size
     - 3.1.1. In contact with timber: Diameter: 3 times bolt diameter; thickness: 0.3 times bolt diameter.
     - 3.1.2. In contact with steel section/ plate (required when surface finish may be damaged by nut or bolt head rotating): To BS 4320.

450 Stainless steel bolt assemblies

1. Description: As per the schedule of works
2. Bolts: To BS EN ISO 3506-1.
   2.1. Designation: As per Structural Engineering Calculations and details
3. Nuts and washers: To suit grade of bolt.
   3.1. Washer size
      3.1.1. In contact with timber: Diameter: 2 times bolt diameter; thickness: 0.2 times bolt diameter.
      3.1.2. In contact with steel section/ plate (required when surface finish may be damaged by nut or bolt head rotating): To BS 4320.

460 Connector assemblies

1. Description: As per the schedule of works
2. Connectors: To BS EN 912.
   2.1. Type: As per the Tender drawings
   2.2. Anti-corrosion treatment: Galvanized
3. Bolts
   3.1. Designation: As per the Tender drawings
   3.2. Diameter: To BS EN 1995-1-1 to suit type and size of connector.
   3.3. Finish as delivered: Galvanized
4. Nuts and washers: Materials, grades and finishes to suit bolts.
   4.1. Washer size
      4.1.1. In contact with timber: Diameter: 2 times bolt diameter; thickness: 0.2 times bolt diameter.
      4.1.2. In contact with steel section/ plate (required when surface finish may be damaged by nut or bolt head rotating): To BS 4320.

470 Nails

1. Description: As per the schedule of works
2. Standard: As section Z20.
3. Type: As per the Tender drawings
4. Material: Steel.
   4.1. Strength (minimum): As per the Tender drawings
5. Finish as delivered: Galvanized

480 Screws

1. Description: As per the schedule of works
2. Standard: As section Z20.
3. Material: Carbon steel & Stainless steel
4. Tensile strength (minimum): 550 N/mm²
5. Finish as delivered: Galvanized

490 Coach screws

1. Description: As per the schedule of works

2. Standard: To DIN 571
3. Material: Carbon steel & Stainless steel
4. Tensile strength (minimum): 550 N/mm².
5. Finish as delivered: Galvanized

510 Carbon steel dowels

1. Description: As per the schedule of works
2. Product form: As per the Tender drawings
3. Standard: As per the Tender drawings
   3.1. Strength grade: As per Structural Engineering Calculations and details & Tender drawings
4. Finish as delivered: Galvanized
5. Other requirements: None

540 Resin grout/ adhesive

1. Description: As per the schedule fo works
2. Type: As per the schedule fo works
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractors choice

Execution

600 Workmanship

1. Skill and experience of site operatives: Appropriate for types of work on which they are employed.
   1.1. Documentary evidence: Submit on request.

610 Temporary supports/ propping

1. General: Provide adequate temporary support at each stage of repair work to prevent damage, overstressing or uncontrolled collapse of any part of the structure.
2. Bearings for temporary supports/ propping: Suitable to carry loads throughout repair operations.

620 Protection of timber and wood components before and during installation

1. Storage: Keep dry, under cover, clear of the ground and with good ventilation. Support sections/ components on regularly spaced, level bearers on a dry, firm base.
2. Handling: Do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.

630 Material samples

1. Representative samples of designated materials: Submit before placing orders.
   1.1. Designated materials: None

650 Dimensions generally

1. Site dimensions: Take as necessary before starting fabrication.
   1.1. Discrepancies with drawings: Report without delay and obtain instructions before proceeding.

660 Cross section dimensions of structural softwood and hardwood

1. Dimensions: Dimensions in this specification and shown on drawings are target sizes as defined in BS EN 336.
2. Tolerances: The tolerance indicators (T1) and (T2) specify the maximum permitted deviations from target sizes as stated in BS EN 336, clause 4.3:
    2.1. Tolerance class 1 (T1) for sawn surfaces.
    2.2. Tolerance class 2 (T2) for further processed surfaces.

665 Cross section dimensions of non-structural softwood

1. Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
2. Maximum permitted deviations from finished sizes: As stated in BS EN 1313-1, clause 6 for sawn sections.

670 Cross section dimensions of non-structural hardwood

1. Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
2. Maximum permitted deviations from finished sizes: As stated in BS EN 1313-2:
    2.1. Clause 6 for sawn sections.
    2.2. Clause NA.3 for further processed sections.

680 Warping of timber

1. Bow, spring, twist and cup: Not greater than the limits set down in BS 4978 or BS EN 14081-1 for softwood, or BS 5756 for hardwood

690 Processing treated timber

1. Cutting and machining: Carry out as much as possible before treatment.
2. Extensively processed timber: Retreat timber sawn lengthways, thicknessed, planed, ploughed, etc.
3. Surfaces exposed by minor cutting and/ or drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

700 Wood components – as delivered finish

1. Components to be painted: Primed
2. Components to be clear finished: First coat of specified finish applied

710 Reuse of timber sections/ wood components

1. Sections/ components scheduled to be removed but not reused in existing locations: Agree extent of retention for reuse elsewhere in the works.
    1.1. Treatment following removal: As per the schedule of works
    1.2. Storage: Protect against damage, and store until required.
        1.2.1. Storage location: On site
2. Reuse: Adapt sections/ components, as necessary, and install in agreed locations.

720 Temporary removal and reinstatement of fittings/ fixtures

1. Items to be removed, and reinstated on completion of repair work
    1.1. Identification: Attach labels or otherwise mark items using durable, non-permanent means, to identify location and refixing instructions, where applicable.

1.2. Treatment following removal: As per the schedule of works
1.3. Storage: Protect against damage, and store until required.
1.3.1. Storage location: On site
1.4. Reinstatement: Refit in original locations using original installation methods.
2. Items unsuitable or not required for reuse: Obtain instructions regarding disposal.

740 Removal of existing decorative/ protective finish

1. Description: As per the schedule of works
2. Extent: Remove completely back to bare wood.
3. Method: Contractor's choice

750 Cleaning dirty or stained wood

1. Generally: Scrub with neutral pH soap and clean, warm water.
2. Old varnish: Remove using mixture of turpentine (not turpentine substitute) and acetone in proportions determined by experiment, followed by washing down.

760 Repair of members – cutting out members

1. Extent of timber removal: Cut out full cross section of member where wood is defective or decayed, plus 50 mm of sound wood.
2. Distance from face of support to cut end of existing timber: Obtain instructions if dimension exceeds 200 mm.
3. Joint profile: As per Structural Engineering Calculations and details & Tender drawings

770 Repair of compression members – piecing in

1. Defective wood: Remove only decayed or defective wood. Finish cut-outs to clean, regular profiles.
2. Timber inserts: Cut accurately to fit. Glue and pin in place. Lie of grain to match as closely as possible that of parent timber.
3. Joint profile: As per Structural Engineering Calculations and details & Tender drawings

780 Repair of distorted timber members

1. Generally: Repair to shape that member has assumed.

790 Pegs for mortise and tenon joints in structural timber

1. Wood species: Oak.
2. Condition: Dry, preferably oven 'baked' before use.
3. Shape: Round and tapered.
4. Second hand pegs: Do not use.
5. Peg holes: Slightly offset such that when pegs are driven home, sections being joined are pulled together.

800 Condition of dowels to be bonded into timber

1. Condition at time of installation
1.1. Dowels generally: Free from corrosive pitting, loose mill scale, loose rust and contaminants that may adversely affect dowels, adhesive, or bond between the two.
1.2. Carbon steel dowels: As above, and free from corrosive pitting, loose mill scale and loose rust.

810 Bolted joints with connectors

1. Connector location: Where not otherwise shown, spacings, end and edge distances are to be not less than Standard values to BS EN 1995-1-1, section 8.9 for split ring and shear plate connectors, and BS EN 1995-1-1, section 8.10 for toothed plate connectors.
2. Centres of bolt holes: Not more than 2 mm from positions shown on drawings.
3. Assembly: Do not crush timber, deform washers or overstress bolts.

830 Critical dimensions for fasteners

1. Critical dimensions: As per Structural Engineering Calculations and details & Tender drawings

840 Fixing framing anchors and cleats

1. Before installation: Submit details if joint geometry prevents installation to manufacturer's recommendations.
2. Installation: Secure using not less than number of fasteners recommended by manufacturer.

850 Glued joints

1. Adhesive: TO BS EN 301, Type 1
    1.1. Compatibility: Where relevant, obtain manufacturer's confirmation that adhesive is compatible with preservative/ fire-retardant treatment.
2. Glued structural components: Fabricated to BS 6446 in clean, controlled workshop conditions.
3. Anticipated equilibrium moisture content of timber in service: As per Structural Engineering Calculations and details & Tender drawings

860 Moisture content checking

1. Procedure: Check moisture content of timber sections with an approved electrical moisture meter.
2. Test results: Keep records of all tests. If moisture content falls outside specified range, obtain instructions.

870 Moisture content testing

1. Procedure: Test timber sections with an electrical moisture meter with deep probes. (A meter that has been carefully calibrated against oven drying tests or otherwise guaranteed by an independent testing authority).
2. Test sample: Test 5% but not less than 10 lengths of each cross-section in the centre of the length.
3. Test results: 90% of values obtained to be within the specified range. Provide records of all tests.

Completion

910 Mechanicallyfastened joints

1. General: Inspect accessible bolted, coach screwed and timber pegged joints and tighten fasteners if necessary.
    1.1. Timing: On Completion and at end of Defects Liability Period or Rectification Period.

920 Dating timbers used in structural repairs

1. Principal replacement members: Mark by carving or branding with date of repair and, when appropriate, initials of carpenter, in characters 20-25 mm high.
2. Location of marks: To be agreed

Ω End of Section

C52
Fungus/ beetle eradication

To be read with preliminaries/ general conditions.

105 Precontract survey

1. General: A survey has been carried out and the report is available for inspection.

115 Survey and report

1. Survey generally
   1.1. Purpose: To ascertain nature and extent of fungal/ beetle attack. To ascertain sources and extent of any dampness.
   1.2. Timing: Before starting eradication work carry out survey and submit survey report.
2. Survey report content
   2.1. Description of investigation methods.
   2.2. Factors affecting execution of the work: Identify problematic site conditions and restrictions, including the presence of bats, barn owls, other protected species or breeding birds.
   2.3. Laboratory results identifying attacking organisms. Plan and section drawings or annotated photographs, defining extent of attack.
   2.4. Proposals for eradication treatments and procedures, including measures to halt damp penetration and promote drying out.
   2.5. Measurements of wood moisture content, with identification of instances above 20%.
   2.6. Identification of neighbouring buildings that may be involved in attack.
   2.7. Associated work: Nature and extent of repair/ replacement work required to load bearing constructions and to the building fabric in general.
   2.8. Other information: Any considered relevant.

120 Associated work

1. Work shown to be necessary by survey: Carry out as part of main contract works

140 Opening up/ Cutting out/ Removal of building fabric

1. Extent: Submit proposals.
2. Retained building fabric: Maintain stability and do not damage.

150 Drying out of building fabric

1. Drying conditions: Establish as soon as possible.
2. Drying methods: Submit proposals for achieving effective permanent ventilation

162 Preparation generally for preservative/ Fungicide treatments to timbers/ Masonry

1. Furnishings/ components/ finishes within treated areas: Prevent staining and other adverse effects.
2. Water supplies: Do not contaminate.
3. Electrical equipment and supplies: Isolate circuits as required and prevent ingress of treatment fluids.
4. Cleanliness: Remove loose material, dust and debris from surfaces to be treated.

210 Dry rot

1. Fruiting bodies: Do not disturb. If heat treatment is not employed, spray with fungicide.
    1.1. Removal: Remove carefully. Clean surfaces.
2. Infected material to be removed: Remove carefully, causing minimum disturbance and damage to adjacent building fabric; dispose of safely at a tip approved by a waste regulation authority. Prevent contamination of other parts of the building.
3. Infected material to be retained: Obtain instructions

220 Wet rot

1. Decayed timber to be removed: Cut out until sound timber is reached.
    1.1. Disposal of previously treated timber: At a tip approved by a waste regulation authority.
2. Decayed timber to be retained: Obtain instructions

230 Beetle infestation

1. Infected timber: Cut, scrape and trim back to sound timber where heat treatment is not employed. Remove debris immediately and dispose of safely at a tip approved by a waste regulation authority. Prevent contamination of other parts of the building.

240 Salvaged materials

1. Sound, uninfected materials: Give notice before reusing/ recycling.

310 Timber preservatives/ Masonry fungicides generally

1. Products: Registered by the Health and Safety Executive (HSE) and listed on the HSE website under non-agricultural pesticides.
2. Application: In accordance with statutory conditions of approval given on product labels and as manufacturers' recommendations.

318 Timber preservative treatment

1. Description: GENERALLY
2. Preservative type: Contractor's choice
3. Tint: Required
4. Treatment method: As manufacturer's recommendations

323 Timber preservative treatment

1. Description: GENERALLY
2. Manufacturer: Submit proposals
    2.1. Product reference: Submit proposals
3. Tint: Required
4. Treatment method: As manufacturer's recommendations

338 Masonry fungicide treatment

1. Fungicide type: Glycol boron formulation
2. Tint: Required
3. Treatment method: As manufacturer's recommendations

343 Masonry fungicide treatment

1. Manufacturer: Submit proposals
   1.1. Product reference: submite proposals
2. Tint: Required
3. Treatment method: As manufacturer's recommendations

355 Drilling timber for injection of preservatives

1. Sizes and location of holes: Submit proposals.
2. Sealing holes after treatment: Submit proposals
3. Approval of appearance: Obtain approval of first few holes before completing remainder.

390 Guarantee

1. Type: Insurance protection. Administered by an independent insurance protection company.
   1.1. Guarantee period from completion of installation (minimum): 20 years
2. Documentation: Provide certificates/ guarantees at completion of installation.

Ω End of Section

C90
Alterations - repair, refurbish, refit

General

110 Descriptions

1. Location of alterations: As per Tender drawings
2. Details of alterations: As per the schedule of work

115 Survey report

1. Submittal: Report prepared as a schedule of works
2. Timing: Prior to tender

120 Employer's property

1. Components and materials arising from alterations that are to remain the property of the employer: None
   1.1. Protection: Maintain until items listed above are removed by the employer or reused in the works, or until the end of the contract.
2. Special requirements: None

130 Recycled materials

1. Materials arising from alterations: May be recycled or reused elsewhere in the project, subject to compliance with the appropriate specification and in accordance with any site waste management plan.
2. Evidence of compliance: Submit full details and supporting documentation.
   2.1. Verification: Allow adequate time in programme for verification of compliance.

140 Removal

1. Scope of removal: As per the schedule of works
2. Special requirements: None

150 Refixing

1. Scope of refixing: As per the schedule of works
2. Special requirements: None

Ω End of Section

D20
Excavating and filling

Generally/the site

110 Site investigation

1. Report: See Preliminaries section A12

112 Site investigation report

1. Refer to Tender documents .

145 Variations in ground water level

1. Give notice: If levels encountered are significantly different from levels in the site investigation report or previously measured.

150 Existing services, features and structures

1. Services: See section A12 for locations.
2. Site features to be retained: See section A12 for details.
3. Structures: See section A34 for details of protection.

Clearance/excavating

168 Site clearance

1. Timing: Before topsoil stripping, if any.
2. General: Clear site of rubbish, debris and vegetation. Do not compact topsoil.
3. Treatment: Apply a suitable residual herbicide to areas to receive gravel surfacing

170 Removing small trees, shrubs, hedges and roots

1. Identification: Clearly mark trees to be removed.
2. Small trees, shrubs and hedges: Cut down.
3. Roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
4. Safety: Comply with Forest Industry Safety Accord safety leaflets.

175 Felling large trees

1. Definition: Girth over 600 mm.
2. Identification: Clearly mark trees to be removed.
3. Safety: Comply with Forest Industry Safety Accord safety leaflets.
4. Felling: As close to the ground as possible.
5. Stumps: Obtain approval before removing by winching. Do not use other trees as supports or anchors
6. Work near retained trees: Take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained, where tree canopies overlap and in confined spaces generally.

180 Chipping and shredding

1. General: Permitted, remove arisings from site

220 Stripping topsoil

1. General: Before beginning general excavation or filling, strip topsoil from areas where there will be regrading, buildings, pavings/ roads and other areas shown on drawings.
2. Depth
   2.1. Remove to an average depth of As per Structural Engineering Calculations and details & Tender drawings.
   2.2. Give notice where the depth of topsoil is difficult to determine.
3. Handling: Handle topsoil for reuse or sale in accordance with clause 225.
4. Around trees: Do not remove topsoil from below the spread of trees to be retained.
5. Site storage: Not required

221 Treating topsoil

1. Treatment: Apply a suitable translocated nonresidual herbicide.
2. Timing: Not less than two weeks before excavating topsoil.

225 Handling topsoil

1. Standard: To BS 3882.
2. Aggressive weeds
   2.1. Species: Notify the presence of species included in the Weeds Act, section 2, or the appropriate Wildlife and Countryside Act for the relevant jurisdiction.
   2.2. Give notice: Obtain instructions before moving topsoil.
3. Contamination: Do not mix topsoil with:
   3.1. Subsoil, stone, hardcore, rubbish or material from demolition work.
   3.2. Other soil or material containing aggressive weeds, sharps, plastics and non soil forming materials and notifiable animal or plant diseases.
   3.3. Oil, fuel, cement or other substances harmful to plant growth.
   3.4. Other classifications of topsoil.
4. Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.

240 Adjacent excavations

1. Requirement: Where an excavation encroaches below a line drawn at an angle from the nearest formation level of another higher excavation, the lower excavation, all work within it and backfilling thereto, must be completed before the higher excavation is made.
2. Angle of line below horizontal: 45°
3. Backfill material: As clause 248 when upper excavation will contain a foundation, otherwise, compacted general filling as clause 626

242 Excavations adjacent to existing backfilled trenches

1. Proximity: When width of undisturbed ground between the two excavations will be less than 900mm.
2. Action: Assume that the ground between the trenches is unstable and provide side support accordingly.

244 Excavations adjacent to existing foundations

1. Prior to commencing excavation
   1.1. Excavate trial pits adjacent to existing foundations to determine extent and formation levels.

1.2. Allow for inspection of trial pits.

1.3. Allow time for amendment of details if required.

1.3.1. Time period: 5 working days

2. Backfill material to new excavation: As clause 248

250 Permissible deviations from formation levels

1. Beneath mass concrete foundations: ±25 mm.
2. Beneath ground bearing slabs and r.c. foundations: ±15 mm.
3. Embankments and cuttings: ±50 mm.
4. Ground abutting external walls: ±50 mm, but such as to ensure that finished level is not less than 150 mm below dpc.

255 Accuracy – linear dimensions

1. Permissible deviations from linear dimensions generally: As per Structural Engineering Calculations and details & Tender drawings

260 Inspecting formations

1. Give notice: Make advance arrangements for inspection of formations for foundations and filling formations.

1.1. Notice (minimum): 5 days

2. Preparation: Just before inspection remove the last 150 mm of excavation. Trim to required profiles and levels.

2.1. Loose material: Remove

3. Seal: Within 4 hours of inspection, seal formations with concrete.

265 Inspecting formations in sand and gravel

1. Notice for inspection (minimum): 5 days
2. Preparation: Just before inspection remove the last 150 mm of excavation. Trim to required profiles and levels and mechanically compact formation.
3. Seal: Within 4 hours of inspection, seal formations with first layer of fill.

267 Inspection of formations in shrinkable soils

1. Inspect formation: For signs of conducting and fine moisture absorbing roots.
2. Give notice: If significant quantities of roots are visible in the formation or in the bottom 75 mm of the walls of the excavation.

270 Foundations generally

1. Give notice if

1.1. A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings.

1.2. The formation contains soft or hard spots or highly variable material.

275 Foundation bearing

1. Requirement: Foundations are designed to bear on:

1.1. Strata: As per Structural Engineering Calculations and details & Tender drawings

1.2. Safe bearing capacity (minimum): As per Structural Engineering Calculations and details & Tender drawings

2. Give notice: If the material at the design depth of the foundation does not comply with this description, or contains soft or hard spots or highly variable material.

290 Foundations in made up ground

1. Depth: Excavate down to a natural formation of undisturbed subsoil.
2. Discrepancy: Give notice if this is greater or less than depth given.

310 Unstable ground

1. Generally: Ensure that the excavation remains stable at all times.
2. Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
3. Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

320 Recorded features

1. Recorded foundations, beds, drains, manholes, etc.: Break out and seal drain ends
2. Contaminated earth: Remove and disinfect as required by Local Authority.

330 Unrecorded features

1. Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

335 New foundations crossing old foundations or walls

1. Break out: The old foundation/ wall where it crosses the new foundation/ wall:
   1.1. Length of breaking out: Width of the new foundation/ wall plus As per Structural Engineering Calculations and details & Tender drawings.
   1.2. Depth of breaking out: As necessary to permit the construction of the new foundation to its design cross section
2. Disturbed/ softened soil: When the formation for the old foundation/ wall is deeper than the formation of the new foundation.
   2.1. Excavate: Soil that has been disturbed and/ or softened on either side of the old wall/ foundation, and for As per Structural Engineering Calculations and details & Tender drawings.
3. Step up: The formation for the new foundation as necessary on either side of the old foundation/ wall until the formation is at its design level.
   3.1. Size of steps: As clause 285
4. Backfilling beneath design formation level: Fill with concrete as foundation is cast

350 Existing watercourses

1. Diverted watercourses which are to be filled: Before filling, remove vegetable growths and soft deposits.

360 Excess excavation

1. Excavation taken wider than required
   1.1. Backfill: As instructed
2. Excavation taken deeper than required
   2.1. Backfill: With well graded granular material or lean mix concrete

Disposal of materials

410 Excavated topsoil storage

1. Storage: Stockpile in temporary storage heaps Submit proposals .

415 Excavated topsoil removal

1. General: Remove from site.

420 Topsoil storage heaps

1. Location: Submit proposals
2. Standard: To BS 3882.
3. Height (maximum): submit proposals
4. Protection
   - 4.1. Do not place any other material on top of storage heaps.
   - 4.2. Do not allow construction plant to pass over storage heaps.
   - 4.3. Prevent compaction and contamination.

441 Surplus subsoil

1. Excavated material: Stockpile in temporary storage heaps.
2. Retained material: Spread and level surplus subsoil on site.
   - 2.1. Locations: submit proposals
   - 2.2. Protected areas: Do not raise soil level within root spread of trees that are to be retained.
3. Remaining material: Remove from site.

450 Water

1. Generally: Keep all excavations free from water until:
   - 1.1. Formations are covered.
   - 1.2. Below ground constructions are completed.
   - 1.3. Basement structures and retaining walls are able to resist leakage, water pressure and flotation.
2. Drainage: Form surfaces of excavations and fill to provide adequate falls.
3. Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute watercourses with silt laden water.

454 Ground water level, springs or running water

1. Give notice: If it is considered that the excavations are below the water table.
2. Springs/ Running water: Give notice immediately if encountered.

460 Permanent drainage system

1. Disposal of water from the excavations through system: Seek approval from CA

Filling

500 Proposed fill materials

1. Details: Submit full details of proposed fill materials to demonstrate compliance with specification, including:

1.1. Type and source of imported fill.
1.2. Proposals for processing and reuse of material excavated on site.
1.3. Test reports as required elsewhere.

2. Timing: At least 21 days before starting filling

510 Hazardous, aggressive or unstable materials

1. General: Do not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structures or instability in the filling, including material that is:
   1.1. Frozen or containing ice.
   1.2. Organic.
   1.3. Contaminated or noxious.
   1.4. Susceptible to spontaneous combustion.
   1.5. Likely to erode or decay and cause voids.
   1.6. With excessive moisture content, slurry, mud or from marshes or bogs.
   1.7. Clay of liquid limit exceeding 80 and/or plasticity index exceeding 55.
   1.8. Unacceptable, class U2 as defined in the 'Specification for highway works', clause 601.

520 Frost susceptibility

1. General: Except as allowed below, fill must be non frost-susceptible as defined in the 'Specification for highway works', clause 801.8.
2. Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non frost- susceptible:
   2.1. Fine grained soil with a plasticity index less than 20%.
   2.2. Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
   2.3. Crushed chalk.
   2.4. Crushed limestone fill with average saturation moisture content in excess of 3%.
   2.5. Burnt colliery shale.
3. Frost-susceptible fill: May only be used:
   3.1. At depths below the finished ground surface greater than: 350 mm
   3.2. Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.
   3.3. Where frost heave will not affect structural elements.

530 Placing fill

1. Surfaces of excavations and areas to be filled: Free from loose soil, topsoil, organic material, rubbish and standing water.
2. Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.
3. Adjacent structures, membranes and buried services
   3.1. Do not overload, destabilise or damage.
   3.2. Submit proposals for temporary support necessary to ensure stability during filling.
   3.3. Allow 14 days (minimum) before backfilling against in situ concrete structures.
4. Layers: Place so that only one type of material occurs in each layer.
5. Earthmoving equipment: Vary route to avoid rutting.

535 Compaction generally

1. General: Compact fill not specified to be left loose as soon as possible after placing.
2. After compaction: Surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like.
3. Defective areas: Remove and recompact to full thickness of layer using new material.

540 Benching in fill

1. Adjacent areas: If, during filling the difference in level between adjacent areas of filling exceeds 600 mm, cut into edge of higher filling to form benches 600 mm minimum width and height equivalent to depth of a layer of compacted filling.
2. New filling: Spread and compact to ensure maximum continuity with previous filling.

610 Compacted filling for landscape areas

1. Fill: Material capable of compaction by light earthmoving plant.
2. Filling: Layers not more than 200 mm thick. Lightly compact each layer to produce a stable soil structure.

615 Loose tip filling for landscape areas

1. Filling: Do not firm, consolidate or compact when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.

617 Type 1 unbound mixture

1. Fill: To 'Specification for highway works', clauses 801 and 803:
    1.1. Crushed rock (other than argillaceous rock).
    1.2. Coarse crushed concrete aggregate.
    1.3. Recycled aggregates.
    1.4. Crushed non-expansive slag to clause 801.2.
    1.5. Well-burned non-plastic colliery shale.
2. Amendments to requirements in the 'Specification for highway works': None
3. Filling: To 'Specification for highway works', clause 802.

618 Type 2 unbound mixture

1. Fill: To 'Specification for highway works', clauses 801 and 804:
    1.1. Crushed rock (other than argillaceous rock).
    1.2. Coarse crushed concrete aggregate.
    1.3. Recycled aggregates.
    1.4. Crushed non-expansive slag to clause 801.2.
    1.5. Well-burned non-plastic colliery shale.
    1.6. Natural gravel.
    1.7. Natural sand.
2. Amendments to requirements in the 'Specification for highway works': None
3. Filling: To 'Specification for highway works', clause 802.

620 Subgrade improvement layer (capping)

1. Fill: To 'Specification for highway works', Table 6/1, Class 6F1 or 6F2.

2. oFilling: Place and compact to MCHW Volume 1: 'Specification for highway works' (SHW), Table 6/1, clause 612 and clause 613.3, 613.9 and 613.10.

621 Type 3 unbound mixture

1. Fill: To 'Specification for highway works', clauses 801 and 805:
   1.1. Crushed rock (other than argillaceous rock) with well-defined edges.
   1.2. Coarse crushed concrete aggregate.
   1.3. Crushed non-expansive slag.
2. Amendments to requirements in the 'Specification for highway works': None
3. Filling: To 'Specification for highway works', clause 802.

622 Type 4 unbound mixture

1. Fill: To 'Specification for highway works', clauses 801 and 807:
   1.1. Asphalt road planings.
   1.2. Granulated asphalt.
   1.3. Crushed rock (other than argillaceous rock) with well-defined edges.
   1.4. Coarse crushed concrete aggregate.
   1.5. Crushed non-expansive slag.
   1.6. Well-burned non-plastic colliery shale.
2. Amendments to requirements in the 'Specification for highway works': None
3. Filling: To 'Specification for highway works', clause 802.

626 Compacted general fill

1. Suitable material: As per Structural Engineering Calculations and details & Tender drawings
2. Excavated material: Select suitable material and keep separate.
3. Filling: Spread and level material in layers. As soon as possible thoroughly compact each layer.
4. Required compaction: To suit use of fill
5. Proposals: Well in advance of starting work submit details of proposed:
   5.1. Materials to be used, including quantities of each type.
   5.2. Type of plant.
   5.3. Maximum depth of each compacted layer.
   5.4. Minimum number of passes per layer.

640 Starter layer of compacted filling

1. Fill: Suitable hard granular material. Compact thoroughly.
2. Thickness: 450 mm

650 Protection of compacted filling

1. Temporary protective filling: Before allowing construction traffic, raise level of compacted cohesive soil filling at least 150 mm above formation level using properly compacted temporary filling.
2. Removal: Remove temporary protective filling from site before permanent construction.

700 Backfilling around foundations

1. Under oversite concrete and pavings: Hardcore as clause 710.

2. Under grassed or soil areas: Material excavated from the trench, laid and compacted in 300 mm maximum layers.

710 Hardcore filling

1. Fill: Granular material, free from excessive dust, well graded, all pieces less than 75 mm in any direction:
   1.1. Test requirements
      1.1.1. Minimum 10% fines value tested in a soaked condition to BS 812-111 Not required.
      1.1.2. Impact value SZ tested to BS EN 1097-2 Not required.
2. Material
   2.1. Permitted materials in any one layer
      2.1.1. Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold the stone together.
      2.1.2. Crushed concrete, crushed brick or tile, free from plaster, timber and metal.
      2.1.3. Crushed non-expansive slag.
      2.1.4. Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of clay.
      2.1.5. Well-burned non-plastic colliery shale.
      2.1.6. Natural gravel.
      2.1.7. Natural sand.
3. Filling: Spread and level in 150 mm maximum layers. Thoroughly compact each layer.

715 Venting hardcore layer

1. Fill: Clean granular material, well graded, passing a 75 mm BS sieve but retained on a 20 mm BS sieve. In each layer only one of the following:
   1.1. Crushed hard rock.
   1.2. Crushed concrete, crushed brick or tile, free from plaster, timber and metal.
   1.3. Gravel.
2. Filling: Spread and level in 150 mm maximum layers. Thoroughly compact each layer whilst maintaining enough voids to allow efficient venting.

730 Blinding

1. Surfaces to receive sheet overlays or concrete:
2. Blind with
   2.1. Concrete where shown on drawings; or
3. Sand, fine gravel, or other approved fine material applied to fill interstices. Moisten as necessary before final rolling to provide a flat, closed, smooth surface.
4. Sand for blinding: To BS EN 12620, grade 0/4 or 0/2 (MP).
5. Permissible deviations on surface level: As per Structural Engineering Calculations and details & Tender drawings

Bioremediation - Not Used

'specification for highway works: earthworks specification' appendices - Not Used

Ω End of Section

E05
In situ concrete construction generally

To be read with preliminaries/ general conditions.

220 Structural design provided

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Requirements
   2.1. Generally: As section B50.
   2.2. Additional requirements: None
3. Production/ execution records: In accordance with the designated code of practice

223 Structural drawings and schedules

1. Standards
   1.1. Drawings: To BS EN ISO 3766.
   1.2. Reinforcement schedules: To BS 8666.

225 Temperature records

1. Requirement: Throughout period of concrete construction record:
   1.1. Daily: Temperature at intervals of four hours (maximum)
   1.2. Under adverse temperature conditions: Temperature at commencement and end of placing.
2. Equipment: Contractor's choice
   2.1. Location: In the shade, close to the structure.

235 Openings, inserts and fixings

1. Requirement: Collate all information.
2. Submit: Details where openings, inserts and fixings can only be accommodated by adjustments to reinforcement.
3. Locate reinforcement: To ensure specified minimum cover at openings and inserts and to be clear of fixing positions.

250 Structural testing

1. Requirement: As per Structural Engineering Calculations and details & Tender drawings
2. Method/ standard: Submit proposals
   2.1. Timing: 3 weeks before comencement on site
3. Report: Standard format
   3.1. Submission: within 5 working days of testing

290 Accuracy of construction

1. Setting out: To BS 5964-1.
2. Geometrical tolerances: To BS EN 13670, Tolerance Class 1
   2.1. Conflicts: Notwithstanding tolerances specified elsewhere, do not exceed requirements for compliance with the designated code of practice.
   2.2. Substitution of alternative requirements: None

300 Levels of structural concrete floors

1. Tolerances (maximum)
   1.1. Level of floor: As Preliminaries section A33
   1.2. Steps in floor level: Not applicable

310 Surface regularity of concrete floors to BS 8204 - general

1. Standard: To BS 8204-1 or -2.
2. Measurement: From underside of a 2 m straightedge (between points of contact) placed anywhere on surface and using a slip gauge.

410 In situ concrete construction - supervision/ checking

1. Standard: As per Structural Engineering Calculations and details & Tender drawings

420 Liquid retaining and containment concrete construction

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Form of construction: To BS 8102, Type A
3. Requirement: Work is to be water resistant when tested to clause E05/ 460 and 470.

430 Surface cracking

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Method of measurement: Graduated magnifying devices, templates and feeler gauges.
3. Maximum crack width: 0.2 mm
4. Action: Should cracks occur that are wider than the maximum crack width:
   4.1. Survey: Frequency and extent of such cracks and investigate cause.
   4.2. Report: Findings together with recommendations for rectification.

Ω End of Section

E10
Mixing/casting/curing in situ concrete

Concrete

101 Specification

1. Concrete generally: To BS 8110 & BS 8500
2. Exchange of information: Provide concrete producer with information required by BS 8110 & BS 8500.

105 Designated concrete

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Designation: As per Structural Engineering Calculations and details & Tender drawings
3. Fibres: Not required
4. Aggregates
   - 4.1. Size (maximum): 20 mm
   - 4.2. Coarse recycled aggregates: No special requirements
   - 4.3. Additional aggregate requirements: None
5. Special requirements for cement/ combinations: None
6. Consistence class: Contractor's choice
7. Chloride class: Normal
8. Admixtures: None
9. Additional mix requirements: None

110 Basic designated concrete

1. Designation: As per Structural Engineering Calculations and details & Tender drawings
2. Coarse recycled aggregates: As permitted by BS 8500-1
3. Consistence class: Contractor's choice
4. Additional requirements: Submit proposals.

115 Designated cement-bound concrete

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Designation: CB28/35
3. Minimum cement or combination content: 3%.
4. Aggregates
   - 4.1. Size (maximum): 20 mm
5. Coarse recycled aggregates: As permitted by BS 8500-1

132 Designed concrete

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Embedded metal: Grade B500A, GradeB500B or Grade B500C confirming to BS 4449:2005
   Grade B
   Ribbed stainless-steel conforming to BS 6744:2001
3. Compressive strength class (cylinder/ cube minimum): As per Structural Engineering Calculations and details & Tender drawings

4. Target density (oven-dry): Normal
5. Fibres: Not required
6. Aggregates
   6.1. Size (maximum): 20 mm
   6.2. Type/ Density: Normal weight
   6.3. Coarse recycled aggregates: RCA permitted
   6.4. Additional aggregate requirements: None
7. Design chemical class: Not applicable
8. Limiting values for composition
   8.1. Water:cement ratio (maximum): As DC-class
   8.2. Cement/ combination content (minimum): As DC-class
   8.3. Cement/ combination content (maximum): Not applicable
   8.4. Air content in situ (minimum): As required for exposure class
9. Consistence class: Contractor's choice
10. Permitted cement/ combinations: As per Structural Engineering Calculations and details & Tender drawings
11. Chloride class: As per Structural Engineering Calculations and details & Tender drawings
12. Admixtures: Concrete producer's choice
13. Colour: Not applicable
14. Additional mix requirements: None

Materials, batching and mixing

215 Ready-mixed concrete

1. Production plant: Currently certified by a body accredited by UKAS to BS EN ISO/IEC 17065 for product conformity certification of ready-mixed concrete.
2. Source of ready-mixed concrete: Obtain from one source if possible . Otherwise, submit proposals.
   2.1. Name and address of depot: Submit before any concrete is delivered.
   2.2. Delivery notes: Retain for inspection.
3. Declarations of nonconformity from concrete producer: Notify immediately.

218 Site mixed concrete

1. Batching by mass
   1.1. Restrictions: None
   1.2. Accuracy of measuring devices: To BS EN 206, clause 9.6.2.2.
      1.2.1. Tolerances for quantity of constituent material: To BS EN 206, Table 27.
2. Batching by volume
   2.1. Restrictions: None
3. Mixing: To BS 8000-2.1, subsections 2, 3 and 4.

221 Information about proposed concretes

1. Submit when requested
   1.1. Details listed in BS 8500-1, clause 5.2.
   1.2. Additional information: Data concerning the anticipated rate of strength gain

225 Changes to specification

1. Changes to specification of fresh concrete (outside concrete producer's responsibility): Prohibited

230 Interruption of supply during concreting

1. Elements without joints: Where elements are detailed to be cast in a single pour without joints, make prior arrangements for a back-up supply of concrete.
2. Elsewhere
   2.1. Preparation: Manage pour to have a full face, and have materials available to form an emergency construction joint while concrete can still be worked.
   2.2. Before pour is completed: Submit location and details of joint, make proposals for joint preparation.

315 Aggregates for exposed visual concrete

1. Limitations on contaminants: Free from absorbent particles which may cause 'popouts', and other particles such as coal and iron sulfide which may be unsightly or cause unacceptable staining.
2. Colour: Consistent.
3. Supply: From a single source and maintained throughout the contract.
4. Samples: Submit on request.

325 Materials for exposed visual concrete

1. Alterations to sources, types and proportions: Submit proposals.

415 Admixtures

1. Calcium chloride and admixtures containing calcium chloride: Do not use.

418 Proprietary admixture

1. Type: As per Structural Engineering Calculations and details & Tender drawings
   1.1. Manufacturer: Contractor's choice
      1.1.1. Product reference: Contractors choice
   1.2. Special requirements: None other than those of manufacturer

430 Pigments for coloured concrete

1. Standard: To BS EN 12878 .
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractors choice
   2.2. Colour: To match existing

490 Properties of fresh concrete

1. Adjustments to suit construction process: Determine with concrete producer . Maintain conformity to the specification.

Project testing/ certification

505 Project testing of concrete - general

1. Testing: To BS EN 206, Annex B
   1.1. Nonconformity: Obtain instructions immediately.

2. Recording: Maintain complete correlated records including:
   2.1. Concrete designation.
   2.2. Sampling, site tests, and identification numbers of specimens tested in the laboratory.
   2.3. Location of the parts of the structure represented by each sample.
   2.4. Location in the structure of the batch from which each sample is taken.

508 Regular project testing of concrete

1. Tests: Compressive strength
2. Tests for consistence class of self-compacting concrete: As required
3. Consistence testing period: 2 h
4. Sampling
   4.1. Point: At point of discharge from delivery truck
   4.2. Rate: One sample from each batch for consistence
5. Other requirements: Cubes for early age strength testing to be stored under same conditions as concrete in members

520 Testing laboratory

1. Laboratory: Accredited by UKAS or other national equivalent.
   1.1. Name and UKAS reference number: Submit well in advance of making trial mixes or concrete for use in the works.

530 Tests results

1. Submission of reports: Within one day of completion of each test.
   1.1. Number of copies: Three
2. Reports on site: A complete set, available for inspection.

550 Broken cubes from failed strength tests

1. Nonconformity: Keep separately the pieces of each cube which fail to meet the conformity requirements for individual results.
2. Period for keeping cubes: Obtain instructions.

Placing/ compacting/ curing and protecting

630 Premature water loss

1. Requirement: Prevent water loss from concrete laid on absorbent substrates.
   1.1. Underlay: Select from:
      1.1.1. Polyethylene sheet: 250 micrometres thick.
      1.1.2. Building paper: To BS 1521, grade B1F.
   1.2. Installation: Lap edges 150 mm.

640 Construction joints

1. Location of joints: As per Structural Engineering Calculations and details & Tender drawings
2. Preparation of joint surfaces: As section E40

648 Adverse temperature conditions

1. Requirement: Submit proposals for protecting concrete when predicted ambient temperatures indicate risk of concrete freezing or overheating.

650 Surfaces to receive concrete

1. Cleanliness of surfaces immediately before placing concrete: Clean with no debris, tying wire clippings, fastenings or free water.

660 Inspection of surfaces

1. Notice: Give notice to allow inspections of reinforcement and surfaces before each pour of concrete.
    1.1. Period of notice: Obtain instructions.
2. Timing of inspections: When reinforcement and formwork are ready for concreting

670 Transporting

1. General: Avoid contamination, segregation, loss of ingredients, excessive evaporation and loss of workability . Protect from heavy rain.
2. Entrained air: Anticipate effects of transport and placing methods in order to achieve specified air content.

680 Placing

1. Records: Maintain for time, date and location of all pours.
2. Timing: Place as soon as practicable after mixing and while sufficiently plastic for full compaction.
3. Temperature limitations for concrete: 30°C (maximum) and 5°C (minimum), unless otherwise specified. Do not place against frozen or frost covered surfaces.
4. Continuity of pours: Place in final position in one continuous operation up to construction joints. Avoid formation of cold joints.
5. Discharging concrete: Prevent uneven dispersal, segregation or loss of ingredients or any adverse effect on the formwork or formed finishes.
6. Thickness of layers: To suit methods of compaction and achieve efficient amalgamation during compaction.
7. Poker vibrators: Do not use to make concrete flow horizontally into position, except where necessary to achieve full compaction under void formers and cast-in accessories and at vertical joints.

690 Compacting

1. General: Fully compact concrete to full depth to remove entrapped air. Continue until air bubbles cease to appear on the top surface.
    1.1. Areas for particular attention: Around reinforcement, under void formers, cast-in accessories, into corners of formwork and at joints.
2. Consecutive batches of concrete: Amalgamate without damaging adjacent partly hardened concrete.
3. Methods of compaction: To suit consistence class and use of concrete.

700 Lightweight aggregate concrete

1. Placing and compacting: Prevent flotation of coarse aggregate and formation of excessive blowholes.

720 Vibrators

1. General: Maintain sufficient numbers and types of vibrator to suit pouring rate, consistency and location of concrete.
2. External vibrators: Obtain approval for use .

730 Plastic settlement

1. Settlement cracking: Inspect fresh concrete closely and continuously wherever cracking is likely to occur, including the top of deep sections and at significant changes in the depth of concrete sections.
    1.1. Timing: During the first few hours after placing and whilst concrete is still capable of being fluidized by the vibrator.
2. Removal of cracks: Revibrate concrete.

810 Curing generally

1. Requirement: Keep surface layers of concrete moist throughout curing period, including perimeters and abutments, by either restricting evaporation or continuously wetting surfaces of concrete.
    1.1. Surfaces covered by formwork: Retain formwork in position and, where necessary to satisfy curing period, cover surfaces immediately after striking.
    1.2. Top surfaces: Cover immediately after placing and compacting. If covering is removed for finishing operations, replace it immediately afterwards.
2. Surface temperature: Maintain above 5°C throughout the specified curing period or four days, whichever is longer.
3. Records: Maintain details of location and timing of casting of individual batches, removal of formwork and removal of coverings. Keep records on site, available for inspection.

811 Coverings for curing

1. Sheet coverings: Suitable impervious material.
2. Curing compounds: Selection criteria:
    2.1. Curing efficiency: Not less than 75% or for surfaces exposed to abrasion 90%.
    2.2. Colouring: Fugitive dye.
    2.3. Application to concrete exposed in the finished work: Readily removable without disfiguring the surface.
    2.4. Application to concrete to receive bonded construction/ finish: No impediment to subsequent bonding.
3. Interim covering to top surfaces of concrete: Until surfaces are in a suitable state to receive coverings in direct contact, cover with impervious sheeting held clear of the surface and sealed against draughts at perimeters and junctions.

812 Preventing early age thermal cracking

1. Deep lifts or large volume pours: Submit proposals for curing to prevent early age thermal cracking, taking account of:
    1.1. Temperature differentials across sections.
    1.2. Coefficient of thermal expansion of the concrete.
    1.3. Strain capacity of the concrete mix (aggregate dependent).
    1.4. Restraint.

815 Additional curing requirement - water curing

1. Commencement of water curing: As soon as practicable after placing and compacting concrete.
   1.1. Surfaces covered by formwork: Expose to water curing as soon as practicable.
   1.2. Top surfaces: Cover immediately with impermeable sheeting to prevent evaporation before commencement of water curing.
2. Water curing: Wet surfaces continuously throughout curing period.
   2.1. Select methods from
      2.1.1. Mist spray.
      2.1.2. Wet hessian covered with impermeable sheeting.

817 Curing class

1. Standard: To BS EN 13670 As per Structural Engineering Calculations and details & Tender drawings.

818 Curing periods generally

1. Minimum periods: When not otherwise indicated, to BS EN 13670, Annex F.8.5.

820 Curing periods

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. General: Curing periods are in days (minimum) .
   2.1. Definition of 't': The average surface temperature of concrete in degrees Celsius during the curing period.
3. Curing periods for concrete made using CEM1 strength class 42.5 or 52.5, or SRPC class 42.5
   3.1. Drying winds or dry, sunny weather (relative humidity < 50%): No less than 7 days
   3.2. Intermediate conditions (relative humidity between 50 and 80%): No less than 7 days
   3.3. Damp weather, protected from sun and wind (relative humidity > 80%): No less than 7 days
4. Curing periods for concrete made using cements listed in BS8500-1, Table A.6 except for those listed above and for supersulfated cement
   4.1. Drying winds or dry, sunny weather (relative humidity < 50%): No less than 7 days
   4.2. Intermediate conditions (relative humidity between 50 and 80%): No less than 7 days
   4.3. Damp weather, protected from sun and wind (relative humidity > 80%): No less than 7 days
5. Curing periods: For concretes using admixtures or other types of cements/ combinations: Submit proposals.
6. Other requirements: Use approved sprayed curing membrane.

840 Protection

1. Prevent damage to concrete, including
   1.1. Surfaces generally: From rain, indentation and other physical damage.
   1.2. Surfaces to exposed visual concrete: From dirt, staining, rust marks and other disfiguration.
   1.3. Immature concrete: From thermal shock, physical shock, overloading, movement and vibration.
   1.4. In cold weather: From entrapment and freezing expansion of water in pockets, etc.

Ω End of Section

E20
Formwork for in situ concrete

Generally/ preparation

110 Loadings

1. Requirement: Design and construct formwork to withstand the worst combination of the following:
   1.1. Total weight of formwork, reinforcement and concrete.
   1.2. Construction loads including dynamic effects of placing, compacting and construction traffic.
   1.3. Wind and snow loads.

120 Formwork details

1. Provide the following: Construction joints - positions and types, Controlled permeability formwork, Sealing methods - at panel joints, form tie holes and construction

132 Propping

1. General: Prevent deflection and damage to the structure. Carry down props to bearings strong enough to provide adequate support throughout concreting operations.
2. Method statement: Submit proposals for prop bearings and sequence of propping/ repropping and backpropping.
   2.1. Timing of submission: To be agreed between the permanent works designer and the temporary works coordinator

145 Permanent formwork

1. Location and materials: Submit proposals.
2. Standard: Design profiled steel shuttering as permanent formwork in accordance with BS EN 1993-1-3.

160 Cambers

1. Application of specified upward cambers: To the concrete immediately before formwork is struck.
   1.1. Formwork: Allow for deflection under weight of fresh concrete.
   1.2. Top surfaces of concrete: Camber to maintain the required structural depths and profiles.
2. Checks after striking of formwork and removal of props: Levels to determine extent of any residual camber. Submit results.
3. Upward cambers: Construct forms to achieve the following:
   3.1. See Tender drawings.

170 Work below ground

1. Description: - FOUNDATIONS
2. Casting vertical faces against faces of excavation: Obtain consent
   2.1. Requirements: Prevent contamination of concrete by loose soil

182 Collapsible board substructure formwork

1. Type: Plastics cellular core, collapsed by predetermined fail load.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Agrément-certified, contractor's choice

3. Thickness: 225 mm
4. Loadbearing capacity: Safe load 15 kN/m²; fail load 22 kN/m²

195 Ventilated substructure formwork

1. Manufacturer: Contractor's choice
   1.1. Product reference: Agrément-certified, contractor's choice
2. Recycled content: 0% (minimum) to BS EN ISO 14021
3. Thickness: 150 mm
4. Loadbearing capacity: 40 kN/m²

225 Permanent formwork for suspended floors

1. Type: Lightweight and compatible with permanent insulation formwork (PIF) system for walls.
2. Manufacturer: As permanent insulation formwork (PIF) system.
   2.1. Product reference: Agrément-certified, contractor's choice

Construction

310 Accuracy

1. General requirement for formwork: Accurately and robustly constructed to produce finished concrete in the required positions and to the required dimensions.
2. Formed surfaces: Free from twist and bow (other than any required cambers).
3. Intersections, lines and angles: Square, plumb and true.

315 Substructure formwork and underslab insulation

1. Cutting: Neat and accurate to edges, and around penetrations and downstands.
2. Laying: Tightly butted and fully supported on firm, even substrate.
3. Vertical faces: Stiffen as necessary to act as shutter.
4. Formwork/ insulation surfaces: Protect from indentation by spacers and other items.
5. Joints in formwork/ insulation and with edge structure and penetrations: Seal to prevent penetration of concrete.
6. Concrete placement: Restrain formwork/ insulation against movement.

320 Joints in forms

1. Requirements including joints in form linings and between forms and completed work
   1.1. Prevent loss of grout, using seals where necessary.
   1.2. Prevent formation of steps. Secure formwork tight against adjacent concrete.

330 Inserts, holes and chases

1. Positions and details
   1.1. Dimensioned on drawings provided on behalf of the Employer: Do not change without consent.
   1.2. Undimensioned or from other sources: Submit proposals.
2. Positioning relative to reinforcement: Give notice of any conflicts well in advance of placing concrete.
3. Method of forming: Fix inserts or box out as required. Do not cut hardened concrete without approval.

340 Kickers

1. Method statement: Submit proposals including means of achieving quality of concrete consistent with that specified for the column or wall.
    1.1. Kicker height: As per Structural Engineering Calculations and details & Tender drawings

350 Form ties

1. Metal associated with form ties/ devices: Prohibited within cover to reinforcement. Compatible with reinforcement metal.

360 Proprietary form ties for water-resistant concrete

1. Tie manufacturer: Contractor's choice
    1.1. Product reference: Agrément-certified, contractor's choice
2. Sealing mortar manufacturer: Contractor's choice
    2.1. Product reference: Agrément-certified, contractor's choice
3. Making good of holes: Fully fill.

361 Form ties for water-resistant concrete

1. General: Maintain water resistance of construction.
2. Tie type and sealing system: Submit proposals.

380 Void formers

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice

390 Coffer units

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice

405 Column shutters

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice

410 Expanded steel mesh formwork lining

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice

420 Ribbed steel mesh formwork and reinforcement

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice
    1.2. Thickness: As per Structural Engineering Calculations and details & Tender drawings

470 Release agents

1. Use: All formwork
2. General: Achieve a clean release of forms without disfiguring the concrete surface.

3. Product types: Compatible with formwork materials, specified formed finishes and subsequent applied finishes. Use the same product throughout the entire area of any one finish.
4. Protection: Prevent contact with reinforcement, hardened concrete, other materials not part of the form face, and permanent forms.

480 Surface retarders

1. Use: Obtain approval.
2. Reinforcement: Prevent contact with retarder.

Striking

510 Striking formwork

1. Timing: Prevent any disturbance, damage or overloading of the permanent structure.

521 Minimum period for retaining formwork/ temporary supports in position

1. Concrete strength at time of formwork removal (minimum): To BS EN 13670, clause 5.7 and 8.5, and Annex F
2. Assumptions: None
   2.1. Before removing formwork: Submit proposals if assumptions will not be realised.
3. Method to be used in assessing early age strength of concrete: Application of appropriate table in CIRIA report R136

Formed finishes

610 Basic finish

1. Location: Faces below ground level
2. Finish: Faces fully compacted and cover to reinforcement provided.

613 Ordinary finish

1. Location: Surfaces to receive applied render finish
2. Finish: Faces fully compacted. Formed surfaces free from major blemishes and honeycombing. Steps at joints to be less than 5 mm.

615 Finish to receive asphalt tanking

1. Finish: Even and suitable to receive asphalt.
2. Permissible deviation of surfaces
   2.1. Sudden irregularities (maximum): 3 mm.
   2.2. Gradual irregularities (maximum): 3 mm, when measured from underside of a 1 m straightedge, placed anywhere on surface.
3. Surface blemishes
   3.1. Permitted: Blowholes less than 10 mm in diameter.
   3.2. Not permitted: Voids, honeycombing, segregation and other large defects.
4. Projecting fins: Remove.
5. Formwork tie holes: Filled with mortar.

620 Plain finish

1. Location: As per Tender drawings

2. Finish: Even and dense. Arrange formwork panels in a regular pattern as a feature of the surface.
3. Permissible deviation of surfaces
   3.1. Sudden irregularities (maximum): 3 mm.
   3.2. Gradual irregularities (maximum): 3 mm, when measured from the underside of a 1 m straightedge, placed anywhere on surface.
4. Variations in colour
   4.1. Permitted: Those caused by impermeable formwork linings.
   4.2. Not permitted: Those caused by contamination or grout leakage.
5. Surface blemishes
   5.1. Permitted: Blowholes less than 10 mm in diameter and at an agreed frequency.
   5.2. Not permitted: Voids, honeycombing, segregation and other large defects.
6. Formwork tie holes: In a regular pattern and filled with matching mortar.

630 Special finish

1. Location:
2. Finish: Smooth and even. Formwork panels as large as practicable. Arrange in a regular pattern as a feature of the surface.
   2.1. Special requirements: None
3. Permissible deviation of surfaces
   3.1. Sudden irregularities (maximum): 3 mm.
   3.2. Gradual irregularities (maximum): 3 mm when measured from the underside of a 1 m straightedge, placed anywhere on surface.
4. Variations in colour
   4.1. Permitted: Those caused by impermeable formwork linings.
   4.2. Not permitted: Those caused by contamination, grout leakage and replacement of formwork panels.
5. Cover spacers: Submit proposals
6. Surface blemishes
   6.1. Permitted: Blowholes less than 5 mm in diameter and at an agreed frequency.
   6.2. Not permitted: Voids, honeycombing, segregation and other defects.
7. Formwork tie holes:

640 Rough board finish

1. Forms or form linings: Rough textured softwood boards with smooth planed joint faces.
   1.1. Width of boards: 100 mm
   1.2. Moisture content at time of casting: 18-25%.
2. Arrangement of boards: Vary textures to give uniform overall effect.
   2.1. Orientation of boards: Horizontal
   2.2. End joints: Randomly staggered
   2.3. Nail heads: Flush with surface.
3. Surface blemishes: Penetration of grout between boards not permitted. Wet pre-assembled forms with clean water before erecting and keep damp until concrete is placed.
4. Formwork tie holes: In a regular pattern and filled with matching mortar.

750 Arrises, margins and junctions

1. Requirements: As per Tender drawings

Ω End of Section

E30
Reinforcement for in situ concrete

Reinforcement

110 Quality assurance of reinforcement

1. Standards
   1.1. Reinforcement: To BS 4449, BS 4482, BS 4483 or BS 6744.
   1.2. Cutting and bending: To BS 8666.
2. Source of reinforcement: Companies holding valid certificates of approval for product conformity issued by the UK Certification Authority for Reinforcing Steels (CARES).

140 Plain bar reinforcement

1. Standard: BS 8666
   1.1. Strength grade: B500A, B500B or B500C

150 Ribbed bar reinforcement

1. Standard: To BS 4449.
   1.1. Strength grade: B500A, B500B or B500C

160 Galvanized steel reinforcement

1. Galvanizing: To BS EN ISO 1461 after cutting but before bending.

170 Stainless steel plain bar reinforcement

1. Standard: BS 6744:2001
   1.1. Designation to BS EN 10088-1: As per Structural Engineering Calculations and details & Tender drawings
   1.2. Strength grade: 200.

180 Stainless steel ribbed bar reinforcement

1. Standard: To BS 6744.
   1.1. Designation to BS EN 10088-1: As per Structural Engineering Calculations and details & Tender drawings
   1.2. Strength grade: 500.

210 Standard fabric reinforcement

1. Standard: To BS 4483:2005
2. Strength grade: B500A, B500B or B500C

240 Proprietary prefabricated reinforcement

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice

245 Prefabricated reinforcement

1. Description: As per Structural Engineering Calculations and details & Tender drawings

2. Prefabricated elements: Submit proposals
3. Source: Obtain from a manufacturer holding valid certification of approval for welded fabrications issued by the UK Certification Authority for Reinforcing Steels (CARES).
   3.1. Certification required: Achievement of CARES appendix 6 for tack welding and appendix 10 for semi-structural/ structural welding.

250 Proprietary prefabricated continuity reinforcement strips

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice

255 Prefabricated continuity reinforcement strips

1. Source: Obtain from a manufacturer holding a valid Technical Product Approval certificate issued by the UK Certification Authority for Reinforcing Steels (CARES) or equivalent.

260 Proprietary mechanical couplers

1. Locations: As per Structural Engineering Calculations and details & Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice

265 Mechanical couplers

1. Locations: As per Structural Engineering Calculations and details & Tender drawings
2. Source: Obtain from a manufacturer holding a valid Technical Product Approval certificate issued by the UK Certification Authority for Reinforcing Steels (CARES) or equivalent.

Workmanship

310 Cutting and bending reinforcement

1. General: To schedules and to BS 8666.
2. Bending on site, including minor adjustments: Obtain instructions

320 Protection of reinforcement

1. Dropping from height, mechanical damage and shock loading: Prevent.
2. Cleanliness of reinforcement at time of pouring concrete: Free from corrosive pitting, loose mill scale, loose rust and contaminants which may adversely affect the reinforcement, concrete, or bond between the two.

410 Laps or splices

1. Details not shown on drawings: Obtain instructions.

427 Laps in fabric reinforcement

1. Terms: As defined in BCA publication 97.321.
2. Lap type
   2.1. Long edge of fabric: Reverse layer lap with bars in centre layer bundled and bars in outer layers spaced apart to ensure full encapsulation in concrete
   2.2. Short edge of fabric: Reverse layer lap with bars in centre layer bundled and bars in outer layers spaced apart to ensure full encapsulation in concrete
3. Other requirements: None

430 Welding reinforcement

1. Standard: To BS EN ISO 17660-1 or -2 as appropriate
2. Joint type/ dimensions: As per Structural Engineering Calculations and details & Tender drawings
   2.1. Location: As per Structural Engineering Calculations and details & Tender drawings
3. Site welding: Submit proposals for quality and safety controls

451 Fixing reinforcement

1. Standard: To BS 7973-1 and -2.
2. Installation: In addition to any spacers and chairs shown on drawings or schedules, provide adequate support, tie securely and maintain the specified cover.
3. Tying
   3.1. Wire type: 16 gauge black annealed. Use stainless steel wire for stainless steel reinforcement.
4. Ends of tying wire: Prevent intrusion into the concrete cover. Remove loose ends.
5. Compatibility of metals: Prevent contact between ordinary carbon steel and stainless or galvanized reinforcement.

454 Fixing reinforcement for spraying concrete

1. First reinforcement layer: Install prior to concreting, with chairs or other means of support fixed ready for installation of subsequent reinforcement layer.
2. Subsequent reinforcement layer: Fabricate as a mat prior to concreting. Install when first reinforcement layer is fully encapsulated in concrete.

470 Tolerances on cover

1. Tolerance (maximum): As per Structural Engineering Calculations and details & Tender drawings
2. Checking specified cover dimensions: Before concreting check that cover dimensions will be achieved.

480 Nominal cover to reinforcement

1. Nominal cover: 75 mm

510 Rust staining

1. Staining of surfaces of concrete which will be exposed to view in the finished work: Prevent.

520 Cover meter survey

1. Purpose of survey: To check positions of reinforcement and that the specified cover has been achieved.
2. Type of cover meter: A magnetic induction digital display type selected to suit arrangement and type of reinforcement.
   2.1. Use: In accordance with recommendations of BS 1881-204 and manufacturer as appropriate to yield accurate results.
   2.2. Surveyor: Experienced with cover meter surveys.
   2.3. Calibration: At the outset and thereafter regularly at 45 minute (maximum) intervals.
3. Locations for checking: Include columns, beams, cantilevers, slab soffits and all faces exposed to the weather in the finished structure.
4. Timing: As soon as practicable after casting.

4.1. Notification: Give adequate notice.

5. Results: Submit. Notify immediately where specified cover has not been achieved.

521 Cover meter for use by others

1. Type of cover meter: Provide a magnetic induction digital display type selected to suit arrangement and type of reinforcement.
2. Availability: Calibrate and maintain ready for use by others as instructed.
   2.1. Periods/ time: Within 24 hours of striking formwork

Ω End of Section

E40
Designed joints in in situ concrete

To be read with preliminaries/ general conditions.

120 Construction/ movement joints generally

1. Accuracy: Position and form joints accurately, straight, well-aligned and truly vertical, horizontal or parallel with setting out lines of the building.
2. Modifications to joint design or location: Submit proposals.
3. Placing concrete to form movement joints
   - 3.1. Maintain effectiveness of joints. Prevent concrete entering joints, penetrating or impregnating compressible joint fillers.
   - 3.2. Do not place concrete simultaneously on both sides of movement joints.

132 Additional requirements for construction joints

1. Limitations: Permitted, but subject to restrictions in section E10

210 Formed joints

1. Forms/ stop ends generally: Rigid and grout-tight.
2. Forms/ stop ends for projecting continuity reinforcement: To accommodate bars or fabric without temporary bending or displacement.

211 Formed joints in concrete wearing surfaces

1. Temporary forms: Square edged with a steel top surface.
2. Placing concrete: Compact thoroughly at edges to give level, closely abutted joints with no lipping.

220 Precast concrete permanent side forms

1. Manufacturer: Contractor's choice
   - 1.1. Product reference: Contractors choice
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Depth: 200 mm
4. Installation: To accurate line and level with concrete thoroughly compacted at edges and with no lipping.

225 Prefabricated steel permanent joint formers

1. Manufacturer: Contractor's choice
   - 1.1. Product reference: Contractors choice
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Depth: 200 mm
4. Installation: To accurate line and level with concrete thoroughly compacted at edges and with no lipping.

230 Preparation of construction joints

1. Roughening of joint surfaces: Select from:

1.1. Brushing and spraying: Remove surface laitance and expose aggregate finish while concrete is still green.

1.2. Other methods: Submit proposals.

2. Condition of joint surfaces immediately before placing fresh concrete: Clean and damp.

240 Bottom of slab crack inducers

1. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
2. Type: As
3. Plastics, triangular section

3.1. Depth: 75 mm

4. Fixing to sub-base: Secure to prevent movement during casting and compacting of concrete.

250 Inserted strip crack inducers

1. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
2. Type: Plastics with detachable top section

2.1. Depth: Not less than one quarter the depth of the slab

3. Installation: To accurate line and level with concrete thoroughly compacted at edges and with no lipping.

260 Sawn crack inducing grooves

1. Groove dimensions

1.1. Depth: Not less than one quarter the depth of the slab

1.2. Width: As narrow as practicable.

2. Sawing: Sufficiently early to prevent random cracking (within 24 hours of casting slab) and to produce strong, well defined arrises.
3. Groove filling: Sheet joint filler and sealant

310 Flexible waterstops

1. Manufacturer: Contractor's choice

1.1. Product reference: Contractors choice

2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Junctions and angles: Use factory formed junction pieces.
4. Placing concrete: Fully compact concrete around waterstops with no voids or porous areas.

320 Hydrophilic waterstops

1. Manufacturer: Contractor's choice

1.1. Product reference: contractore choice

2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Location: As per Structural Engineering Calculations and details & Tender drawings
4. Material: Rubber
5. Method of fixing: Contractor's choice
6. Condition of concrete surface at time of fixing: Clean and free from ponded or running water.

7. Protection: Prevent wetting of exposed sections of waterstop.

410 Carbon steel tie bars

1. Standard: To BS 4449.
   1.1. Product form: Ribbed
   1.2. Strength grade: B500A, B500B, B500C
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Cleanliness: Free from corrosive pitting, loose millscale, loose rust and contaminants which may adversely affect the tie bars, reinforcement, concrete, or bond between the two.
4. Position: Centred on joint.
5. Other requirements: None

415 Stainless steel tie bars

1. Standard: To BS EN 10088-5
   1.1. Product form: Ribbed
   1.2. Designation: As per Structural Engineering Calculations and details & Tender drawings
   1.3. Strength grade: 500
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Cleanliness: Free from contaminants which may adversely affect the tie bars, concrete, or bond between the two.
4. Position: Centred on joint.

420 Fabric tie strips

1. Standard: To BS 4483.
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Cleanliness: Free from corrosive pitting, loose millscale, loose rust and contaminants which may adversely affect the fabric, concrete, or bond between the two.
4. Position: Width of the mesh strip centred on the joint.

430 dowel bars

1. Standard: To BS 4482
   1.1. Product form: Plain.
   1.2. Strength grade: 500
   1.3. Properties: Perfectly straight, with sawn (not sheared) ends.
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Debonding: Achieve effective debonding of each bar
   3.1. Material: Flexible polymeric coating as 'Specification for Highway Works', clause 1011(7)
   3.2. Extent: Full length of bar
4. Position: At right angles to and centred on joint.
5. Other requirements: None

435 Stainless steel dowel bars

1. Standard: To BS 6744 and BS EN 10088-5
    1.1. Designation: As per Structural Engineering Calculations and details & Tender drawings
    1.2. Product form: Plain.
    1.3. Strength grade: 200.
    1.4. Properties: Perfectly straight, with sawn (not sheared) ends.
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Debonding: Achieve effective debonding of each bar.
    3.1. Material: Flexible polymeric coating as 'Specification for Highway Works', clause 1011(7)
    3.2. Extent: Full length of bar
4. Position: At right angles to and centred on joint.
5. Other requirements: None

437 Debonding compound

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice

438 Loop connectors

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice
2. Loop length: 110 mm

440 Load transfer systems

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice

445 Insulating load transfer systems

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Slab depth: 200 mm
4. Fire resistance: As required
5. Thermal conductivity: As required
6. Special requirements: None

510 Sheet membrane for sliding joints

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractors choice
2. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
3. Fixing: Bond to first cast concrete surface, or otherwise hold in position during concreting.

520 Sheet joint filler

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractors choice
3. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
4. Joints finished with sealant: Leave sufficient space for sealant by using temporary formers.

530 Sealant

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractors choice
   2.2. Colour of surfaces exposed to view: To be agreed
3. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)
4. Preparation and application: As section Z22.
5. Guarantee: Required
   5.1. Period: 20 years
   5.2. Requirements: UV resistant

545 Compressible sealing strip system

1. Description: As per Structural Engineering Calculations and details & Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractors choice
   2.2. Colour: To be agreed
3. Certification: Provide European Technical Assessment (ETA) with UKCA/ UKNI/ CE marking and a Declaration of Performance (DoP)

590 Inspection of tied and partially tied joints

1. Purpose: To determine whether shrinkage is concentrated at occasional joints.
2. Timing: At intervals from one month after casting of slab for duration of works.
3. Joints that have opened significantly more than the average: Submit proposals for grouting.

Ω End of Section

E41
Worked finishes to in situ concrete

To be read with preliminaries/ general conditions.

110 Monolithic concrete wearing screed

1. Description: As per Structural Engineering Calculations and details & Tender documents
2. Thickness
   - 2.1. Minimum: 10 mm.
   - 2.2. Maximum: 20 mm.
3. Abrasion resistance class to BS 8204-2: AR0.5/WS
4. Mix
   - 4.1. Cements/ Combinations: To BS EN 197-1 and BS 8500-2.
   - 4.2. Fine aggregate: To BS EN 12620.
     - 4.2.1. Grading limit: To BS EN 12620.
   - 4.3. Coarse aggregate: To BS EN 12620.
     - 4.3.1. Grading limit: 4/10 mm single size
   - 4.4. Proportions: As per Structural Engineering Calculations and details & Tender drawings
5. Construction
   - 5.1. Lay and compact within three hours of laying base (less in hot weather).
   - 5.2. Bleed water on base surface: None.
6. Tolerances
   - 6.1. Surface regularity: As clause E05
   - 6.2. Level: Permissible deviation of wearing surface from datum (maximum): ±5 mm.
7. Finish: Dewatered trowelled
   - 7.1. Additional surface treatment: Not required
   - 7.2. Slip resistance (minimum): PTV 40
8. Curing: As section E10.

120 Directly finished concrete wearing surfaces

1. Description: As per Structural Engineering Calculations and details & Tender documents
2. Abrasion resistance class to BS 8204-2: AR0.5/DF
3. Tolerances
   - 3.1. Surface regularity: As clause E05
   - 3.2. Level: Permissible deviation of wearing surface from datum (maximum): ±5 mm.
4. Finish: Dewatered trowelled
   - 4.1. Additional surface treatment: Not required
   - 4.2. Slip resistance (minimum): PTV 40
5. Curing: As section E10.

150 Finishing

1. Timing: Carry out at optimum times in relation to setting and hardening of concrete.
2. Prohibited treatments to concrete surfaces

2.1. Wetting to assist surface working.
2.2. Sprinkling cement.

210 Tamped finish

1. Surface on completion: Even array of parallel ribs

220 Scored finish

1. Surface on completion: Roughened, irregular pattern
   1.1. Scoring tool: Contractors choice

230 Brushed finish

1. Surface on completion: Light even texture.

240 Wood floated finish

1. Surface on completion: Slightly coarse, even texture with no ridges or steps.

310 Smooth floated finish

1. Surface on completion: Even with no ridges or steps.

320 Trowelled finish

1. Surface on completion: Uniform, smooth but not polished, free from trowel marks and blemishes, and suitable to receive specified flooring material.

330 Trowelled finish for wearing surfaces

1. Surface on completion: Uniform and smooth, free from trowel marks and blemishes.

335 Dry shake trowelled finish for wearing surfaces

1. Dry shake manufacturer: Contractor's choice
   1.1. Product reference: Contractors choice
   1.2. Mix: Manufacturer's standard
   1.3. Colour: To be agreed
   1.4. Application: Sprinkle evenly at appropriate stages during floating and before trowelling.
      1.4.1. Application rate: 3-5 kg/m²
2. Curing agent/ Sealer: As dry shake manufacturer's recommendations
3. Protection: Prevent marking of adjacent surfaces.
4. Surface on completion: Uniform and smooth, free from trowel marks and blemishes.

340 Dewatered trowelled finish for wearing surfaces

1. Dewatering
   1.1. Timing: Immediately after compacting concrete.
   1.2. Removing water: Use vacuum process.
2. Surface on completion: Uniform and smooth, free from trowel marks and blemishes.

410 Power ground finish for wearing surfaces

1. Grinding: Remove 1-2 mm from surface.

1.1. Timing: When concrete is sufficiently hard for fine aggregate surface particles not to be dislodged.

2. Cleaning: Remove dust and wash down.
3. Surface on completion: Even glass-paper texture, free from blemishes and trowel marks.

430 Tooled finish

1. Type: Bush hammering
   1.1. Texture/ Maximum depth of indentations: Medium/ 10 mm
   1.2. Timing: Tool surface minimum 21 days after casting.
2. Margins: Untooled, straight and regular.
   2.1. Width: As per Tender drawings
3. Cleaning: Remove loose particles and dust.

510 Surface hardener

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractors choice
2. Condition of substrate prior to application: Cured, clean and free from surface contaminants.
3. Application: Evenly to dry surfaces. After absorption, wash surface immediately with clean water.
   3.1. Additional applications: As manufacturer's recommendations
4. Solutions and wash water: Do not discharge to drains. Store and dispose of safely.

520 Surface sealer

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractors choice
2. Substrate
   2.1. Moisture content: As recommended by sealer manufacturer. Test relative humidity to BS 8203, Annex A where required to verify suitability.
   2.2. Condition prior to application: Cured, clean and free from contaminants.
3. Primer: *Detailed record of fire safety strategy and fire protection measures in accordance with BS 7974*
4. Application: Evenly to dry surfaces to form an effective seal but without a glossy finish.

530 Slip resistance testing of wearing surfaces

1. Test: To BS 7976-2 using a Transport Research Laboratory (TRL) Pendulum.
   1.1. Timing: Give adequate notice.

Ω End of Section

E42
Accessories cast into in situ concrete

General

110 Accessories specified elsewhere

1. Item/ location: As per Structural Engineering Calculations and details & Tender documents

Products

335 Shear Load Connectors

1. Material: Stainless steel
   1.1. Designation: S355 to BS EN 10025-2
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Anchors: Welded to back of section.
   3.1. Type/ centres: Submit proposals
4. Temporary fixings to shutter/ temporary supports: Stainless steel nails

350 Proprietary corner guards

1. Location: As per Structural Engineering Calculations and details & Tender documents
2. Material: Stainless steel
   2.1. Coating or treatment: Galvanized
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Anchors: Welded to face in contact with concrete.
   4.1. Type/ centres: Contractor's choice
5. Temporary fixings to shutter: Standard

370 Fabricated edge strips and frames

1. Use: As per Structural Engineering Calculations and details & Tender documents
2. Material: As for chequer plate
   2.1. Designation: 1.4401 to BS EN 10088
   2.2. Coating or treatment: Galvanized
3. Section: As per Structural Engineering Calculations and details & Tender documents
4. Anchors: Welded to face in contact with concrete.
   4.1. Type/ centres: As per Structural Engineering Calculations and details & Tender documents
5. Temporary fixings to shutter/ temporary support: Standard

390 Galvanized coatings

1. Standard: To BS EN ISO 1461.
2. Galvanizing: Applied and passivated by component manufacturer. Threaded items tapped after galvanizing.

395 Sherardized coatings on metal fasteners

1. Standard: To BS 7371-8.

Execution

610 Hollow accessories

1. Filling/ sealing: Temporally fill or seal accessory to prevent ingress of grout during concreting. Leave filling/ seals in position until accessory is used.

620 Temporary supports

1. Location: Provide to hold accessories for casting into unshuttered surface of concrete, set at a level that will not adversely affect finish of concrete surface remote from accessory.
2. Position: Hold securely to prevent lateral movement or rotation of accessory during concreting.

630 Protective coatings

1. Inspect: Immediately prior to casting concrete.
2. Damage to coatings
   2.1. Minor: Submit proposals for coating repair.
   2.2. Significant: Replace accessory.

640 Installation

1. Cleanliness: At time of casting, surfaces in contact with concrete to be free from contaminants which may adversely affect accessory, reinforcement, concrete, or bond between accessory and concrete.
2. Position: Hold accessory firmly in position, preventing displacement during concreting.
3. Other requirements: None

Ω End of Section

F10
Brick/ block walling

Types of walling

110 Clay facing brickwork

1. Description: As per Structural Engineering Calculations and details & Tender documents
2. Bricks: To BS EN 771-1.
   - 2.1. Manufacturer: Contractor's choice
     - 2.1.1. Product reference: Contractor's choice
   - 2.2. Recycled content: Submit proposals
   - 2.3. Special shapes: None
3. Mortar: As section Z21.
   - 3.1. Standard: To BS EN 998-2
   - 3.2. Mix: Mix proportions: For a specified designation select a mix from the following:
     Designation (i) (BS EN 998-2 M12 equivalent)
     1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
     1:3 (Portland cement:sand and air entraining additive).
     Designation (ii) (BS EN 998-2 class M6 equivalent)
     1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
     1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
     1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
     1:3-4 (Portland cement:sand and air entraining additive).
     Designation (iii) (BS EN 998-2 class M4 equivalent)
     1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
     1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
     1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
     1:5-6 (Portland cement:sand and air entraining additive).
     Designation (iv) (BS EN 998-2 class M2 equivalent)
     1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
     1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
     1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
     1:7-8 (Portland cement:sand and air entraining additive).
   - 3.3. Additional requirements: None
4. Bond: To match existing
5. Joints: To match existing
6. Features: None

230 Reclaimed brick facing brickwork

1. Description: As per Structural Engineering Calculations and details & Tender documents
2. Reclaimed bricks: To match existing
   - 2.1. Condition: Sound, free from mortar and deleterious matter.
   - 2.2. Supplier/ Source: Contractors choice

2.3. Format: To match existing

3. Mortar: As section Z21.
   3.1. Standard: To BS EN 998-2
   3.2. Mix: Mix proportions: For a specified designation select a mix from the following:
   Designation (i) (BS EN 998-2 M12 equivalent)
   1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (Portland cement:sand and air entraining additive).
   Designation (ii) (BS EN 998-2 class M6 equivalent)
   1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:3-4 (Portland cement:sand and air entraining additive).
   Designation (iii) (BS EN 998-2 class M4 equivalent)
   1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
   1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:5-6 (Portland cement:sand and air entraining additive).
   Designation (iv) (BS EN 998-2 class M2 equivalent)
   1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
   1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:7-8 (Portland cement:sand and air entraining additive).
   3.3. Additional requirements: None
4. Bond: To match existing
5. Joints: To match existing
6. Features: None

255 Concrete facing blockwork

1. Description: As per Structural Engineering Calculations and details & Tender documents
2. Blocks: To BS EN 771-3.
   2.1. Manufacturer:
      2.1.1. Product reference:
   2.2. Configuration:
   2.3. Compressive strength
      2.3.1. Mean value:
      2.3.2. Characteristic value:
      2.3.3. Category:
   2.4. Freeze/ thaw resistance:
   2.5. Recycled content:
   2.6. Work sizes (length x width x height):
      2.6.1. Tolerance category:
   2.7. Finish/ colour:
   2.8. Special shapes:

2.9. Additional requirements:

3. Mortar: As section Z21.
   3.1. Standard:
   3.2. Mix:
   3.3. Additional requirements:
4. Bond:
5. Joints:
6. Features:

255 Aggregate concrete blocks Type A

1. Description: Internal leaf
2. Blocks: To BS EN 771-3:2011
   2.1. Manufacturer: Thomas Armstrong (Concrete Blocks) Ltd
      2.1.1. Contact details
         2.1.1.1. Address: Whinfield Road
         Rowlands Gill
         Newcastle-upon-Tyne
         Tyneside
         United Kingdom
         NE39 1EH
         2.1.1.2. Telephone: +44 (0)1207 544214
         2.1.1.3. Web: www.thomasarmstrongconcreteblocks.co.uk
         2.1.1.4. Email: blocks@thomasarmstrong.co.uk
      2.1.2. Product reference: Insulite Concrete Block (Insulite Concrete Block 75 mm)
   2.2. Standard: To BS EN 771-3:2011; ISO9001; ISO14001; BES 6001 'Excellent'.
   2.3. Block description: Standard.
   2.4. Appearance: Dark Grey.
   2.5. Configuration: Group 1.
   2.6. Compressive strength
      2.6.1. Mean value: 5.2 N/mm².
      2.6.2. Category: II.
   2.7. Freeze/ thaw resistance: Frost resistant.
   2.8. Thermal conductivity: 0.32 W/mK (protected inner leaf), 0.34 W/mK (exposed outer leaf).
   2.9. Recycled content: 90%.
   2.10. Tolerance category: D1.
   2.11. Density
      2.11.1. Net dry density: 950 kg/m³.
   2.12. Reaction to fire: Class A1.
   2.13. Water absorption by capillarity: 90 g/(m2 x s-0.5).
   2.14. Water vapour permeability: 5/15 μ.
   2.15. Moisture movement: 0.6 mm/m.
   2.16. Thickness: 100 mm.
   2.17. Environmental Product Declaration (EPD): ISO 14001.

255 Aggregate concrete blocks Type B

1. Description: External leaf and internal infill
2. Blocks: To BS EN 771-3:2011
   - 2.1. Manufacturer: Thomas Armstrong (Concrete Blocks) Ltd
     - 2.1.1. Contact details
       - 2.1.1.1. Address: Whinfield Road
         Rowlands Gill
         Newcastle-upon-Tyne
         Tyneside
         United Kingdom
         NE39 1EH
       - 2.1.1.2. Telephone: +44 (0)1207 544214
       - 2.1.1.3. Web: www.thomasarmstrongconcreteblocks.co.uk
       - 2.1.1.4. Email: blocks@thomasarmstrong.co.uk
     - 2.1.2. Product reference: Insulite Concrete Block (Insulite Concrete Block 75 mm)
   - 2.2. Standard: To BS EN 771-3:2011; ISO9001; ISO14001; BES 6001 'Excellent'.
   - 2.3. Appearance: Dark Grey.
   - 2.4. Configuration: Group 1.
   - 2.5. Compressive strength
     - 2.5.1. Mean value: 5.5 N/mm².
     - 2.5.2. Category: II.
   - 2.6. Freeze/ thaw resistance: Frost resistant.
   - 2.7. Thermal conductivity: 0.49 W/mK (protected inner leaf), 0.54 W/mK (exposed outer leaf).
   - 2.8. Recycled content: 90%.
   - 2.9. Work sizes (length x width x height): 440 x 215 x 100 mm.
   - 2.10. Tolerance category: D1.
   - 2.11. Density
     - 2.11.1. Net dry density: 1450 kg/m³.
   - 2.12. Reaction to fire: Class A1.
   - 2.13. Water absorption by capillarity: 90 g/(m2 x s-0.5).
   - 2.14. Water vapour permeability: 5/15 µ.
   - 2.15. Moisture movement: 0.6 mm/m.
   - 2.16. Thickness: 100 mm.
   - 2.17. Environmental Product Declaration (EPD): ISO 14001.

255 Multicoat render systems Type D

1. Blocks: To BS EN 771-3.
   - 1.1. Manufacturer: K Rend Silicone Coloured Renders
     - 1.1.1. Contact details
       - 1.1.1.1. Address: Kilwaughter Minerals Ltd
         9 Starbog Road
         Larne
         County Antrim
         BT40 2TJ
       - 1.1.1.2. Telephone: +44 (0)28 2826 0766

1.1.1.3. Web: www.k-rend.co.uk
1.1.1.4. Email: sales@k-rend.co.uk
1.1.2. Product reference: K Mix Mortars - Multicoat render system (K Mix GP Mortar)
1.2. Colour:
1.3. Coverage:
1.4. Temperature: 5–35°C. The product must not be used in frozen conditions.

Testing

400 Hard landscaping materials specification

1. Minimum BRE 'Green Guide to Specification' online rating: Contractor's choice

410 Compressive strength of mortar for each walling type

1. Testing authority: A UKAS-accredited laboratory
2. Test method: To BS EN 1015-11.
3. Preliminary tests procedure: As follows:
   3.1. Specimens
      3.1.1. Number of specimens: Six.
      3.1.2. Type: 40 x 40 x 160 mm prism.
      3.1.3. Preparation: At least six weeks before walling commences.
   3.2. Specimen testing: Half of specimens at seven days. Remainder at 28 days.
      3.2.1. Retarded mixes: Extend curing periods to include retardation period.
   3.3. Response to result: If mean compressive strength at 28 days is not within the range given below repeat tests with more suitable sand or next higher Mortar class.
4. Site tests procedure: As follows.
   4.1. Number of specimens: Six per 150m² of walling or per storey whichever the more frequent.
   4.2. Specimen types: As preliminary test, but prepared during construction.
   4.3. Specimen testing: Half of specimens at seven days. Remainder at 28 days.
      4.3.1. Retarded mixes: Extend curing periods to include retardation period.
5. Required test mean compressive strength at 28 days (N/mm²): To be within the following range:
6. Results: Submit.

415 Fresh mortar cement content

1. Test method: BREMORTEST in accordance with Building Research Establishment Information Paper 8/89
2. Test specimens: Test mortar for the following wall types: F10/ BREMORTEST .
3. Results: Submit.

Workmanship generally

430 Conditioning of clay bricks and blocks

1. Bricks and blocks delivered warm from manufacturing process: Do not use until cold.
2. Absorbent bricks in warm weather: Wet to reduce suction. Do not soak.

440 Conditioning of concrete bricks/ blocks

1. Autoclaved concrete bricks/ blocks delivered warm from manufacturing process: Do not use.
2. Age of nonautoclaved concrete bricks/ blocks: Do not use until at least four weeks old.
3. Avoidance of suction in concrete bricks/ blocks: Do not wet.
   3.1. Use of water retaining mortar admixture: Submit details.

460 Mortar designations

1. Mix proportions: For a specified designation select a mix from the following:
   1.1. Designation (i) (BS EN 998-2 M12 equivalent)
      1.1.1.1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
      1.1.2.1:3 (Portland cement:sand and air entraining additive).
   1.2. Designation (ii) (BS EN 998-2 class M6 equivalent)
      1.2.1.1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
      1.2.2.1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
      1.2.3.1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
      1.2.4.1:3-4 (Portland cement:sand and air entraining additive).
   1.3. Designation (iii) (BS EN 998-2 class M4 equivalent)
      1.3.1.1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
      1.3.2.1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
      1.3.3.1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
      1.3.4.1:5-6 (Portland cement:sand and air entraining additive).
   1.4. Designation (iv) (BS EN 998-2 class M2 equivalent)
      1.4.1.1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
      1.4.2.1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
      1.4.3.1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
      1.4.4.1:7-8 (Portland cement:sand and air entraining additive).
2. Batching: Mix proportions by volume.
3. Mortar type: Continuous throughout any one type of masonry work.

500 Laying generally

1. Mortar joints: Fill vertical joints. Lay bricks, solid and cellular blocks on a full bed.
2. AAC block thin mortar adhesive and gypsum block adhesive joints: Fill vertical joints. Lay blocks on a full bed.
3. Clay block joints
   3.1. Thin-layer mortar: Lay blocks on a full bed.
   3.2. Interlocking perpends: Butted.
4. Bond where not specified: Half-lap stretcher.
5. Vertical joints in brick and concrete block facework: Even widths. Plumb at every fifth cross joint.

520 Accuracy

1. Courses: Level and true to line.
2. Faces, angles and features: Plumb.
3. Permissible deviations
   - 3.1. Position in plan of any point in relation to the specified building reference line and/ or point at the same level: ± 10 mm.
   - 3.2. Straightness in any 5 m length: ± 5 mm.
   - 3.3. Verticality up to 3 m height: ± 10 mm.
   - 3.4. Verticality up to 7 m height: ± 14 mm.
   - 3.5. Overall thickness of walls: ± 10 mm.
   - 3.6. Level of bed joints up to 5 m (brick masonry): ± 11 mm.
   - 3.7. Level of bed joints up to 5 m (block masonry): ± 13 mm.

535 Height of lifts in walling using cement-gauged or hydraulic lime mortar

1. Quoins and advance work: Rack back.
2. Lift height (maximum): 1.2 m above any other part of work at any time.
3. Daily lift height (maximum): 1.5 m for any one leaf.

540 Height of lifts in walling using thin-layer mortar

1. Quoins and advance work: Rack back.
2. Lift height (maximum): 1.3 m above any other part of work at any time.

545 Levelling of separate leaves

1. Locations for equal levelling of cavity wall leaves: As follows:
   - 1.1. Every course containing vertical twist type ties or other rigid ties.
   - 1.2. Every third tie course for double triangle/ butterfly ties.
   - 1.3. Courses in which lintels are to be bedded.

560 Coursing brickwork

1. Gauge: Four brick courses including bed joints to 300 mm.

561 Coursing brickwork with existing

1. Gauge: Line up with existing brick courses.

580 Laying frogged bricks

1. Single frogged bricks: Frog uppermost.
2. Double frogged bricks: Larger frog uppermost.
3. Frog cavity: Fill with mortar.

585 Laying cellular bricks

1. Orientation: Cavities downward.

595 Lintels

1. Bearing: Ensure full length masonry units occur immediately under lintel ends.

610 Support of existing work

1. Joint above inserted lintel or masonry: Fully consolidated with semidry mortar to support existing structure.

615 Brickwork to receive asphalt dpc

1. Substrate: Mortar bed finished flush, smooth and level.

620 Block bonding new walls to existing

1. Pocket requirements: Formed as follows:
   1.1. Width: Full thickness of new wall.
   1.2. Depth (minimum): 100 mm.
   1.3. Vertical spacing
      1.3.1. Brick to brick: 4 courses high at 8 course centres.
      1.3.2. Block to block: Every other course.
2. Pocket joints: Fully filled with mortar.

635 Jointing

1. Profile: Consistent in appearance.

645 Accessible joints not exposed to view

1. Jointing: Struck flush as work proceeds.

665 Pointing

1. Description: As per the structural engineers report and calculations and Tender drawings
2. Joint preparation: Remove debris. Dampen surface.
3. Mortar: As section Z21.
   3.1. Standard: To BS EN 998-2
   3.2. Mix: Mix proportions: For a specified designation select a mix from the following:
   Designation (i) (BS EN 998-2 M12 equivalent)
   1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (Portland cement:sand and air entraining additive).
   Designation (ii) (BS EN 998-2 class M6 equivalent)
   1:½:4-5 (Portland cement:lime:sand with or without air entraining additive).
   1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:3-4 (Portland cement:sand and air entraining additive).
   Designation (iii) (BS EN 998-2 class M4 equivalent)
   1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
   1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
   1:5-6 (Portland cement:sand and air entraining additive).
   Designation (iv) (BS EN 998-2 class M2 equivalent)
   1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
   1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
   1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other

than lime and air entraining additive).
1:7-8 (Portland cement:sand and air entraining additive).

3.3. Additional requirements: None

4. Profile: To match existing

671 Fire-stopping

1. Avoidance of fire and smoke penetration: Fit tightly between cavity barriers and masonry. Leave no gaps.

690 Adverse weather

1. General: Do not use frozen materials or lay on frozen surfaces.
2. Air temperature requirements: Do not lay bricks/ blocks:
   2.1. In cement-gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising.
   2.2. In hydraulic lime:sand mortars when at or below 5°C and falling or below 3°C and rising, or as manufacturer's/ supplier's recommendations.
   2.3. In thin-layer mortars when outside the limits set by the mortar manufacturer.
3. Temperature of walling during curing: Above freezing until hardened.
4. Newly erected walling: Protect at all times from:
   4.1. Rain and snow.
   4.2. Drying out too rapidly in hot conditions and in drying winds.

Additional requirements for facework

710 The term facework

1. Definition: Applicable in this specification to brick/ block walling finished fair.
   1.1. Painted facework: The only requirement to be waived is that relating to colour.

730 Brick/ Concrete block samples

1. General: Before placing orders with suppliers submit for approval of appearance labelled samples of the following: None.
2. Selection of samples: Representative of the range in variation of appearance.

750 Colour consistency of masonry units

1. Colour range: Submit proposals of methods taken to ensure that units are of consistent and even appearance within deliveries.
2. Conformity: Check each delivery for consistency of appearance with previous deliveries and with approved reference panels; do not use if variation is excessive.
3. Facing bricks should be blended on site from a minimum of three packs to ensure an even distribution of colour and texture variation.
4. Finished work: Free from patches, horizontal stripes and racking back marks.

760 Appearance

1. Brick/ block selection: Do not use units with damaged faces or arrises.
2. Cut masonry units: Where cut faces or edges are exposed cut with table masonry saw.
3. Quality control: Lay masonry units to match relevant reference panels.

3.1. Setting out: To produce satisfactory junctions and joints with built-in features and components.

3.2. Coursing: Evenly spaced using gauge rods.

4. Lifts: Complete in one operation.
5. Methods of protecting facework: Submit proposals.

780 Ground level

1. Commencement of facework: Not less than 150 mm below finished level of adjoining ground or external works level.

790 Putlog scaffolding

1. Use: Not permitted in facework.

800 Toothed bond

1. New and existing facework in same plane: Bond together at every course to achieve continuity.

830 Cleanliness

1. Facework: Keep clean.
2. Mortar on facework: Allow to dry before removing with stiff bristled brush.
3. Removal of marks and stains: Rubbing not permitted.

Ω End of Section

F30
Accessories/ sundry items for brick/ block/ stone walling

Cavities

110 Concrete fill to base of cavity

1. Concrete generally: To BS EN 206 and BS 8500-2.
2. Concrete type: Designated GEN1
   2.1. Workability: High.
3. Extent: Maintain 75 mm between top of fill and external ground level and a minimum of 225 mm between top of fill and ground level dpc.
4. Placement: Compact to eliminate voids.

120 Cleanliness

1. Cavity base and faces, ties, insulation and exposed dpcs: Free from mortar and debris.

130 Perpend joint weep holes

1. Form: Open perpend joint.
2. Locations: Through outer leaf immediately above base of cavity, at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
3. Provision: At not greater than 1000 mm centres and not less than two over each opening.

131 Bed joint weep holes

1. Form: Open 10 mm diameter hole.
2. Locations: Through outer leaf immediately above base of cavity at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
3. Provision: At not greater than 1000 mm centres and not less than two over each opening.

132 Perpend joint plastics weep holes

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Locations: Through outer leaf immediately above base of cavity, at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
3. Provision: At not greater than 1000 mm centres and not less than two over each opening.

155 Phenolic foam boards

1. Insulation: Phenolic foam boards to BS EN 13166
2. Manufacturer: Kingspan Insulation
   2.1. Contact details
      2.1.1. Address: Kingspan Insulation Ltd
      Pembridge
      Leominster
      Herefordshire
      United Kingdom
      HR6 9LA
      2.1.2. Telephone: +44 (0)1544 388601

2.1.3. Web: https://www.kingspan.com/gb/en-gb
2.1.4. Email: info@kingspaninsulation.co.uk
2.2. Product reference: Kingspan Kooltherm K108 Cavity Board (Kingspan Kooltherm K108 Cavity Board - 40 mm)
3. Standard: To BS EN 13166.
4. Third party product certification: British Board of Agrément (BBA) certification.
5. Fire performance: Euroclass RtF F to BS EN 13501-1:2018.
6. Thermal conductivity (maximum): 0.019 W/m·K.
7. Cross section: Uniform thickness.
8. Thickness: 75 mm.
9. Face size (length x width): 1200 x 450 mm.
10. Compressive strength (minimum) at 10% compression: 100 kPa.
11. Recycled content: 0% (minimum) to BS EN ISO 14021.
12. Edges: Square.
13. Facing: Low emissivity composite foil.
14. Core: Rigid thermoset fibre-free phenolic insulant core.

160 Airbricks in external walling

1. Standard: To BS 493, Class 1.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Apertures: Square hole
4. Work sizes: To match existing
5. Material/ colour: To match adjoining masonry
6. Placement: Built in with no gaps at joints.

165 Gratings/ ventilators in internal walling

1. Standard: To BS 493, Class 2.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Apertures: Square hole
4. Work sizes: To match existing
5. Material/ colour: To match adjoining masonry
6. Other requirements: Include insect proof screen
7. Placement: Built in with no gaps at joints.

171 Ventilation ducts in external walling

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Placement: Across cavity, sloping away from inner leaf. Full mortar joints to seal cavity.
3. Protection from water penetration to inner leaf: Where barrier is not integral to duct, form stepped dpc cavity tray with stop ends above duct, extending 150 mm on each side.

175 Cavity ventilators

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material/ colour: Plastics/ to match adjoining masonry
3. Number and location: As per the Tender drawings

180 Cavity closers

1. Description: As per the Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Accessories: To include integral insulation

Reinforcing/ fixing accessories

214 Cavity wall ties

1. Description: GENERALLY
2. Standard: To BS EN 845-1.
   2.1. Type: 2 (Masonry general purpose)
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Material/ finish: Austenitic stainless steel - material/ coating reference 1
5. Sizes: 300 mm
6. End types: Asymmetrical deformed plate and flat plate for mortar bedding
7. Embedment length (minimum): 50 mm
8. Movement: Tolerant
9. Additional requirements: None

215 Cavity wall ties used with partial fill insulation

1. Description: FOR ALL CAVITY WALLS USING PARTIAL FILL INSULATION
2. Standard: To BS EN 845-1.
   2.1. Type: 2 (Masonry general purpose)
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Material/ finish: Austenitic stainless steel - material/ coating reference 1
5. Sizes: 300 mm
6. End types: Asymmetrical deformed plate and flat plate for mortar bedding
7. Embedment length (minimum): 50 mm
8. Movement: Tolerant
9. Additional requirements: None
10. Tie-mounted insulation retaining clips: As recommended by the manufacturer.

225 Fixing ties in masonry cavity walls

1. Embedment in mortar beds (minimum): 50 mm.

2. Placement: Sloping slightly downwards towards outer leaf, without bending. Drip centred in the cavity and pointing downwards.
3. Spacing: Staggered in alternate courses.
   3.1. Horizontal centres: 750 mm
   3.2. Vertical centres: 400 mm
4. Provision of additional ties: Within 225 mm of reveals of unbonded openings and at the vertical reveals of unsupported masonry.
   4.1. Spacing: At not more than 300 mm centres vertically

233 Fixing ties in masonry cavity walls with partial fill cavity insulation

1. Embedment in mortar beds (minimum): 50 mm.
2. Placement: Sloping slightly downwards towards outer leaf, without bending. Drip centred in the cavity and pointing downwards.
3. Spacing: Evenly space in non-staggered horizontal and vertical rows.
   3.1. Horizontal centres: 600 mm
   3.2. Vertical centres: 400 mm
4. Provision of additional ties: Within 225 mm of reveals of unbonded openings and at the vertical reveals of unsupported masonry.
   4.1. Spacing: At not more than 300 mm centres vertically

248 Channel/ slot ties used with partial fill insulation

1. Description: As per the Tender drawings
2. Standard: To BS EN 845-1
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Material/ finish: Austenitic stainless steel - material/ coating reference 1
5. Sizes: As per the Tender drawings
6. Channel/ slot fixing: Embedded
7. End types: Asymmetrical sliding tee slot end with deformed plate embedment end
8. Embedment length (minimum): 50 mm
9. Additional requirements: None
10. Tie-mounted insulation retaining clips: As recommended by the manufacturer.

265 Support system

1. Description: GENERALLY
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material: Austenitic stainless steel - material/ coating reference 1 to BS EN 845-1
4. Components, arrangement and dimensions: As shown on drawings.

270 Meshwork joint reinforcement

1. Description: GENERALLY
2. Standard: To BS EN 845-3
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice

4. Type: Expanded metal
5. Material: Austenitic stainless steel - material/ coating reference R1 to BS EN 845-3
6. Width: Approximately 40-50 mm less in width than wall or leaf.
7. Placement: Lay on an even bed of mortar in a continuous strip with full laps at angles. Keep back 20 mm from face of external work, 12 mm back from face of internal work and finish joint to normal thickness.
    7.1. Lap length (minimum): As per the Tender drawings

291 Special fixings

1. Description: GENERALLY
2. Type: Submit proposals.
3. Material/ finish: To PD 6697, clause 5.3.2.
4. Performance: Of type, size, strength and number necessary to resist loads likely to occur during the life of the building, and prevent lateral displacement or pulling apart of construction.
5. Placement: Fill pockets with bedding mortar finished flush where exposed to view.

Flexible damp-proof courses/ cavity trays

320 Polypropylene (PP) damp-proof courses and cavity trays

1. Standard: To BS EN 14909 and BS 6515
2. Manufacturer: Visqueen
    2.1. Contact details
        2.1.1. Address: Visqueen
        Heanor Gate Industrial Estate
        Derbyshire
        Heanor
        Derbyshire
        United Kingdom
        DE75 7RG
        2.1.2. Telephone: +44 (0) 333 202 6800
        2.1.3. Web: www.visqueen.com
        2.1.4. Email: enquiries@visqueen.com
    2.2. Product reference: Visqueen Polyethylene DPC
3. Material: Polyethylene.
4. Standard: To BS 6515.
5. Colour: Black.
6. Accessories: DPC Jointing Tape.
7. Length: 30 000 mm.
8. Width: 100-1200 mm.
9. Thickness: 0.7 mm.
10. Tensile strength MD: 15 N.
11. TensileStrength: 13 N.
12. Tensile elongation property: 500%.
13. Resistance to impact: 200 mm.
14. Reaction to fire: F class.
15. Application temperature: As per the manufactures recomendations

16. Resistance to static loading - 20kg load: 20 kg.
17. Water vapour permeability: 0.13 g/m²/d.

345 Site-formed flexible sheet cavity trays – plastics

1. Standard: To BS EN 14909 and BS 6515
2. Material: Polypropylene
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Additional requirements: none

380 Junction cloaks/ stop ends for preformed dpcs/ cavity trays

1. Manufacturer: Contractor's choice
   1.1. Product references and locations: Contractor's choice
2. Placement: To provide a free draining and watertight installation. Seal laps with dpcs and/ or cavity trays.

385 Junction cloaks/ stop ends for preformed dpcs/ cavity trays

1. Manufacturer: Contractor's choice
   1.1. Product references and locations: As per Tender drawings
2. Placement: Seal laps with dpcs and/ or cavity trays.

390 Junction cloaks/ stop ends for site-formed dpcs/ cavity tray

1. Three dimensional changes in shape: Form to provide a free draining and watertight installation. Seal laps.
2. Alternative use of preformed junction cloaks/ stop ends: Submit proposals.

Installation of dpcs/ cavity trays

415 Installation of horizontal dpcs

1. Placement: In continuous lengths on full even bed of fresh mortar, with 100 mm laps at joints and full laps at angles.
2. Width: At least full width of leaf unless otherwise specified. Edges of dpc not covered with mortar or projecting into cavity.
3. Overlying construction: Immediately cover with full even bed of mortar to receive next masonry course.
4. Overall finished joint thickness: As close to normal as practicable.

425 Installation of ground level dpcs

1. Joint with damp-proof membrane: Continuous and effectively sealed.

435 Installation of stepped dpcs in external walls

1. External walls on sloping ground: Install dpcs not less than 150 mm above adjoining finished ground level.

445 Installation of sill dpcs

1. Form and placement: In one piece and turned up at back when sill is in contact with inner leaf.

455 Installation of coping/ capping dpcs

1. Placement: Bed in one operation to ensure maximum bond between masonry units, mortar and dpc.
2. Dpcs crossing cavity: Provide rigid support to prevent sagging.

465 Sealing of dpcs

1. Description: As per the Tender drawings
2. Overlaps and junctions: Seal with Adhesive recommended by dpc manufacturer.

475 Installation of site-formed cavity trays

1. Requirements to prevent downward ingress of water
   1.1. Profiles: To match those shown on drawings. Firmly secured.
   1.2. Joint treatment: Use continuous length wherever possible, otherwise lap at least 100 mm and seal to produce a free draining and watertight installation.
   1.3. Horizontal cavity trays: Support using cavity closer.
   1.4. Sloping cavity trays: Prevent sagging.
   1.5. Cleanliness: Free from debris and mortar droppings.

485 Installation of cavity trays over openings and other cavity bridgings

1. Length: To extend not less than 150 mm beyond ends of lintels/ bridgings.

495 Installation of gas-resistant dpcs/ cavity trays

1. Joint treatment: Use continuous length wherever possible, otherwise lap at least 150 mm and seal to form a gas and watertight installation.
2. Joint with damp-proof membrane: Overlap dpc/ cavity tray not less than 150 mm.

515 Dpc/ cavity tray leading edge in facework - flush

1. Treatment at face of masonry: Finish flush and clear of mortar at the following locations: Generally.

525 Dpc/ cavity tray leading edge in facework – set back

1. Treatment at face of masonry: Set back 5 mm from face of wall with recessed mortar joint to expose edge at the following locations: Generally.

535 Dpc/ cavity tray leading edge in facework - projecting

1. Treatment at face of masonry: Projecting 5 mm from face of wall at the following locations: Generally.

560 Installation of vertical dpcs

1. Form: In one piece wherever possible.
   1.1. Joints: Upper part overlapping lower not less than 100 mm.

570 Installation of jamb dpcs at openings

1. Joint with cavity tray/ lintel at head: Full underlap.
2. Joint with sill/ horizontal dpc at base: Full overlap.
3. Projection into cavity: Not less than 25 mm.

4. Relationship with frame: In full contact.

580 Installation of jamb dpcs to built-in timber frames

1. Fixing: Securely fastened to back of frame.
    1.1. Fasteners: Galvanized clout nails or staples.

Joints

610 Movement joints with sealant

1. Description: As per the Specification of works
2. Joint preparation and sealant application: As section Z22.
3. Filler: Closed cell polyethylene foam
    3.1. Thickness: To match design width of joint.
    3.2. Manufacturer: Contractor's choice
        3.2.1. Product reference: Contractor's choice
    3.3. Placement: Build in as work proceeds with no projections into cavities and to correct depth to receive sealant system.
4. Sealant
    4.1. Designation: ISO 11600-F-20HM
    4.2. Manufacturer: Contractor's choice
        4.2.1. Product reference: Contractor's choice
    4.3. Colour: To match adjoing surfaces

615 Movement joints without sealant

1. Description: As per the Specification of works
2. Filler: Closed cell polyethylene foam
    2.1. Thickness: To match design width of joint.
    2.2. Manufacturer: Contractor's choice
        2.2.1. Product reference: Contractor's choice
    2.3. Placement: Build in as work proceeds filling the joint but without projecting into cavities.

630 Unexposed contraction joints

1. Formation: Close butt as work proceeds.

650 Pointing in flashings

1. Joint preparation: Free of debris and lightly wetted.
2. Pointing mortar: As for adjacent walling.
3. Placement: Fill joint and finish flush.

655 Pointing in asphalt skirtings

1. Joint preparation: Free of debris and lightly wetted.
2. Pointing mortar: 1:4 cement: sand incorporating a bonding agent.
    2.1. Colour: Match adjacent work.
3. Placement: Fill joint and finish flush.

660 Pinning up to soffits

1. Top joint of loadbearing walls: Fill and consolidate with mortar.

670 Head of non-loadbearing walls

1. Restraints: 50 x 50 mm continuous softwood battens fixed at 600 mm centres with 14 gauge screws
    1.1. Fixing: Secure to soffit.
2. Joint filler: As per the schedule of works

Proprietary sills/ lintels/ copings/ dressings

720 Sills

1. Standard: To BS 5642-1.
2. Material: Precast concrete
3. Manufacturer: Contractor's choice
    3.1. Product reference: Contractor's choice
4. Dimensions: As shown on drawings Tender drawings pack.
5. Finish: Smooth
6. Mortar for bedding/ jointing: Cement-gauged as section Z21.
    6.1. Standard: To BS EN 998-2
    6.2. Mix: As per the Tender drawings
    6.3. Additional requirements: None
7. Joints: Flush.
8. Bedding one-piece sills: Leave bed joints open except under end bearings and masonry mullions. On completion, point to match adjacent work.

755 Prefabricated steel lintels

1. Standard: To BS EN 845-2.
2. Manufacturer: As per the Tender Drawings
    2.1. Product reference: As per the Tender Drawings
3. Types: As per the Schedule of Works
4. Material/ finish: As per the Schedule of Works
5. Sizes: As per Window schedule
6. Additional requirements: As per Window schedule
7. Placement: Bed on mortar used for adjacent work.
    7.1. Bearing length (minimum): 100 mm

Miscellaneous items

820 Tile creasing

1. Tiles: Plain clay to BS EN 1304.
    1.1. Manufacturer: Contractor's choice
        1.1.1. Product reference: Contractor's choice
    1.2. Size: As shown on drawings
2. Placement: Two courses, broken jointed, on full bed of mortar as used for adjacent work.

3. Joints: Full and finished flush.

830 Building in frames

1. Preparation: Remove horns and provide support.
2. Fixing cramps: Fully bed in mortar.

840 Openings for frames

1. Formation: Use accurate, rigid templates to required size.

850 Wall plates

1. Placement: On full bed of mortar to correct horizontal level.

940 Chimney pots

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Coping: To match existing
3. Placement: Bed solid in mortar specified for chimney stack.

970 Refuse chutes and accessories

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. General: Build in to provide a smooth and even interior surface free from voids and restrictions. Fill void between chute and surrounding work with concrete.

Ω End of Section

F31
Precast concrete sills/ lintels/ copings/ features

Types of component

105 Precast

1. Description: As per the schedule of works
2. Concrete: Components manufacturer's 'proprietary' concrete.
   2.1. Identity: Manufacturer's mix reference
3. Conformity: To BS 8500-2 and the recommendations of
   3.1. BS 8500-1, Annex A.4 for the specified exposure class.
   3.2. Evidence: Submit third-party certification from a UKAS-accredited laboratory.
4. Exposure Class: XC4 and XF3
5. Reinforced components: Submit proposals for type of reinforcement and cover.
6. Matching sample for finish to visible faces: As existing
7. Other requirements: None

125 Substitution of proprietary concrete for designated concrete

1. Concrete: Component manufacturer's 'proprietary' concrete.
2. Substitution: Submit proposals for each substitution, including:
   2.1. Identity of concrete: Manufacturer's mix reference
   2.2. Performance: Limiting values for w/c ratio, cement/ combination content or, alternatively
      2.2.1.the exposure class to BS 8500, to which concrete conforms.
   2.3. Reinforcement: Type and cover.
   2.4. Evidence of performance: Third-party certification by body
      2.4.1.from a UKAS-accredited laboratory.

130 Concealed precast lintels

1. Standard: To BS EN 845-2.
   1.1. Verification of performance: Submit calculations or test certificates.

150 Concealed precast

1. Description: PADSTONES
2. Concrete: Designated to BS 8500-2: Minimum RC30.
   2.1. Aggregate size (maximum): 20 mm.
3. Other requirements: None

General requirements

210 Moulds

1. Permissible fabrication and operating tolerances: Length 0 to +6 mm, other dimensions ±3 mm.

220 Concrete generally

1. Specification: To BS 8500-2 and BS EN 206.

2. Producer: Accredited to BS 8500-2 requirements where product conformity certification is required.

250 Reinforcement

1. Carbon steel reinforcement: As appropriate to BS 4449, BS 4482 and BS 4483.
    1.1. Cutting and bending: To BS 8666.
2. Galvanized reinforcement: Galvanized to BS EN ISO 1461 after cutting. Chromate treated.
3. Stainless steel reinforcement: To BS 6744.
    3.1. Designation 1.4301.
    3.2. Cutting and bending: To BS 8666.
4. Non-structural reinforcement: Include to resist shrinkage and handling stresses.
5. Bimetallic corrosion and staining: Prevent by appropriate selection and use of materials.
6. Condition at time of placement: Clean, free of corrosive pitting, loose materials and substances that adversely affect reinforcement, concrete, or bond between the two.
7. Fixing: Accurate and secure.
    7.1. Method: Wire tying, approved steel clips or tack welding if permitted.
    7.2. Concrete cover: Maintain free of all tying wire or clips.

255 Quality assurance of reinforcement

1. Reinforcement to BS 4449, BS 4483 and BS 6744: Obtain valid
2. certificates of approval for product conformity issued by the
3. UK Certification Authority for Reinforcing Steels.

260 Casting and curing

1. Placing of concrete: Thoroughly compact.
2. Protection against drying out: Methods and duration to BS EN 13369.
3. Immature components: Avoid movement, vibration, overloading, physical shock, rapid cooling and thermal shock.
4. Delivery to site: Minimum 14 days after casting.

261 Cutting

1. Cutting of precast concrete components: Not permitted.

262 Records

1. Records for each type of component: Maintain details including:
    1.1. Unique identification number.
    1.2. Identification of the producer.
    1.3. Identification of the place of production.
    1.4. Correlation with records of mixes, including batch numbers.
    1.5. Date of each stage of manufacture.
    1.6. Dates and results of all tests, checks and inspections, including certification where relevant.
    1.7. Dimensions related to specified levels of accuracy.
    1.8. Specific location in the finished work.
    1.9. Weight of the unit.
    1.10. Damage and making good.

1.11. Any other pertinent data, e.g. if unit is a production control unit.

2. Availability of records for inspection: On request.

Fair-faced components

310 Control samples

1. Required samples: After finalization of design, one each of the following components:
2. Coping unit.
3. Approval of appearance: Obtain before manufacture of remaining units.
4. Identification and storage location: Clearly label and retain at factory for comparison with production units.

320 Details of samples

1. Submittals after approval of appearance and before manufacture of production units
   1.1. Aggregates: Confirm type, maximum size, grading and source.
2. Conformity of designed concrete: Evidence of compliance for compressive strength class and limiting values of composition.

330 Mixes for visible faced components

1. Constituent materials and mix design for each finish type: To remain constant.
2. Colour and appearance of each finish type: To remain constant.
3. Aggregates: To BS EN 12620.
   3.1. Origin: Single source for each finish type, having sufficient quantity for whole contract.

341 Conditions for separate facing and backing mixes

1. Difference in cement content: Not greater than 80 kg/m³.
2. Thickness of facing mix: 10 mm greater than maximum aggregate size, minimum 25 mm.
3. Location of reinforcement: Minimum 20 mm away from the interface between mixes.
4. Compaction of facing and backing mix: Carry out to create monolithic construction.

350 Quality of finishes

1. Appearance standard: As established by samples.

365 Cover on exposed aggregate faces

1. Nominal cover: Exclusive of aggregate projection.

370 Cover on visible faces

1. Spacers: Not permitted.
2. Proposed method statement: Submit.

380 Consistency of production methods

1. Production methods: To remain consistent for each matching type of finish.
2. Finish appearance: To remain within the range of variation indicated by the samples
   2.1. submitted.
3. Changes to production methods: If variations are proposed for components of the same finish, submit evidence that there will be no difference in appearance.

390 Inspection

1. Completed components: Give notice when ready to be inspected at factory.

Installation

420 Laying

1. Mortar for bedding and jointing: As section Z21.
   1.1. Type: Site-batched and mixed
   1.2. Mix: As used for adjacent work
   1.3. Packing: If required use slate.
2. Bedding components: On full bed of mortar.
3. Removal of marks, stains and extraneous mortar on visible faces: Rubbing not permitted.

430 Support of existing work over new lintels

1. Joint above lintels: Fully fill and compact with semidry mortar.

440 One-piece sills/ thresholds

1. Bed joints: Leave clear of mortar except at end bearings and beneath masonry mullions.
   1.1. On completion: Point with mortar to match adjacent work.

Ω End of Section

G10
Structural steel framing

General requirements/ information

110 Contractor's design of joints

1. Description: The contractors retains deisgn responsability for connection designs
2. Design concept: To be agreed with John Plummer Partnership
3. Design responsibility: Design connections and detail steelwork and connections.
   3.1. Other responsibilities: As per the Structural Engineering Calculations and Details
4. Structural requirements
   4.1. Generally: As section B50.
      4.1.1. Modifications: None
   4.2. Design: Complete in accordance with the designated code of practice to satisfy specified performance criteria.
   4.3. Connections: As a minimum, steelwork connections, except where otherwise shown on the drawings, shall
   comprise not less than 2 no M16 dia. gr. 8.8 bolts for members up to 25 kg/m and 4 no M16 dia.
   gr. 8.8 bolts for all other members
   4.4. Fixings to foundations and walls: As per Structural Engineering Calculations and Details report
   4.5. Additional requirements: None
5. Design and production information: As Preliminaries section A31

111 Contractor's design of members and joints

1. Description: The contractors retains deisgn responsability for connection designs
2. Design concept: To be agreed with John Plummer Partnership
3. Design responsibility: Design and detail members and joints to suit the conceptual layout detailed in the contract drawings.
   3.1. Other responsibilities: As per the Structural Engineering Calculations and Details
4. Structural requirements
   4.1. Generally: As section B50.
      4.1.1. Modifications: None
   4.2. Design: Complete in accordance with the designated code of practice to satisfy specified performance criteria.
   4.3. Connections: As a minimum, steelwork connections, except where otherwise shown on the drawings, shall
   comprise not less than 2 no M16 dia. gr. 8.8 bolts for members up to 25 kg/m and 4 no M16 dia.
   gr. 8.8 bolts for all other members
   4.4. Fixings to foundations and walls: As per Structural Engineering Calculations and Details report
   4.5. Additional requirements: None
5. Design and production information: As Preliminaries section A31

112 Contractor's design

1. Description: The contractors retains deisgn responsability for connection designs
2. Design concept: To be agreed with John Plummer Partnership
3. Design responsibility: Design and detail members and joints to suit the conceptual layout detailed in the contract drawings.
   3.1. Other responsibilities: As per the Structural Engineering Calculations and Details
4. Structural requirements
   4.1. Generally: As section B50.
      4.1.1. Modifications: None
   4.2. Design: Complete in accordance with the designated code of practice to satisfy specified performance criteria.
   4.3. Connections: As a minimum, steelwork connections, except where otherwise shown on the drawings, shall
   comprise not less than 2 no M16 dia. gr. 8.8 bolts for members up to 25 kg/m and 4 no M16 dia.
   gr. 8.8 bolts for all other members
   4.4. Fixings to foundations and walls: As per Structural Engineering Calculations and Details report
   4.5. Limitations on steelwork layout: The building is designated Class 2A with respect to the requirements to prevent
   disproportionate collapse. No additional measures to normal construction detailing and design are likely to be necessary.
   4.6. Additional requirements: None
5. Design and production information: As Preliminaries section A31

115 Design constraints – general

1. Members forming bracing systems or girders of lattice construction: Unless detailed or instructed otherwise, position so that their lines of action intersect at a point.
2. Bolts
   2.1. Diameter (minimum): 20 mm
   2.2. Number per connection (minimum): Two, unless otherwise indicated.
   2.3. Other requirements: As a minimum, steelwork connections, except where otherwise shown on the drawings, shall
   comprise not less than 2 no M16 dia. gr. 8.8 bolts for members up to 25 kg/m and 4 no M16 dia.
   gr. 8.8 bolts for all other members.
3. Punching of bolt holes: Permitted where detailed on drawings
4. Welds: Permitted where detailed on drawings
5. Other constraints: None

116 Design constraints – steelwork to be galvanized

1. Steel grades: Do not use steel downgraded from a higher specification.
2. Detail design: Avoid details that will increase the risk of initiating liquid metal assisted cracking (LMAC).
   2.1. Particular restrictions: None
3. Other requirements: None

120 Drawings and calculations

1. Information required: As per Structural Engineering Calculations and details report
2. Requirement: Before preparing detailed fabrication drawings, submit:
   2.1. General arrangement drawings with individual steel members clearly identified.
   2.2. Calculations for major connections.

123 Drawings and calculations prepared by Contractor

1. Information required: Full specification and drawings for any works falling under Contractors Design.
2. General arrangement drawings: Submit before preparing calculations. Clearly identify:
   2.1. Individual steel members.
   2.2. Conflicts with other work.
   2.3. Proposed changes to contract drawings.
3. Member and joint calculations: Submit before preparing fabrication drawings.

125 Specification standard

1. Standard: Comply with latest edition of National Structural Steelwork Specification (NSSS).
   1.1. Additional requirements: All materials, fabrication, workmanship, and erection of steelwork shall be in accordance with the
   current version of The National Steelwork Specification for Building Construction (CE Marking) as
   published by the British Constructional Steelwork Association
   1.2. Document availability: For the duration of the work, at fabrication shop and on site.
2. References to Engineer in NSSS: For the purpose of this contract, interpret such references as being to the person named in section A10 as Consulting Structural Engineer.
   2.1. Exceptions: None

130 General steel sections and plates

1. Description: All structural steelworks
2. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
3. Standard: To BS EN 10025-2
4. Grade: All structural steelworks shall be of minimum grade S355J0. Steel plate shall be grade S275JR.
   4.1. Options: As per Structural Engineering Calculations and Details report
5. Source: Obtain steel from a source accredited to a national or internationally accepted quality standard.
6. Other requirements: Provide product analysis for steel that is to be galvanized

Frame systems

150 Steel framing system

1. Manufacturer: Submit proposals
   1.1. System reference: Submit proposals
2. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)

3. Other requirements: As required and in accordance with the Structural Engineering Calculations and Details report

160 Space grid system

1. Manufacturer: Submit proposals
   1.1. System reference: Submit proposals
2. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
3. Other requirements: As required and in accordance with the Structural Engineering Calculations and Details report

Cold-formed materials

170 Cold-formed galvanized steel

1. Description: All structural steelworks
2. Manufacturer: Submit proposals
   2.1. Product reference: Submit proposals
3. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
4. Material: Galvanized steel sheet to BS EN 10346.
   4.1. Thickness: As required and in accordance with the Structural Engineering Calculations and Details report
   4.2. Designation: As shown on drawings

178 Fixing profiled sheet to steelwork

1. End supports
   1.1. Length of sheet bearing onto support (minimum): 50 mm
   1.2. Fasteners: As required and in accordance with the Structural Engineering Calculations and Details report
      1.2.1. Coating applied by manufacturer: Submit proposals
      1.2.2. Location: In trough of sheet.
   1.3. Number/ centres of fixings: Every trough at end of sheet; alternate troughs at internal supports
      1.3.1. Distance from end of sheet (minimum): 20 mm
      1.3.2. Distance from edge of support (minimum): 20 mm
2. Side supports
   2.1. Width of sheet bearing onto support (minimum): 50 mm
   2.2. Fasteners: Shot fired pins
      2.2.1. Coating applied by manufacturer: Galvanized
   2.3. Centres of fixings (maximum): 300
      2.3.1. Distance from edge of sheet (minimum): 20 mm
      2.3.2. Distance from edge of support (minimum): 20 mm
3. Other requirements: Install temporary supports before fixing sheets to permanent supports

Fabrication

180 Notification of commencement

1. Notice: Give notice before fabrication is due to start.
   1.1. Period of notice (minimum): Five working days

190 Marking

1. Identifying and recording materials and components: Submit details of proposed methods.
2. Location of marks
   2.1. Generally: Visible for checking after erection.
   2.2. Weathering steel: On surfaces not exposed to open view in the completed work.
3. Steel to be blast cleaned, pickled, metal sprayed or galvanized: Marked so that subsequent treatment cannot obliterate the marking.

195 Hard stamping

1. Usage: Not permitted except as indicated on drawings.

200 Faying surfaces for preloaded joints

1. Location: As required and in accordance with the Structural Engineering Calculations and Details report
2. Steel 25 mm thick or over: Check faying surfaces for deformities that may reduce slip factor to below design limit.
   2.1. Remedial measures: Submit proposals.
3. Preparation/ treatment: As required and in accordance with the Structural Engineering Calculations and Details report

210 End connections

1. Angle web cleats: Project 10 mm beyond ends of simply supported members.

215 Hollow sections

1. Insides of sections: Debris and moisture removed before sealing ends and openings.

220 Access/ Ventilation holes in base plates

1. Base plates larger than 1 m²: Make 25 mm diameter holes as necessary for pressure grouting, escape of entrapped air or direct compaction of filling/ bedding material.

225 Steelwork to be galvanized

1. Cutting, drilling and shop welding: Complete before galvanizing.
2. Vent and drain holes: Provide as necessary.
   2.1. Locations: Submit proposals.
   2.2. Sealing: Required, submite proposals

Welding

250 Welding procedures

1. Quality management systems: Welding of Stainless Steel is to comply with BS EN 1011, BS EN 1600, BS EN 12072, BS EN
   12073, BS EN ISO 17633 and is to generally follow industry good practice
2. Certification of welders: Submit
   - 2.1. Third party certification: Welding of Stainless Steel is to comply with BS EN 1011, BS EN 1600, BS EN 12072, BS EN
     12073, BS EN ISO 17633 and is to generally follow industry good practice
   - 2.2. Verification of welding procedures: Submit.
   - 2.3. Welding procedure qualification records: Welding of Stainless Steel is to comply with BS EN 1011, BS EN 1600, BS EN 12072, BS EN
     12073, BS EN ISO 17633 and is to generally follow industry good practice

255 Site welding

1. Usage: Permitted only where indicated on drawings.
2. Working conditions: Suitable and safe. Do not weld when surfaces are wet or when ambient temperature is below 0°C.

270 Additional welds

1. Welds (including tack welds) not indicated on drawings: Not permitted without approval.

280 Shear connectors

1. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
2. Connector type: Hoop and bar connectors as PD 6696-2, Figure 1
   - 2.1. Size/ spacing: As required and in accordance with the Structural Engineering Calculations and Details report
3. Welding method: As required and in accordance with the Structural Engineering Calculations and Details report
4. Procedure trials: Required
5. Other requirements: Do not arc weld studs through more than one layer of decking

285 Proprietary shear connectors

1. Manufacturer: Submit proposals
   - 1.1. Product reference: Submit proposals
   - 1.2. Coating applied by manufacturer: Galvanized
2. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
3. Spacing: As required and in accordance with the Structural Engineering Calculations and Details report
4. Method of fixing: Shot fired pins

Bolt assemblies

302 Non-preloaded bolt assemblies

1. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
2. Designation: As a minimum, steelwork connections, except where otherwise shown on the drawings, shall
   comprise not less than 2 no M16 dia. gr. 8.8 bolts for members up to 25 kg/m and 4 no M16 dia. gr. 8.8 bolts for all other members.
   2.1. Threading: To suit design criteria
3. Nuts and washers: To suit property class of bolt, as NSSS, clause 2.4.4.
4. Coating applied by manufacturer: Submit proposals
5. Other requirements: As required and in accordance with the Structural Engineering Calculations and Details report

303 Preloaded bolt assemblies

1. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
2. Designation: As required and in accordance with the Structural Engineering Calculations and Details report
3. Nuts and washers: To suit property class of bolt, as NSSS, clause 2.4.5.
4. Coating applied by manufacturer: Submit proposals

304 Proprietary bolt assemblies

1. Manufacturer: Submit proposals
   1.1. Product reference: Submit proposals
2. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)

305 Proprietary anchors

1. Description: As required and in accordance with the Structural Engineering Calculations and Details report
2. Manufacturer: Submit proposals
   2.1. Product reference: Submit proposals
3. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
4. Anchor type: As required and in accordance with the Structural Engineering Calculations and Details report
5. Material: Stainless steel

310 Anchorages to concrete

1. Design standard: As the designated code of practice.
2. Anchor type: As required and in accordance with the Structural Engineering Calculations and Details report
3. Material: Stainless steel
   3.1. Coating applied by manufacturer: Submit proposals
4. Concrete

4.1. Grade: As required and in accordance with the Structural Engineering Calculations and Details report

4.2. Condition: Cracked

5. Characteristic resistances of single anchor remote from edge of concrete (minimum)

5.1. Tension: As per the Structural Engineering Calculations and Details report

5.2. Shear: As the Structural Engineering Calculations and Details report

6. Fixing in concrete: As required and in accordance with the Structural Engineering Calculations and Details report

325 Direct tension indicators

1. Standard: To BS EN 14399-9.
2. Manufacturer: Submit proposals

2.1. Product reference: Submit proposals

3. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
4. Grade: Appropriate for grade of bolt and nut assembly.
5. Finish: Mechanically galvanized
6. Ancillary components: Washers to BS EN 14399-9.
7. Post installation and inspection treatment: Where no further protective coating is specified, apply a butyl rubber sealing compound to seal measuring gap around indicators.

335 Spring washers

1. Standard: To BS 4464.

370 Galvanized coating to bolt assemblies

1. Standard: To BS 7371-6.
2. Galvanizing: Applied by fastener manufacturer. Passivated and lubricated if no additional coatings are specified. Nuts tapped after galvanizing.
3. Use/location: As required and in accordance with the Structural Engineering Calculations and Details report

Erection

405 Outline method of erection

1. Documentation: Provide Erection method statement in accordance with NSSS

410 Pre-erection checks

1. Scope: At least 7 days before proposed erection start date, check the following:

1.1. Foundations and other structures to which steelwork will be attached: Accuracy of setting out.

1.2. Holding down bolts: Position, protruding length, slackness and condition.

2. Inaccuracies and defects: Report without delay.
3. Permission to commence erection: Obtain.

420 Setting out

1. Permissible deviations: In addition to the requirements of the NSSS, add permissible deviations for different types of dimension and locations, as necessary.

425 Modifications

1. Steelwork: Do not modify without approval.
2. Temporary fabrication/ erection attachments: Remove

432 Temporary support

1. Permanent bracing system
   1.1. Vertical: Contractors choice
   1.2. Horizontal: Contractors choice
2. Temporary bracing/ restraints: Provide as necessary until permanent bracing system is complete and sufficiently mature to carry loads and all connections have been made to the permanent system.
3. Elements to be supported: Columns, Frames
4. Bracing/ Restraints: Provide as necessary until permanent connection can be made to floor.
5. Forces and moments in temporary supports: Structural Engineering Calculations and Details report

440 Column bases

1. Levels: Adjust using steel shims or folding wedges no larger than necessary.
2. Location of shims/ wedges: Position symmetrically around perimeter of base plate. Do not use a single central pack.
3. Give notice: If space beneath any column base is outside specified limits for bedding thickness.
4. Accuracy of erection: Check, and correct errors before filling and bedding beneath bases and carrying out other adjacent work.

441 Mortar filling/ bedding of column bases

1. Mortar
   1.1. Cement: Portland cement BS EN 197-1 - CEM I 42.5 or 52.5.
      1.1.1. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)
   1.2. Fine aggregate: To BS EN 12620, grade 0/4 or 0/2 (MP).
   1.3. Additives: As required and in accordance with the Structural Engineering Calculations and Details report
2. Bedding thickness range: 10mm - 25mm
3. Bolt pockets: Completely filled with neat cement slurry.
4. Spaces beneath base plates: Completely filled as follows:
   4.1. Spaces 0-25 mm deep: Neat Portland cement, CEM 1.
   4.2. Spaces 25-50 mm deep: 1:1 cement:fine aggregate mortar, just fluid enough to pour. Tamped well as filling proceeds.
   4.3. Spaces 50 mm and above: 1:2 cement:fine aggregate mortar, just damp, tamped well against properly fixed supports as filling proceeds.

442 Fine concrete filling/ bedding of column bases

1. Fine concrete filling
   1.1. Cement: Portland cement BS EN 197-1 - CEM I 42.5 or 52.5.
      1.1.1. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP)

1.2. Fine aggregate: To BS EN 12620, grade 0/4 or 0/2 (MP).
1.3. Coarse aggregate size (maximum): 10 mm.
1.4. Additives: As required and in accordance with the Structural Engineering Calculations and Details report

2. Bolt pockets: Completely filled with neat cement slurry.
3. Spaces beneath base plates: 50 mm and above, completely filled with a 1:1.25:2 cement:fine aggregate:coarse aggregate mix, tamped well against properly fixed supports as filling proceeds.

443 Proprietary filling/ bedding of column bases

1. Bedding thickness range: 10mm
2. Preparation: Concrete surfaces scarified to provide a good mechanical key.

445 Movement joints

1. Joint type: As required and in accordance with the Structural Engineering Calculations and Details report
   1.1. Requirements: Anchor bolts
2. Appearance and fit: Bolts centred in slotted holes unless otherwise indicated. Joints free to move.

447 Bonded anchors

1. Holes: Clean and free from dust at time of installing anchor.
2. Permeable sleeves: Use in conditions where otherwise the loss of bonding agent would be unacceptably high.
3. Other requirements: None

Testing

465 Testing

1. Testing: Arrange the following tests. Prepare test pieces as necessary.
2. Test: All structural steelwork
   2.1. Testing authority: UKAS Accredited Laboratory
   2.2. Frequency/ Number: To be agreed
   2.3. Level of acceptability: To be agreed
   2.4. Other requirements: None
3. Test and examination results: Submit 2 copies immediately they are available.

467 Exceptions to NSSS requirements for weld testing

1. Weld location: All welded joints
   1.1. Requirements: Final acceptance of welds to BS EN 1090-2, Section 12.4

470 Site testing of anchors to masonry

1. Standard: To BS 5080.
2. Preliminary tests: 5 No. tests for tensile loading to failure in locations that will be hidden in completed structure.
3. Proof tests: Test 10% of working fixings to 1.5 times the working load.
4. Test results: Report failures and seek instructions.

475 Products

1. Steel: Submit test certificates.

Protective coatings

523 Compatibility of shop primer with site appliedintumescent coating

1. Intumescent coating: M61/ Leighs.
2. Primer: Compatible with coating under general and fire conditions.
3. Manufacturer's recommendations and test evidence: Submit proposals

535 Inspection of coating work

1. Work in progress: Permit coating manufacturer to inspect and take samples of products.
2. Notice: Give notice of dates for:
   2.1. Start of surface preparation and coating.
   2.2. Coated members or components leaving the works.
   2.3. Period of notice (minimum): 5 working days.

550 Post-galvanizing inspection

1. Inspector: Submit, on request, evidence of training and competence in visual inspection for liquid metal assisted cracking.
2. Components for which visual inspection is not required (procedure PGI-0): Not applicable
3. Components requiring additional inspection
   3.1. Procedure PGI-2A: As required and in accordance with the Structural Engineering Calculations and Details report
   3.2. Procedure PGI-2B: As required and in accordance with the Structural Engineering Calculations and Details report
4. Timing: Before erection of steelwork or application of other coatings.
5. Action in event of non-compliance
   5.1. Submit: Full records of all post-galvanizing inspections, drawing attention to any erected components that are required to be quarantined.
   5.2. Procedure PGI-3: Carry out on all quarantined components, and submit report.
   5.3. Sites of suspected defects: Remove zinc coating by grinding back to bright metal for a distance of not less than 50 mm around each defect and from a similar area on opposite face of member and inspect.
   5.4. Remedial actions: Submit proposals.

Protective coating systems

610 Galvanizing to chemically cleaned steel

1. Use/ location: As required and in accordance with the Structural Engineering Calculations and Details report
2. Preparation: Chemical cleaning.
3. Galvanizing: To BS EN ISO 1461.
   3.1. Minimum mean coating thickness: 85 micrometres.

620 Galvanizing to blast cleaned steel

1. Use/ location: As required and in accordance with the Structural Engineering Calculations and Details report
2. Preparation: Blast cleaning to BS EN ISO 8501-1, preparation grade Sa2½ using chilled angular iron grit grade G24 to give a coarse surface profile, followed by chemical cleaning.
3. Galvanizing: To BS EN ISO 1461.
   3.1. Minimum mean coating thickness: 140 micrometres.

633 Thermally sprayed zinc coating

1. Use/ location: All FUNCTIONAL structural steelwork, and, except where specified as galvanized or stainless,
   shall be painted with a suitable good quality high build epoxy zinc phosphate primer (Leighs Paints Epigrip C400V3 Zinc Phosphate Primer/Buildcoat, or similar) to provide the following (not less than) dry film thicknesses (units microns):
2. Zinc coating: To BS EN ISO 2063-1.
   2.1. Minimum local coating thickness: □ Internal, dry environments 75 µm
   □ Internal, damp environments e.g., in cavity walls 125 µm
   □ Internal, wet environments 250 µm
   □ External, rural environments 250 µm
   □ External, light industrial environments 275 µm
   □ External, high industrial or coastal environments 325 µm
3. Sealer: As required.

633 Thermally sprayed zinc coating Type A

1. Use/ location: All DECORATIVE structural steelwork, and, except where specified as galvanized or stainless,
   shall be painted with a suitable good quality high build epoxy zinc phosphate primer (Leighs Paints Epigrip C400V3 Zinc Phosphate Primer/Buildcoat, or similar) and finished with a compatible decorative coat (Leighs Paints Resistex C137V2 Special Finish, or similar) to provide the following (not less than) dry film thicknesses (units microns):
2. Zinc coating: To BS EN ISO 2063-1.
   2.1. Minimum local coating thickness: □ Internal, damp environments e.g., in cavity walls 100 µm Primer/50 µm Finish
   □ Internal, wet environments 200 µm Primer/50 µm Finish
   □ External, rural environments 200 µm Primer/50 µm Finish
   □ External, light industrial environments 200 µm Primer/75 µm Finish
   □ External, high industrial or coastal environments 250 µm Primer/75 µm Finish
3. Sealer: As required

638 Shop priming

1. Description: As required and in accordance with the Structural Engineering Calculations and Details report
2. Use/ location: As required and in accordance with the Structural Engineering Calculations and Details report
3. Shop preparation
   3.1. Generally: Blast cleaning to BS EN ISO 8501-1, preparation grade As required and in accordance with the Structural Engineering Calculations and Details report.
   3.2. Welds/ edges/ areas with surface imperfections: To BS EN ISO 8501-3, preparation grade As required and in accordance with the Structural Engineering Calculations and Details report.

4. Primer: Two pack epoxy
   4.1. Manufacturer: As required and in accordance with the Structural Engineering Calculations and Details report
      4.1.1. Product reference: As required and in accordance with the Structural Engineering Calculations and Details report
   4.2. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
5. Special requirements: As required and in accordance with the Structural Engineering Calculations and Details report

640 Shop painting

1. Description: As required and in accordance with the Structural Engineering Calculations and Details report
2. Use/ location: As required and in accordance with the Structural Engineering Calculations and Details report
3. Paint manufacturer: As required and in accordance with the Structural Engineering Calculations and Details report
4. Shop preparation
   4.1. Generally: Blast cleaning to BS EN ISO 8501-1, preparation grade As required and in accordance with the Structural Engineering Calculations and Details report.
   4.2. Welds/ edges/ areas with surface imperfections: To BS EN ISO 8501-3, preparation grade As required and in accordance with the Structural Engineering Calculations and Details report.
5. Shop primer: As required and in accordance with the Structural Engineering Calculations and Details report
   5.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
6. Shop intermediate coat: As required and in accordance with the Structural Engineering Calculations and Details report
   6.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
7. Shop top coat: As required and in accordance with the Structural Engineering Calculations and Details report
   7.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
   7.2. Colour: As required and in accordance with the Structural Engineering Calculations and Details report
8. Special requirements: As required and in accordance with the Structural Engineering Calculations and Details report

643 Protective painting

1. Description: As required and in accordance with the Structural Engineering Calculations and Details report
2. Use/ location: As required and in accordance with the Structural Engineering Calculations and Details report
3. Paint manufacturer: As required and in accordance with the Structural Engineering Calculations and Details report
4. Shop preparation
   4.1. Generally: Blast cleaning to BS EN ISO 8501-1, preparation grade Sa 2½.

4.2. Welds/ edges/ areas with surface imperfections: BS EN ISO 8501-3, preparation grade As required and in accordance with the Structural Engineering Calculations and Details report.

5. Corrosion protection
   5.1. Standard: To BS EN ISO 12944-1.
   5.2. Corrosivity category: As required and in accordance with the Structural Engineering Calculations and Details report
   5.3. Durability range: As required and in accordance with the Structural Engineering Calculations and Details report
6. System Number: As required and in accordance with the Structural Engineering Calculations and Details report
7. Other requirements: As required and in accordance with the Structural Engineering Calculations and Details report

650 Site painting

1. Description: As required and in accordance with the Structural Engineering Calculations and Details report
2. Use/ location: As required and in accordance with the Structural Engineering Calculations and Details report
3. Paint manufacturer: As required and in accordance with the Structural Engineering Calculations and Details report
4. Site preparation: Manual.
5. Site primer: As required and in accordance with the Structural Engineering Calculations and Details report
   5.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
6. Site intermediate coat: As required and in accordance with the Structural Engineering Calculations and Details report
   6.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
7. Site top coat: As required and in accordance with the Structural Engineering Calculations and Details report
   7.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
   7.2. Colour: As required and in accordance with the Structural Engineering Calculations and Details report
8. Special requirements: Stripe intermediate coat to external angles

660 Shop plus site painting

1. Description: As required and in accordance with the Structural Engineering Calculations and Details report
2. Use/ location: As required and in accordance with the Structural Engineering Calculations and Details report
3. Paint manufacturer: As required and in accordance with the Structural Engineering Calculations and Details report
4. Shop preparation
   4.1. Generally: Blast clean to BS EN ISO 8501-1, preparation grade As required and in accordance with the Structural Engineering Calculations and Details report.

4.2. Welds/ edges/ areas with surface imperfections: To BS EN ISO 8501-3, preparation grade As required and in accordance with the Structural Engineering Calculations and Details report.

5. Shop primer: As required and in accordance with the Structural Engineering Calculations and Details report
   5.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
6. Shop intermediate coat: As required and in accordance with the Structural Engineering Calculations and Details report
   6.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
7. Shop top coat: As required and in accordance with the Structural Engineering Calculations and Details report
   7.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
8. Site intermediate coat: As required and in accordance with the Structural Engineering Calculations and Details report
   8.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
9. Site top coat: As required and in accordance with the Structural Engineering Calculations and Details report
   9.1. Dry film thickness: As required and in accordance with the Structural Engineering Calculations and Details report
   9.2. Colour: As required and in accordance with the Structural Engineering Calculations and Details report
10. Special requirements: As required and in accordance with the Structural Engineering Calculations and Details report

Preparation for painting

710 Offsite preparation and painting

1. Working area: Covered and properly lit, heated and ventilated.
2. Sequence of working: Select from the following and submit proposals:
   2.1. Fabricate, blast clean, prime.
   2.2. Blast clean, fabricate, remove flash rust with a light overall sweep blast, prime.
   2.3. Blast clean, apply weldable prefabrication primer, fabricate, prime.
3. Prefabrication primer (option 3): Type recommended by manufacturer of post fabrication primer.
   3.1. Thickness of post fabrication primer coat: May be reduced if and as recommended by manufacturer.
4. Surfaces inaccessible after assembly: Apply full treatment and coating system including, if necessary, local application of site coatings.

725 Manual cleaning of new steelwork

1. Preparation: Remove fins, burrs, sharp edges, weld spatter, loose rust and loose scale.
2. Surface finish: Clean but unpolished to BS EN ISO 8501-1, grade St 2.
3. Finishing: Thoroughly degrease and clean down. Remove any consequent rusting back to grade St 2. Prime without delay.

730 Preparation for site welding of shop painted steelwork

1. Method: Select from the following:
   1.1. Mask weld areas immediately after blast cleaning and before coating steelwork. If paint system comprises more than one coat, step each coat 30 mm back from edge of preceding coat and away from masked areas. Remove masking immediately before welding.
   1.2. Prepare and paint steelwork including weld areas. Grind off to bare steel around each weld area immediately before welding.

735 Treatment of site welded joints in painted steelwork

1. Preparation: After welding, and without delay, remove scale and weld spatter from weld areas. Remove traces of rust. Wash with clean water and allow to dry. Prime without delay.
2. Protective/ Decorative coatings: Apply to weld areas to match surrounding painted areas.

736 Treatment of site welded joints in galvanized steelwork

1. Preparation: After welding, and without delay, remove scale and weld spatter from weld areas. Remove traces of rust. Wash with clean water and allow to dry.
2. Coating: Reinstate using one of the methods given in BS EN ISO 1461, clause 6.3.

740 Bolted joints (other than preloaded joints)

1. Steelwork to be shop painted: Apply full shop specification to joint faces.
2. Steelwork to be erected with mill finish then site painted: Before erection, prepare and prime joint faces and allow to dry.
3. Bolted joints in externally exposed steelwork
   3.1. Immediately before assembling, apply a further coat of primer and bring surfaces together while still wet.
   3.2. After assembling and before applying site coatings, seal crevices to bolts and joint perimeters with a compatible sealant.

745 Faying surfaces of preloaded joints

1. Protection: Immediately after blast cleaning and before coating surrounding areas, mask faying surfaces to protect from contamination and deterioration.
   1.1. Paint systems comprising more than one coat: Step each coat 30 mm back from edge of preceding coat and away from masked areas.
2. Removal of protection: Immediately before bolting, remove masking. Check faying surfaces are free from adhesive. Clean with solvent if necessary.

750 Preloaded joints in shop painted steelwork

1. Post assembly treatment of bolts and surrounding areas: After final tightening of bolts and inspection of joints:
   1.1. Thoroughly degrease and clean uncoated areas including bolts.
   1.2. Prime without delay.
   1.3. Apply full shop coating specification.
2. Direct tension indicators: Seal measuring gap to prevent ingress of moisture.

755 Uncoated fasteners

1. Treatment: After steelwork erection and before applying site coatings, thoroughly degrease and clean. Without delay, coat to match adjacent shop painted areas.

760 Galvanized fasteners

1. Treatment: After steelwork erection and before applying site coatings, thoroughly degrease and clean. Etch prime.

765 Site preparation of shop painted steelwork

1. Preparation: Touch in shop coats, as necessary, and allow to dry. Before applying site coats (when specified), abrade surfaces or wash down or both, as recommended by paint manufacturer.

770 Site preparation of galvanized surfaces for painting

1. Preparation: Thoroughly degrease. Remove white corrosion products. Wash off and allow to dry before applying etching wash or primer.

Painting

810 Environmental conditions

1. General requirements prior to starting coating work
    1.1. Surfaces: Unaffected by moisture or frost.
    1.2. Steel temperature: At least 3°C above dew point, with conditions stable or improving, and not high enough to cause blistering or wrinkling of the coating.
    1.3. Relative humidity: Below 85%.

815 Coatings

1. Surfaces to be coated: Clean, dust free and suitably dry. Previous coats to be adequately cured.
2. Multiple coats of same material: Use different tints to assist checking of complete coverage.
3. Penultimate coat: Colour recommended by paint manufacturer to suit top coat colour.
4. Finish required: Smooth and even, of uniform thickness and colour, free from defects.

820 Film thickness

1. Wet film thickness: During application, check thickness of each coat with a wheel or comb gauge used in accordance with BS EN ISO 2808.
2. Accumulated dry film thickness: After each coat has dried, check total accumulated film thickness.
    2.1. Method: Magnetic or electromagnetic meter.
    2.2. Number and position of measurements: As directed.
    2.3. Validation: Measurements to be independently witnessed.
    2.4. Meter calibration: Check against standard shims and recalibrate regularly against a smooth steel reference plate.
3. Average dry film thickness
    3.1. At least specified thickness over any square metre.
    3.2. No reading to be less than 75% of specified thickness.
4. Top coat dry film thickness: Sufficient to give an even, solid, opaque appearance.

825 Stripe coat

1. External angles, nuts, bolt heads, rough weld seams, and areas difficult to coat: Apply an additional stripe coat of primer and undercoat .

850 Junctions with concrete

1. Exposed steelwork partially embedded or encased in concrete: Apply two coats of bituminous coating locally to the steel/concrete junction.
2. Bituminous coating: To BS 6949, type 1, class A

Ω End of Section

G20
Carpentry/ timber-framing/ first fixing

General

105 Timber procurement

1. Timber (including timber for wood-based products): Obtained from well-managed forests/ plantations in accordance with:
   1.1. The laws governing forest management in the producer country or countries.
   1.2. International agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
2. Documentation: Provide either in accordance with chain of custody certification scheme requirements:
   2.1. Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied. or
   2.2. Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.
3. Chain of Custody Certification scheme: In accordance with UK Government Timber Procurement Policy (UKTPP), i.e. FSC, GiB or PEFC
   3.1. Other evidence: None

115 Contractor's structural design

1. Design responsibility: Design and detail As per Structural Engineering Calculations and details & Tender drawings.
2. Requirement
   2.1. Generally: As section B50/B51.
      2.1.1. Modifications: None
   2.2. Design: Complete the design in accordance with the designated code of practice to satisfy specified performance criteria.
   2.3. Service class: BS 5268 Part 2.
   2.4. Additional requirements: Sizes shown are nominal timber sizes except as noted on the drawings and will be subject to reductions in finished size to BS EN 336.
3. Design and production information
   3.1. Drawings: Showing As per Structural Engineering Calculations and details & Tender drawings.
   3.2. Other requirements: As Preliminaries section A31
4. Timing of submissions: As Preliminaries section A31

120 Structural design provided

1. Description: As per Structural Engineering Calculations and details
2. Requirements
   2.1. Generally: As section B50/B51.
   2.2. Additional requirements: Sizes shown are nominal timber sizes except as noted on the drawings and will be subject to reductions in finished size to BS EN 336.

160 Grading and marking of softwood

1. Timber of a target/ finished thickness less than 100 mm and not specified for wet exposure: Graded at an average moisture content not exceeding 20% with no reading being in excess of 24% and clearly marked as 'DG' (dry-graded).
2. Timber wet-graded and specified for installation at higher moisture contents: graded at an average moisture content above 20% and unmarked.
3. Structural timber members cut from large graded sections: Regraded to approval and marked accordingly.

Products

210 Structural softwood (graded direct to strength class)

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Grading standard: To BS EN 14081-1 and BS 4978, or other suitable national equivalent, and so marked.
3. Strength class to BS EN 338: minimum C16
4. Treatment
    4.1. Preservative treatment: to BS 8417
        4.1.1. Design service life: 60 years
    4.2. Flame-retardant treatment: As per Structural Engineering Calculations and details

230 Structural softwood (strength class not specified)

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Species: As per Structural Engineering Calculations and details and Tender drawings
3. Grading standard: To the appropriate BS EN 14081-1-compliant standard.
    3.1. Grade: minimum C16
4. Treatment
    4.1. Preservative treatment: T0 BS 8417
        4.1.1. Design service life: 60 years
    4.2. Flame-retardant treatment: As per Structural Engineering Calculations and details and Tender drawings

250 Structural hardwood (graded direct to strength class)

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Grading standard: To BS EN 14081-1 and BS 5756, or other suitable national standard, and so marked
3. Strength class to BS EN 338: As per Structural Engineering Calculations and details and Tender drawings
4. Surface finish: Planed all round
5. Treatment
    5.1. Preservative treatment: To BS 8417
        5.1.1. Design service life: 60 years
    5.2. Flame-retardant treatment: As per Structural Engineering Calculations and details and Tender drawings

270 Ungraded softwood

1. Description: FOR INTERNAL NONSTRUCTURAL USE
2. Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
3. Surface finish: Planed all round
4. Treatment
   - 4.1. Preservative treatment: BS 8417
     - 4.1.1. Design service life: 60 years
   - 4.2. Flame-retardant treatment: As per Structural Engineering Calculations and details and Tender drawings

275 Wood trim

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Species: Contractor's choice
3. Standard: To BS 1186-3.
   - 3.1. Class: CSH 1
4. Treatment: to BS 8417
   - 4.1. Design service life: 60 years
5. Fixing: All bolts into timber are to have 50mm square x 3mm thick mild steel washers below the nut
6. Other requirements: Undercut bottom edge of boards to form drip

311 Non-structural plywood

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Standard: To an approved national standard.
3. Thickness: As required
4. Appearance class to BS EN 635: I
5. Use class to BS EN 335: Use Class 1
6. Bonding quality to BS EN 314-2: Class 1
7. Finish: Sanded
8. Edges: Square
9. Treatment
   - 9.1. Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C11
     - 9.1.1. Design service life: Not applicable
   - 9.2. Flame-retardant treatment: As per Structural Engineering Calculations and details and Tender drawings

336 Structural wood composite

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Type: Laminated veneer lumber
3. Product certification: Agrément-certified
4. Wood species: Contractor's choice
5. Structural performance: Anticipated loadings (maximum): As shown on drawings

6. Treatment: To BS 8417
7. Finish as delivered: As manufactured
8. Other requirements: Provide 50 x 50 mm herringbone strutting at eaves

350 Trussed rafters

1. Design and fabrication standard: To BS EN 14250.
2. Manufacturer: A firm currently registered under a third-party quality assurance scheme.
3. Truss system: Agrément-certified
4. Ancillary components to be supplied by the truss fabricator: As per Structural Engineering Calculations and details and Tender drawings
5. Treatment: Organic solvent type as section Z12 and BWPDA Commodity Specification C8

360 Joist gloves

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Dimensions: As per Structural Engineering Calculations and details and Tender drawings
   2.1. Depth: As per Structural Engineering Calculations and details and Tender drawings
   2.2. Width: As per Structural Engineering Calculations and details and Tender drawings
3. Masonry depth: As per Structural Engineering Calculations and details and Tender drawings

Workmanship generally

401 Cross section dimensions of structural softwood and hardwood

1. Dimensions: Dimensions in this specification and shown on drawings are target sizes as defined in BS EN 336.
2. Tolerances: The tolerance indicators (T1 and T2) specify the maximum permitted deviations from target sizes as stated in BS EN 336, clause 4.3:
   2.1. Tolerance Class 1 (T1) for sawn surfaces.
   2.2. Tolerance Class 2 (T2) for further processed surfaces.

402 Cross section dimensions of non-structural softwood

1. Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
2. Maximum permitted deviations from finished sizes: As stated in BS EN 1313-1, clause 6 for sawn sections.

403 Cross section dimensions of non-structural hardwood

1. Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
2. Maximum permitted deviations from finished sizes: As stated in BS EN 1313-2:
   2.1. Clause 6 for sawn sections.
   2.2. Clause NA.3 for further processed sections.

420 Warping of timber

1. Bow, spring, twist and cup: Not greater than the limits set down in BS EN 14081-1 and BS 4978 for softwood, or BS EN 14081-1 and BS 5756 for hardwood

430 Selection and use of timber

1. Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.

435 Notches, holes and joints in timber

1. Notches and holes
    1.1. General: Avoid if possible.
    1.2. Sizes: Minimum needed to accommodate services.
    1.3. Position: Do not locate near knots or other defects.
    1.4. In same joist: Minimum of 100 mm apart horizontally.
    1.5. Notches in joists
        1.5.1. Position: Locate at top. Form by sawing down to a drilled hole.
        1.5.2. Depth (maximum): 0.15 x joist depth.
        1.5.3. Distance from supports: Between 0.1 and 0.2 x span.
    1.6. Holes in joists
        1.6.1. Position: Locate on neutral axis.
        1.6.2. Diameter (maximum): 0.25 x joist depth.
        1.6.3. Centres (minimum): Three x diameter of largest hole.
        1.6.4. Distance from supports: Between 0.25 and 0.4 of span.
    1.7. Notches in roof rafters, struts and truss members: Not permitted.
    1.8. Holes in struts and columns: Locate on neutral axis.
        1.8.1. Diameter (maximum): 0.25 x minimum width of member.
        1.8.2. Centres (minimum): Three x diameter of largest hole.
        1.8.3. Distance from ends: Between 0.25 and 0.4 of span.
2. Scarf joints, finger joints and splice plates: Do not use without approval.

440 Processing treated timber

1. Cutting and machining: Carry out as much as possible before treatment.
2. Extensively processed timber: Retreat timber sawn lengthways, thicknessed, planed, ploughed, etc.
3. Surfaces exposed by minor cutting/ drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

450 Moisture content

1. Moisture content of wood and wood-based products at time of installation: Not more than:
    1.1. Covered in generally unheated spaces: 24%.
    1.2. Covered in generally heated spaces: 20%.
    1.3. Internal in continuously heated spaces: 20%.

451 Moisture content testing

1. Procedure: When instructed, test timber sections with an approved electrical moisture meter.
2. Test sample: Test 5%, but not less than ten lengths of each cross section in the centre of the length.
3. Test results: 90% of values obtained to be within the specified range. Provide records of all tests.

480 Trussed rafter testing

1. Standard: To BS EN 14250.
2. Number/ timing of tests: 5 time at random during the course of the contract
3. Purpose of testing: quality control
4. Test reports: Submit as soon as available.

510 Protection

1. Generally: Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
2. Timber and components: Store under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack.
3. Trussed rafters: Keep vertical during handling and storage.

520 Exposed end grain protection

1. Components: Seal exposed end grain of the following before delivery to site: as required.
2. Sealer: Clear end grain sealer

530 Painted finishes

1. Structural timber to be painted: Primed as specified before delivery to site.

540 Clear finishes

1. Structural timber to be clear finished: Keep clean and apply first coat of specified finish before delivery to site.

550 Exposed timber

1. Planed structural timber exposed to view in completed work: Prevent damage to and marking of surfaces and arrises.

Jointing timber

570 Jointing/ fixing generally

1. Generally: Where not specified precisely, select methods of jointing and fixing and types, sizes and spacings of fasteners in compliance with section Z20.

580 Framing anchors

1. Manufacturer: Fischer
   1.1. Product reference: FUR-T
2. Material/ finish: Galvanized low-carbon steel
3. Fasteners: Galvanized or sherardized square twist nails.
   3.1. Size: Not less than size recommended by anchor manufacturer.
4. Fixing: Secure using not less than the number of nails recommended by anchor manufacturer.

590 Metal plate fasteners/ gussets

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice

615 Bolt/ screw assemblies

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Designation: As per Structural Engineering Calculations and details and Tender drawings
3. Size: As shown on drawings
4. Coating applied by manufacturer: Contractor's choice
5. Nuts and washers: Material grade and finish to suit bolts.
6. Washer dimensions: Diameter/ side length of washers in contact with timber faces to be a minimum of three times bolt diameter, with a thickness of not less than 0.3 times bolt diameter.

630 Bolted joints

1. Bolt spacings (minimum): To BS EN 1995-1-1, section 8.5.
2. Holes for bolts: Located accurately and drilled to diameters as close as practical to the nominal bolt diameter, and not more than 2 mm larger.
3. Washers: Placed under bolt heads and nuts that would otherwise bear directly on timber. Use spring washers in locations which will be hidden or inaccessible in the completed building.
4. Bolt tightening: So that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut.
    4.1. Checking: At agreed regular intervals up to completion. Tighten as necessary.

640 Bolted joints with connectors

1. Connectors: To BS EN 912.
    1.1. Types and sizes: As shown on drawings.
    1.2. Bolt hole: Where appropriate, size to suit bolt diameter.
    1.3. Manufacturer: Contractor's choice
        1.3.1. Product reference: Contractors choice
    1.4. Finish: Galvanised
2. Bolts and washers: To BS EN 1995-1-1.
3. Connector location: Where not otherwise shown, spacings, end and edge distances are to be not less than standard values to BS EN 1995-1-1, section 8.9 for split-ring and shear plate connectors, and BS EN 1995-1-1, section 8.10 for toothed plate connectors.
4. Centres of bolt holes: Not more than 2 mm from positions shown on drawings.
5. Assembly: Do not crush timber, deform washers or overstress bolts.

670 Anti-corrosion finishes for fasteners

1. Galvanizing: To BS 7371-6, with internal threads tapped and lightly oiled following treatment.
2. Sherardizing: To BS 7371-8, Class 1.
3. Zinc plating: To BS EN ISO 4042 and passivated.

Erection and installation

710 Proposals for erecting structural timber

1. Proposals: Submit details of:
    1.1. Method and sequence of erection.
    1.2. Type of craneage.
    1.3. Temporary guys and bracing proposed for use during erection.

2. Latest date for submission: Ten days befoer erection starts

721 Expansion anchors

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Size: As per Structural Engineering Calculations and details and Tender drawings
3. Material/ finish: galvanised
4. Spacing/ edge distance (minimum): As per Structural Engineering Calculations and details and Tender drawings
   4.1. Obtain instructions if specified spacing or edge distance cannot be achieved.
5. Installation holes: Drilled to diameter and depth recommended by manufacturer. Clean and free from dust.
6. Installation/ tightening: To manufacturer's instructions.

725 Hammer-in fasteners

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Type: As per Structural Engineering Calculations and details and Tender drawings
3. Size: As per Structural Engineering Calculations and details and Tender drawings
4. Spacing/ edge distance (minimum): As per Structural Engineering Calculations and details and Tender drawings
   4.1. Obtain instructions if specified spacing or edge distance cannot be achieved.
5. Installation holes: Drilled to diameter and depth recommended by manufacturer. Clean and free from dust.

730 Deformed rods

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Type: As per Structural Engineering Calculations and details and Tender drawings
3. Material/finish: galvanised

740 Pre-erection checking

1. Timing: Not less than ten days before proposed erection start date.
2. Checklist
   2.1. Foundations and other structures to which timber structure will be attached: Check for accuracy of setting out.
   2.2. Holding down bolts: Check for position, protruding length, condition and slackness.
3. Inaccuracies and defects: Report without delay.
4. Erection: Obtain permission to commence.

750 Modifications/ Repairs

1. Defects due to detailing or fabrication errors: Report without delay.
2. Methods of rectification: Obtain approval of proposals before starting modification or remedial work.
3. Defective/damaged components: Timber members/ components may be rejected if the nature and/or number of defects would result in an excessive amount of site repair.

760 Temporary bracing

1. Provision: As necessary to maintain structural timber components in position and to ensure complete stability during construction.

765 Tension or compression bracing products

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material: Carbon steel
3. Load capacity: As per Structural Engineering Calculations and details and Tender drawings
4. Dimensions
   4.1. Cross section: As per Structural Engineering Calculations and details and Tender drawings
   4.2. Diameter: As per Structural Engineering Calculations and details and Tender drawings
5. Features: As per Structural Engineering Calculations and details and Tender drawings
6. Isolation system: As per Structural Engineering Calculations and details and Tender drawings
7. Finish: As per Structural Engineering Calculations and details and Tender drawings
8. Finish designation: As per Structural Engineering Calculations and details and Tender drawings
9. Fixings: As per Structural Engineering Calculations and details and Tender drawings

770 Additional supports

1. Provision: Position and fix additional studs, noggings and/ or battens to support edges of sheets materials, and wall/ floor/ ceiling-mounted appliances, fixtures, etc. shown on drawings
2. Material properties: Additional studs, noggings and battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

775 Bearings

1. Timber surfaces which are to transmit loads: Finished to ensure close contact over the whole of the designed bearing area.
2. Packings: Where provided, to cover the whole of the designed bearing area.
   2.1. Crushing strength: Not less than timber being supported.
   2.2. In external or inaccessible locations: Rot and corrosion proof.

780 Wall plates

1. Position and alignment: To give the correct span and level for trusses, joists, etc.
2. Bedding: Fully in fresh mortar.
3. Joints: At corners and elsewhere where joints are unavoidable use nailed half-lap joints. Do not use short lengths of timber.

784 Joists generally

1. Centres: Equal, and not exceeding designed spacing.
2. Bowed joists: Installed with positive camber.
3. End joists: Positioned approximately 50 mm from masonry walls.

786 Joists on hangers

1. Hangers: Bedded directly on and hard against supporting construction. Do not use packs or bed on mortar.

2. Joists: Cut to leave not more than 6 mm gap between ends of joists and back of hanger. Rebated to lie flush with underside of hangers.
3. Fixing to hangers: A nail in every hole.

790 Standard joist hangers

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Standard: To BS EN 845-1.
3. Size and type: To suit joist, design load and crushing strength of supporting construction.
4. Material/ finish: Galvanized low-carbon steel

791 Proprietary joist hangers

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material/ finish: Galvanized low-carbon steel sheet
4. Size: To suit joist, design load and crushing strength of supporting construction.

795 Trimming openings

1. Trimmers and trimming joists: When not specified otherwise, not less than 25 mm wider than general joists.

800 Trussed rafter installation

1. Erection: To Trussed Rafter Association (TRA) Technical handbook. Site installation guide and TRA Product data sheet PD3.
2. Trusses generally: Do not modify without approval.
3. Damaged trusses: Do not use.
4. Fixing: With truss clips. Bottom chords of standard trusses and rafters of raised tie trusses bearing fully on wall plates.
   4.1. Bottom chords of standard trusses: Do not fix to internal walls until roofing is complete and cisterns are installed and filled.
5. Tolerances: To NA to BS EN 1995-1-1.

805 Truss clips

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material/ finish: Galvanized steel
3. Fasteners: 32 x 3.5 mm galvanized or sherardized square twisted nails in every hole

810 Permanent bracing of trussed rafters

1. Bracing and binders
   1.1. Size: As per Structural Engineering Calculations and details and Tender drawings
   1.2. Method of fixing: To every rafter, strut or tie with not less than two fasteners.
      1.2.1. Fasteners: 75 x 3.35 mm galvanized round wire nails
2. Lap joints: Extended over and nailed to at least two truss members.

820 Vertical restraint straps

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Type: As per Structural Engineering Calculations and details and Tender drawings
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Material/ finish: Galvanized steel
5. Size
   5.1. Cross section: Not less than: As per Structural Engineering Calculations and details and Tender drawings.
   5.2. Length: As per Structural Engineering Calculations and details and Tender drawings
6. Centres: Not more than 1.2 mm.
7. Fixing
   7.1. To timber members with not less than 30 x 3.5 mm galvanized square twist.
   7.2. To masonry with not less than five 50 mm x 12 gauge sherardized screws evenly spaced, with at least one screw located within 150 mm of the bottom end of each strap.

830 Lateral restraint straps

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material/ finish: Galvanized steel
4. Size: Not less than As per Structural Engineering Calculations and details and Tender drawings.
5. Fixing: To top of joists/ rafters/ ties at not more than 1.2 m centres and as shown on drawings.
   5.1. Ensure that cranked end is in tight contact with cavity face of wall inner leaf and is not pointing upwards.
6. Straps spanning joists/ rafter/ ties running parallel to wall: Fix noggings and packs tightly beneath straps.
   6.1. Size of noggings and packs: Not less than three quarters of joist/ rafter/ tie depth and not less than 38 mm thick.
   6.2. Notching: Notch joists so that straps fit flush with surface. Do not notch rafters/ ties.
7. Fasteners: As per Structural Engineering Calculations and details and Tender drawings

840 Strutting to floor joists

1. Type: One of the following:
   1.1. Herringbone strutting: At least 38 x 38 mm softwood.
   1.2. Solid strutting: At least 38 mm thick softwood and at least three quarters of joist depth.
   1.3. Proprietary metal strutting: As per Structural Engineering Calculations and details and Tender drawings
2. Fixing: Between joists as follows:
   2.1. Joist spans of 2.5 to 4.5 m: One row at centre span.
   2.2. Joist spans over 4.5 m: Two rows equally spaced.
   2.3. Strutting must not project beyond top and bottom edges of joists.
3. Outer joists: Blocked solidly to perimeter walls.

850 Inspection generally

1. Structural timber-work: Give reasonable notice before covering up.

860 Bolted joint inspection

1. Timing: Inspect all accessible bolts at the end of the defects liability period and tighten if necessary.

900 Eaves soffit ventilators

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Type: Continuous strip
3. Colour: Black
4. Airway: The equivalent of a continuous opening of not less than 10 mm for full length of eaves.

910 Eaves soffit ventilation

1. Soffit boards: Fixed to leave a continuous ventilation opening not less than 10 mm wide for full length of eaves.
2. Insect mesh: A 3-4 mm mesh screen fixed across the opening to prevent large insect entry.

950 Fascias/ barges/ soffits

1. Description: As per Structural Engineering Calculations and details and Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material: Veneered plywood
4. Finish: Painted
5. Colour: White
6. Nominal depth: As per Structural Engineering Calculations and details and Tender drawings
7. Edge profile: As per Structural Engineering Calculations and details and Tender drawings
8. Accessories: As per Structural Engineering Calculations and details and Tender drawings
9. Other requirements: As per Structural Engineering Calculations and details and Tender drawings
10. Support: As per Structural Engineering Calculations and details and Tender drawings
    10.1. Provide additional support at joints.
11. Fixings: As per Structural Engineering Calculations and details and Tender drawings
12. Installer: A contractor approved by the system manufacturer.

Ω End of Section

G30
Metal profiled sheet decking

Proprietary specified roof/ floor decking

110 Metal profiled sheet decking

1. Manufacturer: Kingspan
   1.1. Product reference: KS1000RW Trapezoidal roof pannels
2. Material: As per the Tender Drawings
3. Thickness (nominal): As per the Tender Drawings
4. Soffit finish: As per the Tender drawings
5. End laps (minimum): As per the Tender drawings
   5.1. Configuration: As per the Tender drawings
6. Supporting structure: As per the Tender drawings
7. Accessories: As per the Tender drawings

Performance specified roof/ floor decking

165 Completion of design

1. Description: As per the Specification of work and Tender drawings
2. Description: As Preliminaries section A13
3. Requirement: Complete the detailed design to satisfy specified performance criteria and coordinate with the detailed design of related and adjacent work.
4. Structural requirements: As section B50.
5. Additional requirements: None
6. Design and production information: As Preliminaries section A31
7. Timing of submissions: As Preliminaries section A31

175 Structural design provided

1. Description: As per the Structural Engineering Calculations and Details
2. Requirements
   2.1. Generally: As section B50.
   2.2. Additional requirements: None

180 Design requirements for decking

1. Material: As per the Specification of work and Tender drawings
2. Depth of profile: As per the Specification of work and Tender drawings
3. Soffit finish: As per the Specification of work and Tender drawings
4. Maximum allowable deflection: As per the Specification of work and Tender drawings
5. Sound transmittance: As per the Specification of work and Tender drawings
6. Accessories: As per the Specification of work and Tender drawings

Fixing decking

220 Painting structure

1. Sequence: Before the decking is attached paint surfaces of supporting structure that will be subsequently inaccessible.

230 Prevention of electrolytic action

1. Isolating tape: Type recommended by decking manufacturer.
    1.1. Location: To contact surfaces of supports and sheets of dissimilar metals.

240 Fire resisting profile fillers

1. Supplier: Decking manufacturer.
2. Type/ shape: To match decking profile void.
3. Location: Separating walls: Completely fill space between top of wall and underside of tiles with mineral wool quilt to provide
fire-stopping.
Boxed eaves: Boxed eaves: Completely seal air paths in plane of separating wall with wire-reinforced mineral wool, not less
than 50 mm thick, and fire-resisting board carefully cut to shape, fixed and sealed to rafters to provide fire-stopping
4. Fixing: Fit securely, as recommended by manufacturer, to form fire compartment.

260 Fixing decking generally

1. Cut sheets: Clean edges with true lines and no burrs.
    1.1. Treatment of edges: As per the Specification of work and Tender drawings
2. Penetrations: Cut openings to the minimum size necessary.
    2.1. Edge reinforcement: As per the Specification of work and Tender drawings
3. Fixings: Drill all holes.
4. Cleanliness: Remove debris from within decking construction.
5. Installation: Seams and ribs of deck must be parallel, with no damage to deck coating.

280 Attachment of decking

1. Primary deck fasteners: As per the Specification of work and Tender drawings
    1.1. Number of fasteners per sheet width at each support: As per the Specification of work and Tender drawings
    1.2. Fixing locations: Valleys of profile.
2. Side lap stitching fasteners: As per the Specification of work and Tender drawings
    2.1. Fixing centres (maximum): As per the Specification of work and Tender drawings
    2.2. Fixing locations: Valleys of profile.
3. End lap stitching fasteners: As per the Specification of work and Tender drawings
    3.1. Fixing locations in standard end laps: Each valley of profile.
    3.2. Fixing locations in non standard end laps: One web of each trough of profile.

285 Attachment of decking and accessories

1. Scope of contactor's design: As per the Specification of work and Tender drawings
2. Requirement: To resist specified wind load.

2.1. Additional requirements: None

290 Cold formed metal accessories

1. Description: As per the Specification of work and Tender drawings
2. Profile: As per the Specification of work and Tender drawings
   2.1. Material: As per the Specification of work and Tender drawings
   2.2. Finish/ Colour: As per the Specification of work and Tender drawings
3. Workmanship: As section Z11.
4. Method of attachment: As per the Specification of work and Tender drawings
   4.1. Supporting structure: As per the Specification of work and Tender drawings
   4.2. Fixings: As per the Specification of work and Tender drawings

Ω End of Section

H31
Metal profiled/ flat sheet self-supporting cladding/ roof covering

Types of cladding/ covering system

110 Metal

1. Description: As per the Specification of work and Tender drawings
2. Humidity load: As per the Specification of work and Tender drawings
3. External exposure: As per the Specification of work and Tender drawings
4. Fire performance
    - 4.1. External wall cladding: As clause 203
    - 4.2. Roof covering: As clause 204
    - 4.3. Substrate/ ventilated cavities/ inner lining: As clause 205
    - 4.4. Cavity fire barriers: As clause 206
    - 4.5. Insulation: As clause 208
5. Insurance and warranties: As clause 207
6. Support structure: As per the Specification of work and Tender drawings
    - 6.1. Bearing width (minimum): As per the Specification of work and Tender drawings
    - 6.2. Pitch: As per the Specification of work and Tender drawings
7. Cladding/ covering system type: As per the Specification of work and Tender drawings
8. External sheets
    - 8.1. Standards generally: To BS EN 14782
    - 8.2. Material: Stainless steel to BS EN 10088-4
    - 8.3. Composition: Manufacturer standard
    - 8.4. Thickness (nominal): Manufacturer standard
    - 8.5. Profile: As per the Specification of work and Tender drawings
    - 8.6. Cover width: As per the Specification of work and Tender drawings
    - 8.7. Finish side 1 (outer)
        - 8.7.1. Coating/ treatment: As per the Specification of work and Tender drawings
        - 8.7.2. Coating thickness: As per the Specification of work and Tender drawings
        - 8.7.3. Colour: As per the Specification of work and Tender drawings
    - 8.8. Finish side 2 (inner)
        - 8.8.1. Coating/ treatment: As per the Specification of work and Tender drawings
        - 8.8.2. Coating thickness: As per the Specification of work and Tender drawings
        - 8.8.3. Colour: As per the Specification of work and Tender drawings
9. Additional requirements: As per the Specification of work and Tender drawings
10. Accessories: As per the Specification of work and Tender drawings
11. Primary cladding/ covering sheet fasteners: As per the Specification of work and Tender drawings
    - 11.1. Fastener profile location: As per the Specification of work and Tender drawings
    - 11.2. Number and location of fasteners: As per the Specification of work and Tender drawings
    - 11.3. End laps size (minimum): As per the Specification of work and Tender drawings
12. Sealing laps

12.1. End laps: As per the Specification of work and Tender drawings
12.2. Side laps: As per the Specification of work and Tender drawings
13. Stitching laps
13.1. End laps: As per the Specification of work and Tender drawings
13.2. Side laps: As per the Specification of work and Tender drawings
14. Spacers: As per the Specification of work and Tender drawings
14.1. Depth of spacer: As per the Specification of work and Tender drawings
14.2. Fasteners: As per the Specification of work and Tender drawings
15. Breather membrane: As per the Specification of work and Tender drawings
16. U-value (plane): As per the Specification of work and Tender drawings
17. Thermal insulation: As per the Specification of work and Tender drawings
18. Air and vapour control layer: As per the Specification of work and Tender drawings
19. Sound transmittance: As per the Specification of work and Tender drawings
20. Sound absorption: As per the Specification of work and Tender drawings
21. Acoustic insulation: As per the Specification of work and Tender drawings
22. Lining sheet: As per the Specification of work and Tender drawings
23. Safety
23.1. Walkability: As per the Specification of work and Tender drawings
23.2. Fragility: As per the Specification of work and Tender drawings
23.3. Safety glazing classification: As per the Specification of work and Tender drawings
24. Additional requirements: As per the Specification of work and Tender drawings

General requirements

167 Completion of design

1. Description: As per the Specification of work and Tender drawings
2. Description: As per the Specification of work and Tender drawings
3. Requirement: Complete the detailed design to satisfy specified performance criteria and coordinate with the detailed design of related and adjacent work
3.1. Design standard: In accordance with BS 5427
4. Structural requirements: As section B50
5. Additional requirements: As per the Specification of work and Tender drawings
6. Design and production information: As Preliminaries section A31
7. Timing of submissions: As Preliminaries section A31

169 Structural design provided

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings
2. Requirements
2.1. Generally: As section B50
2.2. Additional requirements: None

172 Thermal performance/ Bridging

1. Requirement: Complete the thermal design of the cladding/ covering system to avoid excessive thermal bridging
1.1. Standard: BS 5427 and BS EN ISO 10211

Design/ performance requirements

185 Performance compliance

1. Verification: Before commencing fabrication, submit evidence based on laboratory testing or computer modelling
    1.1. Verifying authority: United Kingdom Accreditation Service (UKAS)

187 Deflection of metal cladding/ roof covering

1. Roof covering: Maximum permitted deflection under distributed loads as a multiple of span and due to:
    1.1. Permanent load: As per the Structural Engineering Calculations and Details & Tender drawings
    1.2. Permanent and imposed loads (or undrifted snow load): As per the Structural Engineering Calculations and Details & Tender drawings
    1.3. Permanent and wind loads: As per the Structural Engineering Calculations and Details & Tender drawings
2. Wall cladding: Maximum permitted deflection under distributed loads as a multiple of span and due to:
    2.1. Wind loads: As per the Structural Engineering Calculations and Details & Tender drawings

190 Deflection of plastics cladding/ roof covering

1. Roof covering: Maximum permitted deflection due to:
    1.1. Wind suction loading: As per the Structural Engineering Calculations and Details & Tender drawings
    1.2. Imposed snow load: As per the Structural Engineering Calculations and Details & Tender drawings
    1.3. Self-load: As per the Structural Engineering Calculations and Details & Tender drawings
2. Wall cladding: Maximum permitted deflection due to:
    2.1. Wind loads: As per the Structural Engineering Calculations and Details & Tender drawings

192 Sound transmittance of cladding/ roof covering system – weighted

1. Location: Through External wall & Roof.
2. Requirement: Measure within 100 to 3150 Hz frequency range to BS 5821-3
    2.1. Minimum weighted sound reduction index (Rw): As per the Structural Engineering Calculations and Details & Tender drawings

193 Sound transmittance of cladding/ roof covering system – frequency specific

1. Location: Through External wall & Roof.
2. Requirement: Measure to BS EN ISO 10140-2
    2.1. Minimum sound reduction index (R): As per the Structural Engineering Calculations and Details & Tender drawings
        2.1.1. For one third octave band centre frequency (Hz) of: As per the Structural Engineering Calculations and Details & Tender drawings

194 Internal sound absorption of cladding/ roof covering system

1. Location: Communit hall

2. Requirement: Measure to BS EN ISO 354
    2.1. Minimum sound absorption coefficient (alpha S): As per the Structural Engineering Calculations and Details & Tender drawings
        2.1.1. For one third octave band centre frequency (Hz) of: As per the Structural Engineering Calculations and Details & Tender drawings

198 Water penetration

1. Requirement: Under site exposure conditions, moisture must not penetrate onto internal surfaces, or into cavities not designed to be wetted

200 Avoidance of interstitial condensation

1. Requirement: Determine interstitial condensation risk of cladding/ covering system using the method described in BS 5250, Annex D. If necessary, provide an air and vapour control layer and/ or revise thermal insulation to ensure that damage and nuisance from interstitial condensation does not occur
2. Outdoor psychrometric conditions (notional)
    2.1. Temperature: As per the Structural Engineering Calculations and Details & Tender drawings
    2.2. Relative humidity: As per the Structural Engineering Calculations and Details & Tender drawings
    2.3. Vapour pressure: As per the Structural Engineering Calculations and Details & Tender drawings
3. Indoor psychrometric conditions (notional): As follows:
    3.1. Temperature: As per the Structural Engineering Calculations and Details & Tender drawings.°C
    3.2. Relative humidity: As per the Structural Engineering Calculations and Details & Tender drawings
    3.3. Vapour pressure: As per the Structural Engineering Calculations and Details & Tender drawings

202 Avoidance of surface condensation

1. Requirement: Determine surface condensation risk of cladding/ covering system using the method described in BS EN ISO 13788. If necessary, revise thermal insulation to provide satisfactory temperature factor (fmin). Ensure that damage and nuisance from surface condensation does not occur

203 Fire performance of external wall cladding

1. Reaction to fire
    1.1. External surfaces: As per the Structural Engineering Calculations and Details & Tender drawings

204 Fire performance of roof sheeting

1. External fire exposure: As per the Structural Engineering Calculations and Details & Tender drawings

205 Fire performance of substrate/ ventilated cavities/ inner linings

1. Reaction to fire
    1.1. Substrate: As per the Structural Engineering Calculations and Details & Tender drawings
    1.2. Internal (cavity) surfaces: As per the Structural Engineering Calculations and Details & Tender drawings

1.3. Inner lining: As per the Structural Engineering Calculations and Details & Tender drawings

206 Fire performance of cavity fire barriers

1. Standard: To BS EN 13501-2
2. Requirement: To resist the passage of flame and smoke for not less than 60 minutes' integrity, 60 minutes' insulation.

207 Insurance and warranties

1. Requirements and testing: To LPS 1581
2. Additional requirements: None

208 Fire performance of insulation

1. Reaction to fire: As per the Structural Engineering Calculations and Details & Tender drawings

Fixing cladding/ roof covering

215 Painting structure

1. Sequence: Paint outer surface of supporting structure before fixing cladding/ covering

219 Fasteners

1. Unspecified fasteners: Recommended for the purpose by the cladding/ covering manufacturer

221 Fittings and accessories

1. Unspecified fittings and accessories: Recommended for the purpose by the cladding/ covering manufacturer

223 Prevention of electrolytic action

1. Isolating tape: Type recommended by cladding/ covering manufacturer
   1.1. Location: To contact surfaces of supports and sheets of dissimilar metals

234 Gutters

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings
2. Manufacturer: Kingspan
   2.1. Product reference: Industrial Highlibne Gutters
3. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings
4. Material: As per the Structural Engineering Calculations and Details & Tender drawings
   4.1. Gauge/ Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
   4.2. External finish: As per the Structural Engineering Calculations and Details & Tender drawings
5. Insulation: As per the Structural Engineering Calculations and Details & Tender drawings
6. Internal liner sheet: As per the Structural Engineering Calculations and Details & Tender drawings
7. Jointing method: As per the Structural Engineering Calculations and Details & Tender drawings
8. Fixing method: As per the Structural Engineering Calculations and Details & Tender drawings
9. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings

240 Lining

1. Standard: BS EN 14782
2. Safety: Roof lining sheets to be non-fragile and walkable in accordance with BS 5427
3. Material: Organic-coated steel to BS EN 10169
   3.1. Profile: Trapezoidal with 19 mm profile height
   3.2. Thickness (minimum)/ gauge: As per the Structural Engineering Calculations and Details & Tender drawings
   3.3. Cover width: As per the Structural Engineering Calculations and Details & Tender drawings
   3.4. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings
4. Primary sheet fasteners: As per the Structural Engineering Calculations and Details & Tender drawings
5. End laps size (minimum): Not less than 40 mm
6. Deflection of installed lining in any direction (maximum): 1/120 of distance between supports
7. Joint sealing: Aluminium foil tape
8. Additional requirements: As per the Structural Engineering Calculations and Details & Tender drawings

254 Acoustic insulation

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Recycled content: As per the Structural Engineering Calculations and Details & Tender drawings

261 Air and vapour control membrane

1. Material: As per the Structural Engineering Calculations and Details & Tender drawings
   1.1. Vapour resistance (minimum): As per the Structural Engineering Calculations and Details & Tender drawings
2. Continuity: No breaks and with the minimum of joints
   2.1. Penetrations and abutments: Seal to AVCL with tape. Achieve full bond
   2.2. Laps: Not less than 150 mm, seal with tape. Achieve full bond
3. Tape: Double-sided sealant with vapour resistivity not less than the AVCL
   3.1. Size (width and thickness): As per the Structural Engineering Calculations and Details & Tender drawings
4. Repairs and punctures: Seal with lapped patch of AVCL and continuous band of sealant tape along edges

270 Mineral wool thermal insulation

1. Standard: To BS EN 13162
2. Material: Flexible mineral wool mat
   2.1. Thermal conductivity (maximum): As per the Structural Engineering Calculations and Details & Tender drawings
3. Recycled content: Contractor's choice
4. Installation: Continuous and not compressed between outer and lining sheets. Secure to prevent future movement or dislodgement

271 Mineral wool thermal insulation

1. Standard: To BS EN 13162
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings
   2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings
3. Thickness (minimum): As per the Structural Engineering Calculations and Details & Tender drawings
4. Recycled content: As per the Structural Engineering Calculations and Details & Tender drawings
5. Installation: Continuous and not compressed between outer and lining sheets. Secure to prevent future movement or dislodgement

280 Breather membrane

1. Standard: As per the Structural Engineering Calculations and Details & Tender drawings
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings
   2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings
3. Continuity: No breaks, minimize joints
   3.1. Penetrations and abutments: Attach to breather membrane with tape. Achieve full bond
   3.2. Laps: Not less than 150 mm, bond with tape. Achieve full bond
4. Tape: As recommended by breather membrane manufacturer
5. Repairs: Lapped patch of breather membrane material secured with continuous band of tape on edges
6. Junctions at flashings, sills, gutters, etc: Overlap and allow free drainage to exterior

300 Profile fillers generally

1. Material: As per the Structural Engineering Calculations and Details & Tender drawings
2. Manufacturer: Contractor's choice
   2.1. Product references: Contractor's choice
3. Colour: Black
4. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
5. Fixing method: Submit proposals
   5.1. Requirement: To close cavities/ regulate air paths within the external envelope. Tight fit with no unintended gaps

305 Fire-resisting profile fillers

1. Location: As per the Structural Engineering Calculations and Details & Tender drawings
2. Fire resistance: 60 minutes from each side
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Types: To accurately match sheet profile
5. Fixing method: Adhesive recommended by profile filler manufacturer
6. Material: As per the Structural Engineering Calculations and Details & Tender drawings

306 Cavity barriers

1. Location: Around all edges of openings

2. Fire resistance: 60 minutes from each side
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Types: To accurately match sheet profile
5. Fixing method: Adhesive recommended by profile filler manufacturer to fully fill void between surfaces of inner and outer sheet
6. Material: As per the Structural Engineering Calculations and Details & Tender drawings

310 Purpose-made cold-formed metal accessories

1. Material: As per the Structural Engineering Calculations and Details & Tender drawings
   1.1. Thickness/ Gauge: As per the Structural Engineering Calculations and Details & Tender drawings
   1.2. Finish
      1.2.1. Coating type: To match covering
      1.2.2. Coating thickness (minimum): As per the Structural Engineering Calculations and Details & Tender drawings
      1.2.3. Coating colour: As per the Structural Engineering Calculations and Details & Tender drawings
2. Fasteners
   2.1. Type: As per the Structural Engineering Calculations and Details & Tender drawings
   2.2. Location: As per the Structural Engineering Calculations and Details & Tender drawings
   2.3. Fixing centres: As per the Structural Engineering Calculations and Details & Tender drawings

410 Fixing sheets generally

1. Cut edges: Clean true lines
2. Penetrations: Openings to minimum size necessary
   2.1. Edge reinforcement: Sections to details
3. Sheet orientation: Exposed joints of side laps away from prevailing wind unless shown otherwise on drawings
4. Sheet ends, laps and raking cut edges: Fully supported and with fixings at top of lap
5. Fasteners: Drill holes. Position at regular intervals in straight lines, centred on support bearings
   5.1. Position of fasteners in oversized drilled holes: Central
   5.2. Fasteners torque: Sufficient to correctly compress washers
6. Debris: Remove dust and other foreign matter before finally fixing sheets
7. Completion: Check fixings and sealants to ensure that they are watertight, and that fixing and sheets are secure with no buckling or distortion
8. Cut edges: Paint to match face finish

460 Accommodation of thermal movement

1. Sheet type/ location: As per the Structural Engineering Calculations and Details & Tender drawings
2. Method: Expansion laps

470 Structural movement joints

1. Type: Cover flashing fixed on one side over gap between sheets

2. Location: Coincident with structural movement joint
3. Width of gap: To match structural movement joint requirements
4. Requirement: Weathertight

480 Flashings/ trims generally

1. Lap joint treatment
    1.1. Vertical and sloping flashings/ trims: End laps to be same as for adjacent sheeting
    1.2. Horizontal flashings/ trims: End laps to be 150 mm, sealed and where possible arranged with laps away from prevailing wind
2. Method of fixing: To structure in conjunction with adjacent sheeting. Otherwise to sheeting
    2.1. Fasteners: As per the Structural Engineering Calculations and Details & Tender drawings

481 Flashings/ trims

1. Locations: As per the Structural Engineering Calculations and Details & Tender drawings
2. Fasteners: As per the Structural Engineering Calculations and Details & Tender drawings

482 Butt-jointed flashings/ trims

1. Locations: As per the Structural Engineering Calculations and Details & Tender drawings
2. Butt straps: 300 mm wide and made from sheet of same material and finish
3. Butt joints: Seal

540 Abutments

1. Junctions with flashings: Weathertight and neatly dressed down

550 Sealing laps on external sheets

1. Sealant tape: Types recommended by sheet manufacturer
    1.1. Position: Below fixing positions in straight unbroken lines, parallel to and slightly back from edge of sheet
2. Seal quality: Effective, continuous and not over compressed
3. End laps: Sealant tape positions: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Side laps: Sealant tape positions: As per the Structural Engineering Calculations and Details & Tender drawings.

554 Water vapour sealing at laps and penetrations in metal linings – sealant tape

1. Sealant tape: Types recommended by sheet manufacturer
    1.1. Position: Below fixing positions in straight unbroken lines, parallel to and slightly back from edge of sheet
2. Seal quality: Effective, continuous and not over-compressed

555 Water vapour sealing at laps and penetrations in metal linings – aluminium tape

1. Aluminium foil tape: Types recommended by sheet manufacturer
    1.1. Position: Centrally and parallel to edge of oversheet in straight unbroken lines
    1.2. Joints in tape: Minimum overlap of 50 mm

2. Seal and adhesion quality: Effective and continuous

560 Safety signs

1. Fixing locations of signs: In accordance with BS 5499-10
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material: Aluminium with polyester powder-coated base, screen printed graphics
4. Signs description: Mandatory action sign to BS EN ISO 7010, code M018 with supplementary text instruction, 'Wear a safety harness'

Ω End of Section

H60
Plain roof tiling

Types of tiling

105 Clay roof tiling

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings
2. Substrate: As per the Structural Engineering Calculations and Details & Tender drawings
3. Pitch: As existing
4. Underlay: As per the Structural Engineering Calculations and Details & Tender drawings
   - 4.1. Recycled content: Contractor's choice
   - 4.2. Direction: Parallel to eaves.
   - 4.3. Head-lap (minimum): 100 mm
5. Counterbatten
   - 5.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings
   - 5.2. Fixing: 65 x 3.35 mm galvanized round plain shank nails
6. Battens
   - 6.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings
   - 6.2. Fixing: 65 x 3.35 mm galvanized round plain shank nails
7. Tiles: To BS EN 1304.
   - 7.1. Manufacturer: Contractor's choice
     - 7.1.1. Product reference: Contractor's choice
   - 7.2. Pattern: None
   - 7.3. Colour: Terracotta
   - 7.4. Size: 265 x 165 mm
   - 7.5. Head-lap (minimum): As per the Structural Engineering Calculations and Details & Tender drawings
   - 7.6. Fixing
     - 7.6.1. Fixing of local areas: Two nails per tile in every course
     - 7.6.2. Fixing of general areas: Two nails per tile in every course
8. Accessories: None

Performance

200 Contractor's design of roof coverings

1. Design responsibility: Determine roof covering
2. Structural and fire requirements
   - 2.1. Generally: As sections B50 and B05.
   - 2.2. Modifications: None
   - 2.3. Design: Complete the design in accordance with the designated code of practice to satisfy specified performance criteria.
3. Functional requirements
   - 3.1. Performance: As specified in this section
4. Additional requirements: None

5. Design and production information: As Preliminaries section A31
6. Timing of submissions: As Preliminaries section A31

205 Hygrothermal design

1. Interstitial condensation within roof construction: Determine risk as recommended in BS 5250 and BS EN ISO 13788.
2. Air and vapour control layer: Provide a suitable membrane so that damage and nuisance from interstitial condensation do not occur.

207 Fire performance

1. External fire exposure
   1.1. Standard: To BS EN 13501-5
   1.2. Requirement: As per the Structural Engineering Calculations and Details & Tender drawings
2. Fire resistance of cavity fire barriers
   2.1. Standard: To BS EN 13501-1
   2.2. Requirement: 60/ 30 minutes (integrity/ insulation)

Tiling generally

210 Basic workmanship

1. General: Fix tiling and accessories to make the whole sound and weathertight at earliest opportunity.
2. Setting out: To true lines and regular appearance, with neat fit at edges, junctions and features.
3. Fixings for tiling accessories: As recommended by tile or accessory manufacturer.
4. Gutters and pipes: Keep free of debris. Clean out at completion.

220 Remove existing tiling

1. General: Carefully remove tiles, battens, underlay, etc. with minimum disturbance of adjacent retained tiling.
2. Undamaged tiles: Set aside for reuse.

230 Mineral wool insulation on structural metal liner trays

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Standard: To BS EN 13162.
   2.1. Reaction to fire: Manufacturer's standard
   2.2. Thermal conductivity (minimum): Manufacturer's standard
   2.3. Thickness: Manufacturer's standard
   2.4. Compressive strength (minimum): Manufacturer's standard
   2.5. Other BS EN 13162 characteristics: None
3. Density (minimum): As per the Structural Engineering Calculations and Details & Tender drawings
4. Edges: Rebated
5. Facing: As per the Structural Engineering Calculations and Details & Tender drawings
6. Recycled content: Contractor's choice
7. Installation: Fix securely with closely butted joints, leaving no gaps.
   7.1. Fasteners: Use where necessary to prevent slumping.

8. Ventilation paths: Do not obstruct.

235 Vapour-permeable underlay

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Standard: To BS EN 13859-1
   2.1. Reaction to fire: Manufacturer's standard
   2.2. Water vapour transmission (minimum): Manufacturer's standard
   2.3. Resistance to water penetration: Manufacturer's standard
   2.4. Tensile strength (minimum): Manufacturer's standard
   2.5. Tear resistance (minimum): Manufacturer's standard
   2.6. Other BS EN 13859 characteristics: None
3. Weight (mass per unit area): As per the Structural Engineering Calculations and Details & Tender drawings
4. Resistance to wind uplift: As per the Structural Engineering Calculations and Details & Tender drawings
5. Tape: Required

240 Underlay

1. Laying: Maintain consistent tautness.
2. Vertical laps (minimum): 100 mm wide, coinciding with supports and securely fixed.
3. Fixing: Galvanized steel, copper or aluminium 20 x 3 mm extra large clout head nails.
4. Eaves: Where exposed, use an external grade (UV-resistant) underlay or a proprietary eaves support product.
5. Penetrations: Use proprietary underlay seals or cut underlay to give a watertight fit around pipes and components.
6. Ventilation paths: Do not obstruct.

245 Battens/ counter battens

1. Timber: Sawn softwood.
   1.1. Species: In accordance with BS 5534, clause 4.11.1.
   1.2. Permissible characteristics and defects: Not to exceed limits in BS 5534, Annex D.
   1.3. Grading: Fully factory pre-graded in accordance with BS 5534
   1.4. Moisture content at time of fixing and covering (maximum): 22%.
2. Preservative treatment: As section Z12 and Wood Protection Association Commodity Specification C8.

255 Counter battens on rigid sarking

1. Fixing: Through rigid sarking into rafters at not more than 300 mm centres.

257 Counter battens on structural metal liner trays

1. Fixing: To each tray upstand at not more than 600 mm centres.

259 Counter battens on rafters

1. Fixing: Into rafters at not more than 300 mm centres.

265 Batten fixing

1. Setting out: Align parallel to ridge in straight horizontal lines to gauge of tiles. Align on adjacent areas.
2. Batten length (minimum): Sufficient to span over three supports.
3. Joints in length: Square cut. Butt centrally on supports. Joints must not occur more than once in any group of four battens on one support.
4. Additional battens: Provide where unsupported laps in underlay occur between battens.
5. Fixing: Each batten to each support. Splay fix at joints in length.

270 Battens fixed to masonry

1. Setting out: In straight horizontal lines. Align on adjacent areas.
2. Batten length (minimum): 3 m.
3. Fixing centres (maximum): 400 mm.

272 Timber for tiling substrate work

1. Timber: Sawn softwood, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
    1.1. Moisture content at time of fixing and covering (maximum): 22%.
2. Preservative treatment: As section Z12 and Wood Protection Association Commodity Specification C8.
    2.1. Type: Contractor' s choice

275 Tile fixing

1. Setting out: Lay tiles to a half lap bond with joints slightly open. Align tails.
2. Ends of courses: Use tile and a half tiles to maintain bond and to ensure that cut tiles are as large as possible.
3. Top and bottom courses: Use eaves/tops tiles to maintain gauge.
4. Perimeter tiles
    4.1. Verges, abutments and each side of valleys and hips: Twice nail end tile in every course.
    4.2. Eaves and top edges: Twice nail two courses of tiles or clip as appropriate.
5. Fixings for tiles: Nails/clips recommended by tile manufacturer.

280 Local and general fixing areas

1. Definitions
    1.1. Local areas: Bands of tiling around all edges or obstructions of each plane of the roof. Calculate extent of each band in accordance with BS 5534, section 5 and Annex H.
    1.2. General areas: Remaining areas of roof tiling.

290 Mortar bedding/ pointing

1. Mortar: As section Z21, 1:3 cement:sand, with plasticizing admixtures permitted.
    1.1. Bond strength providing resistance to uplift: In accordance with BS 5534.
2. Weather: Do not use in wet or frosty conditions or when imminent.
3. Preparation of tiles and accessories to be bedded: Wet and drain surface water before fixing.
4. Appearance: Finish neatly as work proceeds and remove residue.

Roof tiling edges/ junctions/ features

305 Generally

1. Fittings and accessories: As recommended by tile manufacturer, do not improvise.
    1.1. Exposed fittings and accessories: To match tile colour and finish.
2. Cut tiles: Cut only where necessary, to give straight, clean edges.
3. Flashings: Fix with or immediately after tiling. Form neatly.

325 Fire-separating walls

1. Separating walls: Completely fill space between top of wall and underside of tiles with mineral wool quilt to provide fire stopping.
2. Boxed eaves: Completely seal air paths in plane of separating wall with wire reinforced mineral wool, not less than 50 mm thick, fixed to rafters and carefully cut fire-resisting board and quilt to shape to provide fire stopping.

345 Ventilated eaves with integrated grilles/ trays

1. Fascia grilles and ventilator trays
    1.1. Manufacturer: Contractor's choice
        1.1.1. Product reference: Contractor's choice
    1.2. Fix to carry underlay, form drip into gutter and provide free passage of air over insulation.
2. Undercourse and first course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

355 Ventilated eaves with separated grilles/ trays

1. Fascia grilles
    1.1. Manufacturer: Contractor's choice
        1.1.1. Product reference: Contractor's choice
2. Ventilator trays
    2.1. Manufacturer: Submit proposals
3. Product reference: Submit proposals
    3.1. Fix to provide free passage of air over insulation.
4. Underlay support: 12 mm plywood, as section G20
    4.1. Continuous to prevent water retaining troughs.
5. Gutter: Dress underlay or underlay support tray to form drip into gutter.
6. Undercourse and first course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

365 eaves

1. Underlay support: 12 mm plywood, as section G20
    1.1. Continuous to prevent water-retaining troughs.
2. Gutter: Dress underlay or underlay support tray to form drip into gutter.
3. Undercourse and first course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

435 Cloaked verges

1. Underlay and tiling battens: Carry over full width of verge. Project underlay to turn down behind verge tiles.
2. Cloaked verge tiles
   2.1. Product reference: Contractor's choice
   2.2. Projection beyond face of wall (maximum): 50 mm.
   2.3. Fixing: Nails and clips.

445 Mortar-bedded verges with bedded undercloak

1. Underlay: Carry 50 mm onto outer leaf of gable wall and bed on mortar.
2. Undercloak: Matching plain tiles.
   2.1. Position: Over underlay, level with underside of tiling battens, sloping towards verge.
   2.2. Projection beyond face of wall: 38-50 mm.
   2.3. Bedding: On mortar identical to that used in gable walling.
3. Tiling battens: Carry onto undercloak and finish 100 mm from verge edge.
4. Verge tiles
   4.1. Bedding: Flush with undercloak on 75 mm wide bed of mortar.
   4.2. Fixing: Nails. Do not displace or crack mortar.

455 Mortar-bedded verges with nailed undercloak

1. Underlay: Carry over full width of verge.
2. Undercloak: Fibre cement sheet.
   2.1. Position: Over underlay, level with underside of tiling battens, sloping towards verge.
   2.2. Projection: 38-50 mm beyond face of Barge board.
   2.3. Fixing: Nails.
3. Tiling battens: Carry onto undercloak and finish 100 mm from verge edge.
4. Verge tiles
   4.1. Bedding: Flush with undercloak on 75 mm wide bed of mortar.
   4.2. Fixing: Nails. Do not displace or crack mortar.

525 Mitred hips

1. Underlay: Lay courses over hip.
   1.1. Overlaps (minimum): 150 mm.
2. Mitred tiles: Cut tile and a half tiles and fix to form a straight, close mitred junction.
3. Soakers: Interleave with mitred tiles. Fix by turning down over head of mitred tiles.

555 Mortar-bedded and mechanically fixed hips

1. Underlay: Lay courses over hip.
   1.1. Overlaps (minimum): 150 mm.
2. Hip tile fixing battens: As per the Structural Engineering Calculations and Details & Tender drawings
3. Roof tiles: Cut and fix closely at hip.
4. Hip irons: Galvanized steel in accordance with BS 5534, clause 4.15.4
   4.1. Fixing: To hip rafter or hip batten with not less than two zinc-coated steel screws.

5. Hip tiles
    5.1. Manufacturer: Contractor's choice
        5.1.1. Product reference: Contractor's choice
    5.2. Bedding: On mortar, continuous to edges and solid to joints.
    5.3. Fixing: Secure all hip tiles to hip rafters or hip tile fixing battens with self-sealing non-ferrous through fixings.
    5.4. Bottom hip tiles: Shape neatly to align with corner of eaves and fill ends with mortar and slips of tile finished flush.

585 Arris hips

1. Underlay: Lay courses over hip.
    1.1. Overlaps (minimum): 150 mm.
2. Arris hip tiles
    2.1. Product reference: Contractor's choice
    2.2. Bedding: In mortar. Course in with roof tiling.
    2.3. Fixing: Nail to hip rafters or supplementary hip battens.
3. Roof tiles: Cut adjacent tiles to fit neatly.

595 Bonnet hips

1. Underlay: Lay courses over hip.
    1.1. Overlaps (minimum): 150 mm.
2. Bonnet hip tiles
    2.1. Product reference: Contractor's choice
    2.2. Bedding: In mortar, neatly struck back about 13 mm from edge of tiles. Course in with roof tiling.
    2.3. Fixing: Nail to hip rafters or supplementary hip battens.
    2.4. Bottom hip tiles: Fill ends with mortar and tile slips finished flush.
3. Roof tiles: Cut adjacent tiles to fit neatly.

605 GRP valleys

1. Underlay: Lay as recommended by GRP valley manufacturer.
2. GRP valleys
    2.1. Manufacturer: Contractor's choice
        2.1.1. Product reference: Contractor's choice
3. Roof tiles: Cut adjacent tiles to fit neatly.
    3.1. Bedding. On mortar on GRP valleys.
    3.2. Valley width between tiles: As per the Structural Engineering Calculations and Details & Tender drawings

615 Metal valleys

1. Underlay: Cut to rake. Dress over tilting fillets to lap onto metal valley. Do not lay under metal.
2. Roof tiles: Cut adjacent tiles to fit neatly.
    2.1. Bedding: On mortar on fibre cement undercloaks laid loose each side of valleys.
    2.2. Valley width between tiles: As per the Structural Engineering Calculations and Details & Tender drawings

625 Curved plain tile valleys

1. Underlay: Lay strips not less than 600 mm wide centred on valleys. Overlap with general roof underlay.
2. Curved valley tiles
   2.1. Product reference: Contractor's choice
3. Roof tiles: Cut adjacent tiles to fit neatly.

635 Mitred valleys

1. Underlay: Lay strips not less than 600 mm wide centred on valleys. Overlap with general roof underlay.
2. Mitred tiles: Cut tile and a half tiles and fix to form a straight, close mitred junction.
3. Soakers: Interleave with mitred tiles. Fix by turning down over head of mitred tiles.

645 Laced valleys

1. Preparatory work: Lay general roof underlay and tiling battens into valleys.
2. Valley boarding: Timber, 25 mm thick.
   2.1. Centre board: Minimum 250 mm wide.
   2.2. Side boards: 100 mm wide and feather-edged.
3. Underlay: Lay strips not less than 600 mm wide centred on valleys.
4. Valley tiles: Form intersections of tile courses by laying tile and a half tiles diagonally on centre of valley boarding. Sweep roof tile courses neatly upwards to meet the tile and a half tiles at right angles, maintaining specified lap. Fix to battens or direct to valley boarding.

650 Swept valleys

1. Preparatory work: Lay general roof underlay and tiling battens into valleys.
2. Valley boarding: Timber, 25 mm thick.
   2.1. Centre board: Minimum 250 mm wide.
   2.2. Side boards: 100 mm wide and feather-edged.
3. Underlay: Lay strips not less than 600 mm wide centred on valleys.
4. Valley tiles: Cut to an even taper to give a smooth sweep through valleys.
5. Fix to battens or direct to valley boarding.
6. Soakers: Interleave with tapered tiles. Fix by turning down over head of tapered tiles.

660 Side abutments

1. Underlay: Turn up not less than 100 mm at abutments.
2. Abutment tiles: Cut as necessary. Fix close to abutments.
3. Soakers: Interleave with abutment tiles. Fix by turning down over head of abutment tiles.

670 Top edge abutments

1. Underlay: Turn up not less than 100 mm at abutments.
2. Top-course tiles: Fix close to abutments.

675 Top edge ventilated abutments

1. Underlay: Provide air gap at abutment as recommended by ventilator manufacturer.
2. Abutment ventilator

2.1. Manufacturer: Contractor's choice
2.2. Product reference: Contractor's choice
2.3. Fixing: As recommended by manufacturer.

690 Roof windows

1. Underlay: Turn up not less than 100 mm at window surrounds under integral flashings/soakers.
2. Roof tiles: Cut as necessary and fix closely all round.

700 Dry ventilated ridges

1. Underlay: Provide air gap at apex.
2. Dry ridge fixing battens: As per the Structural Engineering Calculations and Details & Tender drawings
3. Dry ridge tiles
   3.1. Manufacturer: Contractor's choice
      3.1.1. Product reference: Contractor's choice
4. Ridge terminals
   4.1. Manufacturer: Contractor's choice
      4.1.1. Product reference: Contractor's choice

710 Dry ridges

1. Underlay: Lay courses over ridge.
   1.1. Overlap (minimum): 100 mm.
2. Dry ridge fixing battens: As per the Structural Engineering Calculations and Details & Tender drawings
3. Dry ridge tiles: As per the Structural Engineering Calculations and Details & Tender drawings
   3.1. Manufacturer: Contractor's choice
      3.1.1. Product reference: Contractor's choice
4. Ridge terminals
   4.1. Manufacturer: Contractor's choice
      4.1.1. Product reference: Contractor's choice

740 Mortar-bedded and mechanically fixed ridges

1. Underlay: Lay courses over ridge.
   1.1. Overlap (minimum): 100 mm.
2. Ridge tile fixing battens: As per the Structural Engineering Calculations and Details & Tender drawings
3. Ridge tiles
   3.1. Manufacturer: Contractor's choice
      3.1.1. Product reference: Contractor's choice
   3.2. Bedding: On mortar, continuous to edges and solid to joints.
   3.3. Fixing: Secure all ridge tiles to ridge boards or supplementary ridge battens with self-sealing non-ferrous fixings.
   3.4. Gable end ridge tiles: Fill ends with mortar and slips of tiles finished flush.
4. Ridge terminals
   4.1. Manufacturer: Contractor's choice

4.1.1. Product reference: Contractor's choice

770 Dry ventilated mono-ridges

1. Underlay: Provide air gap at apex.
2. Dry mono-ridge tiles
   2.1. Manufacturer: Contractor's choice
      2.1.1. Product reference: Contractor's choice

775 Dry mono-ridges

1. Underlay: Lay not less than 100 mm over mono-ridge.
2. Dry mono-ridge tiles
   2.1. Manufacturer: Contractor's choice
      2.1.1. Product reference: Contractor's choice

780 Mortar-bedded mechanically fixed mono-ridges

1. Underlay: Lay not less than 100 mm over mono-ridge.
2. Mono-ridge tiles
   2.1. Manufacturer: Contractor's choice
      2.1.1. Product reference: Contractor's choice
   2.2. Bedding: On mortar, continuous to sloping edges and solid to joints.
   2.3. Fixing: Secure vertical faces to ridge fixing battens with self-sealing non-ferrous fixings.
   2.4. Gable end mono-ridge tiles: Fill ends with mortar finished flush.

800 Change of roof pitch

1. Tiling substrate work: Fix timber tilting fillet to support flashing and course of tiles above change of pitch.
2. Roof tiles: Fix courses above and below change of pitch and make weathertight with flashing.

840 Ventilator tiles

1. Ventilator tiles
   1.1. Manufacturer: Contractor's choice
      1.1.1. Product reference: Contractor's choice
   1.2. Requirement: To ventilate above insulation, in each rafter space
   1.3. Positions: As per the Structural Engineering Calculations and Details & Tender drawings

850 Roof slope terminals

1. Ventilator tiles: As per the Structural Engineering Calculations and Details & Tender drawings
   1.1. Manufacturer: Contractor's choice
      1.1.1. Product reference: Contractor's choice
   1.2. Connect to bathroom ventilation pipes.

Vertical tiling edges/ junctions

910 Bottom edges

1. Tiling substrate work: Fix timber tilting fillet to support bottom course of tiles in correct vertical plane. Fix flashing to tilting fillet.

2. Underlay: Dress over flashing.
3. Undercourse and bottom course tiles: Fix with tails neatly aligned.

920 Top edges

1. Top-course tiles: Fix under abutment and make weathertight with flashings dressed down not less than 150 mm.

930 Side abutments

1. Tiling substrate work: Chase abutment wall and insert stepped flashing.
   1.1. Flashing: Return not less than 75 mm behind tiling, overlapping underlay and battens. Turn back to form a vertical welt.
2. Abutment tiles: Cut and fix neatly.

940 Angles with angle tiles

1. Angle tiles (purpose-made): Fix right and left hand in alternate courses to break bond.
2. Adjacent tiles: Cut and fix neatly.

950 Angles with soakers

1. Angle tiles: 'Cut tile and a half tile' and fix to form a straight, close mitred junction.
2. Soakers: Interleave with angle tiles. Fix by nailing to battens at top edge.

960 Junctions with roof verges

1. Tiling substrate work: Fix additional tiling batten parallel to and below verges.
2. Course end tiles: 'Winchester cut' tile and a half tile to angle of verge rake. Fix to additional tiling batten with cut edge parallel to and below verge.

Ω End of Section

H65
Single-lap roof tiling

Types of tiling

105 Clay roof tiling

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings
2. Substrate: As per the Structural Engineering Calculations and Details & Tender drawings
3. Pitch: As existing
4. Underlay: As per the Structural Engineering Calculations and Details & Tender drawings
   - 4.1. Direction: Parallel to eaves.
   - 4.2. Headlap (minimum): As per the Structural Engineering Calculations and Details & Tender drawings
5. Counter battens: As clause 245
   - 5.1. Fixing: 65 x 3.35 mm galvanized round plain shank nails
6. Battens: As clause 245
   - 6.1. Fixing: 65 mm x 3.35 mm galvanized round plain shank nails
7. Tiles: To BS EN 1304, interlocking.
   - 7.1. Manufacturer: Contractor's choice
     - 7.1.1. Product reference: Contractor's choice
   - 7.2. Colour: Terracotta
   - 7.3. Size: To match existing
   - 7.4. Headlap: Min. 96 mm, max. 108 mm
   - 7.5. Fixing
     - 7.5.1. Fixing of local areas: Nail every tile
     - 7.5.2. Fixing of general areas: Nail every tile
8. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings

Performance

205 Hygrothermal design

1. Interstitial condensation within roof construction: Determine risk as recommended in BS 5250 and BS EN ISO 13788.
2. Air and vapour control layer: Provide a suitable membrane so that damage and nuisance from interstitial condensation do not occur.

207 Fire performance

1. External fire exposure
   - 1.1. Standard: To BS EN 13501-5
   - 1.2. Requirement: As per the Structural Engineering Calculations and Details & Tender drawings
2. Fire resistance of cavity fire barriers
   - 2.1. Standard: To BS EN 13501-1
   - 2.2. Requirement: 60/ 30 minutes (integrity/ insulation)

Tiling generally

210 Basic workmanship

1. General: Fix tiling and accessories to make the whole sound and weathertight at earliest opportunity.
2. Setting out: To true lines and regular appearance, with neat fit at edges, junctions and features.
3. Fixings for accessories: As recommended by tile manufacturer.
4. Gutters and pipes: Keep free of debris. Clean out at completion.

220 Removing existing tiling

1. General: Carefully remove tiles, battens, underlay, etc. with minimum disturbance of adjacent retained tiling.
2. Undamaged tiles: Set aside for reuse.

230 Mineral wool insulation on structural metal liner trays

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Standard: To BS EN 13162.
   2.1. Reaction to fire: Manufacturer's standard
   2.2. Thermal conductivity (minimum): Manufacturer's standard
   2.3. Thickness: Manufacturer's standard
   2.4. Compressive strength (minimum): Manufacturer's standard
   2.5. Other BS EN 13162 characteristics: None
3. Density (minimum): As per the Structural Engineering Calculations and Details & Tender drawings
4. Edges: Rebated
5. Facing: As per the Structural Engineering Calculations and Details & Tender drawings
6. Installation: Fix securely with closely butted joints, leaving no gaps.
   6.1. Fasteners: Use where necessary to prevent slumping.
7. Ventilation paths: Do not obstruct.

235 Vapour-permeable underlay

1. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings
   1.1. Product reference: Contractor's choice
2. Standard: To BS EN 13859-1
   2.1. Reaction to fire: Manufacturer's standard
   2.2. Water vapour transmission (minimum): Manufacturer's standard
   2.3. Resistance to water penetration: Manufacturer's standard
   2.4. Tensile strength (minimum): Manufacturer's standard
   2.5. Tear resistance (minimum): Manufacturer's standard
   2.6. Other BS EN 13859 characteristics: None
3. Weight (mass per unit area): As per the Structural Engineering Calculations and Details & Tender drawings
4. Resistance to wind uplift: As per the Structural Engineering Calculations and Details & Tender drawings
5. Tape: Required

6. Recycled content: Contractor's choice

240 Underlay

1. Handling: Do not tear or puncture.
2. Laying: Maintain consistent tautness.
3. Vertical laps (minimum): 100 mm wide, coinciding with supports and securely fixed.
4. Fixing: Galvanized steel, copper or aluminium 20 x 3 mm clout head nails.
5. Eaves: Where exposed, use an external grade (UV-resistant) underlay or a proprietary eaves support product.
6. Penetrations: Use proprietary underlay seals or cut underlay to give a tight, watertight fit around pipes and components.
7. Ventilation paths: Do not obstruct.

245 Battens/ counter battens

1. Timber: Sawn softwood.
   1.1. Species: In accordance with BS 5534, clause 4.11.1.
   1.2. Permissible characteristics and defects: Not to exceed limits in BS 5534, Annex D.
   1.3. Grading: Fully factory pre-graded in accordance with BS 5534
   1.4. Moisture content at time of fixing and covering (maximum): 22%.
2. Preservative treatment: As section Z12 and Wood Protection Association Commodity Specification C8.
   2.1. Type: Contractor's choice
3. Size: As per the Structural Engineering Calculations and Details & Tender drawings

255 Counter battens on rigid sarking

1. Fixing: Through rigid sarking into rafters at not more than 300 mm centres.

257 Counter battens on structural metal liner trays

1. Fixing: To each tray upstand at not more than 600 mm centres.

259 Counter battens on rafters

1. Fixing: Into rafters at not more than 300 mm centres.

265 Batten fixing

1. Setting out: Align parallel to ridge in straight horizontal lines to gauge of the tile. Align on adjacent areas.
2. Batten length (minimum): Sufficient to span over three supports.
3. Joints in length: Square-cut. Butt centrally on supports. Joints must not occur more than once in any group of four battens on one support.
4. Additional battens: Provide where unsupported laps in underlay occur between battens.
5. Fixing: Each batten to each support. Splay fix at joints in length.

275 Tile fixing

1. Setting out: Lay each course with tails aligned.
2. Ends of courses: Use special tiles to maintain bond and to ensure that cut tiles are as large as possible.

3. Fixing: Mechanically fix all tiles.
   3.1. Nail-fixed tiles: Use nails recommended by tile manufacturer. Fix through every hole.
   3.2. Clip-fixed tiles: Use clips recommended by tile manufacturer.

280 Local and general fixing areas

1. Definitions
   1.1. Local areas: Bands of tiling around edges or obstructions of each plane of the roof. Calculate extent of each band in accordance with BS 5534, section 5 and Annex H.
   1.2. General areas: Remaining areas of roof tiling.

290 Mortar bedding/ pointing

1. Mortar: As section Z21, 1:3 cement:sand, with plasticizing admixtures permitted.
   1.1. Bond strength providing resistance to uplift: In accordance with BS 5534.
2. Weather: Do not use in wet or frosty conditions or when imminent.
3. Preparation of tiles and accessories to be bedded: Wet and drain surface water before fixing.
4. Appearance: Finish neatly as work proceeds and remove residue.

295 Mortar-bedded dentil courses

1. Dentil tile slips: Place in mortar edge bedding of hip and ridge tiles, one to each roof tile pan, projecting a consistent dimension.

Edges/ junctions/ features

305 Generally

1. Fittings and accessories: As recommended by tile manufacturer. Do not improvise.
   1.1. Exposed fittings and accessories: To match tile colour and finish.
2. Cut tiles: Cut only where necessary, to give straight, clean edges.
3. Flashings: Fix with or immediately after tiling. Form neatly.

325 Fire-separating walls

1. Separating walls: Completely fill space between top of wall and underside of tiles with mineral wool quilt to provide fire-stopping.
2. Boxed eaves: Boxed eaves: Completely seal air paths in plane of separating wall with wire-reinforced mineral wool, not less than 50 mm thick, and fire-resisting board carefully cut to shape, fixed and sealed to rafters to provide fire-stopping.

345 Ventilated eaves – integrated grilles/ trays

1. Fascia grilles and ventilator trays
   1.1. Manufacturer: Contractor's choice
      1.1.1. Product reference: Contractor's choice
   1.2. Fix to carry underlay, form drip into gutter and provide free passage of air over insulation.
2. Eaves filler units for profiled tiles: Fix to close underside of first course tiles.
3. First course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

355 Ventilated eaves – separated grilles/ trays

1. Fascia grilles

1.1. Manufacturer: Contractor's choice
1.1.1. Product reference: Contractor's choice
2. Ventilator trays
2.1. Manufacturer: Contractor's choice
2.1.1. Product reference: Contractor's choice
2.2. Fix to provide free passage of air over insulation.
3. Underlay support: 12 mm plywood
3.1. Continuous to prevent water retaining troughs.
4. Gutter: Dress underlay or underlay support tray to form drip into gutter.
5. Eaves filler units for profiled tiles: Fix to close underside of first course tiles.
6. First course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

365 Eaves

1. Underlay support: 12 mm plywood
1.1. Continuous to prevent water retaining troughs.
2. Gutter: Dress underlay or underlay support tray to form drip into gutter.
3. Eaves filler units for profiled tiles: Fix to close underside of first course tiles.
4. First course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

405 Dry verges

1. Underlay: Carry over full width of verge.
2. Tiling battens: Carry over underlay and project as recommended by dry verge manufacturer.
3. Dry verges
3.1. Manufacturer: Contractor's choice
3.1.1. Product reference: Contractor's choice
3.2. Fixing: Nail every unit

435 Cloaked verges

1. Underlay and tiling battens: Carry over full width of verge. Project underlay to turn down behind verge tiles.
2. Cloaked verge tiles
2.1. Manufacturer: Contractor's choice
2.1.1. Product reference: Contractor's choice
2.2. Projection beyond face of wall (maximum): 50 mm.
2.3. Fixing: Nail every tile

445 Mortar-bedded verges with bedded undercloak

1. Underlay: Carry 50 mm onto outer leaf of gable wall and bed on mortar.
2. Undercloak: Fibre cement sheet.
2.1. Position: Over underlay, level with underside of tiling battens, sloping towards verge.
2.2. Projection: 38-50 mm, beyond face of As per the Structural Engineering Calculations and Details & Tender drawings.
2.3. Bedding: On mortar identical to that used in gable walling.

3. Tiling battens: Carry onto undercloak by not less than 50 mm.
4. Verge clips: Fix to every tiling batten.
5. Verge tiles
    5.1. Bedding: Flush with undercloak on 75 mm wide bed of mortar.
    5.2. Fixing: Do not displace or crack mortar.

455 Mortar-bedded verges with nailed undercloak

1. Underlay: Carry over full width of verge.
2. Undercloak: Fibre cement sheet.
    2.1. Position: Over underlay, level with underside of tiling battens, sloping towards verge.
    2.2. Projection: 38-50 mm beyond face of barge board.
    2.3. Fixing: Nails.
3. Tiling battens: Carry onto undercloak by not less than 50 mm.
4. Verge clips: Fix to every tiling batten.
5. Verge tiles
    5.1. Bedding: Flush with undercloak on 75 mm wide bed of mortar.
    5.2. Fixing: Nails. Do not displace or crack mortar.

505 Dry hips

1. Underlay: Lay courses over hip.
    1.1. Overlaps (minimum): 150 mm.
2. Dry hip fixing battens: As per the Structural Engineering Calculations and Details & Tender drawings
3. Roof tiles: Cut and fix closely at hip.
4. Dry hip tiles
    4.1. Manufacturer: Contractor's choice
        4.1.1. Product reference: Contractor's choice
    4.2. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings

525 Mitred hips

1. Underlay: Lay courses over hip.
    1.1. Overlaps (minimum): 150 mm.
2. Mitred tiles: Cut double tiles or tile-and-a-half tiles, and fix through weathering unit supplied by tile manufacturer to form a straight, close mitred junction.

535 Lead roll hips

1. Underlay: Lay courses over hip.
    1.1. Overlaps (minimum): 150 mm.
2. Hip tiles: Cut close to timber roll and fix to form a straight junction.

555 Mortar-bedded and mechanically fixed hips

1. Underlay: Lay courses over hip.
    1.1. Overlaps (minimum): 150 mm.
2. Hip tile fixing battens: As per the Structural Engineering Calculations and Details & Tender drawings

3. Roof tiles: Cut and fix closely at hip.
4. Hip irons: Galvanized steel in accordance with BS 5534, clause 4.15.4.
   4.1. Fixing: To hip rafter or hip batten with not less than two zinc-coated steel screws.
5. Hip tiles
   5.1. Manufacturer: Contractor's choice
      5.1.1. Product reference: Contractor's choice
   5.2. Bedding: On mortar, continuous to edges and solid to joints.
   5.3. Fixing: Secure all hip tiles to hip rafters or supplementary hip battens with self-sealing non-ferrous through fixings.
   5.4. Bottom hip tiles: Shape neatly to align with corner of eaves and fill ends with mortar and slips of tile finished flush.

605 GRP valleys

1. Underlay: Lay as recommended by GRP valley manufacturer.
2. GRP valleys
   2.1. Manufacturer: Contractor's choice
      2.1.1. Product reference: Contractor's choice
3. Roof tiles: Cut adjacent tiles to fit neatly.
   3.1. Bedding: On mortar on GRP valleys.
   3.2. Valley width between tiles: As per the Structural Engineering Calculations and Details & Tender drawings

615 Metal valleys

1. Underlay: Cut to rake. Dress over tilting fillets to lap onto metal valley. Do not lay under metal.
2. Roof tiles: Cut adjacent tiles to fit neatly.
   2.1. Bedding: On mortar on fibre cement undercloaks laid loose each side of valleys.
   2.2. Valley width between tiles: As per the Structural Engineering Calculations and Details & Tender drawings

660 Side abutments

1. Underlay: Turn up not less than 100 mm at abutments.
2. Abutment tiles: Cut as necessary. Fix close to abutments.

670 Top edge abutments

1. Underlay: Turn up not less than 100 mm at abutments.
2. Top course tiles: Fix close to abutments.

675 Top edge ventilated abutments

1. Underlay: Provide air gap at abutment as recommended by ventilator manufacturer.
2. Abutment ventilator
   2.1. Manufacturer: Contractor's choice
      2.1.1. Product reference: Contractor's choice

675 Dry fixing abutments Type A

1. Underlay: Provide air gap at abutment as recommended by ventilator manufacturer.

2. Abutment ventilator
    2.1. Manufacturer: Tapco Roofing Products
        2.1.1. Contact details
            2.1.1.1. Address: Unit 32 Tokenspire Business Park,
            Hull Road
            Woodmansey
            Beverley
            East Yorkshire
            HU17 0TB
            2.1.1.2. Telephone: +44 (0)1482 880478
            2.1.1.3. Web: www.tapcoroofingproducts.com
            2.1.1.4. Email: info@tapcoslate.com
        2.1.2. Product reference: Contractor's choice

690 Roof windows

1. Underlay: Turn up not less than 100 mm at window surrounds under integral flashings.
2. Roof tiles: Cut as necessary and fix closely all round.

Ω End of Section

H71
Lead sheet fully supported roof and wall coverings/ flashings

Types of leadwork

201 Fire performance of external wall

1. Wall covering: Reaction to fire: To BS EN 13501-1, Class A2-s1, d0.
2. Substrate: Reaction to fire: To BS EN 13501-1, Class A2-s1, d0 or better.
3. Additional requirements: As per the Structural Engineering Calculations and Details & Tender drawings

202 Fire performance of roof

1. Roof covering: External exposure to fire: To BS EN 13501-5, Class Broof(t4).
2. Substrate: Reaction to fire: To BS EN 13501-1, Class A2-s1, d0.
3. Additional requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

203 Fire performance of inner lining/ cavities

1. Reaction to fire: As per the Structural Engineering Calculations and Details & Tender drawings

204 Fire performance of cavity fire barriers

1. Standard: To BS EN 13501-2
2. Requirement: To resist the passage of flame and smoke for not less than 60 minutes' integrity, 60 minutes' insulation.

205 Insurance and warranties

1. Requirements and testing: To LPS 1581
2. Additional requirements: To NHBC standard

250 Weathering to

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings
2. Substrate: Plywood on rafters
3. Sheet underlay: Building paper to BS 1521, Class A1
4. Type of lead: Rolled to BS EN 12588
   4.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
5. Joints: Not required
   5.1. Spacing: As per the Structural Engineering Calculations and Details & Tender drawings
6. Edge details: Welted drip at front, upstand at rear with tuck in
7. Fixing: Lead clips at 500 centres
8. Accessories: Fixing of lightning conductor strips

310 Ridge/ hip rolls to lead roofs

1. Core: Rounded timber.
   1.1. Size: 45 mm high x 45 mm wide

1.2. Shape: Tapered to a flat base 30 mm wide
1.3. Fixing: To Ridge/ hip board with brass or stainless steel countersunk screws at not more than 600 mm centres.

2. Roof covering: Dress roofing sheets up roll to form 35 mm upstand.
2.1. Fixing: Nail each sheet at underlapping end.

3. Lead capping
3.1. Thickness: As roof covering.
3.2. Lengths: Not more than As per the Structural Engineering Calculations and Details & Tender drawings.
3.3. Wings: Extend not less than 75 mm on to roof.
3.4. Laps in length: Not less than 150 mm for ridges, 100 mm for hips.

4. Fixing: Secure wings with one copper or stainless steel clip per roofing bay and at each lap.

322 Soakers for mitred hips to slate/ plain tile roofs

1. Lead
1.1. Thickness: 1.25 or 1.32 mm (Code 3).

2. Dimensions
2.1. Length: Slate/ tile gauge + lap + 25 mm.
2.2. Underlaps: Not less than 100 mm.

410 Apron flashings

1. Description: AT LEAN-TO TOP ABUTMENT

2. Lead
2.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings

3. Dimensions
3.1. Lengths: Not more than 1500 mm.
3.2. End to end joints: Laps of not less than 100 mm.
3.3. Upstand: Not less than 75 mm.
3.4. Cover to abutment: Not less than 150 mm.

4. Fixing: Lead wedges into bed joint, clips to bottom edge at laps and 500 mm centres

420 Cover flashings

1. Description: TO BITUMEN SHEET FLAT ROOF

2. Lead
2.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings

3. Dimensions
3.1. Lengths: Not more than 1000 mm.
3.2. End to end joints: Laps of not less than 100 mm.
3.3. Cover: Overlap to upstand of not less than 75 mm.

4. Fixing: Lead wedges into bed joint, clips to lead upstand at laps and 500 mm centres

440 Soakers and step flashings

1. Description: AT LEAN-TO SIDE ABUTMENT

2. Lead soakers

2.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
2.2. Dimensions
2.2.1. Length: Slate/ tile gauge + lap + 25 mm.
2.2.2. Upstand: Not less than 75 mm.
2.2.3. Underlay: Not less than 100 mm.
2.3. Fixing: By roofer.

3. Lead step flashings
3.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
3.2. Dimensions
3.2.1. Lengths: Not more than As per the Structural Engineering Calculations and Details & Tender drawings.
3.2.2. End to end joints: Laps of not less than 100 mm.
3.2.3. Cover: Overlap to soaker upstands of not less than 65 mm.
3.3. Fixing: Lead wedges at every course.

450 Step and cover flashings

1. Description: AT LEAN-TO SIDE ABUTMENT
2. Lead
2.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
3. Dimensions
3.1. Lengths: Not more than As per the Structural Engineering Calculations and Details & Tender drawings.
3.2. End to end joints: Laps of not less than 100 mm.
3.3. Upstand: Not less than 85 mm.
3.4. Cover to roof: Not less than 150 mm.
4. Fixing: Lead wedges at every course and clips at not more than 500 mm centres along free edge.

470 Flashings

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings
2. Lead
2.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
3. Dimensions
3.1. Lengths: Not more than 1500 mm.
4. Fixing: Fixing: Nail top edge at 150 mm centres and welt edge. Clip bottom edge at laps and 500 mm centres.

472 Chimney flashings to slate/ plain tile roofs

1. Lead front apron
1.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
1.2. Dimensions
1.2.1. Length: Width of chimney plus not less than 150 mm underlap to each side flashing.
1.2.2. Upstand: Not less than 75 mm.
1.2.3. Cover to roof: Not less than 150 mm.
1.3. Fixing: Lead wedges into bed joint.

2. Lead soakers
    2.1. Thickness: 1.25 or 1.32 mm (code 3).
    2.2. Dimensions
        2.2.1. Length: Slate/ tile gauge + lap + 25 mm.
        2.2.2. Upstand: Not less than 75 mm.
        2.2.3. Underlap: Not less than 100 mm.
3. Lead step flashings
    3.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
    3.2. Dimensions
        3.2.1. Lengths: Not more than 1500mm.
        3.2.2. End to end joints: Laps of not less than 100 mm.
        3.2.3. Front end: Turn 75 mm around chimney over apron.
        3.2.4. Cover: Overlap to soaker upstands of not less than 65 mm.
    3.3. Fixing: Lead wedges at every course.
4. Lead back gutter
    4.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
    4.2. Dimensions
        4.2.1. Length: Width of chimney plus not less than 100 mm overlap to each side flashing.
        4.2.2. Upstand: Not less than 100 mm.
        4.2.3. Gutter sole: Not less than 150 mm.
        4.2.4. Cover up roof: Not less than 225 mm.
5. Lead back gutter cover flashing
    5.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
    5.2. Dimensions
        5.2.1. Length: Width of chimney plus not less than 100 mm overlap to each side flashing.
        5.2.2. Cover: Overlap to back gutter upstand of not less than 75 mm.
    5.3. Fixing: Lead wedges into bed joint.

476 Chimney damp-proof course

1. Position: Level with Top edge of front apron.
2. Lead
    2.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
3. Protection: Fully coated with high build bitumen based paint on surfaces to be embedded.
4. Dimensions
    4.1. Plan area of chimney plus laps on perimeters: turned up 50 mm against stack in roof void, turned down 50 mm over stack externally, through flue lining and turned up 25 mm all round internally.
5. Laying: On a thin even bed of wet mortar.
    5.1. Next layer of overlying construction: Bed on mortar without delay and finish joint neatly.

478 Chimney damp-proof course

1. Position: Not less than 150 mm above roof finish
2. Lead
    2.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings

3. Protection: Fully coated with high build bitumen based paint on both sides of surfaces to be embedded
4. Dimensions
   4.1. Plan area of chimney plus laps on perimeters: turned down over stack externally with not less than 75 mm overlap to upstand, through flue lining and turned up 25 mm all round internally.
5. Laying: On a thin even bed of wet mortar.
   5.1. Next layer of overlying construction: Bed on wet mortar without delay and finish joint neatly.

497 Lead damp-proof course/ Cavity tray at raking abutments

1. Lead
   1.1. Thickness: 2.00 or 2.24 mm (Code 5)
   1.2. Finish: Fully coated on both sides with high-build, bitumen based paint on the surfaces which are to be embedded.
2. Joints
   2.1. Generally: Lap not less than 50 mm.
   2.2. Where the lead spans a cavity: Lead-welded.
3. Laying: On a thin even bed of wet mortar.
   3.1. Next layer of overlying construction: Bed on mortar without delay and finish joint neatly.
   3.2. Chase in bedding mortar under damp-proof course: Rake out to a depth of 25 mm before fully set, for subsequent fitting of flashing.

498 Combined lead damp-proof course/ Cavity tray and cover flashing at horizontal abutments

1. Lead
   1.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
   1.2. Finish: Fully coated on both sides with high-build, bitumen based paint on the surfaces which are to be embedded.
2. Length: Not more than 1500 mm.
3. Cover of flashing: Not less than 150 mm.
4. Joints: Lead-weld gusset upstand not less than 100 mm from end of each length, coinciding with vertical mortar joint in wall. Lap adjoining length over gusset upstand.
5. Laying: On a thin even bed of wet mortar.
   5.1. Next layer of overlying construction: Bed on mortar without delay and finish joint neatly.
6. Fixing cover flashing: With clips at laps and at 500 mm centres.

General requirements/ preparatory work

510 Workmanship generally

1. Standard: In accordance with BS EN 14783 and BS EN 12588 and to BS 6915 and latest edition of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Training Academy.
2. Fabrication and fixing: To provide a secure, free draining and completely weathertight installation.
3. Operatives: Trained in the application of lead coverings/ flashings. Submit records of experience on request.
4. Preforming: Measure, mark, cut and form lead prior to assembly wherever possible.
5. Marking out: With pencil, chalk or crayon. Do not use scribers or other sharp instruments without approval.

6. Bossing and forming: Straight and regular bends, leaving sheets free from ripples, kinks, buckling and cracks.
7. Solder: Use only where specified.
8. Sharp metal edges: Fold under or remove as work proceeds.
9. Finished work: Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
10. Protection: Prevent staining, discolouration and damage by subsequent works.

515 Lead-welding

1. In situ lead-welding: Not permitted.

516 Lead-welding

1. In situ lead-welding: Is permitted, subject to completion of a 'hot work permit' form and compliance with its requirements.

520 Lead sheet

1. Production method
    1.1. Rolled, to BS EN 12588, or
    1.2. Machine cast and BBA-certified, or
    1.3. Sand cast, from lead free from bitumen, solder, other impurities, inclusions, laminations, cracks, air, pinholes and blowholes; to code thicknesses but with a tolerance (by weight) of ±10%.
2. Identification: Labelled to show compliance with the harmonized standard (hEN) BS EN 14783, where appropriate, and detail of the thickness/ code, weight and type.

550 Lightning protection

1. Lead coverings: Attach the following to a lightning protection system: As per the Structural Engineering Calculations and Details & Tender drawings.
    1.1. Electrical continuity: Provide between lead sheets. Discontinuous sections must be separately bonded.

555 Layout

1. Setting out of longitudinal and cross joints: Submit proposals.

560 Control samples

1. General: Complete areas of the finished work, and obtain approval of appearance before proceeding:
2. Size: Submit proposals
3. Location: Submit proposals

570 Existing metal retained

1. Type/ Location/ Extent: As per the Structural Engineering Calculations and Details & Tender drawings
2. Cleaning: Remove dirt without damage to metal or adversely affecting other material.

580 Existing metal reused

1. Type/ Location/ Extent: As per the Structural Engineering Calculations and Details & Tender drawings

2. Handling/ Storage: Keep for reuse in the Works.

585 Existing metal removed to remain the property of the employer

1. Type/ Location/ Extent: As per the Structural Engineering Calculations and Details & Tender drawings
2. Removal: Give notice when the metal is to be stripped.
    2.1. Handling/ Storage: Keep for reuse by the employer.

610 Suitability of substrates

1. Condition: Dry and free of dust, debris, grease and other deleterious matter.

620 Preparation of existing timber substrates

1. Remedial work: Adjust boards to level and securely fix. Punch in protruding fasteners and plane or sand to achieve an even surface.
2. Defective boards: Give notice.
3. Moisture content: Not more than 22% at time of covering. Give notice if greater than 16%.

625 Existing membrane

1. Defective, unsuitable or missing membrane: Give notice.

627 Existing AVCL

1. Defective, unsuitable or missing AVCL: Give notice.

630 Plywood overlay

1. Standard: Manufactured to an approved national standard and to BS EN 636, section 8 (plywood for use in humid conditions).
    1.1. Sheet size: 2400 or 1200 x 1200 mm and 6 mm thick.
2. Moisture content: Not more than 22% at time of covering. Give notice if greater than 16%.
3. Laying: Parallel to perimeter edges with cross joints staggered and a 0.5-1 mm gap between sheets.
4. Fixing: With 25 mm annular ringed shank copper or stainless steel nails, at 300 mm grid centres over the area of each sheet and at 150 mm centres along edges, set in 10 mm from perimeter edges and in pairs across joints.
    4.1. Nail heads: Set flush with or just below the surface.

640 Timber for use with leadwork

1. Quality: Planed, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
2. Moisture content: Not more than 22% at time of fixing and covering. Give notice if greater than 16%.
3. Preservative treatment: Organic solvent as section Z12 and Wood Protection Association Commodity Specification C8.

645 Sheet underlay

1. Manufacturer: Contractor's choice
    1.1. Product reference: Submit proposals
2. Weight: 200 g/m²

3. Recycled content: 0% (minimum) to BS EN ISO 14021

650 Laying sheet underlay

1. Handling: Prevent tears and punctures.
2. Laying: Butt or overlap jointed onto a dry substrate.
   2.1. Fixing edges: With copper or stainless steel staples or clout nails.
   2.2. Do not lay over roof edges but do turn up at abutments.
   2.3. Wood core rolls: Fixed over sheet underlay.
   2.4. Protection: Keep dry and cover with lead at the earliest opportunity.

Fixing lead

705 Head fixing lead sheet

1. Top edge: Secured with two rows of fixings, 25 mm and 50 mm from top edge of sheet, at 75 mm centres in each row, evenly spaced and staggered.
2. Sheets less than 500 mm deep: May be secured with one row of fixings, 25 mm from top edge of sheet and evenly spaced at 50 mm centres.

710 Fixings

1. Nails to timber substrates: Copper clout nails to BS 1202-2, or stainless steel (austenitic) clout nails to BS 1202-1.
   1.1. Shank type: Annular ringed, helical threaded or serrated.
   1.2. Shank diameter: Not less than 2.65 mm for light duty or 3.35 mm for heavy duty.
   1.3. Length: Not less than 20 mm or equal to substrate thickness.
2. Screws to concrete or masonry substrates: Brass or stainless steel.
   2.1. Diameter: Not less than 3.35 mm.
   2.2. Length: Not less than 19 mm.
   2.3. Washers and plastic plugs: Compatible with screws and lead.
3. Screws to composite metal decks: Self tapping as recommended by the deck and lead manufacturer/ supplier for clips.

715 Clips

1. Manufacturer: Contractor's choice
2. Material
   2.1. Lead clips: Cut from sheets of same thickness/ code as sheet being secured.
   2.2. Copper clips
      2.2.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
      2.2.2. Temper: BS EN 1172, designation R220 in welts, seams and rolls, R240 elsewhere; dipped in solder if exposed to view.
   2.3. Stainless steel clips
      2.3.1. Thickness: 0.46 mm
      2.3.2. Grade: BS EN 10088-1, 1.4301(304) terne-coated if exposed to view.
3. Dimensions
   3.1. Width: 50 mm where not continuous.
   3.2. Length: To suit detail.

4. Fixing clips: Secure each to substrate with either two screw or three nail fixings not more than 50 mm from edge of lead sheet. Use additional fixings where lead downstands exceed 75 mm.
5. Fixing lead sheet: Welt clips around edges and turn over 25 mm.

760 Continuous clips

1. Manufacturer: Contractor's choice
2. Material: Material:
   - 2.1. Lead continuous clips
     - 2.1.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings
   - 2.2. Copper continuous clips
     - 2.2.1. Thickness: 0.60 mm
   - 2.3. Temper: BS EN 1172, designation R220 in welts, seams and rolls, R240 elsewhere.
   - 2.4. Stainless steel continuous clips
     - 2.4.1. Thickness: 0.46 mm
     - 2.4.2. Grade: BS EN 10088-1, 1.4301(304).
3. Dimensions
   - 3.1. Width: To suit detail.
4. Fixing clips: Secure at 75 mm centres.
5. Fixing lead sheet: Welt edge around continuous clip and dress down.

765 Continuous clips for cross joints in roofing

1. Lead continuous clips: 50 mm wide, cut from sheets of same thickness/ code as sheet being secured.
2. Fixing clips: Lead-weld top edge of clips to underlap sheet, 50 mm from lower edge of overlap.
3. Fixing lead sheet: Welt edge around continuous clip and dress down.

770 Wedge fixing into joints/ Chases

1. Joint/ chase: Rake out to a depth of not less than 25 mm.
2. Lead: Dress into joint/chase.
   - 2.1. Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
3. Sealant: Contractor's choice
   - 3.1. Application: As section Z22.

780 Wedge fixing into damp-proof course joints

1. Joint: Rake/ cut out under damp-proof course to a depth of not less than 25 mm.
2. Lead: Dress lead into joint.
   - 2.1. Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
3. Sealant: Contractor's choice
   - 3.1. Application: As section Z22.

790 Screw fixing into joints/ Chases

1. Joint/ chase: Rake out to a depth of not less than 25 mm.

2. Lead: Dress into joint/ chase and up back face.
    2.1. Fixing: Into back face with stainless steel screws and washers and plastics plugs at not more than 450 mm centres, at every change of direction, and with at least two fixings for each piece of lead.
3. Sealant: Submit proposals
    3.1. Application: As section Z22.

Jointing lead

810 Forming details

1. Method: Bossing or lead-welding except where bossing is specifically required.
2. Lead-welded seams: Neatly and consistently formed.
    2.1. Seams: Do not undercut or reduce sheet thickness.
    2.2. Filler strips: Of the same composition as the sheets being joined.
    2.3. Butt joints: Formed to a thickness one third more than the sheets being joined.
    2.4. Lap joints: Formed with 25 mm laps and two loadings to the edge of the overlap.
3. Bossing: Carried out without thinning, cutting or otherwise splitting the lead sheet.
    3.1. Details where bossing must be used: Ends of hollow rolls at parapet walkway

830 Standing seam joints

1. Joint allowance: 100 mm overlap, 75 mm underlap and copper or stainless steel clips at not more than 750 mm centres.
2. Forming joint: Welt overlap and clips around underlap, loosely turn over to form a standing seam of consistent cross section.

840 Wood-cored roll joints without splash lap

1. Wood core
    1.1. Size: 45 x 45 mm round tapering to a flat base 25 mm wide.
    1.2. Fixing to substrate: Brass or stainless steel countersunk screws at not more than 300 mm centres.
2. Undercloak: Dress half way around core.
3. Copper or stainless steel clips. Fix to core at not more than 450 mm centres. Do not restrict thermal movement of the undercloak.
4. Overcloak: Dress around core with edge welted around ends of clips, finishing 5 mm clear of main surface.

845 Wood-cored roll joints with splash lap

1. Wood core
    1.1. Size: 45 x 45 mm round tapering to a flat base 25 mm wide.
    1.2. Fixing to substrate: Brass or stainless steel countersunk screws at not more than 300 mm centres.
2. Undercloak: Dress three quarters around core.
    2.1. Fixing: Nail to core at 150 mm centres for one third length of the sheet starting from the head.
3. Overcloak: Dress around core and extend on to main surface to form a 40 mm splash lap.

847 Hollow roll joints

1. Joint allowance: 125 mm overcloak and 100 mm undercloak.
2. Copper or stainless steel clips: Fix to substrate at not more than 450 mm centres.
3. Overcloak: Welt with clips around undercloak to form a roll of consistent cross section.

860 Drips with splash laps

1. Underlap: Dress into rebate along top edge of drip.
    1.1. Fixing: One row of nails at 50 mm centres on centre line of rebate.
2. Overlap: Dress over drip and form a 40 mm splash lap.

862 Drips with splash laps

1. Underlap: Dress up full height of drip upstand.
    1.1. Fixing: Two rows of nails to lower level substrate, 25 mm and 50 mm from face of drip. At 75 mm centres in each row, evenly spaced and staggered. Seal over nails with a soldered or lead-welded dot.
2. Overlap: Dress over drip and form a 75 mm splash lap.
    2.1. Fixing: Lead clips, lead-welded to underlap, with not less than one per bay.

865 Drips without splash laps

1. Underlap: Dress into rebate along top edge of drip.
    1.1. Fixing: One row of nails at 50 mm centres on centre line of rebate.
2. Overlap: Dress over drip to just short of lower level.

880 Welted joints

1. Joint allowance: 50 mm overlap and 25 mm underlap.
2. Copper or stainless steel clips: Fix to substrate at not more than 450 mm centres.
3. Overlap: Welt around underlap and clips and lightly dress down.

950 Plaques – existing

1. Existing plaques/ inscriptions: Retain and refix in approved locations by lead-welding along edges.

Ω End of Section

J42
Single-layer polymeric sheet roof coverings

To be read with preliminaries/ general conditions.

10 Warm deck roof covering

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Substrate: Plywood deck
   2.1. Preparation: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Roof covering system
   3.1. Manufacturer: Contractor's choice
      3.1.1. Product reference: Contractor's choice
4. Lower protection layer (loose-laid): Polyester fleece
5. Air and vapour control layer: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Insulation: Rigid polyurethane foam (PU) boards, as clause 27
7. Separating layer (loose-laid): Polyester fleece
8. Waterproof membrane: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Attachment: Adhesive
10. Upper protection layer (loose-laid): Polyester-faced fleece
11. Surface protection: Not required
12. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

15 Roofing generally

1. Surfaces to be covered: Secure, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
2. Preliminary work: Complete, including:
   2.1. Grading to correct falls.
   2.2. Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
   2.3. Fixing of battens, fillets and anchoring plugs/ strips.
3. Moisture content and stability of substrate: Must not impair integrity of roof.
4. Adverse weather: Do not lay membrane at temperatures below 5°C in high winds, wet or damp conditions, unless effective temporary cover is provided over working area.
5. Unfinished areas of roof: Keep dry and protect edges of laid membrane from wind action.
6. Completed coverings: Firmly attached, fully sealed, smooth, weatherproof and free-draining.

27 Thermal insulation

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Standard: Rigid polyisocyanurate foam (PIR) roofboard to BS 4841-3
   2.1. Reaction to fire: Manufacturer's standard
   2.2. Thermal conductivity (minimum): Manufacturer's standard
   2.3. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.

2.4. Compressive strength (minimum): Manufacturer's standard
2.5. Other characteristics: None
3. Edges: Square

28 Waterproof membrane

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Width: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Colour: Contractor's choice
6. Guarantee: 25 years

29 Timber trims, etc.

1. Supplier: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Quality: Planed. Free from wane, pitch pockets, decay and insect attack, except ambrosia beetle damage.
3. Moisture content at time of covering (maximum): 22%.
4. Preservative treatment: As membrane manufacturer's/ supplier's recommendations
5. Fasteners: Sherardized steel screws
6. Fixing centres (maximum): As per the Structural Engineering Calculations and Details & Tender drawings.

30 Cover strips to joints in rigid board substrates

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Reinforced bitumen membrane: To BS 8747, Class S2P3
3. Width: 150 mm
4. Cover strip: Lay centrally over substrate joints before laying air and vapour control layers or coverings. Adhere to substrate with bonding compound along edges only.

35 Laying air and vapour control layer

1. Laying: Fully bonded, flat and smooth
2. Side and head laps: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Upstands, kerbs and other penetrations: Enclose edges of insulation. Fully seal at abutment by bonding or taping.

40 Laying warm deck roof insulation

1. Setting out
   1.1. Long edges: Fully supported and running at right angles to Direction of span.
   1.2. End edges: Adequately supported.
   1.3. Joints: Butted together.
   1.4. End joints: Staggered.

2. Attachment: Full bed of cold bitumen bonding compound
3. Mechanical fixing: Not required
4. Completion: Boards must be in good condition, well-fitting and secure.

42 Laying inverted roof insulation

1. Condition of substrate: Clean.
2. Setting out: Loose lay with staggered joints.
   2.1. Cutting: Minimize.
   2.2. Small cut pieces: Avoid at perimeters and penetrations.
   2.3. Joints: Butt together.
3. Projections, upstands, rainwater outlets, etc.: Cut insulation cleanly and fit closely around.
4. Completion
   4.1. Boards must be in good condition, well-fitting and stable.
   4.2. Cover as soon as practicable to prevent wind uplift and flotation.

45 Mechanical fixing of waterproof membrane

1. Setting out: Perpendicular to the deck direction
2. Laying: Loose lay; do not wrinkle or stretch.
3. Installing fasteners
   3.1. Use manufacturer's/ supplier's recommended methods and equipment.
   3.2. Insertion: Correct and consistent.
4. Washers/ pressure plates/ bars
   4.1. Distance from fixed edge (minimum): 10 mm
   4.2. Fixing: Flush with membrane.
5. Sheet overlaps: Extend beyond washers/ pressure plates by minimum: 50 mm.
6. Surface condition at completion: Fully sealed, smooth, weatherproof and free-draining.

50 Adhesive bonding of waterproof membrane

1. Setting out: Perpendicular to the deck direction
2. Attachment: Fully adhered on a continuous even coating of adhesive
   2.1. Do not wrinkle or stretch.
3. Surface condition at completion: Fully sealed, smooth, weatherproof and free-draining.

55 Jointing of waterproof membrane

1. Side and end joints
   1.1. Laps (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.
   1.2. Preparation: Prime, clean and dry surfaces beyond full width of joint and lap
   1.3. Sealing: Apply continuous even coverage of adhesive to both surfaces. Mate and roll together
2. Seam sealant: Even bead of liquid PVC to each joint
3. Condition at completion: Fully sealed, smooth, weatherproof and free-draining.

60 Perimeter details

1. General: Secure membrane at roof edge conditions, changes of plane, curb flashings, upstands to roof lights, etc. with mechanical fasteners.
2. Upstands, edge trims, drips, kerbs, etc: Secure preformed metal sections to roof structure with mechanical fasteners
3. Reinforcing strip: Lay at edge of horizontal roof plane and mechanically fasten
4. Roof membrane: Terminate and secure in accordance with manufacturer's/ supplier's recommendations.

65 Roof penetrations

1. Roof membrane: Cut around penetrations and secure to deck
2. Flanged sleeve
   - 2.1. Type: Form from roof membrane complete with base flange
   - 2.2. Installation: Dress over and around penetration.
   - 2.3. Seating: Flush to roof membrane
   - 2.4. Roof membrane overlap to flange (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.
   - 2.5. Sealing: Bond top edge to pipe with mastic sealant and secure with clamping ring
   - 2.6. Protection to top edge of sleeve: Flashing or weathering cravat

Ω End of Section

K10
Gypsum board dry linings/ partitions/ ceilings

Types of dry lining

115 Metal stud partition system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Partition type: Single row studs
   2.1. Centres: 600 mm
3. Partition height: Approx 2400mm
4. Head condition: Existing timber ceiling
   4.1. Deflection allowance: 15 mm maximum
5. Structural performance
   5.1. Strength grade to BS 5234-2: Medium
      5.1.1. Additional tests: Not required
   5.2. Air pressure and deflection: Not applicable
   5.3. Other requirements: Allow for weight of ceramic tiles, as section M40
6. Fire performance
   6.1. Reaction to fire: To BS EN 13501-1, class B-s3, d2 or better
   6.2. Fire resistance of complete partition assembly: To BS EN 13501-2. EI 60 or better
7. Fire separation
   7.1. Cavity fire barriers: As per P10/410 flexible cavity barrier
8. Airborne sound insulation
   8.1. Laboratory measurement of complete partition assembly:
   8.2. Weighted sound reduction index Rw (minimum) to BS EN ISO 717-1: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Metal framing: Type recommended by board manufacturer to complete the partition assembly and achieve specified performance.
10. Insulation: 25mm isover acoustic partition roll (APR 1200)
    10.1. Recycled content: Contractor's choice
    10.2. Thickness: 50 mm
11. Moisture vapour resistance (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.
12. Resilient layer: As per the Structural Engineering Calculations and Details & Tender drawings.
13. Linings: Two layers 12.5 mm Gyproc wallboard with staggered joints
14. Finishing: skim coat plaster with seamless jointing
    14.1. Primer/ Sealer: Primer to painted areas
    14.2. Accessories: Metal trims recommended by board manufacturer: Reveals
15. Other requirements: Fire-stopping around services as section P12

125 Metal stud partition system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: British Gypsum
   2.1. Product reference: GyWall Single Frame

3. Partition type: Internal partitions only
   3.1. Centres: 600 mm
4. Partition height: Aproxx 2400mm
5. Head condition: Existing timber ceiling
   5.1. Deflection allowance: 15 mm
6. Insulation: 25mm Isover Acoustic partition roll (APR1200)
   6.1. Recycled content: Contractor's choice
   6.2. Thickness: 50mm
7. Linings: Two layers 12.5 mm Gyproc walll board with staggered joints
8. Finishing: Skim coat plaster with Seamless jointing
   8.1. Primer/ Sealer: Primer to painted areas
   8.2. Accessories: Metal beads/ stops recommended by board manufacturer
9. Other requirements: Fire-stopping around services as section P12

175 Wall lining system (metal furrings)

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: British Gypsum
   2.1. Product reference: Submit proposals
3. Wall: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Furring centres: 300mm reduced to 200mm centers at external angles
5. Resilient layer: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Fire performance
   6.1. Reaction to fire: To BS EN 13501-1, class B-s3, d2 or better
   6.2. Fire resistance of complete wall lining assembly: To BS EN 13501-2. REI 30 or better
7. Linings: 12.5 mm plasterboard
8. Finishing: Skim coat plaster and Seamless jointing
   8.1. Primer/ Sealer: Primer to painted areas
   8.2. Accessories: Metal beads/ stops recommended by board manufacturer
9. Other requirements: Fire-stopping around services as section P12

205 Lining on timber

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Background: Studs at 600 mm centres
3. Metal resilient (acoustic) bars: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Fire performance
   4.1. Reaction to fire: To BS EN 13501-1, class B-s3, d2 or better
   4.2. Fire resistance: To BS EN 13501-2. REI 30 or better
5. Linings: Two layers 12.5 mm Gyproc wallboard staggerged at joints
   5.1. Fixing: Screws
6. Finishing: Skim coat plaster with Seamless jointing
   6.1. Primer/ Sealer: Primer to painted areas
   6.2. Accessories: Metal beads/ stops recommended by board manufacturer
7. Other requirements: Fire-stopping around service penetrations as section P12

215 Suspended ceiling system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 13964.
3. Evidence of compliance: Submit Declaration of Performance (DoP).
4. Lining board: Two layers 12.5 mm Gyproc wallboard stagger at joints
   - 4.1. Finishing: Skim coat plaster and Seamless jointing
     - 4.1.1. Primer/ Sealer: Primer to painted areas
   - 4.2. Accessories: Metal beads/ stops recommended by lining board manufacturer
5. Suspension system: As recommended by lining manufacturer to complete the ceiling system and achieve specified performance.
   - 5.1. Grid type: Contractor's choice
   - 5.2. Hangers: Type recommended by board manufacturer
     - 5.2.1. Length: To give ceiling soffit height above finished floor level of 2400 mm
   - 5.3. Top fixing: To suit structural soffit of timber joists at 600 mm nominal centres.
6. Insulation: Type recommended by lining manufacturer to meet specified
   - 6.1. Recycled content: Not applicable
   - 6.2. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Access units: Not required
8. Integrated services fittings: Hangers and housings for linear luminaires
9. Other requirements: Fire-stopping around service penetrations as section P12
10. System performance
    - 10.1. Standard: To BS EN 13964.
    - 10.2. Structural: The ceiling system must safely support all anticipated loads including services fittings.
      - 10.2.1. Uniformly distributed load (maximum): 0.6 kN/m²
      - 10.2.2. Additional loads/ pressures: Luminaires as drawings and schedules
      - 10.2.3. Deflection of grid between points of support (maximum): 0.0025 x span.
    - 10.3. Fire performance
      - 10.3.1. Reaction to fire: To BS EN 13501-1, class B-s3, d2 or better
    - 10.4. Fire resistance: To BS EN 13501-2. REI 30 or better
    - 10.5. Airborne sound insulation (complete floor and ceiling assembly)
      - 10.5.1. Weighted sound reduction index, Rw (minimum), to BS EN ISO 717-1: Not applicable
      - 10.5.2. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.
    - 10.6. Electrical continuity and earth bonding: Not required
    - 10.7. Other BS EN 13964 characteristics: None

255 Encasement system (metal framing)

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Structural members: As drawings
   - 3.1. Extent of protection: Columns: Four sides & Beams: Three sides.

4. Fire performance
   4.1. Fire resistance of encasement system: To BS EN 13501-2. REI 30
   4.2. Reaction to fire: To BS EN 13501-1, class B-s3, d2 or better
5. Framing system: Sizes and spacing of framing and fixings as recommended by the board manufacturer.
6. Linings: 12.5 mm gypsum fibre board
7. Finishing: Skim coat plaster and Seamless jointing
   7.1. Primer/ Sealer: Primer to painted areas
   7.2. Accessories: Metal beads/ stops recommended by board manufacturer
8. Other requirements: Plan dimensions of casings to be the same for all columns

General/ preparation

305 Compliance with performance requirements

1. Testing/ Assessment: Submit UKAS accredited laboratory reports for the following: Fire resistance: Partitions (including deflection heads and doorsets) and suspended ceilings (including access units)..
2. Materials, components and details: As used in testing/ assessment reports. If discrepancies arise, give notice.

325 Preparation of masonry to receive wall linings

1. General: Suitable to receive lining system. Redundant fixtures and services removed. Cutting, chasing and making good completed.
2. Holes, gaps, service penetrations, perimeter junctions and around openings: Seal.
3. Adhesive fixings: Prepare substrate to achieve effective bonding.
   3.1. Contaminants: Remove loose material, dirt, grease, oil, paper, etc.
   3.2. Absorption: Control by dampening, priming or applying bonding agents as necessary.

335 Additional supports

1. Framing: Accurately position and securely fix to give full support to:
   1.1. Partition heads running parallel with, but offset from main structural supports.
   1.2. Fixtures, fittings and service outlets. Mark framing positions clearly and accurately on linings.
   1.3. Board edges and lining perimeters, as recommended by board manufacturer to suit type and performance of lining.

375 New wet laid bases

1. Dpcs: Install under full width of partitions/ freestanding wall linings.
   1.1. Material: Bituminous sheet or plastics.

Components

400 Gypsum boards generally

1. Standard
   1.1. Gypsum plasterboard to BS EN 520.
   1.2. Gypsum fibre board to BS EN 15283-2.
   1.3. Evidence of compliance: Submit Declaration of Performance (DoP).

401 Gypsum plasterboard

1. Type: To BS EN 520, type A
2. Core density (minimum): 650 kg/m³.
3. Reaction to fire: Class A2-s1, d0 or better
4. Water vapour resistance factor: Manufacturer's standard
5. Thermal conductivity: 0.25 W/(m·K)
6. Other BS EN 520 characteristics: None
7. Recycled content: Contractor's choice
8. Exposed surface and edge profiles: Clean and undamaged

402 Gypsum plasterboard (vapour control)

1. Type: To BS EN 520, type A
2. Core density (minimum): 650 kg/m³.
3. Reaction to fire: Class A2-s1, d0 or better
4. Water vapour resistance factor: Manufacturer's standard
5. Thermal conductivity: Manufacturer's standard
6. Other BS EN 520 characteristics: None
7. Recycled content: Contractor's choice
8. Moisture vapour resistance of backing layer (minimum): 60 MNs/g.
9. Exposed surface and edge profiles: Clean and undamaged

403 Gypsum plasterboard (moisture-resistant)

1. Type: To BS EN 520, type H1 and F
2. Core: Moisture-resistant and including fibers and/ or other additives for improved cohesion
   2.1. Density (minimum): 800 kg/m3
3. Paper facings: Moisture-resistant.
4. Reaction to fire: Class A2-s1, d0 or better
5. Water vapour resistance factor: Manufacturer's standard
6. Thermal conductivity: Manufacturer's standard
7. Other BS EN 520 characteristics: None
8. Recycled content: Contractor's choice
9. Exposed surface and edge profiles: Clean and undamaged

404 Gypsum plasterboard (improved fire protection)

1. Type: To BS EN 520, type F
2. Core: Including fibres and/ or other additives for improved cohesion.
   2.1. Density (minimum): 800 kg/m³.
3. Reaction to fire: Manufacturer's standard
4. Water vapour resistance factor: Manufacturer's standard
5. Thermal conductivity: Manufacturer's standard
6. Other BS EN 520 characteristics: BS EN 15283-2
7. Recycled content: Contractor's choice
8. Exposed surface and edge profiles: Clean and undamaged

430 Access panels

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type: 60 minutes fire protection to BS EN 13501-2
   2.1. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.2. Fire performance
      2.2.1. Reaction to fire: To BS EN 13501-1, class B-s3, d2 or better
      2.2.2. Fire resistance: To BS EN 13501-2. REI 30 or better
3. Frame: Bead for taping and jointing
4. Panel: Metal with powder coated factory finish
5. Lock: Tamper-proof and operated by castellated key

432 Metal studs

1. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   1.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.

Installation

435 Dry linings generally

1. General: Use fixing, jointing, sealing and finishing materials, components and installation methods recommended by board manufacturer.
2. Cutting gypsum boards: Neatly and accurately without damaging core or tearing paper facing.
   2.1. Cut edges: Minimize and position at internal angles wherever possible. Mask with bound edges of adjacent boards at external corners.
3. Fixings boards: Securely and firmly to suitably prepared and accurately levelled backgrounds.
4. Finishing: Neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

445 Ceilings

1. Sequence: Fix boards to ceilings before installing dry lined walls and partitions.
2. Orientation of boards: Fix with bound edges at right angles to supports and with ends staggered in adjacent rows.
3. Two layer boarding: Stagger joints between layers.

455 Metal framing for partitions/ wall linings

1. Setting out: Accurately aligned and plumb.
   1.1. Frame/ Stud positions: Equal centres to suit specified linings, maintaining sequence across openings.
   1.2. Additional studs: To support vertical edges of boards.
2. Fixing centres at perimeters (maximum): 600 mm.
3. Openings: Form accurately.
   3.1. Doorsets: Use sleeved or boxed metal studs and/ or suitable timber framing to achieve strength grade requirements for framing assembly and adequately support weight of door.
   3.2. Services penetrations: Allow for associated fire-stopping.

465 Staggered stud partitions

1. Horizontal frame members (noggins, bearers, etc.) and boards: Fix between alternate studs and not touching adjacent offset studs.

475 Metal furrings for wall linings

1. Setting out: Accurately aligned and plumb.
    1.1. Vertical furring positions: Equal vertical centres to suit specified linings, maintaining sequence across openings. Position adjacent to angles and openings.
    1.2. Additional vertical furrings: To support vertical edges of boards and at junctions with partitions.
    1.3. Horizontal furring positions: To provide continuous support to edges of boards.
2. Adhesive bedding to furrings
    2.1. Dabs: Length 200 mm (minimum). Located at ends of furrings and thereafter at 450 mm (maximum) centres.
    2.2. Junctions with partitions: Continuous bed with no gaps across cavity.

485 Suspended ceiling grids

1. Setting out: Accurately aligned and level.
    1.1. Grid members and hangers: Centres to suit specified linings and imposed loads.
    1.2. Additional grid members: Provide bracing and stiffening at upstands, partition heads, access hatches, etc.
2. Fixing: Securely at perimeters, grid joints, top and bottom hanger fixings.

505 Installing mineral wool insulation

1. Fitting insulation: Closely butted joints and no gaps. Use fasteners to prevent slumping or displacement.
2. Services
    2.1. Electrical cables overlaid by insulation: Sized accordingly.
    2.2. Ceilings: Cut insulation around electrical fittings, etc.

510 Sealing gaps and air paths

1. Location of sealant: To perimeter abutments and around openings.
    1.1. Pressurized shafts and ducts: At board-to-board and board-to-metal frame junctions.
2. Application: To clean, dry and dust free surfaces as a continuous bead with no gaps.
    2.1. Gaps greater than 6 mm between floor and underside of gypsum board: After sealing, fill with jointing compound.

530 Cavity fire barriers within partitions/ wall linings

1. Metal framed systems
    1.1. Material: Wire-reinforced mineral wool 50 mm (minimum) thick
    1.2. Installation: Form accurately and fix securely with no gaps to provide a complete barrier to smoke and flame.
2. Adhesive fixed wall lining systems
    2.1. Material: Adhesive compound.
    2.2. Installation: Form in a continuous line with no gaps to provide a complete barrier to smoke and flame.

545 Cavity fire barriers within suspended ceilings

1. Type: As recommended by board manufacturer to meet specified performance
2. Fire resistance: To BS EN 13501-2, REI 30 or better
3. Ceiling void subdivision: Fix barriers as drawings.
4. Fixing at perimeters and joints: Secure, stable and continuous with no gaps, to provide a complete barrier to smoke and flame.
5. Service penetrations: Cut and pack to maintain barrier integrity. Sleeve flexible materials. Adequately support services passing through barrier.
6. Ceiling systems for fire protection: Do not impair fire-resisting performance of ceiling system.

555 Fire-stopping at perimeters of dry lining systems

1. Material: Tightly packed mineral wool or intumescent mastic/ sealant.
2. Application: To perimeter abutments to provide a complete barrier to smoke and flame.

560 Joints between boards

1. Tapered edged gypsum boards
    1.1. Bound edges: Lightly butted.
    1.2. Cut/ unbound edges: 3 mm gap.
2. Square edged plasterboards: 3 mm gap.
3. Square edged gypsum fibre boards: 5 mm gap.

565 Vertical joints

1. Joints: Centre on studs.
    1.1. Partitions: Stagger joints on opposite sides of studs.
    1.2. Two layer boarding: Stagger joints between layers.

570 Horizontal joints

1. Surfaces exposed to view: Horizontal joints not permitted. Seek instructions where height of partition/ lining exceeds maximum available length of board.
2. Two layer boarding: Stagger joints between layers by at least 600 mm.
3. Edges of boards: Support using additional framing.
    3.1. Two layer boarding: Support edges of outer layer.

575 Plank plasterboard

1. First layer in two layer boarding: Square edged with long edges at right angles to studs.

580 Insulation backed plasterboard

1. General: Do not damage or cut away insulation to accommodate services.
2. Installation at corners: Carefully cut back insulation or plasterboard as appropriate along edges of boards to give a continuous plasterboard face, with no gaps in insulation.

590 Fixing gypsum board to metal framing/ Furrings

1. Partitions/ Wall linings: Fix securely and firmly at the following centres (maximum):
    1.1. Single layer boarding: To all framing at 300 mm centres. Reduce to 200 mm centres at external angles.

1.2. Multi-layer boarding: Face layer at 300 mm centres, and previous layers around perimeters at 300 mm centres.

2. Ceilings: 230 mm. Reduce to 150 mm at board ends and at lining perimeters.
3. Position of screws from edges of boards (minimum): 10 mm.
   3.1. Screw heads: Set in a depression. Do not break paper or gypsum core.

592 Fixing insulation backed plasterboard to metal furrings

1. Fixing to furrings: In addition to screw fixings apply continuous beads of adhesive sealant to furrings.

595 Deflection heads

1. Fixing boards: Do not fix to head channels.

610 Fixing gypsum board to timber

1. Fixing to timber: Securely at the following centres (maximum):
   1.1. Nails: 150 mm.
   1.2. Screws to partitions/ wall linings: 300 mm. Reduce to 200 mm at external angles.
   1.3. Screws to ceilings: 230 mm.
2. Position of nails/ screws from edges of boards (minimum)
   2.1. Bound edges: 10 mm.
   2.2. Cut/ unbound edges: 13 mm.
3. Position of nails/ screws from edges of timber supports (minimum): 6 mm.

620 Fixing gypsum board with adhesive dabs

1. Setting out boards: Accurately aligned and plumb.
2. Fixing to substrates: Securely using adhesive dabs.
3. Adhesive dab spacings for each board
   3.1. Horizontally: One row along top edge and one continuous dab along bottom edge.
   3.2. Vertically: One row along each edge and thereafter at intermediate spacings to suit size of board:
4. Thickness (mm) Width (mm) Dab centres (mm)
5. 9.5 1200 400
6. 9.5/12.5 900 450
7. 12.5 1200 600
8. Adhesive dab dimensions (width x length): At least 50-75 mm x 250 mm.
   8.1. Position of dabs from edges/ ends of boards (minimum): 25 mm.

625 Fixing insulation backed plasterboard with adhesive dabs

1. Fixing to substrates: In addition to adhesive dab fixings, secure boards with nailable plugs in locations recommended by board manufacturer.

630 Fixing insulation backed plasterboard with adhesive spots

1. Setting out boards: Accurately aligned and plumb.
2. Fixing to substrates: Securely using adhesive spots and mechanical fastenings.
3. Adhesive spot spacings to each board: Four vertical rows, at 400 mm centres in each row.

4. Adhesive spot diameters (minimum): 25 mm.
5. Mechanical fasteners: Nailable plugs in locations recommended by board manufacturer.

Finishing

650 Level of dry lining across joints

1. Sudden irregularities: Not permitted.
2. Joint deviations: Measure from faces of adjacent boards using methods and straightedges (450 mm long with feet/ pads) to BS 8212, clause 3.3.5.
   2.1. Tapered edge joints
      2.1.1. Permissible deviation (maximum) across joints when measured with feet resting on boards: 3 mm.
   2.2. External angles
      2.2.1. Permissible deviation (maximum) for both faces: 4 mm.
   2.3. Internal angles
      2.3.1. Permissible deviation (maximum) for both faces: 5 mm.

670 Seamless jointing to gypsum boards

1. Cut edges of boards: Lightly sand to remove paper burrs.
2. Filling and taping: Fill joints, gaps and internal angles with jointing compound and cover with continuous lengths of paper tape, fully bedded.
3. Protection of edges/ corners: Reinforce external angles, stop ends, etc. with specified edge/ angle bead.
4. Finishing: Apply jointing compound. Feather out each application beyond previous application to give a flush, smooth, seamless surface.
5. Nail/ screw depressions: Fill with jointing compound to give a flush surface.
6. Minor imperfections: Remove by light sanding.

680 Skim coat plaster finish

1. Plaster type As recommended by board manufacturer..
   1.1. Thickness: 2-3 mm.
2. Joints: Fill and tape except where coincident with metal beads.
3. Finish: Tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.

692 Rigid beads/stops

1. Internal: To BS EN 13658-1.
2. External: To BS EN 13658-2.

695 Installing beads/ Stops

1. Cutting: Neatly using mitres at return angles.
2. Fixing: Securely using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
3. Finishing: After joint compounds/ plasters have been applied, remove surplus material while still wet from surfaces of beads exposed to view.

725 Repairs to existing gypsum board

1. Performance of repairs must match original specified performances.

2. Filling small areas with broken cores: Cut away paper facing, remove loose core material and fill with jointing compound.
   2.1. Finish: Flush, smooth surface suitable for redecoration.
3. Large patch repairs: Cut out damaged area and form neat hole with rectangular sides. Replace with matching gypsum board.
   3.1. Fixing: Use methods to suit type of dry lining, ensuring full support to all edges of existing and new gypsum board.
   3.2. Finishing: Fill joints, tape and apply jointing compound to give a flush, smooth surface suitable for redecoration.

Ω End of Section

K20
Timber board flooring/ sarking/ linings/ casings

To be read with preliminaries/ general conditions.

120 Timber board flooring

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Substrate: As existing on site
3. Boards
   - 3.1. Standard: To BS EN 14342.
     - 3.1.1. Evidence of compliance: Submit.
   - 3.2. Reaction to fire classification: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 3.3. Wood species: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 3.4. Quality: To BS EN 13990, Grade A
   - 3.5. Finished face width (exposed width after fixing): As per the Structural Engineering Calculations and Details & Tender drawings.
   - 3.6. Finished thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 3.7. Edge profile: Tongued and grooved
   - 3.8. Moisture content at time of fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 4.1. Fixing centres: In accordance with BS 8201.

150 Battened timber board floating floor

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Substrate: 50 mm joists at 450 mm centres
3. Preparation: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Resilient layer: 75 mm wide continuous strips of 25 mm mineral wool (density 80-140 kg/m³) to tops of joists
5. Loose laid battens: 50 x 45* mm (*regularized) softwood at 400 mm centres
6. Thermal insulation between battens: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Recycled content of resilient layer and/ or thermal insulation: Contractor's choice
8. Vapour check: Not required
9. Boards
   - 9.1. Standard: To BS EN 14342.
     - 9.1.1. Evidence of compliance: Submit.
   - 9.2. Reaction to fire classification: Class A1fl
   - 9.3. Wood species: Contractor's choice
   - 9.4. Quality: To BS EN 13990, Grade A
   - 9.5. Finished face width (exposed width after fixing): As per the Structural Engineering Calculations and Details & Tender drawings.

9.6. Finished thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
9.7. Edge profile: Tongued and grooved
9.8. Moisture content at time of fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
9.9. Fixing: 50 mm oval brad head nails, two per board
9.10. Fixing centres: In accordance with BS 8201.

220 Timber board sarking

1. Substrate: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Boards: Free from decay, insect attack (except ambrosia beetle damage) and wane.
   2.1. Reaction to fire classification: Class A2-s3, d2 or better
   2.2. Wood species: Contractor's choice
   2.3. Quality: Blue stain, fissures, knot holes and loose or unsound knots not permitted on exposed face (underside) of boards
   2.4. Surface finish: Planed
   2.5. Edge profile: Tongued and grooved
   2.6. Finished face width (exposed width after fixing): As per the Structural Engineering Calculations and Details & Tender drawings.
   2.7. Finished thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.8. Moisture content at time of fixing: Not more than 19%.
3. Treatment
   3.1. Standard: To NBS section Z12 and Wood Protection Association Commodity Specification: Fire-retardant treatment FR4.
   3.2. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
      3.2.1. For preservative treatment: Not required
      3.2.2. For fire-retardant treatment: INT 2
4. Fixing: 65 mm x 4 mm galvanized oval brad head wire nails, two per board to each rafter
5. Termination of sarking at roof edges and junctions: In accordance with drawings and specification for roof covering.

Workmanship

310 Workmanship generally

1. Protection during and after installation: Keep boards dry. Protect from dirt, stain and damage until Completion.
2. Boards to be used internally: Do not install until building is watertight.
3. Methods of fixing, and fasteners: As section Z20.
4. Moisture content of timber supports at time of fixing boards: Not more than 18%.

320 Moisture content of new concrete/ Screed substrates for floating floors

1. Test for moisture content
   1.1. Standard: To BS 8201, Annex A, using an accurately calibrated hygrometer.
   1.2. Readings: Take in corners, along edges, and at random points over the area being tested.
2. Acceptability: Do not lay flooring until all readings show 75% relative humidity or less.

330 Moisture content of timber

1. Conditions during and after installation: Control ambient temperature and humidity conditions to maintain moisture content at average level specified in BS EN 942, Table B.1 for the relevant service condition until Completion.
2. Test for moisture content: When instructed, using an approved moisture meter.

340 Installing vapour check membrane to floating floors

1. Location: Immediately below the floating layer.
2. Joints: Overlap by at least 150 mm and seal with vapour-resistant tape.
3. Perimeter/ upstands: Turn membrane up around perimeter of flooring and around any upstands and seal to top face of boards using polyethylene double-sided adhesive tape.
    3.1. Excess material: Trim off neatly after fixing skirting boards/ cover beads.
4. Membrane condition: Intact, clean and dry prior to laying flooring.

345 Battens for floating floors

1. Quality of timber: Free from decay, insect attack (except ambrosia beetle damage) and with no knots wider than half the width of the section.
2. Surface finish: Planed all round
3. Treatment: Preservative impregnation.
    3.1. Standard: To NBS section Z12 and Wood Protection Association Commodity Specification C8.
    3.2. Type: Organic solvent
4. Moisture content at time of fixing boards: Not more than 16%.

347 Battens for floating floors

1. Quality of timber: Free from decay, insect attack (except ambrosia beetle damage) and with no knots wider than half the width of the section.
2. Surface finish: Planed all round
3. Moisture content at time of fixing boards: Not more than 16%.

350 Treated timber

1. Surfaces exposed by minor cutting and/ or drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

360 Access panels

1. Size and position: Agree before fixing boards.
2. Additional noggings/ dwangs, battens, etc.: Provide as necessary.

370 Fixing boards

1. Environmental conditions: Do not fix boards when ambient temperature is at or below 0°C, or above 30°C.
2. Generally: Fix boards securely to each support to give flat, true surfaces free from undulations, lipping, splits and protruding fasteners.
3. Timber movement: Position boards and fixings to prevent cupping, springing, excessive opening of joints and other defects.
4. Heading joints: Tightly butted, central over supports and at least two board widths apart on any one support.

5. Edges: Plane off proud edges.
6. Exposed nail heads: Neatly punch below surface.

Ω End of Section

K45
Suspended ceiling system alterations

General

110 Definitions

1. Ceiling: Items collectively constituting the ceiling surface, including infill units, boards, stretched fabric, access units and grid.
2. Ceiling system: Ceiling plus suspension components and integrated services fittings.

160 Board-suspended ceiling system alterations

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
    2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Suspension type: As existing
4. Grid: As existing
5. Boards: Gypsum
6. Access units: No alterations proposed
7. Accessories: As existing
8. Integrated services fittings: As existing
9. Void barriers: As existing
10. Acoustic insulation: As existing
11. Performance: None

Products

310 Products generally

1. Ceiling systems and components: To BS EN 13964.

315 Suspension system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Scope: Include all hangers, fixings, main runners, cross members, primary channels, perimeter clips, splines, noggins, clips, bracing, bridging etc. necessary to complete the ceiling and, where applicable, achieve specified performance.
3. Manufacturer: Submit proposals
    3.1. Product reference: Submit proposals
4. Hangers: Wire
    4.1. Material: Galvanized steel
    4.2. Top fixings: Anchor bolts
5. Grid
    5.1. Module: 500 x 500 mm
    5.2. Type: C section
    5.3. Size: 15 mm
    5.4. Material: Aluminium

5.5. Finish: Powder coating as section Z31
5.6. Colour: White RAL 9010

350 Boards

1. Description: - GYPSUM
2. Performance: As per clause 160
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Recycled content: Contractor's choice
5. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Thickness: 12 mm
7. Fillets and cover strips: 9 mm thick across full width of channel
   7.1. Finish: Match textured plastics coating
   7.2. Colour: White RAL 9010

370 Infill units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Performance: As per clause 130
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Material: Gypsum plasterboard
5. Recycled content: Contractor's choice
6. Size: 500 x 500 mm
7. Edge profile: Tegular
8. Finish: Powder coating as section Z31 to panel surfaces
   8.1. Colour: White RAL 9010

390 Access units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Finish: Prefinished
   4.1. Colour: White RAL 9010

400 Accessories

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material: Aluminium
4. Size: 32 x 19 mm
5. Colour: White RAL 9010
6. Fixings to perimeter: Contractor's choice
7. Fixing centres (maximum): 450 mm

8. Joints: Mitre

405 Timber edge battens

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type: Planed softwood to BS EN 942, Class J10.
   2.1. Moisture content at time of fixing: 15% ± 2%.
3. Finished size: 21 x 44 mm

410 Air plenum barriers

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material: Rigid or semi-rigid non-porous sheets with smooth non-dusting surfaces.
3. Reaction to fire (minimum): C-s3, d2 to BS EN 13501-1

415 Cavity fire barriers

1. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   1.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Ceiling system void subdivision (maximum): 40 m
3. Fire
   3.1. Reaction to fire (minimum): C-s3, d2 to BS EN 13501-1
   3.2. Resistance to fire (minimum): EI 30 to BS EN 13501-2
4. Material: Wire-reinforced mineral wool

425 Insulation

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Thickness: 50 mm
4. Density: 45 kg/m³
5. Recycled content: Contractor's choice
6. Facings and wrappings: Aluminium foil to back (facing void) and edges, white glass fibre tissue to front

Execution

610 Preparation

1. Documentation: Obtain available documentation of the existing ceiling system and services, including record drawings and maintenance manual. Check on site.
2. Discrepancies: Give notice

620 Execution generally

1. Workmanship: In accordance with BS EN 13964 Annex A.
2. Designated ceiling system components: Remove carefully without affecting surrounding areas.
3. Disposal of removed components: Set aside for inspection

4. Retained components: Do not distort or damage retained components.
5. Reuse of ceiling system components
   5.1. Condition: Undamaged, free from distortion, clean.
   5.2. Units and boards: Match adjacent areas where appropriate.
6. Cutting units, boards and components: Cut neatly and accurately. Maintain edge profiles.
   6.1. Openings: Suit sizes and edge details of fittings.

650 Setting out

1. General: Maintain ceiling system accurately, continuous, even, and jointed at regular intervals. Provide level soffits free from undulations, lipping and distortions in grid members.
2. Infill units, access units, integrated services: Fit and align correctly.
3. Minimum size for edge and perimeter infill units half standard width or length where practicable.
4. Grid: Position to suit infill unit sizes. Allow for permitted deviations from nominal sizes.
5. Infill joints and exposed suspension members: Straight, aligned and parallel to walls or setting out lines. Where building elements and features to which the ceiling system relates are not square, straight or level, give notice.

670 Installing suspension

1. Fixing
   1.1. Angle or strap hangers: Do not rivet for top fixing.
   1.2. Wire hangers: Tie securely with tight bends to loops to prevent vertical movement.
2. Installation
   2.1. Alignment Vertical or near vertical.
   2.2. Maintain straight, with suitable tension and without bends or kinks.
   2.3. Do not allow hangers to press against fittings, services and insulation covering ducts and pipes.
3. Obstructions: Where obstructions prevent vertical installation, either:
   3.1. brace diagonal hangers against lateral movement; or
   3.2. hang ceiling system on an appropriate rigid sub-grid bridging across obstructions and supported to prevent lateral movement.
4. Extra hangers: Provide as required to carry additional loads.

675 Installing perimeter trims

1. Jointing: Neat and accurate, without lipping or twisting.
   1.1. External and internal corners: Mitre joints.
   1.2. Intermediate butt joints: Minimize. Use longest available lengths of trim. Align adjacent lengths, with matching joints.
2. Fixing: Fix firmly to perimeter wall or other building structure.
   2.1. Fixing centres: As existing.
3. Finish: Apply before ceiling grid is installed.
   3.1. Prime new timber edge battens with undercoat and final coat to visible surfaces.

680 Installing boards

1. Fixing boards to grids: Screw boards securely and firmly to grid members.
2. Surface: Provide a flat surface free from bowing and lipping. Set heads of screws below surface of boards and fill flush with surface.

3. Movement joints: Provide as appropriate for the area of ceiling and align with movement joints in surrounding structure.
4. Boards applied in two or more layers: Stagger joints.
5. Board edges: Fully support. Screw to grid members.

700 Coordination with services

1. Preparation: Check existing position of services against proposed alterations.
2. Clashes between services and ceiling system: Give notice.
3. Coordination: Programme works to minimize impact.
4. Services disconnection: Give notice.

710 Integrated services

1. General: Position services accurately, support adequately. Align and level in relation to the ceiling. Alterations must not diminish performance of ceiling system.
2. Surface spread of flame rating of additional supporting material: Match ceiling material.
3. Services outlets
    3.1. Supported by ceiling system: Provide additional hangers.
    3.2. Independently supported: Provide flanges to support altered ceiling system.

715 Luminaires

1. Independently support luminaires: Adjust suspension to line and level of ceiling as necessary.
2. Surface mounted luminaires: Do not inhibit designed grid expansion in fire.
3. Modular fluorescent recessed luminaires: Compatible with ceiling module. Extension boxes must not foul ceiling system.
4. Continuous recessed rows of luminaires: Provide flanges for support of grid and infill units, unless mounted above grid flanges. Retain in place with lateral restraint.
5. Fire protecting and resisting ceiling systems: Luminaires must maintain protection integrity of ceiling system.
6. Access: Provide access for maintenance of luminaires.

720 Mechanical services

1. Fan coil units
    1.1. Inlet and outlet grilles: Trim ceiling grid and infill units to suit.
    1.2. Void clearance beneath: Sufficient for ceiling system and fan coil components.
    1.3. Suspension and connections: Permit accurate setting out and levelling of fan coil units.
2. Air grilles and diffusers
    2.1. Linear air diffusers: Provide flanges for support of grid and infill units. Provide for displacement of ceiling grid. Retain in place with lateral restraint.
    2.2. Grille and diffuser ceiling joints: Provide smudge rings and edge seals.

725 Other services

1. Smoke detectors and PA speakers
    1.1. Infill units: Scribe to suit.
    1.2. Flexible connections: Required.
2. Sprinkler heads: Carefully set out and level.

730 Installing insulation

1. Fitting: Fit accurately and firmly with closely butted joints and no gaps.
2. Insulation within individual infill units: Fit closely. Secure to prevent displacement when infill units are installed or subsequently lifted. Reseal cut dustproof sleeving.
3. Width: Lay insulation in the widest practical widths to suit grid member spacings.
4. Services: Do not cover electrical cables not sized accordingly. Cut insulation carefully around electrical fittings, etc. Do not lay insulation over luminaires.
5. Sloping and vertical areas of ceiling system: Fasten insulation to prevent displacement.

735 Installing cavity fire barriers

1. Fixing
   1.1. General: Fix firmly to channels or angles at abutments to building structure.
   1.2. At perimeters and joints: Secure. Provide permanent stability and continuity with no gaps. Provide a complete barrier to smoke and flame.
2. Joints: Form to preserve integrity in fire.
3. Service penetrations: Cut and pack to maintain barrier integrity. Sleeve flexible materials. Adequately support services passing through the barrier.
   3.1. Ceiling systems intended for fire protection: Do not impair fire-resisting performance of ceiling system.
   3.2. Ceiling systems not intended for fire protection: Do not mechanically interlink barriers with ceiling system.

805 Electrical continuity and earth bonding

1. Inclusion in finished work: Not required

Completion

910 Documentation

1. Building manual and records: Update showing alterations made.

930 Tools

1. Access tools: Return tools.

Ω End of Section

L10
Windows/ rooflights/ screens/ louvres

General

110 Evidence of performance

1. Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

115 Timber procurement

1. Timber (including timber for wood-based products): Obtained from well managed forests and/ or plantations in accordance with:
   1.1. The laws governing forest management in the producer country or countries.
   1.2. International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
2. Documentation: Provide either in accordance with chain of custody certification scheme requirements:
   2.1. Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
   2.2. Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.
3. Chain of custody certification scheme: In accordance with UK Government Timber Procurement Policy (UKTPP), i.e. FSC, GiB or PEFC
   3.1. Other evidence: UK Government Timber Procurement Policy Category B

120 Pre-construction survey

1. Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
2. Primary support structure: Carry out survey sufficient to verify that required accuracy and security of erection can be achieved.
3. Timing: Before fabrication.

140 Control samples

1. Procedure
   1.1. Finalize component details.
   1.2. Fabricate one of each of the following designated items as part of the quantity required for the project.
   1.3. Obtain approval of appearance and quality before proceeding with manufacturer of the remaining quantity.

150 Daylight performance

1. Daylight calculations: In accordance with BS 8206-2 and CIBSE 'Lighting guide LG10'
2. BREEAM requirements
   2.1. Submit: Daylight performance schedule
   2.2. Calculations showing: Average daylight factor expressed as a percentage for each room/ area

155 View out

1. Windows/ opening sizes and position: Design to meet BREEAM 'View out' criteria for relevant building type.
2. Submit design plan and elevation drawings showing the following
   2.1. All BREEAM defined 'relevant areas' dependent on building type and room depths.
   2.2. Actual or notional workstation/ desk layouts.
   2.3. Window/ open areas.
3. Submit site plan showing: Building location and proximity to external obstructions.

160 Potential for natural ventilation

1. Submit design plan and elevation drawings, and calculations confirming the following: A copy of the results from a software modelling tool recommended in CIBSE AM10

Products

205 Window materials specification

1. Minimum BRE 'Green Guide to Specification Online' rating: A+

330 Aluminium window units

1. Manufacturer: AluK (GB) Ltd
   1.1. Contact details
      1.1.1. Address: Newhouse Farm Industrial Estate
      Mathern
      Chepstow
      NP16 6UD
      1.1.2. Telephone: +44 (0)1291 639739
      1.1.3. Web: uk.aluk.com
      1.1.4. Email: info.uk@aluk.com
   1.2. Product reference: AluK C70S Open Out Thermally Broken Window System (Fixed Light: Anodized.)
2. Dimensions and configurations: Top hung vent.
3. Product performance
   3.1. Weather performance
      3.1.1. Air permeability: Class 4 (600 Pa).
      3.1.2. Watertightness: E1500 (1500 Pa).
      3.1.3. Resistance to wind load: E2400 (2400 pa).
   3.2. Safety
      3.2.1. Security level: Secured By Design certification and to PAS 24.
   3.3. Thermal
      3.3.1. Whole window U-value: 1.1 W/m²K.
4. Frame
   4.1. Finish as delivered
      4.1.1. Coating: Polyester powder coated.
      4.1.2. Colour: Matt.
      4.1.3. Film thickness (minimum): 60 micrometres.

4.2. Ventilator: Trickle vents

5. Glazing or infill
   5.1. Requirements: Glazing.
6. Operation
   6.1. Type: Manual.
7. Execution: Fixing of aluminium frames.
8. Texture: Matt.
9. Bead: Square.

490 Natural smoke and heat exhaust ventilators Type A

1. Manufacturer: VELUX Commercial
   1.1. Contact details
      1.1.1. Address: VELUX Commercial
      Woodside Way
      Glenrothes
      Fife
      KY7 4ND
      1.1.2. Telephone: +44 (0) 1592 778916
      1.1.3. Web: www.veluxcommercial.co.uk
      1.1.4. Email: sales@veluxcommercial.co.uk
   1.2. Product reference: VELUX Modular Rooflights (Linearlight - double glazed, Sun1, 2.8 m² < a ≤ 4.0 m²)
2. Form: Modular.
3. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Product performance
   4.1. Fire performance
      4.1.1. Reaction to fire: To EN 13501-1 Class B, S1 d0.
   4.2. Whole window U-value: 1.6 W/m2K.
5. Frame
   5.1. Material: Aluminium.
   5.2. Finish
      5.2.1. Coating: Powder coated.
      5.2.2. Colour: Traffic grey RAL 7043.
6. Glazing or infill
   6.1. Type: Toughened outer glass and laminated inner safety glass solution.
   6.2. Construction: Double glazed
   6.3. Coating: Low E coating.
7. Integral kerb: Prefabricated, insulated timber upstand.
8. Operation
   8.1. Type: Venting - Powered, electric (chain actuator).
   8.2. Control: Building Management System.
9. Accessories: Rain Sensor (WLA 331), Control Unit (WCC103, WCC 310/320), Control Switch (WSK 102/103).
10. Blinds: Grey RMR 8805.
11. Operation: Blinds: Open System ±24V (OS ±24V DC).

12. Control switch: Blinds: KLI 312 - Wall switch.
13. Air permeability: To EN 12207 and EN 1026, Class 4.
14. Light Transmittance (Tv): Manufactures recommendation
15. Glass units / panels and whole product U-values/G-value: Manufactures Recommendation
16. Wind load resistance: To EN 12210 and EN 12211, Class C5.
17. Watertightness: To EN 12208 and EN 1027, Class E1200.
18. Impact resistance: To EN 13049 and EN 13050, Class 4.

Execution

710 Protection of components

1. General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry floored and covered storage.
2. Stored components: Stack vertical or near vertical on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

730 Priming/ sealing

1. Wood surfaces inaccessible after installation: Prime or seal as specified before fixing components.

740 Corrosion protection

1. Surfaces to be protected: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Protective coating: Two coats of bitumen solution to BS 6949 or an approved mastic-impregnated tape.
    2.1. Timing of application: Before fixing components.

750 Building in

1. General: Not permitted unless indicated on drawings.
    1.1. Brace and protect components to prevent distortion and damage during construction of adjacent structure.

755 PVC-U window installation

1. Standard: In accordance with clause 783 and British Plastics Federation ‘Code of practice for the survey and installation of windows and external doorsets’.

760 Replacement window installation

1. Standard: In accordance with BS 8213-4.

765 Window installation generally

1. Installation: Into prepared openings.
2. Gap between frame edge and surrounding construction
    2.1. Minimum: As per the Structural Engineering Calculations and Details & Tender drawings.
    2.2. Maximum: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Distortion: Install windows without twist or diagonal racking.

766 Location of openable windows in naturally ventilated buildings

1. Location: Over 10 m from sources of external pollution.

770 Damp-proof courses in prepared openings

1. Location: Ensure correct positioning in relation to window frames. Do not displace during fixing operations.

780 Fixing of wood frames

1. Standard: As section Z20.
2. Fasteners: 25 x 3 x 150 mm galvanized carbon steel frame cramps
   2.1. Spacing: When not pre-drilled or specified otherwise, position fasteners not more than 150 mm from ends of each jamb, adjacent to each hanging point of opening lights, and at maximum 450 mm centres.

781 Fixing of steel frames

1. Standard: As section Z20.
2. Fasteners: 25 x 3 x 150 mm galvanized carbon steel frame cramps
   2.1. Spacing: When not pre-drilled or specified otherwise, position fasteners not less than 50 mm and not more than 190 mm from ends of each jamb, adjacent to each hanging point of opening lights and at maximum 900 mm centres.

782 Fixing of aluminium frames

1. Standard: As section Z20.
2. Fasteners: Stainless steel wood screws
   2.1. Spacing: When not pre-drilled or specified otherwise, position fasteners not more than 250 mm from ends of each jamb, adjacent to each hanging point of opening lights, and at maximum 600 mm centres.

783 Fixing of PVC-U frames

1. Standard: As section Z20.
2. Fasteners: Stainless steel wood screws
   2.1. Spacing: When not pre-drilled or specified otherwise, position fasteners 150-250 mm from ends of each jamb, adjacent to each hanging point of opening lights, but no closer than 150 mm to a transom or mullion centre line, and at maximum 600 mm centres.

784 Fixing of composite frames

1. Standard: As section Z20.
2. Fasteners: Stainless steel wood screws
   2.1. Spacing: When not pre-drilled or specified otherwise, position fasteners not more than 150 mm from ends of each jamb, adjacent to each hanging point of opening lights, and at maximum 600 mm centres.

790 Fire-resisting frames

1. Gap between back of frame and reveal: Completely fill with tightly packed mineral wool.

800 Backfilling of steel-frame sections

1. Windows fixed direct into openings: After fixing, fill back of steel frame with waterproof cement fillet.

810 Sealant joints

1. Sealant
   1.1. Manufacturer: Contractor's choice
      1.1.1. Product reference: Contractor's choice
   1.2. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
   1.3. Application: As section Z22 to prepared joints. Finish triangular fillets to a flat or slightly convex profile.

820 Ironmongery

1. Fixing: In accordance with any third-party certification conditions applicable. Assemble and fix carefully and accurately using fasteners with matching finish supplied by ironmongery manufacturer. Do not damage ironmongery and adjacent surfaces.
2. Checking/ adjusting/ lubricating: Carry out at Completion and ensure correct functioning.

Ω End of Section

L20
Doors/ shutters/ hatches

General

110 Evidence of performance

1. Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

112 Timber procurement

1. Timber (including timber for wood-based products): Obtain from well managed forests and/ or plantations in accordance with:
   1.1. The laws governing forest management in the producer country or countries.
   1.2. International agreements such as the 'Convention on International Trade in Endangered Species of wild fauna and flora (CITES)'.
2. Documentation: Provide either in accordance with chain of custody certification scheme requirements:
   2.1. Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied, or
   2.2. Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.
3. Chain of custody certification scheme: In accordance with UK Government Timber procurement policy (UKTPP), i.e. FSC, GiB or PEFC
   3.1. Other evidence: UK Government Timber procurement policy Category B

115 Fire-resisting and smoke control pedestrian doors/ door assemblies/ doorsets

1. UKCA/ UKNI/ CE marked fire-resisting and smoke control pedestrian doorsets: To BS EN 16034 and in conjunction with BS EN 13241, BS EN 14351-1 and BS EN 14351-2.
2. Door products: As defined in BS EN 12519.
3. Evidence of fire performance: Provide certified evidence, in the form of a product conformity certificate, directly relevant fire test report or engineering assessment, that each door/ door assembly/ doorset supplied will comply with the specified requirements for fire-resisting and/ or smoke control if tested to BS 476-22, BS EN 1634-1, BS EN 1634-3 or is UKCA/ UKNI/ CE marked to BS EN 16034. Specified values should not be a combination of both standards. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.
4. Components, assemblies or sets will be marked to the relevant UKCA/ UKNI/ CE marking European product standard (hEN), national product standard and/ or third-party certification rating.

120 Non-fire-resisting pedestrian doors/ door assemblies/ doorsets

1. Provide certified evidence, in the form of a product conformity certificate or engineering assessment, that each pedestrian door/ doorset/ assembly supplied will comply with the specified requirements to BS EN 14351-1. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.
2. Components and assemblies will be marked to the relevant UKCA/ UKNI/ CEI marking European product standard (hEN), national product standard and/ or third-party certification rating.

150 Site dimensions

1. Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.

170 Control samples

1. Procedure
   1.1. Finalize component details.
   1.2. Fabricate one of each of the following designated items as part of the quantity required for the project.
   1.3. Obtain approval of appearance and quality before proceeding with manufacture of the remaining quantity.

Products

230 Wood flush doors

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Facings: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Lippings: Concealed lippings to long edges
5. Preservative treatment: Required
6. Finish as delivered: Full factory finish
7. Glazing/ infill details: Clear fire-resisting glazing
   7.1. Manifestation: Not applicable
   7.2. Beading: External
8. Fire performance
   8.1. Fire resistance: Manufacturer's standard
   8.2. Smoke leakage: Manufacturer's standard
   8.3. Reaction to fire: To BS EN 13501-1, Class B or better

280 Doors

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Finish as delivered: Polyester powder coated to BS EN 12206-1, colour RAL 9011
4. Glazing/ infill details: Clear fire-resisting glazing
   4.1. Manifestation: As drawing
   4.2. Beading: External
5. Fire performance
   5.1. Fire resistance: Manufacturer's standard
   5.2. Smoke leakage: Manufacturer's standard
   5.3. Reaction to fire: To BS EN 13501-1, Class B or better
6. Ironmongery: As ironmongery schedule

310 Wood door frames

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Species: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Preservative treatment: Required
5. Finish as delivered: Prepared and primed, as section M60
6. Perimeter seals: Fire and smoke seal
7. Fire performance
   7.1. Fire resistance: Manufacturer's standard
   7.2. Smoke leakage: Manufacturer's standard
   7.3. Reaction to fire: To BS EN 13501-1, Class B or better

370 Door frames

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Perimeter seals: Fire and smoke seal
4. Finish as delivered: Polyester powder coated
5. Fire performance
   5.1. Fire resistance: Manufacturer's standard
   5.2. Smoke leakage: Manufacturer's standard
   5.3. Reaction to fire: To BS EN 13501-1, Class B or better
6. Thermal performance (U-value maximum): Manufacturer's standard
7. Fixing: Plugged and screwed

430 Wood doorsets

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Materials: Generally to BS EN 942.
3. Door leaf
   3.1. Core: Solid laminated softwood
   3.2. Facings: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.3. Lippings: Concealed lippings to long edges
   3.4. Finish as delivered: Prepared and primed, as section M60
4. Frame and architraves
   4.1. Wood species: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.2. Appearance Class to BS EN 942: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.3. Finish as delivered: Prepared and primed, as section M60
5. Preservative treatment: Organic solvent as section Z12 and WPA Commodity Specification C5; desired service life: 30 years
6. Glazing/ infill details: Clear fire-resisting glazing
   6.1. Manifestation: Not required

6.2. Beading: External

7. Moisture content on delivery: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Ironmongery: As ironmongery schedule
9. Perimeter seals: Fire and smoke seal
10. Fire performance
    10.1. Fire resistance: Manufacturer's standard
    10.2. Smoke leakage: Manufacturer's standard
    10.3. Reaction to fire: To BS EN 13501-1, Class B or better

Execution

710 Protection of components

1. General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry, floored and covered storage.
2. Stored components: Stacked on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

730 Priming/ sealing

1. Wood surfaces inaccessible after installation: Primed or sealed as specified before fixing components.

740 Corrosion protection

1. Surfaces to be protected: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Protective coating: Two coats of bitumen solution to BS 6949 or an approved mastic-impregnated tape.
    2.1. Timing of application: Before fixing components.

750 Fixing doorsets

1. Timing: After associated rooms have been made weathertight and the work of wet trades is finished and dried out.

760 Building in

1. General: Not permitted unless indicated on drawings.

770 Damp-proof courses associated with built-in wood frames

1. Method of fixing: To backs of frames using galvanized clout nails.

780 Damp-proof courses in prepared openings

1. Location: Correctly positioned in relation to door frames. Do not displace during fixing operations.

790 Fixing of wood frames

1. Spacing of fixings (frames not predrilled): Maximum 150 mm from ends of each jamb and at 600 mm maximum centres.

800 Fixing of loose thresholds

1. Spacing of fixings: Maximum 150 mm from each end and at 600 mm maximum centres.

809 Fire-resisting and smoke control doors/ door assemblies/ doorsets/ roller shutters and curtains – accredited installer

1. Installation: By a firm currently registered under a third-party-accredited fire door installer scheme in accordance with instructions supplied with the product conformity certificate, test report or engineering assessment.

810 Fire-resisting and smoke control doors/ door assemblies/ doorsets/ roller shutters and curtains – contractor installed

1. Gaps between frames and supporting construction: Filled as necessary in accordance with requirements for certification and/ or door/ doorset manufacturer's instructions.

811 Fire-resisting and smoke control doorsets, industrial, commercial and garage doors

1. Installation: By manufacturer or their approved installers, in accordance with requirements of BS EN 16034 and in conjunction with BS EN 13241, including the Declaration of Performance (DoP) certification for the UKCA/ UKNI/ CE marked doorset.

820 Sealant joints

1. Sealant
    1.1. Manufacturer: Contractor's choice
        1.1.1. Product reference: Contractor's choice
    1.2. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
    1.3. Application: As section Z22 to prepared joints. Triangular fillets finished to a flat or slightly convex profile.

830 Fixing ironmongery generally

1. Fasteners: Supplied by ironmongery manufacturer.
    1.1. Finish/ corrosion resistance: To match ironmongery.
2. Holes for components: No larger than required for satisfactory fit/ operation.
3. Adjacent surfaces: Undamaged.
4. Moving parts: Adjusted, lubricated and functioning correctly at completion.

840 Fixing ironmongery to fire-resisting door assemblies

1. General: All items fixed in accordance with door leaf manufacturer's recommendations ensuring that integrity of the assembly, as established by testing, is not compromised.
2. Holes for through fixings and components: Accurately cut.
    2.1. Clearances: Not more than 8 mm unless protected by intumescent paste or similar.
    2.2. Lock/ latch cases for fire doors requiring > 60 minutes integrity performance: Coated with intumescent paint or paste before installation.

850 Location of hinges

1. Primary hinges: Where not specified otherwise, positioned with centre lines 250 mm from top and bottom of door leaf.
2. Third hinge: Where specified, positioned with centre line 250 mm below centre line of top hinge .
3. Hinges for fire-resisting doors: Positioned in accordance with door leaf manufacturer's recommendations.

860 Installation of emergency exit devices

1. Standard: Unless specified otherwise, install panic bolts/ latches in accordance with BS EN 1125.

Ω End of Section

L30
Stairs/ ladders/ walkways/ handrails/ balustrades

Preliminary information/ requirements

130 Site dimensions

1. Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.

Components

570 Purpose-made handrails

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Component material, grade and finish as delivered
    2.1. Handrails: Low-carbon steel - nylon-coated
        2.1.1. Lower handrail: Not required
    2.2. Brackets: Low-carbon steel - nylon-coated
3. Workmanship
    3.1. Joinery: To section Z10
    3.2. Metalwork: To section Z11
4. Reaction to fire: Manufacturer's standard
5. Other requirements: Nylon levelling/ packing washers
6. Fixing: Spigot-fixed to wall
    6.1. Centres: As per the Structural Engineering Calculations and Details & Tender drawings.

590 Applied stair nosings

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: In accordance with BS 8300-2
3. Manufacturer: Contractor's choice
    3.1. Product reference: Contractor's choice
4. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Size – outer dimensions (rise x going): As per the Structural Engineering Calculations and Details & Tender drawings.
    5.1. Profile: Bullnose nosing
    5.2. Slip resistance value – water wet (minimum): PTV of 45 to BS 7976 to tread
6. Colour
    6.1. Channel/ Frame: Not applicable
    6.2. Inserts: Manufacturer's standard

592 Trims/ Edgings

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.1. Slip resistance value – water wet (minimum): PTV of 45 to BS 7976

4. Size – outer dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
    4.1. Profile: Bullnose nosing
5. Colour
    5.1. Channel/ Frame: Mill finish
    5.2. Inserts: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Other requirements: None

Installation

610 Moisture content

1. Temperature and humidity: Monitor and control internal conditions to achieve specified moisture content in wood components at time of installation.

620 Priming/ Sealing/ Painting

1. Surfaces inaccessible after assembly/installation: Before fixing components, apply full protective/decorative treatment/coating system.

630 Corrosion protection of dissimilar materials

1. Components/ substrates/ fasteners of dissimilar materials: Isolate using washers/ sleeves or other suitable means to separate materials to avoid corrosion and/ or staining.

640 Installation generally

1. Fasteners and methods of fixing: To section Z20.
2. Structural members: Do not modify, cut, notch or make holes in structural members, except as indicated on drawings.
3. Temporary support: Do not use stairs, walkways or balustrades as temporary support or strutting for other work.
4. Applied finishes: Substrates to be even, dry, sound and free from contaminants. Make good substrate surfaces and prepare/ prime as finish manufacturer's recommendation before application.

670 Installation of tread inserts/ nosings

1. Treads: Fully cured, sound and level.
2. Fixing
    2.1. Location/ position: In accordance with BS 8300-2
    2.2. Fixings: As manufacturer's recommendations
        2.2.1. Centres: As manufacturer's recommendations

Completion

910 Inspection

1. Timing: Two weeks prior to date when contractor expects work to be practically complete
2. Period of notice (minimum): Five working days

920 Documentation

1. Contents

1.1. Copies of structural design calculations/ test reports.
1.2. General product information.
1.3. Installation information.
1.4. Inspection and maintenance reports.

2. Number of copies: 2
3. Submission: Two weeks after request by contract administrator

Ω End of Section

L37
External stair, ramps, handrail and balustrades systems

General

120 Ramp systems

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type: Built in situ
3. Base/ Fabric: Reinforced concrete, as section E10 and E30
4. Surface: Submit design and cost proposals
   4.1. Finish: Applied slip-resistant treatment
5. Minimum surface width: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Gradients
   6.1. Going: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.2. Cross fall: 1:50 maximum
7. Edge protection: 100 mm upstand with visual contrast
8. Accessories: Handrail system

150 Handrail systems

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. System manufacturer: Contractor's choice
3. Material: Austenitic stainless steel
   3.1. Cross section: 100 mm perimeter circular
   3.2. Finish: Polyester powder-coated, as section Z31
4. Height (to upper surface of handrail)
   4.1. Above pitch line: 900 mm
   4.2. Above landing: 800 mm
5. Accessories: Integral lighting, as section V90

System performance - Not Used

Products - Not Used

Fabrication

510 Fabrication generally

1. Design: Complete the detailed design and obtain approval prior to commencing fabrication.
2. Shop drawings: Submit.
3. Structural calculations: Submit.
4. Frameworks: Assemble and brace, including temporary members required for installation.
5. Contact between dissimilar metals: Avoid.
6. Fixings: Fully bolt together. Tighten bolts.
7. Temporary support: Do not subject members to non-design loadings.

Execution

610 Loading

1. Site activities: Restrict, to ensure that design loads are not exceeded, or submit proposals for temporary supports.

620 Concrete foundations generally

1. Standard: To BS 8500-2.
2. Concrete: Designated not less than GEN 1 or standard prescribed not less than ST2.
3. Admixtures: Do not use.
4. Foundation holes: Neat vertical sides.
5. Depth of foundations, bedding, haunching: Appropriate to provide adequate support and to receive overlying soft landscape or paving finishes.

630 Setting components in concrete

1. Holes: 250 x 250 x minimum 300 mm deep
2. Components: Accurately positioned and securely supported.
3. Concrete fill: Compact as filling proceeds.
4. Concrete foundations exposed to view: Finished to weathering profile to shed water and trowel smooth.
5. Temporary component support: Maintain undisturbed for minimum 48 hours.

640 Preservative treated timber

1. Surfaces exposed by minor cutting and drilling: Treated by immersion or with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.
2. Heavily worked sections: Re-treat.

650 Installation generally

1. Fasteners: To section Z20.
2. Structural members: Do not modify, cut, notch or make holes in structural members, except as indicated on drawings.
3. Temporary support: Do not use finished work as temporary support or strutting for other work.
4. Applied finishes: Substrates to be even, dry, sound and free from contaminants. Make good substrate surfaces and prepare/ prime as finish manufacturer's recommendation before application.

660 Installation of manufactured stone elements

1. Selection: Do not use damaged units.
2. Accuracy
   - 2.1. Courses: Level and true to line.
   - 2.2. Faces, angles and features: Plumb.
   - 2.3. Setting out: Achieve satisfactory junctions and joints with adjoining or built-in elements and components.
3. Absorbent units: Dampen in warm weather to reduce suction.
4. Dowels: Resin-fix 6 mm diameter stainless steel rods, two per horizontal element, one per vertical element

5. Mortar joints: 6 x 6 mm recess, filled flush with colour matched mortar
   5.1. Laying: Full bed of mortar with all joints and voids filled.
   5.2. Temporary distance pieces: Lead or stainless steel. Remove when mortar is sufficiently strong.
   5.3. Appearance: Neat and consistent.
6. Cleanliness: Keep facework clean. Rubbing and other abrasive or chemical cleaning methods to remove marks and stains, not permitted.
7. Cutting of reinforced units: Not permitted.

662 Adverse weather

1. General: Do not use frozen materials and do not lay on frozen surfaces.
2. Working limits: Do not lay blocks/ dressings:
   2.1. Cement gauged mortars: When the air temperature is at or below 3°C and falling or below 1°C and rising (unless mortar has a temperature of not less than 4°C when laid and work is thoroughly protected).
   2.2. Hydraulic lime:sand mortars: When the air temperature is at or below 5°C and falling or below 3°C and rising.
3. Temperature of the work: Maintain above freezing until mortar has fully set.
4. Newly erected work: Protect from precipitation; Prevent rapid drying in hot conditions.
5. Remedial work: Rake out and replace mortar damaged by frost.
   5.1. Damaged work: Rebuild.

680 Site painting and staining

1. Timing: Prepare surfaces and apply finishes as soon as possible after installing components.

Completion

910 Inspection

1. Timing: Give reasonable notice before covering up
2. Period of notice (minimum): 3 working days.

915 Slip resistance testing

1. Surfaces to be tested: L37/ As per the Structural Engineering Calculations and Details & Tender drawings..
   1.1. Surface condition: Dry and wet
2. Timing: As agreed with contract administrator
3. Period of notice (minimum): 3 working days.
4. Test standard: To BS 1134
   4.1. Testing authority: A UKAS accredited laboratory
   4.2. Witnessing/ Certification: Arrange for tests to be witnessed/ certified by: Contract administrator.
   4.3. Report: Submit.
      4.3.1. Format: As required under BS 1134

920 Documentation

1. Contents

1.1. Copies of structural design calculations/ test reports.

2. General product information.
   2.1. Installation information.
   2.2. Inspection and maintenance reports.
3. Number of copies: Two
4. Submission: Two weeks prior to date when principal contractor expects work to be practically complete

Ω End of Section

L40
General glazing

General requirements

110 Pre-glazing

1. Pre-glazing of components: Not permitted.

111 Pre-glazing

1. Pre-glazing of components: Permitted.
2. Prevention of displacement: Submit details of precautions to be taken to protect glazing and compound/ seals during delivery and installation.
3. Defective/ displaced glazing/ compound/ seals: Reglaze components in situ.

130 Removal of glass/ plastics for reuse

1. Existing glass/ plastics and glazing compound, beads, etc.: Remove carefully, avoiding damage to frame, to leave clean, smooth rebates free from obstructions and debris.
2. Deterioration of frame/ surround: Submit report on defects revealed by removal of glazing.
   2.1. Affected areas: Do not reglaze until instructed.
3. Reusable materials: Clean glass/ plastics, beads and other components that are to be reused.

140 Material samples

1. Representative samples of designated materials: Submit before cutting panes.
   1.1. Sample size (minimum): 300 x 300 mm
   1.2. Designated materials: As per the Structural Engineering Calculations and Details & Tender drawings.

150 Workmanship and positioning generally

1. Glazing generally: In accordance with BS 6262 series.
2. Integrity: Glazing must be wind and watertight under all conditions with full allowance made for deflections and other movements.
3. Dimensional tolerances: Panes/ sheets to be within ± 2 mm of specified dimensions.
4. Materials
   4.1. Compatibility: Glass/ plastics, surround materials, sealers, primers and paints/ clear finishes to be used together to be compatible. Avoid contact between glazing panes/ units and alkaline materials such as cement and lime.
   4.2. Protection: Keep materials dry until fixed. Protect insulating glass units and plastics glazing sheets from the sun and other heat sources.

151 Preparation

1. Surrounds, rebates, grooves and beads: Cleaned and prepared by others.

152 Preparation

1. Surrounds, rebates, grooves and beads: Clean and prepare before installing glazing; ensure compliance with any certified installation requirements.

155 Glass generally

1. Standards: To BS 952 and relevant parts of:
   1.1. BS EN 572 for basic soda lime silicate glass.
   1.2. BS EN 1748-1-1 for borosilicate glass.
   1.3. BS EN 1748-2-1 for ceramic glass.
   1.4. BS EN 1863 for heat-strengthened soda lime silicate glass.
   1.5. BS EN 12150 for thermally toughened soda lime silicate safety glass.
   1.6. BS EN 12337 for chemically strengthened soda lime silicate glass.
   1.7. BS EN 13024 for thermally toughened borosilicate safety glass.
   1.8. BS EN ISO 12543 for laminated glass and laminated safety glass.
2. Panes/ sheets: Clean and free from obvious scratches, bubbles, cracks, rippling, dimples and other defects.
   2.1. Edges: Generally undamaged. Shells and chips not more than 2 mm deep and extending not more than 5 mm across the surface are acceptable if ground out.

160 Linear patterned/ wired glass

1. Alignment: Vertical/ Horizontal as appropriate, and pattern matched across adjacent panes in close proximity.

170 Plastics glazing sheet

1. Condition: Free from scratches, edge splits and other defects.
2. Preparation for use: Protective coverings carefully peeled back from edges and trimmed off to facilitate glazing. Remainder retained in place until completion unless instructed otherwise.

180 Bead-fixing with pins

1. Pin spacing: Regular at maximum 150 mm centres, and within 50 mm of each corner.
2. Exposed pin heads: Punched just below wood surface.

181 Bead-fixing with screws

1. Screw spacing: Regular at maximum 225 mm centres, and within 75 mm of each corner.

Types of glazing

330 Bead-fixed single-glazing

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Pane material: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Surround/ bead: Aluminium
   3.1. Preparation: Sealant primer
   3.2. Bead location: Inside.
   3.3. Bead-fixing: Proprietary clip-fixing
4. Glazing system
   4.1. Tape: High density foam compression sealant
   4.2. Heel bead sealant: To BS EN ISO 11600, Class G20LM
   4.3. Internal trim: EPDM rubber section

4.4. External capping sealant: As per the Structural Engineering Calculations and Details & Tender drawings.

5. Thermal performance (U-value maximum): Manufacturer's standard
6. Glazing installation
   6.1. Glass: Located centrally in surround using setting and location blocks.
   6.2. Loadbearing glazing tape: Applied to rebate upstand allowing minimum 3 mm contact of heel bead sealant onto external face of glazing. Top edge approximately 6 mm short of sight line to allow for capping sealant. Corners butt-jointed with no gaps.
   6.3. Thickness of glazing tape bed after compression (minimum): 3 mm.
   6.4. Heel bead sealant: Applied to fill void between tape and rebate platform, and edge clearance between glazing and rebate platform.
   6.5. Beads: Bedded in sealant and fixed securely.
   6.6. Internal trim: Inserted under compression between glazing and beads in continuous lengths leaving no gaps.
   6.7. Capping sealant: Applied to fill void between rebate upstand and glazing, and finished to a smooth chamfer.

372 Bead-fixed insulating glass units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. IGU: As clause 650.
   2.1. Perimeter taping: Do not use.
3. Surround/ bead: Aluminium
   3.1. Preparation: Sealant primer
   3.2. Bead location: Inside
   3.3. Bead-fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Glazing system: Synthetic rubber sections with sealant capping
5. Thermal performance (U-value maximum): Manufacturer's standard
6. Glazing installation
   6.1. Insulating unit: Located centrally in surround using setting and location blocks.
   6.2. Glazing sections/ strips/ tapes: Applied to rebate upstands and beads finishing approximately 5 mm short of sight line to allow for capping sealant.
   6.3. Beads: Installed using sufficient pressure to compress inner and outer sections/ strips/ tapes and fixed securely.
   6.4. Capping sealant: Applied to both sides of glazing unit and finish to a smooth chamfer.
   6.5. Drainage and ventilation holes: Unobstructed.

380 Bead-fixed insulating glass units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. IGU: As clause 650.
   2.1. Perimeter taping: Do not use.
3. Surround/ bead: Aluminium
   3.1. Preparation: Sealant primer
   3.2. Bead location: Inside
   3.3. Bead-fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Glazing system

4.1. Inner sealant: Low permeability sealant
4.2. Outer sealant: Moisture vapour-permeable sealant
5. Thermal performance (U-value maximum): Manufacturer's standard
6. Glazing installation
6.1. Insulating unit: Located centrally in surround using setting and location blocks and distance pieces.
6.2. Inner sealant: Applied to full height of rebate.
6.3. Outer sealant: Applied to fill edge clearance void and space between unit and beads up to sight line.
6.4. Finished thickness of back and front bedding after inserting glazing (minimum): 3 mm.
6.5. Beads: Bedded on outer sealant and fixed securely.
6.6. Excess sealant: Trimmed to a smooth chamfer.

496 U-profiled double-glazing

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Supporting structure: Blockwork
3. U-profiled glazing system
3.1. Manufacturer: Contractor's choice
3.1.1. System reference: Contractor's choice
3.2. Arrangement: Double-glazing aligned horizontally
4. Framing system
4.1. Type and reference: Thermally broken extruded aluminium
4.2. Finish: Polyester powder-coated
5. Glazing: Outer pane:
5.1. Material and reference: As per the Structural Engineering Calculations and Details & Tender drawings.
5.2. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
5.3. Colour: Clear
5.4. External surface finish: Smooth
5.5. Coating: Pyrolytic
6. Glazing: Inner pane:
6.1. Material and reference: As per the Structural Engineering Calculations and Details & Tender drawings.
6.2. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
6.3. Colour: Clear
6.4. External surface finish: Smooth
6.5. Coating: Pyrolytic
7. Core insulation: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Joints
8.1. Width (minimum): 2 mm.
8.2. Sealant depth: 8 mm.
8.3. Sealant: Low modulus, neutral curing silicone sealant
9. Ancillary components: Horizontal pivot opening vent
10. Accessories: Sill flashing

11. Thermal performance (U-value maximum): Manufacturer's standard
12. Other requirements: Glazing installation to be from interior

505 Fire-resistant tape/ Strip glazing

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Fire performance
   2.1. Fire resistance: Manufacturer's standard
3. Pane material: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Orientation: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Frame/ Surround material: Rectangular hollow section steel frame
5. Beads
   5.1. Material: Steel angles with extruded aluminium snap-on capping
   5.2. Location: Inside
   5.3. Fixing: 38 mm long No 8 stainless steel screws and cups at maximum 200 mm centres
6. Glazing system
   6.1. Tape/ Strip: Intumescent strip
   6.2. Pointing sealant: Silicone mastic
7. Thermal performance (U-value maximum): Manufacturer's standard
8. Installation: By a firm currently registered under a UKAS-certified accreditation scheme for the installation of fire-resistant glazing, in accordance with glazing manufacturer's recommendations.
9. Certification: Submit test certification for system, including any framing, installation and maintenance requirements or restrictions.

510 Fire-resistant channel glazing

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Fire performance
   2.1. Fire resistance: Manufacturer's standard
3. Pane material: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Orientation: Non fire glass glazed to the protected side
4. Frame/ Surround material: Rectangular hollow section steel frame
5. Fire-resistant channel: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.1. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.2. Intumescent aperture lining/ filler: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Cover strips: Steel trim
7. Thermal performance (U-value maximum): Manufacturer's standard
8. Installation: By a firm currently registered under a UKAS-certified accreditation scheme for the installation of fire-resistant glazing, in accordance with glazing manufacturer's recommendations.
9. Certification: Submit test certification for system, including any framing, installation and maintenance requirements or restrictions.

520 Fire rating

1. Assessment of capability: Submit proposed construction details of designated items to a UKAS/ EA accredited laboratory or other approved authority for assessment of capability of achieving specified fire ratings.

1.1. Test standard: To BS EN 1364-1

2. Assessment/ test results and reports: Submit immediately they are available, and before installing glazing.
3. Designated items: As per the Structural Engineering Calculations and Details & Tender drawings.

560 Plastics mirrors

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Mirror material: Silvered finish to give maximum reflection, free from tarnishing, discoloration, scratches and other defects visible in the designed viewing conditions.
   3.1. Thickness: 3 mm
   3.2. Backing: Lead foil
4. Background: Plastered masonry
5. Fixing method: Double-sided self-adhesive pads at 400 mm centres
6. Installation: Fixed accurately and securely without overtightening fasteners, to provide a flat surface giving a distortion free reflection.

610 Window film

1. Type: Privacy & Solar control
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Colour: Neutral
4. Application: Carried out by a firm approved by the film manufacturer in accordance with manufacturer's recommendations.
   4.1. Evidence of applicator's competence and experience: Submit on request.
   4.2. Sample area: Complete as part of the finished work, in an approved location and obtain approval of appearance before proceeding.
   4.3. Ambient air temperature at time of application: Above 5°C.
5. Installed film: Fully adhered to the glass with no peeling, and free from bubbles, wrinkles, cracks or tears.
6. Further contact with applied films: Avoid until bonding adhesive has cured.
7. Cleaning and maintenance instructions: Submit copies.

630 Manifestation

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Design: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.1. Art work: Supplied by designer
   2.2. Media: Full size drawing
3. Technique: Applied film

650 Insulated glass units (IGUs)

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Standard: To BS EN 1279.

4. Performance characteristics to BS EN 1279-5
    4.1. Fire performance
        4.1.1. Fire resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
        4.1.2. Reaction to fire: As per the Structural Engineering Calculations and Details & Tender drawings.
    4.2. Safety in use
        4.2.1. Bullet resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
        4.2.2. Explosion resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
        4.2.3. Burglar resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
        4.2.4. Pendulum body impact resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
        4.2.5. Resistance against sudden temperature changes and temperature differentials: As per the Structural Engineering Calculations and Details & Tender drawings.
        4.2.6. Resistance against wind, snow, permanent load and/ or imposed loads: As per the Structural Engineering Calculations and Details & Tender drawings.
    4.3. Direct airborne sound reduction: As per the Structural Engineering Calculations and Details & Tender drawings.
    4.4. Energy
        4.4.1. Thermal properties: As per the Structural Engineering Calculations and Details & Tender drawings.
        4.4.2. Light transmittance and reflectance: As per the Structural Engineering Calculations and Details & Tender drawings.
        4.4.3. Solar energy characteristics: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Unit thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Location of relevant glass panes: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Spacer: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

655 Insulated glass units (IGUs)

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Standard: BS EN 1279.
4. Thermal performance (centre pane): Manufacturer's standard
5. Construction
    5.1. Inner pane: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.2. Cavity: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.3. Intermediate pane: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.4. Cavity: As per the Structural Engineering Calculations and Details & Tender drawings.

5.5. Outer pane: As per the Structural Engineering Calculations and Details & Tender drawings.

5.6. Spacer: As per the Structural Engineering Calculations and Details & Tender drawings.

6. Unit thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

Ω End of Section

M10
Cement based levelling/ wearing screeds

Types of screed

160 Proprietary self smoothing levelling screeds

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Substrate: In situ concrete slab
3. Screed manufacturer: Sika Limited
   - 3.1. Contact details
     - 3.1.1. Address: Watchmead
       Welwyn Garden City
       Hertfordshire
       AL7 1BQ
     - 3.1.2. Telephone: +44 (0)1707 394444
     - 3.1.3. Web: www.sika.co.uk
     - 3.1.4. Email: enquiries@uk.sika.com
   - 3.2. Product reference: Sikafloor® Level-30
4. Screed construction: Manufacturer's standard
5. Thickness
   - 5.1. Nominal: 15 mm
   - 5.2. Minimum: 6 mm
   - 5.3. Maximum: 20 mm
6. In situ crushing resistance (ISCR) category: B (4 mm maximum indentation)
   - 6.1. Mass of test weight: 2 kg
7. Flatness/ Surface regularity class: SR2
8. Finish to receive: Varies, ss per the Structural Engineering Calculations and Details & Tender drawings.
9. Other requirements: None

Generally/ preparation

205 Design life of screeds

1. Duration: subject to reasonable wear and tear
   - 1.1. Subject to reasonable wear and tear.
2. Location: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Condition of use: Subject to correct loading and traffic usage throughout duration.

210 Suitability of substrates

1. General
   - 1.1. Suitable for specified levels and flatness/ regularity of finished surfaces. Consider permissible minimum and maximum thicknesses of screeds.
   - 1.2. Sound and free from significant cracks and gaps.
2. Concrete strength: In accordance with BS 8204-1, Table 2.
3. Cleanliness: Remove plaster, debris and dirt.

4. Moisture content: To suit screed type. New concrete slabs to receive fully or partially bonded construction must be dried out by exposure to the air for minimum six weeks.

220 Proprietary levelling/wearing screeds

1. General: Materials, mix proportions, mixing methods, minimum/ maximum thicknesses and workmanship must be in accordance with recommendations of screed manufacturer.
2. Standard: To BS EN 13813

Batching/ mixing

302 Cements

1. Cement types: In accordance with BS 8204-1, clause 5.1.3.

307 Admixtures

1. Standard: In accordance with BS 8204-1, Table 1.
2. Calcium chloride: Do not use in admixtures.

330 Mixing

1. Water content: Minimum necessary to achieve full compaction, low enough to prevent excessive water being brought to surface during compaction.
2. Mixing: Mix materials thoroughly to uniform consistency. Mixes other than no-fines must be mixed in a suitable forced action mechanical mixer. Do not use a free fall drum type mixer.
3. Consistency: Use while sufficiently plastic for full compaction.
4. Ready-mixed retarded screed mortar: Use within working time and site temperatures recommended by manufacturer. Do not retemper.

Laying

345 Level of screed surfaces

1. Permissible deviation: (allowing for thickness of coverings) ± 5mm from datum.

355 Flatness/ Surface regularity of floor screeds

1. Standard: In accordance with BS 8204-1, Table 5.
2. Test: In accordance with BS 8204-1, Annex C.
3. Sudden irregularities: Not permitted.

Finishing/curing

510 Finishing generally

1. Timing: Carry out all finishing operations at optimum times in relation to setting and hardening of screed material.
2. Prohibited treatments to screed surfaces
    2.1. Wetting to assist surface working.
    2.2. Sprinkling cement.

520 Wood floated finish

1. Finish: Slightly coarse, even texture with no ridges or steps.

530 Smooth floated finish

1. Finish: Even texture with no ridges or steps.

540 Trowelled finish to levelling screeds

1. Floating: To an even texture with no ridges or steps.
2. Trowelling: To a uniform, smooth but not polished surface, free from trowel marks and other blemishes, and suitable to receive specified flooring material.

550 Trowelled finish to wearing screeds

1. Floating: To an even texture with no ridges or steps.
2. Trowelling: Successively trowel at intervals, applying sufficient pressure to close surface and give a uniform smooth finish free from trowel marks and other blemishes.

560 Dewatered trowelled finish to wearing screeds

1. Dewatering: Immediately after compaction of wearing screeds, remove water using a vacuum process.
2. Floating: Without delay, power float to an even texture with no ridges or steps.
3. Trowelling: Successively trowel at intervals, applying sufficient pressure to close surface and give a uniform smooth finish free from trowel marks and other blemishes.

600 Power ground finish to wearing screeds

1. Floating: To an even surface with no ridges or steps. Immediately commence curing.
2. Grinding: When concrete is sufficiently hard for sand particles not to be torn from surface, remove 1 - 2 mm from surface to give an even glass-paper texture, free from blemishes and trowel marks.
3. Cleaning: Remove dust and wash down. Resume curing without delay.

650 Curing

1. General: Prevent premature drying. Immediately after laying, protect surface from wind, draughts and strong sunlight. As soon as screed has set sufficiently, closely cover with polyethylene sheeting.
2. Curing period (minimum): Keep polyethylene sheeting in position for: period recommended by screed manufacturer.
3. Drying after curing: Allow screeds to dry gradually. Do not subject screeds to artificial drying conditions that will cause cracking or other shrinkage related problems.

670 Roof screeds

1. Protection: Cover screeds during wet weather. When weathertight coverings are laid, screeds must be as dry as practicable.

680 Surface sealer to wearing screeds

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Preparation: Clean cured screed surface to remove dirt, grease, oil and other surface contaminants.
3. Moisture content of screed: As recommended by sealer manufacturer. Test relative humidity in accordance with BS 8203, Annex A if required to verify suitability to receive sealer.
4. Application: Evenly to dry surfaces using sufficient coats to form an effective seal but without a glossy finish.

690 Slip resistance testing of wearing screeds

1. Test
   1.1. To BS 7976-1, -2 and -3 using a TRL Pendulum.
   1.2. Make arrangements for test to be witnessed/ certified by: Contract Administrator
2. Report: Submit. Include slip resistance values in the wet and dry states.

700 Abrasion testing of wearing screeds

1. Test method: To BS EN 13892-4.

Ω End of Section

M20
Plastered/ rendered/ roughcast coatings

Types of coating

160 Cementitious renders Type A

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Substrate: As existing
   2.1. Preparation: As per manufactuers recomendations
3. Manufacturer: K Rend Silicone Coloured Renders
4. Contact details
   4.1. Address: Kilwaughter Minerals Ltd
   9 Starbog Road
   Larne
   County Antrim
   BT40 2TJ
   4.2. Telephone: +44 (0)28 2826 0766
   4.3. Web: www.k-rend.co.uk
   4.4. Email: sales@k-rend.co.uk
5. Undercoats
   5.1. Product reference: Submit proposals
   5.2. Thickness (excluding dubbing out and keys): As recommended by manufacturer
6. Final coat
   6.1. Thickness: As manufacturer's recommendations
   6.2. Finish: Scraped
7. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

200 Gypsum plaster on cement gauged undercoats

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Substrate: As existing on site
   2.1. Preparation: As per manufactuer's recomendations
3. Undercoats
   3.1. Mix: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.2. Thickness (excluding dubbing out and keys): 10 mm (maximum) overall
4. Final coat: Gypsum plaster to BS EN 13279-1.
   4.1. Manufacturer: Contractor's choice
   4.1.1. Product reference: Contractor's choice
   4.2. Thickness: Ap er manufactuers recomendations
   4.3. Finish: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

210 Lightweight gypsum plaster

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Substrate: As existing on site

2.1. Preparation: Bonding agent recommended by plaster manufacturer
3. Manufacturer: Contractor's choice
4. Undercoats: To BS EN 13279-1.
   4.1. Product reference: Contractor's choice
   4.2. Thickness (excluding dubbing out and keys): Two coat 13 mm overall
5. Final coat: Finish plaster to BS EN 13279-1.
   5.1. Product reference: Contractor's choice
   5.2. Thickness: 2-3 mm.
   5.3. Finish: Smooth.
6. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

220 Multicoat proprietary plaster

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Substrate: As existing on site
   2.1. Preparation: Bonding agent recommended by plaster manufacturer
3. Manufacturer: Contractor's choice
4. Undercoats
   4.1. Product reference: Contractor's choice
   4.2. Thickness (excluding dubbing out): As manufacturer's recommendations
5. Final coat
   5.1. Product reference: Contractor's choice
   5.2. Thickness: As manufacturer's recommendations
   5.3. Finish: Smooth
6. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

280 Gypsum plaster skim coat on plasterboard

1. Plasterboard: 12.5 mm
   1.1. Preparation: Bonding agent recommended by plaster manufacturer
2. Plaster: Board finish/ finish plaster to BS EN 13279-1.
   2.1. Manufacturer: Contractor's choice
      2.1.1. Product reference: Contractor's choice
   2.2. Thickness: As per manufactuers recommendations
   2.3. Finish: Smooth.
3. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

General

413 Samples

1. General: Provide representative samples of the following: Sands for undercoats and final coat for external render.

418 Control samples

1. Complete sample areas, being part of the finished work, in locations as follows: External rendering

421 Scaffolding

1. General: Prevent putlog holes and other breaks in coatings.

424 Special protection of historic plasterwork

1. General: Prevent damage and disturbance to retained plasterwork.
2. Protection methods: Submit proposals.

Materials and marking of mortar

430 Ready-to-use cement gauged mortars

1. Time and temperature limitations: Use within limits prescribed by mortar manufacturer
    1.1. Retempering: Restore workability with water only within prescribed time limits.

438 Cements for mortars

1. Cement: To BS EN 197-1.
    1.1. Types: Portland cement, CEM I.
2. Portland slag cement, CEM II.
3. Portland fly ash cement, CEM II.
    3.1. Strength class: 32.5, 42.5 or 52.5.
4. White cement: To BS EN 197-1.
    4.1. Type: Portland cement, CEM1.
    4.2. Strength class: 52.5.
5. Sulfate resisting Portland cement: To BS EN 197-1.
    5.1. Strength class: 42.5.

440 Sand for cement gauged mortars

1. Standard: To BS EN 13139.
    1.1. Grading: 0/2 or 0/4 (CP or MP); Category 2 fines.
2. Colour and texture: Consistent. Obtain from one source.

443 Lime for cement gauged mortars

1. Standard: To BS EN 459-1.
    1.1. Type: CL 90S.

445 Pigment for coloured mortars

1. Standard: To BS EN 12878.

449 Admixtures for cement gauged mortars

1. Suitable admixtures: Select from:
    1.1. Air entraining (plasticizing) admixtures: To BS EN 934-2 and compatible with other mortar constituents.
    1.2. Other admixtures: Submit proposals.
2. Prohibited admixtures: Calcium chloride and any admixture containing calcium chloride.

450 Chloride content of mortars

1. Chloride content (maximum): 0.1% by dry mass.

478 Hydraulic lime

1. Standard: To BS EN 459-1.
    1.1. Type: Natural hydraulic lime (NHL).

481 Ready prepared lime putty

1. Type: Slaked directly from CL 90 quicklime to BS EN 459-1, using an excess of water.
    1.1. Maturation: In pits/ containers that allow excess water to drain away.
    1.2. Density of matured lime putty: 1.3-1.4 kg/L.
2. Maturation period before use (minimum): 90 days.
3. Storage: Prevent drying out or wetting: Protect from frost.

495 Mixing

1. Render mortars (site prepared)
    1.1. Batching: By volume. Use clean and accurate gauge boxes or buckets.
    1.2. Mix proportions: Based on damp sand. Adjust for dry sand.
    1.3. Lime:sand: Mix thoroughly. Allow to stand, without drying out, for at least 16 hours before using.
2. Mixes: Of uniform consistence and free from lumps. Do not retemper or reconstitute mixes.
3. Contamination: Prevent intermixing with other materials.

497 Cold weather

1. General: Do not use frozen materials or apply coatings on frozen or frost bound substrates.
2. External work: Avoid when air temperature is at or below 5°C and falling or below 3°C and rising. Maintain temperature of work above freezing until coatings have fully hardened.
3. Internal work: Take precautions to enable internal coating work to proceed without detriment when air temperature is below 3°C.

Preparing substrates

510 Suitability of substrates

1. Soundness: Free from loose areas and significant cracks and gaps.
2. Cutting, chasing, making good, fixing of conduits and services outlets and the like: Completed.
3. Tolerances: Permitting specified flatness/ regularity of finished coatings.
4. Cleanliness: Free from dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.

527 Raking out for key

1. Joints in existing masonry: Rake out to a depth of 13 mm (minimum).
    1.1. Dust and debris: Remove from joints.

531 Roughening for key

1. Substrates: Roughen thoroughly and evenly.
    1.1. Depth of surface removal: Minimum necessary to provide an effective key.

536 Splatterdash key

1. Materials
   1.1. Cement: To BS EN 197-1.
   1.2. Sand: Clean, coarse.
   1.3. Admixtures: SBR bonding agent, Agrément certified
2. Mix proportions (cement:sand): 1:1.5-2.
3. Consistency: Thick slurry, well stirred.
4. Application: Throw onto dampened background and leave rough.
   4.1. Thickness: 3-5 mm.
5. Curing: Controlled to achieve a firm bond to substrate.

538 Stipple key

1. Materials
   1.1. Cement: To BS EN 197-1.
   1.2. Sand: Clean, coarse.
   1.3. Admixture: SBR bonding agent, Agrément certified
2. Mix proportions (cement:sand): 1:1.5–2.
3. Consistency: Thick slurry, well stirred.
4. Application: Brushed and stippled to form deep, close textured key.
5. Curing: Controlled to achieve a firm bond to substrate.

541 Bonding agent application

1. General: Apply evenly to substrate to achieve effective bond of plaster/ render coat. Protect adjacent joinery and other surfaces.

551 Removal and renewal of existing plaster/ render

1. Location and extent: Agree, at least on a provisional basis, before work commences. Minimize extent of removal and renewal.

556 Removing defective existing render

1. Render for removal: Detached, hollow, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
2. Removing defective render: Cut out to regular rectangular areas with straight edges.
   2.1. Horizontal and vertical edges: Square cut or slightly undercut.
   2.2. Bottom edges to external render: Do not undercut.
   2.3. Render with imitation joints: Cut back to joint lines.
3. Cracks
   3.1. Fine hairline cracking/ crazing: Leave.
   3.2. Other cracks: Obtain instructions
4. Dust and loose material: Remove from exposed substrates and edges.

566 Removing defective existing plaster

1. Plaster for removal: Detached, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
   1.1. Hollow, detached areas: Remove where area of detachment

2. Stained plaster: Remove
3. Removing defective plaster. Cut back to a square, sound edge.
4. Faults in substrate (structural deficiencies, damp, etc.): Submit proposals.
5. Cracks
   5.1. Fine hairline cracking/ crazing: Leave.
   5.2. Other cracks: Cut out to a width of 75 mm (minimum)
6. Dust and loose material: Remove from exposed substrates and edges.

568 Existing damp affected plaster/ render

1. Plaster affected by rising damp: Remove to a height of 300 mm above highest point reached by damp or 1 m above dpc, whichever is higher.
2. Perished and salt contaminated masonry
   2.1. Mortar joints: Rake out.
   2.2. Masonry units: Submit proposals.
3. Faults in substrate (structural deficiencies, additional sources of damp, etc.): Submit proposals.
4. Drying out substrates: Establish drying conditions. Leave walls to dry for as long as possible before plastering.
5. Dust and loose material: Remove from exposed substrates and edges.

584 Record castings

1. Timing: Make castings before commencing repair work, to enable accurate reproductions to be made.
2. Items for casting: Obtain instructions
3. Identification: Mark clearly to identify original location.

Backings/ beads/ joints

600 Additional framing supports for backings

1. Framing: Accurately position and securely fix to give full support to fixtures, fittings and service outlets.
2. Support board edges and perimeters: As recommended by board manufacturer to suit type and performance of board.

605 Gypsum plasterboard backings

1. Type: To BS EN 520 Type A.
   1.1. Core density (minimum): 650 kg/m³.
2. Exposed surface and edge profiles: Suitable to receive specified plaster finish.

607 Proprietary gypsum plasterboard backings

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Exposed surface and edge profiles: Suitable to receive specified plaster finish.

610 Fixing plasterboard backings to timber

1. Fixings, accessories and installation methods: As recommended by board manufacturer.
2. Fixing: At the following centres (maximum):

2.1. Nails: 150 mm.
2.2. Screws to partitions/ walls: 300 mm. Reduce to 200 mm at external angles.
2.3. Screws to ceilings: 230 mm.

3. Position of nails/ screws from edges of boards (minimum)
3.1. Bound edges: 10 mm.
3.2. Cut/ unbound edges: 13 mm.
4. Position of nails/ screws from edges of supports (minimum): 6 mm.
5. Nail/ screw heads: Set below surface. Do not break paper or gypsum core.

611 Fixing plasterboard backings

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
2.1. Product reference: Contractor's choice
3. Accessories, materials and installation methods: As recommended by the plasterboard manufacturer.

612 Joints in plasterboard backings

1. Ceilings
1.1. Bound edges: At right angles to supports and with ends staggered in adjacent rows.
1.2. Two layer boarding: Stagger joints between layers.
2. Partitions/ walls
2.1. Vertical joints: Centre on studs. Stagger joints on opposite sides of studs.
2.1.1. Two layer boarding: Stagger joints between layers.
2.2. Horizontal joints
2.2.1. Two layer boarding: Stagger joints between layers by at least 600 mm. Support edges of outer layer.
3. Joint widths (maximum): 3 mm.

630 Beads/ stops for internal use

1. Standard: In accordance with BS EN 13914-2, Table 2.
2. Material: Galvanized steel to BS EN 13658-1

634 Beads/ stops

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
2.1. Product reference: Contractor's choice
3. Material: Galvanized steel

636 Beads/ stops for external use

1. Standard: In accordance with BS EN 13914-1, Table 4.
2. Material: Galvanized steel to BS EN 13658-2

640 Beads/ stops generally

1. Location: External angles and stop ends except where specified otherwise.
2. Corners: Neat mitres at return angles.

3. Fixing: Secure, using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
   3.1. Beads/ stops for external render: Fix mechanically.
4. Finishing: After coatings have been applied, remove surplus material while still wet, from surfaces of beads/ stops exposed to view.

646 Crack control at junctions between dissimilar solid substrates

1. Locations: Where defined movement joints are not required. Where dissimilar solid substrate materials are in same plane and rigidly bonded or tied together.
2. Crack control materials
   2.1. Isolating layer: Building paper to BS 1521.
   2.2. Metal lathing: Externally: Stainless steel ribbed expanded metal
3. Installation: Fix metal lathing over isolating layer. Stagger fixings along both edges of lathing.
4. Width of installation over single junctions
   4.1. Isolating layer: 150 mm.
   4.2. Lathing: 300 mm.
5. Width of installation across face of dissimilar substrate material (column, beam, etc. with face width not greater than 450 mm)
   5.1. Isolating layer: 25 mm (minimum) beyond junctions with adjacent substrate.
   5.2. Lathing: 100 mm (minimum) beyond edges of isolating layer.

650 Movement joints

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Installation: Centred over joint in substrate.
   3.1. Fixing: Stainless steel screws

653 Sealant movement joints with stop bead edgings

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Stop beads: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Installation: Centred over joint in substrate.
   3.1. Joint width: To suit that of structural movement joint in background
   3.2. Fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Sealant
   4.1. Manufacturer: Contractor's choice
      4.1.1. Product reference: Contractor's choice
   4.2. Preparation and application: As section Z22. Stainless steel screws.

659 Plasterboard joints

1. Joints and angles (except where coincident with metal beads). Reinforce with continuous lengths of jointing tape.

673 Plasterboard over conduits/ service chases

1. General: Prevent cracking over conduits and other services.

2. Services chased into substrate: Isolate from coating by covering with galvanized metal lathing, fixed at staggered centres along both edges.

Mouldings/ decorative plasterwork - Not Used

Internal plastering

710 Application generally

1. Application of coatings: Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
2. Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
   2.1. Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
3. Drying out: Prevent excessively rapid or localized drying out.

715 Flatness/ surface regularity

1. Sudden irregularities: Not permitted.
2. Deviation of plaster surface: Measure from underside of a straight edge placed anywhere on surface.
   2.1. Permissible deviation (maximum) for plaster not less than 13 mm thick: 3 mm in any consecutive length of 1800 mm.

718 Junction of new plasterwork with existing

1. New plasterwork: Finish flush with original face of existing plasterwork to form a seamless junction.

720 Dubbing out

1. General: Correct substrate inaccuracies.
2. New smooth dense concrete and similar surfaces: Dubbing out prohibited unless total plaster thickness is within range recommended by plaster manufacturer.
3. Thickness of any one coat (maximum): 10 mm.
4. Mix: As undercoat.
5. Application: Achieve firm bond. Allow each coat to set sufficiently before the next is applied. Cross scratch surface of each coat.

725 Undercoats generally

1. General: Rule to an even surface. Cross scratch to provide a key for the next coat.
2. Undercoats on metal lathing: Work well into interstices to obtain maximum key.
3. Undercoats gauged with Portland cement: Do not apply next coat until drying shrinkage is substantially complete.

742 Thin coat plaster

1. Preparation for plasters less than 2 mm thick: Fill holes, scratches and voids with finishing plaster.

747 Projection plaster

1. Application: Evenly and in one continuous operation between angles and joints.
2. Finish: A level open textured surface before finishing manually.

777 Smooth finish

1. Appearance: A tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks. Avoid water brush, excessive trowelling and over polishing.

778 Wood float finish

1. Appearance: An even overall texture. Finish with a dry wood float as soon as wet sheen has disappeared.

782 Textured/ patterned finishes

1. Appearance: Consistent and even. Carry out work on each surface as one continuous operation.

786 Plastering on timber lathing

1. Application of undercoat: Force between laths to form continuous keys.

788 Nonhydraulic lime plaster undercoats

1. Suction control: Dampen substrate.
2. Application: Apply firmly. Trowel to an even surface. Consolidate/ scour as necessary to control shrinkage. Cross scratch to provide an undercut key for the next coat. Do not penetrate through the coat.
    2.1. Key for final coats: Lightly scratch using a wood 'devil' float.
3. Curing coatings: Keep damp by light spraying with water until coating is sufficiently firm.

789 Three layer nonhydraulic lime plaster final coat

1. Suction control: Dampen undercoat.
2. Application
    2.1. First layer: Use steel trowel.
    2.2. Second layer: Use wood float in the opposite direction to the first layer.
    2.3. Third layer: Use a steel trowel in the same direction as second layer.
3. Consolidation/ scouring: As necessary to control shrinkage. Use a wood cross grain float.
4. Finishing: Dampen with a stock brush. Polish with a steel trowel. Finish with a damp stock brush.
5. Drying: Keep damp by light spraying with water until coating is sufficiently firm.

External rendering

810 Application generally

1. Application of coatings: Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
2. Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
    2.1. Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
3. Drying: Prevent excessively rapid or localized drying out.

815 Flatness/ surface regularity of rendering to receive ceramic tiles

1. Sudden irregularities: Not permitted.
2. Deviation of render surface: Measure from underside of a 2 m straight edge placed anywhere on surface.

2.1. Permissible deviation (maximum): 3 mm.

820 Dubbing out rendering

1. General: Correct substrate inaccuracies.
2. Thickness of any one coat (maximum): 16 mm.
   2.1. Total thickness (maximum): 20 mm, otherwise obtain instructions.
3. Mix: As undercoat.
4. Application: Achieve firm bond. Allow each coat to set sufficiently before the next is applied. Comb surface of each coat.

830 Anchored mesh reinforcement

1. Application of first undercoat: Through and round mesh to fully bond with solid substrate.

840 Undercoats generally

1. General: Rule to an even surface. Comb to provide a key for the next coat. Do not penetrate the coat.
2. Undercoats on metal lathing: Work well into interstices to obtain maximum key.

845 Thrown undercoats for lime:sand roughcast (harling)

1. Application of undercoats and dubbing out: Throw from a casting trowel or scoop.
2. Finishing: Press back to give an even thickness without smoothing the surface.

856 Final coat – plain floated finish

1. Finish: Even, open texture free from laitance.

861 Final coat – scraped finish

1. Finish: Scraped to expose aggregate and achieve an even texture.

866 Final coat – roughcast (harling) finish

1. Finish: Left as cast with an even thickness and texture.

871 Final coat – dry dash finish

1. Coarse aggregate: To BS EN 12620. Well washed.
   1.1. Size: 4/10 mm
   1.2. Type: To match existing
2. Application and finishing: Achieve firm adhesion to an even overall appearance. After throwing aggregate tap particles lightly into coating.

880 Curing and drying

1. General: Prevent premature setting and uneven drying of each coat.
2. Curing coatings: Keep each coat damp by covering with polyethylene sheet and/ or spraying with water.
   2.1. Curing period (minimum): As the render manufacturer's recommendations
   2.2. Final coat: Hang sheeting clear of the final coat.
3. Drying: Allow each coat to dry thoroughly, with drying shrinkage substantially complete before applying next coat.

4. Protection: Protect from frost and rain.

885 Curing and drying nonhydraulic lime render

1. General: Prevent premature setting and uneven drying of each coat.
2. Curing coatings: Keep each coat damp by covering with sheeting hung clear of coating. Spray with water until sufficiently firm.
   2.1. Sheeting: Damp hessian and polyethylene sheeting
3. Shrinkage: Thoroughly consolidate/ scour each coat one or more times as necessary to control shrinkage.

Ω End of Section

M50
Rubber/ plastics/ cork/ lino/ carpet tiling/ sheeting

Types of covering

110 Resilient floor tiling

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Location: To office areas
3. Base: Existing concrete floor
    3.1. Preparation: clean and repair base
4. Fabricated underlay: Tiles
5. Tiles
    5.1. Standard: To BS EN 14041.
        5.1.1. Evidence of compliance: Submit.
    5.2. Reaction to fire classification to BS EN 13501-1: BS EB 13501-1
    5.3. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.4. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
        5.4.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.5. BS EN ISO 10874 class: 21
    5.6. Slip potential
        5.6.1. Slip resistance value (SRV) (minimum)/ Pendulum test value (PTV) (minimum) to BS 7976-1, -2 and -3: 36 dry
        5.6.2. Surface roughness (Rz) (minimum) to BS 1134: Not applicable
    5.7. Recycled content: Contractor's choice
    5.8. Size: 101X914mm
    5.9. Thickness: 2mm
    5.10. Colour/ pattern: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Adhesive (and primer if recommended by manufacturer): As recomended by manufactuer
7. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Finishing: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

130 Carpet tiling

1. Location: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Base: Existing concrete floor (gorund floor), timber floor (first floor)
    2.1. Preparation: Remove existing floor finish
3. Fabricated underlay: Carpet tiles to BS EN 14041 and BS EN 1307
4. Carpet tiles
    4.1. Standards: To BS EN 14041 and BS EN 1307.
        4.1.1. Evidence of compliance: Submit.

4.2. Reaction to fire classification: Class A1fl or better
4.3. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
4.3.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
4.4. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
4.5. BS EN 1307 classification
4.5.1. Levels of use class: As per the Structural Engineering Calculations and Details & Tender drawings.
4.5.2. Luxury rating class: As per the Structural Engineering Calculations and Details & Tender drawings.
4.5.3. Additional performance properties to BS EN 1307: As per the Structural Engineering Calculations and Details & Tender drawings.
4.6. Recycled content: Contractor's choice
4.7. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
4.8. Colour/ pattern: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Method of laying: Fully adhere all tiles with release adhesive recommended by tile manufacturer.
6. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

150 Sheeting

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Location: To canteen, toilets and boot room
3. Base: Existing concrete floor
3.1. Preparation: Clean and prepare base, ready for self leveling compound
4. Fabricated underlay: Flooring roll
5. Flooring roll
5.1. Standard: To BS EN 14041.
5.1.1. Evidence of compliance: Submit.
5.2. Reaction to fire classification: Class A1fl or better
5.3. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
5.4. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
5.4.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
5.5. BS EN ISO 10874 class: 21
5.6. Slip potential
5.6.1. Slip resistance value (SRV) (minimum)/ Pendulum test value (PTV) (minimum) to BS 7976-1, -2 and -3: 36 dry
5.6.2. Surface roughness (Rz) (minimum) to BS 1134: As per the Structural Engineering Calculations and Details & Tender drawings.
5.7. Recycled content: Contractor's choice
5.8. Width: 2000 mm
5.9. Thickness: 2-2.5mm

5.10. Colour/ pattern: As per the Structural Engineering Calculations and Details & Tender drawings.

6. Adhesive (and primer if recommended by manufacturer): As recommended by manufactuer
7. Seam welding: Hot welding with complimentary coloured rod
8. Accessories: 100mm cover former
9. Finishing: As per the Structural Engineering Calculations and Details & Tender drawings.
10. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

195 Floor finish materials specification

1. Minimum BRE 'Green Guide to Specification Online' rating: As schedule

General requirements

210 Workmanship generally

1. Base condition after preparation: Rigid, dry, sound, smooth and free from grease, dirt and other contaminants.
2. Finished coverings: Accurately fitted, tightly jointed, securely bonded, smooth and free from air bubbles, rippling, adhesive marks and stains.

220 Samples

1. Covering samples: Before placing orders, submit representative sample of each type.

230 Control samples

1. General: Complete areas of finished work in approved locations as follows, and obtain approval of appearance before proceeding: to all floor coverings .

250 Layout – roll materials

1. Setting out of seams: Agree setting out for sheeting types M50/ As per the Structural Engineering Calculations and Details & Tender drawings. .

251 Layout – seams in roll materials

1. Setting out: Minimise occurrences of seams and cross seams.
2. Cross seams: Not permitted in following locations: As per the Structural Engineering Calculations and Details & Tender drawings..

252 Layout – patterns

1. Setting out: Agree setting out for covering types M50/ As per the Structural Engineering Calculations and Details & Tender drawings. .

270 Extra material

1. Provision of extra material: At completion, hand to Employer extra material of each type of covering to extent of As per the Structural Engineering Calculations and Details & Tender drawings..

330 Commencement

1. Required condition of works prior to laying materials
   1.1. Building is weathertight and well dried out.

1.2. Wet trades have finished work.
1.3. Paintwork is finished and dry.
1.4. Conflicting overhead work is complete.
1.5. Floor service outlets, duct covers and other fixtures around which materials are to be cut are fixed.

2. Notification: Submit not less than 48 hours before commencing laying.

340 Conditioning

1. Prior to laying: Condition materials by unpacking and separating in spaces where they are to be laid. Maintain resilient flooring rolls in an upright position. Unroll carpet and keep flat on a supporting surface.
2. Conditioning time and temperature (minimum): As recommended by manufacturer with time extended by a factor of two for materials stored or transported at a temperature of less than 10°C immediately prior to laying.

350 Environment

1. Temperature and humidity: Before, during and after laying, maintain approximately at levels which will prevail after building is occupied.
2. Ventilation: Before during and after laying, maintain adequate provision.

360 Floors with underfloor heating

1. Commencement of laying: Not before a period of 48 hours after heating has been turned off.
2. Post laying start up of heating system: Slowly return heating to its operative temperature not less than 48 hours after completing laying.

Preparing bases

410 New bases

1. Suitability of bases and conditions within any area: Commencement of laying of coverings will be taken as acceptance of suitability.

420 Existing bases

1. Notification: Before commencing work, confirm that existing bases will, after preparation, be suitable to receive coverings.
2. Suitability of bases and conditions within any area: Commencement of laying of coverings will be taken as acceptance of suitability.

430 New wet laid bases

1. Base drying aids: Not used for at least four days prior to moisture content testing.
2. Base moisture content test: Carry out in accordance with BS 5325, Annexe A or BS 8203, Annexe A.
   2.1. Locations for readings: In all corners, along edges, and at various points over area being tested.
3. Commencement of laying coverings: Not until all readings show 75% relative humidity or less.

440 Substrates to receive thin coverings

1. Trowelled finishes: Uniform, smooth surface free from trowel marks and other blemishes. Abrade suitably to receive specified floor covering material.

460 Smoothing/ levelling underlayment compound

1. Type: As recommended by covering manufacturer
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice

470 Bases from which existing floor coverings have been removed

1. Substrate: Clear of covering and as much adhesive as possible. Skim with smoothing underlayment compound to give smooth, even surface.

480 Existing floor coverings to be overlaid

1. Substrate: Make good by local resticking and patching or filling with smoothing underlayment compound to give smooth, even surface.

510 Wood block flooring

1. Substrate: Clean and free from wax with all blocks sound and securely bonded. Fill hollows with smoothing underlayment compound to give smooth, even surface.
2. Missing and loose blocks: Replace and reset in adhesive to match existing. Sand or plane to make level.

520 Timber boarding/ strip flooring

1. Substrate: Boards/ strips securely fixed and acceptably level with no protruding fasteners. Plane, sand or apply smoothing underlayment compound to give a smooth, even surface.

530 Particleboard flooring

1. Substrate: Boards securely fixed, level and free from surface sealers and contaminants.
   1.1. Gaps between boards: Not more than 1 mm.
   1.2. Priming: As required by covering adhesive manufacturer.
2. Equilibrium moisture content at time of laying covering: As in service conditions.

535 Particleboard floating flooring

1. Substrate: Boards securely fixed and free from surface sealers and contaminants.
2. Level: Sand to remove areas raised more than 1 mm.
   2.1. Gaps between boards: Not more than 1 mm.
   2.2. Priming: As required by covering adhesive manufacturer.
3. Equilibrium moisture content at time of laying covering: As in service conditions.

550 Hardboard underlay

1. Standard: To BS EN 622-2.
   1.1. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Thickness: 2.5 mm
3. Sheet size: 2400 x 1200 mm
4. Substrate: Existing floor boards securely fixed and level with no gross irregularities or protruding fasteners.
5. Conditioning sheets: Prior to fixing.
   5.1. Requirement: To restrict in situ expansion and prevent consequential disfigurement to floor coverings.

6. Laying sheets: Smooth face uppermost
   6.1. Cross joints: Staggered with none coincident with joints in base.
      6.1.1. Joints: Butted
7. Fasteners: 25 mm ringed shank or twisted shank nails or divergent staples.
   7.1. Spacing: Commence at centre of one side of each sheet, at 150 mm grid centres over area of each sheet and at 100 mm centres along perimeter, set in 12 mm from edge.
   7.2. Placement: Not to project above sheet surface or through underside of base. Not deformed.
8. Underlay conditioned by wetting: Do not lay coverings until underlay is dry.

560 Plywood underlay

1. Standard: To BS EN 13986.
2. Bonding quality: To BS EN 314-2, class 1.
3. Appearance: To BS EN 635, class E.
4. Finish: Sanded
5. Thickness: 4 mm
6. Sheet size: 2400 x 1200 mm
7. Substrate: Existing floor boards securely fixed and acceptably level with no gross irregularities or protruding fasteners.
8. Laying sheets: Stagger cross joints such that no joint within base and underlay is coincident and with a 0.5-1 mm gap between sheets.
9. Fasteners: 25 mm ringed shank or twisted shank nails or divergent staples.
   9.1. Spacing: Commencing at centre of one side of each sheet, at 150 mm grid centres over area of each sheet and at 100 mm centres along perimeter, set in 12 mm from edge.
   9.2. Placement: Driven with heads set flush with surface, and not projecting through underside of base. Not deformed.

Laying coverings

610 Setting out tiles

1. Method: Set out from centre of area/ room, so that wherever possible:
   1.1. Tiles along opposite edges are of equal size.
   1.2. Edge tiles are more than 50% of full tile width.

620 Colour consistency

1. Finished work in any one area/ room: Free from banding or patchiness.

640 Adhesive fixing generally

1. Adhesive type: As specified, as recommended by covering/ underlay, manufacturer or as approved.
2. Primer: Type and usage as recommended by adhesive manufacturer.
3. Application: As necessary to achieve good bond.
4. Finished surface: Free from trowel ridges, high spots caused by particles on the substrate, and other irregularities.

645 Laying interlocking tiles and planks

1. Setting out: As manufacturer's recommendations.

2. Fixing temperature: As manufacturer's recommendations
3. Perimeter edges: As manufacturer's recommendations.

650 Seams

1. Patterns: Matched.
2. Joints: Tight without gaps.

670 Borders and feature strips in sheet material

1. Curl: Not acceptable.
2. Corners: Mitre joints.

680 Seam welding coverings

1. Commencement: At least 24 hours after laying, or after adhesive has set.
2. Joints: Neat, smooth, strongly bonded, flush with finished surface.

690 Seam bonding carpet

1. Carpet types: M50/ As per the Structural Engineering Calculations and Details & Tender drawings. .
2. Seaming adhesive application: Continuous bead to edges.
3. Joints: Securely bonded, free of air bubbles.

700 Loose laid carpet tiles

1. Areas of adhered tiles: Secure using double sided tape or peelable adhesive.
2. Joints: Butted.
   2.1. Perimeter joints: Accurately cut to match abutment and prevent movement.

720 Doorways

1. Joint location: On centre line of door leaf.

740 Edgings and cover strips

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material/ finish: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Fixing: Secure with edge of covering gripped. Use matching fasteners where exposed to view

750 Stair nosings and trims

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material/ finish: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Fixing: Secure, level and with mitred joints. Adjusted to suit thickness of covering with continuous packing strips of hardboard or plywood. Nosings and packing strips bedded in gap-filling adhesive recommended by nosing manufacturer.
   3.1. Screw fixing with matching plugs: Required

760 Stair coverings – separate risers and treads

1. Fixing: Accurately cut. Fit risers before treads.

770 Skirtings

1. Types: 100m Bullnose MDF Skirting
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Fixing: Secure with top edge straight and parallel with floor.
   3.1. Corners: Mitre joints.

780 Trafficking after laying

1. Covering types: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Traffic free period: 7 hours

Completion

820 Finishing

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Cleaning operations
   2.1. Wash floor with water containing neutral (pH 6-9) detergent. If necessary, lightly scrub heavily soiled areas.
   2.2. Rinse with clean water, removing surplus to prevent damage to adhesive. Allow to dry.
3. Emulsion polish: Two coats of a type recommended by covering manufacturer.

825 Finishing non-textile antistatic flooring

1. Cleaning operations
   1.1. Wash floor with water containing neutral (pH 6-9) detergent. If necessary, lightly scrub heavily soiled areas.
   1.2. Rinse with clean water, removing surplus to prevent damage to adhesive. Allow to dry for not less than 24 hours before testing.

830 Finishing rubber flooring

1. Cleaning operations
   1.1. Wash floor with a cleaner recommended by covering manufacturer.
   1.2. Wet vacuum or mop up residue.
   1.3. Rinse with clean water. Wet vacuum or mop up and allow to dry.
2. Final treatment: Follow recommendations of covering manufacture and spray buff with wetting agent or dry burnish.

840 Finishing rubber flooring – polish finish

1. Cleaning operations
   1.1. Wash floor with a cleaner recommended by covering manufacturer.
   1.2. Wet vacuum or mop up residue.
   1.3. Rinse with clean water. Wet vacuum or mop up and allow to dry.
2. Polishing: Apply two coats of buffable or semibuffable polish of a type recommended by covering manufacturer.

850 Finishing cork tile flooring – polish finish

1. Preparation: Lightly sand joints to remove any lipping. Match original finish.

2. Cleaning operations
   2.1. Remove dust and wash, using water containing a neutral detergent. Allow to dry.
3. Sealing: Apply a water based seal of a type and number of coats recommended by cork manufacturer. Allow each coat to dry. Dry burnish.
4. Emulsion polish: Two coats of a type recommended by cork manufacturer. Dry burnish each coat.

851 Finishing cork tile flooring – polyurethane finish

1. Preparation: Lightly sand joints to remove any lipping. Match original finish.
2. Cleaning operations
   2.1. Remove dust and wash with water containing a neutral detergent. Allow to dry.
3. Polyurethane varnish: Apply a type and number of coats recommended by cork manufacturer. Allow each coat to dry.

861 Slip resistance testing

1. Testing authority: A UKAS accredited laboratory
2. Floor covering(s) to be tested: All floors
3. Test: To BS 7976-1, -2 and -3.
   3.1. Floor covering condition: Dry and wet
   3.2. Witnessing/ Certification: Arrange for tests to be witnessed/ certified by: Contract Administrator.
4. Report: Submit.

880 Waste

1. Spare covering material: Retain suitable material for patching. On completion submit pieces for selection. Hand over selected pieces to Employer.

Ω End of Section

M60
Painting/clear finishing

Coating systems

110 Water-based finishing coats Type A

1. Description: TO INTERNAL PLASTERED SURFACES
2. Manufacturer: Dulux Trade, brand of AkzoNobel
   2.1. Contact details
      2.1.1. Address: AkzoNobel Decorative Paints
      Wexham Road
      Slough
      Berkshire
      SL2 5DS
      2.1.2. Telephone: +44 (0)333 222 7070
      2.1.3. Web: www.duluxtradepaintexpert.co.uk
      2.1.4. Email: project.support@akzonobel.com
   2.2. Product reference: Diamond Matt
3. Composition: Acrylic copolymer.
4. Sheen: Matt.
5. Colour: Off White - 30GG 72/008
6. Form: Liquid.

110 Water-based finishing coats Type B

1. Description: TO INTERNAL PLASTERED SURFACES
2. Manufacturer: Dulux Trade, brand of AkzoNobel
   2.1. Contact details
      2.1.1. Address: AkzoNobel Decorative Paints
      Wexham Road
      Slough
      Berkshire
      SL2 5DS
      2.1.2. Telephone: +44 (0)333 222 7070
      2.1.3. Web: www.duluxtradepaintexpert.co.uk
      2.1.4. Email: project.support@akzonobel.com
   2.2. Product reference: Diamond Matt
3. Composition: Acrylic copolymer.
4. Sheen: Matt.
5. Colour: Green - 40GY 18/372
6. Form: Liquid.

110 Water-based finishing coats Type C

1. Description: TO INTERNAL PLASTERED SURFACES
2. Manufacturer: Dulux Trade, brand of AkzoNobel
   2.1. Contact details

2.1.1. Address: AkzoNobel Decorative Paints
Wexham Road
Slough
Berkshire
SL2 5DS

2.1.2. Telephone: +44 (0)333 222 7070

2.1.3. Web: www.duluxtradepaintexpert.co.uk

2.1.4. Email: project.support@akzonobel.com

2.2. Product reference: Diamond Matt

3. Composition: Acrylic copolymer.
4. Sheen: Matt.
5. Colour: Basically Balck - 42BB 09/032
6. Form: Liquid.

150 Flame-retardant coatings Type A

1. Description: Skirtings, Door frames & Architraves
2. Manufacturer: Dulux Trade, brand of AkzoNobel
   2.1. Contact details
      2.1.1. Address: AkzoNobel Decorative Paints
      Wexham Road
      Slough
      Berkshire
      SL2 5DS
      2.1.2. Telephone: +44 (0)333 222 7070
      2.1.3. Web: www.duluxtradepaintexpert.co.uk
      2.1.4. Email: project.support@akzonobel.com
   2.2. Product reference: Satinwood
3. Composition: Alkyd.
4. Sheen: Satin.
5. Colour: Almost Black - 09BB/008
6. Form: Liquid.

150 Flame-retardant coatings Type B

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Dulux Trade, brand of AkzoNobel
   2.1. Contact details
      2.1.1. Address: AkzoNobel Decorative Paints
      Wexham Road
      Slough
      Berkshire
      SL2 5DS
      2.1.2. Telephone: +44 (0)333 222 7070
      2.1.3. Web: www.duluxtradepaintexpert.co.uk
      2.1.4. Email: project.support@akzonobel.com
   2.2. Product reference: Eggshell
3. Composition: Alkyd.

4. Sheen: Eggshell.
5. Colour: Off White - 30GG/72/008
6. Execution: Applying coating.
7. Form: Liquid.
8. Viscosity: 5,52 cm²/s.

150 Flame-retardant coatings Type C

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Dulux Trade, brand of AkzoNobel
   2.1. Contact details
      2.1.1. Address: AkzoNobel Decorative Paints
      Wexham Road
      Slough
      Berkshire
      SL2 5DS
      2.1.2. Telephone: +44 (0)333 222 7070
      2.1.3. Web: www.duluxtradepaintexpert.co.uk
      2.1.4. Email: project.support@akzonobel.com
   2.2. Product reference: Eggshell
3. Composition: Alkyd.
4. Sheen: Eggshell.
5. Colour: Cotton White
6. Execution: Applying coating.
7. Form: Liquid.
8. Viscosity: 5,52 cm²/s.

175 Protective coating

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Leighs Paints
   2.1. Product reference: Epigrip C400V3 Zinc Prosphate Primer/Buildcoat
3. Surfaces: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Preparation: Blast clean in accordance with BS EN ISO 8501-1 to preperation grade Sa2 1/2
4. Initial coats: As recommended by manufacturer
   4.1. Number of coats: As recommended by manufactuer
5. Undercoats: As recommended by manufacturer
   5.1. Number of coats: As recommended by manufacturer
6. Finishing coats: As recommended by manufacturer
7. Application: Airless spray
   7.1. Number of coats: As recommended by manufacturer
   7.2. Slip resistance value - water wet (minimum): Not applicable

Generally

210 Coating materials

1. Manufacturers: Obtain materials from any of the following:

2. Dulux Trade.
3. Selected manufacturers: Submit names before commencement of coating work.

215 Handling and storage

1. Coating materials: Deliver in sealed containers, labelled clearly with brand name, type of material and manufacturer's batch number.
2. Materials from more than one batch: Store separately. Allocate to distinct parts or areas of the work.

220 Compatibility

1. Coating materials selected by contractor
   1.1. Recommended by their manufacturers for the particular surface and conditions of exposure.
   1.2. Compatible with each other.
   1.3. Compatible with and not inhibiting performance of preservative/fire-retardant pretreatments.

240 Surfaces not to be coated

1. As per the Structural Engineering Calculations and Details & Tender drawings..

250 Surfaces to be cleaned but not coated

1. As per the Structural Engineering Calculations and Details & Tender drawings..

280 Protection

1. 'Wet paint' signs and barriers: Provide where necessary to protect other operatives and general public, and to prevent damage to freshly applied coatings.

320 Inspection by coating manufacturers

1. General: Permit manufacturers to inspect work in progress and take samples of their materials from site if requested.

321 Inspection of work stages

1. Programme for inspections: Submit as follows:
2. Types of coating Inspection at completion of
3. M60/ 111. Emulsion.
4. Inspection: Give prior notice when each stage is ready for inspection.

Preparation

400 Preparation generally

1. Standard: In accordance with BS 6150.
2. Refer to any pre-existing CDM Health and Safety File.
3. Refer to CDM Construction Phase Plan where applicable.
4. Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
5. Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
6. Substrates: Sufficiently dry in depth to suit coating.

7. Efflorescence salts: Remove.
8. Dirt, grease and oil: Remove. Give notice if contamination of surfaces/ substrates has occurred.
9. Surface irregularities: Remove.
10. Joints, cracks, holes and other depressions: Fill flush with surface, to provide smooth finish.
11. Dust, particles and residues from preparation: Remove and dispose of safely.
12. Water based stoppers and fillers
    12.1. Apply before priming unless recommended otherwise by manufacturer.
    12.2. If applied after priming: Patch prime.
13. Oil based stoppers and fillers: Apply after priming.
14. Doors, opening windows and other moving parts
    14.1. Ease, if necessary, before coating.
    14.2. Prime resulting bare areas.

420 Fixtures and fittings

1. Removal: Before commencing work remove: Coverplates, grilles, wall clocks, and other surface mounted fixtures.
2. Replacement: Refurbish as necessary, refit when coating is dry.

425 Ironmongery

1. Removal: Before commencing work: Remove ironmongery from surfaces to be coated.
2. Hinges: Remove
3. Replacement: Refurbishment as necessary; refit when coating is dry.

430 Existing ironmongery

1. Refurbishment: Remove old coating marks. Clean and polish.

440 Previously coated surfaces generally

1. Preparation: In accordance with BS 6150, clause 11.5.
2. Contaminated or hazardous surfaces: Give notice of:
    2.1. Coatings suspected of containing lead.
    2.2. Substrates suspected of containing asbestos or other hazardous materials.
    2.3. Significant rot, corrosion or other degradation of substrates.
3. Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
4. Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
5. Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
6. Alkali affected coatings: Completely remove.
7. Retained coatings
    7.1. Thoroughly clean to remove dirt, grease and contaminants.
    7.2. Gloss-coated surfaces: Provide key.
8. Partly removed coatings
    8.1. Additional preparatory coats: Apply to restore original coating thicknesses.
    8.2. Junctions: Provide flush surface.

9. Completely stripped surfaces: Prepare as for uncoated surfaces.

451 Previously coated surfaces – blast cleaning

1. Operatives
   1.1. Trained/ experienced in blast cleaning.
   1.2. Submit evidence of training/ experience on request.
2. Dust and nuisance: Minimize.

456 Previously coated surfaces – burning off

1. Risk assessment and method statement: Prepare, and obtain approval before commencing work.
2. Adjacent areas: Protect from excessive heat and falling scrapings.
3. Exposed resinous areas and knots: Apply two coats of knotting.
4. Removed coatings: Dispose of safely.

461 Previously coated wood

1. Degraded or weathered surface wood: Take back to provide suitable substrate.
2. Degraded substrate wood: Repair with sound material of same species.
3. Exposed resinous areas and knots: Apply two coats of knotting.

471 Preprimed wood

1. Areas of defective primer: Take back to bare wood and reprime.

481 Uncoated wood

1. General: Provide smooth, even finish with arrises and moulding edges lightly rounded or eased.
2. Heads of fasteners: Countersink sufficient to hold stoppers/fillers.
3. Resinous areas and knots: Apply two coats of knotting.

490 Previously coated steel

1. Defective paintwork: Remove to leave a firm edge and clean bright metal.
2. Sound paintwork: Provide key for subsequent coats.
3. Corrosion and loose scale: Take back to bare metal.
4. Residual rust: Treat with a proprietary removal solution.
5. Bare metal: Apply primer as soon as possible.
6. Remaining areas: Degrease.

500 Preprimed steel

1. Areas of defective primer, corrosion and loose scale: Take back to bare metal. Reprime as soon as possible.

511 Galvanized, sherardized and electroplated steel

1. White rust: Remove.
2. Pretreatment: Apply one of the following:
   2.1. Mordant solution to blacken whole surface.
   2.2. Etching primer recommended by coating system manufacturer.

521 Uncoated steel – manual cleaning

1. Oil and grease: Remove.
2. Corrosion, loose scale, welding slag and spatter: Remove.
3. Residual rust: Treat with a proprietary removal solution.
4. Primer: Apply as soon as possible.

531 Uncoated steel – blast cleaning

1. Oil and grease: Remove.
2. Blast cleaning
    2.1. Atmospheric conditions: Dry.
    2.2. Abrasive: Suitable type and size, free from fines, moisture and oil.
    2.3. Surface finish: To BS EN ISO 8501-1, preparation grade sa 2 1/2.
3. Primer: Apply as soon as possible and within four hours of blast cleaning.

541 Uncoated aluminium/ copper/ lead

1. Surface corrosion: Remove and lightly key surface.
2. Pretreatment: Etching primer if recommended by coating system manufacturer.

552 Uncoated PVC-U

1. Dirt and grease: Remove. Do not abrade surface.

560 Uncoated concrete

1. Release agents: Remove.

570 Uncoated masonry/ Rendering

1. Loose and flaking material: remove.

580 Uncoated plaster

1. Nibs, trowel marks and plaster splashes: Scrape off.
2. Overtrowelled ‘polished’ areas: Key lightly.

590 Uncoated plasterboard

1. Depressions around fixings: Fill with stoppers/ fillers

601 Uncoated plasterboard – to receive textured coating

1. Joints: Fill, tape and feather out with materials recommended by textured coating manufacturer.

611 Wall coverings

1. Retained wall coverings: Check that they are in good condition and well adhered to substrate.
2. Previously covered walls: Wash down to remove paper residues, adhesive and size.

622 Organic growths

1. Dead and loose growths and infected coatings: Scrape off and remove from site.
2. Treatment biocide: Apply appropriate solution to growth areas and surrounding surfaces.
3. Residual effect biocide: Apply appropriate solution to inhibit re-establishment of growths.

631 Previously painted window frames

1. Paint encroaching beyond glass sight line: Remove.
2. Loose and defective putty: Remove.
3. Putty cavities and junctions between previously painted surfaces and glass: Clean thoroughly.
4. Finishing
    4.1. Patch prime, reputty as necessary, and allow to set.
    4.2. Seal and coat as soon as fully set.

640 External pointing to existing frames

1. Defective sealant pointing: Remove.
2. Joint depth: Approximately half joint width; adjust with backing strip if necessary.
3. Sealant
    3.1. Manufacturer: Contractor's choice
        3.1.1. Product reference: Contractor's choice
    3.2. Preparation and application: As section Z22.

645 Sealing of internal movement joints

1. General: To junctions of walls and ceilings with architraves, skirtings and other trims.
2. Sealant: Waterborne acrylic.
    2.1. Manufacturer: Contractor's choice
        2.1.1. Product reference: Contractor's choice
    2.2. Preparation and application: As section Z22.

651 Existing gutters

1. Dirt and debris: Remove from inside of gutters.
2. Defective joints: Clean and seal with suitable jointing material.

Application

711 Coating generally

1. Application standard: In accordance with BS 6150, clause 9.
2. Conditions: Maintain suitable temperature, humidity and air quality during application and drying.
3. Surfaces: Clean and dry at time of application.
4. Thinning and intermixing of coatings: Not permitted unless recommended by manufacturer.
5. Overpainting: Do not paint over intumescent strips or silicone mastics.
6. Priming coats
    6.1. Thickness: To suit surface porosity.
    6.2. Application: As soon as possible on same day as preparation is completed.
7. Finish
    7.1. Even, smooth and of uniform colour.
    7.2. Free from brush marks, sags, runs and other defects.
    7.3. Cut in neatly.
8. Doors, opening windows and other moving parts: Ease before coating and between coats.

720 Priming joinery

1. Preservative treated timber: Retreat cut surfaces with two flood coats of a suitable preservative before priming.
2. End grain: Coat liberally allow to soak in, and recoat.

730 Workshop coating of concealed joinery surfaces

1. General: Apply coatings to all surfaces of components.

731 Site-coating of concealed joinery surfaces

1. General: After priming, apply additional coatings to surfaces that will be concealed when fixed in place.
    1.1. Components: As per the Structural Engineering Calculations and Details & Tender drawings.
    1.2. Additional coatings: One undercoat

740 Concealed metal surfaces

1. General: Apply additional coatings to surfaces that will be concealed when component is fixed in place.
    1.1. Components: Underside of fence rails
    1.2. Additional coatings: Black bitumen to BS 3416, type 1

751 Staining wood

1. Primer: Apply if recommended by stain manufacturer.
2. Application: Apply in flowing coats and brush out excess stain to produce uniform appearance.

760 Varnishing wood

1. First coat: Thin with white spirit
    1.1. Brush well in and lay off avoiding aeration.
2. Subsequent coats: Provide light key and smooth along the grain between coats.

770 External doors

1. Bottom edges: Prime and coat before hanging doors.

780 Bead glazing to coated wood

1. Before glazing: Apply first two coats to rebates and beads.

790 Linseed oil putty glazing

1. Setting: Allow putty to set for seven days.
2. Sealing
    2.1. Within a further 14 days, seal with a solvent-borne primer.
    2.2. Fully protect putty with coating system as soon as it is sufficiently hard.
    2.3. Extend finishing coats on to glass up to sight line.

800 Glazing

1. Etched, sand blasted and ground glass: Treat or mask edges before coating to protect from contamination by oily constituents of coating materials.

810 Water-repellent

1. Application: Liberally flood surface, giving complete and even coverage.

Ω End of Section

M61
Intumescent coatings for fire protection of steelwork

Protective coating systems

110 On-site coating to primed steel

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Use/ location: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Fire performance: As clause 202
4. Preparation and priming: By steelwork contractor, as section G10.
5. Intumescent coating system
    - 5.1. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
        - 5.1.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
    - 5.2. Intumescent coat
        - 5.2.1. Type: Contractor's choice
        - 5.2.2. Finish: Non-visible areas: basic
    - 5.3. Top sealer coat
        - 5.3.1. Type: Contractor's choice
        - 5.3.2. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Bolt head/ nut protection: As main steelwork

115 On-site coating to galvanized steel

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Use/ location: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Fire performance: As clause 202
4. Preparation: Degrease and clean thoroughly.
5. Pretreatment: 'T wash' or mordant solution recommended by intumescent coating manufacturer.
6. Intumescent coating system
    - 6.1. Manufacturer: Contractor's choice
        - 6.1.1. Product reference: Contractor's choice
    - 6.2. Primer
        - 6.2.1. Type: Contractor's choice
    - 6.3. Intumescent coat
        - 6.3.1. Type: Contractor's choice
        - 6.3.2. Finish: Non-visible areas: basic
    - 6.4. Top sealer coat
        - 6.4.1. Type: Contractor's choice
        - 6.4.2. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Bolt head/ nut protection: As main steelwork

145 Site-applied intumescent castings

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.

2. Use/ location: columns throughout
3. Fire performance: As clause 202
4. Primer to steelwork: As recommended by casting manufacturer
5. Intumescent casting system
    5.1. Manufacturer: Contractor's choice
        5.1.1. Product reference: Contractor's choice
    5.2. Casting
        5.2.1. Type: Contractor's choice
    5.3. Top sealer coat
        5.3.1. Type: Contractor's choice
        5.3.2. Colour: To be agreed
6. Bolt head/ nut protection: As advised by casting manufacturer.

160 Off-site coating to primed steel

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Use/ location: Exposed internal faces of columns, beams and purlins
3. Fire performance: As clause 202
4. Preparation and priming: By steelwork contractor, as section G10 Zinc phosphate, as section G10
5. Intumescent coating system
    5.1. Manufacturer: Contractor's choice
        5.1.1. Product reference: Contractor's choice
    5.2. Intumescent coat
        5.2.1. Type: Contractor's choice
        5.2.2. Finish: Non-visible areas: basic
    5.3. Top sealer coat
        5.3.1. Type: Contractor's choice
        5.3.2. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Bolt head/ nut protection: As main steelwork

170 Off-site coating to galvanized steel

1. Description: INTERNALLY
2. Use/ location: Exposed internal faces of columns, beams and purlins
3. Fire performance: As clause 202
4. Preparation: Degrease and clean thoroughly.
5. Pretreatment: 'T wash' or mordant solution recommended by intumescent coating manufacturer.
6. Intumescent coating system
    6.1. Manufacturer: Contractor's choice
        6.1.1. Product reference: Contractor's choice
    6.2. Primer
        6.2.1. Type: Contractor's choice
    6.3. Intumescent coat
        6.3.1. Type: Contractor's choice
        6.3.2. Finish: Concealed areas: basic

6.4. Top sealer coat

6.4.1. Type: Contractor's choice

6.4.2. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

7. Bolt head/ nut protection: Fire-insulating caps

Performance and general requirements

202 Fire performance

1. Reaction to fire: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Fire resistance to BS EN 13501-2: As per the Structural Engineering Calculations and Details & Tender drawings.

204 Exposure and durability

1. Environmental exposure: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Durability classification: As per the Structural Engineering Calculations and Details & Tender drawings.

205 Validation of materials

1. Project-specific evaluation of intumescent coating materials
   1.1. Standard: In accordance with BS EN 16623, clause 4.
   1.2. Test results: Submit on request.

210 Working procedures

1. Standard: In accordance with BS EN 16623.
2. Give notice: Before commencing surface preparation and coating application.
3. Quality control: Record project specific procedures for surface preparation and coating application.

215 Working conditions

1. General: Maintain manufacturer's recommended temperature, humidity and air quality conditions during application and drying.
2. Surface condition: Clean and dry at time of application.

220 Applicator's personnel

1. Operatives: Trained/ experienced in anticorrosive and intumescent coatings.
2. Evidence of training/ experience: Submit on request.

250 Sprayed coating application on site

1. Standard: In accordance with BS EN 16623.
2. Spray drift: Minimize.
3. Uncoated areas of steel: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Masking: Protect designated adjacent surfaces.
   4.1. Designated surfaces: Fair-faced brickwork

255 Sprayed coating application off site

1. Standard: In accordance with BS EN 16623.
2. Uncoated areas of steel: As per the Structural Engineering Calculations and Details & Tender drawings.

260 Control samples

1. General: Carry out sample areas of finished work as follows: One column and two adjoining beams.
2. Approval of appearance: Obtain before commencement of general application.

270 Inspection

1. Permit intumescent manufacturer to
    1.1. Inspect work in progress.
    1.2. Inspect quality control records.
    1.3. Take dry film thickness and other measurements.
    1.4. Take samples of products.
2. Intumescent manufacturer's inspection reports: Submit without delay.

280 Off-site-coated steel

1. Handling and erection: Use methods and devices designed to minimize damage to intumescent coatings.
2. Damaged areas of coating: Reinstate in accordance with coating manufacturer's recommendations.

Preparation of surfaces

315 New steel – blast-cleaning

1. Preparation: Remove oil, grease and contaminants.
2. Blast-cleaning
    2.1. Atmospheric condition: Dry.
    2.2. Abrasive: Suitable type and size, free from fines, moisture and oil.
    2.3. Finish: To BS EN ISO 8501-1, preparation grade SA2½, with an average profile of approximately 75 micrometres.
    2.4. Abrasive residues and moisture: Remove.
3. Primer: Apply as soon as possible after cleaning and before gingering or blackening appears.

320 Existing steel – blast-cleaning

1. Preparation: Remove oil, grease and contaminants.
2. Blast-cleaning: Remove existing coatings and rust.
    2.1. Atmospheric condition: Dry.
    2.2. Abrasive: Suitable type and size, free from fines, moisture and oil.
    2.3. Finish: To BS EN ISO 8501-1, preparation grade SA2½, with an average profile of approximately 75 micrometres.
    2.4. Abrasive residues and moisture: Remove.
3. Primer: Apply as soon as possible after cleaning and before gingering or blackening appears.

330 Existing steel – manual cleaning

1. Preparation: Remove oil, grease and contaminants.
2. Loose or unsound coatings: Remove to a firm edge.
3. Finish: To BS EN ISO 8501-1, preparation grade St2. Leave a clean but unpolished dry surface.
4. Primer: Apply as soon as possible after cleaning and before gingering or blackening appears. Remove coating edges that lift as a result of priming, and reprime.

340 Existing steel – preparation for overcoating

1. Preparation: Remove oil, grease and contaminants.
2. Loose or unsound coatings: Remove to a firm edge.
3. Exposed steel finish: Manually clean to BS EN ISO 8501-1, grade St2. Leave a clean but unpolished dry surface.
4. Existing coatings finish: Abrade to give a good key. Leave a clean, dry surface.
5. Primer: Apply one brush coat to bare steel areas. Remove coating edges that lift as a result of priming, and reprime.

Application of castings

402 Intumescent casting thickness

1. Required thickness: Determine for every steel member to give specified period of fire resistance. Use intumescent casting manufacturer's current published loading tables.
    1.1. Special sections and partial fire exposure conditions: Obtain required thickness in writing from manufacturer.
2. Schedule and drawings: Submit at least two weeks before starting work.
    2.1. Schedule content: Member sizes, weights/ thicknesses, loading conditions, etc. showing, for each variant, the exposed perimeter/ sectional area (Hp/A) ratio and required casting thickness.
    2.2. Drawing content: Steelwork drawings marked in colour to show required thickness for each member.

404 Intumescent casting installation

1. Assembly: Adhesive fix casting sections tight to steel substrate.
2. Filling: Apply intumescent filler to all joints and deformations to produce a smooth and uniform finish.

Application of coatings

410 Intumescent coating dry film thickness (dft)

1. Applicable coatings: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Required dft: Determine for every steel member to give specified period of fire resistance. Use intumescent coating manufacturer's current published loading tables.
    2.1. Special sections and partial fire exposure conditions: Obtain required dft in writing from manufacturer.
3. Schedule and drawings: Submit at least two weeks before starting work.
    3.1. Schedule content: Member sizes, weights/ thicknesses, loading conditions, etc. showing, for each variant, the exposed perimeter/ sectional area (Hp/A) ratio and required dft.

3.2. Drawing content: Steelwork drawings marked in colour to show required dft for each member.

420 Measurement of intumescent dft

1. Primer dft: Determine average dft (for deduction from total dft after application of intumescent).
2. Intumescent dft: Determine at:
   2.1. 500 mm centres along each coated plane of universal sections (8 planes), and rectangular hollow sections (4 planes).
   2.2. 125 mm centres along coated circular hollow sections, spread evenly around circumference.
3. Acceptance standard
   3.1. Average intumescent dft: Not less than required dft (exclusive of primer and top sealer).
   3.2. Local intumescent dft: Not less than 80% of required dft. Areas greater than 100 mm equivalent diameter with a dft of less than 80% of required dft must be brought up to thickness.

440 Basic finish

1. Definition: Reasonably smooth and even. Orange peel, other texture, minor runs and similar minor defects are acceptable.

450 Normal decorative finish

1. Definition: Good standard of cosmetic finish generally, when viewed from a distance of 5 m or more. Minor orange peel or other texture is acceptable.

460 High decorative finish

1. Definition: High standard of evenness, smoothness and gloss when viewed from a minimum distance of 2 m.

490 Top sealer coat

1. Application: To achieve dft recommended by manufacturer and to give an even, solid, opaque appearance, free from runs, sags and other visual defects.

520 Completion of off-site-coated steel

1. Uncovered areas, including fixings: Following erection of steelwork, apply intumescent coating locally.
2. Unscheduled additional connections to erected steelwork: Remove and reinstate intumescent coating locally.

Completion

530 Records of intumescent application

1. On completion of intumescent work, submit
   1.1. Accurate surface preparation, coating and intumescent application records.
   1.2. Fire resistance certificates.
   1.3. Intumescent manufacturer's recommendations for maintenance and overcoating.

Ω End of Section

N10
General fixtures/ furnishings/ equipment

Products

110 Purpose-made

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
3. Standard: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Timber: To BS EN 942.
   - 4.1. Species: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 4.2. Appearance class: Not applicable
   - 4.3. Moisture content on delivery: 9 to 13%
5. Wood-based boards: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Metal: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 6.1. Grade: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Other materials: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Finishes: As manufactured
9. Adhesive: To BS 1203
10. Fixings: As per the Structural Engineering Calculations and Details & Tender drawings.
    - 10.1. Fasteners: As per the Structural Engineering Calculations and Details & Tender drawings.
11. Joinery workmanship: As section Z10.
12. Metalwork materials and workmanship: As section Z11.
13. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

125 Desks and tables

1. Item: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   - 2.1. Product reference: Contractor's choice
3. Plan shape: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Dimensions
   - 4.1. Plan size: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 4.2. Height: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Worktops
   - 5.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 5.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
   - 5.3. Exposed edges: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Pedestal units
   - 6.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.

6.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

6.3. Exposed edges: As per the Structural Engineering Calculations and Details & Tender drawings.

7. Supports: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Accessories/ Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

135 Storage and display units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Item: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Manufacturer: Contractor's choice

3.1. Product reference: Contractor's choice

4. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Doors/ Drawers

5.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.

5.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

6. Outer panels/ Plinths/ Shelves

6.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.

6.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

7. Frames/ Legs

7.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.

7.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

8. Integral accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

145 Vanity and washroom furniture

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Item: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Manufacturer: Contractor's choice

3.1. Product reference: Contractor's choice

4. Form: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Worktop: As per the Structural Engineering Calculations and Details & Tender drawings.

6.1. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

6.2. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.

7. Doors/ Drawers/ Shelves

7.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.

7.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

7.3. Exposed edges: As per the Structural Engineering Calculations and Details & Tender drawings.

8. Supports: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

160 Shelving system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Shelf Spacing: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Shelves
   4.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Carcass or frame
   5.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Other components: As per the Structural Engineering Calculations and Details & Tender drawings.

177 Chairs

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Adjustability: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Seat/ Back/ Arms
   6.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Frame
   7.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   7.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

180 Free-standing screens

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.

2. Standard: To BS EN 1023-1 and -2.
3. Format: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Manufacturer: Contractor's choice
   4.1. Product reference: Contractor's choice
5. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Screen Surfaces
   6.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Frames
   7.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   7.2. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Add-on elements: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

190 Cages

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Form: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Frame: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.2. Section size: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.3. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Infill panels: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.1. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Roof: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Floor: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Door
   9.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
   9.2. Operation: As per the Structural Engineering Calculations and Details & Tender drawings.
   9.3. Lock: As per the Structural Engineering Calculations and Details & Tender drawings.
10. Underfloor barrier: As per the Structural Engineering Calculations and Details & Tender drawings.
11. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

200 Worktops

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice

3. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.1. Plan size: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.2. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.3. Height: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Front edges: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.1. Cut edges: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Support: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Cutouts: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Integral accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

210 Coat racks

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Arrangement: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Mounting: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Dimensions
   5.1. Overall length: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.2. Overall height: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.1. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Integral accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

240 Blinds

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 13120.
3. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.1. Finish/ Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Operation: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Operating effort: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Testing: As per the Structural Engineering Calculations and Details & Tender drawings.

10. Mechanism endurance: As per the Structural Engineering Calculations and Details & Tender drawings.
11. Accessories/ Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

270 Mirrors

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Dimensions
    2.1. Length: As per the Structural Engineering Calculations and Details & Tender drawings.
    2.2. Width: As per the Structural Engineering Calculations and Details & Tender drawings.
    2.3. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Quality: Free from tarnishing, discoloration, scratches and other defects visible in the designed viewing conditions. Reflection undistorted.
5. Backing: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Edges
    6.1. Treatment: As per the Structural Engineering Calculations and Details & Tender drawings.
    6.2. Profile: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Installation: Accurately with sides vertical.

300 Entrance matting

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
    2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Arrangement: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Pattern: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Integral accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

460 Sealant

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.1. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
        3.1.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.2. Cure: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

Execution

710 Moisture content of wood and wood-based boards

1. Standard: To BS EN 942
2. Moisture content on delivery: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Temperature and humidity: During delivery, storage, fixing and to handover maintain conditions to suit specified moisture contents of timber components.

720 Installation generally

1. General: As Preliminaries section A33
2. Fixing and fasteners: As section Z20.
3. Services: As section V90

760 Sealant bedding and pointing

1. Application: As section Z22.
2. Bedding: Sinks to top of worktops
3. Pointing: Joints between worktop and splash backs

770 Trims

1. Lengths: Wherever possible, unjointed between angles or ends of runs.
2. Running joints: Where unavoidable, obtain approval of location and method of jointing.
3. Angle joints: Mitred.

Completion

910 General

1. Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
2. Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

920 Appliances

1. Test: Ensure that all functions and features work correctly.
2. Documentation: Submit guarantees, instruction manuals, etc.

Ω End of Section

N11
Domestic kitchen fittings, furnishings and equipment

Products

310 Fitted base units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 14749.
3. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Structural performance: To BS 6222-2, test level G.
5. Dimensions: To BS EN 1116.
6. Surface finishes: To BS 6222-3.
7. Doors and drawer fronts
    7.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.2. Finish and colour: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.3. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.4. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Side panels, plinths and shelves
    8.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
    8.2. Finish and colour: As per the Structural Engineering Calculations and Details & Tender drawings.
    8.3. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

320 Fitted wall units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 14749.
3. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Structural performance: To BS 6222-2, test level G.
5. Dimensions: To BS EN 1116.
6. Surface finishes: To BS 6222-3.
7. Doors and drawer fronts
    7.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.2. Finish and colour: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.3. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.4. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Side panels and shelves

8.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
8.2. Finish and colour: As per the Structural Engineering Calculations and Details & Tender drawings.
8.3. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

340 Worktops

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS 6222-3
3. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Exposed edges: Stainless steel strip
7. Support: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

350 Sinks, taps, traps and wastes

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Sinks
   2.1. Standard: To BS EN 13310.
   2.2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
      2.2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.3. Configuration: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.4. Overall size: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.5. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
      2.5.1. Colour and finish: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Tap/ chainstay/ overflow holes: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Taps: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.1. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.
      4.1.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.2. Operation: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.3. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Wastes: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.1. Standard: To BS EN 274-1, -2 and -3.
   5.2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.

5.2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.

5.3. Size: As per the Structural Engineering Calculations and Details & Tender drawings.

5.4. Material: As per the Structural Engineering Calculations and Details & Tender drawings.

5.5. Tail: As per the Structural Engineering Calculations and Details & Tender drawings.

6. Traps: As per the Structural Engineering Calculations and Details & Tender drawings.

6.1. Standard: To BS EN 274-1, -2 and -3.

6.2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.

6.2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.

6.3. Size: As per the Structural Engineering Calculations and Details & Tender drawings.

6.4. Material: As per the Structural Engineering Calculations and Details & Tender drawings.

6.5. Depth of seal (minimum): 75 mm.

7. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

360 Appliances

1. Item: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.

2.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.

3. Colour and finish: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Service connections: As per the Structural Engineering Calculations and Details & Tender drawings.

390 Sealant

1. Standard: To BS EN ISO 11600, Class F20 HM
2. Type: As per the Structural Engineering Calculations and Details & Tender drawings.

2.1. Manufacturer: As per the Structural Engineering Calculations and Details & Tender drawings.

2.1.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.

3. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

Execution

610 Moisture content of wood and wood-based boards

1. Control and monitoring

1.1. Method statement: Submit.

620 Installation generally

1. Fixings and adhesives: As section Z20.
2. Services: As sections S90 and V90

630 Installing units and worktops

1. General: Well-fitting, stable and secure.

640 Installing appliances

1. Connections: Provide to electric, gas, and hot and cold water services.

650 Installing sinks, taps and wastes

1. Water supply: To BS EN 806-2 and -4.
2. Taps
   2.1. Fixing: Secure, watertight seal with the appliance.
   2.2. Positioning: Hot tap to left of cold tap as viewed by the user of the appliance.
3. Wastes
   3.1. Bedding: Waterproof jointing compound.
   3.2. Fixing: With resilient washer between appliance and backnut.

660 Sealant bedding and pointing

1. Application: As section Z22.
2. Bedding: Sink to top of worktop
3. Pointing: Between units and splash backs

670 Installing trims and mouldings

1. Lengths: Un-jointed between angles or ends of runs.
2. Angle joints: Mitred.

Completion

910 General

1. Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
2. Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

920 Appliance commissioning

1. Appliance operation, functions and controls: Verify.
2. Documentation: Submit guarantees, instruction manuals, etc.

Ω End of Section

N13
Sanitary appliances and fittings

Products

300 WCs and cisterns

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. WC standard: To Defra WC suite performance specification or equivalent approved by relevant water company
3. Type: Close-coupled cistern
4. Pan
    - 4.1. Standards: To BS EN 33 and BS EN 997, Class 2
    - 4.2. Manufacturer: Contractor's choice
        - 4.2.1. Product reference: Contractor's choice
    - 4.3. Material: Glazed fireclay, white
5. Seat and cover
    - 5.1. Standard: To BS 1254
    - 5.2. Form: Seat and cover
    - 5.3. Manufacturer: Contractor's choice
        - 5.3.1. Product reference: Contractor's choice
    - 5.4. Material: Plastics
    - 5.5. Finish/ colour: White
        - 5.5.1. Duty: Heavy
        - 5.5.2. Pillars: Contractor's choice
    - 5.6. Soft close: Required
6. Pan connector
    - 6.1. Standard: To BS 5627.
    - 6.2. Manufacturer: Contractor's choice
        - 6.2.1. Product reference: Contractor's choice
    - 6.3. Colour: To match pan
7. Cistern
    - 7.1. Standard: To BS 1125
    - 7.2. Manufacturer: Contractor's choice
        - 7.2.1. Product reference: Contractor's choice
    - 7.3. Material: Vitreous china
    - 7.4. Finish/ colour: To match pan
8. Inlet valve: Cistern manufacturer's standard
    - 8.1. Manufacturer: Contractor's choice
        - 8.1.1. Product reference: Contractor's choice
    - 8.2. Water supply connection: Bottom
9. Flushing arrangement: Cistern manufacturer's standard
    - 9.1. Manufacturer: Contractor's choice
        - 9.1.1. Product reference: Contractor's choice

9.2. Operating control: Lever handle, chrome-plated
9.3. Flush volume: 6 L
10. Flush pipe: Concealed
10.1. Manufacturer: Contractor's choice
10.1.1. Product reference: Contractor's choice
10.2. Material: Plastics, white
11. Accessories: None

311 Accessible WC equipment packages Type A

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Armitage Shanks
2.1. Contact details
2.1.1. Address: Armitage
Old Road
Rugeley
Staffordshire
WS15 4BT
2.1.2. Telephone: +44 (0)870 122 8822
2.1.3. Web: www.idealspec.co.uk
2.1.4. Email: info@thebluebook.co.uk
2.2. Product reference: Contour 21+ - Doc M Close Coupled Left Hand Pack
3. Standards: In accordance with Approved Document M.
4. Form: Complete accessible WC Doc M package and fittings.
5. Arrangement: Close-coupled pack.
6. Transfer handing: Left-hand.
7. Material and colour
7.1. WC pans: Vitreous china to BS EN 997, white.
7.2. WC cisterns: Vitreous china to BS EN 997, white.
7.3. WC seats: Plastics, no cover.
7.4. Washbasins
7.4.1. Material: Vitreous china to BS EN 14688, white.
7.5. Handrails: Powder-coated.
8. Water supply fittings: Lever-operated thermostatic mixer tap.
9. Integral accessories: Toilet roll holder.
10. Type approval certificate: Submit.
11. Finish/ colour
11.1. Pan: Vitreous china, white
11.2. Cistern: Plastics, white (concealed)
11.3. Seat: Plastics, white
11.4. Basin: Vitreous china, white
11.5. Handrails and grab bars: Coated steel, dark grey
12. Transfer handing: As per the Structural Engineering Calculations and Details & Tender drawings.
13. Water supply fittings (basin): Lever-operated thermostatic basin mixer tap
13.1. Water supply temperature (maximum): 43°C

14. Accessories: Clothes hooks, Soap dispenser & Mirror

335 Washbasin manual water supply sets Type A

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 14688
   2.1. Overflow class: CL15
3. Manufacturer: Armitage Shanks
   3.1. Contact details
      3.1.1. Address: Armitage
      Old Road
      Rugeley
      Staffordshire
      WS15 4BT
      3.1.2. Telephone: +44 (0)870 122 8822
      3.1.3. Web: www.idealspec.co.uk
      3.1.4. Email: info@thebluebook.co.uk
   3.2. Product reference: HBN 00-10 HTM64 (LB H M) Contour 21+ 50cm Back Outlet Washbasin
4. Standard: To BS EN 14688.
5. Form: Wall-hung wash basin.
6. Connecting dimensions: To BS EN 31.
7. Materials
   7.1. Body: Vitreous china.
   7.2. Finish and colour: White, SmartGuard (HY).
8. Size: 500 x 400 mm.
9. Water supply, overflow and waste holes
   9.1. Water supply: No tap holes.
   9.2. Overflow: Rear overflow hole.

429 Clothes hooks

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Finish/ colour: As per the Structural Engineering Calculations and Details & Tender drawings.

438 Mirrors

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Type: Contractor's choice
4. Size: 700 X 450
5. Edge treatment: 6 mm polished bevel
6. Protective backing: Masonite
7. Material: Stainless steel
8. Finish/ colour: High polished to give maximum reflection

441 Paper roll dispensers

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Material: Plastic
    2.1. Width: As per the Structural Engineering Calculations and Details & Tender drawings.
    2.2. Finish/ colour: White

442 Paper towel dispensers

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Material: Plastic
3. Finish/ colour: White

446 Sanitary product disposal bins

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Material: Plastic
4. Finish/ colour: Grey

458 Soap dispensers

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Material: Plastic
6. Finish/ colour: White

460 Toilet brush holders

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Material: Plastic
4. Finish/ colour: White

482 Hand-cleansing gel dispensers

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Material: Plastic
4. Finish/ colour: White

494 Baby changing units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Type: Fold-down
4. Size: 550 x 950 mm
5. Material: Plastic
6. Finish/ colour: Grey
7. Accessories: None

580 Sealant for pointing

1. Standard: As per the Structural Engineering Calculations and Details & Tender drawings.
   1.1. Class: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Colour: To be agreed.

Execution

610 Installation generally

1. Standards: In accordance with BS 6465-1, -2 and -3.
2. Assembly and fixing: Surfaces designed to falls to drain as intended.
3. Fasteners: Non-ferrous or stainless steel.
4. Fixing: Fix appliances securely to structure. Do not support on pipework.
5. Jointing and bedding compounds: Recommended by manufacturers of appliances, accessories and pipes being jointed or bedded.
6. Appliances: Do not use. Do not stand on appliances.
7. Supply and discharge pipework: Fix before appliances.
8. On completion: Components and accessories working correctly with no leaks.
9. Labels and stickers: Remove.

613 Compatibility of components

1. General: Each sanitary assembly must consist of functionally compatible components, preferably obtained from a single manufacturer.
   1.1. Exceptions: Water supply fittings, wastes and traps

620 Noggings and bearers

1. Noggings, bearers, etc. to support sanitary appliances and fittings: Position accurately. Fix securely.

630 Tiled backgrounds other than splashbacks

1. Timing: Complete before fixing appliances.
2. Fixing appliances: Do not overstress tiles.

650 Installing WC pans

1. Floor-mounted pans: Screw fix and fit cover caps over screw heads. Do not use mortar or other beddings.
2. Seat and cover: Stable when raised.

670 Installing cisterns

1. Cistern operating components: Obtain from cistern manufacturer.
2. Inlet and flushing valves: Match to pressure of water supply.
3. Internal overflows: Into pan, to give visible warning of discharge.
4. External overflows: Fix pipes to falls and locate to give visible warning of discharge. Agree location where not shown on drawings.

710 Installing taps

1. Fixing: Secure against twisting.
2. Seal with appliance: Watertight.
3. Positioning: Hot tap to left of cold tap as viewed by user of appliance.

720 Installing wastes and overflows

1. Bedding: Waterproof jointing compound.
2. Fixing: With resilient washer between appliance and backnut.

755 Sealant bedding and pointing

1. Bedding: Bed and point basins to underside of vanity units
2. Pointing: Joints between appliances and floors

Ω End of Section

N14
General internal signage systems

General

110 Signage system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. System manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Sign type: Stainless steel plate
4. Layout and dimensions: To be agreed
5. Lettering
   5.1. Language: English
   5.2. Font: Times New Roman
   5.3. Colour: Manufacturer's standard range
   5.4. Size: Manufacturer's standard range
6. Symbols and graphics: Arrows & Logo
   6.1. Colour: Manufacturer's standard range
   6.2. Size: Manufacturer's standard range
7. Background colour: Manufacturer's standard range
   7.1. Inserts: None
8. Supports/ fixings: Door-mounted, self-adhesive & Wall-mounted, self-adhesive
9. Accessories: Not required

120 Inclusive signage systems

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. System manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Sign type: Stainless steel plate
4. Layout and dimensions: To be agreed
5. Surface: Non-reflective with maximum gloss factor of 15% when tested to BS 2782-5 or BS EN ISO 2813
6. Lettering
   6.1. Language: English
   6.2. Font: Times New Roman
   6.3. Colour: Manufacturer's standard range
7. Characters and symbols: To be agreed
   7.1. Position: 6 mm below bottom of the text, Braille location: to the left edge of sign
   7.2. Characters: Raised between 1 and 1.5 mm, with stroke width that allows both sides of the character to be felt with the fingers at a single pass
   7.3. Colour: Manufacturer's standard range
   7.4. Size: Manufacturer's standard range
8. Background colour: Manufacturer's standard range
   8.1. Inserts: None

9. Supports/ fixings: Door-mounted, self-adhesive, Wall-mounted, self-adhesive
10. Accessories: Not required

System performance

210 General requirements

1. Signage system: Complete to BS 559, including facing information, components, inserts, accessories and fixings necessary to complete the system.
    1.1. Comply with the requirements of: Fire strategy report, Building operation report & Wayfinding strategy
2. Geometric shapes, colours and layout: In accordance with BS ISO 7001.
3. Design standard for disabled people: In accordance with BS 8300-2.
4. Proposals: Submit drawings, schedules, technical information, calculations and manufacturer's literature.

240 Fire performance

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
    1.1. Reaction to fire: To BS EN 13501-1

280 Design life

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Duration: Ten years
    2.1. Subject to reasonable wear and tear.
3. Condition of use: Subject to regular maintenance.

290 Signage samples

1. Sign type: As per the Structural Engineering Calculations and Details & Tender drawings.
    1.1. Action: Submit labelled samples.
    1.2. Conformity: Retain samples on site for the duration of the contract, or until instructed to remove them.
    1.3. Delivered product: To conform with labelled samples.

295 Signage samples board

1. Samples board: Submit.
    1.1. Content: Selected labelled signs, showing methods of fixing.
    1.2. Conformity: Retain samples on site for the duration of the contract or until instructed to remove.
    1.3. Delivered product: To conform with labelled samples.

Products

320 Aluminium

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Standard: To BS 559
4. Component thickness: To be agreed.

5. Finish: Manufacturer's standard
6. Perimeters: Manufacturer's standard

Execution

610 Fixing signs generally

1. Installation: Secure, plumb and level.
2. Strength of fasteners: Sufficient to support all live and dead loads.
3. Fasteners and or adhesives: As section Z20.
4. Fixings showing on surface of sign: Must not detract from the message being displayed.

620 Fixing signs for the visually impaired

1. Protection of users
   1.1. Fasteners for tactile/ Braille signs must not have sharp edges or protrusions that would cause confusion or injury to users.

670 Electrical and data services

1. Services connection required: Power for lighting
2. Standard: In accordance with BS 7671.
3. Coordinate with services trades.

Completion

910 Documentation

1. Submit
   1.1. Manufacturer’s maintenance instructions.
   1.2. Guarantees, warranties, test certificates, record schedules and logbooks.

930 Specialist tools

1. Supply as follows: Two sets of nameplate adjustment tools

Ω End of Section

N15
Internal fire and safety signage systems

General

110 Fire and safety signage systems

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. System manufacturer: Contractor's choice
   2.1. System reference: Contractor's choice
3. Locations and layout: To be agreed.
   3.1. Language: English.
4. Material: Stainless steel plate
   4.1. Other properties: Submit proposals

125 Photoluminescent way guidance system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. System manufacturer: Contractor's choice
   2.1. System reference: Contractor's choice
3. Locations and layout: To be agreed
4. Material: Manufacturer's standard
5. Size: Manufacturer's standard

System performance

205 Design of internal signage systems

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Design: Complete detailed design and submit before commencing work.
3. Content: Signs including facing information, components, inserts, accessories and fixings necessary to complete the system.
4. Proposals: Submit drawings, schedules, technical information, calculations and manufacturer's literature before commencing work.

210 General requirements

1. Signage and way guidance system design: As per the Structural Engineering Calculations and Details & Tender drawings.
   1.1. For fire escape and evacuation signage: In accordance with: BS 5499-4 or BS ISO 16069.
   1.2. For way guidance systems: In accordance with BS ISO 16069.
   1.3. For safety signs other than escape route signage: In accordance with: BS 5499-10.
2. Comply with the requirements of: Fire strategy report

220 Sign design and format

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Format: In accordance with BS EN ISO 7010
3. Geometric shapes, colours and layout: In accordance with BS ISO 3864-1.
4. Design principles for graphical symbols: In accordance with BS ISO 3864-3.

5. Colorimetric and photometric properties of safety sign materials: In accordance with BS ISO 3864-4.
6. Water safety: In accordance with BS EN ISO 7010.

260 Photoluminescent properties

1. Description: FOR ESCAPE ROUTE SIGNAGE
2. Luminance delay classification to BS ISO 17398: A

270 Fire performance

1. Description: OF FIRE ESCAPE SIGNAGE SYSTEM
2. Reaction to fire
   2.1. Standard: To BS EN 13501-1

280 Design life

1. Description: OF FIRE ESCAPE SIGNAGE SYSTEM
2. Duration: Ten years
   2.1. Subject to reasonable wear and tear.
3. Condition of use: Subject to regular maintenance.

290 Signage samples

1. Sign type: Fire escape
   1.1. Action: Submit labelled samples.
   1.2. Conformity: Retain samples on site for the duration of the contract, or until instructed to remove them.
   1.3. Delivered products: To conform with labelled samples.

Products

340 Stainless steel plate

1. Description: FOR ESCAPE ROUTE SIGNS
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Base material: Stainless steel, Grade 1.4301 (304) to BS EN 10088-2
4. Component thickness: 2 mm
5. Finish: Self-finished
6. Perimeters: Manufacturer's standard
7. Supports/ fixings: Adhesive
8. Accessories: Not required

Execution

610 Fixing signs generally

1. Installation: Secure, plumb and level.
2. Fasteners and adhesives: As section Z20.
3. Strength of fasteners: Sufficient to support live and dead loads.
4. Fixings showing on surface of sign: Must not detract from the message being displayed.

Completion

910 Documentation

1. Submit
   1.1. Manufacturer's maintenance instructions.
   1.2. Guarantees, warranties, test certificates, record schedules and logbooks.

Ω End of Section

N17
Portable and mobile firefighting systems

General

110 Portable fire extinguisher system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type: Dry powder
3. Capacity: Submit proposals
4. Supports: Mounted on floor stand

System performance

210 Design

1. Design: Complete the design of the portable firefighting system.
2. Basis: In accordance with BS 5306-0
3. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

220 Colour coding

1. Portable fire extinguishers: Colour code in accordance with BS 7863.

Products

320 Dry powder portable extinguishers

1. Standard: To BS EN 3-7
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice

Execution

610 Installing portable fire extinguishers

1. Mounting height above finished floor level: Contractor's choice

Completion

910 Cleaning

1. Protective wrappings: Remove.
2. Cleaning: Clean off and wipe down container finishes.

920 Testing

1. Test standard: To BS 5603-0.
2. Test times: At completion
3. Notice for testing (minimum): 3 days

930 Training

1. Training: Submit instruction manuals or supply other appropriate resources to train the users of the building in the safe and appropriate use of the fire extinguishers and fire blankets.

2. Fire brigade: Submit contact details.

940 Maintenance

1. Servicing: Arrange the first annual service of the portable firefighting systems.
2. Maintenance standard: To BS 5603-0.

Ω End of Section

N91
External signage and interpretation

Signage outline

110 Proprietary signage system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Function: Identification
3. Sign type: External sign
4. Electrical supplies: Not required

System performance

205 Design of signage systems

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Design: Complete detailed design and submit before commencing work.
3. Proposals: Submit drawings, schedules, technical information, calculations and manufacturer's literature before commencing work.

210 External signage generally

1. Signage systems generally: Complete to BS 559, including components, inserts, accessories and fixings necessary to complete the system.
2. External signage: To BS 559, clause 6.1.
3. Content: Signs including facing information, components, inserts, accessories and fixings necessary to complete the system.
4. Geometric shapes, colours and layout: To BS ISO 7001
5. Wind loads: To BS EN 1991-1-4.

215 Design life

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Duration: Ten years
   2.1. Subject to reasonable wear and tear.
3. Environment: Road
4. Condition of use: Subject to regular maintenance.

220 Safety signage requirements

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. General: To relevant parts of BS ISO 3864-1.
3. Safety meaning: To BS ISO 3864-1.
4. Geometric shapes, colours and layout: To BS ISO 3864-1 and BS ISO 3864-4.
5. Water safety: To BS EN ISO 7010.
6. Escape route: To BS ISO 16069.

225 Road traffic signage requirements

1. Signage system design: Complete To BS EN 12899-1 and the Department for Transport ‘Traffic Signs Manual’, chapter 7.

2. Wind loads: To BS EN 12899-1, Table NA.2.

230 Accessibility

1. Design standard for disabled users: In accordance with BS 8300-1.
2. Geometric shapes, colours and layout: To BS ISO 3864-1
   2.1. Font: Helvetica Medium.

235 Electrical requirements for illuminated signs

1. Electrical requirements for illumination: To BS 559, section 7.

Products

305 Signage products generally

1. Materials: To BS 559.
2. Colorimetric and photometric properties: To BS ISO 3864-4.
3. Fabricated letters: To BS 559, clause 6.6.
4. Fixings: To BS 559, clause 6.11 and section Z12.

Materials

455 Stainless steel

1. Description: LETTERS
2. Standards
   2.1. Properties of stainless steels: To BS EN 10088-1.
3. Grade: Manufacturer's standard
4. Finish: Manufacturer's standard
   4.1. Bars, rods and sections for general purposes: To BS EN 10088-3. Stainless steels.
   4.2. Sheet/ plate and strip for general purposes: To BS EN 10088-2.
5. Component thickness: 2 mm
6. Perimeters: Manufacturer's standard
7. Additional requirements: None

Fabrication

575 Letters

1. Description: Front elevation building sign
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material: Contractor's choice
   3.1. Finish: Anodized
   3.2. Background colour: Manufacturer's standard range
4. Layout and dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.1. Content: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.2. Lettering
      4.2.1. Manufacturing process: Manufacturer's standard

4.2.2. Font: Times New Roman
4.2.3. Size: 150 mm
4.2.4. Colours: Manufacturer's standard range
4.2.5. Language: English

5. Fixing accessories: Pre-drilled mounting holes
6. Additional requirements: Backlighting

Execution/ erection/ installation

605 Method of fixing signs

1. Description: LETTERS
2. Method of fixing: Contractor's choice

610 Fixing signs generally

1. Generally: Where not specified precisely, select methods of jointing and fixing, and types, sizes and spacings of fasteners in compliance with section Z20.
2. Installation: To BS 559.
   2.1. Secure, plumb and level.
3. Strength of fasteners: Sufficient to support all live and dead loads.
4. Fasteners and/ or adhesives: As section Z20.
5. Fasteners for external signs: Corrosion-resistant material or with a corrosion-resistant finish. Isolate dissimilar metals to avoid electrolytic corrosion.
6. Fixings showing on surface of sign: Must not detract from the message being displayed.
7. Temporary support: Do not subject members to non-design loadings.
8. Protection of users
   8.1. Fasteners for signs must not have sharp edges or protrusions that would cause injury to users.
   8.2. Fasteners for tactile/ Braille signs must not have protrusions that would cause confusion to users.

615 Building signs into existing structures

1. Components being built in: Accurately position and support securely. Set in mortar and point neatly to match adjacent material.
2. Temporary support: Maintain for 48 hours (minimum) and prevent disturbance.

655 Workmanship for glazing generally

1. Glazing generally: To BS 6262-1,-3,-4 and -6.
2. Preparation of surrounds: ensure that the glazing surfaces are clean and smooth.
3. Integrity: Glazing must be wind-tight and watertight under all conditions, with full allowance made for deflections and other movements.
4. Dimensional tolerances: Panes/ sheets to be within ± 2 mm of specified dimensions.
5. Materials
   5.1. Compatibility: Glass/ plastics, surround materials, sealers, primers and paints/ clear finishes to be used together to be compatible. Avoid contact between glazing panes/ units and alkaline materials such as cement and lime.
   5.2. Protection: Keep materials dry until fixed. Protect insulating glass units and plastics glazing sheets from the sun and other heat sources.

660 Site painting and staining

1. Timing: Prepare surfaces and apply finishes as soon as possible after installing components.

665 Making good galvanized surfaces

1. Minor damage in areas of up to 40 mm² (including on fixings and fittings): Make good.
    1.1. Material: Low-melting-point zinc alloy repair rods or powders made for this purpose, or at least two coats of zinc-rich paint to BS 4652.
    1.2. Thickness: Sufficient to provide a zinc coating at least equal to the original layer.

670 Making good treated wood

1. Surfaces exposed by minor cutting and/ or drilling: Treat by immersion, or with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.
2. Heavily worked sections: Re-treat.
3. Cutting and machining: Carry out as much as possible before treatment.
4. Extensively processed wood: Retreat wood sawn lengthways, planed, ploughed, etc.

675 Electrical and data services

1. Description: GENERALLY
2. Services connection required: Small power system, as section V90
3. Coordinate with services trades.

Completion

905 Inspection of signs

1. Standard for timber structures: In accordance with BS EN 1995-1-1.
2. Timing: Two weeks prior to date when principal contractor expects work to be complete
3. Period of notice (minimum): Three working days.
4. Maintenance inspection: Check and tighten fixings six to eight weeks after completion of structure
5. Access: Provide access for inspection and maintenance of luminaires and other technologies.

910 Testing of signs and structures

1. Standard for testing timber structures: In accordance with BS EN 1995-1-1.
2. Evaluation of conformity for road traffic signs: To BS EN 12899-1, section 10.

915 Cleaning of signs/ graffiti removal

1. Method: As approved by manufacturer
2. Subsequent treatment: Not required
    2.1. Finish: Gloss

920 Documentation

1. Submit
    1.1. Copies of structural design calculations/ test reports.
    1.2. General product information.
    1.3. Installation information.
    1.4. Inspection and maintenance reports.

1.5. Manufacturer's maintenance instructions.
1.6. Guarantees, warranties, test certificates, record schedules and logbooks.

2. Number of copies: two
3. Submission: Two weeks prior to date when principal contractor expects work to be complete

Ω End of Section

P10
Sundry insulation/ proofing work

Types of insulation

110 Eaves roof ventilators for existing roofs

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Eaves free air space (minimum): As recommended in BRE Report 262.

125 Mineral wool slab insulation Type A

1. Manufacturer: ROCKWOOL Ltd
   1.1. Contact details
      1.1.1. Address: ROCKWOOL Ltd
      14th Floor, Chiswick Tower
      389 Chiswick High Road
      London
      W4 4AJ
      1.1.2. Telephone: +44 (0)1656 862621
      1.1.3. Web: https://www.rockwool.com/uk/
      1.1.4. Email: info@rockwool.com
   1.2. Product reference: Submit proposals
2. Material: Mineral wool to BS EN 13162
3. Recycled content: Contractor's choice
4. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Installation requirements
   5.1. Installation standard: To BS 5803-5
   5.2. Joints: Butted, no gaps.
   5.3. Insulation at perimeter: Carried over wall plates.
   5.4. Eaves ventilation: Unobstructed.
   5.5. Service holes: Sealed, and debris removed before laying insulation.
   5.6. Electric cables overlaid by insulation: Sized accordingly.
   5.7. Water cistern platforms: Not applicable

135 Mineral wool slab insulation Type A

1. Manufacturer: ROCKWOOL Ltd
   1.1. Contact details
      1.1.1. Address: ROCKWOOL Ltd
      14th Floor, Chiswick Tower
      389 Chiswick High Road
      London
      W4 4AJ
      1.1.2. Telephone: +44 (0)1656 862621
      1.1.3. Web: https://www.rockwool.com/uk/
      1.1.4. Email: info@rockwool.com

1.2. Product reference: Submit proposals
2. Material: Mineral wool to BS EN 13162
3. Recycled content: Contractor's choice
4. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Installation requirements
   5.1. Installation standard: To BS 5803-5
   5.2. Insulation widths: Widest practical.
   5.3. Laid direction: At right angles to ties/ joists.
   5.4. Joints: Butted, no gaps.
   5.5. Insulation: Fitted neatly around rafter ends and extended over wall plates.
   5.6. Service holes: Sealed, and debris removed before laying insulation.
   5.7. Eaves ventilation: Unobstructed.
   5.8. Electric cables overlaid by insulation: Sized accordingly.
   5.9. Water cistern platforms: Not applicable

140 Mineral wool slab insulation Type A

1. Manufacturer: ROCKWOOL Ltd
   1.1. Contact details
      1.1.1. Address: ROCKWOOL Ltd
      14th Floor, Chiswick Tower
      389 Chiswick High Road
      London
      W4 4AJ
      1.1.2. Telephone: +44 (0)1656 862621
      1.1.3. Web: https://www.rockwool.com/uk/
      1.1.4. Email: info@rockwool.com
   1.2. Product reference: Submit proposals
2. Material: Mineral wool to BS EN 13162
3. Facing: Contractor's choice
4. Recycled content: Contractor's choice
5. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Installation requirements
   6.1. General: Insulation to be friction fitted between rafters with no gaps.
   6.2. Joints: Butted, no gaps.
   6.3. Fasteners: Used where necessary to retain insulation and/ or prevent slumping.
   6.4. Vapour control facing (if specified): Fit insulation with facing on warm side. Staple overlap (if provided) to underside of rafters; tape joints between adjacent overlaps using vapour impermeable adhesive tape.
   6.5. Air space above insulation: Not restricted.
   6.6. Eaves ventilation: Unobstructed.

165 Insulation to eaves

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material: Rock wool quilt to BS EN 13162

3. Recycled content: Contractor's choice
4. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Installation: Continuous with roof insulation, with no gaps.

185 Soffit insulation

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Material: Phenolic foam boards to BS EN 13166
3. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Facing: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Installation requirements: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.1. Joints: Butted, no gaps.
    5.2. Fixing: As per the manufacturers recommendations
        5.2.1. Fasteners: As per the manufacturers recommendations

190 Mineral wool slab insulation Type A

1. Manufacturer: ROCKWOOL Ltd
    1.1. Contact details
        1.1.1. Address: ROCKWOOL Ltd
        14th Floor, Chiswick Tower
        389 Chiswick High Road
        London
        W4 4AJ
        1.1.2. Telephone: +44 (0)1656 862621
        1.1.3. Web: https://www.rockwool.com/uk/
        1.1.4. Email: info@rockwool.com
    1.2. Product reference: Submit proposals
2. Material: Rigid polyurethane foam to BS EN 13165
    2.1. Facing: Contractor's choice
3. Recycled content: Contractor's choice
4. Thickness: 100 mm
5. Installation requirements
    5.1. Joints: Butted, no gaps.
    5.2. Fasteners: Use where necessary to retain insulation and/ or prevent slumping.

220 Mineral wool insulation Type A

1. Manufacturer: ROCKWOOL Ltd
    1.1. Contact details
        1.1.1. Address: ROCKWOOL Ltd
        14th Floor, Chiswick Tower
        389 Chiswick High Road
        London
        W4 4AJ
        1.1.2. Telephone: +44 (0)1656 862621
        1.1.3. Web: https://www.rockwool.com/uk/

1.1.4. Email: info@rockwool.com

1.2. Product reference: ROCKWOOL® Insulation Slabs – RWA45, RW3, RW4 and RW5 (ROCKWOOL RWA45, unfaced - 600 x 1200 x 30 mm)

2. General requirements: Insulation products generally.
3. Standard: To BS EN 13162; ISO 14001.
4. Thickness: 100 mm.
5. Facing: Aluminium foil.
6. Edges: Square.
7. Density: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Thermal conductivity (maximum): 0.034 W/m·K.
9. Fire performance: Euroclass A1 non-combustible.
10. Dimensions: 600 x 1200 mm.

240 Mineral wool slab insulation Type A

1. Manufacturer: ROCKWOOL Ltd
   1.1. Contact details
      1.1.1. Address: ROCKWOOL Ltd
      14th Floor, Chiswick Tower
      389 Chiswick High Road
      London
      W4 4AJ
      1.1.2. Telephone: +44 (0)1656 862621
      1.1.3. Web: https://www.rockwool.com/uk/
      1.1.4. Email: info@rockwool.com
   1.2. Product reference: Submit proposals
2. Material: Rock wool to BS EN 13162
3. Recycled content: Contractor's choice
4. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Installation requirements
   5.1. Support: 20-25 mm square mesh polyethylene net draped over joists and stapled to sides of joists.
   5.2. Joints: Butted, no gaps.
   5.3. Service holes: Sealed, and debris removed before laying insulation.

250 Mineral wool slab insulation Type A

1. Manufacturer: ROCKWOOL Ltd
   1.1. Contact details
      1.1.1. Address: ROCKWOOL Ltd
      14th Floor, Chiswick Tower
      389 Chiswick High Road
      London
      W4 4AJ
      1.1.2. Telephone: +44 (0)1656 862621
      1.1.3. Web: https://www.rockwool.com/uk/
      1.1.4. Email: info@rockwool.com
   1.2. Product reference: Submit proposals

2. Material: Foamed polystyrene boards
3. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Supports: Preservative treated timber battens
5. Installation requirements
    5.1. Joints: Boards butted, no gaps.

260 Absorbent pugging

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Density (minimum): 10 kg/m²
3. Thickness: 100 mm.
4. Installation requirements
    4.1. Joints: Butted, no gaps.
    4.2. Service holes: Sealed, and debris removed before laying insulation.

310 Air and vapour control layer

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Material: 1000 gauge virgin polyethylene
4. Minimum vapour resistance: 250 MN s/g
5. Installation requirements
    5.1. Setting out: Joints minimized.
    5.2. Method of fixing: Double-sided sealant tape to metal framing
    5.3. Joints: At supports only, lapped 150 mm minimum.
    5.4. Openings: Membrane fixed to reveals.
    5.5. Joints and edges: Sealed with double-sided tape with vapour resistivity not less than the air and vapour control layer.
6. Penetrations: Sealed.
7. Other requirements: Prime substrates as necessary

320 Breather membrane

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Standard: BS EN 13859-1
    2.1. Characteristics: Reaction to fire: To BS EN 13501-1, Class B-s3, d0 or better
3. Installation requirements
    3.1. Setting out: Joints minimized. Membrane to form a continuous barrier to prevent water, snow and wind blown dust reaching the substrate.
    3.2. Method of fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.3. Joints: Lapped 100 mm minimum horizontally and 150 mm minimum vertically.
    3.4. Openings: Membrane fixed to reveals.
    3.5. Bottom edges: Membrane lapped over flashings, sills, etc. to allow free drainage to the exterior.

4. Penetrations: Sealed.

410 Flexible cavity barriers

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Fire resistance rating: To BS EN 13501-2, EI 60
4. Installation requirements
   4.1. Spacing: Installed in voids so the maximum unobstructed dimension in any direction is 20 m.
   4.2. Fixing: Secure at perimeters and joints with no gaps, to provide a complete barrier to smoke and flame.

420 Sleeved mineral wool small cavity barriers

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material: Mineral wool sleeved in polyethylene with flanges.
3. Fire resistance rating: To BS EN 13501-2, EI 60
4. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Installation requirements
   5.1. Fasteners: Staples at maximum 150 mm centres.
   5.2. Vertical barriers: Fixed by both flanges.
   5.3. Horizontal barriers: Fixed by upper flange only.
   5.4. Joints and intersections: Butted, with barriers compressed along full length to give complete seal.

430 Wired mineral wool small cavity barriers

1. Material: Wire reinforced mineral wool minimum 50 mm thick.
2. Fire resistance rating: To BS EN 13501-2, EI 60
3. Installation requirements
   3.1. Fasteners: Staples at maximum 150 mm centres. Fold cavity barrier if necessary to ensure a tight fit.
   3.2. Joints and intersections: Butted, no gaps.

432 Cavity barriers

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Fire resistance rating: To BS EN 13501-2, EI 60
3. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Installation requirements: Continuous, with minimum joints.
   3.2. Fasteners: Galvanized steel brackets at 500 mm centres
4. Other requirements: None

435 Ventilated cavity barriers

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice

2. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Fire resistance rating: To BS EN 13501-2, EI 60
6. Free air provision: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Installation requirements: Continuous, with minimum joints.
   7.1. Fasteners: Stainless steel self-drilling screws in selvage at 300 mm centres
8. Other requirements: None

440 Fire protection

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Fire resistance rating: To BS EN 13501-2, EI 60
5. Number of layers: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Installation requirements: Continuous, with minimum joints.
   6.1. Fasteners: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Other requirements: None

Ω End of Section

P11
Foamed/ fibre/ bead cavity wall insulation

To be read with preliminaries/ general conditions.

110 Pre-contract survey of existing walls

1. Timing: Already carried out.
2. Purpose: To confirm suitability for filling.

130 Survey of existing walls

1. Timing: Before starting insulation work.
2. Purpose: To confirm suitability for filling.
3. Report: Submit, stating:
   - 3.1. Form of construction, materials used.
   - 3.2. General condition of walls.
   - 3.3. Thickness of walls.
   - 3.4. Width and condition of cavity.
   - 3.5. Exposure to wind driven rain.
   - 3.6. Nature and extent of remedial work and other work required to ensure suitability.
   - 3.7. Other information considered relevant.

140 Remedial work to existing walls

1. Responsibility: Contractor
2. Work to be carried out: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Approval: Obtain before starting insulation work.

170 Suitability of walls

1. Suitability: Check.
2. Timing: Before and during filling of cavities.
3. Defects: Report immediately.

220 Loose-fill mineral wool fibre insulation Type A

1. Standard: To BS EN 14064-1
2. Manufacturer: Knauf Insulation Ltd
   - 2.1. Contact details
     - 2.1.1. Address: Knauf Insulation
       Stafford Road
       St Helens
       Merseyside
       WA10 3LZ
     - 2.1.2. Telephone: +44 (0)1744 766 666
     - 2.1.3. Web: www.knaufinsulation.co.uk
     - 2.1.4. Email: technical.uk@knaufinsulation.com
   - 2.2. Product reference: Contractor's choice

3. Recycled content: Contractor's choice
4. Installer: Approved in accordance with the British Board of Agrément Surveillance Scheme.

240 Polyurethane foam cavity fill

1. Standard: BS 7457
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Stabilization system: Not required
   3.1. Installation standard: To BS 7456.
   3.2. Removal of corroded ties: By contractor
   3.3. Location and spacing of stainless steel anchors: At first floor level at 1 m centres
4. Installer: Approved in accordance with the British Board of Agrément Surveillance Scheme.

310 Gaps and openings

1. Gaps: Seal with tightly packed mineral wool to prevent loss of fill and fulfil any fire-stopping requirements.
2. Openings: Fit approved sleeve to keep openings permanently clear.
3. Air bricks/ grilles of untrunked vents: Remove and seal openings into cavity.

320 Injection holes

1. Arrangement: Form neatly to a regular pattern and to sizes recommended by cavity fill manufacturer.
2. Before commencing filling of each wall: Form all holes in that wall.
3. Precautions: Avoid damage to dpcs, cavity trays, flues, etc.
4. Debris: Prevent from falling into cavity.

330 Making good

1. Blockages: Remove from vents and refix or replace any air bricks.
2. Injection holes: Fill, replacing existing materials where possible.
   2.1. Finished appearance: Obtain approval of first few holes before completing the remainder.

340 Flues with no appliance

1. Blockages: Remove.
2. Smoke test: Carry out if full inspection cannot be made.
   2.1. Purpose: To ensure there is no leakage of gases from flue walls/ joints.

350 Flues with an appliance fitted

1. Test: Before and after filling cavities. Give notice before testing.
   1.1. Purpose: To ensure there is no leakage of gases from flue walls/ joints.
2. Blockages: Remove and retest until performance is satisfactory.

360 Records

1. Record of installation: Include survey results, materials, weather conditions and any unusual features.

365 Thermographic integrity test

1. Standard: To BS EN 13187.
2. Testing: To be carried out by: Specialist independent tester.
   2.1. Timing: On completion of cavity fill
3. Prior to testing: Remove all furniture, pictures and other interior or exterior moveable items from the area to be tested.
   3.1. Make good: Plastering, rendering and gap sealing defects.
4. Defects discovered by testing: Mark locations on walls, prepare report and submit together with proposals for remedial measures.
5. Retesting: As necessary after making good of any defects.

370 Documentation

1. Certificates, records, guarantees and other documents: Submit on completion.

Ω End of Section

P12
Fire-stopping systems

General

110 Fire-stopping system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Penetration seal/ Gap filler: As per the Structural Engineering Calculations and Details & Tender drawings.

130 Fire-stopping system to individual services penetrations

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Fire resistance: As clause 240
3. Penetration seal: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Size: To match wall thickness
4. Gap sealer: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Capping sealant: Fire-resisting silicone, as clause 390
   5.1. Colour: Contractor's choice

140 Fire-stopping system to multiple services penetrations

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Fire resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Board barrier
   3.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
      3.1.1. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
      3.1.2. Number of layers: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.2. Framing: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.3. Finish: Painting as section M60
4. Gap sealer: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Capping sealant: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.1. Colour: Contractor's choice

150 Loose fire-stopping

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Fire resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Penetration seal: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings.

160 Linear gap sealing

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Fire resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Gap width or height (nominal): As per the Structural Engineering Calculations and Details & Tender drawings.

4. Gap filler: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Capping sealant: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.1. Colour: Contractor's choice

System performance

210 Design

1. Design: Complete the design of the fire-stopping system.
2. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

240 Fire performance

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Resistance to fire: To BS EN 13501-2, EI 60 or better
3. Reaction to fire: To BS EN 13501-1, Class A1
4. Smoke resistance
    4.1. Air leakage rate (maximum): As per the Structural Engineering Calculations and Details & Tender drawings.

260 Design life

1. Effective design life: 30 years

Products

305 Product certification

1. Certification: For products specified generically, submit evidence of compliance with the specification.
2. Acceptable evidence: Agrément certificate

310 Boards

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

330 Flexible intumescent gap sealer

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Strip width: Wider than joint width
3. Approval: Declaration of Performance (DoP)

335 Intumescent foam

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice

338 Intumescent mastic

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice

340 Intumescent mortar

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice

342 Fire-resisting mortar

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice

345 Intumescent pillows

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Composition: Sealed polyethylene bags containing graphite and vermiculite granules treated with fire activated chemicals.
3. Integral reinforced eyelets: Required.
4. Linking cable: Non-corrosive cotton-coated wire.

350 Intumescent putty

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice

360 Mineral wool rigid batts

1. Standard: To BS EN 13162.
2. Surface treatment: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Manufacturer: Contractor's choice
    3.1. Product reference: Contractor's choice
4. Recycled content: Contractor's choice

370 Pipe collar

1. Type: Concealed intumescent pipe collar
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

385 Sealant backing material

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice

390 Sealant

1. Type: Fire-resisting silicone
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice

Execution

610 Third-party-certified installer

1. Certification: For the technical competency of the installer of the evidence of compliance with a third-party installation certification scheme.
2. Acceptable evidence: FIRAS Installer Certification

620 Workmanship generally

1. Gaps: Seal between building elements and services, to provide effective resistance to fire and the passage of smoke. Allow for capping sealants where required. Finish flush with surrounds.
2. Adjacent surfaces: Prevent overrun of filler, sealant or mortar on to finished surfaces.

640 Installing boarding

1. Position of boarding: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Framing: Provide framing to all edges of boarding
3. Bedding: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Multiple board layers: Stagger joints between layers.
   4.1. Joints: Seal with board adhesive
5. Fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Other requirements: None

650 Installing flexible intumescent gap sealer

1. Fitting of strips: Compress strips and fit into gap so that, as they decompress, the strips wedge themselves in the void.
2. Shrink wrapping: Not applicable
3. Joints
   3.1. Ends of strips: Fit intumescent 'end piece' at both ends of run of fire stop laminate.
   3.2. Joints between strips: Fit two intumescent 'end pieces' at each butt joint.

660 Applying intumescent foam

1. New joints: Remove builders' debris, mortar droppings, grease, and other contaminants.
2. Old joints: Clean and remove existing sealant from each joint.
3. Priming: Lightly moisten substrate with water.
4. Application: Fill joint to approximately half its depth, and allow foam to expand to face of joint.
5. Trimming: Trim excess foam to give a neat, flush appearance

670 Applying intumescent mortar

1. Sequence: Install mortar after services are permanently installed.
2. Loose dust and combustible materials: Remove from the opening.
3. Shuttering: Install suitable shuttering panels to the faces of the opening.
4. Temperature: Do not apply mortar when it could be damaged by frost.
5. Powder:water ratio: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Mortar cure: Do not disturb mortar before final set has taken place.

7. Shuttering: Remove after mortar has cured.

680 Installing intumescent pillows

1. Number of pillows (per m² of opening): Number necessary to achieve fire resistance
2. Orientation of bags: As per the Structural Engineering Calculations and Details & Tender drawings.

690 Applying intumescent putty

1. Sequence: Install putty after services are permanently installed.
2. Loose dust and combustible materials: Do not disturb putty before final set has taken place.

710 Installing mineral wool batts

1. Installing batts: Fit tight into void between the penetrating services and the surrounding construction to form a solid barrier.
    1.1. Brackets: Impale batts on proprietary pressed steel brackets at 500 mm maximum centres and not greater than 250 mm from ends of batts.
        1.1.1. Bracket fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Face of batts: Flush with the surface of wall, floor or soffit.
3. Joints between batts: Butt joints, seal with acoustic intumescent sealant
4. Gaps between services and barrier: Seal with fire-resisting sealant.

730 Fixing pipe collars

1. Collar fixing: Self-tapping screws, stainless steel
2. Gap around collar: Seal with gap filler and sealant
3. Length of wraps: Project 50 mm from each side of the element

740 Inserting sealant backing material

1. Preparation: Removed debris from service penetration.
2. Installation: Build-in joint filler as the work proceeds

745 Applying sealants generally

1. Application: As section Z22.

750 Applying capping sealant

1. Preparation: De-grease using cleaner recommended by sealant manufacturer
2. Priming: Primer recommended by sealant manufacturer
3. Depth of sealant: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Temperature: Do not apply water-based sealants when they could be damaged by frost.

Completion

910 Cleaning

1. Masking tapes: Remove.
2. Cleaning: Clean off splashes and droppings. Wipe down finishes.

920 Inspection

1. Notice for inspection (minimum): Five working days

Ω End of Section

P20
Unframed isolated trims/ skirtings/ sundry items

To be read with preliminaries/ general conditions

110 Softwood

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Quality of wood and fixing: To BS 1186-3.
   2.1. Species: Contractor's choice
   2.2. Class: CSH
3. Moisture content at time of fixing: 9-13%
4. Preservative treatment: Water-based microemulsion as section Z12, service life 30 years
5. Reaction to fire rating: To BS EN 13501-1, Class A2
6. Profile: Bullnosed
   6.1. Finished size: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Finish as delivered: Prepared and primed, as section M60
8. Fixing: As per the Structural Engineering Calculations and Details & Tender drawings.

200 Medium-density fibreboard

1. Description: SKIRTING BOARDS
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Standard: To BS EN 622-5.
   3.1. Type: MDF
   3.2. Formaldehyde class: To BS EN 622-1, class E1.
4. Reaction to fire rating: Not applicable
5. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Finish: Prepared and primed, as section M60
8. Recycled content: Contractor's choice
9. Support/ Fixing: Fix to softwood grounds with lost head nails at 600 mm centres.

240 Plywood

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Face ply species: Contractor's choice
4. Appearance class to BS EN 635: Class E/I
5. Bond quality to BS EN 314-2: Class 1
6. Reaction to fire rating: Not applicable
7. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Finish: Prepared and primed, as section M60

10. Support/ Fixing: As required

250 Particleboard

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Standard: To BS EN 312.
    3.1. Type: P1
4. Reaction to fire rating: Not applicable
5. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Finish: Sanded to receive clear stain
8. Recycled content: Contractor's choice
9. Support/ Fixing: As required

270 Plastics-veneered board

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS 4965.
    2.1. Durability class: D2
    2.2. Laminate grade: HD
    2.3. Reaction to fire rating: Not applicable
3. Colour/ Finish: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Balancing veneer: To match face colour
5. Finished thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Edges: Matching plastics strip
7. Support/ Fixing: Screw fixed sherardized pressed steel cleats

315 Hardboard

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Standard: To BS EN 622-2.
    3.1. Type: HB
4. Reaction to fire rating: To BS EN 13501-1, Class A2
5. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Edges: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Finish: Primed and painted, as section M60
8. Support/ Fixing: Nailed at 150 mm centres

420 Bracket supports

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Material: Aluminium
    2.1. Finish: Brushed

2.2. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.

3. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Fixing: Plugged and screwed to substrate

Execution

510 Installation generally

1. Joinery workmanship: As section Z10.
2. Metal workmanship: As section Z11.
3. Methods of fixing and fasteners: As section Z20 where not specified.
4. Straight runs: To be in one piece, or in long lengths with as few joints as possible.
5. Running joints: Location and method of forming to be agreed where not detailed.
6. Joints at angles: Mitre, unless shown otherwise
7. Position and level: To be agreed where not detailed.

Ω End of Section

P21
Door/ window ironmongery

Pre-tender

10 Quantities and locations

1. Quantities and locations of ironmongery are given in the schedules .
2. Fixing: As sections L10 and L20.

General

120 Ironmongery range selected by Contractor

1. Source: Single co-ordinated range.
2. Notification: Submit details of selected range, manufacturer and/ or supplier.
3. Principal material/ finish: Satin stainless steel, grade 1.4301 (304)
4. Items unavailable within selected range: Submit proposals.

141 Sample boards

1. General: Before placing orders with suppliers submit a sample board, containing labelled samples of ironmongery and showing methods of fixing.
2. Range: Include As per the Structural Engineering Calculations and Details & Tender drawings. .
   2.1. Conformity: Retain board on site in an approved location for the duration of the Contract. Ensure conformity of ironmongery as delivered with labelled samples.

170 Ironmongery for fire doors

1. Relevant products: Ironmongery fixed to, or morticed into, the component parts of a fire resisting door assembly.
2. Compliance: Ironmongery included in successful tests to BS 476-22 or BS EN 1634-1 on door assemblies similar to those proposed.
   2.1. Certification: Submit CERTIFIRE certificates
3. Melting point of components (except decorative non-functional parts): 800°C minimum.

180 Strength class or category of duty for door ironmongery

1. Requirement: As schedule
2. General: Durability of ironmongery components to be compatible with stated category of duty of each door leaf.
   2.1. Exclusions: Ironmongery with specific duty or 'category of use' defined elsewhere.
   2.2. Documentation: Before placing orders with suppliers submit documentation showing product compliance with stated category of duty.

Door hanging devices

315 Performance specification for single axis door hinges

1. Description: Internal Doors
2. Standard: To BS EN 1935.
3. Minimum classification grades
   3.1. Category of use: 2

3.2. Durability: 4
3.3. Suitability for use on fire/ smoke doors: 1
3.4. Safety: 1.
3.5. Corrosion resistance: 1
3.6. Hinge grade: As recommended by door manufacurer
4. Type: Double ball bearing butt
5. Size: As recommended by door manufacturer
6. Material/ finish: Satin stainless steel, grade 1.4301 (304)

315 Performance specification for single axis door hinges Type A

1. Description: External Doors
2. Standard: To BS EN 1935.
3. Minimum classification grades
   3.1. Category of use: 3
   3.2. Durability: 7
   3.3. Test door mass: 2
   3.4. Safety: 1.
   3.5. Corrosion resistance: 2
   3.6. Security - Burglar resistance: 1
   3.7. Hinge grade: As recommended by door manufacurer
4. Type: Double ball bearing butt
5. Size: As recommended by door manufacurer
6. Material/ finish: Satin stainless steel, grade 1.4301 (304)
7. Other requirements: None

Window hanging devices - Not Used

Door operating devices

412 Performance specification for overhead door closers

1. Description: Overhead door closers
2. Standard: To BS EN 1154.
3. Minimum classification grades
   3.1. Category of use: 4
   3.2. Durability: 8.
   3.3. Door closer power size: 3 - widths up to 950mm
   3.4. Suitability for use on fire/ smoke doors: 1
   3.5. Safety: 1.
   3.6. Corrosion resistance: 1
4. Type: Face fixed
5. Other functions: Delayed closing
6. Casing finish: As schedule
7. Operational adjustment
   7.1. Variable power: Matched to the sizes and weights of doors.

7.2. Latched doors: Override latches and/ or door seals when fitted.
7.3. Unlatched doors: Hold shut under normal working conditions.
7.4. Closing against smoke seals of fire doors: Positive. No gaps.

472 Performance specification for electromagnetic hold open/ swing Free devices

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 1155.
3. Type: Hold open, separate wall mounted
4. Minimum classification grades
   4.1. Category of use: 3.
   4.2. Durability: 8
   4.3. Hold open power size: As per the Structural Engineering Calculations and Details & Tender drawings.
   4.4. Suitability for use on fire/ smoke doors: 1.
   4.5. Safety: 1.
   4.6. Corrosion resistance: 1
5. Material/ finish: As schedule
6. Means of release: Alarm system and/ or failure of power supply.
7. Test switch: Located in a convenient position adjacent to door.
8. Operational adjustment of integral closer
   8.1. Variable power: Matched to size, weight and location of doors.
   8.2. Latched doors: Override latches and/ or door seals when fitted.
   8.3. Unlatched doors: Hold shut under normal working conditions.

Door securing devices

515 Door locks

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 12209.
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Type: As schedule
5. Backset: As schedule
6. Material/ finish: As schedule
7. Keying: In master keyed suite

540 Door latches

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 12209.
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Type: Horizontal case mortice latch
5. Backset: As schedule

6. Material/ finish: As schedule
7. Latch spring strength: Select to prevent unsprung lever handles drooping.

572 Performance specification for emergency exit devices

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 179.
3. Minimum classification grades
   - 3.1. Category of use: 3.
   - 3.2. Durability: 6
   - 3.3. Door mass: 5
   - 3.4. Suitability for use on fire/ smoke doors: 1
   - 3.5. Safety: 1.
   - 3.6. Corrosion resistance: 3
   - 3.7. Security: 2
   - 3.8. Projection of operating element: 2
   - 3.9. Type of operation: B: Push pad operation
4. Material/ finish: Satin stainless steel
5. Additional requirements: External locking attachment to be suited with other locks

578 Performance specification for panic exit devices

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 1125.
3. Minimum classification grades
   - 3.1. Category of use: 3.
   - 3.2. Durability: 6
   - 3.3. Door mass: 5
   - 3.4. Suitability for use on fire/ smoke doors: 1
   - 3.5. Safety: 1.
   - 3.6. Corrosion resistance: 3
   - 3.7. Security: 2.
   - 3.8. Projection of bar: 1
   - 3.9. Type of bar operation: A: Push bar operation
4. Material/ finish: Satin stainless steel
5. Additional requirements: None

586 Privacy indicator bolts

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   - 2.1. Product reference: Contractor's choice
3. Type: Rotary, internal thumbturn
4. Material/ finish: Satin stainless steel, grade 1.4401 (316)
5. Emergency release facility: Required.

Window securing devices - Not Used

Door furniture

651 Performance specification for pull handles

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS 8424.
3. Minimum classification grades
   - 3.1. Category of use: 2
   - 3.2. Durability: 2.
   - 3.3. Door mass: - (no classification).
   - 3.4. Suitability for use on fire/ smoke doors: 1
   - 3.5. Safety: 1.
   - 3.6. Corrosion resistance: 1
4. Shape: D handle
5. Diameter: 22 mm
6. Distance between centres: 300 mm
7. Material/ finish: Satin stainless steel, grade 1.4401 (316)
8. Mounting: Consealed fixings
9. Additional requirements None.

670 Push plates

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   - 2.1. Product reference: Contractor's choice
3. Size: 330 x 90 mm
4. Material/ finish: Satin stainless steel, grade 1.4401 (316)
5. Mounting: Face fix
6. Additional requirements: Screw heads colour matched to plate

690 Kick plates

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   - 2.1. Product reference: Contractor's choice
3. Size: As schedule
4. Material/ finish: Satin stainless steel, grade 1.4401 (316)
5. Mounting: Face fix
6. Additional requirements: Screw heads colour matched to plate

720 Door stops

1. Manufacturer: Contractor's choice
   - 1.1. Product reference: Contractor's choice
2. Type: Floor mounted rubber buffer on stainless steel shoe for concrete fixing

3. Usage: To doors opening against walls other than those fitted with closers with a back check facility

811 Door mounted coat hooks

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Type: Coat hook, rubber buffered
4. Material/ finish: Satin stainless steel, grade 1.4401 (316)

850 Threshold weatherstrip

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Type: Neoprene wiping strip on door with low profile metal threshold
4. Size: To suit door
5. Material/ finish: Powder coated aluminium, colour to match door finish

855 Weatherstrip to door head and jambs

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Type: Elastomeric wiping strip in metal carrier
4. Size: To suit door
5. Material/ finish: Powder coated aluminium, colour to match door finish

860 Door seals for

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Type: Rebated elastomeric wiping strip
4. Size: To suit door
5. Material/ finish: Powder coated aluminium, colour to match door finish

Window furniture - Not Used

Ω End of Section

P30
Trenches, pipeways and pits for buried engineering services

General

140 Buried engineering services systems

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Positions and dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Service routes and enclosures: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.1. Support and backfill: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.2. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Access points: As per the Structural Engineering Calculations and Details & Tender drawings.

150 Access and inspection chamber systems

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Positions and dimensions: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Chamber material: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.1. Other chamber materials: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Backfill: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Cover slabs
    5.1. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.2. Thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
    5.3. Openings: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
    6.1. Bedding: As per the Structural Engineering Calculations and Details & Tender drawings.

System performance

210 Design

1. Design: Complete the design of The access and inspection chamber systems & The buried engineering services systems.
2. Extent of work
    2.1. Type of service: As per the Structural Engineering Calculations and Details & Tender drawings.
    2.2. Location: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Ground investigation report: Consider adequacy of data provided, and submit proposals if additional investigation will be necessary to justify contractor design.
4. Easements: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Performance criteria: As per the Structural Engineering Calculations and Details & Tender drawings.

6. Proposals: As per the Structural Engineering Calculations and Details & Tender drawings.

Products

301 Access covers, manhole tops and frames

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 124-1 and BS EN 124-2
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Material: Steel
5. Class: A15

335 Small surface boxes

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS 5834-2
   2.1. Grade: Pedestrian use
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Types: Hinged cover
6. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Accessories: Provide two keys
8. Marking: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Pipeguard: Cut as required from 110 mm outside diameter PVC-U pipe to BS EN 1401-1, Class SN4

340 Small surface access points

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Material: Aluminium
4. Types: Hinged lid
5. Sizes: 100 x 100 mm
6. Accessories: Provide two keys
7. Marking: Marked 'CATV'

411 Selected as-dug material

1. Material: Selected, free from vegetable matter, rubbish, frozen soil and excluding lumps and stones retained on a 40 mm sieve.

412 Granular material

1. Material: Granular: To Department for Transport (DfT) 'Specification for the reinstatement of openings in highways'.

415 Concrete – precast

1. Description: GENERALLY

2. Standard: To BS EN 124-1, BS EN 124-4 and BS EN 1992-1-1
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Panel size: Contractor's choice
5. Unit weight (maximum): Contractor's choice
6. Finish to exposed faces: Contractor's choice

440 Mortar bedding

1. Mix: 1:3 cement:sand

470 Foamed concrete for backfilling

1. Standard: In accordance with Good Concrete Guide 7: 'Foamed concrete: application and specification'
2. Concrete
   2.1. Density (minimum): 1400 kg/m³
   2.2. Target compressive strength: No requirement
3. Ground conditions: As existing

Execution

610 Routes of services below ground

1. Locations of existing service runs and pipeducts: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Site survey: Required
   2.1. Purpose: To verify location of existing services
   2.2. Submit: Copy of survey, notifying the design team of any discrepancies
3. Locations of new service runs and pipeducts: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Temporary markings: For soft surfaces, indicate new service runs and pipeducts with 75 x 75 mm softwood posts painted white and projecting not less than 600 mm above ground level, or with clearly visible waterproof markings on hard surfaces

620 Existing roads and pavings

1. Excavation and backfilling: To Department for Transport (DfT) 'Specification for the reinstatement of openings in highways'

625 Trenches

1. Trench depth: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Trench width: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Trench sides: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Trench bottoms: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Inspection: As per the Structural Engineering Calculations and Details & Tender drawings.

630 Cutting tree roots in service trenches

1. Protected area: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Roots in protected area: Do not cut.

3. Roots exceeding 25 mm diameter: Give notice and do not cut without permission.
4. Cutting: Use a handsaw to make clean, smooth cuts, minimizing wound area and ragged edges. Pare-cut surfaces smooth with a sharp knife
5. Unintentionally severed roots: Give notice and form a new, clean cut slightly nearer the trunk
6. Backfilling: Retained topsoil, as section D20

670 Bedding of frames for access covers and surface boxes

1. Bedding: Bed solidly in cement:sand mortar, centrally over opening and level with surrounding finishes
    1.1. Hard surfaces: Road and pavement finishes to be flush, and square with block or slab joints
    1.2. Soft landscaping: In grassed areas set 30 mm below soil surface. Haunch the back edge of the bedding so that it is not visible

675 Backfilling generally

1. Backfill from top of pipeduct surround: Material excavated from the trench
2. Backfilling: Lay and compact in 300 mm maximum layers. Do not use heavy compactors before backfill is 600 mm deep over pipeducts

680 Backfilling under roads and pavings

1. Backfill from top of pipeduct surround: As section D20
2. Backfilling: Lay and compact in 150 mm maximum layers

700 Backfilling with foamed concrete

1. Preparation: Repair damaged drainage or ducts and seal off cavities in or adjacent to the excavation which are not to be filled
2. Excavation and backfilling: To Department for Transport (DfT) 'Specification for the reinstatement of openings in highways'

Completion

910 Inspection

1. Dates for inspection: To be agreed
    1.1. Requirement: Give notice
    1.2. Period of notice (minimum): Five working days
2. Inspection of pipeducts: Before backfilling.
    2.1. Inspection by: CA

920 Testing

1. Timing: Where services require testing as set out in the respective work section; undertake tests before backfilling the service
2. Notice for inspection (minimum): Five days
3. Defects: Report immediately.

930 Documentation

1. Record drawings: Submit details of system make-ups, locations and arrangement of services
    1.1. Format: Electronic
    1.2. Number of copies: Two

2. Submittal date: At handover

Ω End of Section

P31
Holes, chases, covers and supports for services

Products

370 Access covers/ gratings for

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Covers/ Gratings: Hot dip galvanized Durbar pattern mild steel tread plate
   3.1. Sizes: As drawings
   3.2. Loading grade: Pedestrian
4. Frame/ Support/ Fixing: Frame cast in using integral anchors, covers fixed with corrosion resistant locking screws
5. Accessories: None

400 Meter cabinets

1. Type: Surface mounted
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Size: As drawings

Execution

610 Coordination

1. Locations and dimensions of holes and chases for services: Submit details As per the Structural Engineering Calculations and Details & Tender drawings..

620 Holes, recesses and chases in in situ concrete

1. Cast in: Holes larger than 10 mm diameter, recesses and chases.
2. Cutting and drilling
   2.1. Permitted for holes not larger than 10 mm diameter.
   2.2. Not permitted for holes larger than 10 mm diameter except as indicated on drawings.

630 Holes, recesses and chases in precast concrete

1. Cutting and drilling: Not permitted except as indicated on drawings.

640 Holes in structural steelwork

1. Cutting and drilling: Not permitted except as indicated on drawings.

650 Holes, recesses and chases in masonry

1. Locations: To maintain integrity of strength, stability and sound resistance of construction.
2. Sizes: Minimum needed to accommodate services.
   2.1. Holes (maximum): 300 mm².
3. Walls of hollow or cellular blocks: Do not chase.

4. Walls of other materials
    4.1. Vertical chases: No deeper than one third of single leaf thickness, excluding finishes.
    4.2. Horizontal or raking chases: No longer than 1 m. No deeper than one sixth of the single leaf thickness, excluding finishes.
5. Chases and recesses: Do not set back to back. Offset by a clear distance at least equal to the wall thickness.
6. Cutting: Do not cut until mortar is fully set. Cut carefully and neatly. Avoid spalling, cracking and other damage to surrounding structure.

660 Preformed holes in masonry

1. Width of holes without bridging over (maximum): one block
    1.1. Holes requiring bridging: Submit proposals.

670 Notches and holes in structural timber

1. General: Avoid if possible.
2. Sizes: Minimum needed to accommodate services.
3. Position: Do not locate near knots or other defects.
4. Notches and holes in same joist: Minimum 100 mm apart horizontally.
5. Notches in joists
    5.1. Position: Locate at top. Form by sawing down to a drilled hole.
    5.2. Depth (maximum): 0.15 x joist depth.
    5.3. Distance from supports: Between 0.1 and 0.2 x span.
6. Holes in joists
    6.1. Position: Locate on neutral axis.
    6.2. Diameter (maximum): 0.25 x joist depth.
    6.3. Centres (minimum): 3 x diameter of largest hole.
    6.4. Distance from supports: Between 0.25 and 0.4 of span.
7. Notches in roof rafters, struts and truss members: Not permitted.
8. Holes in struts and columns: Locate on neutral axis.
    8.1. Diameter (maximum): 0.25 x minimum width of member.
    8.2. Centres (minimum): 3 x diameter of largest hole.
    8.3. Distance from ends: Between 0.25 and 0.4 of span.

680 Fixing floor ducting/ trunking

1. Bases
    1.1. Fixing method: Plug and screw
    1.2. Fixing level: So as to provide a flush smooth surface when the floor finish is laid.
    1.3. Jointing: Standard
2. Covers
    2.1. Applied finish: Same as surrounding floor finish
    2.2. Fixing: Countersink fixing screws 1 mm below surface and leave exposed.
    2.3. Configuration: Concealed below floor finish
3. Intumescent fire barriers: Not required

690 Installing pipe sleeves

1. Sleeves: Fit to pipes passing through building fabric.
2. Material: Match pipeline.
3. Size: One or two sizes larger than pipe to allow clearance.
4. Finish: Install sleeves flush with building finish. In areas where floors are washed down, install protruding 100 mm above floor finish.
5. Masking plates: Fit at visible penetrations, including through false ceilings of occupied rooms.

710 Sealing

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Service: As drawings
3. Location: As drawings
4. Sealing material: Intumescent sealant
5. Method: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Performance requirement: As drawings

730 Installing access covers/ gratings and frames

1. Seating: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Bedding and haunching of frames: Continuously.
   2.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
   2.2. Top of haunching: 30 mm below surrounding surfaces.
3. Horizontal positioning of frames
   3.1. Centred over openings.
   3.2. Install square with joints in surrounding surfaces: Wherever practicable
4. Vertical positioning of frames
   4.1. Level; or
   4.2. Marry in with levels of surrounding surfaces.
5. Permissible deviation in level of external covers and frames: +0 to -6 mm.

740 Installing meter cabinets

1. Fixing: Heavy duty masonry fixing bolts
2. Keys: Hand over to Employer at completion.

Ω End of Section

Q10
Kerbs/ edgings/ channels/ paving accessories

Types of kerbs/edgings and channels

112 Precast concrete

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 1340.
3. Recycled content: Contractor's choice
4. Designations: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Size (width x height x length): 125 x 150 x 915 mm
6. Special shapes: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Finish: As cast
8. Colour: Natural
9. Bending strength: Class 2
10. Weathering resistance: Class 3
11. Abrasion resistance: Class 1
12. Slip/ skid resistance: No requirement
13. Bedding: Cement mortar
14. Joints generally: Dry, 2-3 mm gap
15. Sealant movement joints: Not required
16. Accessories: None

170 Linear slot drainage channel systems

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Bore: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Finish: As cast
4. Colour: Natural
5. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Bedding: Cement mortar
7. Joints generally: Drain unions as required

180 Drainage channel systems with gratings

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Type of fall: Integral continuous fall
4. Finish: As cast
5. Colour: Natural
6. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Bedding: Cement mortar
8. Joints generally: Drain unions as required

9. Cover gratings: Galvanized steel, slotted
    9.1. Fixings: Hexagon head bolts with black moulded polypropylene protective cover caps
    9.2. Loading grade to BS EN 124-1: B125
    9.3. Finish/ Colour: Galvanized

Roads/paving accessories/ marking/ demarcation

395 Road marking (thermoplastic)

1. Standard: Road Safety Markings Association standard specification document for road marking and road studs (StanSpec).
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Colour: White - standard parking spaces and yellow - accesible parking spaces (including wheel chair symboyl) & hatched zone.
4. Retroreflectivity to BS EN 1436: Not required (Class R0)

Laying

510 Laying kerbs, edgings and channels

1. Cutting: Neat, accurate and without spalling. Form neat junctions.
    1.1. Long units (450 mm and over) minimum length after cutting: 300 mm.
    1.2. Short units minimum length after cutting: The lower of one third of their original length or 50 mm.
2. Bedding of units: Positioned true to line and levelled along top and front faces, in a mortar bed on accurately cast foundations or on a race of fresh concrete.
3. Securing of units: After bedding has set, secured with a continuous haunching of concrete or on a race of fresh concrete with backing concrete cast monolithically.

520 Adverse weather

1. Conditions: Do not construct if the temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.

530 Concrete for foundations, races and haunching

1. Standard: To BS 8500-2.
2. Designated mix: Not less than GEN0 or Standard mix ST1.
3. Workability: Very low.

540 Cement mortar bedding

1. General: To section Z21.
2. Mix (Portland cement:sand): 1:3.
    2.1. Portland cement: Class CEM I 42.5 to BS EN 197-1.
    2.2. Sand: to BS EN 12620, grade 0/4 or 0/2 (MP).
3. Bed thickness: 12-40 mm.

543 Lime mortar bedding

1. General: To section Z21.

2. Mix: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Bed thickness: 12-40 mm.

547 Bedding/ Backing of units on fresh concrete races

1. Standard: To BS 7533-6.

550 Kerb dowels

1. Dowels: Steel bar to BS 4482.
   1.1. Size: 12 mm diameter, 150 mm long.
2. Installation of dowels: Vertically into foundation while concrete is plastic.
   2.1. Centres: To suit holes in kerbs.
   2.2. Projection: 75 mm.
3. Grouting of holes in kerbs: Filled with 1:3 cement:sand mortar finished flush.

560 Haunching dowels

1. Dowels: Steel bar to BS 4482.
   1.1. Size: 12 mm diameter, 150 mm long.
2. Installation of dowels: Vertically into foundation while concrete is plastic.
   2.1. Centres: 450 mm.
   2.2. Distance from back face of kerb: 50 mm.
   2.3. Projection: 75 mm.
3. Haunching: Rectangular cross section, cast against formwork, fully enclosing and protecting dowels.

570 Channels

1. Installation: To an even gradient, without ponding or backfall.
2. Lowest points of channels: 6 mm above drainage outlets.

580 Drainage channel systems

1. Installation: To an even gradient, without ponding or backfall. Commence laying from outlets.
2. Silt and debris: Removed from entire system immediately before handover.
3. Washing and detritus: Safely disposed without discharging into sewers or watercourses.

590 Drainage channel systems with built in fall

1. Installation: Top of channels level, installed in correct sequence to form an even gradient without ponding or backfall. Commence laying from outlets.
2. Silt and debris: Removed from entire system immediately before handover.
3. Washings and detritus: Safely disposed without discharging into sewers or watercourses.

600 Radius kerbs/ channels

1. Usage: Radii of 15 m or less.

610 Angle kerbs

1. Usage: Internal and external 90° changes of direction.
2. Cutting of mitres: Not permitted.

620 Accuracy

1. Deviations (maximum)
    1.1. Level: ± 6 mm.
    1.2. Horizontal and vertical alignment: 3 mm in 3 m.

625 Regularity of paved surfaces

1. Maximum undulation of (non-tactile) paving surface: 3 mm.
    1.1. Method of measurement: Under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface).
2. Difference in level between adjacent units (maximum)
    2.1. Joints flush with the surface: Twice the joint width (with 5 mm max difference in level).
    2.2. Recessed, filled joints: 2 mm.
        2.2.1. Recess depth (maximum): 5 mm.
    2.3. Unfilled joints: 2 mm.
3. Sudden irregularities: Not permitted.

630 Narrow mortar joints

1. Jointing: Ends of units buttered with bedding mortar as laying proceeds. Joints completely filled, tightly butted and surplus mortar removed immediately.
    1.1. Joint width: 3 mm.

640 Tooled mortar joints

1. Jointing: Ends of units buttered with bedding mortar as laying proceeds. Joints completely filled and tooled to a neat flush profile.
    1.1. Joint width: 6 mm.

641 Tooled coloured mortar joints

1. Jointing: Ends of units buttered with bedding mortar as laying proceeds. Joints completely filled and raked out to a depth of 10 mm for pointing.
    1.1. Joint width: 6 mm.
2. Pointing: Joints refilled and tooled to a neat flush profile.
    2.1. Pointing mortar: 1:3 cement:sand.
    2.2. Pigment colour: Select from list

650 Sealant movement joints

1. Joint filler: Compressible cellular rubber or plastics compatible with specified sealant.
2. Filler installation: Built in as work proceeds, extending through haunching and foundation. Filler positioned accurately to fully support sealant at the recommended depth below exposed faces of units.
3. Joint width: 10-15 mm
4. Sealant: Silicone
    4.1. Colour: Colour match to kerbs
5. Sealant application: As section Z22.

Ω End of Section

Q22
Asphalt roads/ pavings

Types of paving

110 Asphalt concrete paving

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 13108-1
3. Subgrade improvement layer: As per the Structural Engineering Calculations and Details & Tender drawings.
    3.1. Compacted thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Geotextile: As per the Structural Engineering Calculations and Details & Tender drawings.
    4.1. Manufacturer: Contractor's choice
        4.1.1. Product reference: Contractor’s choice
5. Granular sub-base: As section Q20
    5.1. Compacted thickness: Contractor's choice
6. Base: AC 32 dense base
    6.1. Paving grade: As per the Structural Engineering Calculations and Details & Tender drawings.
    6.2. Compacted thickness: Contractor's choice
7. Binder course: Contractor's choice
    7.1. Paving grade: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.2. Compacted thickness: Contractor's choice
8. Surface course: As per the Structural Engineering Calculations and Details & Tender drawings.
    8.1. Paving grade: As per the Structural Engineering Calculations and Details & Tender drawings.
    8.2. Slip/ Skid resistance: As per the Structural Engineering Calculations and Details & Tender drawings.
    8.3. Compacted thickness: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Reclaimed content
    9.1. Standard: To BS EN 13108-8.
    9.2. Value (maximum): As per the Structural Engineering Calculations and Details & Tender drawings.
10. Surface treatment: As per the Structural Engineering Calculations and Details & Tender drawings.
11. Other requirements: As per the Structural Engineering Calculations and Details & Tender drawings.

Preparatory work/ requirements

195 Hard landscaping materials specification

1. Minimum 'BRE Green Guide to Specification' online rating: As schedule

220 Bituminous materials generally

1. Suppliers' names: Submit.
    1.1. Timing (minimum): Two weeks before starting work.
2. Test certificates: At the time of delivery for each manufacturing batch submit certificate:
    2.1. Confirming compliance with this specification and the relevant standard.
    2.2. Stating full details of composition of mix.

240 Acceptance of surfaces

1. Surface: Sound, clean and suitably close textured.
2. Level tolerances: To BS 594987.
3. Kerbs and edgings: Complete, adequately bedded and haunched and to the required levels.

250 Abutments

1. Vertical edges of manholes, gullies, kerbs and other abutments: Clean and paint with a thin uniform coating of cold applied thixotropic bitumen emulsion.
2. Finishing: Tamp surface around projections.
    2.1. Level: Flush or not more than 3 mm above projections.

Laying

310 Laying generally

1. Preparation: Remove all loose material, rubbish and standing water.
2. Adjacent work: Form neat junctions. Do not damage.
3. Channels, kerbs, inspection covers etc: Keep clean.
4. New paving
    4.1. Keep traffic free until it has cooled to prevailing atmospheric temperature.
    4.2. Do not allow rollers to stand at any time.
    4.3. Prevent damage.
    4.4. Lines and levels: With regular falls to prevent ponding.
    4.5. Overall texture: Smooth, even and free from dragging, tearing or segregation.
    4.6. State on completion: Clean.

320 Adverse weather

1. Frozen materials: Do not use.
2. Suspend laying
    2.1. During freezing conditions
    2.2. If the air temperature reaches 0°C, or in calm dry conditions -3°C, on a falling thermometer.
    2.3. Hot rolled asphalt: During periods of continuous or heavy rain or if there is standing water on the base.

330 Levels

1. Permissible deviation from the required levels, falls and cambers (maximum): In accordance with BS 594987, clause 5.2.

340 Flatness/ Surface regularity

1. Deviation of surface: Where appropriate in relation to the geometry of the surface, the variation in gap under a 3 m straightedge placed anywhere on the surface to be not more than:
    1.1. Base: Machine laid, 25 mm
    1.2. Binder course: Machine laid, 13 mm
    1.3. Surface course: Machine laid, 7 mm
    1.4. Where a straightedge cannot be used the surface must be of a comparable standard of accuracy when judged by eye.

350 Contractor's use of pavements

1. Before use
    1.1. Timing: allow newly laid sections to cool before trafficking.
    1.2. Open-grained surface: Fill with 0/4 mm size coated grit. Remove surplus.
    1.3. Finish: Uncoated chipping and binder surface treatment.
2. Preparation for final surfacing
    2.1. Timing: Defer laying until as late as practicable.
    2.2. Immediately before laying final surfacing: Clean and make good the base/ binder course. Allow to dry.
    2.3. Adhesion: Contractor's choice
        2.3.1. Application rate: As manufacturer's recommendation
        2.3.2. Accuracy: Uniform, without puddles.
    2.4. Finishing: Allow emulsion to break completely before applying surface.

351 Contractor's use of pavements

1. Preparation for final surfacing
    1.1. Timing: Defer laying until as late as practicable.
    1.2. Immediately before laying final surfacing: Clean and make good the base/ binder course. Allow to dry.
    1.3. Adhesion: Contractor's choice
        1.3.1. Application rate: As manufacturer's recommendation
        1.3.2. Accuracy: Uniform, without puddles.
    1.4. Finishing: Allow emulsion to break completely before applying surface.

Completion

390 Documentation

1. Standard: BS EN 13108-4
    1.1. Declaration of conformity: Submit.
2. Number of copies: two
3. Submission: Two weeks prior to date when Contractor expects work to be complete

Ω End of Section

Q40
Fencing

Fencing systems

340 Steel vertical bar fencing

1. Manufacturer: Contractor's choice
    1.1. Product reference: Contractor's choice
2. Standard: To BS 1722-9.
3. Height: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Verticals: 20 mm square bar, angle to view. bow top
5. Centres of verticals: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Posts: As per the Structural Engineering Calculations and Details & Tender drawings.
    6.1. Finish: Hot-dip galvanized to BS EN ISO 1461
        6.1.1. Colour: Black
7. Centres of posts (maximum): 2.8 m.
8. Method of setting posts/ stays/ legs: Contractor's choice
9. Accessories: Two double leaf pedestrian gate
10. Conformity: Submit manufacturer's and installer's certificates, to BS 1722-9.

440 Boundary protection materials specification

1. Minimum BRE 'Green Guide to Specification Online' rating: As schedule

Gates, posts and stiles

560 Steel

1. Description: GATES
2. Manufacturer: Contractor's choice
3. Standard
    3.1. Domestic gates: To BS 4092-1.
    3.2. Steel palisade gates: To BS 1722-12.
4. Manufacturer: Contractor's choice
    4.1. Product reference: Contractor's choice
5. Materials and workmanship: As section Z11.
6. Finish: Hot-dip galvanized to BS EN ISO 1461
    6.1. Colour: Black
7. Jointing: Welded.
8. Fittings: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Finish: Primed for painting
10. Method of fixing: As per the Structural Engineering Calculations and Details & Tender drawings.
11. Accessories: Gate opener

570 Gates

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice
2. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Posts: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Finish as delivered: Primed for painting
5. Fittings: As per the Structural Engineering Calculations and Details & Tender drawings.
   5.1. Finish: Primed for painting
6. Method of fixing: Contractor's choice
7. Accessories: Gate opener

Accessories

635 Gate openers

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Type: Sliding
4. Mechanism: Electro-mechanical
5. Number of transmitters: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Accessories: Access control panel as section W90

Execution

710 Installation generally

1. Set out and erect
   1.1. Alignment: Straight lines or smoothly flowing curves.
   1.2. Tops of posts: Following profile of the ground.
   1.3. Setting posts: Rigid, plumb and to specified depth, or greater where necessary to ensure adequate support.
   1.4. Fixings: All components securely fixed.

715 Competence

1. Operatives: Contractors must employ competent operatives.
2. Qualifications: Submit certification of training.
   2.1. NHSS Sector Scheme 2A sub categories: (b) (g)
   2.2. NHSS Sector Scheme 2C sub categories: (a)

720 Setting posts in concrete

1. Standard: To BS 8500-2.
2. Mix: Designated concrete not less than GEN1 or Standard prescribed concrete not less than ST2.
3. Alternative mix for small quantities: 50 kg Portland cement to 150 kg fine aggregate to 250 kg 20 mm nominal maximum size coarse aggregate, medium workability.
4. Admixtures: Do not use.

5. Holes: Excavate neatly and with vertical sides.
6. Filling: Position post/ strut and fill hole with concrete to not less than the specified depth, well rammed as filling proceeds and consolidated.
7. Backfilling of holes not completely filled with concrete: Excavated material, well rammed and consolidated.

730 Exposed concrete foundations

1. Filling: Compact until air bubbles cease to appear on the upper surface.
2. Finishing: Weathered to shed water and trowelled smooth.

740 Setting posts in earth

1. Holes: Excavated neatly, with vertical sides and as small as practicable to allow refilling.
2. Filling: Position posts/ struts and replace excavated material, well rammed as filling proceeds.

750 Driven posts

1. Damage to heads: Minimize.
    1.1. Repair: Neatly finish post tops after installation.

760 Nailed wood rails

1. Length (minimum): Two bays, with joints in adjacent rails staggered.
2. Fixing: Nail each length of rail to each post with two 100 mm galvanized nails.
3. Rails with split ends: Replace.

765 Cleft wood rails

1. Length (maximum): 3.05 m.
2. Fixing: Rail end section shaped to adequately fill the post mortice. Nail each rail to each prick post with two galvanized nails.
3. Rails with split ends: Replace.

766 Arris rails

1. Fixing
    1.1. Rail end section: Shaped to adequately fill the post mortice or recess.
    1.2. Recessed posts: Rails bolted to each post.
    1.3. Top rails: Fixed at both ends using One 8 mm diameter bolt .
2. Rails with split ends: Replace.

770 Site cutting of wood

1. General: Kept to a minimum.
2. Below or near ground level: Cutting prohibited.
3. Treatment of surfaces exposed by minor cutting and drilling: Two flood coats of solution recommended for the purpose by main treatment solution manufacturer.

780 Making good galvanized surfaces

1. Treatment of minor damage (including on fasteners and fittings): Low melting point zinc alloy repair rods or powders made for this purpose, or at least two coats of zinc-rich paint to BS 4652.

2. Thickness: Apply sufficient material to provide a zinc coating at least equal in thickness to the original layer.

790 Site painting

1. Timing: Prepare surfaces and apply finishes as soon as possible after fixing.

Completion

910 Cleaning

1. General: Leave the works in a clean, tidy condition.
2. Surfaces: Clean immediately before handover.

920 Fixings

1. All components: Tighten.
   1.1. Timing: Before handover.

930 Gates

1. Hinges, latches and closers: Adjust to provide smooth operation. Lubricate where necessary.
   1.1. Timing: Before handover.

Ω End of Section

R10
Rainwater drainage systems

General

110 Gravity rainwater drainage system

1. Rainwater outlets: Rainwater collector units
2. Gutters: PVC-U
3. Pipework: PVC-U, external
4. Below ground drainage: As section R12
5. Disposal: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Controls: As section S90
7. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

System performance

210 Design

1. Design: Complete the design of the rainwater drainage system.
2. Standard
   2.1. To BS EN 12056-3, clauses 3–7, Annex A and National Annexes.
   2.2. To BS EN 12056-5, clauses 3, 4, 6 and 11.
3. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

221 Collection and distribution of rainwater

1. General: Complete, and without leakage or noise nuisance.

230 Design parameters - general

1. Roof and gutter construction and finish: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Design rate of rainfall: As BS EN 12056-3, National Annex NB.2.
   2.1. Category: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Design life of building: 60 years
4. Available capacity of existing below ground drainage (maximum): As per the Structural Engineering Calculations and Details & Tender drawings.

Products

350 PVC-U gutters

1. Standard: To the relevant parts of BS EN 607 and BS EN 1462, Kitemark certified.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Recycled content: Contractor's choice
4. Profile: Half round
5. Nominal size: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Colour: Black

7. Brackets: Galvanized steel top rafter type
    7.1. Fixings: Stainless steel screws
        7.1.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Accessories: Gutter stop ends

360 Sealant for gutters

1. Type: As per the Structural Engineering Calculations and Details & Tender drawings.

420 PVC-U pipework - external

1. Standard: To BS EN 12200-1, Kitemark certified.
2. Manufacturer: Contractor's choice
    2.1. Product reference: Contractor's choice
3. Recycled content: Contractor's choice
4. Section: Round
5. Nominal size: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Colour: Black
7. Brackets: PVC-U clips, black
    7.1. Fixings: Stainless steel screws
        7.1.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Accessories: Rainwater shoes, Rainwater heads

Custom made products - Not Used

Execution

600 Preparation

1. Work to be completed before commencing work specified in this section
    1.1. Below ground drainage. Alternatively, make temporary arrangements for dispersal of rainwater without damage or disfigurement of the building fabric and surroundings.
    1.2. Painting of surfaces which will be concealed or inaccessible.

605 Installation generally

1. Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
2. Plastics and galvanized steel pipes: Do not bend.
3. Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
4. Protection
    4.1. Fit purpose made temporary caps to prevent ingress of debris.
    4.2. Fit access covers, cleaning eyes and blanking plates as the work proceeds.

610 Fixing and jointing gutters

1. Joints: Watertight
2. Brackets: Securely fixed.
    2.1. Fixings: Plugged and screwed into masonry
        2.1.1. Fixing centres: To every rafter

2.2. Additional brackets: Where necessary to maintain support and stability, provide at joints in gutters and near angles and outlets.

3. Roofing underlay: Dressed into gutter.

615 Setting out eaves gutters - to falls

1. Setting out: To true line and even gradient to prevent ponding or backfall. Position high points of gutters as close as practical to the roof and low points not more than 50 mm below the roof.
2. Outlets: Align with connections to below ground drainage.

616 Setting out eaves gutters - level

1. Setting out: Level and as close as practical to the roof.
2. Outlets: Aligned with connections to below ground drainage.

630 Installing rainwater outlets

1. Fixing: Secure. Fix before connecting pipework.
   1.1. Method: Screw to timber spacing blocks
2. Junctions between outlets and pipework: Accommodate movement in structure and pipework.

635 Fixing pipework

1. Pipework: Fix securely, plumb and/ or true to line.
2. Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
3. Externally socketed pipes and fittings: Fix with sockets facing upstream.
4. Additional supports: Provide as necessary to support junctions and changes in direction.
5. Vertical pipes
   5.1. Provide a loadbearing support at least at every storey level.
   5.2. Tighten fixings as work proceeds so that every storey is self supporting.
   5.3. Wedge joints in unsealed metal pipes to prevent rattling.
6. Wall and floor penetrations: Isolate pipework from structure.
   6.1. Pipe sleeves: As section P31.
   6.2. Masking plates: Fix at penetrations if visible in the finished work.
7. Expansion joint pipe sockets: Fix rigidly to buildings. Elsewhere, provide brackets and fixings that allow pipes to slide.

640 Fixing vertical pipework

1. Bracket fixings: Plugged and screwed into masonry
2. Distance between bracket fixing centres (maximum): 900 mm

645 Fixing low gradient pipework

1. Bracket fixings: Plugged and screwed into masonry
2. Distance between bracket fixing centres (maximum): 900 mm

650 Jointing pipework and gutters

1. General: Joint with materials and fittings that will make effective and durable connections.
2. Jointing differing pipework and gutter systems: Use adaptors intended for the purpose.
3. Cut ends of pipes and gutters: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.

4. Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
5. Junctions: Form with fittings intended for the purpose.
6. Jointing material: Strike off flush. Do not allow it to project into bore of pipes and fittings.
7. Surplus flux, solvent jointing materials and cement: Remove.

660 Jointing external pipework

1. Jointing: Solvent welded with lubricated ring seal joints at no more than 1.8 m spacing

665 Installing prefabricated galvanized steel pipework

1. Installation: Do not cut pipes to length or otherwise damage coatings.

670 Installing full-bore flow drainage pipework

1. Fixing: Secure. Prevent movement during extreme operating conditions including oscillating pressure and cavitation. Provide for thermal movement.
2. Number of joints, bends and offsets: Minimize.
3. Condition on completion: Smooth, consistent bore, clean and free from distortion, wrinkling, cracks and other defects.

675 Cutting coated pipework and gutters

1. Cutting: Recoat bare metal.

680 Fixing insulation to internal pipelines and gutters

1. Fixing: Secure and neat. Provide continuity at supports and leave no gaps. Fix split pipe insulation with the split on 'blind' side of pipeline.
   1.1. Method: Contractor's choice
2. Timing: Do not fit insulation until completion of pipe airtightness or leakage testing.

685 Identification of internal rainwater pipework

1. Standard: In accordance with Water Regulations Advisory Scheme (WRAS) Information and guidance note 9-02-05 and BS 8515.

690 Electrical continuity - pipework

1. Joints in metal pipes with flexible couplings: Clips (or suitable standard pipe couplings) supplied for earth bonding by pipework manufacturer to ensure electrical continuity.

695 Electrical continuity - gutters

1. Joints in metal gutters: Purpose made links supplied by the gutter manufacturer to ensure electrical continuity.

700 Access for testing and maintenance

1. General: Install pipework and gutters with adequate clearance to permit testing, cleaning and maintenance, including painting where necessary.
2. Access fittings and rodding eyes: Position so that they are not obstructed.

Completion

900 Testing generally

1. Dates for testing: Give notice.

1.1. Period of notice (minimum): 5 days

2. Preparation
   2.1. Pipework: Complete, securely fixed, free from defects, obstruction and debris before testing.
3. Testing
   3.1. Supply clean water, assistance and apparatus.
   3.2. Do not use smoke to trace leaks.
4. Records: Submit a record of tests.

905 Internal pipework test - England, Wales, Ireland and Northern Ireland

1. Preparation: Temporarily seal open ends of pipework with plugs.
2. Test apparatus: Connect a 'U' tube water gauge and air pump to pipework via a plug.
3. Testing: Pump air into pipework until gauge registers 38 mm.
4. Required performance
   4.1. Allow a period for temperature stabilization, after which the pressure of 38 mm is to be maintained without loss for at least 3 minutes.

906 Internal pipework test - Scotland

1. Standard: To BS EN 12056-2, National annex NG.

910 Gutter test

1. Preparation: Temporarily block all outlets.
2. Testing: Fill gutters to overflow level and after 5 minutes closely inspect for leakage.

915 Maintenance instructions

1. General: At completion, submit printed instructions recommending procedures for maintenance of the rainwater installation, including full details of recommended inspection, cleaning and repair procedures.

920 Immediately before handover

1. Construction rubbish, debris, swarf, temporary caps and fine dust which may enter the rainwater system: Remove. Do not sweep or flush into the rainwater system.
2. Access covers, rodding eyes, outlet gratings and the like: Secure complete with fixings.

Ω End of Section

R11
Above ground foul drainage systems

General

115 Above ground foul drainage system

1. Sanitary and floor drainage outlets: Floor drains
2. Waste pipework: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Discharge stack and branch pipework: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Separate ventilating pipework: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Disposal: As per the Structural Engineering Calculations and Details & Tender drawings.

System performance

210 Design

1. Design: Complete the design of the above ground foul drainage system.
2. Standards: To BS EN 12056-1 and BS EN 12056-2, and in accordance with BS EN 12056-2 National Annexes NA-NG.
    2.1. System type to BS EN 12056-2: System III.
3. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

220 Collection and distribution of foul water

1. General: Quick, quiet and complete, self-cleansing in normal use, without blockage, crossflow, backfall, leakage, odours, noise nuisance or risk to health.
2. Pressure fluctuations in pipework (maximum): ±38 mm water gauge.
3. Water seal retained in traps (minimum): 25 mm.

Products

320 ABS pipework

1. Description: FOR WASTES
2. Standard
    2.1. To BS EN 1455-1 and Kitemark certified.
        2.1.1. Application area code: B.
        2.1.2. Opening dimensions of access fittings, design of swept fittings, stand off dimensions of pipe and fitting brackets and requirements for adaptors and plugs: To BS 4514.
3. Manufacturer: Contractor's choice
    3.1. Product reference: Contractor's choice
4. Nominal sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Colour: White where exposed to view
6. Brackets: As per the Structural Engineering Calculations and Details & Tender drawings.
    6.1. Fixings: As per the Structural Engineering Calculations and Details & Tender drawings.
        6.1.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings.

7. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

350 MUPVC or PVC-C pipework

1. Description: FOR WASTES
2. Material and standard
   2.1. To BS EN 1566-1, and Kitemark certified.
      2.1.1. Application area code: B.
      2.1.2. Opening dimensions of access fittings, design of swept fittings, stand off dimensions of pipe and fitting brackets and requirements for adaptors and plugs: To BS 4514.
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Nominal sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Colour: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Brackets: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.1. Fixings: As per the Structural Engineering Calculations and Details & Tender drawings.
      6.1.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

365 PVC-U pipework

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 1329-1, Kitemark certified.
   2.1. Weather resistance, connectors to WC pans, opening dimensions of access fittings, design of swept fittings, stand off dimensions of pipe and fitting brackets and requirements for adaptors and plugs: To BS 4514.
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice
4. Nominal sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Colour: Black
6. Brackets: Plastics pipe clips, colour to match pipes
   6.1. Fixings: As per the Structural Engineering Calculations and Details & Tender drawings.
      6.1.1. Size: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.

Fabrication - Not Used

Execution

601 Installation generally

1. Standard: To BS EN 12056-5.
2. Components: From the same manufacturer for each type of pipework.
3. Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
4. Plastics and galvanized steel pipes: Do not bend.
5. Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
6. Concealed or inaccessible surfaces: Decorate before starting work specified in this section.
7. Protection

7.1. Purpose made temporary caps: Fit to prevent ingress of debris.
7.2. Access covers, cleaning eyes and blanking plates: Fit as the work proceeds.

605 Pipe routes

1. General: The shortest practical, with as few bends as possible.
   1.1. Bends in wet portion of soil stacks: Not permitted.
   1.2. Routes not shown on drawings: Submit proposals before commencing work.

610 Fixing pipework

1. Pipework: Fix securely plumb and/ or true to line. Fix discharge stack pipes at or close below socket collar or coupling.
2. Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
3. Externally socketed pipes and fittings: Fix with sockets facing upstream.
4. Additional supports: Provide as necessary to support junctions and changes in direction.
5. Vertical pipes: Provide a load bearing support not less than every storey level. Tighten fixings as work proceeds so that every storey is self supporting.
6. Wall and floor penetrations: Isolate pipework from structure, e.g. with pipe sleeves.
   6.1. Masking plates: Fix at penetrations if visible in the finished work.
7. Expansion joint sockets: Fix rigidly to the building.
8. Fixings: Allow the pipe to slide.

615 Fixing vertical pipework

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Bracket fixings: Plugged and screwed into masonry
3. Distance between bracket fixing centres (maximum): 900 mm

620 Fixing low gradient pipework

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Bracket fixings: Plugged and screwed into masonry
3. Distance between bracket fixing centres (maximum): 900 mm

625 Jointing floor channels

1. Jointing: Silicone sealant

630 Jointing pipework – generally

1. General: Joint with materials, fittings and techniques that will make effective and durable connections.
2. Jointing differing pipework systems: With adaptors intended for the purpose.
3. Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
4. Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
5. Junctions: Form with fittings intended for the purpose.
6. Jointing material: Do not allow it to project into bore of pipes and fittings.
7. Surplus flux, solvent jointing materials and cement: Remove from joints.

635 Jointing pipework – borosilicate glass

1. Jointing: Bolted flange couplings with insert.

660 Jointing pipework – ABS, MUPVC, PVC-C and PVC-U

1. Jointing: Solvent welded with lubricated ring seal joints at maximum 1800 mm spacing

675 Coated pipes

1. Cutting: Recoat bare metal.

680 Electrical continuity

1. Joints in metal pipes with flexible couplings: Make with clips (or suitable standard pipe couplings) supplied for earth bonding by pipework manufacturer to ensure electrical continuity.

685 Identification of internal foul drainage pipework

1. Markings: To BS 1710.
    1.1. Type: Black bands, with arrows to indicate direction of flow
    1.2. Wording: White lettering 'FOUL DRAINAGE' on a black background
2. Type: Integral lettering on pipe wall, self-adhesive bands or identification clips.
3. Locations: At 500 mm centres, junctions and both sides of slabs, valves, appliances, bulkheads and wall penetrations.

700 Installing air admittance valves

1. Position: Vertical, above flood level of highest appliance served and clear of insulation materials (other than the manufacturer's insulating cover).
2. Connection to discharge stack: Allow removal for rodding, e.g. ring seal.
3. Roof spaces and other unheated locations: Fit manufacturer's insulating cover.

703 Fixing insulation to internal pipelines

1. Fixing: Secure and neat. Provide continuity at supports and leave no gaps. Fix split pipe insulation with the split on ‘blind’ side of pipeline.
    1.1. Method: Waterproof adhesive
2. Timing: Do not fit insulation until completion of pipe airtightness or leakage testing.

705 Access for testing and maintenance

1. General: Install pipework with adequate clearance to permit testing, cleaning and maintenance, including painting where necessary.
2. Access fittings and rodding eyes: Position to avoid obstruction.

Completion

900 Testing generally

1. Dates for testing: Give notice.
    1.1. Period of notice (minimum): 5 working days
2. Preparation
    2.1. Pipework: Securely fixed and free from obstruction and debris.
    2.2. Traps: Filled with clean water.

3. Testing
   3.1. Supply clean water, assistance and apparatus.
   3.2. Do not use smoke to trace leaks.
4. Records: Submit a record of tests.

905 Pipework airtightness test

1. Preparation
   1.1. Open ends of pipework: Temporarily seal using plugs.
   1.2. Test apparatus: Connect a 'U' tube water gauge and air pump to pipework via a plug or through trap of an appliance.
2. Testing: Pump air into pipework until gauge registers 38 mm.
3. Required performance: Pressure of 38 mm is to be maintained without loss for at least three minutes.

915 Prehandover checks

1. Temporary caps: Remove.
2. Permanent blanking caps, access covers, rodding eyes, floor gratings and the like: Secure complete with fixings.

920 Submittals

1. Manufacturer's instructions for grease traps: Handover at completion.

Ω End of Section

R12
Below ground drainage systems

General

110 Below ground drainage system

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Surface water and rainwater drainage sources: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Foul drainage sources: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Land drainage sources: Below ground pipelines from land drainage, as section R13
5. Pressure relief drainage sources: Below ground pipelines from pressure relief drainage, as section R16
6. Pipes, bends and junctions: As per the Structural Engineering Calculations and Details & Tender drawings.
   6.1. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Manholes, inspection chambers, traps, and separators: As per the Structural Engineering Calculations and Details & Tender drawings.
   7.1. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Disposal: As per the Structural Engineering Calculations and Details & Tender drawings.
9. Accessories – general: As per the Structural Engineering Calculations and Details & Tender drawings.

122 Soakaway system – plastics units

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Rainwater drainage sources: Below ground rainwater pipelines
3. Foul drainage sources: None
4. Soakaway units: As section R17
   4.1. Accessories: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Pipes, bends and junctions: As per the Structural Engineering Calculations and Details & Tender drawings.

System performance

211 Design – below ground drainage systems

1. Design: Complete the design of the below ground drainage system in accordance with BS EN 752, BS EN 1295-1 and BS EN 1610.
2. Ground conditions: As existing
3. Performance criteria: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

221 Design – soakaway systems

1. Design: Complete the design of the soakaway system in accordance with BRE Digest 365.
2. Ground conditions: as existing

3. Required percolation rate: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Design life of system: 60 years
5. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.
6. Maintenance requirements: Submit details.

Products

312 Adaptors to plastics drainage

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Material and standard: Plastics to BS 4660 and Kitemark certified or to BS EN 1401-1 and Kitemark certified.
3. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Manufacturer: Contractor's choice
    4.1. Product reference: Contractor's choice

313 One piece gullies

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standards: To BS EN 1253-1, -2, -3, -4 and -5; or
    2.1. Cast iron: To BS 437 and Kitemark certified, or Agrément certified.
    2.2. Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
    2.3. Concrete: To BS 5911-6 and Kitemark certified, or Agrément certified.
    2.4. Plastics: To BS 4660 and Kitemark certified, or Agrément certified.
    2.5. Polypropylene: To BS EN 1852-1.
3. Material: Plastics
4. Manufacturer: Contractor's choice
    4.1. Product reference: Contractor's choice
5. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Outlet sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Silt buckets: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.

315 One piece gullies and covers

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standards: To BS EN 1253-1, -2, -3, -4 and -5; or
    2.1. Cast iron: To BS 437 and Kitemark certified, or Agrément certified.
    2.2. Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
    2.3. Concrete: To BS 5911-6 and Kitemark certified, or Agrément certified.
    2.4. Plastics: To BS 4660 and Kitemark certified, or Agrément certified.
    2.5. Polypropylene: To BS EN 1852-1.
3. Material: Plastics
4. Manufacturer: Contractor's choice
    4.1. Product reference: Contractor's choice
5. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.

6. Outlet sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Covers: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.2. Type: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.3. Material: Plastics
    7.4. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
    7.5. Loading grades to BS EN 124: As per the Structural Engineering Calculations and Details & Tender drawings.
8. Silt buckets: As per the Structural Engineering Calculations and Details & Tender drawings.
    8.1. Product reference: As per the Structural Engineering Calculations and Details & Tender drawings.

329 Pipes, bends and junctions – supply

1. Pipes and fittings: From same manufacturer for each pipeline.

344 Pipes, bends and junctions - plastics - structured wall

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 13476-1 and -2 or -3, Kitemark or Agrément certified
    2.1. Supplementary requirements: Puncture resistance, jetting resistance and longitudinal bending to requirements of WIS 4-35-01, issue 2.
3. Material: PVC-U
4. Manufacturer: Contractor's choice
    4.1. Product reference: Contractor's choice
5. Recycled content: Contractor's choice
6. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Jointing type: Spigot and socket

346 Pipes, bends and junctions – pvc-u – solid wall

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: BS EN 1401-1 with flexible joints.
    2.1. Class: Contractor's choice
3. Manufacturer: Contractor's choice
    3.1. Product reference: Contractor's choice
4. Recycled content: Contractor's choice
5. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.
6. Application area code: UD.

352 Access points – plastics

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS 4660 and Kitemark certified, to BS EN 13589-1, or Agrément certified.
3. Manufacturer: Contractor's choice
4. Nominal diameter: As per the Structural Engineering Calculations and Details & Tender drawings.
5. Bases
    5.1. Product reference: Contractor's choice

6. Raising pieces
   6.1. Product reference: Contractor's choice
   6.2. Heights: As per the Structural Engineering Calculations and Details & Tender drawings.
7. Access covers and frames
   7.1. Product reference: Contractor's choice
   7.2. Loading grades to BS EN 124: As per the Structural Engineering Calculations and Details & Tender drawings.

357 Connectors – saddle

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standards
   2.1. Cast iron: To BS 437 and Kitemark certified, or Agrément certified.
   2.2. Clay: To BS EN 295-1 and Kitemark certified, or Agrément certified.
   2.3. Concrete: To BS 5911-6 and Kitemark certified, or Agrément certified.
   2.4. Plastics: To BS 4660 and Kitemark certified, BS EN 13598-1 or Agrément certified.
3. Material: Plastics
4. Manufacturer: Contractor's choice
   4.1. Product reference: Contractor's choice
5. Sizes: As per the Structural Engineering Calculations and Details & Tender drawings.

359 Flexible couplings

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 295-4 or WIS 4-41-01 and Kitemark certified, or Agrément certified.
3. Manufacturer: Contractor's choice
   3.1. Product reference: Contractor's choice

401 Inspection chambers – plastics

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Standard: To BS EN 13598-1, BS EN 13598-2 or Agrément certified.
3. Diameter: As per the Structural Engineering Calculations and Details & Tender drawings.
4. Manufacturer: Contractor's choice
5. Bases
   5.1. Product reference: Contractor's choice
6. Shaft units
   6.1. Product reference: Contractor's choice
7. Access covers and frames
   7.1. Product reference: Contractor's choice
   7.2. Loading grades to BS EN 124: As per the Structural Engineering Calculations and Details & Tender drawings.

Fabrication

510 Vermin gratings for outfalls and outlet headwalls

1. Construction: Mild steel frame extending 75 mm beyond pipe opening all around, with 25 mm maximum opening steel mesh grille. Top hinged on built-in fish-tail straps and with bottom pin lock.
2. Finish: Galvanized to BS EN ISO 1461 after fabrication.
3. Submit: Shop drawings.
    3.1. Timing: Before manufacture.

Execution

610 Stripping out

1. Extent of stripping out: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Exposed ends of existing drainage to be abandoned: Seal with concrete.

611 Existing drains

1. Setting out: Before starting work, check invert levels and positions of existing drains, sewers, inspection chambers and manholes against drawings. Report discrepancies.
2. Protection: Protect existing drains to be retained and maintain normal operation if in use.

613 Excavated material

1. Turf, topsoil, hardcore, etc: Set aside for use in reinstatement.

616 Selected fill for backfilling

1. Selected fill: As-dug material, free from vegetable matter, rubbish, frozen soil and material retained on a 40 mm sieve.
    1.1. Compaction: By hand in 100 mm layers.

623 Lower part of trench – general

1. Trench up to 300 mm above crown of pipe: Vertical sides, width as small as practicable.
    1.1. Width (minimum): External diameter of pipe plus 300 mm.

625 Lower part of trench – transition depth

1. Trench widths up to 300 mm above crown of pipe (maximum)
    1.1. DN 100 pipelines more than 6.0 m deep: 600 mm.
    1.2. DN 150 pipelines more than 5.4 m deep: 700 mm.
    1.3. DN 225 pipelines more than 4.0 m deep: 800 mm.
    1.4. DN 300 pipelines more than 2.9 m deep: 900 mm.

631 Type of subsoil

1. General: Where type of subsoil at level of crown of pipe differs from that stated for the type of bedding, surround or support, give notice.

635 Formation for beddings

1. Timing: Excavate to formation immediately before laying beddings or pipes.

2. Mud, rock projections, boulders and hard spots: Remove. Replace with consolidated bedding material.
3. Local soft spots: Harden by tamping in bedding material.
4. Inspection of excavated formations: Give notice.

641 Pipes at different levels in common trench

1. Subtrench: Permissible provided soil of step is stable and unlikely to break away.
   1.1. Subtrench not permissible: Trench depth as required for lower pipe. Increase thickness of bedding to upper pipe as necessary.
2. Lower pipe: Backfill with compacted granular material to at least half way up higher pipe.
3. Clear horizontal distance between pipes (minimum)
   3.1. Pipes up to DN 700: 350 mm.
   3.2. Pipes exceeding DN 700: 500 mm.

661 Class O support

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type of subsoil: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Granular material: Contractor's choice
   3.1. Sizes: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
4. Bedding
   4.1. Material: Granular, compacted over full width of trench.
   4.2. Thickness (minimum): 100 mm.
5. Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
6. Initial testing before placing support: Required
7. Support
   7.1. Material: Granular.
   7.2. Depth: To slightly above crown of pipe.
   7.3. Compaction: By hand.
8. Backfilling
   8.1. Material and depth
      8.1.1. Protective cushion of selected fill to 300 mm above crown of pipe; or
      8.1.2. Additional granular material, to 100 mm above crown of pipe.
   8.2. Compaction: By hand in 100 mm layers.

665 Class Q surround

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type of subsoil: As per the Structural Engineering Calculations and Details & Tender drawings.
3. Granular material: As per the Structural Engineering Calculations and Details & Tender drawings.
   3.1. Sizes: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
4. Bedding
   4.1. Material: Granular, compacted over full width of trench.
   4.2. Thickness (minimum): 100 mm.
5. Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
6. Initial testing before placing support: Required

7. Surround
    7.1. Material: Granular.
    7.2. Depth (minimum): To 75 mm above crown of pipe.
    7.3. Compaction: By hand.
8. Flexible filler
    8.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
    8.2. Laying: Continuously over completed surround before laying protection slabs.
9. Protection slabs
    9.1. Material: Concrete
        9.1.1. Type: Reinforced.
    9.2. Thickness: 100 mm
    9.3. Reinforcement: B196
    9.4. Minimum bearing: 300 mm.
10. Backfilling: Soil or topsoil, as appropriate.

673 Class W surround

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type of subsoil: As existing
3. Timing: Excavate trench after hardcore has been laid and compacted.
4. Granular material: Natural
    4.1. Sizes: To Water Industry Specification WIS 4-08-02 (as amended by WIS 4-08-02A, 2008).
5. Bedding
    5.1. Material: Granular, compacted over full width of trench.
    5.2. Thickness (minimum): 100 mm.
6. Pipes: Dig slightly into bedding, rest uniformly on barrels and adjust to line and gradient.
7. Initial testing before placing surround: Required
8. Surround
    8.1. Material: Granular.
    8.2. Depth: To 100 mm above crown of pipe.
    8.3. Compaction: By hand.
9. Backfilling
    9.1. Material: Hardcore as section D20, or granular.
    9.2. Depth: Up to slab formation.
    9.3. Compaction: In 300 mm (maximum) thick layers.

678 Class Z surround

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Type of subsoil: As existing
3. Blinding
    3.1. Material: Concrete.
    3.2. Thickness (minimum): 25 mm.
    3.3. Width: Full width of trench.
    3.4. Allow to set before proceeding.

4. Pipes
    4.1. Temporary support: Folding wedges of compressible board. Prevent flotation.
    4.2. Clearance under pipes (minimum): 100 mm.
    4.3. Adjust pipes to line and gradient.
5. Initial testing before placing surround: Required
6. Surround
    6.1. Material: Concrete.
    6.2. Depth: To 150 mm above crown of pipe.
    6.3. Width: Full width of trench.
7. Vertical construction joints
    7.1. Location: At face of flexible pipe joints.
    7.2. Material: 18 mm thick compressible board precut to profile of pipe.
    7.3. Socketed pipes: Fill gaps between spigots and sockets with resilient material to prevent entry of concrete.

680 Concrete surround for pipe runs near foundations

1. Class Z surround: Provide in locations where bottom of trench is lower than bottom of foundation and as follows (horizontal clear distance between nearest edges of foundations and pipe trenches):
    1.1. Trenches less than 1 m from foundations: Top of concrete surround not lower than bottom of foundation.
    1.2. Trenches more than 1 m from foundations: Top of concrete surround not lower than D mm below bottom of foundation, where D mm is horizontal distance of trench from foundation, less 150 mm.

683 Laying pipelines

1. Laying pipes: To true line and regular gradient on even bed for full length of barrel with sockets (if any) facing up the gradient.
2. Ingress of debris: Seal exposed ends during construction.
3. Timing: Minimize time between laying and testing.

685 Jointing pipelines

1. Connections: Durable, effective and free from leakage.
2. Junctions, including to differing pipework systems: With adaptors intended for the purpose.
3. Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
4. Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
5. Allowance for movement: Provide and maintain appropriate clearance at ends of spigots as fixing and jointing proceeds.
6. Jointing material: Do not allow to project into bore of pipes and fittings.

687 Concrete surround for crossovers

1. Class Z surround: Provide where two pipelines (other than plastics pipes) cross with less than 300 mm separation.
    1.1. Extent, on both pipes: 1 m centred on the crossing point, and beyond as necessary to come within 150 mm of nearest flexible joints.

689 Pipelines passing through structures

1. Pipelines that must be cast in or fixed to structures (including manholes, catchpits and inspection chambers): Provide 600 mm long rocker pipes adjacent to the external face of the structure (or both faces where appropriate, e.g. walls to footings), with flexible joints at both ends.
    1.1. Distance to rocker pipe from structure (maximum):150 mm.
2. Provision for movement for pipelines that need not be cast in or fixed to structures (e.g. walls to footings)
    2.1. Rocker pipes as specified above; or
    2.2. Openings in the structures to give 50 mm minimum clearance around the pipeline. Closely fit a rigid sheet to each side of opening to prevent ingress of fill or vermin.

691 Bends at base of soil stacks

1. Type: Nominal 90° rest bends
    1.1. Radius to centreline of pipe (minimum): 800 mm
2. Height of invert of horizontal drain at base of stack below centreline of lowest branch pipe (minimum): 450 mm
3. Bedding: Do not impair flexibility of pipe couplings.
    3.1. Material: Concrete.

693 Direct connection of ground floor wcs to drains

1. Drop from crown of WC trap to invert of drain (maximum): 1.5 m
2. Horizontal distance from the drop to a ventilated drain (maximum): 6 m.

695 Backdrop pipes outside manhole walls

1. Excavation beneath backdrop pipe: Backfill.
    1.1. Material: Concrete.
2. Pipe encasement:.
    2.1. Material: Concrete.
    2.2. Thickness (minimum): 150 mm.

697 Installing flexible couplings

1. Ends of pipes to be joined: Cut cleanly and square.
2. Outer surfaces of pipes to be joined: Clean and smooth. Where necessary, e.g. on concrete or iron pipes, smooth out mould lines and/ or apply a cement grout over the sealing area.
3. Clamping bands: Tighten carefully to make gastight and watertight seals.

699 Connections to sewers

1. General: Connect new pipework to existing adopted sewers to the requirements of the adopting authority or its agent.

705 Initial testing of pipelines

1. Before testing
    1.1. Cement mortar jointing: Leave 24 h.
    1.2. Solvent welded pipelines: Leave 1 h.
2. Method: Block open ends of pipelines to be tested and pressurise. Air test short lengths to BS EN 1610.

711 Trench supports

1. Removal of trench supports and other obstacles: Sufficient to permit compacted filling of all spaces.

713 Installing root barriers

1. Root barrier installation: Full depth of excavation. Fit closely to trench wall nearest the tree.

715 Backfilling to pipelines

1. Backfilling above top of surround or protective cushion: Material excavated from trench, compacted in layers 300 mm (maximum) thick.
2. Heavy compactors: Do not use before there is 600 mm (total) of material over pipes.

718 Backfilling over concrete

1. Minimum times from placing concrete
    1.1. Backfilling generally: 24 h.
    1.2. Heavy compactors and traffic loads: 72 h.

720 Backfilling under roads and pavings

1. Backfilling from top of surround or protective cushion up to formation level: Granular sub-base material, laid and compacted in 150 mm layers.

722 Public roads and pavings – Eng, Wales, Scot

1. Excavating and backfilling of trenches: To Department for Transport ‘Specification for the reinstatement of openings in highways’.

724 Public roads and pavings – NI

1. Excavating and backfilling of trenches: To Northern Ireland Road Authority and Utilities Committee 'Specification for the reinstatement of openings in roads – code of practice'.

726 Foamed concrete backfill

1. Preparation: Seal off openings in, and ends of, abandoned pipelines and ducts. Seal off cavities in or next to the excavation which are not to be filled.

728 Laying warning marker tapes

1. Installation: During backfilling, lay continuously over pipelines.
2. Depth: 300-400 mm.
    2.1. Pipelines deeper than 2 m: Lay an additional tape 600 mm above the top of the pipeline.

732 Temporary bridges

1. Trench bridges: As necessary to prevent construction traffic damaging pipes after backfilling.

734 Installing access points and gullies

1. Bedding
    1.1. Material: Granular - natural, size 4/10 to BS EN 13242
    1.2. Thickness (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.
2. Surround

2.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
2.2. Thickness (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.
2.3. Height: As per the Structural Engineering Calculations and Details & Tender drawings.

3. Backfilling
3.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
3.2. Compaction: By hand in 100 mm layers.

4. Setting out relative to adjacent construction features: Square and tightly jointed.
5. Permissible deviation in level of external covers and gratings: +0 to -6 mm.
6. Raising pieces (clay and concrete units): Joint with 1:3 cement:sand mortar.
7. Exposed openings: Fit purpose made temporary caps. Protect from traffic.

736 Installing rodding points

1. Bedding and surround
1.1. Material: Concrete.
1.2. Thickness (minimum): 150 mm.

2. Permissible deviation in level of external covers and gratings: +0 to -6 mm.

741 Installing inspection chambers – plastics

1. Bedding
1.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
1.2. Thickness (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.

2. Surround
2.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
2.2. Thickness (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.

3. Backfilling: As per the Structural Engineering Calculations and Details & Tender drawings.
3.1. Compaction: By hand in 100 mm layers.

4. Concrete collar
4.1. Material: As per the Structural Engineering Calculations and Details & Tender drawings.
4.2. Thickness (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.
4.3. Width (minimum): As per the Structural Engineering Calculations and Details & Tender drawings.

5. Seating: As per the Structural Engineering Calculations and Details & Tender drawings.

757 Laying conventional channels, branches and benching

1. Main channel: Bed solid in 1:3 cement:sand mortar.
1.1. Branches: Connect to main channel at or slightly above invert level, but not higher than half channel level, so that discharge flows smoothly in direction of main flow.
1.2. Branches greater than nominal size 150 mm: Connect the branch soffit level with the main drain soffit.
1.3. Connecting angles more than 45° to direction of flow: Use three-quarter section channel bends.

2. Benching

2.1. Material: Concrete.

2.2. Profile: Rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls.

2.3. Topping

2.3.1. Material: 1:3 Cement:sand mortar

2.4. Application: Before benching concrete has set, and with dense smooth uniform finish.

759 Laying preformed plastics channels, branches and benching

1. Main channel: Bed solid in 1:3 cement:sand mortar.
   1.1. Branches: Connect to main channel at or slightly above invert level, but not higher than half channel level, so that discharge flows smoothly in direction of main flow.
   1.2. Connecting angles more than 45° to direction of flow: Use three-quarter section channel bends.
2. Bedding: 1:3 cement:sand mortar. Use clips or ensure adequate mechanical key.
3. Benching
   3.1. Material: Concrete.
   3.2. Profile: Rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls.
   3.3. Topping
      3.3.1. Material: 1:3 Cement:sand mortar
      3.3.2. Application: Before benching concrete has set, and with dense smooth uniform finish.

761 Laying sealed access fittings, branches and benching

1. Unused branches: Fit caps.
2. Bedding: 1:3 cement:sand mortar.
3. Benching
   3.1. Material: Concrete.
      3.1.1. Profile: 10% fall from manhole walls to component rim.
   3.2. Topping
      3.2.1. Material: 1:3 Cement:sand mortar
      3.2.2. Application: Before benching concrete has set, and with dense smooth uniform finish.

771 Installing outfalls

1. Pipe outflow invert (minimum): Seasonal peak level or 150 mm above normal water level, whichever is the higher.
2. Pipe surround and backfill to the last 2 m run of drain: Excavated subsoil, rammed home.

776 Exposed openings in inspection chambers, access points, fittings and equipment

1. General: Fit purpose made temporary caps. Protect from site traffic.

Completion

901 Removal of debris and cleaning

1. Preparation: Lift covers to manholes, inspection chambers and access points. Remove mortar droppings, debris and loose wrappings.

1.1. Timing: Before cleaning, final testing, CCTV inspection if specified, and immediately before handover.

2. Cleaning: Thoroughly flush pipelines with water to remove silt and check for blockages. Rod pipelines between access points if there is any indication that they may be obstructed.
3. Washings and detritus: Do not discharge into sewers or watercourses.
4. Covers: Securely replace after cleaning and testing.

903 Temporary measures

1. Water used to stabilize tanks and the like during installation: Drain.

911 Testing and inspection

1. Dates for testing and inspection: Give notice.
   1.1. Period of notice: 5 days

921 Final testing of private gravity drains and sewers up to dn 300

1. Before testing
   1.1. Cement mortar jointing: Leave 24 h.
   1.2. Solvent welded pipelines: Leave 1 h.
2. Standard: To Building Regulations.
3. Method: Contractor's choice

941 Water testing of manholes and inspection chambers

1. Timing: Before backfilling.
2. Standard
   2.1. Exfiltration: To BS EN 1610.
   2.2. Method: Testing with water (method W).
   2.3. Infiltration: No identifiable flow of water penetrating the chamber.

976 CCTV inspection of adoptable pipelines

1. General: Permit the Adopting Authority or its agent to carry out and record internal CCTV inspection of pipelines and associated manholes after completion.
   1.1. Locations to be inspected: Foul and surface water drains
2. Pipelines under highways: Complete construction, except for laying of wearing course, before inspection.

978 Lifting keys

1. Lifting keys: Supply suitable keys for each type of access cover.
   1.1. Timing: At completion.

980 Instructions

1. Manufacturer's user instructions: Contractor's choice

Ω End of Section

Z10
Purpose made joinery

To be read with preliminaries/ general conditions.

110 Fabrication

1. Standard: To BS 1186-2.
2. Sections: Accurate in profile and length, and free from twist and bowing. Formed out of solid unless shown otherwise.
   2.1. Machined surfaces: Smooth and free from tearing, wooliness, chip bruising and other machining defects.
3. Joints: Tight and close fitting.
4. Assembled components: Rigid. Free from distortion.
5. Screws: Provide pilot holes.
   5.1. Screws of 8 gauge (4 mm diameter) or more and screws into hardwood: Provide clearance holes.
   5.2. Countersink screws: Heads sunk at least 2 mm below surfaces visible in completed work.
6. Adhesives: Compatible with wood preservatives applied and end uses of timber.

120 Cross section dimensions of timber

1. General: Dimensions on drawings are finished sizes.
2. Maximum permitted deviations from finished sizes
   2.1. Softwood sections: To BS EN 1313-1:-
      2.1.1.Clause 6 for sawn sections.
   2.2. Hardwood sections: To BS EN 1313-2:-
      2.2.1.Clause 6 for sawn sections.
      2.2.2.Clause NA.3 for further processed sections.

130 Preservative treated wood

1. Cutting and machining: Completed as far as possible before treatment.
2. Extensively processed timber: Retreat timber sawn lengthways, thicknessed, planed, ploughed, etc.
3. Surfaces exposed by minor cutting and/ or drilling: Treat as recommended by main treatment solution manufacturer.

140 Moisture content

1. Wood and wood based products: Maintained within range specified for the component during manufacture and storage.

210 Laminated plastics veneered boards/ panels

1. Fabrication: To British Laminated Plastics Fabricators Association Ltd (BLF) fabricating standards.
2. Balancing veneer: From decorative veneer manufacturer and of similar composition. Applied to reverse side of core material.
3. Finished components: Free from defects, including bow, twist, scratches, chipping, cracks, pimpling, indentations, glue marks, staining and variations in colour and pattern.

4. Joints visible in completed work: Tight butted, true and flush.

220 Wood veneered boards/ panels

1. Core material and veneers: Conditioned before bonding.
2. Setting out: Veneer features and grain pattern aligned regularly and symmetrically unless instructed otherwise.
3. Balancing veneer: Applied to reverse side of core material.
   3.1. Moisture and temperature movement characteristics: As facing veneer.
4. Veneer edges: Tight butted and flush, with no gaps.
5. Tolerance of veneer thickness (maximum): ± 0.5 mm.
6. Finished components: Free from defects, including bow, twist, scratches, chipping, splits, blebs, indentations, glue marks and staining.
7. Surface finish: Fine, smooth, free from sanding marks.

250 Finishing

1. Surfaces: Smooth, even and suitable to receive finishes.
   1.1. Arrises: Eased unless shown otherwise on drawings.
2. End grain in external components: Sealed with primer or sealer as section M60 and allowed to dry before assembly.

Ω End of Section

Z11
Purpose made metalwork

To be read with preliminaries/ general conditions.

310 Materials generally

1. Grades of metals, section dimensions and properties: To appropriate British Standards. When not specified, select grades and sections appropriate for the purpose.
2. Prefinished metal: May be used if methods of fabrication do not damage or alter appearance of finish, and finish is adequately protected.
3. Fasteners: To appropriate British Standards and, unless specified otherwise, of same metal as component being fastened, with matching coating or finish.

320 Steel long and flat products

1. Hot rolled structural steels (excluding structural hollow sections and tubes): To BS EN 10025-1.
2. Fine grain steels, including special steels: To BS EN 10025-3 and -4.
3. Steels with improved atmospheric corrosion resistance: To BS EN 10025-5.

330 Steel plate, sheet and strip

1. Plates and wide flats, high yield strength steel: To BS EN 10025-6.

340 Hot rolled steel plate, sheet and strip

1. Flat products, high yield strength for cold forming: To BS EN 10149-1, -2 and -3.
2. Carbon steel sheet and strip for cold forming: To BS EN 10111.
3. Narrow strip, formable steel and steel for general engineering purposes: To BS 1449-1.8 and BS 1449-1.14.

350 Cold rolled steel plate, sheet and strip

1. Steel sections: To BS EN 10162.
2. Flat products, high yield strength micro-alloyed steels for cold forming: To BS EN 10268.
3. Carbon steel flat products for cold forming: To BS EN 10130 and BS EN 10131.
4. Uncoated carbon steel narrow strip for cold forming: To BS EN 10139 and BS EN 10140.
5. Narrow strip steel for general engineering purposes: To BS EN 10132-1, -2, and -3.
6. Carbon steel flat products for vitreous enamelling: To BS EN 10209.

360 Coated steel flat products

1. Hot dip zinc coated carbon steel sheet and strip for cold forming: To BS EN 10346 and BS EN 10143.
2. Hot dip zinc coated structural steel sheet and strip: To BS EN 10143 and BS EN 10346.
3. Hot dip zinc-aluminium (za) coated sheet and strip: To BS EN 10346.
4. Hot dip aluminium-zinc (az) coated sheet and strip: To BS EN 10346.
5. Organic coated flat products: To BS EN 10169.

370 Steel structural hollow sections (SHS)

1. Non alloy and fine grain steels, hot finished: To BS EN 10210-1 and -2.
2. Non-alloy and fine grain steels, cold formed welded: To BS EN 10219-2.

3. Weather resistant steels, hot finished: To BS 7668.

380 Other steel sections

1. Equal flange tees: To BS EN 10055.
2. Equal and unequal angles: To BS EN 10056-1 and -2.
3. Wire, carbon steel for general engineering purposes: To BS 1052.
4. Wire and wire products, general: To BS EN 10218-2.
5. Tubes
    5.1. Seamless circular: To BS EN 10297-1.
    5.2. Seamless cold drawn: To BS EN 10305-1.
    5.3. Welded and cold sized square and rectangular: To BS EN 10305-5.
    5.4. Welded circular: To BS EN 10296-1.
    5.5. Welded cold drawn: To BS EN 10305-2.
    5.6. Welded cold sized: To BS EN 10305-3.

400 Stainless steel products

1. Chemical composition and physical properties: To BS EN 10088-1.
2. Sheet, strip and plate: To BS EN 10088-2.
3. Semi-finished products bars, rods and sections: To BS EN 10088-3.
4. Wire: To BS EN 1088-3.
5. Tubes
    5.1. Welded circular: To BS EN 10296-2.
    5.2. Seamless circular: To BS EN 10297-2.

410 Aluminium alloy products

1. Designations
    1.1. Designation system, chemical composition and forms: To BS EN 573-1, -2, -3 and -5.
    1.2. Temper designations: To BS EN 515.
2. Sheet, strip and plate: To BS EN 485-1 to -4.
3. Cold drawn rods, bars and tubes: To BS EN 754-1 and -2.
4. Extruded rods, bars, tubes and profiles: To BS EN 755-1 and -2.
5. Drawn wire: To BS EN 1301-1, -2 and -3.
6. Rivet, bolt and screw stock: To BS 1473.
7. Structural sections: To BS 1161.

420 Copper alloy products

1. Sheet, strip, plate and circles for general purposes: To BS EN 1652.
2. Sheet and strip for building purposes: To BS EN 1172.
3. Rods: To BS EN 12163.
4. Profiles and rectangular bars: To BS EN 12167.
5. Wire: To BS EN 12166.
6. Tubes: To BS EN 12449.

Fabrication

515 Fabrication generally

1. Contact between dissimilar metals in components: Avoid.
2. Finished components: Rigid and free from distortion, cracks, burrs and sharp arrises.
   2.1. Moving parts: Free moving without binding.
3. Corner junctions of identical sections: Mitre.

520 Cold formed work

1. Profiles: Accurate, with straight arrises.

525 Adhesive bonding

1. Preparation of surfaces of metals to receive adhesives
   1.1. Degrease.
   1.2. Abrade mechanically or chemically etch.
   1.3. Prime: To suit adhesive.
2. Adhesive bond: Form under pressure.

527 Welding

1. Description: As per the schedule of works
2. Welding procedures
   2.1. Method and standard: Metal arc welding to BS EN 1011-1 and -2.
   2.2. Welding Procedure Specification (WPS): Not required
3. Preparation
   3.1. Joint preparation: Clean thoroughly.
   3.2. Surfaces of materials that will be self-finished and visible in the completed work: protect from weld splatter.
4. Jointing
   4.1. Joints: Fully bond parent and filler metal throughout with no inclusions, holes, porosity or cracks.
   4.2. Dissimilar metals: Filler metal grade to be approved by a qualified metallurgist
   4.3. Strength requirements: Welds to achieve design loads.
   4.4. Heat straightening: Obtain approval
   4.5. Complex assemblies: Agree priority for welding members to minimize distortion caused by subsequent welds.
   4.6. Tack welds: Use only for temporary attachment.
   4.7. Jigs: Provide to support and restrain members during welding.
   4.8. Filler plates: Obtain approval
   4.9. Lap joints: Minimum 5 x metal thickness or 25 mm, whichever is greater.
   4.10. Weld terminations: Clean and sound.

530 Stainless steel fabrication

1. Guillotining or punching: Do not use for metal thicknesses greater that 10 mm.
2. Thermal cutting
   2.1. Carbonation in the heat affected zone: Remove, after cutting.

3. Bending
   3.1. Plates or bars: Cold bending radius not less than material thickness.
   3.2. Tubes: Cold bending radius not less than 2 x tube diameter.
4. Welding: In addition to general welding requirements:
   4.1. Protect adjacent surfaces from weld spatter.
   4.2. Pickle all welds before post fabrication treatments.
5. Protection: Provide protection to fabricated components during transit and on site.

555 Brazing

1. Standard: To BS EN 14324.
2. Testing
   2.1. Destructive testing: To BS EN 12797.
   2.2. Nondestructive testing: To BS EN 12799.

Finishing

710 Finishing welded and brazed joints visible in complete work

1. Standard: To BS EN ISO 8501-3.
   1.1. Preparation grade: P2
2. Butt joints: Smooth, and flush with adjacent surfaces.
3. Fillet joints: Neat.
4. Grinding: Grind smooth where indicated on drawings.

745 Preparation for application of coatings

1. General: Complete fabrication, and drill fixing holes before applying coatings.
2. Paint, grease, flux, rust, burrs and sharp arrises: Remove.

750 Liquid organic coating for aluminium alloy components

1. Standard: To BS 4842.

760 Zinc and cadmium plating of iron and steel surfaces

1. Zinc plating: To BS EN ISO 2081.
2. Cadmium plating: To BS EN ISO 2082.

770 Chromium plating

1. Standard: To BS EN ISO 1456.

780 Galvanizing

1. Standard: To BS EN ISO 1461.
2. Preparation
   2.1. Vent and drain holes: Provide in accordance with BS EN ISO 14713-1 and -2. Seal after sections have been drained and cooled.
   2.2. Components subjected to cold working stresses: Heat treat to relieve stresses before galvanizing.
   2.3. Welding slag: Remove.
   2.4. Component cleaning: To BS EN ISO 8501-3.

2.5. Grade: St 2½

790 Vitreous enamelling

1. Standard: To BS EN ISO 28722.
2. Substrate metal: Steel to BS EN 10209.

Completion

910 Documentation

1. Submit
   1.1. Manufacturer's maintenance instructions.
   1.2. Guarantees, warranties, test certificates, record schedules and log books.

920 Completion

1. Protection: Remove.
2. Cleaning and maintenance: Carry out in accordance with procedures detailed in fabricators' guarantees.

Ω End of Section

Z12
Preservative/ flame-retardant treatment

To be read with preliminaries/ general conditions.

110 Treatment application

1. Timing: After cutting and machining timber, and before assembling components.
2. Processor: WPA Benchmark-accredited for the specified treated components.

120 Commodity specifications

1. Standard: In accordance with the Wood Protection Association (WPA) publication 'Code of practice: Industrial Wood Preservation'.

130 Preservative treatment solution strengths/ treatment cycles

1. General: Select to achieve specified service life and to suit treatability of specified wood species.

140 Copper-organic preservative treatment

1. Solution
    1.1. Manufacturer: Submit proposals
        1.1.1. Product reference: Submit proposals
    1.2. Colour: Seek instruction
    1.3. Application: High-pressure impregnation.
2. Moisture content of wood
    2.1. At time of treatment: Not more than 28%.
    2.2. After treatment: Timber to be surface dry before using.

150 Water-based organic preservative treatment

1. Solution
    1.1. Manufacturer: Submit proposals
        1.1.1. Product reference: Submit proposals
    1.2. Application: High-pressure impregnation.
2. Moisture content of wood
    2.1. At time of treatment: Not more than 28%.
    2.2. After treatment: Timber to be surface dry before use.

160 Organic solvent preservative treatment

1. Solution
    1.1. Manufacturer: Submit proposals
        1.1.1. Product reference: Submit proposals
    1.2. Application: Double vacuum and low-pressure impregnation, or immersion.
2. Moisture content of wood
    2.1. At time of treatment: As specified for the timber/ component at time of fixing.
    2.2. After treatment: Timber to be surface dry before use.

165 Water-based microemulsion preservative treatment

1. Solution
   1.1. Manufacturer: Submit proposals
      1.1.1. Product reference: Submit proposals
   1.2. Application: Double vacuum and low-pressure impregnation.
2. Moisture content of wood
   2.1. At time of treatment: As specified for the timber/ component at time of fixing.
   2.2. After treatment: Timber to be surface dry before use.

167 Boron compound preservative treatment

1. Solution
   1.1. Manufacturer: Submit proposals
      1.1.1. Product reference: Submit proposals
   1.2. Application: High-pressure impregnation.
2. Moisture content of wood
   2.1. At time of treatment: Not more than 28%.
   2.2. After treatment: Timber to be surface dry before using.

180 Recycled treated timber

1. Usage: Seek Instruction

210 Flame-retardant treatment

1. Standard: In accordance with the Wood Protection Association (WPA) publication 'Industrial flame retardant treatment of wood and wood-based panel products'.
2. Solution type: EXT
   2.1. Manufacturer: Submit proposals
      2.1.1. Product reference: Submit proposals
   2.2. Application: Vacuum and pressure impregnation.
3. Moisture content of wood
   3.1. At time of treatment: As specified in product classification report.
   3.2. After treatment (INT1 only): Timber to be re-dried slowly at temperatures not exceeding 60°C to minimize distortion and degradation.

610 Making good to preservative treatment on site

1. Preservative solution: Compatible with off-site treatment.
2. Application: In accordance with preservative manufacturer's recommendations.

620 Making good to flame-retardant treatment on site

1. Flame-retardant: Compatible with off-site treatment.
2. Application: In accordance with flame-retardant manufacturer's recommendations.

Ω End of Section

Z20
Fixings and adhesives

Products

310 Fasteners generally

1. Materials: To have:
   1.1. Bimetallic corrosion resistance appropriate to items being fixed.
   1.2. Atmospheric corrosion resistance appropriate to fixing location.
2. Appearance: Submit samples on request.

320 Packings

1. Materials: Noncompressible, corrosion proof.
2. Area of packings: Sufficient to transfer loads.

330 Nailed timber fasteners

1. Nails
   1.1. Steel: To BS 1202-1 or BS EN 10230-1.
   1.2. Copper: To BS EN 1202-2.
   1.3. Aluminium: To BS 1202-3.

340 Masonry fixings

1. Light duty: Plugs and screws.
2. Heavy duty: Expansion anchors or chemical anchors.

350 Plugs

1. Type: Proprietary types to suit substrate, loads to be supported and conditions expected in use.

360 Anchors

1. Types
   1.1. Expansion: For use in substrate strong enough to resist forces generated by expansion of anchor.
   1.2. Adhesive or chemical
      1.2.1. For use in substrate where expansion of anchor would fracture substrate.
      1.2.2. For use in irregular substrate where expansion anchors cannot transfer load on anchor.
   1.3. Cavity: For use where the anchor is retained by toggles of the plug locking onto the inside face of the cavity.

370 Wood screws

1. Type
   1.1. Wood screws (traditional pattern).
      1.1.1. Standard: To BS 1210.
   1.2. Wood screws.
      1.2.1. Pattern: Parallel, fully threaded shank or twin thread types.
2. Washers and screw cups: Where required are to be of same material as screw.

380 Miscellaneous screws

1. Type: To suit the fixing requirement of the components and substrate.
   1.1. Pattern: Self-tapping, metallic drive screws, or power driven screws.
2. Washers and screw cups: Where required to be of same material as screw.

390 Adhesives

1. Standards
   1.1. Hot-setting phenolic and aminoplastic: To BS 1203.
   1.2. Thermosetting wood adhesives: To BS EN 12765.
   1.3. Thermoplastic adhesives: To BS EN 204.

410 Powder actuated fixing systems

1. Types of fastener, accessories and consumables: As recommended by tool manufacturer.

Execution

610 Fixing generally

1. Integrity of supported components: Select types, sizes, quantities and spacings of fixings, fasteners and packings to retain supported components without distortion or loss of support.
2. Components, substrates, fixings and fasteners of dissimilar metals: Isolate with washers/ sleeves to avoid bimetallic corrosion.
3. Appearance: Fixings to be in straight lines at regular centres.

620 Fixing through finishes

1. Penetration of fasteners and plugs into substrate: To achieve a secure fixing.

630 Fixing packings

1. Function: To take up tolerances and prevent distortion of materials and components.
2. Limits: Do not use packings beyond thicknesses recommended by fixings and fasteners manufacturer.
3. Locations: Not within zones to be filled with sealant.

640 Fixing cramps

1. Cramp positions: Maximum 150 mm from each end of frame sections and at 600 mm maximum centres.
2. Fasteners: Fix cramps to frames with screws of same material as cramps.
3. Fixings in masonry work: Fully bed in mortar.

650 Nailed timber fixing

1. Penetration: Drive fully in without splitting or crushing timber.
2. Surfaces visible in completed work: Punch nail heads below wrot surfaces.
3. Nailed timber joints: Two nails per joint (minimum), opposed skew driven.

660 Screw fixing

1. Finished level of countersunk screw heads
   1.1. Exposed: Flush with timber surface.

1.2. Concealed (holes filled or stopped): Sink minimum 2 mm below surface.

670 Pelleted countersunk screw fixing

1. Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
2. Pellets: Cut from matching timber, match grain and glue in to full depth of hole.
3. Finished level of pellets: Flush with surface.

680 Plugged countersunk screw fixing

1. Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
2. Plugs: Glue in to full depth of hole.
3. Finished level of plugs: Projecting above surface.

690 Using powder actuated fixing systems

1. Powder actuated fixing tools: To BS 4078-2 and Kitemark certified.
2. Operatives: Trained and certified as competent by tool manufacturer.

700 Applying adhesives

1. Surfaces: Clean. Adjust regularity and texture to suit bonding and gap filling characteristics of adhesive.
2. Support and clamping during setting: Provide as necessary. Do not mark surfaces of or distort components being fixed.
3. Finished adhesive joints: Fully bonded. Free of surplus adhesive.

Ω End of Section

Z21
Mortars

Cement gauged mortars

110 Cement gauged mortar mixes

1. Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

120 Sand for site made cement gauged masonry mortars

1. Standard: To BS EN 13139.
2. Grading: 0/2 (FP or MP).
    2.1. Fines content where the proportion of sand in a mortar mix is specified as a range (e.g. 1:1: 5-6):
        2.1.1. Lower proportion of sand: Use category 3 fines.
        2.1.2. Higher proportion of sand: Use category 2 fines.
3. Sand for facework mortar: Maintain consistent colour and texture. Obtain from one source.

131 Ready-Mixed lime:sand for cement gauged masonry mortars

1. Standard: To BS EN 998-2.
2. Lime: Nonhydraulic to BS EN 459-1.
    2.1. Type: CL 90S.
3. Pigments for coloured mortars: To BS EN 12878.

135 Site made lime:sand for cement gauged masonry mortars

1. Permitted use: Where a special colour is not required and in lieu of factory made ready-mixed material.
2. Lime: Nonhydraulic to BS EN 459-1.
    2.1. Type: CL 90S.
3. Mixing: Thoroughly mix lime with sand, in the dry state. Add water and mix again. Allow to stand, without drying out, for at least 16 hours before using.

160 Cements for mortars

1. Cement: To BS EN 197-1 and CE marked.
    1.1. Types: Portland cement, CEM I.
        1.1.1. Portland limestone cement, CEM II/A-L or CEM II/A-LL.
2. Portland slag cement, CEM II/B-S.
3. Portland fly ash cement, CEM II/B-V.
    3.1. Strength class: 32.5, 42.5 or 52.5.
4. White cement: To BS EN 197-1 and CE marked.
    4.1. Type: Portland cement, CEM I.
    4.2. Strength class: 52.5.
5. Sulfate resisting Portland cement
    5.1. Type: To BS EN 197-1 Sulfate resisting Portland cement, CEM I/SR and CE marked.
6. To BS EN 197-1 fly ash cement, CEM II/B-V and CE marked.

6.1. Strength class: 32.5, 42.5 or 52.5.

7. Masonry cement: To BS EN 413-1 and CE marked.
   7.1. Class: MC 12.5.

180 Admixtures for site made cement gauged mortars

1. Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
2. Other admixtures: Submit proposals.
3. Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

190 Retarded ready to use cement gauged mortar

1. Standard: To BS EN 998-2.
2. Lime for cement:lime:sand mortars: Nonhydraulic to BS EN 459-1.
   2.1. Type: CL 90S.
3. Pigments for coloured mortars: To BS EN 12878.
4. Time and temperature limitations: Use within limits prescribed by mortar manufacturer.
   4.1. Retempering: Restore workability with water only within prescribed time limits.

200 Storage of cement gauged mortar materials

1. Sands and aggregates: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
2. Factory made ready-mixed lime:sand/ ready to use retarded mortars: Keep in covered containers to prevent drying out or wetting.
3. Bagged cement/ hydrated lime: Store off the ground in dry conditions.

210 Making cement gauged mortars

1. Batching: By volume. Use clean and accurate gauge boxes or buckets.
   1.1. Mix proportions: Based on dry sand. Allow for bulking of damp sand.
2. Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
   2.1. Mortars containing air entraining admixtures: Mix mechanically. Do not overmix.
3. Working time (maximum): Two hours at normal temperatures.
4. Contamination: Prevent intermixing with other materials.

Lime:sand mortars

310 Lime:sand mortar mixes

1. Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

320 Sand for lime:sand masonry mortars

1. Type: Sharp, well graded.
   1.1. Quality, sampling and testing: To BS EN 13139.
   1.2. Grading/ Source: As specified elsewhere in relevant mortar mix items.

330 Ready prepared lime putty

1. Type: Slaked directly from CL 90 quicklime to BS 890, using an excess of water.
   1.1. Maturation: In pits/ containers that allow excess water to drain away.
   1.2. Density of matured lime putty: 1.3 - 1.4 kg/litre.
2. Maturation period before use (minimum): Seek instructions

335 Ready prepared lime putty

1. Manufacturer: Submit proposals
   1.1. Product reference: Submit proposals
2. Maturation period before use (minimum): Seek instructions

340 Pozzolanic additives for nonhydraulic lime:sand mortars

1. Manufacturer/ Supplier: Submit proposals
   1.1. Product reference: Submit proposals
2. Mixing: Mix thoroughly into mortar during knocking up.

345 Admixtures for hydraulic lime:sand mortars

1. Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
2. Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

350 Storage of lime:sand mortar materials

1. Sands and aggregates: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
2. Ready prepared nonhydraulic lime putty: Prevent drying out and protect from frost.
3. Nonhydraulic lime:sand mortar: Store on clean bases or in clean containers that allow free drainage. Prevent drying out or wetting and protect from frost.
4. Bagged hydrated hydraulic lime: Store off the ground in dry conditions.

360 Making lime:sand mortars generally

1. Batching: By volume. Use clean and accurate gauge boxes or buckets.
2. Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
3. Contamination: Prevent intermixing with other materials, including cement.

370 Site prepared nonhydraulic lime:sand mortars

1. Mixing: Mix materials thoroughly by compressing, beating and chopping. Do not add water.
   1.1. Equipment: Roller pan mixer or submit proposals.
2. Maturation period before use (maximum): Seek instructions

380 Ready to use nonhydraulic lime:sand mortars

1. Manufacturer: Submit proposals
   1.1. Product reference: Submit proposals
2. Materials: Select from:
   2.1. Lime putty slaked directly from quicklime to BS EN 459-1 and mixed thoroughly with sand.

2.2. Quicklime to BS EN 459-1 slaked directly with sand.

3. Maturation period before use (maximum): Seek instructions

390 Knocking up nonhydraulic lime:sand mortars

1. Knocking up before and during use: Achieve and maintain a workable consistency by compressing, beating and chopping. Do not add water.

1.1. Equipment: Roller pan mixer or submit proposals.

400 Making hydraulic lime:sand mortars

1. Mixing hydrated hydraulic lime:sand: Follow the lime manufacturer's recommendations for each stage of the mix.

1.1. Water quantity: Only sufficient to produce a workable mix.

2. Working time: Within limits recommended by the hydraulic lime manufacturer.

Ω End of Section

Z22
Sealants

Products

310 Joints

1. Description: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.
4. Fire performance
   4.1. Fire resistance: Manufacturer's standard
   4.2. Reaction to fire: Manufacturer's standard

Execution

610 Suitability of joints

1. Presealing checks
   1.1. Joint dimensions: Within limits specified for the sealant.
   1.2. Substrate quality: Surfaces regular, undamaged and stable.
2. Joints not fit to receive sealant: Submit proposals for rectification

620 Preparing joints

1. Surfaces to which sealant must adhere
   1.1. Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
   1.2. Clean using materials and methods recommended by sealant manufacturer.
2. Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primer or sealant.
3. Backing strip and/ or bond breaker installation: Insert into joint to correct depth, without stretching or twisting, leaving no gaps.
4. Protection: Keep joints clean and protect from damage until sealant is applied.

630 Applying sealants

1. Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
2. Environmental conditions: Do not dry or raise temperature of joints by heating.
3. Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
4. Sealant profiles
   4.1. Butt and lap joints: Slightly concave.
   4.2. Fillet joints: Flat or slightly convex.
5. Protection: Protect finished joints from contamination or damage until sealant has cured.

Ω End of Section

Z31
Powder coatings

To be read with preliminaries/ general conditions.

120 Powder coating materials

1. Manufacturer: Obtain from one only of the following: Contractors choice .
2. Selected manufacturer: Submit details before commencement of powder coating including:
   2.1. Name and contact details.
   2.2. Details of accreditation schemes.
   2.3. Technical data of product including current Agrément certificates.

210 Working procedures

1. Comply with the follow following standards.
   1.1. Aluminium components: To BS 6496 or BS EN 12206-1.
   1.2. Steel components: To BS EN 13438.
   1.3. Safety standards: To British Coatings Federation 'Code of safe practice: Powder coating. Application of coating powders by electrostatic spraying'.
   1.4. Health and safety guidance: Health and Safety Executive 'Reducing risk associated with using coating powders - employers' web page.

220 Powder coating applicators

1. Applicator requirements
   1.1. Approved by powder coating manufacturer.
   1.2. Currently certified to BS EN ISO 9001.
   1.3. Comply with quality procedures, guarantee conditions, standards and tests required by powder coating manufacturer.
   1.4. Selected applicator: Submit details before commencement of powder coating including:
      1.4.1. Name and contact details.
      1.4.2. Details of accreditation schemes.

225 Guarantees

1. Powder coating manufacturer and applicator guarantees
   1.1. Submit sample copies before commencement of powder coating.
   1.2. Submit signed project specific copies on completion of work.

230 Control samples

1. Sequence: Prior to ordering materials for the works, obtain approval of appearance for:
   1.1. Powder coated samples: Of various grades and forms of background metal to be used, showing any colour, texture and gloss variation.
   1.2. Fabrication samples: Showing joint assembly, how powder coating is affected and how any cut metal edges are finished and protected.
   1.3. Where manual application is required, controlled samples should be coated and inspected for colour and gloss stability.
2. Samples to include the following information

2.1. Product reference.
2.2. Colour.
2.3. Reference number.
2.4. Name.
2.5. Gloss level.

235 Independent inspection at plant

1. Requirement: Contractors/ suppliers of the following designated components must commission an approved Independent Inspection Authority to carry out acceptance inspections to confirm that powder coating application complies with this specification.
   1.1. Designated components: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Acceptance inspections: Carry out for each variation of colour and finish of each component work package at applicator's plant prior to any fabrication of units, in accordance with the following:
   2.1. Where three of more production runs are required for application of coatings, not less than three acceptance inspections must be carried out in accordance with BS 6001-1, general inspection level 2, with an acceptance quality limit of 1%.
   2.2. Where less than three production runs are required for application of coatings, one acceptance inspection must be carried out in accordance with BS 6001-2, with a limiting quality of 5% where the probability of acceptance is 10%.
3. Components failing inspection: Reprocess or replace and reinspect.
4. Inspection reports: Independent Inspection Authority must submit copies.

240 Qualicoat quality assurance system

1. Requirement: Powder and coating application to the following designated components is to be tested and approved in accordance with the Qualicoat system.
   1.1. Designated components: As per the Structural Engineering Calculations and Details & Tender drawings.

250 Component design

1. Condition of components to be powder coated
   1.1. To comply with relevant recommendations of BS 4479-1, -3, and -4.
   1.2. Of suitable size to fit plant capacity.
   1.3. Of suitable thickness to withstand oven curing.

310 Pretreatment of aluminium components

1. Condition of components to be pretreated
   1.1. Free from corrosion and damage.
   1.2. All welding and jointing completed and finish off as specified.
   1.3. Free from impurities including soil, grease and oil.
   1.4. Suitable for and compatible with the pretreatment process.
2. Conversion coating requirements
   2.1. Chromate system: To BS 6496 or BS EN 12206-1.
   2.2. Chromate-free system: To BS EN 12206-1. Submit details before using.
3. Rinsing requirements: Use demineralized water. Drain and dry.

320 Pretreatment of steel components

1. Condition of components to be pretreated
   1.1. Free from corrosion and damage.
   1.2. All welding and jointing completed and finish off as specified.
   1.3. Free from impurities including soil, grease and oil.
   1.4. Suitable for and compatible with the pretreatment process.
2. Conversion coating requirements: To BS EN 13438.
3. Rinsing requirements: Use demineralized water. Drain and dry.

330 Pretreatment for protection in aggressive environments

1. Minimum thickness of 60 microns across significant and/ or primary surfaces.
2. Minimum thickness of 25 microns on non-significant and/ or secondary faces ensuring a coherent film layer.
3. All cut edges, drilled holes and mitres to be fully sealed.
4. Cleaning and maintenance: Carried out once every three to twelve months (dependent on proximity to pollutant).

430 Extent of powder coatings

1. Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces will be deemed 'significant surfaces' for relevant BS 6496 or BS EN 13438 performance requirements.

435 Application of powder coatings

1. Surfaces to receive powder coatings: Free from dust or powder deposits.
2. Powder colours: Obtain from one batch of one manufacturer.
3. Commencement of powder coating: To be continuous from pretreatment.
4. Components to be installed on site in order of application.
5. Jig points: Not visible on coated components.
6. Curing: Controlled to attain metal temperatures and hold periods recommended by powder coating manufacturer.
7. Stripping and recoating of components: Only acceptable by prior agreement of powder coating manufacturer. Stripping, pretreatment and powder coating are to be in accordance with manufacturer's requirements.
8. Overcoating of components: Not acceptable.

440 Performance and appearance of powder coatings

1. For aluminium components
   1.1. Standard: To BS 6496 or BS EN 12206-1.
2. For steel components
   2.1. Standard: To BS EN 13438.
3. Visual inspection after powder coating: Significant surface viewing distances to be as specified in the relevant Standard, unless specified otherwise.
4. Colour and gloss levels: To conform with approved samples.

450 Aluminium alloy fabrications

1. Units may be assembled

1.1. Before powder coating.
1.2. From components powder coated after cutting to size.
1.3. Where approved, from components powder coated before cutting to size.

2. Exposure of uncoated background metal: Not acceptable.
3. Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

460 Steel fabrications

1. Unit assembly: Wherever practical, before powder coating.
2. Exposure of uncoated background metal: Not acceptable.
3. Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

470 Fixings

1. Exposed metal fixings: Powder coat together with components, or coat with matching repair paint system applied in accordance with the powder coating manufacturer's recommendations.

480 Damaged components – repair or replacement

1. Before delivery to site: Check all components for damage to powder coatings. Replace damaged components.
2. Site damage: Submit proposals for repair or replacement.

510 Protection

1. Powder coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.
2. Protective coverings must be
   2.1. Resistant to weather conditions.
   2.2. Partially removable to suit building in and access to fixing points.
3. Protective tapes in contact with powder coatings must be
   3.1. Low tack, self adhesive and light in colour.
   3.2. Applied and removed in accordance with tape and powder coating manufacturers' recommendations. Do not use solvents to remove residues as these are detrimental to the coating.
4. Inspection of protection: Carry out monthly. Promptly repair any deterioration or deficiency.

520 Protection in hazardous locations

1. Minimum thickness of 60 microns across significant and/ or primary surfaces.
2. Minimum thickness of 25 microns on non-significant and/ or secondary faces ensuring a coherent film layer.
3. All cut edges, drilled holes and mitres to be fully sealed.
4. Cleaning: Carried out once every three to twelve months (dependent on proximity to pollutant).

535 Documentation

1. Submit the following information for each batch of powder coated components
   1.1. Supplier.
   1.2. Trade name.

1.3. Colour.
1.4. Type of powder.
1.5. Method of application.
1.6. Batch and reference number.
1.7. Statutory requirements.
1.8. Test certificates.
1.9. Maintenance instructions.

540 Completion

1. Protection: Remove any protective coverings.
2. Cleaning and maintenance of powder coatings: Carry out in accordance with procedures detailed in powder coating manufacturer and applicator guarantees.

Ω End of Section

Z33
Anodizing

To be read with preliminaries/ general conditions.

110 Anodic coating

1. Anodizer: Select one only of the following: Contractors choice .
2. Selected anodizer: Submit details before commencement of anodizing, including:
   2.1. Name and contact details.
   2.2. Details of accreditation schemes.
   2.3. Technical data of product including current Agrément certificates.

210 Working procedures

1. Standard: To BS 3987 for anodic coatings on wrought aluminium.

220 Anodizer requirements

1. Processing
   1.1. Approved: By the Aluminium Finishing Association.
   1.2. Certified: To BS EN ISO 9001.
   1.3. Anodizing plant: Each anodizer to use only one plant.

230 Guarantees

1. Anodizer guarantees: Submit sample copies before commencement of anodizing.
2. Project specific guarantees: Submit signed copies on completion of work.
3. Guarantees to cover
   3.1. Life expectancy.
   3.2. Colour: Opacity and consistency.
   3.3. Texture: Gloss, satin or matt.
   3.4. Quality of coating.

240 Control samples

1. Sequence: Prior to ordering materials for the works, obtain approval of appearance for:
   1.1. Anodic coated samples: Showing colour and texture variation.
   1.2. Fabrication samples: Showing joint assembly, how anodic coating is affected and how cut metal edges are finished and protected.

250 Independent inspection at plant

1. Requirement: Contractors/ suppliers of the following designated components must commission an approved Independent Inspection Authority to carry out acceptance inspections to confirm that anodic coating application complies with this specification.
   1.1. Designated components: As per the Structural Engineering Calculations and Details & Tender drawings.
2. Acceptance inspections: Carry out for each variation of colour and finish of each component work package at anodizer's plant prior to any fabrication of units, in accordance with the following:

2.1. Where three of more production runs are required for application of coatings, not less than three acceptance inspections must be carried out in accordance with BS 6001-1, general inspection level 2, with an acceptance quality limit of 1%.

2.2. Where less than three production runs are required for application of coatings, one acceptance inspection must be carried out in accordance with BS 6001-2, with a limiting quality of 5% where the probability of acceptance is 10%.

3. Components failing inspection: Reprocess or replace and reinspect.
4. Inspection reports: Independent Inspection Authority must submit copies.

255 Quality assurance system

1. Requirement: Powder and coating application to the following designated components is to be tested and approved in accordance with the Qualanod system.
   1.1. Designated components: As per the Structural Engineering Calculations and Details & Tender drawings.

270 Component design

1. Condition of components to be anodized
   1.1. To comply with relevant recommendations of BS 4479-1, and -5.
   1.2. Of suitable size to fit plant capacity.

310 Pretreatment

1. Condition of components to be anodized
   1.1. Free from corrosion and damage.
   1.2. Suitable for and compatible with the pretreatment and anodizing process.
2. Process: In accordance with the specification requirements for the finish.

410 Extent of anodic coatings

1. Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces will be deemed ‘significant surfaces’ for relevant BS 3987 performance requirements.

420 Application of anodic coatings

1. Surfaces to receive anodic coatings: Clean.
2. Commencement of anodic coating: To be continuous from pretreatment.
3. Jig points: To be agreed. Not on visible areas of anodic coated components.
4. Use of touch-up paint: Not acceptable.

430 Performance and appearance of anodic coatings

1. Standard: To BS 3987.
2. Visual inspection after anodizing: Significant surfaces to be free from visible coating/ defects when viewed from a distance of not less than 5 m for external and 3 m for internal applications.

440 Fabrication

1. Units may be assembled
   1.1. Before anodizing, providing sufficient drainage holes are included in components to fully drain components.
   1.2. From components anodized after cutting to size.
   1.3. Where approved, from components anodized before cutting to size.

1.4. Exposure of uncoated background metal: Not acceptable.

1.5. Assembly sealants: Compatible with anodic coatings. Obtain approval of colour if sealants are visible after fabrication.

450 Damaged components – repair/ replacement

1. Before delivery to site: Check all components for damage to anodic coatings. Replace damaged components.
2. Site damage: Submit proposals for repair or replacement.

510 Protection

1. Anodic coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.
2. Protective coverings: Must be:
   2.1. Resistant to weather conditions.
   2.2. Partially removable to suit building in and access to fixing points.
3. Protective tapes in contact with anodizing to be
   3.1. Low tack, self adhesive and light in colour.
   3.2. Applied and removed in accordance with tape and anodizers recommendations.
4. Inspection of protection: Carry out weekly. Promptly repair any deterioration or deficiency.

530 Documentation

1. Submit the following information for each batch of anodic coated components
   1.1. Supplier.
   1.2. Trade name.
   1.3. Colour (if required).
   1.4. Batch and reference number.
   1.5. Statutory requirements.

540 Completion

1. Protection: Remove.
2. Cleaning and maintenance of anodic coatings: Carry out in accordance with procedures detailed in anodizer's guarantees.

Ω End of Section

BWL Consulting (EAST) Limited

Sprowston Town Council

New Viking Centre

New Viking Centre, on behalf of Sprowston Town Council, Norwich

13-10-2023

A new community centre is to provided by refurbishing a former Public House. The new community facility will provide a community hall, cafe/social space and room hire facilities.

Contents

Ss_50_30_04_97
Above-ground internal stack wastewater drainage systems

Systems

Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

1. Description: New PVC-U above ground drainage systems will be installed to the building to provide wastewater drainage from new sanitary ware installations.
2. System performance: Ss_50_30_04/210 Design of above-ground wastewater drainage systems
3. Sanitary pipework
   - 3.1. Small-diameter branch discharge pipework
     - 3.1.1. Pipelines and fittings: Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) above-ground drainage pipes and fittings
   - 3.2. Discharge stack pipework
     - 3.2.1. Pipelines and fittings: Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) above-ground drainage pipes and fittings
4. Ventilating pipework
   - 4.1. Ventilating branch pipework
     - 4.1.1. Pipelines and fittings: Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) above-ground drainage pipes and fittings
5. Pipework identification: Pr_40_10_57_51 Mechanical plant and equipment identification labels; Pr_40_10_57_78 Self-adhesive colour pipe bands
6. Fire-stopping
   - 6.1. Floor penetrations: Pr_65_52_61_63 Pipe sleeves
7. System accessories: Pr_65_54_24_02 Air admittance valves
8. Execution: Ss_50_30_04/622 Access to above-ground wastewater drainage systems for testing and maintenance; Ss_50_30_04/612 Applying above-ground wastewater drainage internal pipework identification; Ss_50_30_04/614 Installing above-ground wastewater drainage discharge branch pipework; Ss_50_30_04/616 Installing above-ground wastewater drainage discharge stack pipework generally; Ss_50_30_04/610 Installing above-ground wastewater drainage systems; Ss_50_30_04/605 Removing above-ground wastewater drainage systems
9. System completion: Ss_50_30_04/820 Above-ground wastewater drainage system pipework airtightness test; Ss_50_30_04/850 Above-ground wastewater drainage system submittals; Ss_50_30_04/862 Demonstration of systems; Ss_50_30_04/895 Maintenance of above-ground drainage systems

System performance

Ss_50_30_04/210 Design of above-ground wastewater drainage systems

1. Design: Complete the design of the above-ground wastewater drainage system.
2. Standards: To BS EN 12056-1, BS EN 12056-2 and relevant parts of BS EN 12056-4 and BS EN 12056-5, and to BS EN 12056-2 National Annexes NA–NG.
3. System configuration
   - 3.1. Form: System II, single discharge stack system with small-bore discharge branch pipes.
   - 3.2. Configuration:
4. Requirements: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.

Products

Pr_40_10_57_51 Mechanical plant and equipment identification labels

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems , Ss_65_80_45_72 Room air conditioning systems , Ss_65_40_33_50 Mechanical extract ventilation systems and Ss_60_40_37_48 Low-temperature hot water heating systems

1. Description:
2. Material: Face-engraved rigid plastic laminate.
3. Colour
   3.1. Background: White.
   3.2. Lettering: Black.
4. Typography
   4.1. Font: *Helvetica medium*
5. Information to be included: Equipment name. Equipment reference number.
6. Execution: Pr_40_10_57/611 Installing mechanical plant and equipment identification

Pr_40_10_57_78 Self-adhesive colour pipe bands

1. Standards: To BS 1710.
2. Identification type: Adhesive colour bands.
3. Identification label:
4. Execution: Pr_40_10_57/660 Installing identification on pipework
5. Verification
   5.1. Submissions:
   5.2. Timing:

Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) above-ground drainage pipes and fittings

1. Standard: To BS EN 1329-1. To BS EN 1329-1 and the weathering resistance requirements of BS 4514.
2. Third-party product certification: *Kitemark-certified*orBBA*Agrément certificate*.
3. Integral accessories: Access fittings. Air admittance valves. Plastics cages. Rainwater heads.
4. Execution: Pr_65_52_03/630 Fixing and jointing rainwater and above ground drainage pipes

Pr_65_52_61_63 Pipe sleeves

1. Description:
2. Manufacturer:
3. Material:
4. Form:

Pr_65_54_24_02 Air admittance valves

1. Standard: To BS EN 12380.
2. Minimum airflow rate: To BS EN 12056-2.
3. Execution: Pr_65_54_95/660 Installation of discharge connections
4. Verification
   4.1. Third-party certification: BBA Agrément certificate. BSI Kitemark certified.
   4.2. Submittals:

4.3. Timing:

Execution

Pr_40_10_57/611 Installing mechanical plant and equipment identification

1. Fixing: Plug and screw.
2. Position: On equipment.

Pr_40_10_57/660 Installing identification on pipework

1. Application of basic identification colour:
2. Safety colour identification:
3. Information:
4. Direction of flow:

Pr_65_52_03/630 Fixing and jointing rainwater and above ground drainage pipes

1. Fixing
   1.1. Supports
      1.1.1. Stability: Fix securely.
      1.1.2. Fixing centres (nominal):
   1.2. Pipework
      1.2.1. Alignment: Plumb and/ or true to line.
      1.2.2. Externally socketed pipes and fittings: Fix with socket ends forming inlet for each individual pipe.
2. Jointing
   2.1. Jointing differing pipework systems: Use adaptors intended for the purpose.
   2.2. Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer ends of plastics pipes before inserting into ring seal sockets. Where metal pipes are to be used, recoat bare metal with appropriate primer and paint.
   2.3. Jointing or mating surfaces: Clean and, where necessary, use jointing lubricant immediately to allow safe and efficient jointing assembly.
   2.4. Unsealed joints: Wedge unsealed joints to cast pipes with timber or sheet lead cut-offs to centralize pipe joints and reduce rattling.
   2.5. Expansion joint pipe sockets: Fix rigidly to buildings. Elsewhere, provide brackets and fixings that allow pipes to slide.
   2.6. Solvent-welded pipelines: Install ring seal joints in all long runs of solvent-welded pipework, as movement joints.
3. Spacing (maximum):
4. Wall and floor penetrations:

Pr_65_54_95/660 Installation of discharge connections

Shared by: Pr_65_54_95_75 Safety valves

1. General requirements:
2. Safety and relief valves:
3. Vent cocks:
4. Air bottles:
5. Automatic air vents:

Ss_50_30_04/605 Removing above-ground wastewater drainage systems

1. Scope: Entire system.

Ss_50_30_04/610 Installing above-ground wastewater drainage systems

1. Standards: To BS EN 12056-2 and BS EN 12056-5.
2. Collection and distribution of wastewater
   - 2.1. General: Quick, quiet and complete; self-cleansing in normal use, without blockage, crossflow, backfall, leakage, odours, noise nuisance or risk to health.
   - 2.2. Pressure fluctuations in pipework (maximum):
   - 2.3. Water seal retained in traps (minimum):
3. Pipelines: Plumb and/ or true to line.
4. Routes
   - 4.1. Routes generally: The shortest practical, with as few bends as possible.
   - 4.2. Routes not shown on drawings: Submit proposals.
5. Jointing:
6. Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
7. Concealed or inaccessible surfaces:
8. Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
9. Protection
   - 9.1. Purpose-made temporary caps:
   - 9.2. Access covers, cleaning eyes and blanking plates: Fit as the work proceeds.

Ss_50_30_04/612 Applying above-ground wastewater drainage internal pipework identification

1. Standard: To BS 1710.
2. Method: Integral lettering on pipe wall, self-adhesive bands or identification clips.
3. Form
   - 3.1. Wastewater system without recycling
     - 3.1.1. Definition: All wastewater from sanitary appliances and sinks.
     - 3.1.2. Direction of flow: White arrow on black background.
     - 3.1.3. Wording: White lettering: 'FOUL DRAINAGE' on a black background.
   - 3.2. Blackwater in system with recycling
     - 3.2.1. Definition: Containing faecal matter or urine.
     - 3.2.2. Direction of flow: White arrow on black background.
     - 3.2.3. Wording: White lettering: 'FOUL DRAINAGE' on a black background.
   - 3.3. Grey water in system with recycling
     - 3.3.1. Definition: As defined in BS EN 12056-1, clause 3.1.
     - 3.3.2. Direction of flow: Black arrow on light grey background.
     - 3.3.3. Wording: Black lettering: 'GREY WATER' on a light grey background.

Ss_50_30_04/614 Installing above-ground wastewater drainage discharge branch pipework

1. Pipework
   - 1.1. Alignment: Fix securely plumb and/ or true to line.

1.2. Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
1.3. Socketed pipes and fittings: Fix with sockets facing upstream.
1.4. Additional supports: Provide as necessary to support junctions and changes in direction.

2. Wall and floor penetrations
2.1. Isolating pipework: Isolate pipework from structure, e.g. with pipe sleeves.
2.2. Masking plates: Fix at penetrations if visible in the finished work.

Ss_50_30_04/616 Installing above-ground wastewater drainage discharge stack pipework generally

1. Pipework
1.1. Alignment: Fix securely plumb and true to line.
1.2. Externally socketed pipes and fittings: Fix with sockets facing upstream.
1.3. Vertical pipes:
1.4. Additional supports: Provide as necessary to support junctions and changes in direction.

2. Wall and floor penetrations
2.1. Isolating pipework: Isolate pipework from structure, e.g. with pipe sleeves.
2.2. Masking plates: Fix at penetrations if visible in the finished work.

3. Expansion joint sockets: Fix rigidly to the building.
4. Fixings: Allow the pipe to slide.

Ss_50_30_04/622 Access to above-ground wastewater drainage systems for testing and maintenance

1. General: Install pipework with adequate clearance to permit testing, cleaning and maintenance, including painting where necessary.
2. Access fittings and rodding eyes: Position to avoid obstruction.

System completion

Ss_50_30_04/820 Above-ground wastewater drainage system pipework airtightness test

1. Preparation
1.1. Open ends of pipework: Temporarily seal using plugs.
1.2. Test apparatus: Connect a 'U' tube water gauge and air pump to pipework via a plug or through trap of an appliance.

2. Testing: Pump air into pipework until gauge registers 38 mm.
3. Required performance: Maintain pressure of 38 mm without loss for at least three minutes.

Ss_50_30_04/850 Above-ground wastewater drainage system submittals

1. Content: Include manufacturers' drawings, technical information, calculations, literature, warranties and handling and maintenance instructions.
2. Timing: Hand over at completion.

Ss_50_30_04/862 Demonstration of systems

1. Demonstration: Required.

Ss_50_30_04/895 Maintenance of above-ground drainage systems

1. Servicing and maintenance: Undertake for 12 months after practical completion.

2. Air admittance valves: Required annually.
3. Logbook: Required.

Ω End of System

Ss_60_40_37_48
Low-temperature hot water heating systems

Systems

Ss_60_40_37_48 Low-temperature hot water heating systems

1. Description:
2. System performance: Ss_60_40_37/210 Design of heating systems
3. Arrangement: Two-pipe.
4. Distribution: Variable flow. Variable temperature.
5. Heat source: Heat pumps.
6. Feed and expansion: Pr_65_53_86_68 Pressurization units
7. Pumps: Pr_65_53_86_11 Canned rotor pumps
8. Water treatment plant
   - 8.1. Equipment: Pr_60_55_97_12 Chemical dosing pots
   - 8.2. Chemicals: Pr_60_55_96_16 Corrosion inhibitor chemicals for closed circuits; Pr_60_55_96_06 Bacteria and biofouling inhibitors
9. Pipework: Pr_65_52_63_17 Copper pipes; Pr_65_52_63_82 Steel pipes
10. Pipework ancillaries
    - 10.1. Venting devices: Pr_65_54_93_05 Automatic air vents
    - 10.2. Deaerators: Pr_65_52_22_66 Pressure differential deaerators
    - 10.3. Separators:
    - 10.4. Gauges: Pr_65_52_34_88 Temperature gauges; Pr_65_52_34_65 Pressure and altitude gauges
    - 10.5. Accessories: Pr_65_57_96_99 Y-type water strainers
11. Valves
    - 11.1. Isolating valves: Pr_65_54_95_06 Ball valves
    - 11.2. Check valves:
    - 11.3. Regulating valves: Pr_65_54_95_26 Double regulating valves
    - 11.4. Draining devices: Pr_65_54_95_27 Draining taps
    - 11.5. Accessories: Pr_65_54_95_75 Safety valves; Pr_65_54_93_87 Test points
12. Thermal insulation: Pr_80_77_76_54 Mineral wool pipe section insulation
13. Heat emitters: Underfloor heating
14. Controls: Heating systems control.
15. Plant and equipment identification: Pr_40_10_57_93 Valve charts and schematics; Pr_40_10_57_94 Valve identification labels; Pr_40_10_57_29 Equipment labels and warning notices; Pr_40_10_57_51 Mechanical plant and equipment identification labels
16. Execution: Ss_60_40_37/620 Installing water based heating systems; Ss_60_40_37/670 Installing water treatment for heating systems; Ss_60_40_37/650 Filling and pressure testing of water-based heating systems; Ss_60_40_37/660 Flushing and pre-commission cleaning of heating systems
17. System completion: Ss_60_40_37/810 Commissioning water heating systems; Ss_60_40_37/845 Demonstration of heating systems; Ss_60_40_37/850 Inspection and test records for heating systems; Ss_60_40_37/860 Documentation for heating systems; Ss_60_40_37/880 Servicing and maintenance of heating systems

System performance

Ss_60_40_37/210 Design of heating systems

1. Design: Complete the design of the heating systems.
2. Method: In accordance with CIBSE AM11. In accordance with CIBSE Code W, section W2.
3. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.
4. Computer calculations
    4.1. Submittals: U-values and heat loss calculations for each room. Pump sizing calculations. Pipe sizing calculations.
    4.2. Format: HEVACOMP. IES.

Products

Pr_40_10_57_29 Equipment labels and warning notices

Shared by: Ss_70_30_25_45 Lightning protection systems , Ss_70_30_45_45 Low-voltage distribution systems , Ss_70_30_80_35 Hardwired low-voltage small power systems , Ss_70_80_25_05 Amenity lighting systems and Ss_70_80_33_35 Hardwired general lighting systems

1. Description:
2. Material: Face-engraved rigid plastic laminate.
3. Colour
    3.1. Background: White.
    3.2. Lettering: Black.
4. Typography
    4.1. Font: *Helvetica medium*.
5. Notice wording: Distribution Board reference, as indicated on drawing ???. 'BATTERY ROOM. EXTINGUISH ALL NAKED FLAMES BEFORE ENTERING. NO SMOKING'. 'THIS STRUCTURE IS PROVIDED WITH A LIGHTNING PROTECTION SYSTEM THAT IS IN ACCORDANCE WITH BS EN 62305-3 AND THE BONDING TO OTHER SERVICES AND MAIN EARTH TERMINAL SHOULD BE MAINTAINED ACCORDINGLY'. 'MAINTAIN A DISTANCE OF AT LEAST 3 M DURING A THUNDERSTORM'. 'SUPPLIED FROM WIND TURBINE: ISOLATE AT TURBINE ISOLATOR BEFORE CARRYING OUT WORK'. 'SWITCH OFF WHEN NOT IN USE'. 'THIS EQUIPMENT MAY START AUTOMATICALLY WITHOUT WARNING. ISOLATE BEFORE CARRYING OUT WORK'.
6. Verification
    6.1. Submittals:
    6.2. Timing:

See Pr_40_10_57_51 Mechanical plant and equipment identification labels in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

Pr_40_10_57_93 Valve charts and schematics

1. Material: Paper print, glazed frame.
2. Size: A1.
3. Execution: Pr_40_10_57/620 Installing valve charts and schematics

Pr_40_10_57_94 Valve identification labels

1. Material: Face-engraved rigid plastic laminate.
2. Colour

2.1. Background: White.
2.2. Lettering: Black.
3. Typography
3.1. Font: Helvetica medium.
4. Information: Purpose and reference number.
5. Execution: Pr_40_10_57/630 Installing valve identification labels

Pr_60_55_96_06 Bacteria and biofouling inhibitors

Pr_60_55_96_16 Corrosion inhibitor chemicals for closed circuits

Pr_60_55_97_12 Chemical dosing pots

1. Standard: To PD 5500.
2. Material:
3. Execution: Pr_60_55_97/610 Installing dosing equipment

Pr_65_52_22_66 Pressure differential deaerators

Pr_65_52_34_65 Pressure and altitude gauges

1. Standard
1.1. Bourdon: To BS EN 837-1.
1.2. Diaphragm: To BS EN 837-3.
2. Execution: Pr_65_52_34/630 Installing pressure gauges

Pr_65_52_34_88 Temperature gauges

1. Standard: To BS EN 13190.

Pr_65_52_63_17 Copper pipes

1. Standard: To BS EN 1057.
2. Execution: Pr_65_52_63/630 Installing copper pipework

Pr_65_52_63_82 Steel pipes

1. Standard: To BS EN 10255, heavy weight and BS EN 10216-1.
2. Third-party certification: Kitemark-approved.
3. Execution: Pr_65_52_63/680 Installing steel pipework

Pr_65_53_86/320 Pumps generally

1. General safety standard: To BS EN 809.
2. Electrical safety: To BS EN 60335-1 and BS EN 60335-2-51.
3. Dynamic balance: To BS ISO 21940-21.
4. Test standards: To BS EN ISO 9906 and in accordance with BS EN ISO 5198.
5. Belts and pulleys: To BS 3790.
6. Rotodynamic pumps: To BS EN 16297-1 and BS EN 16644.
7. Connections
7.1. Flanged, copper alloy and composite: To BS EN 1092-3.
7.2. Flanged, cast iron: To BS EN 1092-2.
7.3. Threaded: To BS EN 10226-1.

Pr_65_53_86_11 Canned rotor pumps

1. General requirements: Pr_65_53_86/320 Pumps generally
2. Arrangement: Single.
3. Speed control: Variable.
4. Execution: Pr_65_53_86/610 Installation of pumps generally

Pr_65_53_86_68 Pressurization units

1. Description:
2. Manufacturer: Mikrofill
3. Standards
   - 3.1. General: To BS EN 13831.
   - 3.2. Domestic heating and hot water supply: In accordance with BS 7074-1.
   - 3.3. Low and medium temperature hot water heating: In accordance with BS 7074-2.
   - 3.4. Chilled water and condenser water: In accordance with BS 7074-3.
4. Format: Fully automatic pre-wired packaged unit on common base plate.
5. Arrangement:
6. Execution: Pr_65_53_86/630 Installing pressurization units

Pr_65_54_93_05 Automatic air vents

1. Description: At all high point on system
2. Manufacturer: Spirotech

Pr_65_54_93_87 Test points

1. Arrangement: Self-sealing.

Pr_65_54_95_06 Ball valves

1. Description:
2. Manufacturer: Crane Fluid Systems
3. Contact details
   - 3.1. Address: Crane House
     Epsilon Terrace
     West Road
     Ipswich
     Suffolk
     IP3 9FJ
   - 3.2. Telephone: +44 (0)1473 277300
   - 3.3. Web: www.cranefs.com
   - 3.4. Email: enquiries@cranefs.com
4. Product reference: D171 Ball Valve (D171 DN8)
5. Material: Bronze, Steel, PVC, EPDM, Aluminium and PTFE.
6. Connections:
7. Finish: Hex-Nut (steel plated); Lever (Steel Dacromet Plated); Sleeve (maroon PVC); Ball (chrome plated); Extension stern outer (aluminium); Extension stern inner (steel plated).
8. Standards: To BS EN 1982, BS EN 12164; BS EN 12165; to BS EN 10226-2 (ISO 7-1).
9. Third-party certification: WRAS approved.
10. Operator: Lever.

11. PressureRange: Temperature: -10 to +100°C: 25 bar, Temperature: +120°C: 21.8 bar.
12. Execution: Pr_65_54_95/610 Installation of valves generally

Pr_65_54_95_26 Double regulating valves

1. Description:
2. Manufacturer: Crane Fluid Systems
3. Contact details
   - 3.1. Address: Crane House
     Epsilon Terrace
     West Road
     Ipswich
     Suffolk
     IP3 9FJ
   - 3.2. Telephone: +44 (0)1473 277300
   - 3.3. Web: www.cranefs.com
   - 3.4. Email: enquiries@cranefs.com
4. Product reference: D931 Fixed Orifice Double Regulating Valve (DN15)
5. Standard: To BS 7350:1990, BS EN 10226-2 (ISO 7-1), BS 2779 (ISO 228) and BS EN 1254/2.
6. Arrangement: Globe.
7. Material: Bronze BS EN 1982 CC491K, DZR Copper Alloy BS EN 12164/5 CW602N, EPDM Rubber and Plastic.
8. Connections: Compression to BS EN 1254-2.
9. Approvals: Water Regulations Advisory Scheme (WRAS).
10. PressureRange: Temperature (Threaded): -10 to +100°C: 25 bar, Temperature (Threaded): +110°C: 23.4 bar, Temperature (Threaded): 120°C: 21.8 bar. Temperature (Compression): -10 to +30°C:16 bar, Temperature (Compression): +65°C: 10 bar, Temperature (Compression): +120°C: 5 bar. WRAS approved -10 to +85°C.
11. Flow capacity:
12. Execution: Pr_65_54_95/620 Installation of double regulating valves

Pr_65_54_95_27 Draining taps

1. Description:
2. Manufacturer: Crane Fluid Systems
3. Contact details
   - 3.1. Address: Crane House
     Epsilon Terrace
     West Road
     Ipswich
     Suffolk
     IP3 9FJ
   - 3.2. Telephone: +44 (0)1473 277300
   - 3.3. Web: www.cranefs.com
   - 3.4. Email: enquiries@cranefs.com
4. Product reference: D340
5. Standard: To BS 2879.
6. Material: Copper alloy.
7. Connections: Threaded joints to BS EN 10226-1.
8. Execution: Pr_65_54_95/610 Installation of valves generally

Pr_65_54_95_75 Safety valves

1. Standard: To BS EN ISO 4126-1.
2. Execution: Pr_65_54_95/660 Installation of discharge connections; Pr_65_54_95/680 Installation of safety valves

Pr_65_57_96_99 Y-type water strainers

1. Manufacturer: Crane
2. Execution: Pr_65_57_96/650 Installing strainers

Pr_80_77_76_54 Mineral wool pipe section insulation

1. Description:
2. Manufacturer: ROCKWOOL Ltd
3. Contact details
   - 3.1. Address: ROCKWOOL Ltd
     14th Floor, Chiswick Tower
     389 Chiswick High Road
     London
     W4 4AJ
   - 3.2. Telephone: +44 (0)1656 862621
   - 3.3. Web: https://www.rockwool.com/uk/
   - 3.4. Email: info@rockwool.com
4. Product reference: ROCKLAP H&V PIPE SECTION
5. Standard: To BS 3958-4. To BS EN 14303.
6. Finish: Aluminium foil-faced.
7. Insulation thickness (minimum): To BS 5422.
8. Vapour barrier
   - 8.1. Material:
   - 8.2. Vapour permeability: To BS 5422, clause 5.6.
9. Protection: Pr_80_77_76_92 Unplasticized polyvinyl chloride (PVC-U) sheet insulation casing
10. Accessories: Pr_80_77_76_94 Valve and flange insulation
11. Execution: Pr_80_77_76/625 Installing foil-faced mineral wool insulation on pipelines; Pr_80_77_76/780 Installing vapour barriers

Pr_80_77_76_92 Unplasticized polyvinyl chloride (PVC-U) sheet insulation casing

1. Material: PVC-U casing.
2. Colour: Self-finish.
3. Execution: Pr_80_77_76/610 Installing insulation and protection products generally

Pr_80_77_76_94 Valve and flange insulation

1. Form: Removable and reusable pads.
2. Execution: Pr_80_77_76/610 Installing insulation and protection products generally

Execution

See Pr_40_10_57/611 Installing mechanical plant and equipment identification in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

Pr_40_10_57/620 Installing valve charts and schematics

1. Fixing: *Plug and screw to wall*.
2. Position: Plant room.

Pr_40_10_57/630 Installing valve identification labels

1. Fixing: Secure with metal chain.

Pr_60_55_97/610 Installing dosing equipment

1. Position: Install where there is a high differential pressure between flow and return pipeline.

Pr_65_52_34/630 Installing pressure gauges

1. Position:

Pr_65_52_63/610 Pipework installation generally

Shared by: Pr_65_52_63_20 Copper refrigerant pipes , Pr_65_52_63_23 Cross-linked polyethylene (PE-X) pipes and fittings and Pr_65_52_63_89 Unplasticized polyvinyl chloride (PVC-U) pipes

1. Standard:
2. Dissimilar metals: Prevent electrolytic corrosion.

Pr_65_52_63/630 Installing copper pipework

1. General requirements: Pr_65_52_63/610 Pipework installation generally; Pr_65_52_63/690 Spacing of pipework
2. Standard: In accordance with CDA publication 88 Copper tube in buildings.
3. Jointing method
   - 3.1. Permanently concealed joints: *Brazed*
   - 3.2. Accessible joints: Capillary, up to 67 mm for pressure up to 600 kPa and 110°C. Capillary, 67–108 mm for pressure up to 400 kPa and 110°C.
4. Expansion loops: Formed bends from single pipe length.

Pr_65_52_63/680 Installing steel pipework

1. General requirements: Pr_65_52_63/610 Pipework installation generally; Pr_65_52_63/690 Spacing of pipework
2. Permanently concealed joints: *Welded*.
3. Accessible joints: Screwed, up to and including 50 mm.
4. Expansion loops: Formed bends from single pipe length.

Pr_65_52_63/690 Spacing of pipework

1. Minimum clearance between insulated pipework and
   - 1.1. Wall finish: *25 mm*.
   - 1.2. Ceiling finish or soffit: *100 mm*
   - 1.3. Floor: 150mm
   - 1.4. Electrical services: 150mm
   - 1.5. Adjacent services: 100mm
   - 1.6. Uninsulated pipework: 75mm
   - 1.7. Adjacent insulated pipework: 25mm
2. Minimum clearance between uninsulated pipework and

2.1. Wall finish: 25mm
2.2. Ceiling finish or soffit: 100mm
2.3. Floor: 150mm
2.4. Electrical services: 150mm
2.5. Adjacent services: 150mm
2.6. Adjacent uninsulated pipework: 25mm

Pr_65_53_86/610 Installation of pumps generally

1. Pipeline connections: Arrange to prevent transmission of pipeline forces to pump casing.
2. Pressure gauge tappings: Provide in flow and return pipeline connections and in common suction and delivery pipeline.
3. Brackets: Support pipeline mounted pumps on purpose made brackets lined with vibration absorbent material.
4. Alignment: Align and balance to minimize vibration.
5. Belt tension: Correctly tension drive belts.
6. Access: Provide adequate space for service and maintenance.
7. Identification plate
   7.1. Format:
   7.2. Details:

Pr_65_53_86/630 Installing pressurization units

1. Standards:
2. Location of expansion vessel: In the system return pipeline close to the heat source or chilled water unit.

Pr_65_54_95/610 Installation of valves generally

1. Installation: In accordance with BS 6683.
2. Position:
3. Isolation and regulation valves: Provide at equipment and on sub-circuits.
4. Access: Locate valves so they can be readily operated and maintained. Locate next to equipment which is to be isolated.
5. Connection to pipework: Fit with joints that suit the pipe material.

Pr_65_54_95/620 Installation of double regulating valves

1. General requirements:
2. Position:

See Pr_65_54_95/660 Installation of discharge connections in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

Pr_65_54_95/680 Installation of safety valves

1. General requirements:
2. Inlet connection: As short as possible; diameter no smaller than the outlet bore.
3. Discharge lines : Rise vertically. Fit with small bore drain points to prevent the accumulation of water.

Pr_65_57_96/650 Installing strainers

1. Orientation:

2. Direction of flow:

Pr_80_77_76/610 Installing insulation and protection products generally

Shared by: Pr_80_77_76_52 Mineral wool duct metal-mesh-faced mattress insulation

1. Standard: In accordance with BS 5970.
2. Timing: Insulate after installed system has been fully tested and joints proved sound.
3. Insulation: Do not enclose adjacent units together.
4. Clearance: Maintain between pipes.
5. Finish: Neatly finish joints, corners, edges and overlaps.

Pr_80_77_76/625 Installing foil-faced mineral wool insulation on pipelines

1. Joints:
2. At fittings:
3. Vapour seal:

Pr_80_77_76/780 Installing vapour barriers

1. Integrity:

Ss_60_40_37/620 Installing water based heating systems

1. Standard: To BS EN 14336.

Ss_60_40_37/650 Filling and pressure testing of water-based heating systems

1. Testing: Watertightness test to BS EN 14336, annex A. Pressure testing to BS EN 14336, annex B. Procedure for filling and pressure testing in accordance with BSRIA BG 29/2021.
2. Notice (minimum): Five working days.
3. Pressure: Two times working pressure.

Ss_60_40_37/660 Flushing and pre-commission cleaning of heating systems

1. Preliminary checks: Thoroughly inspect pipework. Complete pressure tests before cleaning.
2. Flushing: In accordance with BSRIA BG 29/2021.
3. Cleaning: In accordance with BSRIA BG 29/2021 and BSRIA BG 50/2021.
4. Waste products: Neutralize, and dispose of to drain. Preferably direct to manhole.

Ss_60_40_37/670 Installing water treatment for heating systems

1. Treatment: Closed-circuit systems in accordance with BSRIA BG 50/2021.
2. Water sampling: In accordance with BS 8552.

System completion

Ss_60_40_37/810 Commissioning water heating systems

1. Pre-commissioning: In accordance with BSRIA BG 2/2010, CIBSE Commissioning Code M, section M6 and CIBSE Commissioning Code W.
2. Commissioning: In accordance with BSRIA BG 2/2010, CIBSE Commissioning Code M and CIBSE Commissioning Code W.
3. Variable flow systems: In accordance with CIBSE Knowledge Series KS09.
4. Notice (minimum): One week.

Ss_60_40_37/845 Demonstration of heating systems

1. Running of plant
   1.1. Operation: Run, maintain and supervise the installations under normal working conditions.
2. Instruction: Instruct and demonstrate the purpose, function and operation of the installations.

Ss_60_40_37/850 Inspection and test records for heating systems

1. Construction phase reports: System design is commissionable. System commissionable.
2. Records for water systems: In accordance with BSRIA BG 2/2010.
3. Record sheets
   3.1. Submission: On completion.
   3.2. Number of copies: Five.

Ss_60_40_37/860 Documentation for heating systems

1. Operating and maintenance instructions
   1.1. Scope: Submit for the system giving optimum settings for controls.
   1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
   1.3. Number of copies: Three.
2. Record drawings
   2.1. Content: Location and arrangement of plant in plant rooms. Location, size and route of mechanical services. Location, size, route and depth of underground services. Location and identification of pipework regulating, isolation and control valves. Location of outlets.
   2.2. Format: A1 paper print drawing. Electronic drawing.
   2.3. Number of copies: Three.
3. Submittal date: At handover.

Ss_60_40_37/880 Servicing and maintenance of heating systems

1. Requirement: Undertake for 24 months after completion.

Ω End of System

Ss_60_40_92_94
Underfloor low-temperature hot water heating systems

Systems

Ss_60_40_92_94 Underfloor low-temperature hot water heating systems

1. Description:
2. System performance: Ss_60_40_92/210 Design of underfloor heating and cooling systems; Ss_60_40_92/220 Basic design temperatures for underfloor heating and cooling systems
3. Heat source: Low-temperature hot water heating system.
4. Pipework
   4.1. Underfloor: Pr_65_52_63_23 Cross-linked polyethylene (PE-X) pipes and fittings
5. Floor components: Insulation.
6. Execution: Ss_60_40_92/620 Installing underfloor heating and cooling systems; Ss_60_40_92/650 Flushing underfloor heating and cooling systems
7. System completion: Ss_60_40_92/810 Commissioning underfloor heating and cooling systems; Ss_60_40_92/850 Inspection and test records for underfloor heating and cooling systems; Ss_60_40_92/860 Documentation for underfloor heating and cooling systems; Ss_60_40_92/880 Servicing and maintenance of underfloor heating and cooling systems

System performance

Ss_60_40_92/210 Design of underfloor heating and cooling systems

1. Design: Complete the design of the water-based underfloor heating and cooling systems.
2. Standard: In accordance with BSRIA Guide BG 4/2011. To BS EN 1264-1, BS EN 1264-2, BS EN 1264-3 and BS EN 1264-5. To BS EN ISO 11855-1, BS EN ISO 11855-2 and BS EN ISO 11855-3.
3. Method: Full dynamic thermal analysis.
4. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.
5. Computer calculations
   5.1. Format: IES.

Ss_60_40_92/220 Basic design temperatures for underfloor heating and cooling systems

1. Internal air temperature:
2. External air temperature:
3. Air changes per hour:

Products

Pr_65_52_63_23 Cross-linked polyethylene (PE-X) pipes and fittings

1. Description:
2. Standards
   2.1. Pipe: To BS EN ISO 15875-2, Class 1.
3. Third-party certification: Kitemark-approved.
4. Pressure rating:
5. Colour:
6. Execution: Pr_65_52_63/645 Installing plastics pipework

Execution

See Pr_65_52_63/610 Pipework installation generally in Ss_60_40_37_48 Low-temperature hot water heating systems

Pr_65_52_63/645 Installing plastics pipework

Shared by: Pr_65_52_63_89 Unplasticized polyvinyl chloride (PVC-U) pipes

1. General requirements: Pr_65_52_63/610 Pipework installation generally
2. Pipe material: Unplasticized polyvinylchloride.
3. Jointing method: Solvent.

Ss_60_40_92/620 Installing underfloor heating and cooling systems

1. Standard: To BS EN 1264-4. BS EN ISO 11855-5.
2. Fixing of manifold: Locate with access for regulation and maintenance and away from areas sensitive to noise.

Ss_60_40_92/650 Flushing underfloor heating and cooling systems

1. Preliminary checks: Thoroughly inspect pipework and complete pressure tests before flushing and cleaning.
2. Flushing: In accordance with BSRIA Guide BG 29/2021.
3. Waste products : Neutralize, and dispose of to drain; preferably direct to manhole. In accordance with trade effluent licence agreement.

System completion

Ss_60_40_92/810 Commissioning underfloor heating and cooling systems

1. Pre-commissioning: In accordance with BSRIA Guide BG 2/2010 and CIBSE Commissioning Code: Water distribution systems.
2. Commissioning: In accordance with BSRIA Guide BG 2/2010 and CIBSE Commissioning Code: Water distribution systems.
3. Variable flow systems: In accordance with CIBSE KS09 Commissioning variable flow pipework systems.
4. Notice (minimum): One week.

Ss_60_40_92/850 Inspection and test records for underfloor heating and cooling systems

1. Records for water systems: In accordance with BSRIA Guide BG 2/2010.

Ss_60_40_92/860 Documentation for underfloor heating and cooling systems

1. Operating and maintenance instructions
    1.1. Scope: Submit for the system giving optimum settings for controls.
    1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
    1.3. Format: Paper copy. Electronic.
2. Record drawings
    2.1. Content: Location and arrangement of plant in plant rooms. Location, route and depth of underground services. Location and identification of pipework regulating, isolation and control valves. Location, size and route of mechanical services.

2.2. Format: A1 paper print. Electronic.

Ss_60_40_92/880 Servicing and maintenance of underfloor heating and cooling systems

1. Requirement: Undertake for 24 months after completion.

Ω End of System

Ss_65_40_33_48
Local extract ventilation systems

Systems

Ss_65_40_33_48 Local extract ventilation systems

1. Description: New dedicated extract air systems will be provided to toilet, kitchen and tea point areas as required.
2. System performance:
3. Extract terminals:
4. Fan:
5. Ductwork:
6. External exhaust air terminals:
7. Controls:
8. Execution:
9. System completion:

Ω End of System

Ss_65_40_33_50
Mechanical extract ventilation systems

Systems

Ss_65_40_33_50 Mechanical extract ventilation systems

1. Description:
2. System performance: Ss_65_40_33/210 Design of ventilation systems
3. Room extract air terminal devices: Pr_70_65_04_03 Air grilles
4. Air ductwork and accessories
   - 4.1. Ductwork: Pr_65_65_25_14 Circular sheet metal ductwork and fittings; Pr_65_65_25_72 Rectangular sheet metal ductwork and fittings
   - 4.2. Accessories: Pr_65_65_24_29 Fire and smoke dampers; Pr_65_65_23_20 Duct access panels; Pr_65_65_24_42 Intumescent fire and smoke dampers
5. Thermal insulation on extract air ductwork: Pr_80_77_76_52 Mineral wool duct metal-mesh-faced mattress insulation
6. Heat recovery: Pr_60_65_03_87 Supply and return air-handling units
7. Acoustic treatment:
8. Extract fans:
9. External exhaust air terminals: Pr_30_59_48_04 Aluminium louvre panel units
10. Controls: Ss_75_70_52_94 Ventilation control systems; Ss_75_70_52_28 Extract ventilation control systems
11. Identification of ductwork and equipment: Pr_40_10_57_51 Mechanical plant and equipment identification labels; Pr_40_10_57_79 Self-adhesive plastics ductwork labels and transfers
12. Execution: Ss_65_40_33/630 Installing ductwork to fans and air-handling units
13. System completion: Ss_65_40_33/810 Commissioning of air distribution systems; Ss_65_40_33/870 Maintenance of ventilation systems; Ss_65_40_33/830 Inspection and test records for ventilation systems

Ss_75_70_52_28 Extract ventilation control systems

1. Description:
2. System performance:
3. Objectives:
4. Programme controls:
5. Extract fan control strategies:
6. Additional functions:
7. Equipment:
8. Sensors:
9. Equipment interconnectivity:
10. Cables:
11. Containment:
12. Containment accessories:
13. Rewireable installations:
14. Concealed installation:
15. Control equipment power supply: Mains supply.
16. Execution:

17. System completion:

Ss_75_70_52_94 Ventilation control systems

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Description: \Linked to BMS
2. Control equipment power supply: Mains supply.

System performance

Ss_65_40_33/210 Design of ventilation systems

1. Design: Complete the design of the ventilation systems.
2. Method: In accordance with CIBSE Applications Manual AM 11.
3. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.
4. Computer calculations
   4.1. Submittals: Duct sizing calculations. Fan sizing calculations.
   4.2. Format: IES. Hevacomp.

Products

Pr_30_59_48_04 Aluminium louvre panel units

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Description:
2. Material: Extruded aluminium alloy frame and louvre blades, to BS EN 755-1.
3. Finish: Powder coating to BS EN 12206-1.
4. Construction: Flanged frame.
5. Weather performance
   5.1. Water penetration class (minimum): To BS EN 13030, Class A.
   5.2. Discharge loss coefficient (minimum): To BS EN 13030, Class 1.

See Pr_40_10_57_51 Mechanical plant and equipment identification labels in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

Pr_40_10_57_79 Self-adhesive plastics ductwork labels and transfers

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Description:
2. Standard: To BS 1710.

Pr_60_60_36_62 Plate recuperators

1. Standards
   1.1. Performance: To BS EN 13053
   1.2. Testing: Category I to BS EN 308

Pr_60_65_03_87 Supply and return air-handling units

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Description:

2. Standard: To BS EN 13053.
3. Environment: Internal.
4. Casing construction
    4.1. Standard: To BS EN 1886.
    4.2. Filter bypass leakage: To BS EN 1886, section 7.
    4.3. Acoustic insulation of casing: To BS EN 1886, section 9.
    4.4. Mechanical safety: To BS EN 1886, section 11.
5. Components
    5.1. Filters: Pr_65_57_02_66 Panel air filters
    5.2. Heat recovery
        5.2.1. Heat recovery equipment: Pr_60_60_36_62 Plate recuperators
    5.3. Supply fan
        5.3.1. Fan type: Pr_65_67_29_12 Centrifugal fans; Pr_65_67_29_62 Plug fans
    5.4. Extract fan
        5.4.1. Fan type: Pr_65_67_29_12 Centrifugal fans
6. Execution: Pr_60_65_03/610 Installing air-handling units

Pr_65_57_02_66 Panel air filters

1. Standards
    1.1. Performance: To BS EN ISO 16890-1.
    1.2. Testing: To Eurovent 4/11: Energy efficiency classification of air filters for general ventilation purposes.
2. Filter type: Pleated panels.
3. Filter class: ISO ePM2.5.

Pr_65_65_23_20 Duct access panels

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Safety
    1.1. Screws: No self-tapping or piercing screws within one metre of an access opening in accordance with BS EN 12097

Pr_65_65_24_29 Fire and smoke dampers

1. Standard
    1.1. Fire dampers: To BS EN 15650.
    1.2. Test: To BS EN 1366-2.
    1.3. Classification: To BS EN 13501-3.
    1.4. Aerodynamic performance: To BS EN 1751 and BS EN ISO 5135.
2. Execution: Pr_65_65_24/725 Installing fire and smoke control dampers; Pr_65_65_24/750 Access to dampers for resetting and maintenance

Pr_65_65_24_42 Intumescent fire and smoke dampers

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Standard: To BS ISO 10294-5.
2. Execution: Pr_65_65_24/725 Installing fire and smoke control dampers; Pr_65_65_24/750 Access to dampers for resetting and maintenance

Pr_65_65_25_14 Circular sheet metal ductwork and fittings

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Standards: To BESA DW/144, BS EN 1506 and BS EN 12237.
2. Classification: Class A.
3. Regulating dampers
   3.1. Standard: As BESA DW/144.
   3.2. Regulating function: Balancing.
   3.3. Material: To match ductwork.
4. Access openings
   4.1. Purpose: Inspection. Cleaning. Maintenance.
   4.2. Sizes: To BS EN 12097.
5. Execution: Pr_65_65_25/610 Air ductwork generally; Pr_65_65_25/640 Installing sheet metal ductwork

Pr_65_65_25_72 Rectangular sheet metal ductwork and fittings

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Standards: To BESA DW/144, BS EN 1505 and BS EN 1507.
2. Classification: Class A.
3. Material: Zinc-coated steel to BS EN 10346, Grade DX51D+Z140.
4. Regulating dampers
   4.1. Standard: To BESA DW/144.
5. Access openings
   5.1. Purpose: Inspection. Cleaning. Maintenance.
   5.2. Sizes: To BS EN 12097.
6. Execution: Pr_65_65_25/610 Air ductwork generally; Pr_65_65_25/640 Installing sheet metal ductwork

Pr_65_67_29_12 Centrifugal fans

1. Standards
   1.1. Performance: To BS EN ISO 5801.
   1.2. Mechanical safety: To BS EN ISO 12499.
   1.3. Electrical safety: To BS EN 60335-1 and BS EN 60335-2-80.
   1.4. Dimensions: To BS EN ISO 13351.

Pr_65_67_29_62 Plug fans

1. Standards
   1.1. Performance: To BS EN ISO 5801.
   1.2. Mechanical safety: To BS EN ISO 12499.
   1.3. Electrical safety: To BS EN 60335-1 and BS EN 60335-2-80.
   1.4. Dimensions: To BS EN ISO 13351.
2. Fan blades: Backward-curved.
3. Motor and drive: EC motor.

Pr_70_65_04_03 Air grilles

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Standards
   1.1. Mixed flow applications: To BS EN 12238.
   1.2. Displacement flow applications: To BS EN 12239.
   1.3. Sound power levels: To BS EN ISO 5135.
2. Application: Supply. Extract.
3. Grille type: Perforated, mesh.
4. Finish: Epoxy resin powder/ hardener coating.
5. Accessories: Pr_70_65_04_04 Air plenum boxes
6. Execution: Pr_70_65_04/650 Installing grilles; Pr_70_65_04/690 Support of air terminal units in ceiling grids

Pr_70_65_04_04 Air plenum boxes

1. Configuration:
2. Construction: Sturdy and rigid with circular inlet spigots of 65 mm minimum length.
3. Fixing: Incorporate means for fixing to, or suspending from, building or other construction.

Pr_80_77_76_52 Mineral wool duct metal-mesh-faced mattress insulation

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Standard: To BS EN 14303.
2. Insulation thickness (minimum): To BS 5422.
3. Vapour barrier
   3.1. Vapour permeability: To BS 5422, clause 5.6.
4. Items to be insulated: Removable access covers.
5. Execution: Pr_80_77_76/610 Installing insulation and protection products generally

Execution

See Pr_40_10_57/611 Installing mechanical plant and equipment identification in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

Pr_60_65_03/610 Installing air-handling units

1. Standard: In accordance with BS EN 13053.
2. Component assembly
   2.1. Sealing: Provide gaskets between air-handling unit sections to prevent air leakage from casing.
   2.2. Site-drilling :

Pr_65_65_24/725 Installing fire and smoke control dampers

1. Standard: In accordance with ASFP Volume 1: EN fire dampers. (Grey book). In accordance with BESA DW/145. Installation record information to BS EN 12101-8. Install fire dampers in accordance with Good Building Guide 81.

Pr_65_65_24/750 Access to dampers for resetting and maintenance

1. Position: Provide access to damper mechanisms on fire dampers; smoke dampers; combined smoke and fire dampers, and volume control dampers through access doors, suspended ceilings, etc. Where more than one fire damper is installed in a frame provide access to all fire dampers.
2. Fire links: Provide access for replacement.

Pr_65_65_25/610 Air ductwork generally

1. Cut edges on ductwork, flanges and supports: Smooth and burr-free.

Pr_65_65_25/640 Installing sheet metal ductwork

1. Standard: To BESA DW/144.

Pr_70_65_04/610 Installing air terminal devices

1. General: Do not distort air terminal devices. Fix securely.
2. Air leakage: Prevent. Seal joints with self adhesive foam strip or equivalent.
3. Appearance: Finish visible edge joints neatly. Do not leave sharp edges and protruding screws.
4. Operation: Fit so that moving parts operate correctly and removable cores can be taken out and replaced.
5. High level and ceiling applications: On removable cores, provide safety wires with quick release ends.

Pr_70_65_04/650 Installing grilles

1. General requirements: Pr_70_65_04/610 Installing air terminal devices

Pr_70_65_04/690 Support of air terminal units in ceiling grids

1. Standard: To BESA DW/144.
2. Position: Agree final position of air terminals before installation.

See Pr_80_77_76/610 Installing insulation and protection products generally in Ss_60_40_37_48 Low-temperature hot water heating systems

Ss_65_40_33/630 Installing ductwork to fans and air-handling units

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Air discharge:

System completion

Ss_65_40_33/810 Commissioning of air distribution systems

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Pre-commissioning: In accordance with BSRIA BG 49/2015 and CIBSE Commissioning code A.
2. Commissioning: In accordance with BSRIA BG 49/2015 and CIBSE Commissioning code A.
3. Notice (minimum):

Ss_65_40_33/830 Inspection and test records for ventilation systems

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Records for air systems: In accordance with BSRIA BG 49/2015.

Ss_65_40_33/870 Maintenance of ventilation systems

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Servicing and maintenance: Undertake for 24 months after practical completion.

Ω End of System

Ss_65_40_33_51
Mechanical supply ventilation systems

Systems

Ss_65_40_33_51 Mechanical supply ventilation systems

1. Description:
2. System performance:
3. Type of system: Multizone, constant volume.
4. External air intake: Pr_30_59_48_04 Aluminium louvre panel units
5. Air filters: Pr_60_65_03_87 Supply and return air-handling units
6. Heat recovery: Pr_60_65_03_87 Supply and return air-handling units
7. Air-handling units: Pr_60_65_03_87 Supply and return air-handling units
8. Supply fans: Pr_60_65_03_87 Supply and return air-handling units
9. Acoustic treatment: Pr_60_65_03_87 Supply and return air-handling units
10. Air ductwork and accessories
    - 10.1. Ductwork: Pr_65_65_25_14 Circular sheet metal ductwork and fittings; Pr_65_65_25_72 Rectangular sheet metal ductwork and fittings
    - 10.2. Accessories: Pr_65_65_23_20 Duct access panels; Pr_65_65_24_42 Intumescent fire and smoke dampers
11. Thermal insulation on supply air ductwork: Pr_80_77_76_52 Mineral wool duct metal-mesh-faced mattress insulation; Pr_80_77_76_58 Nitrile rubber insulation
12. Room supply air terminal devices: Pr_70_65_04_03 Air grilles
13. Controls: Ss_75_70_52_94 Ventilation control systems
14. Identification of ductwork and equipment: Pr_40_10_57_79 Self-adhesive plastics ductwork labels and transfers; Pr_40_10_57_51 Mechanical plant and equipment identification labels
15. Execution: Ss_65_40_33/630 Installing ductwork to fans and air-handling units
16. System completion: Ss_65_40_33/810 Commissioning of air distribution systems; Ss_65_40_33/830 Inspection and test records for ventilation systems; Ss_65_40_33/870 Maintenance of ventilation systems

See Ss_75_70_52_94 Ventilation control systems in Ss_65_40_33_50 Mechanical extract ventilation systems

Products

See Pr_30_59_48_04 Aluminium louvre panel units in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_40_10_57_51 Mechanical plant and equipment identification labels in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

See Pr_40_10_57_79 Self-adhesive plastics ductwork labels and transfers in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_60_60_36_62 Plate recuperators in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_60_65_03_87 Supply and return air-handling units in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_57_02_66 Panel air filters in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_65_23_20 Duct access panels in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_65_24_42 Intumescent fire and smoke dampers in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_65_25_14 Circular sheet metal ductwork and fittings in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_65_25_72 Rectangular sheet metal ductwork and fittings in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_67_29_12 Centrifugal fans in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_67_29_62 Plug fans in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_70_65_04_03 Air grilles in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_70_65_04_04 Air plenum boxes in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_80_77_76_52 Mineral wool duct metal-mesh-faced mattress insulation in Ss_65_40_33_50 Mechanical extract ventilation systems

Pr_80_77_76_58 Nitrile rubber insulation

Shared by: Ss_65_80_45_72 Room air conditioning systems

1. Description:
2. Standard: To BS EN 60684-3-151.
3. Environmental rating:
4. Volatile organic compounds (VOC) emissions level (maximum):
5. Thermal conductivity:
6. Insulation thickness (minimum): To BS 5422.
7. Vapour barrier
    7.1. Vapour permeability: To BS 5422, clause 5.6.
8. Execution: Pr_80_77_76/630 Installing nitrile rubber insulation on pipelines
9. Verification
    9.1. Submittals:
    9.2. Timing:

Execution

See Pr_40_10_57/611 Installing mechanical plant and equipment identification in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

See Pr_60_65_03/610 Installing air-handling units in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_65_24/725 Installing fire and smoke control dampers in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_65_24/750 Access to dampers for resetting and maintenance in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_65_25/610 Air ductwork generally in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_65_65_25/640 Installing sheet metal ductwork in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_70_65_04/610 Installing air terminal devices in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_70_65_04/650 Installing grilles in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_70_65_04/690 Support of air terminal units in ceiling grids in Ss_65_40_33_50 Mechanical extract ventilation systems

See Pr_80_77_76/610 Installing insulation and protection products generally in Ss_60_40_37_48 Low-temperature hot water heating systems

Pr_80_77_76/630 Installing nitrile rubber insulation on pipelines

1. Joints:
2. At fittings:

See Ss_65_40_33/630 Installing ductwork to fans and air-handling units in Ss_65_40_33_50 Mechanical extract ventilation systems

System completion

See Ss_65_40_33/810 Commissioning of air distribution systems in Ss_65_40_33_50 Mechanical extract ventilation systems

See Ss_65_40_33/830 Inspection and test records for ventilation systems in Ss_65_40_33_50 Mechanical extract ventilation systems

See Ss_65_40_33/870 Maintenance of ventilation systems in Ss_65_40_33_50 Mechanical extract ventilation systems

Ω End of System

Ss_65_40_33_90
Toilet extract ventilation systems

Systems

Ss_65_40_33_90 Toilet extract ventilation systems

1. Description:
2. System performance:
3. Room extract air terminal devices:
4. Air ductwork and accessories
   - 4.1. Ductwork:
   - 4.2. Accessories:
5. Thermal insulation on extract air ductwork:
6. Vibration isolation mountings:
7. Acoustic treatment:
8. Extract fans:
9. External exhaust air terminals:
10. Accessories:
11. Controls:
12. Identification of ductwork and equipment:
13. Testing:
14. Execution:
15. System completion:

Ω End of System

Ss_65_80_45_72
Room air conditioning systems

Systems

Ss_65_80_45_72 Room air conditioning systems

1. Description:
2. System performance: Ss_65_80_45/210 Design of local air conditioning system; Ss_65_80_45/230 Design parameters for local air conditioning systems
3. Air conditioning units: Pr_70_65_03_86 Split coil room air conditioning units; Pr_70_65_03_84 Split coil remote air-cooled condensing units
4. Refrigerant pipeline: Pr_65_52_63_20 Copper refrigerant pipes
5. Pipeline insulation: Pr_80_77_76_58 Nitrile rubber insulation
6. Controls:
7. Condensate pipelines: Pr_65_52_63_89 Unplasticized polyvinyl chloride (PVC-U) pipes
8. Accessories:
9. Identification of ductwork and equipment: Pr_40_10_57_51 Mechanical plant and equipment identification labels
10. Execution: Ss_65_80_45/620 Installing local air conditioning refrigeration
11. System completion: Ss_65_80_45/815 Commissioning of refrigeration systems; Ss_65_80_45/830 Inspection and test records; Ss_65_80_45/840 Demonstrations; Ss_65_80_45/870 Maintenance

System performance

Ss_65_80_45/210 Design of local air conditioning system

1. Design: Complete the design of the local air conditioning system.
2. Standard: Performance to BS EN 16798-3.
3. Method:
4. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.
5. Calculations
    5.1. Submittals: U-values and heat gain calculations for each room.
    5.2. Format: IES. HEVACOMP.

Ss_65_80_45/230 Design parameters for local air conditioning systems

1. Summer external conditions
    1.1. Dry bulb: 30degC
    1.2. Relative humidity: 50%
2. Winter external conditions
    2.1. Wet bulb:
    2.2. Dry bulb: -3degC
    2.3. Relative humidity: 100%
3. Internal data
    3.1. Human occupancy: 1 Person/6m2
4. Internal conditions
    4.1. Winter temperature: 21degC or otherwise as room data sheets

4.2. Summer temperature: 23degC or otherwise as room data sheets
4.3. Relative humidity: 40–70%.
4.4. Fresh air ventilation rates: 10 Litres/secon/person
4.5. Air change rates: 6ACH to WC's

Products

See Pr_40_10_57_51 Mechanical plant and equipment identification labels in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

Pr_65_52_63_20 Copper refrigerant pipes

1. Description: All refrigerant pipelines will be thermally insulated using Nitrile Rubber with a minimum 13mm wall.
2. Standard: To BS EN 378-2.
3. Pipes: To BS EN 12735-1.
4. Execution: Pr_65_52_63/665 Installing refrigerant pipework

Pr_65_52_63_89 Unplasticized polyvinyl chloride (PVC-U) pipes

1. Description: Condense water from air conditioning fan coils will be disposed of via gravity within new PVC-U pipelines
2. Standards
   2.1. Pipe: To BS EN ISO 1452-2.
3. Third-party certification: Kitemark-approved.
4. Execution: Pr_65_52_63/645 Installing plastics pipework

Pr_70_65_03_84 Split coil remote air-cooled condensing units

1. Description:
2. Manufacturer: Mitsubishi Electric or Daikin
3. Standards
   3.1. Performance: To BS EN 378-1 and BS EN 378-2.
   3.2. Electrical safety: To BS EN 60335-1 and BS EN 60335-2-40.
4. Duty: Match split coil room air conditioning unit.
5. Mounting: Ground level.
6. Execution:

Pr_70_65_03_86 Split coil room air conditioning units

1. Description:
2. Manufacturer: Mitsubishi Electric or Daikin
3. Standards
   3.1. Performance: To BS EN 14511-2, BS EN 14511-3, BS EN 14511-4, BS EN 15218, BS EN 378-1 and BS EN 378-2.
   3.2. Electrical safety: To BS EN 60335-1 and BS EN 60335-2-40.
4. Refrigerant: R32
5. Access: Provide for filter, fan and motor.
6. Controls: Wired Proprietary controller
7. Condensate drainage: Condensate pump within unit.
8. Execution: Pr_70_65_03/610 Installing drain lines

See Pr_80_77_76_58 Nitrile rubber insulation in Ss_65_40_33_51 Mechanical supply ventilation systems

Execution

See Pr_40_10_57/611 Installing mechanical plant and equipment identification in Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

See Pr_65_52_63/610 Pipework installation generally in Ss_60_40_37_48 Low-temperature hot water heating systems

See Pr_65_52_63/645 Installing plastics pipework in Ss_60_40_92_94 Underfloor low-temperature hot water heating systems

Pr_65_52_63/665 Installing refrigerant pipework

1. General requirements: Pr_65_52_63/610 Pipework installation generally
2. Standards: To BS EN 378-3 and BS EN 378-4.
3. Refrigerant lines: *Short and straight*.

Pr_70_65_03/610 Installing drain lines

1. Drain connections: Connect drainline flush with bottom of drip tray.
2. Drain line material:

See Pr_80_77_76/630 Installing nitrile rubber insulation on pipelines in Ss_65_40_33_51 Mechanical supply ventilation systems

Ss_65_80_45/620 Installing local air conditioning refrigeration

1. Standard: To BS EN 378-3.

System completion

Ss_65_80_45/815 Commissioning of refrigeration systems

1. Pre-commissioning: In accordance with CIBSE Commissioning Code R.
2. Commissioning: In accordance with CIBSE Commissioning Code R.
3. Notice (minimum): . One week.

Ss_65_80_45/830 Inspection and test records

1. Records for water systems: In accordance with BSRIA BG 2/2010.
2. Records for air systems: In accordance with BSRIA BG 49/2015.
3. Record sheets
   - 3.1. Submission: On completion.
   - 3.2. Number of copies: Three.

Ss_65_80_45/840 Demonstrations

1. Running of plant
   - 1.1. Operation: *Run, maintain and supervise the installations under normal working conditions*
   - 1.2. Duration: Two weeks.
2. Instruction: Instruct and demonstrate the purpose, function and operation of the installations.

Ss_65_80_45/870 Maintenance

1. Servicing and maintenance: Undertake for 12 months after completion.

Ω End of System

Ss_70_10_70_85
Stand-alone photovoltaic systems

Systems

Ss_70_10_70_85 Stand-alone photovoltaic systems

1. Description:
2. System performance: Ss_70_10_70/210 Design of photovoltaic systems; Ss_70_10_70/220 Structural and weatherproofing considerations; Ss_70_10_70/230 Photovoltaic arrays
3. System manufacturer:
4. Input source: Pr_60_70_65_63 Photovoltaic modules
5. Mounting: Pr_80_77_27_72 Roof anchors for solar modules
6. Switchgear and controls: Pr_65_72_43_42 Inverters
7. Cable type: Pr_65_70_48_90 Thermosetting insulated thermoplastic-sheathed low-smoke halogen-free (LSHF) armoured cables Type A
8. System accessories: Pr_80_51_51_22 Digital metering equipment
9. Execution: Ss_70_10_70/630 Installing PV module arrays; Ss_70_10_70/620 Installing photovoltaic systems generally; Ss_70_10_70/660 Installing d.c. isolation switches
10. System completion: Ss_70_10_70/810 Testing and commissioning photovoltaic systems; Ss_70_10_70/815 PV array performance tests; Ss_70_10_70/820 Documentation for photovoltaic systems; Ss_70_10_70/840 Maintenance of photovoltaic systems

System performance

Ss_70_10_70/210 Design of photovoltaic systems

1. Design: Complete the design of the photovoltaic system.
2. Standards: In accordance with BS 7671, BS IEC 62548 and EREC G98. In accordance with BS 7671, BS IEC 62548 and EREC G99. To BS EN 61427-1. To BS EN 61427-2. To BS EN 62124.
3. Testing and commissioning: Incorporate adequate measures to allow full testing and commissioning of the completed system.
4. Proposals: Submit detailed design drawings, manufacturers' literature and technical information, and calculations showing estimated annual energy yield using the method prescribed in the BRE publication Standard Assessment Procedure for energy rating of dwellings, Appendix M. Submit detailed design drawings, manufacturers' literature and technical information, and calculations showing estimated annual energy yield using the method prescribed in the BRE publication Simplified Building Energy Model (SBEM). Submit detailed design drawings, manufacturers' literature and technical information, and calculations showing estimated annual energy yield using the Photovoltaic Geographical Information System (PVGIS) calculator.
5. Approvals: Obtain written approval of the Distribution network operator.

Ss_70_10_70/220 Structural and weatherproofing considerations

1. Supports and fixings
    1.1. Requirement: No impairment to the thermal and weatherproofing performance of the building fabric.
    1.2. Arrangement of fixings or proposed supporting structure: Submit proposals.
    1.3. Submittals to include: *Electronic drawing in dwg format and two no. A3 paper prints, together with written confirmation of compliance with requirement.*

Ss_70_10_70/230 Photovoltaic arrays

1. Nominal output

1.1. Peak power: No less than 6kW peak output

Products

Pr_60_70_65_63 Photovoltaic modules

1. Description:
2. Manufacturer:
3. Standards: To BS EN IEC 61730-1 and BS EN IEC 61730-2.
4. Third-party certification: *MCS-certified product*
5. Application class:
6. Cell type: Monocrystalline to BS EN IEC 61215-1.
7. Module interconnections
   7.1. Standard: To BS EN 62852.
   7.2. Module connectors: Polarized and suitably rated for the applicable d.c. voltage and current.
8. Nominal output of module
   8.1. Peak power: 630W with a minimum efficiency of 22.5%
   8.2. Power output tolerance: 0/3%.
9. Bypass diodes: Three, integral to panel.
10. Output warranty: Minimum of 90% power output after ten years.

Pr_65_70_48_90 Thermosetting insulated thermoplastic-sheathed low-smoke halogen-free (LSHF) armoured cables Type A

1. Description:
2. Manufacturer:
3. Standard: To BS 6724.
4. Third-party certification:
5. Size:
6. Insulation:
7. Sheath colour: Black.
8. Reaction to fire class
   8.1. Fire behaviour:
   8.2. Additional classification for smoke production:
   8.3. Additional classification for flaming droplets and/ or particles:
   8.4. Additional classification for acidity:
9. Execution:

Pr_65_72_43_42 Inverters

1. Description:
2. Manufacturer: SMA
3. Standard: In accordance with Energy Networks Association EREC G99/1-6.
4. Output
   4.1. Overall efficiency (minimum): Minimum 97%

Pr_80_51_51_22 Digital metering equipment

Shared by: Ss_70_30_45_45 Low-voltage distribution systems

1. Description:
2. Manufacturer:
3. Standards: To BS EN 50470-1 and BS EN 50470-2. To BS EN 50470-1 and BS EN 50470-3.
4. Third-party certification: Measuring Instruments Directive-approved.
5. Display: Nine-digit (including two decimal places) and display of import/ export arrow; suitable for dual tariff, via backlit LCD; with imp/ kWh LED.
6. Rated frequency: 50 Hz.
7. Metering functions: Voltage between phases (V). Voltage between phases and neutral (V). Phase currents (A). Frequency (Hz). Power factor cos ø. Active power (kW). Reactive power (kVA(r)). Active energy (kWh). Reactive energy (kVA(r)h).
8. Outputs: To BMS
9. Execution: Pr_80_51_51/620 Installing electrical monitoring and metering equipment

Pr_80_77_27_72 Roof anchors for solar modules

1. Description:
2. Manufacturer:
3. Material:
4. Anchor type:

Execution

Pr_80_51_51/620 Installing electrical monitoring and metering equipment

1. Standard: In accordance with BS 7671.
2. Digital metering equipment: Connect to building management system.

Ss_70_10_70/620 Installing photovoltaic systems generally

1. Standards: In accordance with BS 7671. In accordance with EREC G98. In accordance with EREC G99.
2. Installer: Microgeneration Certification Scheme-accredited.
3. Materials: Separate dissimilar metallic materials to prevent bimetallic corrosion.
4. Fixing equipment: Fix independently of any other systems installation with zinc electroplated fasteners indoors and stainless steel fasteners outdoors.
5. Orientation: Accurate and square to vertical and horizontal axes. Align adjacent items of switchgear on the same horizontal axis.
6. Cable installation
   6.1. Timing: Complete installation of d.c. cabling before connecting to PV array.
   6.2. Routes and arrangement: Minimize length of d.c. cable runs. Install positive and negative conductors from the same string together.
7. Cable terminations: Label string cables with push-on plastics markers showing unique circuit reference. Label main incoming d.c. and outgoing a.c. cables at power conditioning unit with push-on plastics markers showing unique circuit reference.

Ss_70_10_70/630 Installing PV module arrays

1. General requirements: Ss_70_10_70/620 Installing photovoltaic systems generally
2. Fixings: Suitable for wind loading. Minimum of four clamps per module, placed symmetrically.
3. PV modules
   3.1. Mounting: Allow adequate ventilation between building fabric and underside of PV module.

3.2. Electrical connection: Interconnect between PV modules using integrated connection cables, connector plugs and string cables to form an array consisting of two strings, each string consisting of four modules. Form strings beginning at bottom left of array when viewed from front.

Ss_70_10_70/660 Installing d.c. isolation switches

1. Position: Conveniently accessible for operation inspection and maintenance. Next to power conditioning unit.

System completion

Ss_70_10_70/810 Testing and commissioning photovoltaic systems

1. Standards: In accordance with BS 7671. To BS EN 62446-1. In accordance with EREC G98. In accordance with EREC G99.
2. Witnessing of testing and commissioning: Required.
3. Approval: Obtain written approval of the distribution network operator.
4. Specialist commissioning engineer: System manufacturer.

Ss_70_10_70/815 PV array performance tests

1. Standard: To BS EN 62446-1, Annex C.
2. Test conditions: Minimum irradiation level 600 W/m².

Ss_70_10_70/820 Documentation for photovoltaic systems

1. Operating and maintenance instructions
   1.1. Scope: Submit for the system giving optimum settings for controls.
   1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
   1.3. Format: Paper copy.
   1.4. Number of copies: Three.
2. Record drawings
   2.1. Content: General arrangement drawings showing the location of modules, PV array junction boxes, d.c. isolation switches, PV generator junction boxes, power conditioning units, energy meters, a.c. isolation switches and point of connection to a.c. distribution network. Include cabling routes, conductor material and c.s.a., insulation type and colour, number of cores per cable, number of cables in ducts, on tray or ladder.
   2.2. Format: A1 paper print drawing. Electronic drawing.
   2.3. Number of copies: Three.
3. Submittal date: At handover.
4. Site test results and system performance analysis: Submit.
5. Test equipment calibration certificates: Submit.
6. System commissioning completion certificate: Submit.
7. Approval of Electricity Distributor (grid-connected systems only): Submit.
8. Warranty for system: Submit.
9. Microgeneration Certification Scheme: Submit certificate.

Ss_70_10_70/840 Maintenance of photovoltaic systems

1. Servicing and maintenance: Undertake.
2. Duration: Until 24 months after practical completion.

Ω End of System

Ss_70_10_70_85
Stand-alone photovoltaic systems Type A

Systems

Ss_70_10_70_85 Stand-alone photovoltaic systems Type A

1. Description:
2. System performance:
3. System manufacturer:
4. Input source:
5. Mounting:
6. Switchgear and controls:
7. Cable type:
8. Rewireable installation:
9. Concealed installation:
10. Cable containment:
11. Containment accessories:
12. System accessories:
13. Execution:
14. System completion:

Ω End of System

Ss_70_30_25_45
Lightning protection systems

Systems

Ss_70_30_25_45 Lightning protection systems

1. Description:
2. System performance: Ss_70_30_25/211 Design of lightning protection systems
3. Air-termination system: Pr_65_70_46_03 Aluminium earth tapes
4. Down-conductor system: Pr_65_70_46_03 Aluminium earth tapes
5. Earth-termination system: Use reinforcing steel in concrete foundations.
6. Accessories:
7. Electrical identification: Pr_40_10_57_29 Equipment labels and warning notices
8. Execution: Ss_70_30_25/631 Installing lightning protection systems
9. System completion: Ss_70_30_25/811 Inspection and testing of lightning protection systems; Ss_70_30_25/821 Documentation

System performance

Ss_70_30_25/211 Design of lightning protection systems

1. Design: Complete the design of the lightning protection system.
2. Standards: To BS EN 62305-1, BS EN 62305-2, BS EN 62305-3 and BS EN 62305-4.
3. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.

Products

See Pr_40_10_57_29 Equipment labels and warning notices in Ss_60_40_37_48 Low-temperature hot water heating systems

Pr_65_70_46_03 Aluminium earth tapes

1. Standards: To BS EN 755-5. To BS EN IEC 62561-2 and BS EN 755-5.
2. Execution: Pr_65_70_46/660 Installing earth conductor tapes

Execution

Pr_65_70_46/660 Installing earth conductor tapes

1. Position: Concealed within wall construction.
2. Number of joints: Minimize.
3. Contact surfaces: Clean. Coat with corrosion inhibitor.
4. Bimetallic joints: Do not cross-contaminate.
5. Conductors passing through roofs: Provide puddle flanges.
6. Fasteners: Spaced at a maximum of 600 mm apart.

Ss_70_30_25/631 Installing lightning protection systems

1. Standards: To BS EN 62305-3 and BS EN 62305-4.
2. Position

System completion

Ss_70_30_25/811 Inspection and testing of lightning protection systems

1. Standards: To BS EN 62305-3 and BS EN 62305-4.
2. Results: Include within inspection guide.

Ss_70_30_25/821 Documentation

1. Standards: To BS EN 62305-3 and BS EN 62305-4.
2. Inspection guide
   - 2.1. Submit including the following information: The general status of the LPS including conditions of air termination components, down-conductors and earth system components. Earth resistance measurements of the earth-termination system. The result of any measurements performed. Any deviation from the technical documentation.
   - 2.2. Format: A4 paper print. Electronic.
   - 2.3. Number of copies: Two.
3. Record drawings
   - 3.1. Content: General arrangement drawings showing the location of all air terminals, tapes, earth rods, plates and electrodes, test joints, and plates, route of protective bonding conductors from the lightning protection system to other services and to the main earthing terminal.
   - 3.2. Format: A1 paper print drawing. Electronic drawing.
   - 3.3. Number of copies: Two.
4. Submittal date: At handover.

Ω End of System

Ss_70_30_45_45
Low-voltage distribution systems

Systems

Ss_70_30_45_45 Low-voltage distribution systems

1. Description:
2. System performance: Ss_70_30_45/211 Design of low-voltage distribution systems; Ss_70_30_45/215 Low-voltage distribution circuit cables generally; Ss_70_30_45/221 Conduit, trunking and ducting generally; Ss_70_30_45/231 Input power supply characteristics
3. Connection to low-voltage supply:
4. Switchgear: Pr_60_70_22_22 Distribution boards; Pr_60_70_48_44 Low-voltage fuse-switch-disconnectors
5. Protective devices : Pr_65_72_27_53 Moulded case circuit breakers; Pr_65_72_27_72 Residual current circuit breakers; Pr_65_72_27_52 Miniature circuit breakers
6. Distribution circuit cabling: Pr_65_70_48_90 Thermosetting insulated thermoplastic-sheathed low-smoke halogen-free (LSHF) armoured cables
7. Cable accessories: Pr_65_70_11_13 Cable cleats; Pr_65_70_11_15 Cable ties
8. Containment: Pr_65_70_11_17 Cable trays; Pr_65_70_11_71 Rigid conduit
9. Monitoring and metering: Pr_80_51_51_22 Digital metering equipment
10. Electrical identification: Pr_40_10_57_23 Electrical diagrams; Pr_40_10_57_29 Equipment labels and warning notices
11. Execution: Ss_70_30_45/611 Removing low-voltage distribution systems; Ss_70_30_45/625 Installing low-voltage distribution systems
12. System completion: Ss_70_30_45/811 Inspecting, testing and commissioning of switchgear generally; Ss_70_30_45/821 Documentation for low-voltage distribution systems; Ss_70_30_45/840 Maintenance of low-voltage distribution

System performance

Ss_70_30_45/211 Design of low-voltage distribution systems

1. System designer:
2. Design: Complete the design of the low-voltage distribution system.
3. Standard: In accordance with BS 7671.
4. Provision of low-voltage distribution: Provide electrical supplies to equipment requiring power.
5. Spare capacity throughout the low-voltage distribution system:
6. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.

Ss_70_30_45/215 Low-voltage distribution circuit cables generally

1. Proposed selection of low-voltage distribution cables: Submit drawings, technical information, calculations and manufacturers' literature.
2. Conductor sizes (minimum): 16 mm².
3. Cable sizes not stated: Submit.
4. Format: Amtech.

Ss_70_30_45/221 Conduit, trunking and ducting generally

1. Standard: In accordance with BS 7671.

2. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.
3. Conduit, trunking and ducting sizes not stated: Submit.

Ss_70_30_45/231 Input power supply characteristics

1. Earthing type: TN-C-S.

Products

Pr_40_10_57_23 Electrical diagrams

Shared by: Ss_70_30_80_35 Hardwired low-voltage small power systems , Ss_70_80_25_05 Amenity lighting systems and Ss_70_80_33_35 Hardwired general lighting systems

1. Material: Paper print, glazed frame.
2. Format: Single line engineering drawings to BS EN 61082-1.
3. Information to be included: Supply characteristics. Cable types and sizes. Protective device types, ratings and function. Earth fault loop impedance values at each item of switchgear.
4. Size: A2.

See Pr_40_10_57_29 Equipment labels and warning notices in Ss_60_40_37_48 Low-temperature hot water heating systems

Pr_60_70_22_22 Distribution boards

1. Description:
2. Manufacturer: Eaton or Schneider
3. Standards: To BS EN IEC 61439-1 and BS EN 61439-3.
4. Third-party certification: ASTA Type test certification.
5. Rated operational voltage (Ue): 250 V a.c. 415 V a.c.
6. Outgoing devices
   6.1. Type: Residual current circuit breakers with integral overcurrent protection. Miniature circuit breakers.
7. Busbars and connections
   7.1. Type: Fully shrouded.
8. Neutral and earth bars: Individual terminal for each outgoing circuit.
9. Neutral terminations: Match current carrying capacity of phase conductor.
10. Spare ways: Fit with blank plates.
11. Accessories: Analogue metering equipment. Digital metering equipment. Padlock and key cabinets.
12. Execution: Pr_60_70_22/665 Installing low-voltage switchgear generally; Pr_60_70_22/676 Circuit schedules

Pr_60_70_48_44 Low-voltage fuse-switch-disconnectors

1. Standards: To BS EN IEC 60947-1 and BS EN IEC 60947-3.
2. Execution: Pr_60_70_22/665 Installing low-voltage switchgear generally

Pr_65_70_11_13 Cable cleats

Shared by: Ss_70_30_80_35 Hardwired low-voltage small power systems

1. Standard: To BS EN IEC 61914.
2. Environmental influences

2.1. Non-metallic and composite components: Resistant to ultraviolet light.

Pr_65_70_11_15 Cable ties

Shared by: Ss_70_30_80_35 Hardwired low-voltage small power systems

1. Standard: To BS EN IEC 62275.
2. Material: Metal.

Pr_65_70_11_17 Cable trays

Shared by: Ss_75_70_54_10 Building monitoring and management systems , Ss_75_40_75_40 Intrusion and hold-up alarm systems , Ss_70_30_80_35 Hardwired low-voltage small power systems , Ss_70_80_33_35 Hardwired general lighting systems , Ss_75_10_21_21 Data distribution systems and Ss_75_50_28_29 Fire detection and alarm systems

1. Standard: To BS EN 61537.
2. Material: Metal.
3. Coating material: Hot-dip-galvanized.
4. Features
   4.1. Segregation: Cable dividers.
5. Execution: Pr_65_70_11/621 Installing cable tray and cable ladder; Pr_65_70_11/650 Multiple cable runs

Pr_65_70_11_71 Rigid conduit

Shared by: Ss_75_10_46_05 Audio frequency induction loop systems , Ss_75_70_54_10 Building monitoring and management systems , Ss_75_40_75_40 Intrusion and hold-up alarm systems , Ss_70_30_80_35 Hardwired low-voltage small power systems , Ss_70_80_25_05 Amenity lighting systems and Ss_70_80_33_35 Hardwired general lighting systems

1. Description:
2. Standards: To BS EN 61386-1 and BS EN IEC 61386-21.
3. Mechanical properties
   3.1. Resistance to impact: Heavy.
   3.2. Resistance to bending: Rigid.
4. Resistance to external influences
   4.1. Protection against ingress of solid objects (minimum): To BS EN 60529, IP3X.
   4.2. Protection against ingress of water (minimum): To BS EN 60529, IPX0.
5. Execution: Pr_65_70_11/721 Installing rigid metallic conduit

Pr_65_70_48_90 Thermosetting insulated thermoplastic-sheathed low-smoke halogen-free (LSHF) armoured cables

1. Description:
2. Manufacturer:
3. Standard: To BS 6724.
4. Third-party certification:
5. Size:
6. Insulation:
7. Sheath colour: Black.
8. Reaction to fire class
   8.1. Fire behaviour:

8.2. Additional classification for smoke production:
8.3. Additional classification for flaming droplets and/ or particles:
8.4. Additional classification for acidity:
9. Execution:

Pr_65_72_27_52 Miniature circuit breakers

1. Description:
2. Standards: To BS EN 60898-1. To BS EN 60898-1 and BS EN 60898-2. To BS EN IEC 60947-1 and BS EN 60947-2.
3. Third-party certification: ASTA Type test certification.

Pr_65_72_27_53 Moulded case circuit breakers

1. Description:
2. Standards: To BS EN IEC 60947-1 and BS EN 60947-2.
3. Third-party certification: ASTA Type test certification.

Pr_65_72_27_72 Residual current circuit breakers

1. Description:
2. Standards: To BS EN 61008-1. To BS EN 61008-1 and BS EN 62423.

See Pr_80_51_51_22 Digital metering equipment in Ss_70_10_70_85 Stand-alone photovoltaic systems

Execution

Pr_60_70_22/665 Installing low-voltage switchgear generally

1. General requirements:
2. Switchgear cubicles: Arrange in modular form to facilitate future extension.
3. Clearance (minimum)
   3.1. Front access switchgear:
   3.2. Rear access switchgear:
4. Fixing equipment
   4.1. Generally: Fix independently of wiring installation with zinc electroplated fasteners.
   4.2. Indoor equipment: Fix using internal lugs.
   4.3. Outdoor equipment: Fix using external lugs.
5. Orientation: Accurate and square to vertical and horizontal axes. Align adjacent items of switchgear on the same horizontal axis.
6. Extension boxes: Provide where necessary.
7. Gland plates: Non-ferrous for single core cables.
8. Interconnection of close-coupled switchgear
   8.1. Cable type:
   8.2. Containment:
9. Identification
   9.1. Neutral and earth bar terminals: Label with the outgoing circuit reference.
   9.2. Cable terminations: Label with circuit reference, with push-on plastics markers.

Pr_60_70_22/676 Circuit schedules

1. Circuit schedules:

Pr_65_70_11/621 Installing cable tray and cable ladder

1. Standards: In accordance with BS 7671 and IET Guidance Note 1.
2. Preparation
   - 2.1. Burrs and sharp edges: Make smooth.
   - 2.2. Cutting: Minimize and make good edges. Cuts to cable tray to be square along an unperforated line.
   - 2.3. Treatment of cut surface: Extend 25 mm beyond the cut. Match finish of cable supports.
3. Access: Provide space around cable ladder and tray to permit access for installing and maintaining cables.
4. Joints and expansion couplers
   - 4.1. Position: Locate between the bracket support and the quarter point.
   - 4.2. Number of joints: Minimize.
   - 4.3. Lengths of cable ladder and tray: Maximize.
   - 4.4. Ends: Blank with end plates.
5. Changes of size and direction: Manufacturer's accessories of the same material type, pattern, finish and thickness as cable supports.
6. Fire barriers: Provide where required to maintain fire performance of fabric.
7. Protective covers: Provide to cables requiring mechanical protection.
8. Support
   - 8.1. Fixing arrangement:
   - 8.2. Clearance from building fabric (minimum): 20 mm.
9. Components: Avoid contact between dissimilar metals.
10. Routing of cable ladder and tray: Submit drawings showing the proposed routes of cable ladder and cable tray.

Pr_65_70_11/650 Multiple cable runs

1. Requirement: Use cable tray when three or more cables are run in parallel.

Pr_65_70_11/721 Installing rigid metallic conduit

1. General requirements:
2. Fixings:
3. Joints:
4. Threaded conduits: Tightly screw to ensure electrical continuity, with no thread showing.
5. Conduit connections to boxes and items of equipment, other than those with threaded entries: Earthing coupling with male brass bush and protective conductor.

See Pr_80_51_51/620 Installing electrical monitoring and metering equipment in Ss_70_10_70_85 Stand-alone photovoltaic systems

Ss_70_30_45/611 Removing low-voltage distribution systems

1. Scope:

Ss_70_30_45/625 Installing low-voltage distribution systems

1. Standard: In accordance with BS 7671.

2. Layout: Position cabling and equipment to provide safe and easy access for operation and maintenance.

System completion

Ss_70_30_45/811 Inspecting, testing and commissioning of switchgear generally

1. Standard: In accordance with BS 7671.
2. Notice before testing and commissioning: Seven days.
3. Switches and circuit breakers: Clean to remove all visible traces of dust.
4. Protective devices settings: Configure to match the grading study.
5. Switchboard monitoring: Continuous for 30 minutes following first energizing.
6. Additional inspecting and testing: Check levelling and alignment of assembly. Check operation of instruments and metering devices. Check and adjust tightness of busbar connections and supports. Check tightness of bolted connections. Check busbar joints with duct or resistance measurements. Check earth connections at compartments, switches and earth electrodes. Check clearance of live parts from direct contact. Check polarity and phase sequence of protective devices. Check operation of protective devices using secondary and primary current injection. Manually operate protective devices. Carry out earth fault protection simulation tests. Check functional operation of circuit breakers. Check operation of switch tripping devices.
7. Testing and commissioning results: Submit two copies.
8. Certificates of calibration for meters and instruments: Submit.

Ss_70_30_45/821 Documentation for low-voltage distribution systems

1. Operating and maintenance instructions
   1.1. Scope: Submit for the system giving optimum settings for controls.
   1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
   1.3. Format: Electronic.
   1.4. Number of copies: Two.
2. Record drawings
   2.1. Content: For all low-voltage distribution circuits: the cable origin, circuit designation, route, loading, conductor material and c.s.a., insulation type and colour, number of cores per cable, number of cables in trunking and conduit. Whether cables are run on surface, concealed in walls, floors, above suspended ceilings or within roof spaces. Location, route and depth of underground cables. Location of LV switchgear including distribution boards. Routes of trunking, conduit, cable tray and cable ladders. Schematic drawings showing all low-voltage distribution circuits: the cable origin, circuit designation, cable type, size, number of cores, size and type of overcurrent protective device.
   2.2. Drawing format: A1 paper print drawing. Electronic drawing.
   2.3. Number of copies: Three.
3. Submittal date: At handover.

Ss_70_30_45/840 Maintenance of low-voltage distribution

1. Servicing and maintenance: Undertake.
2. Duration:

Ω End of System

Ss_70_30_80_35
Hardwired low-voltage small power systems

Systems

Ss_70_30_80_35 Hardwired low-voltage small power systems

1. Description:
2. System performance: Ss_70_30_80/210 Design of low-voltage small power systems; Ss_70_30_80/215 Low-voltage small power cables generally; Ss_70_30_80/220 Conduit, trunking and ducting generally; Ss_70_30_80/230 Multi-gang power outlets
3. Connection to low-voltage supply:
4. Final circuit cabling: Pr_65_70_48_75 Low-smoke halogen-free (LSHF) insulated single-core non-sheathed cables; Pr_65_70_48_29 Fire-resistant screened low-smoke halogen-free (LSHF) cables; Pr_65_70_48_91 Thermosetting insulated thermoplastic-sheathed low-smoke halogen-free (LSHF) cables
5. Cable accessories: Pr_65_70_11_15 Cable ties; Pr_65_70_11_13 Cable cleats
6. Containment: Pr_65_70_11_17 Cable trays; Pr_65_70_11_71 Rigid conduit; Pr_65_70_11_96 Dado Trunking Wall and ceiling-mounted cable trunking and ducting
7. Power conditioning equipment: Pr_65_72_27_48 Low-voltage power supply surge protection devices
8. Electrical accessories and outlets: Pr_65_72_97_21 Cooker connection units; Pr_65_72_97_29 Electric vehicle charging points; Pr_65_72_97_30 Fan isolators; Pr_65_72_97_31 Fused connection units; Pr_65_72_97_52 Multi-gang power outlets; Pr_65_72_97_84 Standard socket outlets
9. Electrical identification: Pr_40_10_57_23 Electrical diagrams; Pr_40_10_57_29 Equipment labels and warning notices
10. Execution: Ss_70_30_80/610 Removing low-voltage small power systems; Ss_70_30_80/620 Installing low-voltage small power systems; Ss_70_30_80/630 Installing cabling to socket outlets
11. System completion: Ss_70_30_80/820 Documentation for low-voltage small power systems; Ss_70_30_80/840 Maintenance of low-voltage small power systems

System performance

Ss_70_30_80/210 Design of low-voltage small power systems

1. Provision of small power: For fixed and portable equipment requiring power.
2. Design: Complete for the low-voltage small power systems.
3. Standards: In accordance with BS 7671.
4. Diversity: In accordance with IET Guidance Note 1.
5. Spare capacity throughout the small power system: 20%.
6. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.

Ss_70_30_80/215 Low-voltage small power cables generally

1. Standard: In accordance with BS 7671.
2. Proposed selection of low-voltage cables: Submit drawings, technical information, calculations and manufacturers' literature.
3. Cable sizes not stated: Submit.
4. Format: Amtech.

Ss_70_30_80/220 Conduit, trunking and ducting generally

1. Standard: In accordance with BS 7671.
2. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.
3. Conduit, trunking and ducting sizes not stated: Submit.

Ss_70_30_80/230 Multi-gang power outlets

1. Quantity:

Products

See Pr_40_10_57_23 Electrical diagrams in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_40_10_57_29 Equipment labels and warning notices in Ss_60_40_37_48 Low-temperature hot water heating systems

See Pr_65_70_11_13 Cable cleats in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11_15 Cable ties in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11_17 Cable trays in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11_71 Rigid conduit in Ss_70_30_45_45 Low-voltage distribution systems

Pr_65_70_11_96 Dado Trunking Wall and ceiling-mounted cable trunking and ducting

Shared by: Ss_75_70_54_10 Building monitoring and management systems and Ss_75_40_75_40 Intrusion and hold-up alarm systems

1. Description:
2. Manufacturer: Marshall-Tufflex Ltd
3. Contact details
   - 3.1. Address: 55-65 Castleham Road
     St. Leonards-on-Sea
     East Sussex
     TN38 9NU
   - 3.2. Telephone: +44 (0)1424 856600
   - 3.3. Web: www.marshall-tufflex.com
   - 3.4. Email: sales@marshall-tufflex.com
4. Product reference: Sterling Curve Profile 2 PVC-U Trunking
5. Standards: BS 7671:2018 BS EN 50085-1:2005+A1:2013 BS EN 50085-2-1:2006+A1:2011 IEC 61084-1:2017 IEC 61084-2-1:2017 BS 5733:2010+A1:2014 BS EN 60695-2-11:2014
6. Sizes: 167 x 50 mm
7. Execution: Pr_65_70_11/741 Installing trunking generally

Pr_65_70_48_29 Fire-resistant screened low-smoke halogen-free (LSHF) cables

1. Description: Fro fire alarm etc.
2. Standard: To BS 7629-1.
3. Third-party certification: British Approvals Service for Cables (BASEC)-certified.
4. Fire resistance category:

5. Execution: Pr_65_70_48/635 Installing low-voltage cables; Pr_65_70_48/660 Installing low-voltage cables in conduit and trunking; Pr_65_70_48/735 Cable installation on channel cable supports, cable tray, cable ladder and cable basket

Pr_65_70_48_75 Low-smoke halogen-free (LSHF) insulated single-core non-sheathed cables

Shared by: Ss_70_80_33_35 Hardwired general lighting systems

1. Description:
2. Standards: To BS EN 50525-1 and BS EN 50525-3-41.
3. Third-party certification: British Approvals Service for Cables (BASEC)-certified.
4. Execution: Pr_65_70_48/635 Installing low-voltage cables; Pr_65_70_48/660 Installing low-voltage cables in conduit and trunking

Pr_65_70_48_91 Thermosetting insulated thermoplastic-sheathed low-smoke halogen-free (LSHF) cables

Shared by: Ss_70_80_33_35 Hardwired general lighting systems

1. Description: Twin and Earth
2. Standard: To BS 7211.
3. Third-party certification: British Approvals Service for Cables (BASEC)-certified.
4. Execution: Pr_65_70_48/635 Installing low-voltage cables; Pr_65_70_48/660 Installing low-voltage cables in conduit and trunking; Pr_65_70_48/735 Cable installation on channel cable supports, cable tray, cable ladder and cable basket

Pr_65_72_27_48 Low-voltage power supply surge protection devices

1. Description:
2. Standard: To BS EN 61643-11, Type 2.
3. Operating voltage and frequency (nominal): 400 V at 50 Hz.
4. Mode of protection: Lines to earth, lines to neutral, neutral to earth.
5. Execution: Pr_65_72_27/610 Installing surge protective devices for low-voltage power supplies

Pr_65_72_97_21 Cooker connection units

1. Description:
2. Manufacturer: MK Electric
3. Standard: To BS 5733.
4. Individual terminal block capacity (minimum): 10 mm² stranded cable.
5. Mounting: Flush.
6. Execution: Pr_65_72_97/610 Installing electrical accessories

Pr_65_72_97_29 Electric vehicle charging points

1. Description: TBC
2. Manufacturer:
3. Standards:
4. Charging mode:
5. Input voltage:
6. Input current:
7. Rated frequency: 50 Hz.

8. Power output:
9. Outlet type:
10. Mounting:
11. Impact protection (minimum):
12. Ingress protection (minimum):
13. Circuit protection:
14. Accessories:

Pr_65_72_97_30 Fan isolators

1. Description:
2. Manufacturer: MK Electric
3. Model: Logic Plus
4. Standards: To BS EN 60669-1 and BS EN 60669-2-4.
5. Current rating: 10 A.
6. Poles: Triple-pole.
7. Mounting: Flush.
8. Insert colour:
9. Execution: Pr_65_72_97/610 Installing electrical accessories

Pr_65_72_97_31 Fused connection units

1. Description:
2. Manufacturer: MK Electric
3. Standard: To BS 1363-4.
4. Control
    4.1. Type: Double-pole, switched.
    4.2. Indicator lamp: Not required.
5. Mounting: Flush.
6. Flex outlet: Front entry.
7. Ingress protection (minimum): To BS EN 60529, IP20.
8. Fuse carrier access: Pull out.
9. Execution: Pr_65_72_97/610 Installing electrical accessories

Pr_65_72_97_52 Multi-gang power outlets

1. Description:
2. Manufacturer:
3. Standard: To BS 1363-2.
4. Current rating:
5. Fuse protection: To BS 1362.
6. Outgoing ways
    6.1. Type:
    6.2. Quantity:
7. Cable length (minimum):
8. Features:

Pr_65_72_97_84 Standard socket outlets

1. Description:
2. Manufacturer: MK Electric
3. Model: MK Logic Plus
4. Standard: To BS 1363-2.
5. Control
   5.1. Switch position: Outboard.
6. Mounting: Flush.
7. Features: Two no. 5 V d.c. 2.2 A USB-C charger ports. - where indicated on room data sheets
8. Execution: Pr_65_72_97/610 Installing electrical accessories

Execution

See Pr_65_70_11/621 Installing cable tray and cable ladder in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/650 Multiple cable runs in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/721 Installing rigid metallic conduit in Ss_70_30_45_45 Low-voltage distribution systems

Pr_65_70_11/741 Installing trunking generally

1. Changes of direction: Manufacturer's bends and tees.
2. Joints
   2.1. Generally: Manufacturer's jointing fittings. Maintain rigidity of trunking across joint.
   2.2. Number of joints: Minimize.
   2.3. Lengths of trunking: Maximize.
   2.4. Open ends: Blank using manufacturer's removable end caps.
   2.5. Metal edging: Protect with PVC edging strip.
   2.6. Electrical continuity: Maintain at each joint with a copper link fitted on the outside of the trunking.
3. Connections to conduit, boxes, equipment and accessories: Screwed couplings, adaptors, connectors and glands, with rubber bushes at open ends.
4. Connections to trunking covers: Minimize.
5. Electrical continuity of covers: Electrically continuous with the trunking or provide protective conductors.
6. Access: Provide space around trunking to permit access for installing and maintaining cables. Set out access with covers on a continuous face to allow cabling to be laid in throughout its entire length.
7. Trunking passing through building fabric openings: Provide fixed trunking covers. Extend covers 50 mm from both sides of the opening.
8. Cable-retaining straps: Required except when trunking cover is on top.

Pr_65_70_48/635 Installing low-voltage cables

Shared by: Pr_65_70_15_53 Multicore alarm cables and Pr_65_70_15_06 Balanced twisted pair cables

1. Standard: In accordance with BS 7671.
2. Timing: Do not start internal cabling until building enclosure provides permanently dry conditions.

3. Preparation: Store cables above 5°C for 24 hours before installation.

   Clear cable path of debris.
4. Installation temperature (minimum): 5°C.
5. Cables: Install in one length. Dress cables flat, free from twists, kinks and strain.
6. Cable pulling: Do not overstress. Prevent kinks and twisting of the cable.
7. Cable protection: Cables passing through walls and floors to be sleeved with conduit or pipeduct to a minimum of 300 mm. Bush at both ends. Ensure that appropriate fire stopping materials are used to maintain the original fire integrity of the wall or floor around the penetration.
8. Concealed cable runs to wall accessories: Run vertically from the accessory.
9. Exposed cable runs:
10. Distance from other services running parallel (minimum): 150 mm. Position cables below heating pipes.
11. Jointing and termination
    11.1. Final circuit cables: At electrical accessories only.
    11.2. Core connections: Using compression lugs to equipment without integral clamping terminals.
    11.3. Terminating cables when not using glands: Take sheathing of cables into accessory boxes and equipment and protect against abrasion with grommets.

Pr_65_70_48/660 Installing low-voltage cables in conduit and trunking

1. Cable installation: Orderly and capable of being withdrawn.
2. Single-core wiring: Arrange using the loop-in method.
3. Cables within trunking: Tie at 2 m intervals for cables of the same circuit reference. Label ties with circuit reference number at 10 m intervals.
4. Cables in vertical conduit: Provide cable clamps in accessible conduit boxes at 5 m intervals.
5. Extra-low-voltage cables: Install within a separate partition from low-voltage cables where installed in multi compartment trunking.

Pr_65_70_48/735 Cable installation on channel cable supports, cable tray, cable ladder and cable basket

1. Cabling: Install when cable supports are complete.
2. Position: Place single and multicore cables side by side.
3. Fastening
    3.1. Fastenings generally: Secure cables, do not indent sheaths. Position to enable any submain cable to be individually removed.
    3.2. Submain cables <95 mm²:
    3.3. Submain cables >95 mm²:
    3.4. Final circuit cabling: Cable ties at 250 mm (maximum) spacing.
    3.5. Extra-low-voltage and fibre-optic cabling: Cable ties at 250 mm (maximum) spacing.

Pr_65_72_27/610 Installing surge protective devices for low-voltage power supplies

1. Standards: In accordance with BS 7671 and DD CLC/TS 61643-12.
2. Point of installation: At main low-voltage switchboard.
3. Mounting arrangement: Within the enclosure of the equipment to be protected.

Pr_65_72_97/610 Installing electrical accessories

Shared by: Pr_70_75_04_06 Balanced twisted pair cable outlet plates and Pr_65_72_97_22 Dimmer switches and controls

1. Standard: In accordance with BS 7671.
2. Accessory faceplates: Free from any traces of plaster, grout, paint or similar.
3. Positioning: Coordinate with other wall- or ceiling-mounted equipment.
4. Alignment: Align adjacent accessories on the same vertical or horizontal axis.
5. Fixing: Fix securely, plumb and level to vertical and horizontal axes.
6. Mounting heights
    6.1. Generally: Measure from finished floor level to centre line of accessory.
    6.2. Light switches: *1100 mm*
    6.3. Socket outlets: *900 mm where not mounted on trunking system*
    6.4. Fan isolators: Adjacent fan.
    6.5. Telecommunications and data outlets: *450 mm where not mounted on trunking system*.
7. Separation distance between adjacent accessories (minimum): 30 mm.

Ss_70_30_80/610 Removing low-voltage small power systems

1. Scope:

Ss_70_30_80/620 Installing low-voltage small power systems

1. Standard: In accordance with BS 7671.

Ss_70_30_80/630 Installing cabling to socket outlets

1. General:

System completion

Ss_70_30_80/820 Documentation for low-voltage small power systems

1. Operating and maintenance instructions
    1.1. Scope: Submit for the system giving optimum settings for controls.
    1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
    1.3. Format: Paper copy.
    1.4. Number of copies:
2. Record drawings
    2.1. Content:
    2.2. Format:
    2.3. Number of copies:
3. Submittal date: At handover.

Ss_70_30_80/840 Maintenance of low-voltage small power systems

1. Servicing and maintenance:
2. Duration:

Ω End of System

Ss_70_30_94_27
Electric vehicle charging systems

Systems

Ss_70_30_94_27 Electric vehicle charging systems

1. Description:
2. System performance:
3. System manufacturer:
4. System reference:
5. Standards:
6. Certification:
7. Products:
8. Execution:
9. System completion:

Ω End of System

Ss_70_80_25_05
Amenity lighting systems

Systems

Ss_70_80_25_05 Amenity lighting systems

1. Description:
2. System performance: Ss_70_80_25/220 Design of amenity lighting systems; Ss_70_80_25/250 Lighting performance of external lighting systems
3. Electrical supply:
4. Final circuit cabling: Pr_65_70_48_61 Polyvinyl chloride (PVC)-insulated and sheathed cables
5. Containment: Pr_65_70_11_71 Rigid conduit
6. Rewireable installation: Required.
7. Concealed installation: Required.
8. Luminaires: Pr_70_70_48_02 Area floodlights
9. Lamp types:
10. Controls
    10.1. Types: BMS
11. System accessories:
12. Electrical identification: Pr_40_10_57_23 Electrical diagrams; Pr_40_10_57_29 Equipment labels and warning notices
13. Execution: Ss_70_80_25/620 Installing external lighting systems
14. System completion: Ss_70_80_25/820 Documentation for external lighting systems; Ss_70_80_25/812 Commissioning of external lighting systems

System performance

Ss_70_80_25/220 Design of amenity lighting systems

1. Design: Complete the design of the amenity lighting system.
2. Standards:
3. Lighting class:
4. Average power density energy consumption (maximum):
5. Initial circuit luminous efficacy (minimum):
6. Proposals:

Ss_70_80_25/250 Lighting performance of external lighting systems

1. Task area:
2. Maintained average illuminance level (lx):
3. Glare index (maximum):
4. Uniformity (minimum):
5. Colour rendering index (Ra):
6. Colour temperature (K):

Products

See Pr_40_10_57_23 Electrical diagrams in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_40_10_57_29 Equipment labels and warning notices in Ss_60_40_37_48 Low-temperature hot water heating systems

See Pr_65_70_11_71 Rigid conduit in Ss_70_30_45_45 Low-voltage distribution systems

Pr_65_70_48_61 Polyvinyl chloride (PVC)-insulated and sheathed cables

1. Description:
2. Manufacturer:
3. Standard: To BS 6004.
4. Third-party certification:
5. Cable type:
6. Size:
7. Sheath colour: Grey.
8. Reaction to fire class
    - 8.1. Fire behaviour:
    - 8.2. Additional classification for smoke production:
    - 8.3. Additional classification for flaming droplets and/ or particles:
    - 8.4. Additional classification for acidity:
9. Execution:

Pr_70_70_48_02 Area floodlights

1. Description:
2. Manufacturer:
3. Standards: To BS EN IEC 60598-1 and BS EN 60598-2-5.
4. Third-party certification:
5. Luminaire description:
6. Classification
    - 6.1. Electric shock:
    - 6.2. Ingress protection (minimum):
    - 6.3. Suitability for direct mounting on normally flammable surfaces:
    - 6.4. Circumstances of use:
7. Rated maximum ambient temperature:
8. Impact protection (minimum):
9. Luminaire performance: To BS EN 62722-1 and BS EN 13032-1.
10. Controlgear position:
11. Supply circuit conductor connections:
12. Internal fuse:
13. Nominal voltage:
14. Luminaire power factor:
15. LED luminaires
    - 15.1. Performance standards: To BS EN 62717 and BS EN 62722-2-1.
    - 15.2. Safety standard: To BS EN IEC 62031.
    - 15.3. Initial LED luminaire efficacy (minimum):
    - 15.4. Wattage:
    - 15.5. Colour temperature:
    - 15.6. Colour rendering index (Ra):

15.7. Beam angle:
15.8. Useful life:

16. Non-LED luminaires
    16.1. Ballasts' CELMA energy efficiency index (minimum):
    16.2. Lamp properties
        16.2.1. Wattage:
        16.2.2. Colour temperature:
        16.2.3. Colour rendering index (Ra):
        16.2.4. Beam angle:
        16.2.5. Initial lumens (minimum):
17. Dimming protocol:
18. Prewired cable length (minimum):
19. Accessories:
20. Execution:

Execution

See Pr_65_70_11/721 Installing rigid metallic conduit in Ss_70_30_45_45 Low-voltage distribution systems

Ss_70_80_25/620 Installing external lighting systems

1. Standard:

System completion

Ss_70_80_25/812 Commissioning of external lighting systems

1. Setting for control devices: Submit.
2. Operation of control devices: Verify.
3. Orientation of adjustable luminaires: Adjust to give optimum performance.

Ss_70_80_25/820 Documentation for external lighting systems

1. Operating and maintenance instructions
    1.1. Scope: Submit for the system giving optimum settings for controls.
    1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
    1.3. Format: Paper copy.
    1.4. Number of copies:
2. Record drawings
    2.1. Content:
    2.2. Format:
    2.3. Number of copies:
3. Submittal date: At handover.

Ω End of System

Ss_70_80_33_35
Hardwired general lighting systems

Systems

Ss_70_80_33_35 Hardwired general lighting systems

1. Description:
2. System performance: Ss_70_80_33/210 Design of general lighting systems; Ss_70_80_33/215 Design of emergency lighting systems; Ss_70_80_33/240 Lighting performance; Ss_70_80_33/245 Maintenance factor calculations; Ss_70_80_33/270 Lighting cables generally; Ss_70_80_33/280 Conduit, trunking and ducting generally
3. Final circuit cabling: Pr_65_70_48_91 Thermosetting insulated thermoplastic-sheathed low-smoke halogen-free (LSHF) cables; Pr_65_70_48_75 Low-smoke halogen-free (LSHF) insulated single-core non-sheathed cables
4. Containment: Pr_65_70_11_17 Cable trays; Pr_65_70_11_71 Rigid conduit
5. Luminaire types: Pr_70_70_48_86 Suspended luminaires; Pr_70_70_48_85 Surface luminaires; Pr_70_70_48_71 Recessed luminaires
6. Lamp types:
7. Connections to luminaires: Pr_60_70_22_46 Lighting distribution boxes
8. Lighting controls: Pr_70_70_47_45 Lighting control modules; Pr_70_70_47_21 Daylight sensors; Pr_65_72_97_22 Dimmer switches and controls; Pr_75_50_76_58 Occupancy detectors
9. Accessories:
10. Electrical identification: Pr_40_10_57_23 Electrical diagrams; Pr_40_10_57_29 Equipment labels and warning notices
11. Execution: Ss_70_80_33/610 Removing lighting systems; Ss_70_80_33/630 Installing general lighting systems; Ss_70_80_33/640 Installing emergency lighting systems; Ss_70_80_33/710 Installing safety signs; Ss_70_80_33/720 Labelling of lighting controls
12. System completion: Ss_70_80_33/810 Testing and commissioning of general lighting systems; Ss_70_80_33/812 Testing and commissioning emergency lighting systems; Ss_70_80_33/815 Photometric survey of general lighting systems; Ss_70_80_33/817 Photometric survey of emergency lighting systems; Ss_70_80_33/820 Documentation relating to general lighting; Ss_70_80_33/822 Documentation relating to emergency lighting; Ss_70_80_33/840 Maintenance of lighting systems

System performance

Ss_70_80_33/210 Design of general lighting systems

1. Design: Complete the design of the general lighting systems. Complete commissioning checklist in accordance with Commissioning Code L, Appendix LA2.
2. Standard: To BS EN 12464-1. In accordance with SLL Code for lighting.
3. Design calculations: Luminaire efficacy method.
4. Submit the following information: Luminaire layout drawings. Luminaire photometric data, including flux fraction ratios, polar intensity curves and utilization factors. Luminaire spacing tables. Lamp and luminaire technical information. Computer generated point calculations with contribution from inter-reflected light showing isolux contour plots for working plane and room surfaces. Room surface reflectance values. Schedule of design and calculated maintained average illuminance values. Schedule of design and calculated uniformity values.

Ss_70_80_33/215 Design of emergency lighting systems

1. System designer:
2. Design: Complete the design of the emergency lighting and signage systems.

3. Standards: To BS EN 1838, BS EN 50172 and in accordance with BS 5266-1.
4. Submit the following information: Luminaire layout drawings. Luminaire photometric data, including lamp light output data at beginning and end of battery discharge. Luminaire spacing tables. Lamp and luminaire technical information. Isolux contour plots. Schedule of design and calculated maintained average illuminance values. Schedule of design and calculated uniformity values.
5. Emergency lighting classification
    5.1. Type: X.
    5.2. Duration of emergency mode: 120 minutes.

Ss_70_80_33/240 Lighting performance

1. Task area: Floor.
2. Colour temperature (K): 4000.
3. Means of control: Local.
4. Lamp Lifetime Factor: L80/80,000

Ss_70_80_33/245 Maintenance factor calculations

1. Luminaire cleaning interval:
2. Lamp replacement strategy:
3. Maintenance factors:

Ss_70_80_33/270 Lighting cables generally

1. Standard: In accordance with BS 7671.
2. Requirement: Submit proposals, including detailed design drawings, technical information, calculations and manufacturers' literature.
3. Conductor sizes (minimum)
    3.1. Lighting circuits: 1.5 mm².
    3.2. Final connection: 0.75 mm².
4. Cable sizes not stated: Submit.
5. Format:

Ss_70_80_33/280 Conduit, trunking and ducting generally

1. Standard: In accordance with BS 7671.
2. Requirement: Submit proposals, including detailed design drawings, technical information, calculations and manufacturers' literature.
3. Conduit, trunking and ducting sizes not stated: Submit.

Products

See Pr_40_10_57_23 Electrical diagrams in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_40_10_57_29 Equipment labels and warning notices in Ss_60_40_37_48 Low-temperature hot water heating systems

Pr_60_70_22_46 Lighting distribution boxes

1. Description:
2. Standards: To BS 5733.
3. Material: Low-carbon sheet steel.
4. Finish: Galvanized.
5. Rated current (InA):

6. Connectors
    6.1. Arrangement: Recessed input and outgoing connections.
    6.2. Power input connection: Extender lead from master distribution box.
    6.3. Power output connector type: Fully shrouded female connector.

See Pr_65_70_11_17 Cable trays in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11_71 Rigid conduit in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_48_75 Low-smoke halogen-free (LSHF) insulated single-core non-sheathed cables in Ss_70_30_80_35 Hardwired low-voltage small power systems

See Pr_65_70_48_91 Thermosetting insulated thermoplastic-sheathed low-smoke halogen-free (LSHF) cables in Ss_70_30_80_35 Hardwired low-voltage small power systems

Pr_65_72_97_22 Dimmer switches and controls

1. Description: Integrated into light fittings where possible
2. Standards: To BS EN 60669-1 and BS EN 60669-2-1.
3. Insert colour:
4. Execution: Pr_65_72_97/610 Installing electrical accessories; Pr_65_72_97/640 Installing light switches

Pr_70_70_47_21 Daylight sensors

1. Description: Integrated into light fittings where possible
2. Manufacturer:
3. Standards: To BS EN 60669-1 and BS EN 60669-2-1
4. Equipment interconnectivity:
5. Input voltage:
6. Light level sensor:
7. Remote set-up/ override:
8. Mounting:
9. Ingress protection (minimum):
10. Execution:

Pr_70_70_47_45 Lighting control modules

1. Description:
2. Manufacturer:
3. Standards:
4. Controller type:
5. Equipment interconnectivity:
6. Rated voltage: 230 V a.c.
7. Rated current:
8. Control protocol:
9. Communication ports:
10. Addressable input ports:
11. Addressable output ports:
12. Enclosure
    12.1. Ingress protection (minimum):

12.2. Material:
12.3. Finish:
12.4. Mounting:
13. Execution:

Pr_70_70_48_71 Recessed luminaires

1. Description:
2. Manufacturer:
3. Standards:
4. Third-party certification:
5. Luminaire description:
6. Classification
   6.1. Electric shock:
   6.2. Ingress protection (minimum):
   6.3. Suitability for direct mounting on normally flammable surfaces:
   6.4. Circumstances of use:
7. Rated maximum ambient temperature:
8. Impact protection (minimum):
9. Luminaire performance: To BS EN 62722-1 and BS EN 13032-1.
10. Controlgear position:
11. Supply circuit conductor connections:
12. Internal fuse:
13. Nominal voltage:
14. Luminaire power factor:
15. LED luminaires
    15.1. Performance standards: To BS EN 62717 and BS EN 62722-2-1.
    15.2. Safety standard: To BS EN IEC 62031.
    15.3. Initial LED luminaire efficacy (minimum):
    15.4. Wattage:
    15.5. Colour temperature:
    15.6. Colour rendering index (Ra):
    15.7. Beam angle:
    15.8. Useful life:
16. Non-LED luminaires
    16.1. Ballasts' CELMA energy efficiency index (minimum):
    16.2. Number of lamps:
    16.3. Lamp properties
        16.3.1. Wattage:
        16.3.2. Colour temperature:
        16.3.3. Colour rendering index (Ra):
        16.3.4. Beam angle:
        16.3.5. Initial lumens (minimum):
17. Dimming protocol:
18. Emergency version

18.1. Standard: To BS EN 60598-2-22.
18.2. Classification
18.2.1. Type:
18.2.2. Mode of operation:
18.2.3. Facilities:
18.2.4. Duration of emergency mode (minimum):
19. Integral sensors:
20. Accessories:
21. Execution:

Pr_70_70_48_85 Surface luminaires

1. Description:
2. Manufacturer:
3. Standard:
4. Third-party certification:
5. Luminaire description:
6. Classification
6.1. Electric shock:
6.2. Ingress protection (minimum):
6.3. Suitability for direct mounting on normally flammable surfaces:
6.4. Circumstances of use:
7. Rated maximum ambient temperature:
8. Impact protection (minimum):
9. Luminaire performance: To BS EN 62722-1 and BS EN 13032-1.
10. Controlgear position:
11. Supply circuit conductor connections:
12. Internal fuse:
13. Nominal voltage:
14. Luminaire power factor:
15. LED luminaires
15.1. Performance standards: To BS EN 62717 and BS EN 62722-2-1.
15.2. Safety standard: To BS EN IEC 62031.
15.3. Initial LED luminaire efficacy (minimum):
15.4. Wattage:
15.5. Colour temperature:
15.6. Colour rendering index (Ra):
15.7. Beam angle:
15.8. Useful life:
16. Non-LED luminaires
16.1. Ballasts' CELMA energy efficiency index (minimum):
16.2. Number of lamps:
16.3. Lamp properties
16.3.1. Wattage:
16.3.2. Colour temperature:

16.3.3. Colour rendering index (Ra):
16.3.4. Beam angle:
16.3.5. Initial lumens (minimum):
17. Dimming protocol:
18. Emergency version
18.1. Standard: To BS EN 60598-2-22.
18.2. Classification
18.2.1. Type:
18.2.2. Mode of operation:
18.2.3. Facilities:
18.2.4. Duration of emergency mode (minimum):
19. Integral sensors:
20. Accessories:
21. Execution:

Pr_70_70_48_86 Suspended luminaires

1. Description:
2. Manufacturer:
3. Standards: To BS EN IEC 60598-1 and BS EN IEC 60598-2-1.
4. Third-party certification:
5. Luminaire description:
6. Classification
6.1. Electric shock:
6.2. Ingress protection (minimum):
6.3. Suitability for direct mounting on normally flammable surfaces:
6.4. Circumstances of use:
7. Rated maximum ambient temperature:
8. Impact protection (minimum):
9. Luminaire performance: To BS EN 62722-1 and BS EN 13032-1.
10. Controlgear position:
11. Supply circuit conductor connections:
12. Internal fuse:
13. Nominal voltage:
14. Luminaire power factor:
15. LED luminaires
15.1. Performance standards: To BS EN 62717 and BS EN 62722-2-1.
15.2. Safety standard: To BS EN IEC 62031.
15.3. Initial LED luminaire efficacy (minimum):
15.4. Wattage:
15.5. Colour temperature:
15.6. Colour rendering index (Ra):
15.7. Beam angle:
15.8. Useful life:
16. Non-LED luminaires

16.1. Ballasts' CELMA energy efficiency index (minimum):
16.2. Number of lamps:
16.3. Lamp properties
16.3.1. Wattage:
16.3.2. Colour temperature:
16.3.3. Colour rendering index (Ra):
16.3.4. Beam angle:
16.3.5. Initial lumens (minimum):
17. Dimming protocol:
18. Emergency version
18.1. Standard: To BS EN 60598-2-22.
18.2. Classification
18.2.1. Type:
18.2.2. Mode of operation:
18.2.3. Facilities:
18.2.4. Duration of emergency mode (minimum):
19. Integral sensors:
20. Accessories:
21. Execution:

Pr_75_50_76_58 Occupancy detectors

1. Description:
2. Manufacturer:
3. Standards: To BS EN 60669-1 and BS EN 60669-2-1.
4. Sensor type:
5. Nominal voltage:
6. Rated current:
7. Detection method:
8. Occupancy sensitivity:
9. Light level sensor:
10. Range:
11. Field of view:
12. Switching delay:
13. Set-up:
14. Mounting:
15. Ingress protection (minimum):
16. Equipment interconnectivity
16.1. Wired: Required.
16.2. Radio-based
16.2.1. Communications protocol:
16.2.2. Sensor power supply:
16.2.3. Battery life (minimum):
17. Execution:

Execution

See Pr_65_70_11/621 Installing cable tray and cable ladder in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/650 Multiple cable runs in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/721 Installing rigid metallic conduit in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_48/635 Installing low-voltage cables in Ss_70_30_80_35 Hardwired low-voltage small power systems

See Pr_65_70_48/660 Installing low-voltage cables in conduit and trunking in Ss_70_30_80_35 Hardwired low-voltage small power systems

See Pr_65_70_48/735 Cable installation on channel cable supports, cable tray, cable ladder and cable basket in Ss_70_30_80_35 Hardwired low-voltage small power systems

See Pr_65_72_97/610 Installing electrical accessories in Ss_70_30_80_35 Hardwired low-voltage small power systems

Pr_65_72_97/640 Installing light switches

1. Multigang switches: Connect so that there is a logical relationship with luminaire positions.
2. Unused switch spaces: Fit with blanks.
3. Segregation: Internally segregate each phase with phase barriers. Include warning plates.

Ss_70_80_33/610 Removing lighting systems

1. Scope:
2. Disposal of batteries: In accordance with manufacturer's recommended procedures.

Ss_70_80_33/630 Installing general lighting systems

1. Standard: In accordance with BS 7671 and CIBSE Commissioning Code L.
2. Commissioning method statement:
3. Luminaire layout:
4. Fixing master/ lighting distribution boxes:
5. Connection of luminaire-supporting couplers
    5.1. General luminaires: White plug with white cover.
    5.2. Flex length (maximum):
6. Switches and controls
    6.1. Location:
    6.2. Staircases: Two-way switching at top and bottom landings with intermediate at full landings.
7. Rooms smaller than 4 m²: Restrict lighting circuits to one electrical phase.

Ss_70_80_33/640 Installing emergency lighting systems

1. Standards: In accordance with BS 5266-1 and BS 7671.
2. Connection of luminaire-supporting couplers
    2.1. Emergency luminaires: Red plug with red cover.
    2.2. Flex length (maximum):
3. Permanent electrical supplies to self-contained emergency luminaires: Derive from the closest general lighting circuit.

Ss_70_80_33/710 Installing safety signs

1. Standard: Escape route signs in accordance with BS 5499-4, other safety signs in accordance with BS 5499-10.
2. Position:
3. Fixing: To building fabric so that the removal of the sign requires a special tool.
4. Orientation: Plumb and level.

Ss_70_80_33/720 Labelling of lighting controls

1. Equipment and sensor identification labels: Provide.
2. Lighting controls: Label each component describing its purpose.
3. Output circuits: Label each cable at point of connection to lighting distribution boxes, master distribution boxes and lighting control modules.

System completion

Ss_70_80_33/810 Testing and commissioning of general lighting systems

1. Standards:
2. Test results:
3. Certificates of calibration for meters and instruments: Submit.

Ss_70_80_33/812 Testing and commissioning emergency lighting systems

1. Commissioning:
2. Results:
3. Certificates of calibration for meters and instruments: Submit.

Ss_70_80_33/815 Photometric survey of general lighting systems

1. Standard: In accordance with SLL Code for lighting.
2. Position:
3. Test conditions: Full blackout.

   Allow lamps and luminaire output to stabilize prior to beginning measurement.
4. Average illuminance measurement method: Full grid.
5. Results
   5.1. Submit for the following: Maintained average illuminance.

   Diversity.

   Uniformity.
   5.2. Format:
   5.3. Number of copies:
6. Survey photographs:

Ss_70_80_33/817 Photometric survey of emergency lighting systems

1. Standard: In accordance with BS 5266-1, Annex D.
2. Position:
3. Test conditions: Full blackout.

   Minimize extraneous light.

4. Results
    4.1. Format:
    4.2. Number of copies:

Ss_70_80_33/820 Documentation relating to general lighting

1. Operating and maintenance instructions
    1.1. Scope: Submit for the system giving optimum settings for controls.
    1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
    1.3. Format: Paper copy.
    1.4. Number of copies:
2. Record drawings
    2.1. Content:
    2.2. Format:
    2.3. Number of copies:
3. Submittal date: At handover

Ss_70_80_33/822 Documentation relating to emergency lighting

1. Operating and maintenance instructions
    1.1. Scope: Submit for the system giving optimum settings for controls.
    1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
    1.3. Format: Paper copy.
    1.4. Number of copies:
2. Record drawings
    2.1. Content:
    2.2. Format:
    2.3. Number of copies:
3. Submittal date: At handover.
4. Certification for re-engineered luminaires:
5. Logbook: Submit, including the following information: date of commissioning of the system, including any certificate relating to alterations;

    Date of each periodic inspection and test;

    Date and brief details of each service, inspection or test carried out;

    Dates and brief details of any defects and of remedial action taken;

    Date and brief details of any alteration to the emergency lighting installation;

    If any automatic testing device is employed, a description of the main characteristic and the mode of operation;

    Details of replacement components

    of luminaires such as lamp type, battery and fuses.

Ss_70_80_33/840 Maintenance of lighting systems

1. Servicing and maintenance: Undertake.
2. Duration: Until 12 months after completion.

Ω End of System

Ss_75_10_21_21
Data distribution systems

Systems

Ss_75_10_21_21 Data distribution systems

1. Description:
2. System performance: Ss_75_10_21/210 Design of data distribution systems
3. Applications: 10GBase-T (BS ISO/IEC/IEEE 8802-3 an 10 gigabit Ethernet).
4. Cabling hierarchy
   - 4.1. Building backbone cabling:
   - 4.2. Subsidiary distributors: Pr_80_77_28_27 Fibre-optic patch panels; Pr_80_77_28_21 Data equipment cabinets; Pr_80_77_28_06 Balanced twisted pair cabling patch panels
   - 4.3. Horizontal cabling: Pr_65_70_15_06 Balanced twisted pair cables
   - 4.4. Consolidation points (CP):
   - 4.5. Telecommunications outlets (TO): Pr_70_75_04_06 Balanced twisted pair cable outlet plates
5. Containment: Pr_65_70_11_17 Cable trays
6. System accessories: Pr_40_10_57_88 Telecommunications equipment and outlets labels; Pr_70_75_88_21 Data and telecom transient overvoltage surge suppression devices
7. Execution: Ss_75_10_21/650 Installing cabinets; Ss_75_10_21/660 Connection to the public telephone network; Ss_75_10_21/670 Labelling of data distribution systems components
8. System completion: Ss_75_10_21/810 Testing and inspection of data distribution systems; Ss_75_10_21/820 Documentation for data distribution systems; Ss_75_10_21/840 Maintenance of data distribution systems

System performance

Ss_75_10_21/210 Design of data distribution systems

1. System designer
   - 1.1. Registration:
   - 1.2. Evidence of registration: Submit.
2. Design: Complete the design of the data distribution systems.
3. Standards:
4. Cabling topology
   - 4.1. Campus backbone:
   - 4.2. Building backbone cabling:
   - 4.3. Horizontal cabling:
5. Requirement:

Products

Pr_40_10_57_88 Telecommunications equipment and outlets labels

1. Description:
2. Material: Machine-printed adhesive label.
3. Content: Label each outlet with complete circuit reference. Label each outlet with complete circuit reference.

See Pr_65_70_11_17 Cable trays in Ss_70_30_45_45 Low-voltage distribution systems

Pr_65_70_15_06 Balanced twisted pair cables

Shared by: Ss_75_70_54_10 Building monitoring and management systems

1. Standard: To BS EN 50173-1. To BS EN 50173-1.
2. Third-party certification: British Approvals Service for Cables (BASEC)-certified.
3. Category: 6_A.
4. Execution: Pr_65_70_48/635 Installing low-voltage cables

Pr_70_75_04_06 Balanced twisted pair cable outlet plates

1. Description:
2. Manufacturer: MK Electric
3. Standard: To BS EN 50173-1.
4. Category: 6_A.
5. Screening: Match cabling.
6. Outlet ports: Double RJ45. Four RJ45. Single RJ45.
7. Spring-loaded shutter: Required.
8. Circuit designation label with transparent cover: Required.
9. Cable termination: Insulation displacement connection (IDC).
10. Plate
    - 10.1. Material: Plastics.
    - 10.2. Finish: White.
11. Execution: Pr_65_72_97/610 Installing electrical accessories

Pr_70_75_88_21 Data and telecom transient overvoltage surge suppression devices

1. Description:
2. Manufacturer:
3. Standard: To BS EN 61643-21.
4. Category:
5. Maximum continuous operating voltage (Uc):
6. Mode of protection:
7. Rated current:
8. Voltage protection level (Up):
9. Bandwidth:
10. Mounting method:
11. Execution:

Pr_80_77_28_06 Balanced twisted pair cabling patch panels

1. Description:
2. Manufacturer:
3. Standard: To BS EN 50173-1.
4. Arrangement:
5. Adaptor plates:
6. Height:

7. Ports with RJ-45 outlets:
8. Category:
9. Cable connections
   9.1. Front:
   9.2. Rear: Insulation displacement connection (IDC).
10. Outlet labelling
   10.1. Front: Engraved port number with circuit description and transparent cover.
   10.2. Rear: Engraved port number.

Pr_80_77_28_21 Data equipment cabinets

1. Description:
2. Manufacturer:
3. Format: To accept 19 inch racking with front and rear adjustable rails.
4. Enclosure
   4.1. Mounting:
   4.2. Size
      4.2.1. Width:
      4.2.2. Depth:
      4.2.3. Height:
   4.3. Material:
   4.4. Finish:
   4.5. Front door:
   4.6. Rear door:
   4.7. Side panels:
   4.8. Base:
5. Cabinet locks: Common key.
6. Ventilation:
7. Socket outlets
   7.1. Type:
   7.2. Arrangement:
8. Lighting:
9. Space for active equipment:
10. Cable entry with grommets:
11. Horizontal cable supports:
12. Vertical cable supports:
13. Spare U sections: Provide individual blanking plates.
14. Accessories:

Pr_80_77_28_27 Fibre-optic patch panels

1. Description:
2. Manufacturer:
3. Standard: To BS EN 50173-1.
4. Arrangement:
5. Adaptor plates:
6. Splice tray:

7. Height:
8. Ports:
9. Connector type:
10. Labelling:

Execution

See Pr_65_70_11/621 Installing cable tray and cable ladder in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/650 Multiple cable runs in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_48/635 Installing low-voltage cables in Ss_70_30_80_35 Hardwired low-voltage small power systems

See Pr_65_72_97/610 Installing electrical accessories in Ss_70_30_80_35 Hardwired low-voltage small power systems

Ss_75_10_21/650 Installing cabinets

1. Cable termination sequence: Left to right and bottom to top.
2. Clear access (minimum)
   2.1. Cabinet front: 1200 mm.
   2.2. Cabinet rear: 1200 mm.
   2.3. Cabinet sides: 1200 mm.
3. Fixing: Level and secure to floor or wall. Group wall-mounted cabinets into logical arrangements.
4. Cable route: Do not exceed 24 cables in any loom. Maximum distance between cable supports: 300 mm.
5. Patch panels: Install any fibre-optic patch panels at top of cabinet with copper patch panels below.
6. Interconnecting cabinets: Connect without side panels with manufacturer's baying kit.
7. Cabinet identification
   7.1. Type: Face-engraved rigid plastic laminate.

Ss_75_10_21/660 Connection to the public telephone network

1. Public telephone network: Connect to the main telecommunication cabinet.

Ss_75_10_21/670 Labelling of data distribution systems components

1. Standards: In accordance with BS EN 50174-1, BS EN 50174-2 and BS EN 50174-3.
2. Equipment: Label with unique identifier on face-engraved rigid plastic laminate.
3. Cable schedules
   3.1. Location: At each cabinet.
   3.2. Format: Card within a reusable clear plastics envelope.
   3.3. Size: A5.
   3.4. Contents: Incoming cable designation, purpose and origin. Outgoing cable designation, purpose and destination.
4. Patch panels: Machine-printed label with patch panel identifier.
5. Outlet ports: Machine-printed label with circuit description.
6. Cables: Wrap-around machine-printed label with cable identifier within 100 mm of each termination and every 4 m throughout the cable length.
7. Outlets: Machine-printed label with circuit description.
8. Format:

System completion

Ss_75_10_21/810 Testing and inspection of data distribution systems

1. Standards: In accordance with BS EN 50173-1.
2. Testing and inspection agent:
3. Notice before commencing tests (minimum):
4. Inspection of cabling: Inspect cables for kinks, bends, snags and compression and deformation damage.
5. Permanent link: Measure length of each cabling segment (connector to connector).
6. Pin assignment and continuity: Verify and submit results.
7. Cable temperature during testing: Submit.
8. Results: Submit in accordance with BS EN 50346, Annex A.
9. Certificates of calibration for meters and instruments: Submit.

Ss_75_10_21/820 Documentation for data distribution systems

1. Standard: In accordance with BS EN 50174-1.
2. Operating and maintenance instructions
   - 2.1. Scope: Submit for the system giving optimum settings for controls.
   - 2.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
   - 2.3. Format: Paper copy.
   - 2.4. Number of copies: Three.
3. Record drawings
   - 3.1. Content: Point of entry of PABX cable into building. Route of incoming connection cable to the public telephone network from point of entry into building and PABX. For all data cabling, the cable origin, circuit designation, route, conductor material and c.s.a., insulation type and colour, number of cores per cable, number of cables in ducts, on tray or ladder. General arrangement drawings. Cabling topology schematics. Distribution point layout drawings. Equipment room layout drawings. Interconnection diagrams. Work area layout drawings.
   - 3.2. Format: Electronic drawing. A1 paper print drawing.
   - 3.3. Number of copies: Three.
4. System warranty: Submit.
5. Submittal date: At handover.

Ss_75_10_21/840 Maintenance of data distribution systems

1. Servicing and maintenance: Undertake.
2. Duration:

Ω End of System

Ss_75_10_46_05
Audio frequency induction loop systems

Systems

Ss_75_10_46_05 Audio frequency induction loop systems

1. Description:
2. System performance: Ss_75_10_46/210 Design of induction loop systems; Ss_75_10_46/220 Induction loop system objectives
3. System manufacturer:
4. Source equipment: Pr_60_75_06_53 Microphones
5. Distribution equipment: Pr_70_75_36_40 Induction loop amplifiers; Pr_70_75_36_43 Induction loop transformers
6. Equipment interconnectivity: Wired.
7. Loop cabling
   - 7.1. Loop arrangement: Pr_70_75_36_41 Induction loop pads
   - 7.2. Cable type: Manufacturer's standard.
   - 7.3. Containment: Pr_65_70_11_71 Rigid conduit
   - 7.4. Rewireable installation: Required.
   - 7.5. Concealed installation: Required.
8. System accessories:
9. Execution: Ss_75_10_46/630 Installing induction loop systems generally; Ss_75_10_46/670 Installing induction loop cabling; Ss_75_10_46/780 Installing signage for induction loop systems
10. System completion: Ss_75_10_46/810 Testing and commissioning induction loop systems generally; Ss_75_10_46/820 Documentation for induction loop systems; Ss_75_10_46/840 Maintenance of induction loop systems; Ss_75_10_46/850 Verification certificate for induction loop systems

System performance

Ss_75_10_46/210 Design of induction loop systems

1. Design: Complete the design of the induction loop system.
2. Qualifications of designer: Member of the Institute of Sound, Communications and Visual Engineers.
3. Standards: To BS EN IEC 60118-4 and in accordance with PD IEC/TR 63079.
4. Requirement: Submit proposals including detailed design drawings, technical information including location, type and size of loop cable, calculations and manufacturers' literature.
5. System design certificate: Submit with design proposals.

Ss_75_10_46/220 Induction loop system objectives

1. Standards: To BS EN IEC 60118-4 and in accordance with PD IEC/TR 63079.
2. Environment: Indoors.
3. Listening plane: Horizontal plane 1450 mm above finished floor level.
4. Frequency response: Maximum variation of ± 3 dB over the range 100 Hz–5 kHz.

Products

Pr_60_75_06_53 Microphones

1. Standard: To BS EN IEC 60268-4.

See Pr_65_70_11_71 Rigid conduit in Ss_70_30_45_45 Low-voltage distribution systems

Pr_70_75_36_40 Induction loop amplifiers

1. Standard: To BS EN IEC 60118-4 and BS EN 62489-1
2. Coverage area: 100 m² minimum.

Pr_70_75_36_41 Induction loop pads

1. Standards: To BS EN IEC 60118-4 and BS EN 62489-1
2. Loop cables: Encapsulated within flexible plastic cover.

Pr_70_75_36_43 Induction loop transformers

Execution

See Pr_65_70_11/721 Installing rigid metallic conduit in Ss_70_30_45_45 Low-voltage distribution systems

Ss_75_10_46/630 Installing induction loop systems generally

1. Installation: In accordance with PD IEC/TR 63079 and BS 7671.
2. Equipment interconnectivity:

Ss_75_10_46/670 Installing induction loop cabling

1. Position: Floor level.
2. Timing: Keep cabling dry. Commence internal cabling when building enclosure provides permanently dry conditions.
3. Cables: Install in one length. Segregate from cables of other systems. Cable crossings should be avoided; however, where necessary cross at 90° as far apart as practicable.
4. Cable pulling: Submit proposals.
5. Cables passing through walls: Sleeve with conduit or pipe duct, bush at both ends. Ensure the transition is appropriately sealed against the spread of smoke and fire once all cabling is completed.
6. Jointing: At equipment and terminal fittings only.
7. Cable route: Permanently identify.

Ss_75_10_46/780 Installing signage for induction loop systems

1. Position:
2. Mounting:

System completion

Ss_75_10_46/810 Testing and commissioning induction loop systems generally

1. Standard: To BS EN IEC 60118-4 and in accordance with PD IEC/TR 63079.
2. System commissioning agent: System manufacturer.
3. Notice before commencing tests (minimum): Two weeks.
4. System commissioning

4.1. Magnetic field strength: Measure.

4.2. Speech transmission index value (minimum): Measure in accordance with BS EN IEC 60268-16.

5. Cable testing: Measure the insulation resistance between conductors, between each conductor and earth, and between each conductor and any screen. Measure the continuity of loop cable, and earth continuity.
6. Loop circuit: Measure the d.c. resistance.
7. Test results: Submit at handover.
8. Verification of performance: By measurement.

Ss_75_10_46/820 Documentation for induction loop systems

1. Standards: To BS EN IEC 60118-4, BS EN 62489-1 and in accordance with PD IEC/TR 63079.
2. Operating and maintenance instructions
   2.1. Scope: Submit for the system giving optimum settings for controls.
   2.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), methods of operation and control, and cleaning and maintenance requirements.
   2.3. Format: Paper copy. Electronic.
   2.4. Number of copies: Three.
3. Logbook: Submit one copy.
4. Record drawings
   4.1. Content: General arrangement drawings showing the location of distribution equipment including equalizers, induction loop amplifiers or induction loop transformers, the type, c.s.a. and route of all induction loop cables, the position of induction loop pads, microphones and reassurance indicators or visual alarm signal devices.
   4.2. Format: Electronic drawing. A1 paper print drawing.
   4.3. Number of copies: Three.
5. Certification
   5.1. Design certificate: Submit two copies.
   5.2. Installation certificate: Submit two copies.
   5.3. Commissioning certificate: Submit two copies.
6. Submittal date: At handover.

Ss_75_10_46/840 Maintenance of induction loop systems

1. Servicing and maintenance: Undertake.
2. Duration: Until 24 months after practical completion.

Ss_75_10_46/850 Verification certificate for induction loop systems

1. Verification certificate: Submit two copies.

Ω End of System

Ss_75_40_75_40
Intrusion and hold-up alarm systems

Systems

Ss_75_40_75_40 Intrusion and hold-up alarm systems

1. Description:
2. System performance: Ss_75_40_75/210 Design of intrusion and hold-up alarm systems; Ss_75_40_75/235 Connection to fire detection and alarm systems
3. Control and indicating equipment (CIE): Pr_75_80_42_41 Intrusion and hold-up alarm panels; Pr_75_80_42_42 Intrusion and hold-up alarm remote keypads
4. Notification equipment: Pr_75_80_42_28 Intrusion and hold-up alarm external warning devices; Pr_75_80_42_40 Intrusion and hold-up alarm internal warning devices
5. Detectors: Pr_75_80_42_52 Microwave movement detectors; Pr_75_80_42_67 Protective switches
6. Cable type: Pr_65_70_15_53 Multicore alarm cables
7. Containment: Pr_65_70_11_17 Cable trays; Pr_65_70_11_96 Dado Trunking Wall and ceiling-mounted cable trunking and ducting; Pr_65_70_11_71 Rigid conduit
8. Rewireable installation: Required.
9. Concealed installation: Required.
10. Execution: Ss_75_40_75/620 Installing intrusion and hold-up alarm systems
11. System completion: Ss_75_40_75/810 Testing and commissioning intrusion and hold-up alarms systems; Ss_75_40_75/820 Documentation for intrusion and hold-up alarm systems; Ss_75_40_75/850 Device identification and testing; Ss_75_40_75/880 Testing actuation, integration and interfacing with other alarm and security systems

System performance

Ss_75_40_75/210 Design of intrusion and hold-up alarm systems

1. Design: Complete the design of the intrusion and hold-up alarm system.
2. Standard: In accordance with PD 6662.
3. Security grading: To BS EN 50131-1, Grade 3.
4. Confirmation of alarm condition
   4.1. Standard: In accordance with BS 8243.
5. Requirement: Submit proposals In accordance with DD CLC/TS 50131-7, Annex G.

Ss_75_40_75/235 Connection to fire detection and alarm systems

1. Fire and fault signal: Accept and relay to the alarm-receiving centre.

Products

See Pr_65_70_11_17 Cable trays in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11_71 Rigid conduit in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11_96 Dado Trunking Wall and ceiling-mounted cable trunking and ducting in Ss_70_30_80_35 Hardwired low-voltage small power systems

Pr_65_70_15_53 Multicore alarm cables

1. Standard: To BS 4737-3-30.

2. Third-party certification: British Approvals Service for Cables (BASEC)-certified.
3. Execution: Pr_65_70_48/635 Installing low-voltage cables

Pr_75_80_42_28 Intrusion and hold-up alarm external warning devices

1. Standard: To BS EN 50131-4.
2. Security grading: To BS EN 50131-1, Grade 3.
3. Status indicators: Alternating LEDs indicating power supply ‘On’ and ‘Tamper/ fault’.
4. Execution: Pr_75_80_42/665 Installing intrusion and hold-up alarm warning devices

Pr_75_80_42_40 Intrusion and hold-up alarm internal warning devices

1. Standard: To BS EN 50131-4.
2. Security grading: To BS EN 50131-1, Grade 3.
3. Environmental classification:
4. Status indicators: Alternating LEDs indicating alarm condition.
5. Execution: Pr_75_80_42/665 Installing intrusion and hold-up alarm warning devices

Pr_75_80_42_41 Intrusion and hold-up alarm panels

1. Standard: To BS EN 50131-3 and BS EN 50131-6.
2. Security grading: To BS EN 50131-1, Grade 3.
3. Execution: Pr_75_80_42/605 Installing intrusion and hold-up alarm control and indicating equipment

Pr_75_80_42_42 Intrusion and hold-up alarm remote keypads

1. Standard: To BS EN 50131-3 and BS EN 50131-6.
2. Security grading: To BS EN 50131-1, Grade 3.
3. Execution: Pr_75_80_42/610 Installing intrusion and hold-up alarm remote keypads

Pr_75_80_42_52 Microwave movement detectors

1. Standard: To BS EN 50131-2-3.
2. Security grading: To BS EN 50131-1, Grade 3.
3. Execution: Pr_75_80_42/640 Installing microwave movement detectors

Pr_75_80_42_67 Protective switches

1. Standard: To BS 4737-3-3. To BS EN 50131-2-6.
2. Security grading: To BS EN 50131-1, Grade 3.
3. Device type: Magnetic reed switch.
4. Mounting: Surface.
5. Execution: Pr_75_80_42/675 Installing protective switches

Execution

See Pr_65_70_11/621 Installing cable tray and cable ladder in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/650 Multiple cable runs in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/721 Installing rigid metallic conduit in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/741 Installing trunking generally in Ss_70_30_80_35 Hardwired low-voltage small power systems

See Pr_65_70_48/635 Installing low-voltage cables in Ss_70_30_80_35 Hardwired low-voltage small power systems

Pr_75_80_42/605 Installing intrusion and hold-up alarm control and indicating equipment

1. Standard: In accordance with DD CLC/TS 50131-7.
2. Position:
3. Fixing equipment: Fix independently of wiring installation with zinc electroplated fasteners.
4. Orientation: Accurate and square to vertical and horizontal axes. Align control panels with adjacent items of switchgear and accessories on the same horizontal axis.
5. Main power supply: From an unswitched fused connection unit. Permanently wire with a dedicated circuit from the building's main low voltage switchboard.

Pr_75_80_42/610 Installing intrusion and hold-up alarm remote keypads

1. Mounting:
2. Height (finished floor level to underside of equipment):

Pr_75_80_42/640 Installing microwave movement detectors

1. Mounting:
2. Height (finished floor level to underside of equipment):

Pr_75_80_42/665 Installing intrusion and hold-up alarm warning devices

1. Mounting:
2. Height (finished floor level to underside of equipment):

Pr_75_80_42/675 Installing protective switches

1. Mounting:
2. Height (finished floor level to underside of equipment):

Ss_75_40_75/620 Installing intrusion and hold-up alarm systems

1. Standards: To DD CLC/TS 50131-7.

System completion

Ss_75_40_75/810 Testing and commissioning intrusion and hold-up alarms systems

1. Standard: To DD CLC/TS 50131-7.
2. System commissioning agent:
3. Notice before commencing tests (minimum):
4. Cable testing
   - 4.1. Insulation resistance: Submit results.
   - 4.2. Earth continuity: Submit results.
5. Charger: Verify operation.
6. Detection devices: Verify the operation, and adjust to provide maximum coverage.
7. Device voltage: Submit details of the voltage at powered devices.

8. Local warning devices: Verify operation.
9. Remote signalling: Verify operation.
10. Standby supply: Verify operation in the event of a mains failure. Check capacity and submit results.
11. Tamper detection: Verify operation.
12. Timers: Set up and adjust entry and exit timers.
13. User codes: Set up and commission.

Ss_75_40_75/820 Documentation for intrusion and hold-up alarm systems

1. Standard: To DD CLC/TS 50131-7.
2. Operating and maintenance instructions
    2.1. Scope: Submit for the system giving optimum settings for controls.
    2.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
    2.3. Format:
    2.4. Number of copies:
3. Logbook: Hardback cover embossed 'INTRUSION AND HOLD-UP ALARM SYSTEM LOGBOOK' with A4 lined paper, minimum 100 pages.
4. Number of copies:
5. Record drawings
    5.1. Content:
    5.2. Format:
    5.3. Number of copies:
6. Submittal date: At handover.

Ss_75_40_75/850 Device identification and testing

1. Device list: Before commissioning submit proposals, including proposed device, zone and group names.
2. Zone diagram: Before commissioning submit proposals.
3. Timing of submittals: Prior to commissioning.
4. Device identification: Label devices with a unique address corresponding to that used by the CIE.
5. Device testing: Verify the operation of each device. Submit a schedule of devices, including the device test methods and results.

Ss_75_40_75/880 Testing actuation, integration and interfacing with other alarm and security systems

1. Connections with other systems and equipment: Verify and demonstrate operation of the systems and equipment under fire and fault conditions. Submit results.

Ω End of System

Ss_75_50_11_25
Emergency assistance call systems

Systems

Ss_75_50_11_25 Emergency assistance call systems

1. Description: To each acc. WC
2. System performance: Ss_75_50_11/210 Design of emergency assistance call systems
3. Control and indicating equipment: Pr_75_75_04_28 Emergency assistance call pull cord units; Pr_75_75_04_25 Emergency assistance call indicator units
4. Execution: Ss_75_50_11/630 Installing emergency assistance call systems
5. System completion: Ss_75_50_11/812 Testing and commissioning emergency assistance call systems; Ss_75_50_11/830 Documentation for emergency assistance call systems; Ss_75_50_11/842 Maintenance of emergency assistance call systems

System performance

Ss_75_50_11/210 Design of emergency assistance call systems

1. Design: Complete the design of the emergency assistance call system.
2. Standard: In accordance with BS 7671.
3. Proposals: Submit detailed design drawings, technical information, calculations and manufacturers' literature.

Products

Pr_75_75_04_25 Emergency assistance call indicator units

1. Description:
2. Standards: In accordance with BS 8300-2.
3. Mounting type: Flush.
4. Material: White plastics.
5. Ingress protection (minimum): To BS EN 60529, IP30.
6. Visual indicator: Red LED.
7. Integral buzzer: Required.
8. Execution: Pr_70_75_94/650 Installing emergency assistance call indicator units

Pr_75_75_04_28 Emergency assistance call pull cord units

1. Description:
2. Standards: In accordance with BS 8300-2.
3. Mounting type: Recessed.
4. Material: Plastic.
5. Colour: White.
6. Cord
    - 6.1. Material: Nylon.
    - 6.2. Colour: Red.
    - 6.3. Pull handles: Two.
    - 6.4. Length: Sufficient to reach finished floor level.
7. Audible indication: Integral alarm.

8. Visual indication:
9. Ingress protection (minimum): To BS EN 60529, IP30.
10. Execution: Pr_75_75_04/610 Installing emergency assistance call pull cord units

Execution

Pr_70_75_94/650 Installing emergency assistance call indicator units

1. Position:
2. Mounting arrangement: On wall, 200 mm above door top. On ceiling, 300 mm away from wall. On wall, midway between door top and underside of ceiling.

Pr_75_75_04/610 Installing emergency assistance call pull cord units

1. Mounting arrangement: Ceiling.
2. Position within room: Within reach of persons using the toilet. Within reach of persons using the changing accommodation.
3. Pull handles: Set so that the lower handle is at 100 mm and the upper handle is between 800–1000 mm above finished floor level.

Ss_75_50_11/630 Installing emergency assistance call systems

1. Standard: In accordance with BS 7671.

System completion

Ss_75_50_11/812 Testing and commissioning emergency assistance call systems

1. Standard: In accordance with BS 7671.
2. Notice before commencing commissioning:
3. System commissioning agent:
4. Controls: Verify operation.
5. Alarm signalling: Verify operation.
6. Results: Submit
7. Certificates of calibration for meters and instruments: Submit.

Ss_75_50_11/830 Documentation for emergency assistance call systems

1. Operating and maintenance instructions
    1.1. Scope: Submit for the system giving optimum settings for controls.
    1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use) method of operation and control, and cleaning and maintenance requirements.
    1.3. Format: Electronic. Paper copy.
    1.4. Number of copies: Three.
2. Record drawings
    2.1. Content: General arrangement drawings showing the location of all power supply units to actuators, reset units, and visual alarm signal devices. Schematic diagram showing all control cabling, the cable origin, route from power supply units to actuators, reset units, visual alarm signal devices. Include conductor material and c.s.a., insulation type and colour, number of cores per cable, number of cables in ducts, on tray or ladder.
    2.2. Format: A1 paper print drawing. Electronic drawing.
    2.3. Number of copies: Three.

3. Submittal date: At handover.

Ss_75_50_11/842 Maintenance of emergency assistance call systems

1. Servicing and maintenance: Undertake.
2. Duration:

Ω End of System

Ss_75_50_28_29
Fire detection and alarm systems

Systems

Ss_75_50_28_29 Fire detection and alarm systems

1. Description:
2. System performance: Ss_75_50_28/210 Design of non-domestic premises' fire detection and alarm systems; Ss_75_50_28/230 Performance of fire detection and alarm systems
3. System type: Addressable.
4. Detection devices
   4.1. Atmosphere: Normal.
   4.2. Types: Pr_75_80_30_82 Smoke and heat multi-sensor detectors; Pr_75_80_30_50 Manual call points; Pr_75_80_30_65 Point smoke detectors; Pr_75_80_30_64 Point heat detectors
5. Equipment interconnectivity:
6. Cable containment: Pr_65_70_11_17 Cable trays
7. Internal alarms
   7.1. Primary: Pr_75_80_30_30 Fire alarm sounders
8. External alarms: To landlord's fire detection and alarm system.
9. Controls: Pr_75_80_30_29 Fire alarm panels
10. System accessories: Pr_40_10_57_33 Fire zone diagrams
11. Execution: Ss_75_50_28/605 Removing fire detection and alarm systems; Ss_75_50_28/610 Installing fire detection and alarm systems in non-domestic premises; Ss_75_50_28/760 Installing end of line devices
12. System completion: Ss_75_50_28/805 System information; Ss_75_50_28/806 Device identification and testing; Ss_75_50_28/807 Standby battery testing; Ss_75_50_28/809 Measurement of sound pressure levels; Ss_75_50_28/810 Testing and commissioning non-domestic premises' fire detection and alarm systems; Ss_75_50_28/820 Documentation for non-domestic premises' fire detection and alarm systems; Ss_75_50_28/829 Documentation for interfaces to ancillary systems and equipment; Ss_75_50_28/840 Maintenance of fire detection and alarm systems; Ss_75_50_28/850 Verification certificate for fire detection and alarm systems in non-domestic premises; Ss_75_50_28/860 Acceptance certificate for fire detection and alarm systems in non-domestic premises

System performance

Ss_75_50_28/210 Design of non-domestic premises' fire detection and alarm systems

1. System designer: System manufacturer.
2. Standards: Complete the design of the fire detection and alarm system in accordance with BS 5839-1 and BS EN 54-13.
3. Category: L2.
4. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.
5. System design certificate: Submit with design proposals.

Ss_75_50_28/230 Performance of fire detection and alarm systems

1. Spare system capacity: 10% of installed detection devices.

Products

Pr_40_10_57_33 Fire zone diagrams

1. Description:
2. Style:
3. Size:
4. Layout:
5. Verification
    5.1. Submittals:
    5.2. Timing:

See Pr_65_70_11_17 Cable trays in Ss_70_30_45_45 Low-voltage distribution systems

Pr_75_80_30_29 Fire alarm panels

1. Description:
2. Standard: To BS EN 54-2.
3. Third-party certification: LPCB-approved.
4. Standby power supply
    4.1. Standard: To BS EN 54-4.
5. Execution: Pr_75_80_30/610 Installing main control and indicating equipment (CIE)

Pr_75_80_30_30 Fire alarm sounders

1. Standard: To BS EN 54-3.
2. Third-party certification: LPCB-approved.
3. Sounder type: Electronic sounder.
4. Sound patterns: In accordance with BS 5839-1.
5. Execution: Pr_75_80_30/640 Installing sounders

Pr_75_80_30_50 Manual call points

1. Description:
2. Standard: To BS EN 54-11.
3. Third-party certification: LPCB-approved.
4. Designation: Type A.
5. Frangible element: Non-resettable.
6. Integral red visual indicator: Required.
7. Execution: Pr_75_80_30/630 Installing manual call points

Pr_75_80_30_64 Point heat detectors

1. Description:
2. Standard: To BS EN 54-5.
3. Third-party certification: LPCB-approved.
4. Classification: A1. A2.
5. Execution: Pr_75_50_76/620 Installing point detectors

Pr_75_80_30_65 Point smoke detectors

1. Description:

2. Manufacturer:
3. Standard: To BS EN 54-7.
4. Third-party certification: LPCB-approved.
5. Execution: Pr_75_50_76/620 Installing point detectors

Pr_75_80_30_82 Smoke and heat multi-sensor detectors

1. Description:
2. Standard: To BS EN 54-17.
3. Third-party certification: LPCB-approved.

Execution

See Pr_65_70_11/621 Installing cable tray and cable ladder in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/650 Multiple cable runs in Ss_70_30_45_45 Low-voltage distribution systems

Pr_75_50_76/620 Installing point detectors

1. Protective cage: *Provide in sports hall*

Pr_75_80_30/610 Installing main control and indicating equipment (CIE)

1. Position: Main entrance.
2. Power supply: Derive from a dedicated circuit from the main switchboard and connect to CIE via unswitched fused connection units.

Pr_75_80_30/630 Installing manual call points

1. Mounting height: 1.4 m.
2. Test key: Locate to allow easy test operation.
3. Labelling
   3.1. Type: Face-engraved rigid plastic laminate.
   3.2. Background: White.
   3.3. Lettering: Red, identifying the manual call point address.

Pr_75_80_30/640 Installing sounders

1. Circuit wiring: Wire sounders on a single radial circuit, and in addition, wire an independent radial circuit to a single sounder positioned above the main control panel.

Ss_75_50_28/605 Removing fire detection and alarm systems

1. Scope:

Ss_75_50_28/610 Installing fire detection and alarm systems in non-domestic premises

1. General requirements:
2. Standard: In accordance with BS 5839-1.

Ss_75_50_28/760 Installing end of line devices

1. Position:
2. Labelling: Identify the presence of an end of line device, and describe its function.

System completion

Ss_75_50_28/805 System information

1. Device list: Before commissioning, submit proposals, including proposed device, zone and group names.
2. Zone diagram: Before commissioning submit proposals.

Ss_75_50_28/806 Device identification and testing

1. Device identification: Label devices with a unique address corresponding to that used by the CIE. Label non-addressable devices with a unique reference corresponding to that shown on the record drawings.
2. Device testing: Verify the operation of each device. Submit a schedule of devices, including the device test methods and results.

Ss_75_50_28/807 Standby battery testing

1. Mains power supply: Isolate.
2. Quiescent mode:
3. Alarm mode:
4. Test results:

Ss_75_50_28/809 Measurement of sound pressure levels

1. Sound pressure levels: Measure throughout the building during worst case building operation with all doors shut.
2. Test instrument
   - 2.1. Standard: To BS EN 61672-1.
   - 2.2. Setting: Slow response, weighting A.
3. Doors: Close before measuring sound pressure levels.
4. Results:

Ss_75_50_28/810 Testing and commissioning non-domestic premises' fire detection and alarm systems

1. Standard: In accordance with BS 5839-1.
2. Notice before commencing tests (minimum): Two weeks.

Ss_75_50_28/820 Documentation for non-domestic premises' fire detection and alarm systems

1. Standard: In accordance with BS 5839-1.
2. Operating and maintenance instructions
   - 2.1. Scope: Submit for the system, giving optimum settings for controls.
   - 2.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
   - 2.3. Format: Paper copy.
   - 2.4. Number of copies: Three.
3. Logbook:
4. Record drawings
   - 4.1. Content: General arrangement drawings showing the location of all control and indicating equipment, manual call points, detectors, radio transmitters and aerials, sounders, visual

alarm signal devices, short circuit isolators, end of line devices, remote indicators, interface units connecting to other equipment, and automatic door hold-open devices. Schematic diagram showing all control cabling, the cable origin, device addresses, route from control and indicating equipment to manual call points, detectors, radio transmitters and aerials, sounders, visual alarm signal devices, short circuit isolators, end of line devices, remote indicators, interface units connecting to other equipment, and automatic door hold-open devices. Include conductor material and c.s.a, insulation type and colour, number of cores per cable, number of cables in ducts, on tray or ladder.

4.2. Drawing format: Electronic drawing. A1 paper print drawing.

4.3. Number of copies: Three.

4.4. Submittal date: At handover.

5. Fire evacuation plan: Submit electronic colour CAD layout.

6. Certification

6.1. Design certificate: Submit two copies in accordance with BS 5839-1, annex G.1.

6.2. Installation certificate: Submit two copies in accordance with BS 5839-1, annex G.2.

6.3. Commissioning certificate: Submit two copies in accordance with BS 5839-1, annex G.3.

Ss_75_50_28/829 Documentation for interfaces to ancillary systems and equipment

1. Certification: Submit in accordance with BS 7273-6, annex B.

Ss_75_50_28/840 Maintenance of fire detection and alarm systems

1. Standard: In accordance with BS 5839-1. In accordance with BS 5839-6.
2. Duration: Until 12 months after practical completion.

Ss_75_50_28/850 Verification certificate for fire detection and alarm systems in non-domestic premises

1. System verification agent:
2. Verification certificate: Submit two copies in accordance with BS 5839-1, annex G.5.

Ss_75_50_28/860 Acceptance certificate for fire detection and alarm systems in non-domestic premises

1. Acceptance certificate: Submit two copies in accordance with BS 5839-1, annex G.4.

Ω End of System

Ss_75_70_54_10
Building monitoring and management systems

Systems

Ss_75_70_54_10 Building monitoring and management systems

1. Description:
2. System performance: Ss_75_70_54/210 Design; Ss_75_70_54/247 Ventilation systems monitoring and management; Ss_75_70_54/257 Low-voltage supply monitoring and management; Ss_75_70_54/240 Heating systems monitoring and management
3. Heating systems linked to BMMS: Air source heat pump system.
4. Ventilation systems linked to BMMS: Mechanical supply. Mechanical extract. Toilet extract.
5. Air conditioning systems linked to BMMS: Local.
6. Low-voltage electricity supply systems linked to BMMS: Low-voltage distribution system.
7. Communications network type: Wired local area network.
8. Equipment: Pr_80_77_28_49 Low-voltage switchgear and controlgear assembly enclosures; Pr_75_50_20_29 Field controllers
9. Equipment interconnectivity: Wired.
10. Cables: Pr_65_70_15_06 Balanced twisted pair cables
11. Containment: Pr_65_70_11_17 Cable trays; Pr_65_70_11_71 Rigid conduit; Pr_65_70_11_96 Dado Trunking Wall and ceiling-mounted cable trunking and ducting
12. Rewireable installations: Required.
13. Concealed installation: Required.
14. Control equipment power supply: Mains supply.
15. Execution: Ss_75_70_54/620 Installation of building monitoring and management systems; Ss_75_70_54/630 Installation of field controllers; Ss_75_70_54/640 Installation of cables; Ss_75_70_54/650 Installation of sensors
16. System completion: Ss_75_70_54/810 Inspection and testing; Ss_75_70_54/820 Commissioning; Ss_75_70_54/830 Documentation

System performance

Ss_75_70_54/210 Design

1. Design: Complete the design of the building monitoring and management system.
2. Standards
   - 2.1. Communications network: To BS EN 50174-1.
   - 2.2. Communications protocol: To BS EN ISO 16484-5.
   - 2.3. Documentation of plant and application specific functions: To BS EN ISO 16484-3.
3. Requirements: Submit proposal including detailed design drawings, technical information, calculations and manufacturers' literature.

Ss_75_70_54/240 Heating systems monitoring and management

1. Input: Heat Pump Failure Alarm
2. Output: Fault alarm

Ss_75_70_54/247 Ventilation systems monitoring and management

1. Input: *Fan failure alarm*.

2. Output: Faul alarm

Ss_75_70_54/257 Low-voltage supply monitoring and management

1. Input: Monitoring energy use

Products

See Pr_65_70_11_17 Cable trays in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11_71 Rigid conduit in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11_96 Dado Trunking Wall and ceiling-mounted cable trunking and ducting in Ss_70_30_80_35 Hardwired low-voltage small power systems

See Pr_65_70_15_06 Balanced twisted pair cables in Ss_75_10_21_21 Data distribution systems

Pr_75_50_20_29 Field controllers

1. Description:
2. Enclosure
   2.1. Ingress protection (minimum): To BS EN 60529, IP54.
   2.2. Mounting: Suitable for surface fixing.
3. Network communications options: BACnet MS/TP. LON FT/TP-10. RS-232.
4. User interfaces: Access password protected programmable LCD with back light.
5. Accessories:
6. Execution: Pr_75_50_20/606 Installing control components

Pr_80_77_28_49 Low-voltage switchgear and controlgear assembly enclosures

1. Standard: To BS EN 62208.
2. Ingress protection (minimum): To BS EN 60529, IP55.
3. Impact protection (minimum): To BS EN 62262, IK04.
4. Material: Low-carbon sheet steel.
5. Finish: White powder-coated.
6. Access: Hinged door.
7. Handles: Not required.
8. Mounting: Surface-mounted.
9. Arrangement: Wall.
10. Hardware: Cylinder lock and handle. Standardize key type.
11. Labelling: Describe controlgear purpose.

Execution

See Pr_65_70_11/621 Installing cable tray and cable ladder in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/650 Multiple cable runs in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/721 Installing rigid metallic conduit in Ss_70_30_45_45 Low-voltage distribution systems

See Pr_65_70_11/741 Installing trunking generally in Ss_70_30_80_35 Hardwired low-voltage small power systems

See Pr_65_70_48/635 Installing low-voltage cables in Ss_70_30_80_35 Hardwired low-voltage small power systems

Pr_75_50_20/606 Installing control components

1. Standard: In accordance with BS 7671.
2. Equipment and sensor identification labels: Provide.
3. Position:
4. Insulation: Submit details of proposed insulation method where control components are on insulated pipelines.
5. Supports: Do not strain components.
6. Access: Adequate for operation and maintenance.

Ss_75_70_54/620 Installation of building monitoring and management systems

1. General: Install in accordance with BSRIA AG 9/2001.

Ss_75_70_54/630 Installation of field controllers

1. Clearance (minimum)
    1.1. Front access:
    1.2. Mounting height:
2. Fixing equipment:

Ss_75_70_54/640 Installation of cables

1. Timing: Do not start internal cabling until building enclosure provides permanently dry conditions.
2. Cables: Install in one uninterrupted run.
3. Arrangement: Position vertically and horizontally in line with equipment served, and parallel with building lines. Provide drip loop to prevent water entering equipment.
4. Orientation: Dress cables flat, free from twists, kinks and strain.
5. Cable pulling
    5.1. Cable: Do not overstress.
    5.2. Installation method: Submit proposals.
6. Jointing: At equipment and terminal fittings only.
7. Cables routes generally:
8. Cables from other systems
    8.1. Segregation: Segregate and cross at right angles.
    8.2. Distance from steam and low-temperature hot water systems running parallel: 500 mm minimum.
9. Cable terminations: Support cable within 150 mm of termination.
10. Balanced twisted pair cables
    10.1. Maximum untwist at terminations: 12 mm

Ss_75_70_54/650 Installation of sensors

1. General: Install in accordance with BCIA Controls for End Users.

System completion

Ss_75_70_54/810 Inspection and testing

1. Standard: In accordance with BS 7671.

2. Notice before commencing tests (minimum):
3. Certificates
   3.1. Submission:
   3.2. Number of copies:
4. Test equipment identity: Record on test certificates.
5. Certificates of calibration: Submit for each test instrument.
6. Control panel test certificates
   6.1. Submission:
   6.2. Number of copies:

Ss_75_70_54/820 Commissioning

1. General:

Ss_75_70_54/830 Documentation

1. Operation and maintenance instructions
   1.1. Scope: Submit giving optimum settings for controls.
   1.2. Product information:
   1.3. Format: Paper copy.
   1.4. Number of copies:
2. Record drawings
   2.1. Content:
   2.2. Format:
   2.3. Number of copies:
3. Cable schedules
   3.1. Location:
   3.2. Format:
   3.3. Size:
   3.4. Contents:
4. Submittal date: At handover.

Ω End of System

Pr_30_59_94_06
Air transfer grilles

Products

Pr_30_59_94_06 Air transfer grilles

1. Description:
2. Manufacturer:
3. Standard:
4. Third-party certification:
5. Configuration:
6. Size:
7. Equivalent area (minimum):
8. Material and finish:
9. Colour:
10. Execution:

Ω End of Product

Pr_30_59_94_31
Fire-resisting air transfer grilles

Products

Pr_30_59_94_31 Fire-resisting air transfer grilles

1. Description:
2. Manufacturer:
3. Standard: To BS EN 13141-1.
4. Third-party certification:
5. Size:
6. Fire resistance:
7. Material and finish:
8. Colour:
9. Execution:

Ω End of Product

Pr_65_65_25_71
Rectangular plastics ductwork and fittings

Products

Pr_65_65_25_71 Rectangular plastics ductwork and fittings

1. Description:
2. Manufacturer:
3. Standard: To BESA DW/154.
4. Classification:
5. Environmental conditions:
6. Material:
7. Accessories
   - 7.1. Material: Compatible with ductwork.
   - 7.2. Finish: To match ductwork.
8. Regulating dampers
   - 8.1. Standard: To BESA DW/154.
   - 8.2. Type:
   - 8.3. Operation:
9. Access openings
   - 9.1. Purpose:
   - 9.2. Sizes:
10. Execution:

Ω End of Product

Specification created using NBS Chorus

3.0 Schedule of Works

Item	Work Required	Quantity	Unit	Rate	Tender
	SECTION 3 - SCHEDULE OF WORKS				
1.00	**GENERAL**				
	Tender Submission Allowances				
1.01	The following schedule of works is to be read in conjunction with all other sections and appendices of the main contract specification of works and all reports, drawings, product data sheets and schedules provided.		Item		
1.02	The Contractor should allow for including the whole of the works in one phase, in accordance with best building practices, guidance and regulations and to the full satisfaction of the Employer/Contract Administrator, where specifically described in the scope or not.		Item		
1.03	The Contractor shall enter a lump sum price against each of the items within the Schedule of works. Such sum shall include for all Builders Works In Connection (BWIC) with the works including but not limited to; cutting away, making good, joining new to existing and other labours, plugging, preparation of surfaces/substrates and supplying and fixing of all sundry items.		Item		
1.04	The contractor shall make all provisions within their individual pricing for assessing the working areas. No extra costs will be entertained by the employer for failure to do so.		Item		
1.05	Provisional Sums (PS) or Provisional Quantities (PQ) have been provided against some items throughout the schedule of works. These are only intended as a guide to the tenderer when pricing the particular items. Such quantities will not form part of the contract and will only be adjusted where the item is marked provisional or the quantity noted as a provisional quantity and shall not be executed without prior written agreement from the Contract Administrator.		Item		
1.06	**Design**				
1.07	The structural Engineering design and installation for this project is detailed and provided within section 4 'John Plumber Partnership structural Engineering Calculations' document. The contractor is to provide all required structural technical design submittals to the Contract Administrator and the consulting Structural Engineer for approval prior to installation.		Item		
1.08	The mechanical and electrical design and installation for this project forms part of the Contractors Design portion (CDP) under the JCT Contract. The CDP for all the M&E items of work are detailed and provided within section 5 'Building Services Consultants Design Specification Overview' document. The contractor is to provide all required M&E technical design submittals to the Contract Administrator and the consulting Mechanical and Electrical Engineer for approval prior to installation. The contractor is required to refer to the relevant Mechanical and Electrical sections within this specification for pricing.		Item		
1.09	Contractor to provide the following JCT collateral warranties for the works as part of the JCT Intermediate Contract with Contractors Design 2016.		Item		
	Samples				
1.10	The Contractor shall provide sample pallets of all paint colours and any other material products / finishes for approval as may reasonably be required by the Contract Administrator, prior to the any expenditure of any monies.		Item		
	Site Management				
1.11	The Contractor is to employ a full time and qualified site foreman / manager with a working mobile telephone during the course of the works. The foreman will be responsible for the smooth running of the works. The site manager should be based on site during normal working hours and must be contactable at all times.		Item		
1.12	Whilst the premises will not be occupied for the duration of the works, it should be noted that works will be carried out in close proximity to the general public. A high level of workmanship and overall method undertaking these works is expected at all times together with an exceptional level of behaviour and noise. No smoking is permitted on site and at anytime.		Item		
	Site Access & Security				
1.13	The Contractor shall allow for gaining all necessary Licences in respect of scaffolding, storing skips, gaining access etc., for the works and shall provide the Contract Administrator with copies of the relevant approvals prior to commencement of the works. This includes the submission of any required applications to the Local Authority / Highways Agency.		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
1.14	The Contractor shall allow for ensuring safe and adequate escape from the building, via the fire escape routes, at all times throughout the works.		Item		
1.15	The Contractor is to include for supplying plant and other equipment necessary to facilitate access for the complete and proper execution of the works.		Item		
1.16	Allow to put in place and maintain security provisions to the existing property to ensure that any unauthorised access is not gained to the site. The existing property is to be left safe and secure at the end of each working day. Provide Heras fencing, barriers or screens to the site perimeter where required to prevent unauthorised access and to maintain escape routes at all times.		Item		
	Scaffolding / Mobile Access Towers				
1.17	The contractor is to price here for designing, providing, erecting maintaining and, removing on completion, any scaffolding system required and necessary for the proper execution of the works. Scaffolding should be suitable for carrying out inspections of all specified and provisional work, including work by contractors, sub contractors and any other persons employed on or administering the works. All access systems are to comply with all statutory requirements and adhere to the relevant standards (BSEN) as well as any other safe access method as determined suitable by the Contractor to allow for the full and proper execution of the works. Attention is drawn to the following which are to be allowed for and included for within the price:		Item		
•	The contractor is to investigate and undertake any necessary works in relation to shoring or temporary reinforcement of the pavement lights and vaults. If temporary shoring is impractical, the contactor is to include alternative measures within their scaffold design.		Item		
•	The Contractor will be required to provide all sketches drawings and calculations for the proposed scaffold designs to the Principal Designer / Contract Administrator no later than 2 weeks from commencement o the works for approval prior to installation.		Item		
•	Any required scaffolding required to complete the works is to be designed and erected so as to be independent from the building. Fixing directly into the building fabric is not permitted under any circumstances and tying to the exterior through open windows, is to be agreed withe Contract Administrator prior to any works commencing on site.		Item		
•	Prior to erecting the scaffold, the contractor is to provide a Schedule of Condition and inform the CA of any existing damage to elevations and basement areas. Any damage not recorded and picked up will be the contractors liability to remedy at their cost.		Item		
•	If required, the contractor is to utilise Hilti resin fixing rods for fixing scaffolding to the building facade or similar approved universal fixing method so fixing points can reused in the future to minimise damage to the brickwork and cladding. Upon striking of scaffold, the contractor is to remove rod and the resin anchor can stay in place for future use. Holes are to be capped off at completion of work with a stone coloured plastic cap fitting into the permanent fixing or cover cladding panels. CA to approve cap samples prior to contractor placing orders.		Item		
•	It is essential that the number of scaffolding standards are kept to a minimum and are positioned such that no doors and windows are obstructed in any way.		Item		
•	Protection of all substrates upon which the scaffolding standards and loading points bare on to with use of protective sole / floor plates.		Item		
•	All scaffolding is to be fully enclosed with debris netting / monoflex. Allow to provide new branded monoflex sheeting to the scaffolding for all lifts of scaffolding (approximately at the top middle and bottom of the elevation). The contractor will be expected to keep the scaffold sheeting in a good condition ensuring that it is clean and in tension at all times.		Item		
•	Protection to all floors, pavement lights especially where open and susceptible to water ingress, signs, lighting and any other fixings of fixings services especially when striking and erecting the scaffolding. Include for making good all damaged caused due to the scaffolding. The contractor should note that the scaffolding cannot be fixed in a destructive method and other suitable restraining methods are to be adopted.		Item		
•	Protection of all existing public, private and emergency routes. Access equipment must not hinder access or egress from the building.		Item		
•	Physical protection from any falling debris or run-off of liquids over doorways and entrances and along the length of scaffold.		Item		
•	Scaffold shall be enclosed and have securely fixed fans as appropriate to protect persons and property from falling debris.		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
•	When scaffolding is being erected, altered or dismantled, below passers and general public must be excluded from the vicinity by hoardings or other barriers. Banks men must be deployed at ground level to ensure that such passers by are safely directed away from the area whiles such works are in progress. Signs must be in place at pavement level warning that works are in progress above.		Item		
•	Standing scaffolding shall be left in position until no longer required. The Contract Administrator shall be given notice in writing of not less than one week of the removal of any scaffold.		Item		
•	The Contractor will be required to make good any damage caused by the erection and dismantling of the scaffolding. Ensure that all roof lights are fully protected prior to the erection or dismantling of scaffolding.		Item		
•	The Contractor shall allow for providing adequate “wet paint” signage at all ground floor, pedestrian areas and for providing security and pedestrian lighting and painted plywood timber casings securely fixed to the vertical standards up to a minimum of 3 m above ground floor level, where scaffold is provided. All hoarding is to be constructed from external quality ply and to incorporate a skirting and capping detail. Hoarding is to be fully prepared for painting and painted in one coat of undercoat and 2 no coats of Dulux external grade topcoat.		Item		
•	Include for undertaking all scaffolding in full accordance with the Local Authority and County Council requirements. The contractor is to obtain necessary road closure consents and scaffold licences from the Local Authority in respect of any scaffolding over and affecting the Highway and/or Highway footpath.		Item		
•	On completion of each section of scaffolding and prior to the works commencing on that scaffold, the CA must be provided with a copy of a recognised and valid suitability and handover Certificate.		Item		
1.18	The Contractor is reminded of their statutory duty of care to scaffold users, and other persons who may foreseeably be affected by the scaffolding during its erection, use or dismantling. The scaffolding shall comply in all respects with the relevant statutory requirements, including: a) The Factories Act 1961 b) Health & Safety at Work Act 1974 c) BS 5973 (Scaffolding) d) The Construction (Health, Safety and Welfare) Regulations 1996.		Item		
2.19	The scaffolding must not be struck or be moved until the CA has approved the works and in the event of this being so, the Contractor shall re-erect the scaffolding at its own expense.		Item		
•	Please note that your chosen sub contractor must be able to demonstrate competency and experience of working on projects in similar environments to this project i.e. Listed buildings and busy high streets and must have an excellent health and safety track record. The scaffolding sub contractors must be members of the National Access and Scaffolding Confederation (NASC) and evidence of membership must be submitted with the Principal Contractor’s tender return documents. All scaffolding sub contractors will be required to meet the core criteria for demonstration of competence in accordance with the Construction (Design and Management) Regulations 2015 Approved Code of Practice. Including demonstrating its competency to the Principal Designer / CA that they meet the above criteria in full. Please advise on the name of your chosen scaffolding sub contractor and demonstrate previous experience: Scaffolding Sub Contractor: Tel: Address:		Item		
	Temporary Services & Supply				
1.20	The contractor is to make safe all services as required prior to starting on site. The Contractor is to provide and maintain all necessary temporary services required to undertake the works.		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
1.21	Mains water may will be available for use on site although the contractor is entitled to use the mains water supply if available. Where a separate water supply is required the contractor is to make all arrangements and applications for connections.		Item		
1.22	Mains electric will be directly available on site although the contractor is entitled to use the main electricity supply if available. Where a separate power supply is required the contractor is to provide their own generator(s), temporary supply, where necessary and make all arrangements and applications for connections.		Item		
1.23	The mains gas supply is being isolated by the client ahead of the works.				
	Health, Safety & Welfare				
1.24	The contractor is to comply with and fulfil their duties as a designer under the Construction (Design and Management) Regulations 2015 at all times during the project.		Item		
1.25	The Contractor is to allow to provide a detailed construction phase health and safety plan, keep all necessary site registers and other H&S information on site throughout the course of the works, and provide the Principal Designer / Contract Administrator with a detailed operation and maintenance manual for the works upon completion.		Item		
1.26	The Contractor is to prepare and provide specific risk assessments and method statements (RAMS) in connection with the below works to the Principal Designer / Contract Administrator prior to commencement of works on site. All RAMS and safe working practices in relation to COVID-19 must also be included within the contractors RAMS.		Item		
1.27	The contractor is to make all due allowances to comply with the building's house rules if required, including arranging any permits to work, adhering to any noisy working hours, use permitted access routes during business hours, and access pass requirements.		Item		
1.28	The Contractor is to allow for welfare facilities offsite and must allow for their own accommodation and welfare facility provisions. All proposals for welfare facilities must be submitted to the Principal Designer / Contract Administrator at least 1 week prior to the commencement of works on site and detailed within the construction phase health and safety plan.		Item		
1.29	The contractor is not to store any materials, tools or equipment on site without prior approval from the Contract Administrator. Should this be required, all materials, tools and equipment must be kept in a secure location with any flammable material stored within a secure fireproof box. The contractor is to confirm any storage location with the Principle Designer / Contract Administrator prior to works commencing on site.		Item		
1.30	The contractor is to provide copies of all current insurance certificates and safe contractor scheme certificates as part of their tender return submission.		Item		
	Deleterious Materials				
1.31	The contractor is required to review the Demolition and Refurbishment Asbestos Survey report and Asbestos Register provided within the Pre-Construction information pack and to act in accordance with the Control of Asbestos Regulations 2012 in relation to the works on site.		Item		
1.32	Allow to remove, encapsulate and professionally clean all identified asbestos containing materials (ACM'S) within the property as identified and recommended within Demolition and Refurbishment Asbestos survey report. All works are to be undertaken using an appropriately qualified and licensed Asbestos removal contractor. Allow for replacement for all items with modern equivalent as maybe required. Contractor to provide all asbestos waste disposal certificates.		Item		
1.33	If any suspected deleterious materials are found, the contractor must follow safety procedures, cease work and inform the Client & Contract Administrator immediately.		Item		
	Temporary Protection				

Item	Work Required	Quantity	Unit	Rate	Tender
1.34	Whilst the work proceeds the Contractor shall allow for providing, and maintaining as necessary, temporary protection to all existing internal and external surfaces, components, fixings and fittings within the building. The Contractor shall allow for all temporary screens, dust sheets, tarpaulins and other measures necessary to protect the building and its features. This includes but is not limited to providing adequate protection to all ceiling and wall plasterwork, windows, doors, paintings, fire places, balustrades, floor boards/stones and all other items of special architectural interest or value.		Item		
	Site Clearance & Waste Management				
1.35	The Contractor is to ensure that the site is cleared on a regular basis as the work proceeds. The contractor is to allow for all required waste removal and skip hire and undertake a full and thorough professional clean of site following completion of the works.		Item		
1.36	The Contractor is to provide waste consignment certificates for the disposal of all waste material removed from site. These are to be submitted to the Contract Administrator at Practical Completion. All waste is to be disposed at licensed waste sites and dealt with in accordance with statutory requirements.		Item		
	Limitations				
1.37	The Contractor will be required to comply fully with any specific limitations on the working sequence determined by the Principal Designer / Contract Administrator. It is suggested that the Contractor discuss the requirements with the Principal Designer / Contract Administrator as part of the Tender process.		Item		
	Snagging / Completion				
1.38	In order to avoid the property being handed over prematurely, the contractor shall carry out an internal snag of the works and rectify any defective work. Works to all external and internal areas are to be completed and cleaned (i.e. ready for handover) before they are offered to the Contract Administrator for inspection. This inspection is required at least one week prior to the proposed practical completion and formal handover of the site.		Item		
1.39	The Contract Administrator and/or employer's representative shall make one inspection of the works prior to Practical Completion to compile a list of incomplete or defective work which the contractor will be in attendance for. Any outstanding works will be provided to the contractor and are to be completed prior to Practical Completion.		Item		
	Contingency				
1.40	**Provisional Sum:** Allow the contingency sum of Fifty Thousand Pounds (£50,000.00) for additional unforeseen works. Sum only to be expended upon formal written instructions from the Contract Administrator via a contract instruction.	1	**PS**	£50,000.00	**£50,000.00**
2.00	**DEMOLITION / STRIP OUT**				
2.01	Carefully isolate all supplies, strip out and cart away from site including associated fixings, fittings and service media back to source to the following;		Item		
•	Existing dumb waiter to the basement.		Item		
•	Existing keg pump and associated fixings and fittings to the basement.		Item		
•	Existing timber staircase to the basement including all associated fixings and fittings.		Item		
•	Existing internal and external surface mounted loose, defective and redundant service media conduits, fixings and fittings (to include all roof areas and elevations		Item		
•	Existing external and internal walls as per Drawing 8341,B04A - Existing Building Demolition Plan		Item		
•	Existing external and internal doors as per Drawing 8341,B04A - Existing Building Demolition Plan		Item		
•	Existing ground floor fire place's to the Dining area 2 and Kitchen including all associated fixings and fittings.		Item		
•	Existing internal and external fixed and loose chattels including but not limited to furniture, equipment, surface mounted fixings and fittings, signage, mirrors, racking, shelving, redundant fire fighting equipment etc. Contractor to ensure the building is clear and ready to commence works.		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
•	Remove existing wall tiles finish back to substrate throughout the ground and first floor including all associated fixings and fittings.		Item		
•	Remove existing WC fittings to the ground and first floor including all associated fixings and fittings.		Item		
•	All existing windows as per Drawing 8341,B04A - Existing Building Demolition Plan with reference to the 'Window Key'		Item		
•	Existing pitches roof covering back to roof structure including all coverings, battens, felts, flashing and fixtures and fittings.		Item		
•	Existing flat roof and dormer coverings		Item		
•	Existing guttering, downpipes and hoppers throughout all elevations.				
•	Existing facia and sofit boards throughout all elevations.		Item		
•	Existing stone copping stones to parapet wall.				
•	Existing damaged boundary fence		Item		
•	Existing chattels, fixings and structures to the rear courtyard.		Item		
•	Existing external joinery & metal work including but not limited to bollards, furniture, concrete steps.		Item		
•	Existing Mechanical Services installations and service media back to source in accordance with 'Building Services Consultant' M&E Design specification Overview'		Item		
•	Existing Electrical installations and service media back to source in accordance with Building Services Consultant' M&E Design specification Overview' Document.		Item		
3.00	**SUB-STRUCTURE AND SUPER STRUCTURE**				
	Generally				
3.01	To all new and existing sub-structure and super structure works: Contractor to supply and install all required structural works strictly in accordance with the 'John Plumber Partnership Structural Engineering Calculations and Details' Document **(Issue B2)**. Should the Contractor have any specific queries in relation to the structural design and specification they should seek guidance from the Structural Engineer prior to undertaking any works. Contractor to provide cost breakdown for each structural element below. For the avoidance of doubt the below structural works cost summary schedule is for cost collection and pricing purposes only.		Item		
3.02	STRUCTURAL ENGINEERING STATEMENT(B2)		Item		
3.03	TEMPORARY STABILITY(B2)		Item		
3.04	PERMENANT STABILITY		Item		
3.05	DISPROPORTIONATE COLLAPSE		Item		
3.06	CONSTRUCTION DESIGN & MANAGEMENT (CDM) REGULATIONS		Item		
3.07	CONTRACTOR DESIGN ELEMENTS		Item		
3.08	INFORMATION UPON WHICH THE DESIGN IS BASED		Item		
3.09	ANALYSIS AND DESIGN COMPUTER PROGRAMMES		Item		
3.10	REFERENCES		Item		
3.11	ASSUMPTIONS		Item		
3.12	DIMENSIONS		Item		
3.13	SEQUENCE OF CONSTRUCTION (B2)		Item		
3.14	STRUCTURAL STEELWORK SPECIFICATION		Item		
3.15	MASONRY AND ANCILLARY COMPONENTS SPECIFICATION		Item		
3.16	STRUCTURAL (LOOSE CUT) TIMBER SPECIFICATION		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
3.17	GROUND BEARING GROUND FLOOR SLAB SPECIFICATION		Item		
3.18	CONCRETE SPECIFICATION(B2)		Item		
3.19	FOUNDATION SPECIFICATION		Item		
3.20	REINFORCEMENT SPECIFICATION		Item		
3.21	APPENDIX A - JOHN PLUMBER PARTERNSHIP DRAWINGS		Item		
3.22	APPENDIX B - CLIENT SUPPLIED INFORMATION		Item		
3.23	SPPENDIX C - STRUCTURAL ENGINEERING DESIGN CALCULATIONS		Item		
3.24	**Provisional Sum**: Allow Provisional Sum of Ten Thousand Pounds (£10,000.00) for additional unforeseen foundation excavation & installation works. Sum only to be expended upon formal written instructions from the Contract Administrator via a contract instruction.	1	**PS**		**£ 10,000.00**
4.00	**ROOF**				
	Existing Roof				
4.01	To the existing timber roof structure: Allow to undertake woodworm treatment survey and instruct suitable woodworm treatment as recommended by the treatment survey. Contractor is to ensure all presence of wood worms have been effectively treated and all necessary certification and documentation is forwarded to the Contract Administrator.		Item		
4.02	To the existing pitched roof: Remove all existing roof coverings, battens and underfelts taking the roof back to timber structure, setting aside all clay tiles to be reused where possible. Supply and install new insulation boards (Kingspan Kooltherm K107) between rafters with eaves ventilation strips (Sandtoft Eaves Vent 10mm or similar approved) installed to provide a minimum of 50mm ventilation gap over insulation. Install breathable membrane underfelt (Kingspan Nilvent or similar approved) over the rafters with tanalised sawn timber battens to BS5534 fixed vertically and then counter battened horizontally at no more than 600mm apart. Install clay tiles (previously set aside) with ridge tiles (half round Marley ridge tiles) mechanically fixed with twice nailed mechanical H fixings installed between each ridge tile. Include for galvanised hip irons to all external corners. Clay tiles to be fixed using two nails to secure each plain tile in at least every fifth course complete with suitable mortar mix to secure ridge and hip tiles including all associated mortars (1:3 cement: sand, with plasticizing admixtures) fixings and fittings. Where tiles are damaged they are to be replaced like for like to match existing. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.		Item		
4.03	The Contractor is to allow for replacing 25% of clay tiles here.		Item		
4.04	To all roofs: Allow for providing temporary weatherproofing to the existing structure with tarpaulins or similar to be suitably fixed to the retained roof structure whilst the roof area is stripped in order to ensure minimal water ingress occurs to the existing retained structure. Arrange for Contract Administrator/Structural Engineer to undertake full inspection of exposed roof timbers to identify any repairs required to the roof structure prior to new works.		Item		
4.05	To the existing roof voids and eaves: Supply and install mineral wool insulation (ROCKWOOL Roll, Twin roll and Roolbatt) as per the manufacturers recommendations including all associated fixings and fittings. Insulation to be installed between ceiling joists then cross laid in 100mm layers to achieve a total thickness off 400mm. Care should be taken not to block any ventilation grills along the eaves. Upon completion of works the Contractor is to allow for carrying out all tests and provide certification to confirm that the loft insulation achieves a U-value rating of 0.11(W/m2K).		M2		
	Extension Roof				

Item	Work Required	Quantity	Unit	Rate	Tender
4.06	To the new extension roof primary steelwork. Supply and install new cold-rolled galvanised Z-purlins (Kingspan multibeam or similar approved) as per the manufacturers recommendations. The span direction, size and type and spacing of the Z-purlins is to be in accordance with 'John Plumber Partnership Structural Engineering Calculations and Details' Document. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. Should the Contractor have any specific queries in relation to the structural design and specification they should seek guidance from the Structural Engineer prior to undertaking any works.		M2		
4.07	To the new extension primary steel work: Further to the installation of the z-purlins supply and install new trapezoidal composite roof panels (Kingspan KS1000RW 135mm). Roof panels to be fixed to z-purlins as per the manufacturers recommendation including all associated trims, fixtures and fittings. All works to be in accordance with the 'John Plumber Partnership Structural Engineering Calculations and Details' Document. Should the Contractor have any specific queries in relation to the structural design and specification they should seek guidance from the Structural Engineer prior to undertaking any works.		M2		
4.08	To the proposed extension roof lights: Supply and install new powder coated (colour Traffic Grey RAL 7043) aluminium framed doubled glazed (toughened outer glass and laminated inner safety glass) Velux commercial roof lights (Velux Modular Rooflights - Linear light) complete with Rain sensor (WLA 331), Control unit (WCC103, WCC 310/320), Control switch (WSK102/103), blinds (Colour RMR 8805), Blind control wall switch (KLI 312) and prefabricated insulated timber upstands including all associated ironmongery, operating mechanisms, sealants, adhesives and fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8341,B05C - Proposed Site Layout Plan'.		Item		
	Flat Roof				
4.09	To the new flat roof: Further to the remove all of all existing coverings and timber joists supply and install Sika - Sarnafil, single ply PVC membrane in Lead grey (Sika colour No.9500) new flat roof complete with timber joists (47x 220mm C24 timber at 400 mm centres) notched and packed tight into the proposed steel work and hung from timber wall plate (47X220mm C24 Timber fixed to the existing masonry wall with H10 chemical anchors at every 200mm) on joist hangers with 22mm marine plywood decking (screwed to every joist at a maximum of 150mm centres around the perimeter of each board/300mm centres internal within each board) with a suitable vapour control barrier laid on the ply decking followed by a minimum of 130mm insulation (Kingspan Theraroof or similar approved) including all associated sealants, adhesives fixings and fittings. Contractor to allow for a minimum of 200mm upstand. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works are to be in accordance with the 'John Plumber Partnership Structural Engineering Calculations and Details' Document.		M2		
4.10	To the existing bay window and dormer window flat roofs: Strip flat roof back to timber structure and supply and install new warm deck flat roof with Sika - Sarnafil, single ply PVC membrane in Lead grey (Sika colour No.9500) with 22mm marine plywood decking (screwed to every joist at a maximum of 150mm centres around the perimeter of each board/300mm centres internal within each board) with a suitable vapour control barrier laid on the ply decking followed by a minimum of 130mm insulation (Kingspan Theraroof or similar approved) including all associated sealants, adhesives, fixings and fittings. Contractor to allow for a minimum of 200mm upstand as per drawing and for PVC membrane to be dressed over parapet wall as per drawing. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8341 - B06 - Proposed Ground and Basement Floor Plans'.		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
4.11	To the existing painted timber facias and soffits: Further to the removal of the existing timber facias and soffits supply and install new white UPVC facias boards (Eurocell standard facia board) fixed directly to the rafter ends with timber fillets for additional support using 65mm fixings pins and white UPVC vented soffits (Eurocell 25mm Airspace Eurosoffit Board) including all associated trims, ends caps, panel joints, fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.		M2		
4.12	To all new and existing roofs: Supply and install new code 4 lead flashing to all new roof tile joints, ridge tiles and chimneys. All work to be carried out in accordance with the Lead Sheet Association best working practises and including all required and associated fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.		Lm		
4.13	To all new flat roofs: Contractor to allow for detailing flat roof covering to all upstands, Rainwater goods, drips, parapet walls and render as per drawings: - DT01 - FLAT ROOF UPSTAND DETAIL - DT02 - GUTTER DETAIL - DT03 - DRIP DETAIL - DT04 - PARAPIT WALL DETAIL - DT05 - RENDER DETAIL All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. **Rainwater Goods**		Item		
4.14	To the next extension roof: Supply and install a new hidden ppc rainwater system in goosewing grey (Kingspan Industrial Highline Gutter) including but not limited to gutters, internal and external corners, stop ends, overflows, downpipes,, brackets, swan necks, elbows, shoes, collars and adapters including all associated fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.		Lm		
4.15	To the existing pitched roof and new flat roof: Supply and install new PVC-U deep flow rainwater system in black (Marley Plumbing & Drainage Solutions) including but not limited to gutters, internal and external corners, stop ends, overflows, downpipes,, brackets, swan necks, elbows, shoes, collars and adapters including all associated fixings and fittings. Contractor to allow for connecting all new RWG into existing underground drainage. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.		Lm		
4.16	To all rainwater goods and surface drainage services: Thoroughly clean, rod and jet wash all gutters, downpipes liner slot drains and gulley's and ensure running clear. Ensure that gutter joints are adequately sealed and water tight and free flowing upon completion of the works.		Item		
5.00	**ELEVATIONS**				
5.01	To all brickwork elevations throughout the property: Remove any debris undertake a professional deep clean to soiled facing brickwork ensuring all vegetation/moss growth and staining is removed from facing brickwork.		M2		
5.02	**Provisional Quantity:** To the existing brickwork walls: Undertake localised repairs to remove damaged bricks and replace & repoint with new brick work to match existing including all associated fixings and fittings. Contractor to price for 30m2 of brickwork repairs here: ..... Contractor to price for 30m2 of repointing here:		**PQ**		
5.03	To all new connections between existing old and new masonry walls throughout: Supply and install wall starters (Ancon Staifix Universal Wall Starter System) fixed to the existing masonry wall using the wall plugs, washers and screws provided in accordance with the manufacturers recommendations including all associated fixings and fittings. Wall starters are to be used for each individual skin of a masonry wall.		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
5.04	To all door and window openings: Supply and install new cavity closers (Kooltherm Cavity Closer or similar approved) cavity closers to be cut precisely to the opening width with the jambs overhanging the bottom of the closers by a minimum of 50mm including all associated fixings and fittings. All specified products to be installed in accordance with the manufacturerrs recommendations including all associated fixings and fittings.		Lm		
5.05	To the existing Window openings: Further to the removal of the existing windows supply and install new cavity wall infill with 100mm low density concrete blockwork (Thomas Armstrong - Insulite Concrete Block) inner and outer leaf with 75mm insulation board (Kingspan Kooltherm K108 Cavity Insulation board) fixed to the internal leaf with wall tie retaining clips ensuring a 25mm cavity void is left between insulation board and outer leaf including all associated mortar, 225mmcavity ties (Ancon Staifix RT2 - Type 2 fixed at no less than 2.5 per meter square 900mm horizontal x 450mm vertical centres) , fixings and fittings. New Infill must achieve improvement u-value of 0.3. As per the Building Regulations Part L. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8241 - B10 - Ground Floor Wall Specification Plan'.		M2		
5.06	To the proposed extension: Supply and install new cavity wall with 100mm splitface concrete blockwork outer leaf and 100mm Medium density concrete blockwork (Thomas Armstrong - Insulite Concrete Block) inner leaf with 100mm cavity insulation (Kingspan Kooltherm K108 Cavity Insulation board) fixed to the inner leaf and 50mm cavity void between insulation board and outer leaf and including all associated mortar, cavity ties, fixings and fittings. New wall must achieve improvement u-value of 0.26. As per the Building Regulations Part L The contractor is to ensure the new cavity wall is tied to the steel columns using anco SDB Ties at maximum 225 vertical centres and tired in with the existing masonry wall using wall starters at a maximum of 225 vertical centres. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works are to be in accordance with 'John Plumber Partnership Structural Engineering Calculations and Details' Document.		M2		
5.07	To the existing dormer window cheeks: Strip dormer cheeks back to structural timber stud. Remove existing tiling, trims, boarding, battens/counter battens and internal finishes. Supply and install 50mm (minimum) - 75mm insulation between existing timber studs (insulation to be install along the full length of dormer walls) and single layer of felt breather membrane on 18mm marine quality plywood complete with Accoya wood horizontal cladding with translucent finish on the vertical supporting battens and trims in accordance with the manufacturers recommendations including all associated fixtures and fittings. All specified products to be installed in accordance with the manufactures recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8341 - B11 - First Floor Wall Specification Plan'.		M2		
6.00	**EXTERNAL WINDOWS**				
6.01	To the existing dormer windows: Undertake condition survey of all dormer window timber openings and strengthen existing timber frames where required to support new proposed aluminium framed windows including all associated fixings and fittings.		Item		
6.02	**Provisional Sum**: Allow provisional sum of £300.00 per dormer window for timber strengthening works including all associated fixtures and fittings as recommended by condition survey.	4	**PS**	£300.00	**£ 1,200.00**

Item	Work Required	Quantity	Unit	Rate	Tender
6.03	To window openings 1 -17: Supply and install new top hung vent aluminium framed polyester powder coated (colour RAL 9011)double glazed casement windows (AluK C70S Open Out Thermally Broken Window System) complete with trickle vents including all associated ironmongery, operating mechanisms, trims, sealants and fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8341,B20A - Window Schedule' & '8341,B06 - Proposed Ground and Basement Floor plans' 8341,B07 - Proposed First Floor Plan' On completion of the works the Contractor is to provide a 10 year insurance backed product and workmanship guarantee for the new windows including profiles, hardware and accessories.	17	No.		
6.04	To the existing dormer windows: Supply and install new code 4 lead flashing to the dormer window edges. All work to be carried out in accordance with the Lead Sheet Association best working practises and including all required and associated fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.		Lm		
7.00	**EXTERNAL DOORS**				
7.01	To all new doors: All door closers should be capable of operating with an opening force of no more than 30N, for the first 30° of opening, and 22.5° for remainder of swing. Ensure that all existing and relocated doors meet currently Building Regulations requirements in terms of fire-rating and suitability of ironmongery. Consideration must be made when selecting door frame colours to ensure contrasting effect in line with Equality Act requirements.		Item		
7.02	To door openings 1, 10 and 25 (Door Type 8) : Supply and install new 44mm thick 926x2060mm polyester powder coated (Colour RAL 9011) aluminium framed solid FD 30 door sets. Allow for fire rated(FR to match door) double glazed vision panel in accordance with The building Regulations 2010 - Approved Document K4/K5. Doors to be hung on 3 no. heavy duty single axix door hinges complete with fire and smoke seals including all associated fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	3	No.		
7.03	To door opening 2 (Door Type 9) : Supply and install new 44mm thick 926x2060mm polyester powder coated (Colour RAL 9011) aluminium framed FD 30 glazed door. Allow for fire rated (FR to match door) double glazed clear glazing in accordance with The building Regulations 2010 - Approved Document K4/K5. Door to be hung as per the manufacturers recommendations complete with fire and smoke seals including all associated fixings and fittings. All specified products to be installed in accordance with the manufactures recommendations including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	1	No.		
7.04	To door opening 11 (Door Type 10) : Supply and install new leaf and a half 44mm thick 826/434x2060mm polyester powder coated (Colour RAL 9011) aluminium framed solid FD30 fire exit door. Allow for fire rated emergency exit push bar with shoot bolts in accordance with BS EN 179:2008. Doors to be hung as per then manufacturers recommendations and be complete with fire and smoke seals including all associated fixings and fittings. All specified products to be installed in accordance with the manufactures recommendations including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	1	No.		
7.05	To door opening 2 (Type 9): Supply and install manifestation to glazed door in accordance with The Building Regulations 2010 - Approved Document K5.2 Section 7: Manifestation of Glazing including all associated fixings and fittings	1	No.		

Item	Work Required	Quantity	Unit	Rate	Tender
7.06	To all external doors throughout: Supply and install ironmongery and signage to all doors including but not limited to push plates, pull handles, kick plates, overhead closers, door stops, door holders, door mounted coat hooks, mortice cylinder key locks, thumb turn operation to mortice cylinder on internal side, thumb turn privacy indicators and surface mounted signage including all associated fixings and fittings. All specified products to be installed in accordance with the manufactures recommendations including all associated fixings and fittings. All door ironmongery, signage and finishes are to be in accordance with drawing 'B341,B19 - Ironmongery Schedule'. The Contractor is to ensure that before any orders are place a sample board containing labelled samples of ironmongery and signage showing methods of fixing is provided to the Contract Administrator for approval.	1	Item		
7.07	To all lockable external doors throughout all elevations: supply 3no. sets of keys to all locks for all security and access doors to the property.	4	No.		
8.00	**EXTERNAL AREAS**				
	Hardstanding's				
8.01	To the tarmac car park areas and concrete hardstanding's throughout the site: Remove rubbish and debris and thoroughly brush clean down surface.		M2		
8.02	To the front entrance of the building: Supply and install subframe on pad supports at 450mm centres with noggins. Supply and fit new Millboard lasta-grip anti slip composite decking in golden oak finish raised decking complete balustrades, handrails, stepped and ramped access in accordance with The Building Regulations - Approved documents K and M. Allow for all necessary supports and subframe recommended by the manufacture including all associated fixtures and fittings. Contractor to allow for access hatch for beer hatch below proposed decking. All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'.		M2		
8.03	To the proposed car park area: Remove existing tarmac layer back to existing sub-base and supply and install new 190mm toping course to new carpark. Allow for any adjustments to existing manholes, gullies as necessary to ensure correct fall to rainwater gullies. The proposed build up of the car park is as follows: 40mm Thick close graded asphalt concrete 60mm Thick dense binder course (20mm coarse aggregate) 90mm Thick dense base Existing sub-base All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'.		M2		
8.04	To the proposed car park area: Thoroughly prepare and apply new thermoplastic lining. Allow for White line marking to standard car parking bays and yellow line marking to accessible parking spaces including wheel chair symbol and hatched areas. All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'		Lm		
8.05	To all new soakaways: Allow to excavate as necessary and form new soakaway, minimum size 2m x 2m x 1m and to be positioned a minimum 5m from the existing building or new extension and other adjacent buildings. Positions to be approx. as detailed on the drawings. Allow to connect all new surface water drainage into new soakaways. New soakaways to be formed Wavin Aquacell Eco Modular units. These units to be wrapped with geotextile membrane. Base of the soakaway is to be covered with pea gravel to a depth of approx. 100mm and hole to be back filled with similar pea gravel to a minimum depth of 150mm. Ensure all relevant connections made to soakaway and back fill with top soil to bring levels back to match existing. All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'		Lm		

Item	Work Required	Quantity	Unit	Rate	Tender
8.06	To all new and existing below surface drainage: Allow for all necessary excavation and provide and install complete below ground foul and surface water drainage system to the layout shown on the drawings and as detailed. The below ground drainage installation to include for all new inspection chambers, suitable covers, frames, gullies, linear drainage channels and pipework etc. to complete the installation. All new drainage installation to be strictly in accordance with current Building Regulations. All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'		Lm		
8.07	To all new and existing below and surface drainage: Allow for cleaning out and rodding through existing and new surface water and foul water drainage on completion of the works and ensure that all pipework is clear and free running.		Item		
8.08	To all new below ground M&E services installations: Contractor to allow for all BWIC with the installation of all new below ground drainage, soakaways, manholes, connections, electrical and data runs including all associated fixings and fittings. All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'		Item		
	Boundaries, Fences and Gates				
8.09	To the NE & SE boundary fence: Supply and install new 1800mm high timber boundary fence. Allow for concrete posts with concrete gravel boards and timber vertical timber feather board fence.		Lm		
8.10	To the proposed perimeter fence: Supply and install new 1200mm high bow top metal fence with coated black finish and 2no. sliding entrance gates including all associated fixings and fittings. Contractor to present proposed fence to Contract Administrator for approval prior to placing any orders. All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'		Lm		
8.11	To the air source heat pump: Supply and install new 1800mm timber slat double leaf gates into 100x100mm timber weathered top gate posts. Allow for slide latch within the gate frame including all associated fixings and fittings.	3	Lm		
8.12	To the Air source heat pump: Supply and install new 200mm thick reinforced concrete base for the proposed air source heat pump. All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'		m2		
	Out Buildings, Sheds and Shelters				
8.13	To the left hand side of the building: Supply and install new Steel framed 'Bi-store' open end clear thermoplastic (RG665) cycle shelter with 5no. galvanised steel cycle rings including all associated fixtures and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.	1	Item		
8.14	To the bin store: Supply and install new bin store with 100x100 timber gate posts and timber chevron slates. Contractor to all for 2no. Timber framed gates with chevron slats. All works to be in accordance with drawing '8341,B05C - Proposed Sit Layout Plan'		Lm		
9.00	**CEILINGS**				
9.01	To all ceilings throughout: Fix boards to ceilings before installing dry lined walls and partitions. Boards are to be fixed with bound edges at right angles to supports and with ends staggered in adjacent rows. Where two layers of boarding is required stagger joints between layers.		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
9.02	**Provisional Quantity:** To the existing plasterboard ceilings Undertake patch repairs to damaged and damp stained sections of plasterboard ceiling cutting out defective sections and replacing with new sections of plasterboard to match existing including all associated fillers, fixings and fittings. Contractor to price for 10m2 of Plasterboard repairs here: ..... Where ceiling is beyond economical repair the contractor is to price to replacing the ceiling with new to match existing including all associated trims, tapes, fixtures and fittings. Contractor to price for 10m2 of new plasterboard ceiling here:		**PQ**		
9.03	To the ceiling voids throughout: Allow to upgrade and install new fire stopping between compartments where required to comply with Part B of The Building Regulations. This includes but is not limited to fire boarding as part of finishes, intumescent seals to building fabric joints and junctions and fire stopping to services penetrations etc. The contractor is to ensure the CA and Approved Inspector for the project are notified prior to voids being closed up so that all required inspections in relation to statutory compliance can be undertaken. All works to be in accordance with drawings ' 8241,B10 - Ground Floor Wall Specification Plan and 8241 - B11 - First Floor Wall Specification Plan'.	1	M2		
9.04	To the areas receiving new MF ceilings as per the reflected ceiling plan: Supply and install new metal frame ceiling (British Gypsum Casoline MF Ceiling System) with 12.5mm plasterboard layer (British Gypsum Gyproc Wallboard) complete with 3mm plaster skim coat including all associated beads, trims, tapes, fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works are to be in accordance with drawing '8341,B12 - Reflected Ceiling Plans'.	167.1	M2		
9.05	To the areas receiving new overboard ceilings as per the reflected ceiling plan: Supply and install 12.5mm (British Gypsum Gyproc) finish with 3mm plaster skim coat including all associated beads, trims, tapes, fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works are to be in accordance with drawing '8341,B12 - Reflected Ceiling Plans'.	198.3	M2		
9.06	To the areas receiving new moisture resistant MF ceilings as per the reflected ceiling plan: Supply and install new metal frame ceiling (British Gypsum Casoline MF Ceiling System) with 12.5mm plasterboard layer (British Gypsum Gyproc Moisture Resistant Plasterboard) complete with 3mm plaster skim coat including all associated beads, trims, tapes, fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works are to be in accordance with drawing '8341,B12 - Reflected Ceiling Plans'.	23.3	M2		
9.07	To the areas receiving new moisture resistant overboard as per the reflected ceiling plan: Supply and install 12.5mm plasterboard layer (British Gypsum Gyproc Moisture Resistant Plasterboard) complete with 3mm plaster skim coat including all associated beads, trims, tapes, fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works are to be in accordance with drawing '8341,B12 - Reflected Ceiling Plans'.	25.4	M2		

Item	Work Required	Quantity	Unit	Rate	Tender
9.08	To the community hall ceiling: Supply and install new suspended ceiling system (Gyproc - MF Gypceiling) with ceiling sections at 600mm centres (British Gypsum Gypframe MF5), primary supports at 400mm centres (British Gypsum Gypframe MF7), steel angles (British Gypsum Gypframe MFEA1) and 150mm of mineral wool insulation(Isover Acoustic Partition Roll) complete with Supawood Supaslat 3 timber slat feature ceiling (Colour Supacolour - Black SF) including all associated fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. Allow for lighting, emergency lighting, electrical fittings and all service media to be set between the timber slats. Service void to be adjusted to suit proposed M&E services. Suspended ceiling system to be fixed to the primary steelwork. Roof purlins with feature timber ceiling installed between primary and secondary steel beams as per the manufactures recommendations.	129.5	M2		
10.00	**WALLS**				
10.01	**Provisional Quantity:** To all existing internal partitions: Undertake localised repairs to internal walls raking out defective sections of plaster and replacing with new plaster skim including all associated beads, joints, tapes, fixings and fittings. Contractor to price for 20m2 of Plaster repairs here:		**PQ**		
10.02	To the existing ground floor partitions: Supply and install new 100mm low density concrete blockwork (Thomas Armstrong Ultralite Concrete Block) partitions complete with 12.5mm plasterboard (British Gypsum Gyproc Wallboard and Moisture Resistant Plasterboard) fixed to either side using adhesive dabs and 3mm plaster skim including all associated adhesives, beads, joints, tapes, fixings and fittings. Contractor to use Gyproc moisture resistant plasterboard for all WC partitions. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8241,B10 - Ground Floor Wall Specification Plan'.		M2		
10.03	To the existing internal ground floor partitions: Supply and install new 100mm low density concrete blockwork (Thomas Armstrong Ultralite Concrete Block) wall infill with 100mm cavity void complete with 12.5mm plasterboard (BritishGypsum Gyproc Wallboard) fixed to either side using adhesive dabs and 3mm plaster skim including all associated adhesives, beads, joints, tapes, fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8241,B10 - Ground Floor Wall Specification Plan'.		M2		
10.04	To the community hall high level internal wall lining: Supply and install new cold-rolled Z-purlins (Kingspan multibeam or similar approved) with 48mm metal stud (British Gypsum Gypframe C Stud) between steel bracing and 50mm mineral wool cavity fill (Isover acoustic insulation) finished with 12.5 plaster board (BritishGypsum Gyproc Wallboard) and 3mm plaster skim including all associated adhesives, beads, joints, tapes, fixings and fittings. The span direction, size and type and spacing of the Z-purlins is to be in accordance with 'John Plumber Partnership Structural Engineering Calculations and Details' Document. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. Should the Contractor have any specific queries in relation to the structural design and specification they should seek guidance from the Structural Engineer prior to undertaking any works.		M2		

Item	Work Required	Quantity	Unit	Rate	Tender
10.05	To the first floor new internal partitions: Supply and install new 130mm metal stud partitions (British GypsumGywall single frame) at 600mm centres with 50mm cavity insulation roll (Isover Acoustic Partition roll APR 1200) finished with two layers of 12.5mm plasterboard (BritishGypsum Gyproc Wallboard) with staggered joints and 3mm plaster skim including all associated adhesives, beads, joints, tapes, fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.		M2		
10.06	To the basement: Supply and install new floor to ceiling store rooms with 100x50mm preservative treated timber stud walls installed at 600mm centres with suitable noggins finished with chain link fencing to one side. Door to be structural timber frame with cross bracing with chain link fence including all associated fixings and fittings.		Lm		
10.07	To all new and proposed partitions throughout: Allow to upgrade and install new fire stopping between compartments where required to comply with Part B of The Building Regulations. This includes but is not limited to fire boarding as part of finishes, intumescent seals to building fabric joints and junctions and fire stopping to services penetrations etc. The contractor is to ensure the CA and Approved Inspector for the project are notified prior to voids being closed up so that all required inspections in relation to statutory compliance can be undertaken. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8241,B10 - Ground Floor Wall Specification Plan'.		M2		
11.00	**INTERNAL WINDOWS**				
	N/A				
12.00	**INTERNAL DOORS**				
12.01	All door closers should be capable of operating with an opening force of not more than 30N, for the first 30° of opening, and 22.5° for remainder of swing. Ensure that all existing and relocated doors meet requirements in terms of fire-rating and suitability of ironmongery. Consideration must be made when selecting door frame colours to ensure contrasting effect in line with Equality Act requirements.		Item		
12.02	To door openings 8 & 24 (Door Type 1) : Supply and hang new 54mm thick 926x2060mm polyrey HPL laminate chene bastude C129(Natural woods, Oak) solid FD 60 door sets. Allow for 180mm fire rated (FR to match door) double glazed vision panel in accordance with The building Regulations 2010 - Approved Document K4/K5. Doors to be hung on 3 no. Heavy duty single axix door hinges complete with fire and smoke seals including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	2	No.		
12.03	To door openings 6, 7, 13, 14 and 16 (Door Type 2) : Supply and hang new 44mm thick 826x2060mm polyrey HPL laminate chene bastude C129(Natural woods, Oak) solid FD 30 door sets. Allow for 180mm clear fire rated (FR to match door) double glazed vision panel in accordance with The building Regulations 2010 - Approved Document K4/K5. Doors to be hung on 3 no. Heavy duty single axix door hinges complete with fire and smoke seals including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	5	No.		
12.04	To door openings 3, 17, 22, 23, 26, 27, 29, 32, 34 and 35 (Door Type 3) : Supply and hang new 44mm thick 826x2060mm polyrey HPL laminate chene bastude C129(Natural woods, Oak) solid FD 30 door sets. Doors to be hung on 3 duty single axix door hinges complete with fire and smoke seals including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	10	No.		
12.05	To door openings 5, 20 and 28 (Door Type 4) : Supply and hang new 44mm thick 726x2060mm polyrey HPL laminate chene bastude C129(Natural woods, Oak) solid FD 30 door sets. Doors to be hung on 3 duty single axix door hinges complete with fire and smoke seals including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	3	No.		

Item	Work Required	Quantity	Unit	Rate	Tender
12.06	To door openings 4, 9, 18, 19, 21, 30 and 31 (Door Type 5) : Supply and hang new 44mm thick 1050 x2060mm polyrey HPL laminate chene bastude C129(Natural woods, Oak) solid FD 30 door sets. Doors to be hung on 3 duty single axix door hinges complete with fire and smoke seals including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	7	No.		
12.07	To door opening 15 (Door Type 6) : Supply and hang new leaf and a half 44mm thick 826/434 x2060mm polyrey HPL laminate chene bastude C129(Natural woods, Oak) solid FD 30 door set. Doors to be hung on 3 duty single axix door hinges complete with fire and smoke seals including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	1	No.		
12.08	To door opening 12 (Door Type 7) : Supply and hang new 54mm thick 626x2060mm polyrey HPL laminate chene bastude C129(Natural woods, Oak) solid FD 60 door sets. Doors to be hung on 3 duty single axix door hinges complete with fire and smoke seals including all associated fixings and fittings. All doors to be installed in accordance with drawing '8341,B18 - Door Schedule'.	1	No.		
12.09	To all internal doors throughout: Supply and install ironmongery and signage to all doors including but not limited to push plates, pull handles, kick plates, overhead closers, door stops, door holders, door mounted coat hooks, mortice cylinder key locks, thumb turn operation to mortice cylinder on internal side, thumb turn privacy indicators and surface mounted signage including all associated fixings and fittings. All door ironmongery, signage and finishes are to be in accordance with drawing 'B341,B19 - Ironmongery Schedule'. The Contractor is to ensure that before any orders are place a sample board containing labelled samples of ironmongery and signage showing methods of fixing is provided to the Contract Administrator for approval.	29	No.		
12.10	To all new fire doors throughout: where new fire doors sets have been fitted the Contractor is to provide certification of compliance with the Building Regulations Part B.	1	Item		
13.00	**JOINERY**				
13.01	To all walls and internal partitions thought: Supply and install new 100mm softwood bullnose skirting securely fixed with mitred corners including all associated fixings and fittings.		Lm		
13.02	To all door openings throughout: Supply and install new 75mm softwood bullnose architraves securely fixed with mitred corners including all associated fixings and fittings.		Lm		
13.03	To all the new window openings: Supply and install new 25mm softwood windows cills with profiled edges to match existing like for like including all associated fixings and fittings.		Lm,		
13.04	**Provisional Quantity:** To all exposed pipework and services throughout the WC's: Supply and instal new 10mm ply boxing to all exposed services and pipe work leaving all surfaces ready to receive decoration including all associated fixing and fittings. Contractor to price for 50m2 of new ply boxing here:	50	**PQ**		
13.05	To the basement: Supply and install new timber staircase from the basement to the ground floor. Staircase is to be constructed from treated softwood and ply with closed risers and strings. Staircase to comply with Buildings Regulations Part K in respect to hand rail heights, widths, goings and risers, etc. Staircase to allow for a quatre landing and anti slip strips on all goinings with aluminium noggings. **WC's**		Item		
13.06	To the first floor WC's: Supply and install new 1250x597x12 marine pattress board (Smartply Pattress Plus or similar approved) within the metal stud frame including all associated fixings and fittings. All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings.		M2		

Item	Work Required	Quantity	Unit	Rate	Tender
13.07	To all WC's throughout: Supply and install new close coupled toilets (white glazed fireclay pan, vitreous china cistern and plastic seat and cover) with dual flush including all associated pipework, fixings and fittings. All works to be in accordance with drawing '8341,B16 - Proposed WC Details'	9	No.		
13.08	To all WC's throughout: Supply and install: Supply and install washbasins (Armitage shanks - HBN - 00-10-HTM65[LB G M] Contour 21+ 50cm back outlet basin) complete with chrome thermostatic basin mixer taps (Sanceram Sequential TMV3 mixer tap) and chrome waste trap including all associated pipework, fixings and fittings. All works to be in accordance with drawing '8341,B16 - Proposed WC Details'	9	No.		
13.09	To all WC's throughout: Supply and install new highly polished stainless steel 700x450mm 6mm thick mirrors with bevelled edges including all associated fixings and fittings. All works to be in accordance with drawing '8341,B16 - Proposed WC Details'	12	No.		
13.10	To all WC's throughout: Supply and instal new wall mounted paper towel dispensers (Tork Xpress® Multifold Hand Towel Dispenser 552000) including all associated fixings and fittings. All works to be in accordance with drawing '8341,B16 - Proposed WC Details'	12	No.		
13.11	To all WC's throughout: Supply and install new wall mounted soap dispensers (Tork Liquid and Spray Soap Dispenser 560000) including all associated fixings and fittings. All works to be in accordance with drawing '8341,B16 - Proposed WC Details'	12	No.		
13.12	To all WC's throughout: Supply and install new free standing white plastic brissled toilet brushed including all associated fixings and fittings.	12	No.		
13.13	To all accessible WC's throughout: Supply and install new Doc M assessable WC equipment packages (Armitage Shanks contour 21+ close coupled WC Doc M pack Stock Code: S0683AC) including all associated fixings and fittings. All accessible WC installations are to be in accordance with The Building Regulations - Approved Document M - Access and use of Buildings and Drawing '8341,B16 - Proposed WC Details'. **Tea point**	3	No.		
13.14	To Tea point A (Room Hire A): Supply and install new tea point complete with all associated base units, worktops, sinks, waste, traps, end panels, plinths, metal edging strips, sealants, adhesives, fixings and fittings. Tea point to include(Unit Colours to be confirmed): - Greenwich Gloss 575mm integrated undercounter fridge housing unit - Greenwich Gloss 425mm Pullout Bin unit (including bin) - Greeneich Gloss 900mm Double Base unit - Greenwich Gloss 900mm Double Base unit with 450mm soft close drawer - Howdens T Bar Brushed Stainless Steel Effect Classic Cupboard Handle 230mm - Howdens Franke Bell 1.5 Bowl Inset Stainless Steel Sink - Howdens Franke Bell Polished Chrome Swan Neck Mixer Tap with chrome pop up waste - HPL Bonded Laminate Chene Bastude C129 (Natural woods, Oak) worktop All works to be in accordance with drawing '8341,B17 - Tea point Details'	1	Item		
13.15	To Tea point B (Community Hall): Supply and install new tea point complete with all associated base units, worktops, sinks, waste, traps, end panels, plinths, metal edging strips, sealants, adhesives, fixings and fittings. Tea point to Include (unit Colours to be confirmed): - Greenwich Gloss 575mm integrated undercounter fridge housing unit - Greenwich Gloss 425mm Pullout Bin unit (including bin) - Greenwich Gloss 900mm Double Base unit with 450mm soft close drawer - Howdens T Bar Brushed Stainless Steel Effect Classic Cupboard Handle 230mm - Howdens Franke Bell 1.5 Bowl Inset Stainless Steel Sink - Howdens Franke Bell Polished Chrome Swan Neck Mixer Tap with chrome pop up waste - HPL Bonded Laminate Chene Bastude C129 (Natural woods, Oak) worktop - 2.no 18x300mm White laminate floating shelves at 300mm centres (length to match tea point) All works to be in accordance with drawing '8341,B17 - Tea point Detail	1	Item		

Item	Work Required	Quantity	Unit	Rate	Tender
13.16	To Tea point C (Room hire B): Supply and install new tea point complete with all associated base units, worktops, sinks, waste, traps, end panels, plinths, metal edging strips, sealants, adhesives, fixings and fittings. Tea point to include(Unit Colours to be confirmed): - Greenwich Gloss 575mm integrated undercounter fridge housing unit - Greenwich Gloss 425mm Pullout Bin unit (including bin) - Greenwich Gloss 900mm Double Base unit with 450mm soft close drawer - Howdens T Bar Brushed Stainless Steel Effect Classic Cupboard Handle 230mm - 2.no 18x600mm White Laminate open shelving at 300mm centres (Cut to fit flush against angle of the wall) - Howdens Franke Bell 1.5 Bowl Inset Stainless Steel Sink - Howdens Franke Bell Polished Chrome Swan Neck Mixer Tap with chrome pop up waste - HPL Bonded Laminate Chene Bastude C129 (Natural woods, Oak) worktop - Altro Whitrock 2.5x610mm splash back (White W103/W104) Length to match tea point	1	Item		
13.17	To Tea point D (Offices): Supply and install new tea point complete with all associated base units, worktops, sinks, waste, traps, end panels, plinths, metal edging strips, sealants, adhesives, fixings and fittings. Tea point to include(Unit Colours to be confirmed): - Greenwich Gloss 575mm integrated undercounter fridge housing unit - Greenwich Gloss 425mm Pullout Bin unit (including bin) - Greeneich Gloss 900mm Double Base unit - Greenwich Gloss 900mm Double Base unit with 450mm soft close drawer - Howdens T Bar Brushed Stainless Steel Effect Classic Cupboard Handle 230mm - Howdens Franke Bell 1.5 Bowl Inset Stainless Steel Sink - Howdens Franke Bell Polished Chrome Swan Neck Mixer Tap with chrome pop up waste - HPL Bonded Laminate Chene Bastude C129 (Natural woods, Oak) worktop All works to be in accordance with drawing '8341,B17 - Tea point Details'	1	Item		
13.18	To all the new tea points: Supply and install new integrated undercounter fridge (Lamona LAM6000 Integrated White Larder Fridge) including all associated service media, fixings and fittings.	4	Item		
13.19	To Tea point D (Offices): supply and install new freestanding solo microwave (Russle Hobbs RHM20765 Solo Microwave - Silver) including all associated service media, fixings and fittings.	1	Item		
13.20	To all WC's, Tea points & the Community Space: Supply and install new Altro Whitrock -Rigid PVC Wall Sheeting echo satin (White W103/W104) with 150mm coving to all WC's, cleaners stores and tea points with aluminium skirting cap including all associated trims, fixings and fittings in accordance with the manufacturer's recommendations. WC's - Full wall height Tea points - 610mm above worktops All specified products to be installed in accordance with the manufacturers recommendations including all associated fixings and fittings. All works to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'		M2		
14.00	**METALWORK**				
15.00	**FLOORS**				
15.01	To all floors through the ground floor: Prepare existing substrate by removing dust and debris and Supply and install new self levelling screed (Sikafloor Level-30) in accordance with the manufactures recommendations. Contractor to ensure even floor finish throughout the ground floor and that adequate curing time in line with the manufactures recommendations is allowed for before floor finishes are laid.	218	M2		
15.02	To the Community hall, Room Hire A, Room Hire B and Frist Floor lobbies: Supply and instal new hardwearing entrance flooring (Forbo Coral Classic 4751 Silver Grey) including all required threshold strips, fixings and fittings. All works to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'	3	M2		

Item	Work Required	Quantity	Unit	Rate	Tender
15.03	To the first floor offices 1, 2 & 3: Prepare existing timbe board flooring (ply sheet overboard if required) and supply and install new carpet tile floor covering (500x500.6,7mm Forbo, Tessera Infused Carpet Tile 4500 Magic Mood (Grey) including all associated threshold strips, fixings and fittings in accordance with the manufactures recommendations. All works to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'	175	M2		
15.04	To room hire A WC's & Lobbies, Store Rooms and Tea points throughout: Supply and install new sheet vinyl floor covering (Forbo Laguna Surestep - 181922 Concrete) with 150mm height coving to all vinyl floor finishes with aluminium skirting cap including all associated threshold strips, jointing trims, fixings and fittings in accordance with the manufactures recommendations. All works to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'	84	M2		
15.05	To the Community space and Room hires A & B: Supply and install new sheet vinyl floor covering (Forbo - Surestep wood - 18952 Dark Grey Oak) including all associated threshold strips, jointing trims, fixings and fittings in accordance with the manufactures recommendations. All works to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'	7	M2		
15.06	To the community hall: Supply and install new sprung timber floor (Boen Boflex Olympia Timber Floor - Beech Finish) with 5mm foam insulation (Evazote) including all associated threshold strips, trims, adhesives, fixings and fittings in accordance with the manufacturers recommendations. All works to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'	124	M2		
16.00	**MECHANICAL AND ELECTRICAL**				
16.01	The design and installation of the mechanical & electrical works form part of the contractors design portion of the contract works. All mechanical & electrical works are to be designed and completed in accordance with 'Building Services Consultants Design Specification Overview' and all relevant and current statutory requirements, regulations, guidance and in line with the best practices. Contractor to ensure all new mechanical & electrical installations are to be chased into the existing substrate with no exposed or surface mounted conduits. Final setting out positions for all new face plates, fixtures and fittings are to be agreed with the CA prior to installation. Contractor to all for all design & installation of all above ground drainage in accordance with IoP, CIBSE and Building Regulations Approved Documents.		Item		
16.02	Carryout full validation measurements of existing building performance. Including but not limited to:- •Water tests •Electrical tests		Item		
16.03	New MVHR Ventilation Systems		Item		
16.04	New Intermittent Extract Ventilation Systems		Item		
16.05	New Split Type air to air heat pump heating and cooling systems		Item		
16.06	New direct electric radiant space heating system		Item		
16.07	New ASHP and VLTHW to Community Hall Underfloor heating system		Item		
16.08	New hot and cold water systems		Item		
16.09	New above ground drainage wastewater disposal systems		Item		
16.10	New Building Management Control Systems		Item		
16.11	New LV Distribution Systems		Item		
16.12	New Small Power Distribution system		Item		
16.13	New data and AV cabling systems		Item		
16.14	New general and emergency internal lighting systems		Item		
16.15	New Lightening Protection System		Item		
16.16	New fire alarm systems		Item		
16.17	New CCTV Systems		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
16.18	New security and access control system		Item		
16.19	New hand driers		Item		
16.20	New call systems (acc. WC's)		Item		
16.21	Induction loop systems		Item		
16.22	New Roof mounted Photovoltaic (PV) Systems		Item		
16.23	New electric vehicle charging points		Item		
16.24	AV Equipment (supply and install)		Item		
16.25	Commissioning		Item		
16.26	Legionella Risk Assessment		Item		
16.27	12 Months Maintenance in accordance with maintenance specification SFG20 and manufacturers recommendations		Item		
17.00	**DECORATIONS**				
17.01	All previously decorated finishes and new finishes are to have full redecoration throughout. Refer to drawing '8341,B15 - Proposed Finishes Plan' for colours and paint finishes. Contractor to allow for 1no. mist coats to all new plastered surfaces prior to applying finishing coats.		M2		
17.02	To all ceilings and walls throughout: Prepare surfaces and decorate with 2no. coats of Dulux Trade Diamond Emulsion in White cotton (off white) in accordance with the manufacturer's recommendations. All decorations to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'		M2		
17.03	To the canteen, Room Hire A lobby, Room Hire B & Community Hall walls: Prepare surfaces and decorate with 2no. coats of Dulux Trade Emulsion Green - 40GY-371 in accordance with the manufacturer's recommendations. All decorations to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'		M2		
17.04	To all WC's, Tea points & Cleaners stores walls: Prepare surfaces and decorate with 2no. coats of Dulux Trade Diamond Egg shell White cotton in accordance with the manufacturer's recommendations. All decorations to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'		M2		
17.05	To all skirtings and architraves throughout: Prepare surfaces and decorate with 2no. coats of Dulux Trade Diamond Satinwood Almost Black 09BB/008 in accordance with the manufacturer's recommendations. All decorations to be in accordance with drawing '8341,B15 - Proposed Finishes Plan'		M2		
17.06	**Provisional Quantity**: To all new internal boxings : Thoroughly prepare and decorate with 2no. coats of Dulux Trade Diamond Satin Paint in accordance with the manufacturer's recommendations. Contractor to price for 50m2 of decorations to boxing here:	50	**PQ**		
17.07	To the new timber staircase : Thoroughly prepare and decorate with 2no. coats of Dulux Trade Diamond Satin Paint in accordance with the manufacturer's recommendations.	1	M2		
18.00	**CLEANING**				
18.02	To all windows and doors throughout: thoroughly clean all internal and external glazing panes upon completion of the works.		Item		
18.03	To all external hard standing areas: Remove all rubbish, vegetation and undertake a full builders clean and jet wash all floor coverings upon completion of the works.		Item		

Item	Work Required	Quantity	Unit	Rate	Tender
18.04	To all internal areas and surfaces throughout the entire building: remove all rubbish and debris upon completion of the works and thoroughly clean all surfaces, finishes fixings and finishes throughout ready to the hand the building over to the employer upon completion of the project works.		Item		
19.00	**HANDOVER INFORMATION**				
19.01	Upon completion the contractor is to provide a full health and safety file in relation to the works inclusive of all test certificates, product data sheets, warranties and operation and maintenance manuals.		Item		
19.02	Upon completion the contractor is to provide as built drawings in electronic and hardcopy format for works which form part of the Contractors design portion of the contract works		Item		

BWL Consulting (EAST) Limited

29th September 2023

NEW EXTENSION AND REFURBISHMENT

VIKING CENTRE

SPROWSTON, NORWICH

SEPTEMBER 2023

DESIGN SPECIFICATION OVERVIEW

ISSUE 3

1.0. Introduction and Project Scope

This is a Performance Specification intended for the purposes of tender issue to allow contractors to provide pricing of Mechanical, Electrical and Public Health Works.

The Site address is:

The Former Viking Pub
Tills Road
Norwich
NR6 7QZ

The purpose of this document is to describe the strategic intent and performance requirements of the employer for the contractor to meet when both tendering the project and developing the design prior to installation.

The MEP Contractor will be responsible for the development of the design to construction phase in accordance with this specification and all other project and utilities documentation

The works of this project generally involve the following:-

1. Validation Surveys to inform design development and confirmation of design intent.
2. New underfloor heating to new community hall provided by ASHP
3. New direct electric radiant panel space heating to the building
4. New heating and cooling split type AC systems to selected rooms
5. New Ventilation systems featuring mechanical ventilation heat recovery units and intermittent extract units
6. New mains cold water distribution and direct electric unvented hot water storage units
7. New Low Voltage Electrical distribution systems including new switchgear and small power distribution
8. New data and wi fi systems
9. New AV Systems including cable infrastructure and equipment (i.e. Projectors, TVs and Audio Equipment)
10. New general and emergency internal lighting
11. New Fire Alarm system
12. New Access control system
13. New security system
14. New CCTV system
15. New Building Management Systems
16. New Lightning protection system
17. New Roof Mounted Photo-Voltaic (PV) Systems
18. New electrical window controls to the new community hall
19. New Induction Loops Systems
20. New Electric Vehicle Charging Units
21. New External Lighting System
22. Commissioning of all new systems

23. Provide full 12 Maintenance in accordance with SFG20 and the manufacturers recommendations for the:-

SUPPLEMENTARY DOCUMENTS DOCUMENT

Appendix	Equipment Schedule
Appendix	Technical Specification

ALL THE ABOVE DOCUMENTS AND ASSOCIATED OTHER ARCHITECTS AND STRUCTURAL DOCUMENTS ARE TO BE READ IN CONJUNCTION WITH THIS DOCUMENT

2.0 Preliminaries

The contractor will develop the design in accordance with the employer requirements, inclusive of this specification. The intent of this design will be verified by the contractor and the concept tender design developed to a conclusion.

Prior to providing a price for the project, the contractor will attend site to inspect the premises to ensure that the existing services and installation methodologies required and site limitations are understood.

The contractor will submit the fully coordinated design to the employer for acceptance. The contractors design will be developed in accordance with the BSRIA BG6/2018 guidance document to a completed RIBA Stage 4 standard. The design to be submitted to the employer is Defined within BG6 as Co-ordinated Specific Design.

The contractor will be responsible for the development of the design including the submission of information to the building control officer to obtain all necessary approvals.

During the process of design development the contractor will liaise with statutory bodies the employer and any appointed agents on the employer's behalf, including but not limited to the other contractors associated with the project appointed by the employer.

The contractor will be responsible for completing a full CDM Pre-Construction pack of information including but not limited to Designers Risks Assessments (DRA's) and:-

- Description/Overview of the Project
- Clients Conditions and Management Requirements
- Requirements relating to the Health and Safety of clients employees, customers or those involved in the project
- Environmental Restrictions and Existing on Site risks
- Significant design and Construction Hazards
- Construction Phase Plan
- Health and Safety File

The contractor will complete a full set of Operating and Maintenance (O&M) Manuals and as built drawings and schedules. The O&M and as built information should be prepared at least one month prior to the completion of the project to allow the employer (or employers agent) to review the information.

The contractor will be responsible for all PPE, access equipment and task lighting etc.

The contractor will provide a site supervisor responsible for the day to day management of the MEP installation activities and liaise day to day with the employers representative.

The contractor will be responsible of for the management and disposal of all the waste associated with the MEP installations.

Following the Practical Completion of the Project the contractor will provide the employer with 12 Months Programmed Preventative Maintenance (PPM) in accordance with the manufacturers recommendations and the BESA SFG20.

The contractor will provide documentation to ensure that the full manufacturers warranties are provided to the employer. This will include all manufacturers warranties for equipment where the manufacturers provide warranties that last for durations in excess of the 12 Month warranty of the installations generally.

At the completion of the project all equipment will be serviced and the reports proved to the employer. If there are any defects, these will be rectified under the warranty.

General Standards

- Chartered Institution of Building Services Engineers (CIBSE) Guides
- CIBSE Commissioning Codes
- Institute of Engineering and Technology (IET) Guides and Regulations
- Building Regulations and the associated Approved Documents
- Non -Domestic Building Services Compliance Guide
- The SBEM Calculation for the project (where applicable)
- Gas Safe/Corgi Guidance
- Gas Safety (Installation and use) Regulations 1998
- Water Supply (Water Fittings) Regulations 1999
- Electricity at Work Regulations 1989
- British Standards
- The Wiring Regulations 18th Edition BS7671
- NICEIC Guidance Documents
- Manufacturers Recommendations of any equipment proposed or specified systems, equipment or products
- Institute of Plumbing Guides
- The latest versions of all applicable guides, regulations and legislation apply.

All works to take place in accordance with current Regulations and Guidance including but not limited to:-

- Building Regulations and associated Approved Documents including Non-Domestic Building Services Guide
- British Standards, Guides, Codes of Practice and Specifications, Published Documents

- CIBSE Guides and Codes of Practice including Society Light and Lighting Guides
- BSRIA Guides
- Institute of Plumbing (IoP) Guides
- Institute of Refrigeration (IoR) Guides
- ASHRAE Handbooks
- BS7671 Wiring Regulations 18th Edition of otherwise current or updated including amendments

Wherever there is conflict between the guides, the most onerous will prevail to be used for the project.

2.1. Limitations

This specification is based upon available information at the time of production. There will need to be validation surveys undertaken within an appropriate timeframe to inform the final scope & design and ordering of plant and equipment.

3.0 Site Utilities Works

The existing building is provided with connections to mains services or power, fuel and water. These services are generally summarised below and the strategy associated with their adjustment also described:-

Service	Existing Supply	Proposed Adjustment Required	Works required by as part of contract works
Mains Water	Mains Water from boundary meter to existing extension	NONE	Measurement and testing of pressure and water quality
Mains Natural Gas	Mains natural Gas routed in ground to MDA25 meter installed in existing building. Existing service routed below location of proposed new extension	Removal and disconnection to be arranged by client	NONE
Mains Electrical Power	Mains LV connection to existing basement - is a 3 phase 100 amp supply	NONE	Measurement of supply characteristics to inform design calculations
Telecoms	TBC		

4.0 Validation Survey

	Validation Tests	Condition Reports	NOTES
Electrical Testing	Measure incoming electrical supply characteristics to inform detailed electrical design		
Mains water testing	Water quality testing at existing outlets and mains incoming service:- E-Coli Coliforms Pseudonomads species Legionella TVC's	Water quality reports provided at outset to record existing condition and to inform potential need for chlorination of existing service prior to extension.	

5.0 Mechanical Services Specification

5.1 Ventilation

The proposed new extension will be naturally ventilated by opening windows. The tea points and WC's will require mechanical ventilation.

Room Hire and Office Spaces within the existing building will be naturally ventilated via opening windows.

The new extension will require automatic controls (switches and actuators including wiring) and rain sensors to be installed to operate the windows.

The natural ventilation to the existing building (Room Hire and Offices) will rely upon manual openable windows.

Where mechanical ventilation is required to the WC's, Tea Points and Cafe Areas there will be a combination of strategically located intermittent extract fans and energy efficient mechanical ventilation heat recovery.

Proposed performance parameters:-

Heating, Ventilation and Air Conditioning Proposed Performance

	Dry bulb	Humidity
External Air Temperature (WINTER)	-3degC	Saturated 100%RH
External Air Temperature (SUMMER)	+30degC	50% RH
Internal Air Temperature	Discussed in Room Data Sheets	N/A

Caption

The final connections between the ductwork and air terminals (grilles and diffusers) will be manufactured using Regaduct mega acoustic flexible duct with a minimum length of 600mm to help minimise noise at the terminal and cross talk.

All air grilles will be white aluminium perforated mesh type grilles powder coated finish RAL9010 (white).

The external air intake and exhaust terminals will be class A weatherproof louvres, powder coated to be finished to a colour to be determined.

All ductwork will be installed in accordance with the BESA standard - DW144.

All ductwork (air intake, air exhaust, supply and return/extract) to be insulated using mineral wool duct wrap. The ductwork insulation will be installed in accordance with BS5970. The thickness of the duct is to prevent heat gain and heat loss. The warehouse areas are to be assumed to be ambient conditions (similar as outside) and the insulation applied control heat loss when determining thicknesses.

All insulation will be labelled in accordance with BS1710.

Fire dampers will be required to minimise the spread of fire between rooms within the building. The contractor should refer to the fire strategy drawings to understand which walls will require fire dampers to be installed.

Ventilation Units

REF	AREA SERVED	TYPE	NOTES:
EF1	Cafe/Social Community Space WC and Acc. WC	MVHR Unit	connected to PIR within each room connected to MVHR for extract. Upon detection of presence the fan speed will increase
EF2	Tea Point C	MVHR Unit	connected to PIR within each room connected to MVHR for extract. Upon detection of presence the fan speed will increase

REF	AREA SERVED	TYPE	NOTES:
EF3	Acc. WC adjacent Room Hire (B)	Intermittent Extract	connected to PIR within each room connected to MVHR for extract. Upon detection of presence the fan speed will increase
EF4	Tea Point (D)	Intermittent Extract	To meet Part F with integrated humidity sensor
EF5	1st Floor WC 1	Intermittent Extract	To meet Part F with integrated PIR sensor
EF6	1st Floor WC 2	Intermittent Extract	To meet Part F with integrated PIR sensor

Caption

PROPOSED AHU Units

REF	AREA SERVED	TYPE	NOTES:
AHU1	Cafe Community Space	MVHR Unit	To provide sufficient ventilation for a prospective cafe bar environment - fan speed controls to be integrated to Dado Trunking
AHU2	WC Block between Community Hall and Room Hire (A), including Tea Point (A) and B()	MVHR Unit	connected to PIR within each room connected to MVHR for extract. Upon detection of presence the fan speed will increase

Caption

AHU Manufacturers

The following AHU Manufacturer has been engaged in relation to the project:-

Nuaire,
Western Industrial Estate,
Caerphily
CF83 1NA

5.1.1 Air Distribution Ductwork

Following the completion of the survey of the existing ductwork a new ductwork arrangement will be produced to replicate the existing, except to connect to new AHU arrangements and consider the requirements below.

All ductwork is to be considered to be Medium Pressure Class B as defined by DW144.

All new ductwork will be steel and hot dip galvanised to provide suitable protection.

All duct bends bends will be Medium of Long Radius Bends unless not possible to fit.

All bends will include turning vanes or splitters to help reduce air turbulence and resistance

All new and existing ductwork will be tested for Air Leakage in accordance with DW143.

Temperature Gauges will be installed to the supply and return ductwork for each AHU within 2000mm of the connection to the AHU. Each Temperature Gauge will be a Brannan Stainless Steel Liquid Expansion Gauge (-20degC to +60degC Back Entry 250mm stem). The temperature gauges will assist with maintenance and inspections.

All new and existing ductwork including the kitchen extract ducts and hoods and general existing distribution ducts and grilles below the roof will be cleaned and tested in accordance with B&ES TR/19.

All new air ducts will be thermally insulated using mineral wool, clad with aluminium and labelled in accordance with BS1710. The thermal insulation will be selected and installed in accordance with BS5422. The wall thickness will be the largest of the options for either prevention or heat loss or heat gain.

The ductwork will be supported upon new proprietary roof supports. The roof supports will ensure that there is a minimum of 450mm clear void between the new roof covering and the bottom of the air duct cladding.

5.2 Low Temperature Hot Water (LTHW)

A new Mitsubishi Electric Air Siource Heat Pump (ASHP) will provide LTHW to the underfloor heating in the hall. A new room dedicated air source heat pump will be installed to provide a dedicated heat source to the community hall.

The Heat Pump will provide LTHW to underfloor heating below the sprung floor via new stainless steel pipework. A low loss header will be used to hydraulically separate the pumping arrangements between the ASHP and the underfloor heating system.

A dedicated inverter driven variable speed primary circulation pump will circulate LTHW through the heat pump. A separate dedicated LTHW circulation pump will circulate heated water from the low loss header to the underfloor heating pipework embedded below the sprung floor.

The low loss header will be a proprietary device with combined deaeration and dirt separation. Strainers will be installed as filters to collect debris and help protect equipment.

Commissioning sets will be used on each the primary and secondary sides fo the low loss header to ensure correct flow through the heat pump and the underfloor heating circuits.

A dosing pot will be installed to allow ease of dosing the system with corrosion inhibitor during maintenance.

The system will be unvented in it's arrangement and utilise a pressurisation unit and expansion vessel.

The underfloor heating manifold will be include flow indicators, pressure and temperature gauges. The temperature of the underfloor heating water will be controlled by the heat pump with direct weather compensation. The manifold will therefore not include a pump as part of the manifold itself.

The Heat Pump along with all heating and cooling split systems (via any necessary interface(s)) will be linked to a central controller mounted to the fascia of the BMS panel. The central controller will be provided with any necessary interfaces to allow full integration with the BMS controller. Via the BMS controller and data link the client will be able to fully control and monitor the split and air to water heat pump system.

GENERAL PIPELINE & ANCILLARY SPECIFICATIONS

	Manufacturer		NOTES
Pipework Generally for Lot Temperature Hot Water and Natural Gas.	GF Heavy Duty Steel	Screwed up to 50mm & flanged 65mm and above	In accordance with BS EN 10255
Commissioning Valves	CRANE	D931	Up to 50mm
Commissioning Valves	CRANE	DA931	Above 50mm
Automatic Air Vent	CRANE	D2003/D2004	65mm and above
Ball Valve	CRANE	D171AC	quarter turn lever valve - up to 50mm -
Ball Valve for Natural Gas	CRANE	D191	quarter turn lever valve - up to 50mm
Butterfly Valve	CRANE	F614	Fuly Lugged Lever Operated - 50mm to 200mm
Swing Check Valve	CRANE	D135	Up to 50mm
Check Valve	CRANE	FM492	50mm to 300mm
Drain off cock	CRANE	D344.5	65mm and above
Strainer	CRANE	D297	up to 50mm
Strainer	CRANE	FM276	65mm and above
Low Loss Header	Spirotech	Spirocross	To be provided with proprietary thermal insulation jacket
~~**Air Seperator**~~	~~Spirotech~~	~~Spirovent~~	~~To be provided with proprietary thermal insulation jacket~~
~~**Dirt Seperator**~~	~~Spirotech~~	~~Spirotrap~~	~~To be provided with proprietary thermal insulation jacket~~
~~**Air and Dirt Seperator**~~	~~Spirotech~~	~~Spirocombi~~	~~To be provided with proprietary thermal insulation jacket~~

	Manufacturer		NOTES
~~**Dosing Pot**~~	~~BOSS~~	~~X-Pot 6 c/w sight glass, auto air vent, 20Micron filter, insulation jacket PICV, Packaged differential pressure monitor and isolation valves etc. as recommended by manufacturer~~	
~~**Gas Safety Valve**~~	~~Black Teknigas~~	~~Seires 2000~~	
Pressure Temperature safety Relief Valves	Nabic	Fig 500T	To be installed as appropriate and to manufacturers recommendations and British Standards etc. to unvented systems. Installed via tun dish.
Temperature Gauges for heating system	Brannan	80mm 0-120degC	Immersion Types
Temperature Gauges for domestic hot and cold water system	Brannan	63mm 0-120degC	Surface temperature types
Pressure Gauges for heating system, either side of pumps	Brannan	80mm	
Temperature Gauges for ductwork	Brannan	150mm Stainless Steel Liquid Expansion -20degC to +60degC Back Entry 250mm Stem.	Installed to ductwork at each AHU on the supply and return air within 2000mm of the connection to the AHU.
~~**Boiler condensate pump**~~	~~Grundfos~~	~~Condense Lift Tank Pump.~~	~~High level alarm linked to control panel.~~ ~~Discharge to be linked to foul water drain in rear plant room, which gravity discharged to external vertical stack~~
Thermal Insulation to Pipelines	Kingspan	Kooltherm	Thickness to meet BS5422 to prevent heat loss for heating and hot water pipelines. Cold Water Pipelines - thickness to prevent freezing and heat gain or whichever is greater

	Manufacturer		NOTES
Thermal Insulation to Valves and Flanges		Preformed Valve and Flange Boxes	
Pipeline Cladding where internal	ISOGENOPAK	PVC Cladding	
Pipeline cladding external		Aluminium	
Pipeline Labelling		In accordance with BS1710	With Written labels and arrows showing flow direction
Valve Labelling		White Discs connected to steel chains linked to valve with black lettering	
Valve Chart and Plant Room Schematic		Each Provided in separate A3 Size Mounted on Wall within plant room within Hardwood Glazed Frame	

All heating pipelines to be thermally insulated utilising mineral wool or phenolic foam manufacturers by Kingspan and installed in accordance with BS5422, clad with Aluminium and labelled to BS1710.

All heating valves and other pipework ancillaries (including flanges) will be provided with thermally insulated removable valve boxes. Details of valves boxes to be in accordance with BS5970. Al valve boxes should be Aluminium Clad.

All new and existing pipework will be pressure tested to 1.5 times working pressure to ensure the arrangement is satisfactory for reconnection of new heating plant.

As discussed in the validation report requirements the heating system will be sampled and tested to ensure satisfactory water quality.

Water Quality Tests in accordance with BSRIA BG29 to be analysed in a UKAS laboratory for all relevant parameters BSRIA BG29.

5.3 Natural Gas Piped Distribution

The existing natural mains connection is to be removed.

5.4 Split Type Air Conditioning Systems

The fan coil types will generally be either high level wall mounted or ceiling recessed types.

All split type air conditioning systems will be manufactured by Mitsubishi Electric.

Controllers will be installed in each room. Each controller will be suitable to control the on and off times (7 day programmable), temperature, fan speed.

All split systems (via any necessary interface(s)) will be linked to a central controller mounted to the fascia of the BMS panel. The central controller will be provided with any necessary interfaces to allow full integration with the BMS controller. Via the BMS controller and data link the client will be able to fully control and monitor the split and air to water heat pump system.

The control system will be include sufficient interlocks to prevent the heating and cooling within any single room from operating simultaneously.

Interfaces will be utilised to allow connected condensate lift pumps to switch fan coils off in the event of lift pump failure. Interfaces will also allow the mechanical ventilation units in the space to accept a run signal, which only begins after a preset period of 15 or 30 minutes or when the room is at set point temperature.

The air conditioning systems will be designed and installed in accordance with the manufacturers recommendations.

The sizing of the air conditioning systems will be carried out in accordance with CIBSE Guidance, including but not limited to Guide B.

The air conditioning installation will utilise medium duty cable tray to support the refrigeration pipework and interconnecting cables. The refrigeration pipework will be installed in accordance with the recommendations of the manufacturers and Institute of Refrigeration (IoR) and the CIBSE.

The refrigerant pipework will be insulated utilising Class 0 Nitrile Rubber Thermal Insulation such as Armaflex with a minimum wall thickness of 13mm. Insulation with a thickness of 9mm of less will not be acceptable.

The condense formed in the fan coils will be drained by gravity means within insulated copper pipework (Rigid plastic may also be acceptable, subject to approval). Flexible plastic will only be acceptable for short lengths up to 600mm to lift condensate from lift pumps.

Lift pumps will be needed to elevate the head of the water at strategic locations. The lift pumps shall be sump types and linked by control cabling to the AC units that drain into the pumps. In the event that the lift pump fails a signal will prevent the AC units from operating.

All condense drain and refrigeration pipework will be installed within ceiling voids.

All condense drains will be installed with a minimum 1:50 gravity fall.

The condense drains shall be routed terminated into the foul wastewater via a Hepworth HepVo dry sealing valve to prevent odours entering the condense drain.

All wall mounted units will be linked to proprietary trunking to encapsulate the pipework, condense pumps and cabling from view. The trunking should be manufactured specifically for the purpose and intended by Inoac or similar.

Any condense pumps installed should be wired to the AC unit it serves, the wiring should switch the AC unit off in the event of pump failure.

The external heat pumps will be installed upon proprietary powder coated mounting brackets with a condense drain tray beneath the units. Pipework will be connected to the drip trays to route the condense to low level. Typical mounting brackets and drip trays that would be acceptable are manufactured by Castell Engineering from the Aspen Xtra range.

All external heat pump and fan coils units will be labelled with references to ensure it is clear which external unit connects to which internal unit.

An F-gas register will be provided at the completion of the project to allow the employer to manage their systems in accordance with the F-Gas Regulations

Room	Fan Coil reference	Fan coil type	External Unit
Community Hall	FC1	High Level Wall Mount	CU1
Community Hall	FC2	High Level Wall Mount	CU1
Cafe Social Space	FC3	High Level Wall Mount	CU2
Cafe Social Space	FC4	High Level Wall Mount	CU2
Room Hire (A)	FC5	High Level Wall Mount	CU3
Room Hire (B)	FC6	High Level Wall Mount	CU4
Office (1)	FC7	High Level Wall Mount	CU5
Office (2)	FC8	High Level Wall Mount	CU6

5.5 Mechanical Services Controls

A new dedicated mechanical services control panel with Trend, Schneider or Priva controller will be installed in the Plant Room.

The new control panel will provide control and monitoring of the following equipment:-

A. ASHP and heating to Community Hall (note LTHW heating to be interlocked to AC systems to prevent simultaneous cooling and underfloor heating)
B. Temperature control of rooms heated with direct electric radiant panels
C. Control and monitoring of all MVHR units
D. Control and monitoring of all Split system AC units and heat pump
E. Control of all external lighting
F. Energy monitoring by collating and recording all information from electricity energy meters at distribution boards
G. Fire Alarm interface, upon activation switching off all supply air ventilation
H. Remote access via data point to allow remote client dialling into information
I. Link to external lighting to allow remote adjustment of time switch
J. Monitor trace heating
K. Monitor Hot water service flow temperatures
L. Leak detection to basement

The new control panel will be within a powder coated steel enclosure with a touchscreen controller interface installed on the fascia.

The touchscreen controller will be provided with the capability for connection to a data point and remote operation via a web browser.

Community Hall Heating Control Description

The heating to the community hall will be via a room dedicated ASHP. The heat pump manufacturer will provide a proprietary controller, which will be able to provide direct weather compensation of the ASHP flow temperature.

The ASHP proprietary controller will be mounted upon the fascia of the control panel.

The BMS system will sense the room and floor temperature within the community hall by:-

- 2No. Room temperature sensors
- 1No. floor temperature sensor

The BMS will switch on the ASHP when the room temperature drops below set point. A time switch within the BMS software will determine the occupancy time.

The BMS will feature time optimisation to ensure that the room is at set point prior to occupation.

A local digital room controller will be installed installed within the community hall store. The controller will allow the user group to adjust the temperature locally within a range controllable from the BMS. The range will be able to be adjusted by the BMS.

General Heating

The BMS will control the heating to the general building spaces, such as Tea Points, WC's, Circulation Spaces etc. The BMS will sense heat requirements to each room by a wall mounted temperature sensor and switch the direct electric radiant heater in each space.

Leak detection to basement

New leak detection will be installed around the full perimeter of the basement. In the event of a leak being detected the BMS will alarm.

Power supply to basement sump pump

A power supply will be provided to the sump pump in the basement. A high level alarm within the sump will be installed. In the event the high level is trigged the BMS will alarm.

5.6 Direct Electric Radiant Panel Space Heating

Direct Electric Radiant heating will be provided to rooms other than those with Underfloor Heating or Split Type Air Conditioning.

The radiant heating will be intended to heat the spaces to the design criteria set out within this specification.

Radiant Panel Heating

Room Type	Radiant Panel	Controls
Each WC	600 x 600mm Ceiling Recessed White Panel Heater	Linked to BMS.
Acc. WC	600 x 600mm Ceiling Recessed White Panel Heater	Linked to BMS.
ENTANCE LOBBY	600 x 600mm Ceiling Recessed White Panel Heater	Linked to BMS.
TEA POINT	600 x 600mm Ceiling Recessed White Panel Heater	Linked to BMS.
LOBBY	600 x 600mm Ceiling Recessed White Panel Heater	Linked to BMS.

All radiant panels to be manufactured by Frenger from the Energy Cassette Range of products

5.7 Domestic Hot and Cold Water

There is an existing mains cold water supply to the premises, which enters the existing basement. This existing supply will be reused to provide a supply of potable water to the premises.

It is expected that the existing mains supply will be sufficient to provide cold water distribution to the premises. Sufficient space will be allowed in the basement area to install a future water storage and pressure booster.

A Hydrotec HydroMag water conditioner will be supplied and installed at the incoming mains location to help prevent scale within the distribution system.

A new Category 5 back flow protection pressure booster will be supplied and installed to provide water to an external tap with hose union.

All water installations shall be designed in accordance with CIBSE and Institute of Plumbing Guides (IoP), BS8558, Water Supply (Water Fittings) Regulations 1999 and Building regulations.

The design of the pipework installations should follow the guidance set out within BS8558:2015 Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. Complementary guidance to BS EN 806.

The contractor will ensure that all fittings are WRAS approved and that the water provider has checked the installation for compliance with local (Anglian Water) requirements.

The design and installation of the domestic water installations should take into account all appropriate necessary measures to minimise risks to water hygiene. For example, mitigating all potential dead legs, ensuring that hot water is readily available at hot water outlets and installing pipelines away from sources of heat and insulating cold water distribution to prevent heat gain.

The hot and cold water distribution system will utilise new copper pipework and be insulated using mineral wool insulation.

All hot and cold water pipework will terminate to outlets with an isolation valves, flow restrictor and strainer.

All outlets, except for cleaners and tea point sinks will be thermostatically controlled and limited to a maximum of 41degC.

All pipework will be insulated utilising mineral wool to prevent heat gain. Wall thickness of the insulation to be in accordance with BS5422:2009

Hot Water

Hot water will generally be generated locally and stored within an insulated and unvented arrangement. The hot water generation will be by proprietary unvented direct electric hot water storage units.

The hot water supply pipe (to outlets) from each direct electric hot water heater will be fitted with a clip on Brannan pipe surface temperature gauge to allow ease of temperature monitoring for legionella control.

Domestic Hot Water Schedule

	Manufacturer	Model	Notes
tea Point (A)	Heatrae Sadia	15 Litre	
Tea Point (B) and central (5No.) WC's and cleaners store	Heatrae Sadia	50Litre	Located in cleaners cupboard with trace heating throughout length of distribution to maintain flow temperature
Tea Point (C)/Acc WC & Community Cafe WC	Heatrae Sadia	30 Litre	Located in store room with trace heating throughout length of distribution to maintain flow temperature
Tea Point (D) and adjacent WC's	Heatrae Sadia	30 Litres	
Unisex/Acc. WC (adjacent Room Hire (B)	Heatrae Sadia	10 Litres	
WC Adjacent Room Hire (A)	Heatrae Sadia	10 Litre	
Cafe Bar Hot Water	Heatrae Sadia	30 Litre	

Completion and Testing

The existing and new hot and cold water installations will be tested for correct operation. The following tests will be carried out Hot and Cold water sampling and laboratory analysis (including E-Coli, Coliform's, Lead, Legionella, Pseudo nomads.

At the completion of the works installations will be chlorinated, flushed and tested to ensure that the domestic water installations provide potable water quality.

Hot water will be provided to each outlet by indirect unvented hot water storage units. Each hot water heater will include a scale inhibitor device with taste and odour protection.

5.8 Drainage

Drainage will be provided to suit the sanitaryware specified for the project. All drainage will Osma PVC-U. The drainage will be designed and installed in accordance with IoP, CIBSE and Building Regulation Approved Documents.

The condense drainage from the air conditioning fan coils will be routed by gravity to the general foul wastewater drain via a waterless trap. The condense drains will be installed utilising copper pipes

All condensate pipework within the building will be thermally insulated and labelled in accordance with BS1710.

5.9 Labelling

All new items of plant will require new white Traffolyte labels to be installed directly on the equipment with engraved black lettering stating the equipment name and reference.

Each label will be made from engraved Traffolyte with white background and black lettering.

All valves will require numbering with circular white Traffolyte labels with black engraved font. Each label will be connected to the valve with a stainless steel chain link.

Separate glazed framed valve charts and plant room schematics will be mounted upon the walls in the plant room.

All distribution pipework and ductwork will be labelled with directional arrows and wording describing the service in accordance with BS1710.

6.0 Electrical

6.1. Low Voltage Distribution

The existing incoming electrical supply is a three phase 100amp supply, which supplies power to the existing building. The supply is located in the basement of the existing premises.

The existing installations will be entirely removed and replaced with new.

A new MCCB Board will be installed at the location of the existing incoming supply with LV sub mains providing power to new local distribution boards in the building.

Distribution boards will be required to the following locations:-

Distribution Board Location	Serving	Metering
Basement	Providing power to sockets and lighting within the basement	Split load (Lighting and Power) metering connected to BMS.
Dedicated Distribution Board for the Cafe/Social Community Space (including WC & Acc. WC acc accessed from the Cafe/Social Community Space.	Providing lighting and general power as indicated. Prospective Cafe operator will be able to adjust to suit.	Split load (Lighting and Power) metering connected to BMS.
Plant Room	Providing power to all other space on the ground floor including external Electric Vehicle and Lighting	Metering connected to BMS
Plant Room	Electric Vehicle Charging board with sufficient capacity for the proposed 6No. Chargers and a further 12 in the future. N.B EV Charging points to include load management.	Metering connected to BMS
Plant Room	Providing power to the mechanical equipment within the building, such as heat pumps, ventilation units (except in the Cafe), air conditioning units.	Metering connected to BMS
1st Floor Storage Cupboard	Providing power to all rooms on the 1st Floor	Split load (Lighting and Power) metering connected to BMS.
PV Connection NOTE:	The PV will be linked direct to the MCCB Panel in the basement.	

Distribution boards are to be supplied by Eaton or Schneider and utilise split load type arrangements to ensure that the power and lighting is distributed separately. Energy metering will be provided to each distribution board including to each side (power and lighting).

The electrical distribution will be designed and installed in accordance with the 18th edition of the wiring regulations (BS7671) and include the installations of surge protection. All circuits are to be provided with RCD protection unless specifically precluded by the equipment manufacturers requirements or BS7671.

All cables will be designed with 25% spare carrying capacity and all distribution boards with minimum 20% spare ways.

The EV Charger Distribution board will have 20% spare capacity of ways in excess of the spare ways for expected future EV chargers.

The wiring systems to employed are explained below.

All wiring accessories to the general areas will be white plastic types manufactured by MK Electric from the Logic Plus Range. All wiring accessories to the plant or equipment rooms (eg. plant room, switch rooms or cupboards are to be metal clad and manufactured by MK Electric from the Metalclad Plus range.

All electrical accessories (sockets and switches etc.) will be installed flush within the wall with cables embedded in the walls.

All Electrical accessories within Trunking to be graphite to allow clear DDA complaint colour differentiation of socket perimeter demarcation.

Electrical accessories in the basement can be surface mounted with cables routed within steel conduits and installed to the wall with saddle clips.

External sockets and accessories will be MK Electric from the Masterseal Plus.

Plastic Dado (3 compartment) trunking will be provided to the spaces as shown upon the drawings or room data sheets. The dado trunking will be manufactured by MK and from the 3D Prestige Range. The dado trunking will include vertical risers to the ceiling in room where dado is used.

The general locations of the sockets are indicated upon the drawings. Quantities are confirmed for the avoidance of doubt within Room Data Sheets. The power supplies to the mechanical or other equipment is not shown on the tender drawings, but should be allowed for.

<u>Wiring System types for LV and small power distribution</u>

The wiring systems will generally be as per the following:-

- General areas flush accessories – 6242B multi-core & earth cables contained in cable basket in ceiling voids with High Impact PVCu (HIP) conduit drops to accessories, etc. NOTE: where cables route vertically to Dado Trunking, the cables should be routed within the Dado

trunking. Vertical Dado trunking is not to be shared to adjacent rooms, each room should have independent vertical Dado Trunking where horizontal Dado Trunking is installed.

- Back of house, storage cupboard or plant and equipments areas with surface accessories – 6491B single core cables contained in galvanised steel cable trunking & conduits

- Distribution circuits, supplies to mechanical plant or similar – 694XB multi-core single wire armoured cables (SWA) contained on galvanised cable tray and / or basket where multiple runs occur & secured to the building structure utilising cleats where single cable runs occur

Power and data provision generally

The general provision of small power and data is indicated upon the drawings and or room data sheets. Further information is detailed below to assist with the design development. Where there is any conflict the contractor should query with the employer and until any other information is available assume the larger quantity of any specific requirement takes precedence,

Sufficient Power supplies will be provided to all mechanical services as needed.

6.2. Telecoms, Data and AV systems

An existing BT connection is provided to the building.

A new 6U data cabinet will be installed in the basement. The rack and all data cabling will be supplied and installed as part of the project. The client will arrange the provision of the active equipment (switches etc.) separately.

All data points will be wired to the server room utilising Cat 6a cable within or upon steel trunking and conduit or cable tray in ceiling voids..

The Fibre Optic Cables (as needed) will be 50/125 (OM4) Cable. - NOTE SUBJECT TO CLIENT CONFIRMATION

Data (Cat 6a) and Fibre cables will be routed from the incoming location to the server room. The IT specialist will provide the active equipment and terminate the data cables into the IT equipment.

The contractor will test all data cables once installed to ensure sufficient integrity for the purpose.

All data points will be RJ45 type sockets. Where installed within the office areas white plastic accessories will be acceptable manufactured by MK Electric from the Logic Plus Range. All data points within the Plant Room and basement will be Metal Clad types manufactured by MK Electric from the MK Metalclad Plus range.

Where TV's points are shown, there will be power, data and HDMI Sockets installed. The HDMI sockets will be connected to nearby sockets. For example, within the room hire an HDMI socket will connect the Dado below the TV to the TV. Within the Community Hall a flush mounted HDMI and 3.5mm Jack socket will link to the AV receiver in the store room. The AV receiver will link to the projector and speakers.

6.3. CCTV

CCTV will be provided to the building with strategically located cameras providing high definition and night vision imaged to the head end.

The CCTV Coverage will include the following areas as a minimum plus any other areas indicated by the Room Data Sheets:-

Internal Camera

- Community Hall Mains Entrance within building
- Room Hire (B) and 1st Floor Entrance Lobby
- 1st Floor Landing
- Basement stairs

External Camera

- Community Hall Main Entrance towards car park

- Community Hall Fire Escape towards car park and Room Hire (B) Entrance.
- Cafe Social/Community Space entrance
- external entrance to Room Hire (A)
- 4No. Cameras covering Front Car Park and cycle shelter
- 2No. Rear Boundary

The external car parking cameras must be suitable for reading number plates of vehicles within the whole extent of the car park.

The head end will be located in the the server room and will include recording equipment to view the CCTV footage in High Definition (HD). The recording capacity should be for a minimum of 1 month.

Live and recorded screen footage from the CCTV cameras will be available via a data connection to allow remote access from other site. The location of the on site screens and recording is to be confirmed.

Recording equipment will be provided. The equipment will be installed with capacity for future cameras (up to 8 further cameras) to be installed in the future

The existing service and maintenance contractor for the client in relation to CCTV is:-

Broadland Security Alarms

6.4. General Lighting

Internal general and emergency lighting will be provided by low energy LED lighting.

Light fittings will be chosen to suit the Architectural finish of the space.

Wall lights will be used in the stairwell as required.

The lighting throughout will be dimmable, the dimming will operate automatically in response to daylight via daylight sensors.

All lighting will be designed and selected to both meet the required lighting illuminance levels (eg. Lux, Uniformity and colour temperature), energy efficacy and life time expectancies (eg. L80) of the criteria below, the Society of Light and Lighting (SLL) and British Standard BS12464.

Performance criteria

General overview

1. All lighting to be low energy LED types
2. LED lighting throughout to be dimmable (except for plant room, WC, stores and basement)
3. Minimum efficacy to be lumen per circuit watt - as per Part L
4. Lifetime Luminaire maintenance factor to be no less than L80/80,000hours
5. The lighting control system will be designed to meet the requirements set out in the lighting control matrix below.

Lighting Performance Parameters

	Lux	Uniformity	Ra	Life Maintenance Factor
Community Hall	500	0.7	80	L80/80,000
Room Hire	500	0.7	80	L80/80,000
Cafe/Social Community Space	200	0.4	80	L80/80,000
Circulation Space	125	0.45	40	L80/80,000
Stairs	150	0.4	80	L80/80,000
Office	500	0.6	80	L80/80,000
Cupboards	100	0.4	80	L80/80,000
WC	100	0.4	80	L80/80,000
Meeting Room	500	0.6	80	L80/80,000

	Lux	Uniformity	Ra	Life Maintenance Factor
Plant and Equipment Rooms	400	0.6	80	L80/80,000
Basement	250	0.6	80	L80/80,000
Basement	200	0.5	80	

All general and emergency lighting to be manufactured by Glamox, other manufacturers can be considered based upon client approval only. If alternative lighting types are to be proposed then

Light fitting types

	Manufacturer	Proposed Model	Notes
Community Hall	Glamox	C80-PR	Complete with sensors and emergency fittings as appropriate
Room Hire	Glamox	C80-PR	Complete with sensors and emergency fittings as appropriate
Cafe/Social Community Space	Glamox	C80-PR	Complete with sensors and emergency fittings as appropriate
Circulation Space	Glamox	D70-R	separate sensors required - such as
Stairs	Glamox	A35-S	Wall mounted light fittings with controls
Office	Glamox	C35-R	Complete with sensors and emergency fittings as appropriate
Cupboards	Glamox	D70-R	separate sensors required - such as
WC	Glamox	D70-R	separate sensors required - such as
Meeting Room	Glamox	C80-PR	Complete with sensors and emergency fittings as appropriate
Plant and Equipment Rooms	Glamox	i40	Complete with sensors and emergency fittings as appropriate

	Manufacturer	Proposed Model	Notes
Basement	Glamox	i40	Complete with sensors and emergency fittings as appropriate

All light fittings to be 4000K

Lighting control matrix:-

Room	Manual Switching on with absence detection	Auto on and off via presence detection and scene control	Auto on and off with daylight dimming	Presence detection auto dimming
Community Hall		X	X	X
Room Hire		X	X	X
Cafe/Social Community Space			X	
Circulation Space			X	
Stairs				X - note lights to dim to 20% during abe
Office			X	
Cupboards	X			
WC	X			X (control positions to be determined - not shown on drawings)
Meeting Room		X		
Plant and Equipment Rooms	X			
Basement	X			

6.5. Emergency Lighting and safety signage (including fire safety signage).

The emergency lighting is to be generally integrated into the general lighting to provide sufficient illuminance in the event of power failure to facilitate safe escape from the building in line with BS5266

Safety signage will be provided in accordance with the requirements of BS5499.

All emergency lights will be linked to key switches for testing purposes.

The key switches will be installed in discreet locations, such as the cupboards

All switches will be labelled to inform the user of which switch connects to which lights. The room references will be used eg. Meeting Room, Community Hall etc. etc

6.6. External Lighting and signage

External lighting will be provided to illuminate the Car Park, Entrance and egress locations. A dedicated lighting connection with independent controls will provide a supply to illuminate future signage.

The external lighting will generally be as follows:-

Area	Light Fitting Type		Control Type
Car Park	Flood Light	055 with DALI Dimming	Integrated PIR with central photocell and solar dial time switch control (within BMS panel) - Dimming to be provided to allow different lighting levels and different times of day/night.
Cycle Shelter	Dedicated strip light	MIR	Integrated PIR with central photocell and solar dial time switch control (within BMS panel)
Rear Access Route including heat pump units	Wall lights	024-W	Integrated PIR with central photocell and solar dial time switch control within BMS panel)
Entrance to Main Hall	Wall lights	22	Integrated PIR with central photocell and solar dial time switch control within BMS panel)
Entrance to 1st Floor Offices and Room (B)	Wall lights	22	Integrated PIR with central photocell and solar dial time switch control within BMS panel)

A power supply will be provided externally at high level. The power supply is intended for future connect to external signage,

The power supply will be connected to the BMS control panel to allow the prospective signage to be illuminated during predetermined hours only.

6.7. Fire Alarm

New Fire detection and alarm systems are to be installed to the new and modified areas. The fire alarm within the existing building is to be extended to suit the requirements

The existing panel will be modified or replaced to ensure sufficient capacity is available.

It is expected that the existing fire alarm devices and equipment will need to be removed in the existing building which is part of the works.

The building will be fitted with a new fire alarm system, designed to meet the requirements of BS5839.

The design of the new fire alarm system will be in accordance with BS5839 and meet the requirements of Category L2.

The contractor is to include for all ceiling voids 80mm and above or as otherwise indicated within the the British Standard BS5839.

The fire alarm system will include fire alarm interfaces to switch off the Ventilation systems, operate any access control equipment, which from part of the fire escape strategy and isolate the gas supply via a 2 port solenoid valve.

The fire alarm panel will be installed in the main entrance front area. A zone chart will be provided adjacent the panel.

The existing maintenance contractor for the Town Council is:-

Flameskill Ltd

6.8. Security and Access control –

New security and access control will be provided to the new building and refurbished areas of the existing building and new extension.

The new security and access control system will feature of combination of internal motion detectors, door contacts and magnetic locks to doors with key pad entry.

The alarm will be able to be disabled by internal key fob/key pads inside of the 3No. main entrances (Community Hall, Room Hire (B) and Cafe). The Cafe Entrance fob will be limited to disabling the alarm to the cafe zone including basement only.

The intruder alarm will be a Class 3 system utilising a combination of door contacts and motion detectors within the building.

Door contacts will be installed on all entrance doors, including the basement hatch.

Motrion detectors will be installed in all main rooms, including but not limited to:-

- Cafe

- Community Hall
- Room Hire (A)
- Room Hire (B)
- Office 1
- Office 2
- Office 3
- Basement

Access Control

Access control in the form of keypad entry and magnetic locks will be provided to the following doors:-

- Room Hire (A)
- Room Hire (B)
- Community Hall entrances
- Basement
- Plant Room
- Office 1
- Office 2
- Office 3

The access control system will be wired to a head end within the building and linked by a data point for remote access and control. The remote access will allow the council head office to alter the access codes for each keypad entry door via a web portal.

The existing maintenance contractor for the Town Council is:-

The Alarm Company

6.9. Hand Driers

Hand driers will be required to each new WC. Each WC will have a single Armadillo stainless steel finished hand drier.

Each hand drier will be an Armadillo ECO, supplied by Hanydryers

Contact
info@handydryers.co.uk (+44) 01279 466500
Handy Dryers
Unit 9, Stort Valley Industrial Estate Bishop's Stortford
CM23 2TU.

6.10 Induction Loop Systems

Induction loop systems will be provided to the following rooms:-

- Room Hire (A)
- Room Hire (B)
- Community Hall

Each Induction Loop will be provided with:-

- Ceiling mounted Omni-directional Microphone
- Amplifier located in store adjacent to room served by Induction Loop
- Ceiling Mounted Loop Cable for Room Hire
- Floor Mounted Loop Cable for Community Hall due to vaulted ceiling not being suitable for ceiling mounted loop.

6.11 Solar Photovoltaic (PV) Panels

New Photovoltaic (PV) Panels will be installed to the roof of the new Community Hall. The new PV Panels will provide a minimum of 28m2 PV Panels capable of within an efficiency no less than 21% efficiency.

The PV Panels will be be linked to an internally installed inverter. The inverter will be no less 20% efficient.

The inverter will be linked to the BMS.

A firemans isolation switch to be located at the front entrance adjacent the fire alarm panel. The fireman switch will be linked to a contractor, which upon activation will isolate the PV generated power from the LV distribution system.

The installation of the PV will carried out by an MCS accredited contractor.

6.12 Electric Vehicle Charging Points

New EV Chargers to be Pilot Group EV Chargers with contactless payment soft and hard ware installed.

There are to be 6No. Proposed 7.2kW individual Electric Vehicle Car Charging Points (EVC). Each EVC will serve a single car parking bay.

Prospective below ground power and data ducts (and draw pits) will be routed to the further 8No. car parking bays for future connection.

All EV Chargers will be linked to a load management system to ensure the peak loads demanded from the system is managed and prevent from exceeding a preset demand (subject to final calculation but around 20kVA).

Each EVC will be provided with a GSM card prepared for contactless payments for users to receive electrical car charing power.

7.0 Commissioning Requirements

All commissioning of new equipment will strictly follow the CIBSE Commissioning Codes. A summary of the relevant commissioning codes are detailed below:-

- CIBSE CODE A - Air Distribution Systems
- CIBSE CODE C - Automatic Controls
- CIBSE CODE - R - Refrigerations
- CIBSE CODE W - Water Distribution Systems
- CIBSE CODE - M - Management

Below is a non-exhaustive summary of the commissioning records and general documentation required at completion of the project:-

1. Water Flow Tests
2. Water Quality Reports (Domestic)
3. Existing and New Pipework Pressure Tests
4. Gas Safety Inspection Certificates
5. Legionella Risk Assessment
6. EICR Certificates for Control System
7. EICR for fixed wire Tests
8. Emergency Lighting Test Certificates
9. Demonstration of Control System complete with Video
10. O&M's in paper and electronic form

8.0 General Scope of Works

GENERAL SCOPE OF WORKS - non exhaustive

ITEM	DESCRIPTION	Cost (£)
1	Carryout full validation measurements of existing building performance. Including but not limited to:- • Water tests • Electrical tests	
	Strip out of existing services	
2	New MVHR Ventilation Systems	
3	New Intermittent Extract Ventilation Systems	
4	New Split Type air to air heat pump heating and cooling systems	
5	New direct electric radiant space heating system	
6	New ASHP and VLTHW to Community Hall Underfloor heating system	
7	New hot and cold water systems	
8	New above ground drainage wastewater disposal systems	
9	~~New Natural gas distribution systems~~	
10	New Building Management Control Systems	
11	New LV Distribution Systems	
12	New Small Power Distribution system	
13	New data and AV cabling systems	
14	New general and emergency internal lighting systems	
	New general and emergency external lighting systems	
15	New Lightining Protection System	
16	New fire alarm systems	
17	New CCTV Systems	
18	New security and access control system	

ITEM	DESCRIPTION	Cost (£)
19	New hand driers	
20	New call systems (acc. WC's)	
21	Induction loop systems	
22	New Roof mounted Photovoltaic (PV) Systems	
23	New electric vehicle charging points	
24	AV Equipment (supply and install)	
25	Commissioning	
26	Legionalla Risk Assessment	
27	12 Months Maintenance in accordance with maintenance specification SFG20 and manufacturers recommendations	

APPENDIX A - ROOM DATA SHEETS

Community Hall MEP Room Data

	Floor	Wall	Ceiling
Power Sockets		8No. Double Sockets white metal clad plus	
Data Sockets		• 1No. At High level for Wi FI • 1No. Double Data in Metal Clad Accessory on Projector Wall • 1no. Double Data at high level for projector	
HDMI		1No. at projector wall linked to Amplifier in store (AV Receiver to link to projector and speakers)	1No. HDMI Socket for Projector
A/V		• 4No. Speaker points at high level linked to amplifier (AV Receiver) with QEDXT25 speaker cable. • Speaker specification: 4No. Cornered Audio C3 (Black) • Amplifier (AV Reciever) with bluetooth and wi-fi streaming capability (amplifier to be located in store room and to be Sony STR-DH790 (Black) or similar) • Sound level monitoring and cut off system	
Projector		Projector Screen	Projector
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		Projector on ceiling	
Lighting		Suspended LED	

	Floor	Wall	Ceiling
Lighting Control			see lighting control matrix - Daylight dimming with manual scene controls
Emergency Lighting		Illuminated signage	Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security		Door Contacts	Movement Sensor
Access Control		Fob and contactless push to exit To:- D11 Escape D14 Lobby D24 Community Hall Main Entrance	
Electric Window Controls		To roof and wall windows	Rain sensors to roof mounted windows
Ventilation		Naturally driven via openable windows and opening roof lights	
Winter/Summer Temperature (degC)		21/23degC	
Heating		VLTHW Underfloor Heating via ASHP	
Cooling		High level wall mounted split systems with cooling interlock to underfloor heating	
Hot and Cold Water		N/A	
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	
Induction Loop	Yes with microphone, amplifier kit, signage and associated equipment		

Cafe Social/Space

	Floor	Wall	Ceiling
Power Sockets		• 5No. Double Sockets In Cafe Bar Area • 3No. Double pockets in Bar Window Area (with USB-C Power) • 4No. Double Sockets LL Side Walls with (USB-C Power)	
Data Sockets		• 1no. For Wi FI Point • 1No. Mid Level on Wall for TV	
Wi Fi		1No. HL WAP	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		• 3 Compartment Traunking on Cafe Wall • 4No. Sockets and • Specialist power as below	
Specialist Power (eg. heavy equipment)		2No. 16 amps spurs for cafe equipment.	
Lighting			Suspended LED - Feature Spot Lighting above Cafe Ba Containment only
Lighting Control			see lighting control matrix - Daylight dimming with manual scene controls
Emergency Lighting		Illuminated signage	Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security			Movement Sensor
Access Control		To all personnel doors	

	Floor	Wall	Ceiling
Electric Window Controls		To roof and wall windows	Rain sensors to roof mounted windows
Ventilation		Natural with mechanical assistance to cafe area	
Winter/Summer Temperature (degC)		21/23degC	
Heating		Split type heating and cooling - 4 Way Blow 2No. Fan Coils BL TO check	
Cooling		Split type heating and cooling - 4 Way Blow 2No. Fan Coils BL TO check	
Hot and Cold Water		N/A	
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	
Induction Loop			Yes with amplifier kit adjacent Dado under TV

Room Hire (A)

	Floor	Wall	Ceiling
Power Sockets		• 1No. Double Socket at Tea Point (A) • Under Tea Point Work Top - Switch Outlet to Dishwasher and Fridge (at Tea Point (A) • 1No. TV Socket flush in wall • 2No. Power Sockets in Dado below TV • 4No. Flush Wall Double Sockets with integrated dual USB(C) Sockets	
Data Sockets		• 1No. For Wi FI Point • 1No. To Dado below TV	
Wi FI		1No. At High Level	
HDMI		2No. TV to Dado Underneath	
A/V Sockets		• 3.5mm Audio Jack Sockets within Dado below TV linked to sounder • USB (A) Socket in Dado to TV • USB(A) Socket in Dado to Soundbar • HDMI Socket in Dado to TV	

	Floor	Wall	Ceiling
Projector/TV		• TV on wall (Sony Bravia KD50X75WL (2023) LED HDR 4K Ultra HD Smart Google TV, 50 inch with Youview/Freesat HD & Dolby Atmos, Black) • Denon Home Sound Bar 550 (Black) TV to be installed on wall adjacent Acc WC	
TV		1 No. On Wall adjacent WC	
Dado Trunking (length)		6m below TV	
Specialist Power (eg. heavy equipment)		Point of use hot water storage heater	
Lighting			Suspended LED
Lighting Control			see lighting control matrix - Daylight dimming with manual scene controls
Emergency Lighting		Illuminated signage	Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security			Movement Sensor
Access Control		To all personnel doors	
Electric Window Controls			
Ventilation		Natural with mechanical extract to tea point area	
Winter/Summer Temperature (degC)		21/23degC	
Heating		Split type heating and cooling	
Cooling		Split type heating and cooling	
Hot and Cold Water		Hot and Cold Water to Tea Point	

	Floor	Wall	Ceiling
Hot and Cold Beverage Systems		Cold Water Tap Outlet at sink.	
Hand Driers		N/A	
Induction Loop			Yes with amplifier kit

Room Hire (B)

	Floor	Wall	Ceiling
Power Sockets		• 1No. TV Socket flush in wall • 2No. Power Sockets in Dado below TV • 4No. Flush Wall Double Sockets with integrated dual USB(C) Sockets	
Data Sockets		• 1No. For Wi FI Point • 1No. To Dado below TV	
Wi FI		1No. At High Level	
HDMI		2No. TV to Dado Underneath	
A/V Sockets		• 3.5mm Audio Jack Sockets within Dado below TV linked to sounder • USB (A) Socket in Dado to TV • USB(A) Socket in Dado to Soundbar • HDMI Socket in Dado to TV	
Projector/TV		• TV on wall (Sony Bravia KD50X75WL (2023) LED HDR 4K Ultra HD Smart Google TV, 50 inch with Youview/Freesat HD & Dolby Atmos, Black) • Denon Home Sound Bar 550 (Black) TV to be installed on wall adjacent WC	
Dado Trunking (length)		6m below TV	
Specialist Power (eg. heavy equipment)		Point of use hot water storage heater	
Lighting			Suspended LED

	Floor	Wall	Ceiling
Lighting Control			see lighting control matrix - Daylight dimming with manual scene controls
Emergency Lighting		Illuminated signage	Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security			Movement Sensor
Access Control		To all personnel doors	
Electric Window Controls			
Ventilation		Natural with mechanical extract to tea point area	
Winter/Summer Temperature (degC)		21/23degC	
Heating		Split type heating and cooling	
Cooling		Split type heating and cooling	
Hot and Cold Water		Hot and Cold Water to Tea Point	
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	
Induction Loop			Yes with amplifier kit

ENTRANCE LOBBY

	Floor	Wall	Ceiling
Power Sockets		1No. Double Sockets	
Data Sockets		For Wi FI Pont	
WI FI Point		1No. At High Level	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		N/A	
Lighting			Downlights
Lighting Control			see lighting control matrix - Daylight dimming with manual scene controls
Emergency Lighting		Illuminated signage	Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security			Movement Sensor
CCTV		Yes	
Access Control		To all personnel doors	
Electric Window Controls		N/A	
Ventilation		Natural	
Winter/Summer Temperature (degC)		Winter - 19degC - No summer condition	
Heating			Direct electric radiant panel heater
Cooling		N/A	
Hot and Cold Water		N/A	

	Floor	Wall	Ceiling
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	

1st Floor

Office (1)

	Floor	Wall	Ceiling
Power Sockets		4No. Double Sockets	
Data Sockets		2No. Double Data	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		Along 2 Wall - Estimate 4 metres horizontally	
Specialist Power (eg. heavy equipment)		N/A	
Lighting			600 x 600 modular Recessed light fitting
Lighting Control			see lighting control matrix - Daylight dimming with manual scene controls
Emergency Lighting		Illuminated signage	Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security			Movement Sensor
Access Control		To all personnel doors	
Electric Window Controls		N/A	
Ventilation		Natural with mechanical assistance to cafe area	
Winter/Summer Temperature (degC)		Winter - 21degC - summer 23degC	
Heating		Split type heating and cooling	
Cooling		Split type heating and cooling	
Hot and Cold Water		N/A	

	Floor	Wall	Ceiling
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	

Office (2)

	Floor	Wall	Ceiling
Power Sockets		4No. Double Sockets	
Data Sockets		2No. Double Data	
Wi FI		N/A	
HDMI		N/A	
A/V Sockets		N/A	
Projector		Along 2 Wall - Estimate 4 metres horizontally	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)			600 x 600 modular Recessed light fitting
Lighting			see lighting control matrix - Daylight dimming with manual scene controls
Lighting Control		Illuminated signage	Integrated to general fittings
Emergency Lighting		To British Standard	
Signage		Call Points to L2	Sounders to L2
Fire Alarm			Movement Sensor
Security		To all personnel doors	
Access Control		To all personnel doors	
Electric Window Controls		Natural with mechanical assistance to cafe area	
Ventilation		Split type heating and cooling	
Winter/Summer Temperature (degC)		Winter - 21degC - summer 23degC	
Heating		Split type heating and cooling	
Cooling		N/A	
Hot and Cold Water		N/A	
Hot and Cold Beverage Systems		N/A	

	Floor	Wall	Ceiling
Hand Driers		N/A	

Office (3)

	Floor	Wall	Ceiling
Power Sockets		8No. Double Sockets	
Data Sockets		4 Double data in Dado plus 1 for Wi FI.	
Wi FI		1No. Wi FI Point	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		Along Walls all walls BL to check Roof line	
Specialist Power (eg. heavy equipment)		N/A	
Lighting			600 x 600 modular Recessed light fitting
Lighting Control			see lighting control matrix - Daylight dimming with manual scene controls
Emergency Lighting		Illuminated signage	Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security		To all personnel doors	Movement Sensor
Access Control		To all personnel doors	
Electric Window Controls		N/A	
Ventilation		Natural with mechanical assistance to cafe area	
Winter/Summer Temperature (degC)		Winter - 21degC - summer 23degC	
Heating		Split type heating and cooling	
Cooling		Split type heating and cooling	
Hot and Cold Water		N/A	

	Floor	Wall	Ceiling
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	

GENERAL SPACES

Each Tea Point - note there are 4no. Tea Points reference (A), (B), (C) & (D)

	Floor	Wall	Ceiling
Power Sockets		• 2No. Double Sockets above work top • 1No. Switched socket below work top for Fridge • 1No. Switched Socket for Dishwasher	
Data Sockets		N/A	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		2No. 16amp spurs for tea making facility	
Lighting			Downlights
Lighting Control			see lighting control matrix -
Emergency Lighting		Illuminated signage	Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security			Movement Sensor
Access Control		To all personnel doors	
Electric Window Controls			
Ventilation		Supply and Extract to meet AD Part F	
Winter/Summer Temperature (degC)		Winter - 19degC - summer, no summer condition	
Heating			Direct electric radiant panel heater
Cooling			

	Floor	Wall	Ceiling
Hot and Cold Water		Hot and Cold Water to sanitary ware and dishwasher	
Hot and Cold Beverage Systems		Chilled Tap	
Hand Driers		N/A	

WC's (NOTE there are 6no. ground floor and 2No. FF)

	Floor	Wall	Ceiling
Power Sockets		N/A	
Data Sockets		N/A	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		Hand Drier and sensor taps	
Lighting			Downlights
Lighting Control			see lighting control matrix -
Emergency Lighting			Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Call Assistance Systems		N/A	
Security			N/A
Access Control		N/A	
Electric Window Controls		N/A	
Ventilation		Supply and Extract to meet AD Part F	
Winter/Summer Temperature (degC)		Winter - 19degC - summer, no summer condition	
Heating			Direct electric radiant panel heater
Cooling		N/A	
Hot and Cold Water		Hot and Cold Water to sanitary ware with TMV3 mixing	
Hot and Cold Beverage Systems		N/A	

	Floor	Wall	Ceiling
Hand Driers		1No. Required - Armadillo ECO required	

Acc. WC's (NOTE there are 3no. ground floor

	Floor	Wall	Ceiling
Power Sockets		N/A	
Data Sockets		N/A	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		Hand Drier and sensor taps	
Lighting			Downlights
Lighting Control			see lighting control matrix -
Emergency Lighting			Integrated to general fittings
Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Call Assistance Systems		Disabled Call System	
Security			N/A
Access Control		N/A	
Electric Window Controls		N/A	
Ventilation		Supply and Extract to meet AD Part F	
Winter/Summer Temperature (degC)		Winter - 19degC - no summer condition	
Heating			Direct electric radiant panel heater
Cooling		N/A	
Hot and Cold Water		Hot and Cold Water to sanitary ware - DOC-M PACK	
Hot and Cold Beverage Systems		N/A	

	Floor	Wall	Ceiling
Hand Driers		1No. Required - Armadillo ECO	

CIRCULATION SPACES and STAIRWELLS

	Floor	Wall	Ceiling
Power Sockets		1No. Single Socket	
Data Sockets		1No. for Wi FI Point at High Level for each circulation space i.e. • 1No. for Room Hire (B) Entrance Lobby . • 1No. for Community Hall Entrance Lobby • 1No. 1st Floor Landing	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		N/A	
Lighting			Downlights
Lighting Control			see lighting control matrix - Daylight dimming with manual scene controls
Emergency Lighting		Illuminated signage	Integrated to general fittings
Illuminated Signage		To British Standard	
Fire Alarm		Call Points to L2	Sounders to L2
Security			Movement Sensor
CCTV		Yes	
Access Control		To all personnel doors	
Electric Window Controls		N/A	
Ventilation		Natural with supply for adjoining WC's	
Winter/Summer Temperature (degC)		Winter - 19degC - summer, no summer condition	

	Floor	Wall	Ceiling
Heating			Direct electric radiant panel heater
Cooling		N/A	
Hot and Cold Water		N/A	
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	

STORES

	Floor	Wall	Ceiling
Power Sockets		1No. Double Sockets per store 2No. Double Sockets per Large Store All 1st Floor Stores are small. All Ground Floor Stores are large	
Data Sockets		N/A	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		N/A	
Lighting			Downlights
Lighting Control			see lighting control matrix - Manual on - abesnce/auto off
Emergency Lighting		N/A	
Illuminated Signage		N/A	
Fire Alarm		Detection as L2	N/A
Security			N/A
Access Control		N/A	
Electric Window Controls		N/A	
Ventilation		N/A	
Heating			N/A
Cooling		N/A	
Hot and Cold Water		N/A	

	Floor	Wall	Ceiling
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	

PLANT

	Floor	Wall	Ceiling
Power Sockets		1No. Metal Clad Double Power Socket	
Data Sockets		1No. Double RJ45 for BMS	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		N/A	
Lighting			Strip Light
Lighting Control			see lighting control matrix - Manual on - abesnce/auto off
Emergency Lighting			Integrated to general fittings
Illuminated Signage		N/A	
Fire Alarm		Call Points to L2	Sounders to L2
Security			
Access Control			Keypad to magnetic lock
Electric Window Controls		N/A	
Ventilation		N/A	
Heating			N/A
Cooling		N/A	
Hot and Cold Water		N/A	
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	

BASEMENT

	Floor	Wall	Ceiling
Power Sockets		4No. MK Metal Clad Plus Double Power Sockets	
Data Sockets		8No. Double RJ45 MK Metaclad Plus	
HDMI		N/A	
A/V Sockets	Specialist leak detection linked to BMS	N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)	Power to leak detection	1No. 16 Amp SP&N MK Commando Socket for IT Rack 1No. 20Amp SP&N Weatherproof rotary isolator for sump pump	
Lighting			Strip Lights
Lighting Control			see lighting control matrix - Manual on - abesnce/auto off - NOTE: Light switch to be MK metal clad Plus type
Emergency Lighting			Integrated to general fittings
Illuminated Signage		N/A	
Fire Alarm		Call Points to L2	Sounders to L2
Security		Alarm contacts to external hatch (former beer keg delivery hatch)	Motion Detectors
Access Control			Keypad to magnetic lock
Electric Window Controls		N/A	
Ventilation		N/A	
Heating			N/A

	Floor	Wall	Ceiling
Cooling		N/A	
Hot and Cold Water		N/A	
Hot and Cold Beverage Systems		N/A	
Hand Driers		N/A	

EXTERNAL

	Floor	Wall	Ceiling
Power Sockets	125mm dia PE Duct for future UKPN power upgrade	1No. MasterSeal Plus (Grey - Lockable)	
EV Points	6No. Electric Vehicle Charging Points Power and Data Ducts to 8no. future Bays - prospectively		
Data Sockets		N/A	
HDMI		N/A	
A/V Sockets		N/A	
Projector		N/A	
Dado Trunking (length)		N/A	
Specialist Power (eg. heavy equipment)		EV	
Lighting		Yes- described within specification in detail	
Lighting Control		Solar Dial Time Switching and photocell with BMS remote control	see lighting control matrix - Manual on - abesnce/auto off
Emergency Lighting		Yes	Integrated to general fittings
Illuminated Signage		To British Standard	
Fire Alarm		Sounders to L2	
Security		Sounder	
CCTV		Yes - all sides of building with car park coverage, coverage detailed in specification	
Access Control		To all personnel doors	
Electric Window Controls		Rain Sensors	
Hot and Cold Water		N/A	

APPENDIX B - TECHNICAL SPECIFICATION

APPENDIX C - EQUIPMENT SCHEDULE

NEW EXTENSION AND REFURBISHMENT

VIKING CENTRE

SPROWSTON, NORWICH

SEPTEMBER 2023

GENERAL EQUIPMENT SCHEDULE
ISSUE 1

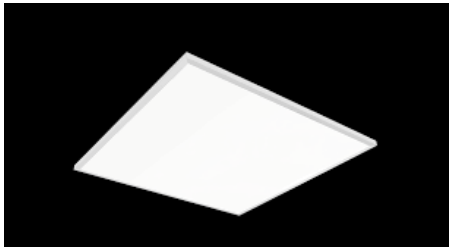
1.0. Schedule

The below schedule is a summary of the general equipment specified for the project. See specification for details:

ITEM	MANUFACTURER	MODEL	IMAGE
Electrical Accessories Generally including but not limited to:- • Power Sockets • Spurs • Light Switches • Data Sockets • AV Sockets	MK Electric	MK Logic Plus, double sockets with USB-C as described	 

ITEM	MANUFACTURER	MODEL	IMAGE
Electrical Accessories in back of house area (eg. basement, stores and plant room) • Power Sockets • Spurs • Light Switches • Data Sockets • AV Sockets	MK Electric	MK Metalclad Plus with USB-C sockets as described	 

ITEM	MANUFACTURER	MODEL	IMAGE
Electrical Accessories to external	MK Electric	MK Masterseal Plus (Grey) - Lockable type	
Dado Trunking to Room Hire and Offices etc.	MK Electric	Prestige 3D Trunking	
Internal General Lighting to Community Hall and Room Hires	Glamox	C80-PR to incorporate emergency lighting dimming and presence and light sensors as required	

ITEM	MANUFACTURER	MODEL	IMAGE
Internal General Lighting to circulation spaces	Glamox	D70-R to incorporate emergency lighting dimming and presence and light sensors as required	
Internal Spaces - Stairs	Glamox	A35-S to incorporate emergency lighting dimming and presence and light sensors as required	
Offices	Glamox	C35-R to incorporate emergency lighting dimming and presence and light sensors as required	

ITEM	MANUFACTURER	MODEL	IMAGE
Cupboards and WC's	Glamox	D70-R to incorporate emergency lighting dimming and presence and light sensors as required	
Plant and Equipment Rooms and Basement	Glamox	i40 to incorporate emergency lighting dimming and presence and light sensors as required	
External Lighting - Car Park	Glamox	055- with DALI Dimming	

ITEM	MANUFACTURER	MODEL	IMAGE
External - Cycle Shelter	Glamox	MIR	
External - Rear Access route including heat pump area	Glamox	024-W	
External - Entrance walkways - Community Hall and Room Hire (B) Entracnes	Glamox	22	

ITEM	MANUFACTURER	MODEL	IMAGE
Lighting and Ventilation Presence/ Absence Detector	CP Electronics	TBC	
Lighting light sensor/photocell	CP Electronics where not able to be incorporated into light fittings	TBC	

ITEM	MANUFACTURER	MODEL	IMAGE
Hand Driers	Handy Dryers	Armadillo - Stainless Steel Finish	
EV Points	Pilot Group	EV Charger 7.2kW with contactless payment (GSM features) and load management	

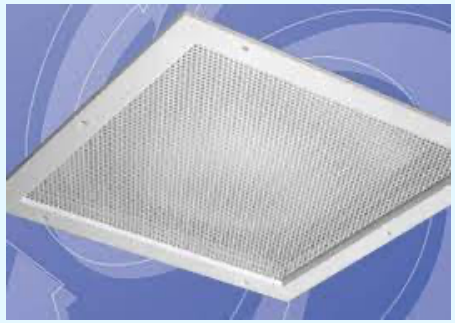
ITEM	MANUFACTURER	MODEL	IMAGE
AV Receiver to Community Hall	Sony	STR-DH-790 (Black)	
Speakers to Community Hall	Cornered Audio	Cornered Audio C3 Black	

ITEM	MANUFACTURER	MODEL	IMAGE
Speaker Cable to Speakers in Community Hall	QED	QEDXT25	
Sound level monitoring and cut off system	Sentry	Music Noise Controller - linked to contractor to disconnect to power to AV Receiver/Amplifier in the event of excessive noise being detected.	
Projector to Community Hall	TBC		

ITEM	MANUFACTURER	MODEL	IMAGE
TV to Room Hire	Sony	• Sony Bravia KD50X75WL (2023) LED HDR 4K Ultra HD Smart Google TV, 50 inch with Youview/ Freesat HD & Dolby Atmos, Black)	
Soundbar to Room Hire	Denon	• Denon Home Sound Bar 550 (Black)	
PV Panels	JA Solar	Minimum 20.7% Efficiency	

ITEM	MANUFACTURER	MODEL	IMAGE
PV Inverter	SMA	Sunnyboy	
Ventilation MVHR Units	Nuaire	XBOXER	

ITEM	MANUFACTURER	MODEL	IMAGE
Ventilation Intermittent Extract Room Dedicated	Nuaire	Genie	
Ventilation Intermittent Extract Central (Multi Room)	Nuaire		

ITEM	MANUFACTURER	MODEL	IMAGE
Supply and extract grilles in building	Gilberts or Waterloo	Perforated grille - powder coated to suit architectural requirements. (default is RAL 9010)	
External supply and exhaust air louvres	Gilberts or Waterloo	Class A weatherproof powder coated to suit architectural requirements (default Goosewing Grey)	
Air Source heat Pump to Community Hall	Mitsubishi Electric		

ITEM	MANUFACTURER	MODEL	IMAGE
Split Type Air Conditioning Units	Mitsubishi Electric	Mr Slim Power Inverter P Series - R32 generally where. Only where Mr Slim P Series cannot be accommodated for technical reasons - MSZ range can be utilised - using the Zen range. All wall mounted units to be finished in Crystal White unless otherwise specified. Units to always be connected to a wired controller. NOT A REMOTE TYPE	   

ITEM	MANUFACTURER	MODEL	IMAGE
Water Conditioner	Hydrotec	HydroMAG	
Hot Water Heaters	Heatrae Sadia	Unvented Type.	

ITEM	MANUFACTURER	MODEL	IMAGE
Temperature Gauges to hot water distribution pipes discharging from how water heaters	Brannan	Clip on type 0-120degC	
Temperature gauges to LTHW piped systems and Air Duct systems to allow simple temperature monitoring	Brannan Immersion Types	TBC	

ITEM	MANUFACTURER	MODEL	IMAGE
Switchgear generally - LV Power Distribution Boards N.B. MCCB Panel Boards to be by same manufacturer.	Schneider or Eaton	Acti 9 Isobar with metering and split board arrangements	
Rotary Isolator to mechanical services equipment and other associated equipment	Schneider or Eaton	TBC	

5.0 Structural Engineer's Specification

STRUCTURAL ENGINEERING CALCULATIONS AND DETAILS

VIKING CENTRE, SPROWSTON

STRUCTURAL ENGINEER : 

Job 2022-302

CLIENT : BIDWELLS LLP

B2 Issue

FOR BUILDING REGULATIONS APPROVAL

JOHN PLUMMER PARTNERSHIP

JOHN PLUMMER

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CONTENTS

ISSUE NUMBER	DATE	DESCRIPTION
B1	13th April 2023	FOR BUILDING REGULATIONS APPROVAL
B2	22nd August 2023	UPDATED TO INCORPORATE STRUCTRURAL DESIGN AND DETAILS ASSOCIATED WITH COLUMN REMOVAL WORKS IN ENTRANCE FOYER

STRUCTURAL ENGINEERING STATEMENT(B2)

1. The main works at the property involve construction of a new steel framed community hall in the rear courtyard area of the former 2-storey Viking Public House building, which is being converted into a community centre. The existing building wall also undergo minor structural alterations to internal walls, and will be linked to the new community hall structure via a timber flat roof construction at first floor level.
2. (B2) In addition to the main works at the rear of the property, the existing central column at ground floor level in the entrance lobby is intended to be removed. To facilitate this, a structural solution has been developed involving installation of steel transfer beams and support posts. See additional drawings and calculations in Appendices A & C.
3. The new community hall steel frame is designed as being independent to the existing building in respect to supporting gravitational loads. In terms of lateral stability under wind loading, it will rely partially on being propped by the existing building via the flat roof to the link structure, which will act a stiff diaphragm at first floor level.
4. A fire boundary condition is thought to exist on the north east and south east sides of the new community hall. As the building will have a perimeter masonry cavity wall construction, it is not considered necessary to employ any special provisions in respect to the design of the steel frame.
5. The existing building is constructed as load bearing masonry supporting timber 1st floor and roof elements. Existing foundations are assumed to be mass concrete. The existing ground floor slab is assumed to be ground bearing. There is no obvious evidence of any significant structural distress that might otherwise indicate that the existing structure has not been able to sustain the loads imposed upon it to date.
6. By inspection the pattern and quantum of loading acting on the existing structure will not be significantly affected therefore remedial strengthening works are not considered to be required.

TEMPORARY STABILITY(B2)

1. **THE MAIN CONTRACTOR IS RESPONSIBLE FOR MAINTAINING STABILITY OF THE WORKS DURING CONSTRUCTION AT ALL STAGES.**
2. Particular attention is drawn to the temporary stability of the steel frame for the new community hall. The two main steel rafters are to be propped at mid-span until the steel fame erection is complete, i.e all bracings installed. This is to ensure that the roof will not deflect excessively as it relies on interaction with the perimeter ring beam structure to control eaves. In addition, the steel frame is to be propped laterally until it has been positively tied into the new flat roof construction of the link infill.
3. (B2) Particular attention is also drawn to the temporary propping required to facilitate the column removal work in the entrance lobby. Refer to additional drawings SK09 & 10 in Appendix A, and the updated construction sequence.
4. Do not stockpile demolition arisings onto suspended timber or concrete floors.
5. Do not prop off suspended floors unless back propping is in place.

PERMANENT STABILITY

1. Permanent stability of the new community hall structure is achieved through diaphragm action of the roof acting in conjunction with vertical bracing in the perimeter walls and though being

propped laterally by the existing building via connection through the link roof. By inspection, the stability of the existing structure will not be adversely affected.

DISPROPORTIONATE COLLAPSE

1. The building is class 2A with respect to the requirements to mitigate the risk of disproportionate collapse. Horizontal ties are provided in the steel frame by ensuring that the tops of the columns are tied out by incoming members in two orthogonal directions. All steelwork connections are to incorporate at least 2N° M20 or 4N° M16 bolts depending on member weight(see steelwork specification in this document), which will more than adequately provide code-compliant tying forces.

CONSTRUCTION DESIGN & MANAGEMENT (CDM) REGULATIONS

1. If more than one Contractor is to be appointed by the Client, then the Client is required to appoint a Principal Designer and Principal Contractor. For the avoidance of doubt, I have assumed that Principal Designer duties are being undertaken by others.
2. I confirm I will discharge my duties as Designer under the CDM Regulations.

CONTRACTOR DESIGNED ELEMENTS

1. The Contractor has design responsibility for the following elements. The design of these elements is to be in accordance with the specifications contained within this document.

   - Steel connections (other than those included within this document).
   - Ground bearing floor slab

INFORMATION UPON WHICH THE DESIGN IS BASED

1. These details and specifications are based upon the Client Supplied Information shown in Appendix B together with observations from John Plummer site visit 26th July 2021.

ANALYSIS AND DESIGN COMPUTER PROGRAMMES

1. The following analysis and design software programmes have been used in these calculations:
   - CADS A3d Max Version 4.59
   - CADS Steelwork Member Designer Version 3.78
   - CADS Steelwork Moment Connection Version 1.86

REFERENCES

1. Building Regulations Approved Document Part A
2. The Construction (Design Management) Regulations 2015
3. NHBC Chapter 4.2 ‘Building Near Trees’
4. Loads — BS6399/BS648
5. Lintels — BS5977
6. Structural Masonry — BS5628
7. Structural Steelwork — BS5950
8. Structural Timber — BS5268
9. Foundations — BS8004
10. Interactive Blue Book https://www.steelforlifebluebook.co.uk/
11. Guidance of Meeting the Robustness Requirements of Approved Doc. A — SCI P341

ASSUMPTIONS

1. The Design is produced on the assumptions that the work will be carried out by a competent Building Contractor in accordance with the Building Regulations, relevant British Standards and to generally accepted standards and methods of building construction.
2. The Design is to be read in conjunction with all drawings, sketc.hes, specifications etc.
3. Any queries with respect to the information described within these calculations are to be referred to John Plummer Partnership. **DO NOT GUESS, IF IN DOUBT ASK**.
4. If conditions are encountered on site which are at variance to assumptions made in these calculations, then John Plummer Partnership is to be informed immediately in order that our advice on how to proceed can be obtained. John Plummer Partnership cannot be held liable for the design of construction which has not been built in accordance with the design information we have supplied, including the assumptions we have made.

DIMENSIONS

1. We are not responsible for dimensional information except where shown on our drawings. All setting out information, dimensions etc. shall be calculated from information supplied by others.
2. DIMENSIONS SHOWN IN CALCULATIONS ARE NOT TO BE USED FOR CONSTRUCTION.

SEQUENCE OF CONSTRUCTION(B2)

1) Main Rear Extension Works

(i) Existing courtyard to be cleared of all items that will impinge on the works.
(ii) Mark-out locations of known buried services and proposed foundation. Undertake any drainage diversion work as required. CAT scan to check for presence of unknown buried services and carefully proceed with excavation work for foundations.
(iii) Construct foundations and install the steel columns.
(iv) Prop the steel columns laterally if required to do so for temporary stability, and install the inclined eaves beams on the northwest and south west sides of the frame which are required to support the ends of the main steel rafters, and the truss bracing members on the north west elevation frame which has the longer (propped) cantilever eaves beam.
(v) Install the main steel rafters (533UB sections), and temporarily prop them vertically to ensure that lateral spread of the eaves beams is controlled.
(vi) After installation of the steel frame, immediately construct the timber flat roof for the link to the existing building to prop the fame prior to commencing cladding works. Alternatively provide lateral propping to the steel frame until the flat roof has been constructed.
(vii) Once the flat roof has been constructed and the roof cladding installed, carefully release the propping to the main rafters to ensure that the roof load is taken up by the frame in a controlled manner.

2) Column removal works in Entrance Lobby

(i) Carry out trial pit investigation in existing basement to establish modifications required (if any) to existing basement wall foundation to accommodate new RHS support post (see SK-10).
(ii) Carry out modifications to basement wall foundation.
(iii) Temporary prop existing suspected concrete-encased steel beam at first floor currently supported by the circular column that is to be removed, and adjacent ceiling joists. Back prop though to basement floor slab. Safely deconstruct/remove the section of existing brickwork wall at ground floor level at the right hand side bearing end of the existing beam (see SK-10).
(iv) Cut out pocket and construct C35 concrete padstone to received right hand side RHS support post for transfer beams.
(v) Install RHS support posts for transfer beam, including lower level post at left hand side connected to extended basement wall foundation.
(vi) Install outer segments of 305UB transfer beams either side of column that is to be removed, connecting them to tops of RHS posts, and with dry pack mortar bed placed hard up to soffit of existing suspected concrete encased steel beam, and pack prop the beam segments though to basement floor level. Install beam segments one at a time so existing beam is continuously back-propped at all times.
(vii) Construct new ceiling diaphragms either side of existing beam - see SK-09 & 10.
(viii) Once dry pack mortar has gained sufficient strength and ceiling diaphragms have been constructed, carefully remove the circular column.
(ix) Install central segments of 305UB transfer beams (see splice joint detail in calculations in Appendix C), and apply dry pack hard up to underside of existing beam.
(x) Carefully release props to ensure that load is taken up by the new 305 UB transfer beams in a controlled manner.

STRUCTURAL STEELWORK SPECIFICATION

1. All materials, fabrication, workmanship, and erection of steelwork shall be in accordance with the current version of The National Steelwork Specification for Building Construction (CE Marking) as published by the British Constructional Steelwork Association.
2. **Unless otherwise indicated the works, the component and all details are specified for Execution Class 2 (EXC2).**
3. Unless otherwise specified, all structural steelworks shall be of minimum grade S355J0. Steel plate shall be grade S275JR.
4. **The building is designated Class 2A with respect to the requirements to prevent disproportionate collapse. No additional measures to normal construction detailing and design are likely to be necessary.**
5. As a minimum, steelwork connections, except where otherwise shown on the drawings, shall comprise not less than 2 no M16 dia. gr. 8.8 bolts for members up to 25 kg/m and 4 no M16 dia. gr. 8.8 bolts for all other members.
6. Unless noted otherwise all steelwork connections shall be in accordance with the SCI's 'Green Books'.
7. Where connection loads are provided by John Plummer Partnership, the Steelwork Contractor shall design connections which will be subject to comment by John Plummer Partnership. The Steelwork Contractor retains design responsibility for the connection design and is also responsible for obtaining Building Regulations Approval for the connection design.
8. Where connections are of aesthetic importance, then the form of connection is to be agreed with John Plummer Partnership and Architect. Benchmarking of welding will be required, against which the visual appearance of the welding will be agreed to be satisfactory or unsatisfactory. Unsatisfactory welding will be replaced at the Contractor's expense and in a manner agreed with John Plummer Partnership and Architect.
9. Steel beams shall at least have the minimum bearings on masonry walls as shown on the drawings. Where no details of bearings are shown provide bearings to the full width of the supporting leaf or 150mm whichever is greater. Unless otherwise indicated on the drawings steel beams are to be bedded on nominally 10mm thick dry pack mortar (or other non-shrink bedding grout), typically 1 part cement to 3 parts sand mixed with just sufficient water to bind, under the full bearing area of the steel beam.
10. Steel beams inserted to support existing masonry construction shall be constructed such that a nominal gap (minimum 10mm / maximum 25mm) is formed between the top of the steel beam and the underside of the masonry structure above. The gap shall be fully filled with dry pack mortar (or other non-shrink bedding grout), typically 1 part cement to 3 parts sand mixed with just sufficient water to bind, rammed tight.
11. Steel columns shall be raised or lowered to the correct levels off foundations/masonry supports using sawn steel packs not less than 75mm square. Allowance shall be made for nominal 25mm thickness of grout between column baseplates and foundations/masonry supports. Grout shall be high strength and shall take the form of neat cement slurry with a non-shrink additive and should be just fluid enough to pour.
12. Site modifications to structural steelwork shall not be carried out unless prior approval has been obtained from John Plummer Partnership.
13. Prior to painting all structural steelwork shall be blast cleaned in accordance with BS EN ISO 8501-1, to preparation grade Sa 2½.
14. A pre-fabrication primer may be used at the fabricator's discretion. The Contractor shall ensure that the primer used is compatible with subsequent coatings specified by others. (e.g., intumescent paint).

STRUCTURAL STEELWORK SPECIFICATION cont'd

15. All FUNCTIONAL structural steelwork, and, except where specified as galvanized or stainless, shall be painted with a suitable good quality high build epoxy zinc phosphate primer (Leighs Paints Epigrip C400V3 Zinc Phosphate Primer/Buildcoat, or similar) to provide the following (not less than) dry film thicknesses (units microns):

    - Internal, dry environments 75 µm
    - Internal, damp environments e.g., in cavity walls 125 µm
    - Internal, wet environments 250 µm
    - External, rural environments 250 µm
    - External, light industrial environments 275 µm
    - External, high industrial or coastal environments 325 µm

16. All DECORATIVE structural steelwork, and, except where specified as galvanized or stainless, shall be painted with a suitable good quality high build epoxy zinc phosphate primer (Leighs Paints Epigrip C400V3 Zinc Phosphate Primer/Buildcoat, or similar) and finished with a compatible decorative coat (Leighs Paints Resistex C137V2 Special Finish, or similar) to provide the following (not less than) dry film thicknesses (units microns):

    - Internal, damp environments e.g., in cavity walls 100 µm Primer/50 µm Finish
    - Internal, wet environments 200 µm Primer/50 µm Finish
    - External, rural environments 200 µm Primer/50 µm Finish
    - External, light industrial environments 200 µm Primer/75 µm Finish
    - External, high industrial or coastal environments 250 µm Primer/75 µm Finish

    All **DECORATIVE** structural steelwork in internal, dry environments shall receive instead Leighs M255 Gloss Protective Finish (not less than 75 µm) or Leighs Paints M155 Matt Protective Finish (not less than 75 µm).

    Paint colour, for both Primer and Finish coats, are to be agreed with the Architect.

17. Steelwork that is to be galvanised shall be first blast cleaned in accordance with BS EN ISO 8501-1, to preparation grade Sa 2½. Steelwork shall then be hot dip galvanised to BS EN 1461, to provide a minimum coating thickness of 85 microns unless otherwise noted.
18. If stainless steel is to be adopted, then it is to conform strictly to the requirements of BS EN 10088. Stainless steel is to austenitic stainless steel of grade 1.4404 (grade 316L), to BS EN 10088 Part 1.
19. Fasteners are to accord with BS EN ISO 3056 and are to be austenitic.
20. If carbon steel fasteners are adopted, then due care is to be taken when detailing connections so as to avoid the risk of bi-metallic corrosion occurring (when stainless steel is in contact with carbon steel). Neoprene washers, caps etc. are to be provided.
21. Welding of Stainless Steel is to comply with BS EN 1011, BS EN 1600, BS EN 12072, BS EN 12073, BS EN ISO 17633 and is to generally follow industry good practice.
22. Steelwork below DPC, including baseplate and holding down bolts, shall be encased in not less than 100mm (unless otherwise noted) of concrete, not weaker than specified on the drawings.
23. Defects (to protective paint coatings) that are identified on site shall be made good using 'touch up' paint compatible with the applied protective paint coating. The minimum dry film thickness shall be achieved at all repair locations.
24. Provide all necessary fire protection to new steelwork that might be required by the Architect and/or Building Control.

STRUCTURAL STEELWORK SPECIFICATION cont'd

25. John Plummer Partnership is not responsible for dimensional information except where shown on his drawings. All setting out information, dimensions etc. shall be calculated from the Architect's drawings and/or measurements taken on site.

MASONRY AND ANCILLARY COMPONENTS SPECIFICATION

1. The Contractor is responsible for the stability of the works at all stages during construction.
2. The Contractor should be aware that in the permanent condition, stability of the masonry elements of construction is often provided by the diaphragm action of floors and/or roofs and/or framed construction acting compositely with the masonry elements. Until such time that these other elements of construction are constructed and capable of acting as the design intent, the stability of masonry wall elements may often rely solely on their own bending and shear strength. Bending strength of unsupported walls and columns is low and measures should therefore be taken to either temporarily support or protect these elements against lateral loading, particularly wind loading, until such time that the elements are permanently supported.
3. The Contractor should be aware that forming openings (be they temporary or permanent) in external walls will often expose internal walls to wind loading, for which they may not have been designed and may not therefore have the capacity to safely resist the loads. In some instances, exposed internal partitions may either need to be temporarily supported or protected against wind loading. The Contractor is responsible for the stability of the internal partitions during the construction period.
4. The maximum weight of an individual masonry unit must not exceed 20kg unless it is intended to employ mechanical lifting devices to lift and place the individual masonry units. Blockwork should be adequately protected on site to avoid saturation and possible increase in lifting weight.
5. The Contractor shall verify all site dimensions, setting out dimensions and levels with the Architect and inform the Engineer of any amendments required.
6. Refer to the Architect's details/specifications for masonry requirements in respect of acoustic, thermal insulation and durability requirements. The Engineer shall be notified immediately if this conflicts with structural requirements.
7. Masonry is to be constructed in accordance with the recommendations of BS 5628 and is to be fully bonded, bedded and tied.
8. The manufacture of all masonry units is to comply with BS5628 requirements for CATEGORY I.
9. All ancillary masonry components e.g., wall ties, straps, hangers etc. are to comply with BS EN 845-1 **and are to be of austenitic stainless steel**.
10. Stainless steel ties, where they are fixed to mild steel e.g., structural steel frame, are to be fully separated from the mild steel face by means of neoprene washers and/or caps.
11. Provide Type 1 cavity wall ties (Ancon ST1 or similar) in accordance with BS 5628 at 900mm horizontal & 450mm vertical staggered centres in cavity external walls unless noted otherwise. Reduce tie vertical centres to 225mm around the perimeter of openings.
12. All concrete masonry block units shall be solid and of standard format (215 high x 440 long on the work face) unless noted otherwise.
13. Blockwork units to have a minimum compressive strength as specified on the drawings.
14. Blockwork below DPC to be of foundation quality (refer to manufacturers guidelines) and to be of at least equal minimum compressive strength to that indicated between ground and first floor and in no case less than 7N/mm².
15. Brickwork units to have a minimum compressive strength of 20N/mm².
16. Frogs in brickwork must always be laid with the frog up, with the frog fully filled with mortar as work progresses.
17. Mortar designation (as defined in BS5628) as follows:
    - **above** DPC, mortar designation iii or equivalent approved masonry cement
    - **below** DPC mortar designation ii or equivalent approved masonry sulfate resisting cement
18. Provide 2 course of bed-joint crack control reinforcement above and below all internal and external wall openings. Bed joint reinforcement to extend minimum 600mm beyond the edges of the openings. For internal walls provide galvanised Bricktor CCR. For internal walls provide stainless steel Bricktor CCR.

MASONRY AND ANCILLARY COMPONENTS SPECIFICATION cont'd

19. Refer to the Architects details/specifications for details of DPC's, DPM's, waterproofing and insulation. All DPC's incorporated within structural walls shall be of a non-compressible 'High Load' type.
20. Masonry walls/columns are always to be provided with head restraint unless they are otherwise specified as having no head restraint. Where the floor or roof plate spans parallel to the wall or column, head restraint is to take the form of strapping to floor/roof plates as per the Building Regulations Part A. Otherwise, satisfactory head restraint is likely to be provided by means of the floor/roof plate bearing directly onto the wall or column.

REINFORCED MASONRY WALLS

21. All bed joint reinforcement is to comply with BS EN 845-3.
22. Bed joint reinforcement in external walls to be stainless steel. Bed joint reinforcement in internal walls to be galvanised.
23. Masonry to be built in strict accordance with BS 5628 Part 2.
24. Minimum 10mm/maximum 20mm cover is to be provided to all bed joint reinforcement.
25. The cavity/void to be infilled with reinforced concrete is to be completely cleared of mortar droppings, debris etc.. before concrete is poured.
26. Where the cavity is to be reinforced with concrete and high lift technique is adopted for their construction (lift depth exceeds 450mm) then walls ties are to be enhanced – refer BS 5628-2.

LINTELS

27. Refer to the Architect's lintel schedule for type, location, fire resistance etc. of lintels.
28. The design and manufacture of all lintels is to comply with the requirements of BS EN 845-2, recognizing the loads applied to the lintel and the environment in which the lintel will be operating.
29. It is anticipated that proprietary 'Standard Duty' lintels will generally be acceptable unless the lintels support point loads and/or concrete floors etc. in which case 'Heavy Duty' or 'Extra Heavy Duty' lintels may be required.
30. **External walls:**
    Unless otherwise specified, provide proprietary Catnic carbon steel lintels as specified on the drawings or equivalent approved by alternative manufacturer.
    Internal walls:
    Unless otherwise specified, provide proprietary Catnic 'Internal Standard Duty' (box) carbon steel lintels to loadbearing internal walls as specified on the drawings or equivalent approved by alternative manufacturer.
31. Unless otherwise specified, provide proprietary Catnic 'Internal Light Duty' carbon steel lintels to small openings in non-loadbearing blockwork walls or equivalent approved by alternative manufacturer.
32. Unless otherwise noted all carbon steel lintels are, as a minimum, to be fully galvanised and have a minimum 150mm bearing to each end.
33. If concrete lintels are proposed, then they are to be Naylor pre-stressed concrete lintels (or similar equivalent by another manufacturer).
34. All lintels are to be designed to act as independent units and not dependent upon composite action with the wall above to achieve their full loadbearing potential.
35. All lintels are to be installed strictly in accordance with the manufacturer's instructions, particularly noting requirements for temporary propping. The design/detail of any temporary propping will be the responsibility of the Contractor.

MASONRY AND ANCILLARY COMPONENTS SPECIFICATION cont'd

PADSTONES

36. Padstones are to be of minimum size as specified on the drawings.
37. Unless otherwise specified, concrete padstones are to be of generally unreinforced concrete of grade GEN1 to BS8500 but may require reinforcement to suit the Contractor's proposed methods of lifting in which case the Contractor is responsible for the design/detail of any reinforcement.
38. Concrete padstones are to be either cast insitu or precast and are to have cured a minimum of 2 days before load is applied to the padstone. The timing of when moulds are struck and precast concrete padstones are 1st lifted/moved is to be determined by the Contractor and is to recognize the early age strength of the concrete unit.
39. Precast concrete padstones may be heavy (heavier than 20 kg) and require mechanical lifting devices to assist in lifting them into position.
40. Precast concrete padstones are to be bedded on mortar of the same designation as the remainder of the wall. Mortar must have cured minimum 2 days before any load is applied to the padstone.
41. Where brickwork padstones are specified, only engineering brick units (no frogs, minimum class B, minimum unit crushing strength 50N/mm^2) in mortar designation (ii) are to be used. Brick units must be laid in stretcher bond fashion. Where brick units are cut, the cut face must be positioned on the outside edge of the padstone. When padstone thickness is equal to one brick length (215mm), brick units must be laid in English Bond fashion i.e., alternating courses of headers and stretchers which are vertically aligned. Mortar must be allowed to cure minimum 2 days before any load is applied to the padstone.
42. Unless otherwise noted steel beams or the like bearing onto the padstone are to be centred on the padstone. Refer to drawings for minimum bearing length. Beams are to be bear onto a levelling dry mortar mix maximum 10mm thick (mortar designation (i), i.e., 1 part cement: 3 parts sand mixed with just sufficient water to bind). The levelling mortar is to be provided beneath the full bearing area. Mortar must be allowed to cure minimum 2 days before any load is applied to the padstone.

STRUCTURAL (LOOSE CUT) TIMBER SPECIFICATION

1. The main Contractor is responsible and liable for ensuring the overall stability of the works and protection of surrounding works and services during the construction of the roof.
2. All timber elements are to be preservative treated in accordance with BS 8417, for a desired service life of 60 years (unless otherwise specified). Preservative is to be pressure impregnated, cut ends to be brush treated.
3. The preparation, fabrication, inspection, storage, handling and maintenance of materials and components is to be in strict accordance with the requirements of BS 5268 Part 2.
4. All structural timber floor/roof members to be of minimum size as shown on the detail drawings. Sizes shown are nominal timber sizes except as noted on the drawings and will be subject to reductions in finished size to BS EN 336.
5. Structural timber elements shall have minimum bearings of 100mm on masonry or timber plates except as noted on the drawings. Timber floor joists shall not be built into party wall constructions but shall be supported on proprietary joist hangers at such locations.
6. Double joists shall be provided under non-load bearing studwork partitions running parallel with joist spans.
7. All members supported on proprietary hangers shall be accurately cut to provide a full contact with the base of the hanger and shall be fixed in accordance with the hanger manufacturer's instructions. Joists shall be rebated to lie flush with underside of hangers.
8. End joists/rafters etc. shall be positioned approximately 50mm from masonry walls. Joist/rafter centres generally shall be equal and shall not exceed the design centres shown on the drawing. Multiple joists/rafters, where shown on the drawings, shall be securely nailed together at not more than 600mm centres along the full length of the element. Nails to penetrate minimum 2/3-member thickness on pointside.
9. **All fixings are to be corrosion resistant**. All fixings are to comply with the requirements of BS 5628 Part 2.
10. Timber wall plates are to be minimum 38mm thickness and grade C16. Where plates are located on steel beams and the like then they are to be bolted to the steelwork at 500mm longitudinal centres using M8 bolts and washers. Timber wall plates sitting on masonry walls are to be fully bedded and fixed to the masonry using galvanised vertical steel restraint straps (Expamet or similar equivalent) in accordance with Building Regulations Part A unless noted otherwise. In addition, wall plates are to be fixed to the masonry using Fischer FUR-T fixings (or similar equivalent) at 400mm longitudinal centres through the centerline of plate and masonry leaf.
11. Unless specified otherwise, securely fix 1 row of strutting between floor joists at centre span. Strutting shall take the form of one of the following:
    - a). 38mm x 38mm softwood herringbone strutting located between 5 & 25mm clear of top and bottom edges of joist.
    - b). Proprietary galvanized metal strutting fixed in accordance with manufacturer's instructions.
    - c). Solid softwood strutting not less than 38mm thick at least three quarters of the depth of the joist.
12. For new floor and/or roof construction, provide wall to floor/roof tension strapping as per the Building Regulations Part A. Tension straps are to be screwed to wall plates, joists, packing etc. using all the holes. Fixings must be capable, in total, of generating 8 kN shear per strap.
13. All Builders metalwork e.g., joist hangers, straps, plates etc. shall be fully fixed using all the holes, fixings of the correct diameter as per the manufacturer's instructions.
14. All bolts into timber are to have 50mm square x 3mm thick mild steel washers below the nut.

FLITCH BEAMS

15. Bolt fixings are to be penetrate the full width of the flitch beam in tight tolerance holes (hole diameter = bolt diameter + maximum 1mm). (Pre-drill steel plate and use as a template to drill

the holes in the timber). Timbers are to be clamped tight to steel plate along its full length whilst bolts are inserted and tightened.

16. Unless otherwise noted provide M12 gr 4.6 bolts at 600mm centres staggered +/- 30mm above / below the centerline. At supports provide 4M12 gr 4.6 symmetrical about centerline at 50 horizontal and vertical centres.

GROUND BEARING GROUND FLOOR SLAB SPECIFICATION

1. All deleterious materials shall be stripped from the sub-strata prior to construction of the slab. The depth of oversite excavation shall not exceed 600mm without the approval of the Engineer.
2. Formations and sub-bases shall be protected from inclement weather and damage caused by construction traffic. On all sites the Contractor shall protect exposed formations for ground bearing slabs to prevent subsequent damage resulting from saturation or drying out of near surface soils.
3. Any soft spots in the exposed formation are to be dug out and backfilled with compacted granular material.
4. Sub-base materials shall be laid and thoroughly compacted in layers not exceeding 125mm thick. Obtain instructions from the Engineer where sub-base thickness exceeds 600mm.
5. The integrity of the sub-base is crucial to the successful 'in-service' performance of the slab. The sub-base can easily be disturbed/damaged etc. through the actions of construction traffic and other building operations being undertaken. The Contractor is to therefore ensure that prior to the sub-base being covered over by the nominal fines (or concrete) blinding that any disturbance/damage to the sub-base is made good by means of digging out affected areas and replacing with compacted granular (DoT type 1) fill material.
6. Welded steel fabric reinforcement in ground bearing floor slabs shall have minimum laps of 225mm. Sheets shall be laid to avoid excessive build-up of depths at laps. Spacers/chairs etc. used to support the reinforcement shall be such that they are suitable for use with DPM's i.e., they will not puncture or tear the DPM.
7. Loose bar reinforcement is to be provided at all re-entrant corners in the slab, to typically comprise 2H16 bars x 1000mm long for each re-entrant corner, placed at mid depth of the slab and symmetrically about the re-entrant corner.
8. Welded steel fabric reinforcement shall be fabricated in accordance with BS 4483, whilst loose bar reinforcement shall be fabricated to BS 4449.
9. Where the slab is Contractor designed then the Contractor is to submit the following information to the Engineer for his comment and agreement before the slab is constructed:

    - Design calculations, using industry recognized empirical formulae, to substantiate the ability of the slab to adequately support the Client's loading requirements
    - Design calculations to determine and substantiate the load transfer at joints
    - Layout and type of joints together with predicted short- and long-term joint movements

    The Contractor shall obtain Building Regulations Approval for Contractor designed slabs before the slab is constructed.

10. Where the Contractor wishes to use steel fibre reinforcement in lieu of loose bar and/or welded mesh reinforcement, then the Contractor is to submit the following information to the Engineer for his comment and agreement before the slab is constructed:

    - Type, grade and dosage of fibre to be used
    - Method statement for the introduction of steel fibres to the concrete mix, to ensure that they are uniformly dispersed throughout the concrete mix
    - Method statement for removing steel fibres that may be left projecting above the surface of the slab once the slab construction is complete (if the top of the slab is the finished floor level)

GROUND BEARING GROUND FLOOR SLAB SPECIFICATION cont'd

11. Unless otherwise specified, the Contractor should make allowance in his tender sum for the following jointing:

    - Internal joints at 8.0m maximum centres in each direction, being sawn induced tied joints incorporating H12 dowel bars x 900mm long at 600mm centres.
    - Isolation joint around the perimeter of the slab wherever it is adjacent a upstand eg wall, column surround concrete, pit wall etc.

12. Unless another joint layout is specified, prior to the slab being constructed the Contractor shall submit a proposed joint layout to the Engineer for comment and agreement.
13. Joints in the floor slab should be reflected through floor finishes which are directly bonded to the top surface of the slab.
14. In some instances, either the Engineer or the Contractor may intend that the slab is constructed utilizing large pour techniques with few, if any, internal joints. In this case the Contractor should pay particular attention to selecting a concrete mix design that seeks to minimize shrinkage as it cures, but that is also workable.
15. All slabs shall be cured for not less than 7 days using an approved sprayed curing membrane. Details of the proposed curing membrane are to be submitted to the Engineer for comment prior to construction of the floor slab.
16. Refer to the Architect's drawings (where appropriate) for details of levels, floor finishes, services, DPM's etc. The DPM beneath the slab must be minimum 1000g polyethylene, taped and lapped minimum 300mm at joints. The DPM is to be lapped with the DPC in accordance with the Architect's details. DPM's are to be laid flat and must not project into the body of the slab.
17. Where gas protection measures are required, refer to separate drawings and/or specification.
18. The top surface of the slab, unless specified otherwise, is to be cast to a tolerance of +/- 10mm from datum. The top surface of the sub-base, unless specified otherwise, is to be laid (after compaction) to a tolerance of +0mm/-20mm from datum. Where the slab is constructed on concrete blinding, the top surface of the blinding is to be cast to a tolerance of +0mm/-10mm from datum.
19. The slab will take many weeks/several months to dry out, which may have an adverse effect on subsequently applied floor coverings e.g., vinyl flooring. The Contractor is to recognize this risk when looking to programme slab construction and floor covering operations and is to identify remedial risk management measures
20. Unless otherwise specified, the surface of the slab is to be cast to a tolerance satisfying the requirements of FM3 classification (as defined in Concrete Society Report TR34 3rd Edition).
21. Refer to the Concrete Specification for information pertaining to concrete.

SLABS WHERE THE TOP OF THE SLAB IS ALSO THE FINISHED FLOOR LEVEL

22. The surface of the slab is to receive a power float finish unless specified otherwise. The timing of the power floating is to be selected by the Contractor and is to be a balance between ensuring that the concrete has had sufficient time to cure such that it can support the power floating operation without causing damage to the surface of the slab but not leaving it the power float operation too long such that the floating operation does not adequately compact and seal the surface of the slab (typically expect to power float between 12 – 24 hours after the slab has been poured).
23. Prior to power floating, and where specified, a dust inhibitor/surface hardener agent is to be applied to the surface of the slab. Details of the proposed agent are to be submitted to the Engineer for comment prior to construction of the floor slab. The agent is to be applied to the surface of the slab strictly in accordance with the manufacturer's instructions and recommendations. The agent must not compromise the slip resistance of the slab, documented

GROUND BEARING GROUND FLOOR SLAB SPECIFICATION cont'd

evidence of this is to be submitted to the Engineer for comment prior to construction of the floor slab.

24. The Contractor is to submit, within his tender, details of anticipated crack repair methodologies (should cracks form in the slab post construction).
25. Joints that are subject to traffic from wheeled vehicles shall have their arrises protected using steel plates which have a positive connection into the slab.

CONCRETE SPECIFICATION(B2)

1. All mass and reinforced concrete elements are to be constructed in accordance with the National Structural Concrete Specification (NSCS) 4th edition.
2. All concrete work, including mixing, transportation, placement, and curing shall be fully in accordance with BS 8110 and BS 8500. Any deleterious material that may have entered into excavations, formwork etc. is to be completely removed before concrete is poured such that no deleterious material is contained within the body of the concrete element constructed.
3. Unless specified otherwise, concrete shall be a designated mix. The Contractor may adopt equivalent designed mixes (eg equivalent in strength, durability etc..) but only after agreement with the Engineer.
4. Formwork, and falsework, for concrete shall be designed, fabricated, erected, struck, cleaned, stored etc. by the Contractor, all of which is to generally comply with recognized industry good practice.
5. The Contractor is responsible for the design of supports to falsework, the stability of which must be Maintained at all times. Where falsework is to be supported by the permanent structure eg propped off floor slabs, the Contractor is to ensure that the loads from the falsework do not adversely affect the permanent structure, which at the time of loading may not have reached its final design strength. The Contractor will be required to agree all falsework support proposals with the Engineer when the Contractor intends to make use of the permanent structure to support the falsework.
6. Formwork tolerances, both in fabrication and erection, shall unless otherwise specified comply with the 'normal quality' tolerances defined in the Concrete Society Report 'Formwork: A Guide to Good Practice 2nd Edition'.
7. Reinforced concrete and plain concrete shall be placed and compacted (if required) such that a dense concrete, free from voids, is produced. Concrete within the foundation may be compacted by means of a mechanical vibrating poker.
8. Concrete cast in the stem of Stepoc retaining walls shall NOT be compacted with mechanical vibrating plant.
9. Unless specified otherwise, aggregate size shall be maximum 20mm.
10. Consistence class where indicated on the drawings is for information only. It is the responsibility of the Contractor to select a consistence class appropriate to the Contractor's methods of concrete placement and construction.
11. Construction joints in mass concrete foundations shall be located at least 1.5m from any foundation junction, pad base or step in underside of foundation. Joints are to be formed against a vertical grout tight shutter and shall incorporate 2no H16 bars x 1500 long placed at mid depth of foundation with 100mm cover to sides.
12. The location of construction joints in reinforced concrete construction shall be agreed by the Main Contractor with the Engineer prior to construction.
13. Construction joints in reinforced concrete construction shall be formed against a vertical grout tight shutter, leaving sufficient reinforcement projecting such that minimum lap length with reinforcement in the subsequent pour can be achieved. The exposed concrete face, which is to be covered up by the subsequent concrete pour, is to be scabbled/roughened etc. and cleaned of all loose debris, dirt etc. immediately prior to pouring the subsequent concrete pour.
14. The grades of concrete defined in the table below shall be adopted:

LOCATION	CONCRETE DESIGNATION	ADDITIONAL REQUIREMENTS
MASS CONCRETE FOUNDATIONS	C20/25	None
GROUND FLOOR SLAB	CONTRACTOR DESIGN, MIN C28/35	

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		Job N°.	2022-302
		Date	August 2023
		Designer	TM
Job Title	VIKING CENTRE, SPROWSTON	Sheet N°.	19
		Revision	B2
ELEMENT	STRUCTURAL ENGINEERING CALCULATIONS AND DETAILS		

(B2) CONCRETE PADSTONE FOR RHS TRANSFER BEAM SUPPORT POST	C28/35	MAXIMUM 10mm AGGREGATE

FOUNDATION SPECIFICATION

1. The Main Contractor is responsible and liable for ensuring the stability of the works and services at all stages of construction. Open excavations are dangerous and can be prone to collapse unless the sides of the excavation are adequately supported. The following actions significantly increase the risk of collapse of open excavations and are either to be avoided or carefully managed:

    - Storage and/or stockpiling of materials etc. close to or adjacent the sides of open excavations
    - Operation and traffic of mechanical plant close to the sides of open excavations
    - Failure to protect open excavations from the effects of adverse weather
    - Failure to control water ingress into the excavation from water contained in the ground e.g. high water table

2. Coordination of other construction activities, by the Main Contractor, whilst excavations are being formed and left open is crucial to the mitigation of the risk of collapse.
3. Bottoms of all foundations shall be protected from inclement weather. Foundation excavations and the surrounding site shall be kept free of water.
4. Unsupported excavations are to be filled in as soon as possible e.g., by pouring of concrete etc.
5. Unless otherwise noted, the Main Contractor is responsible for the design, detail and construction of excavation supports. The design of the excavation supports is to consider, amongst other things:

    - the ground conditions that exist at the site, particularly noting whether groundwater is present
    - the lateral pressures acting on the sides of the excavation arising from surcharge loading

6. No man access into unsupported excavations should be permitted for excavations deeper than 1.2m. This does NOT mean that man access into unsupported excavations less than 1.2m deep is safe and is ONLY to be permitted once a risk assessment has been undertaken and measures put in place to mitigate the risk of excavation collapse. IF IN DOUBT, DO NOT ALLOW MAN ACCESS INTO ANY OPEN EXCAVATION.
7. Before commencing any activity associated with formation of excavations, the Main Contractor is to satisfy himself that there are no buried services (live or dead) below the footprint of the proposed excavation and is to take all necessary measures to remove/protect/divert any services which either present a risk to the operatives forming the excavation or are at risk of being damaged because of the excavation activities.
8. The foundation design intent information shall be read in conjunction with all relevant Civil/Structural Engineering drawings, the project specification and drawings produced by the Architect, Services Engineer, Landscape Architect.
9. The Contractor shall verify all site and setting out dimensions before putting work in hand. Where dimensions are shown on John Plummer Partnership's drawings, any discrepancies shall be reported to John Plummer Partnership.
10. Unless noted otherwise foundations are to be centred on the wall construction above.
11. The foundation design is based upon the assumption that strata capable of providing a net allowable bearing capacity of at least 100 kN/m^2 will be found at the depths indicated. The discovery of conditions not in accordance with this assumption shall be reported to the Engineer

and/or Building Inspector in order that instruction can be given, before proceeding with the construction of the foundations.

12. Unless otherwise noted top of foundations are be cast to a tolerance of +/- 20mm from datum unless the foundation is supporting a steel element (e.g., column) in which case the tolerance is +5/-15mm from datum.

FOUNDATION SPECIFICATION cont'd

13. Foundations shall be founded at the depths indicated but notwithstanding this the foundations must penetrate a minimum of 150mm into the stratum providing the specified allowable bearing capacity.
14. Notwithstanding the foundation depths specified, foundations must be founded at least 300mm below the invert of any adjacent/perpendicular existing or proposed drainage. Refer to drainage drawings for information pertaining to below ground drainage.

    Where drainage or other services are required to pass through the sides of the foundation, then they are to be either sleeved or rocker pipes are to be employed, such that the drain/service will not be adversely affected by settlement of the foundation. On clay sites, sleeves to allow drains and services to pass through foundations shall be so constructed so as to allow for the following potential ground heave:

Soil Volume Change Potential	Potential Ground Heave (mm)
High (plasticity >= 40%)	150
Medium (20%=<plasticity<40%)	100
Low (10%<plasticity<20%)	50

15. On clay sites, where there is existing and/or proposed vegetation in proximity to the foundations, foundation depths are to be determined in accordance with NHBC Chapter 4.2, with reference to the volume change potential of the clay, the distance of the foundation from the vegetation, the type and age of the vegetation.

    On clay sites, where foundation depths are specified on John Plummer Partnership drawings, they have been determined with reference to the location of buildings and details of trees and shrubs etc. shown on the Engineer's drawings. Report to John Plummer Partnership if site conditions or details of trees and shrubs vary from the information shown.
16. Notwithstanding the foundation depths specified, for foundations founding in CLAY, foundation depths shall be increased as required to penetrate a minimum of 500mm below any root activity. To ensure compliance, a Banksman shall be employed by the Contractor to inspect excavated soil during the final 500mm of any excavation. The Banksman shall break open clumps of soil excavated to examine the soil for roots. If in doubt John Plummer Partnership should be consulted before proceeding further with the construction of the foundations.
17. On clay sites, all foundations shall be constructed with a vertical face without the presence of any overbreak of concrete overspill. The Engineer is to be informed if such criteria are not met to agree appropriate remedial action.
18. Provided the requirements of the foundation depth specifications are adhered to, to suit levels, the bottoms of foundation excavations may be stepped a maximum of 500mm high by a minimum 1000mm long unless otherwise noted on the drawings.
19. Before placement of foundation concrete and/or blinding, the bottoms of all foundation excavations shall be trimmed and levelled, such that the ground conditions capable of providing the necessary allowable bearing capacity are revealed. The Building Inspector must be called out to inspect and approve the bottom of the foundation before the blinding concrete is placed.
20. Bottoms of excavations to receive reinforced concrete shall, where specified, be blinded with not less than 50mm of designated concrete grade GEN1 to BS 8500.
21. Foundations taken down lower than the depths indicated shall, with the approval of the Engineer and NHBC/Building Control/other statutory bodies, shall be made up with concrete, to comply with BS 8500, of at least the same grade/strength as the foundation concrete.
22. Refer to Concrete Specification for information pertaining to foundation concrete.

FOUNDATION SPECIFICATION cont'd

23. If piling is specified refer to Piling Specification for information pertaining to pile design and construction.

REINFORCEMENT SPECIFICATION

1. The condition, storage and fixing of reinforcement shall be fully in accordance with BS 8110.
2. Reinforcement shall be fabricated fully in accordance with BS 8666.
3. The type and grade of steel reinforcement shall be designated as follows:

TYPE OF STEEL REINFORCEMENT	NOTATION
Grade B500A, Grade B500B or Grade B500C confirming to BS 4449:2005	H
Grade B500A conforming to BS 4449:2005	A
Grade B500B or Grade B500C conforming to BS 4449:2005	B
Grade B500C conforming to BS 4449:2005	C
A specified grade and type of ribbed stainless-steel conforming to BS 6744:2001	S
Reinforcement of a type not included in the above list having material properties that are defined in the design or contract specification	X
Note: In the Grade description B500A, etc.., 'B' indicates reinforcing steel	

4. Fabric reinforcement to BS 4483:2005.
5. Nominal cover to all reinforcement to be as follows unless noted otherwise:

    - Minimum 50mm cover to all edges except where cast against a soil face in which case minimum 75mm cover.

6. The type of spacers/chairs etc. used to support the reinforcement must be such that the reinforcement is securely held in place and not subject to movement during construction and whilst concrete is poured. Spacers/chairs etc. are to comply with BS 7973.
7. Minimum bar lap lengths to be as follows:

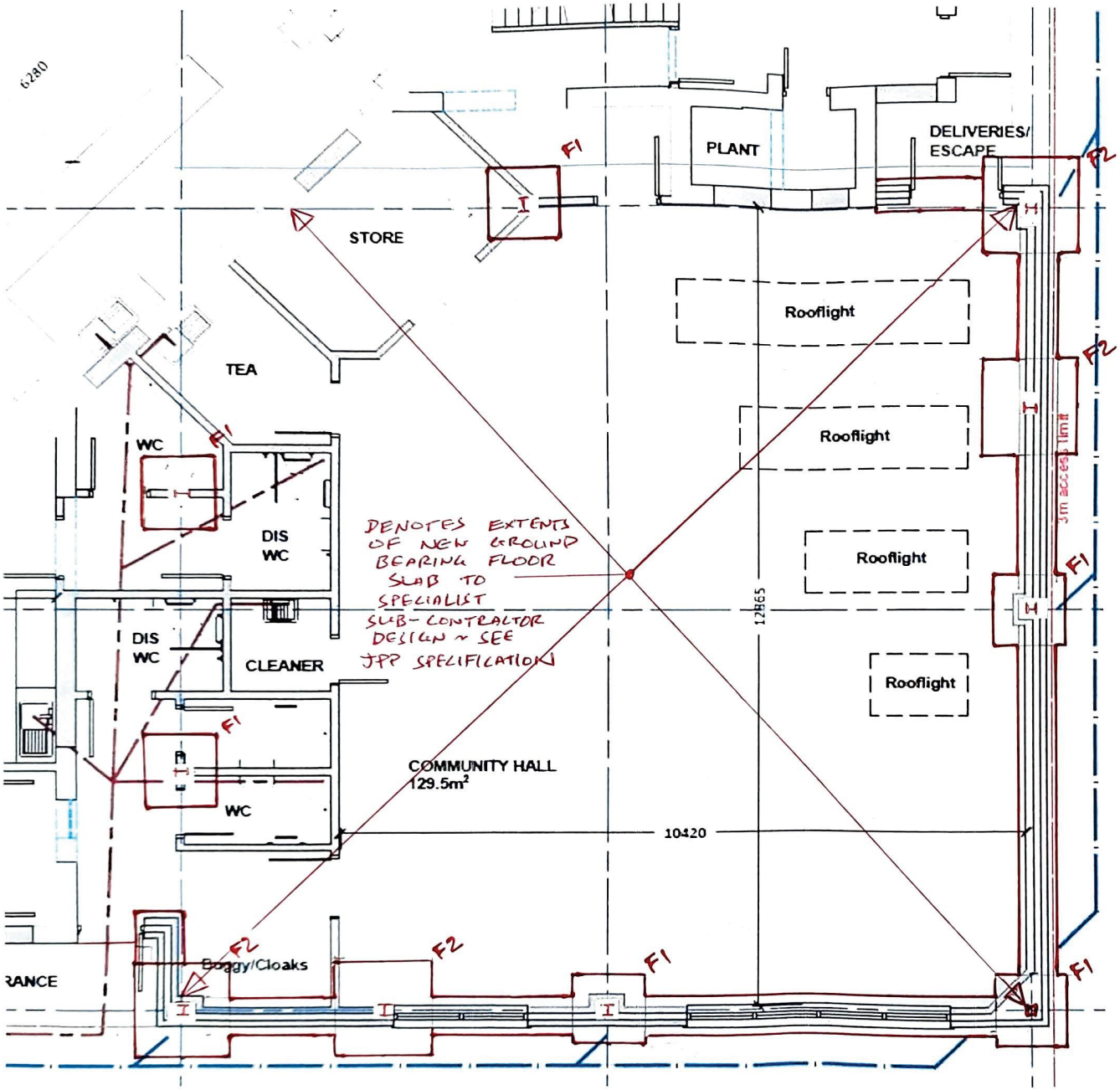
BAR DESIGNATION	MINIMUM LAP LENGTHS (mm)	
	CONCRETE CUBE CRUSHING STRENGTH 35 N/mm²	CONCRETE CUBE CRUSHING STRENGTH 40 N/mm²
H8	325	300
H10	400	375
H12	475	450
H16	625	600

8. Welded steel fabric reinforcement shall have minimum laps in accordance with note 7 (above). Sheets shall be laid to avoid excessive build-up of depths at laps. Spacers/chairs etc. used to support the reinforcement shall be such that they are suitable for use with DPM's i.e., they will not puncture or tear the DPM.

APPENDIX A

JOHN PLUMMER PARTNERSHIP DRAWINGS

REF.	ISSUE	TITLE
SK-01	B1	ANNOTATED ARCHITECTURAL GROUND FLOOR PLAN SHOWING SUBSTRUCTURE STRUCTURAL REQUIREMENTS
SK-05	B1	ANNOTATED ARCHITECTURAL GROUND FLOOR PLAN SHOWING SUPERSTRUCTURE STRUCTURAL REQUIREMENTS
SK-06	B1	ANNOTATED ARCHITECTURAL ROOF PLAN SHOWING STRUCTURAL REQUIREMENTS
SK-07	B1	STEELWORK CONNECTION DETAILS (1 OF 2)
SK-08	B1	STEELWORK CONNECTION DETAILS (2 OF 2)
SK-09	B2	STRUCTURAL REQUIREMENTS TO FACILITATE INTERNAL COLUMN REMOVAL IN ENTRANCE LOBBY (1 OF 2)
SK-10	B2	STRUCTURAL REQUIREMENTS TO FACILITATE INTERNAL COLUMN REMOVAL IN ENTRANCE LOBBY (2 OF 2)



ANNOTATED EXTRACT FROM ARCHITECTURAL GROUND FLOOR PLAN SHOWING SUBSTRUCTURE STRUCTURAL REQUIREMENTS (1:75)

PAD FOUNDATION SCHEDULE

REF	MIN SIZE REQ'D
F1	1m x 1m x 0.4m
F2	1.5m x 1.5m x 0.6m

Notes:

1) To be read in conjunction with all relevant architectural drawings

Issue	Date	Description
B1		Preliminary Issue

B1 ISSUE

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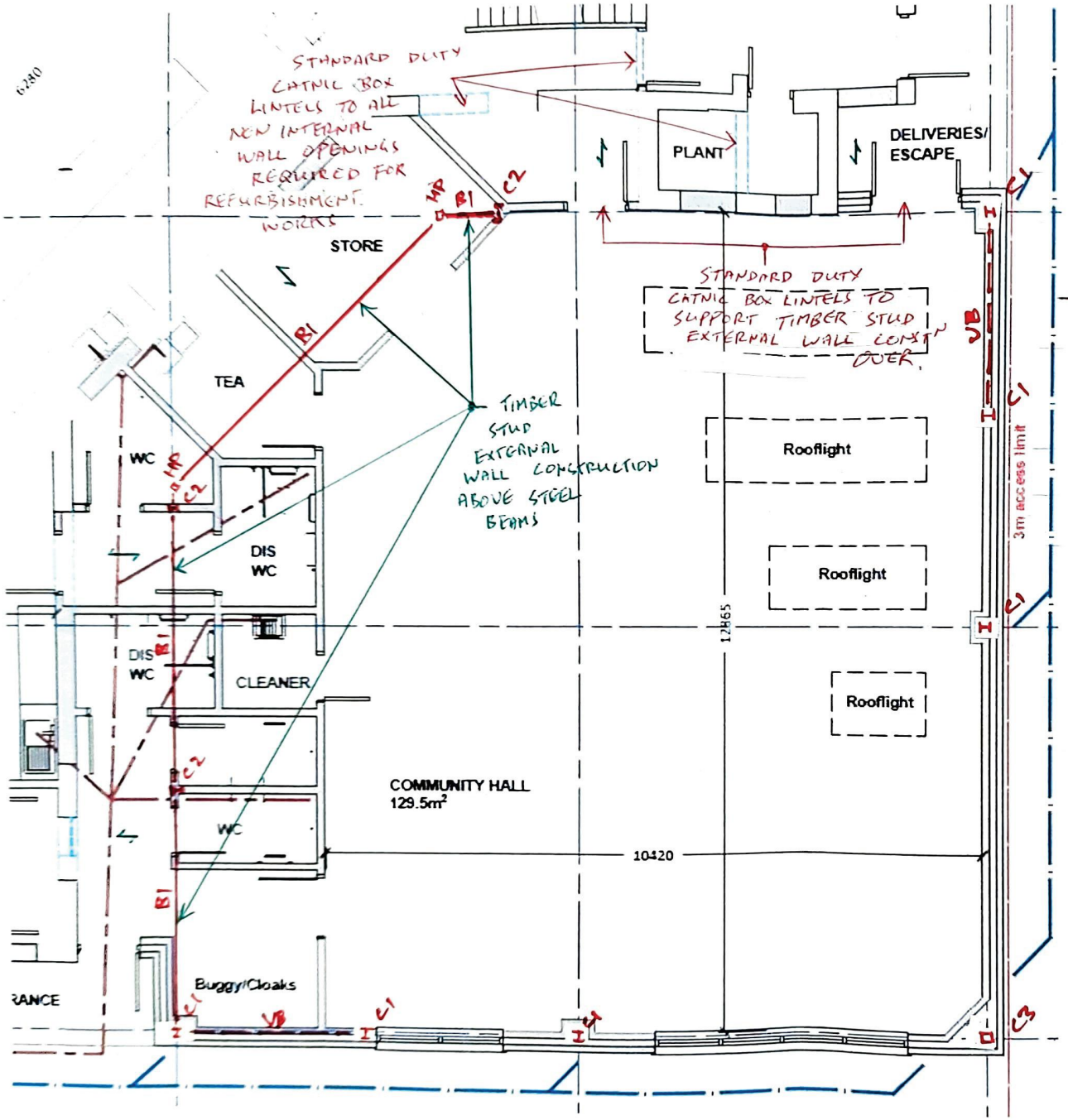
Contract
2022-302
VIKING CENTRE, SPROWSTON

Title
ANNOTATED ARCHITECTURAL GROUND FLOOR PLAN SHOWING SUBSTRUCTURE STRUCTURAL REQUIREMENTS

Scale(A3) AS NOTED

Drawing No. SK-01

Issue B1



ANNOTATED EXTRACT FROM ARCHITECTURAL GROUND FLOOR PLAN SHOWING STEEL COLUMNS AND BEAMS AT FLAT ROOF LEVEL (1:75)

STEEL MEMBER SCHEDULE

MEMBER REF.	SECTION SIZE
B1	203 x 133 UB 25
C1	152 UC 23
C2	203x133 UB 30
C3	150x150x8 SHS
HP	100x100x5 SHS (HANGER POST) FROM FLAT ROOF TO HIGH ROOF EAVES
VB	100x100x5 SHS (VERTICAL BRACING IN PLANE OF CAVITY WALL INNER LEAF MASONRY)

√ DENOTES SPAN OF 200x50 C24 TIMBER RAFTERS TO FLAT ROOF @ MAX 600 c/c.

Notes:

1) To be read in conjunction with all relevant architectural drawings

Issue	Date	Description
B1		Preliminary Issue

B1 ISSUE

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Client
BIDWELLS LLP

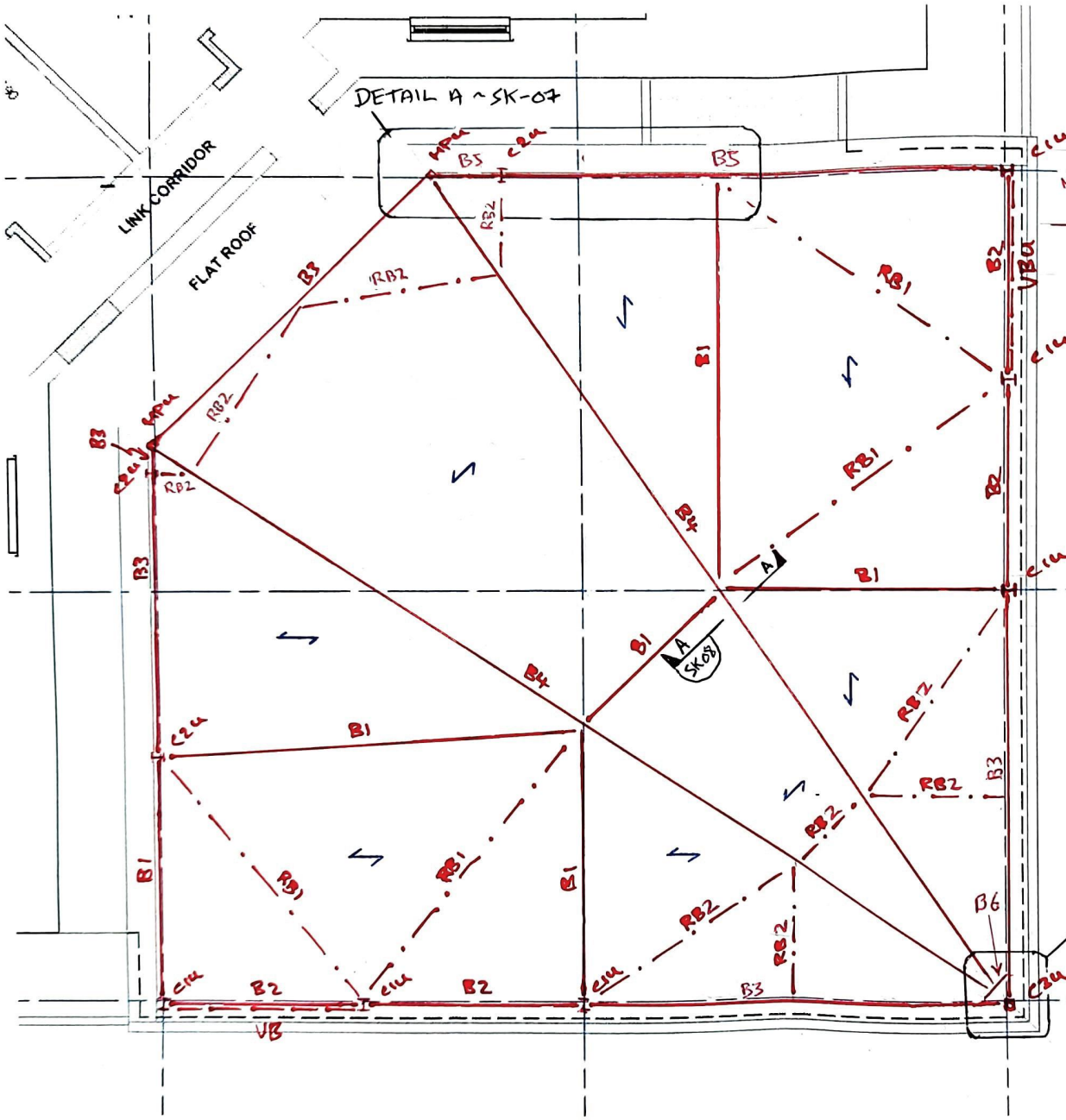
Contract
2022-302
VIKING CENTRE, SPROWSTON

Title
ANNOTATED ARCHITECTURAL GROUND FLOOR PLAN SHOWING SUPERSTRUCTURE STRUCTURAL REQUIREMENTS

Scale(A3) AS NOTED

Drawing No. SK-05

Issue B1



ANNOTATED EXTRACT FROM ARCHITECTURAL FIRST FLOOR PLAN SHOWING ROOF STEELWORK (1:75)

STEEL MEMBER SCHEDULE

MEMBER REF.	SECTION SIZE
B1	203 x 133 UB 25
B2	152 UC 30
B3	254 x 146 UB 31
B4 *	533 x 210 UB 82
C1U	152 UC 23
C2U	203 x 133 UB 30
C3U	150 x 150 x 8 SHS
HPU	100 x 100 x 5 SHS
VBU	100 x 100 x 5 SHS
B5	254 x 146 UB 37
RB1	114.3 x 5 CHS
RB2	88.9 x 4 CHS
B6	300 x 100 PFE

* SEE ALSO SPLICE JOINT DETAIL ON SK-08

↓ DENOTES SPAN OF COLD-ROLLED Z-PURLINS.

Notes:

1) To be read in conjunction with all relevant architectural drawings

Issue	Date	Description
B1		Preliminary Issue

B1 ISSUE

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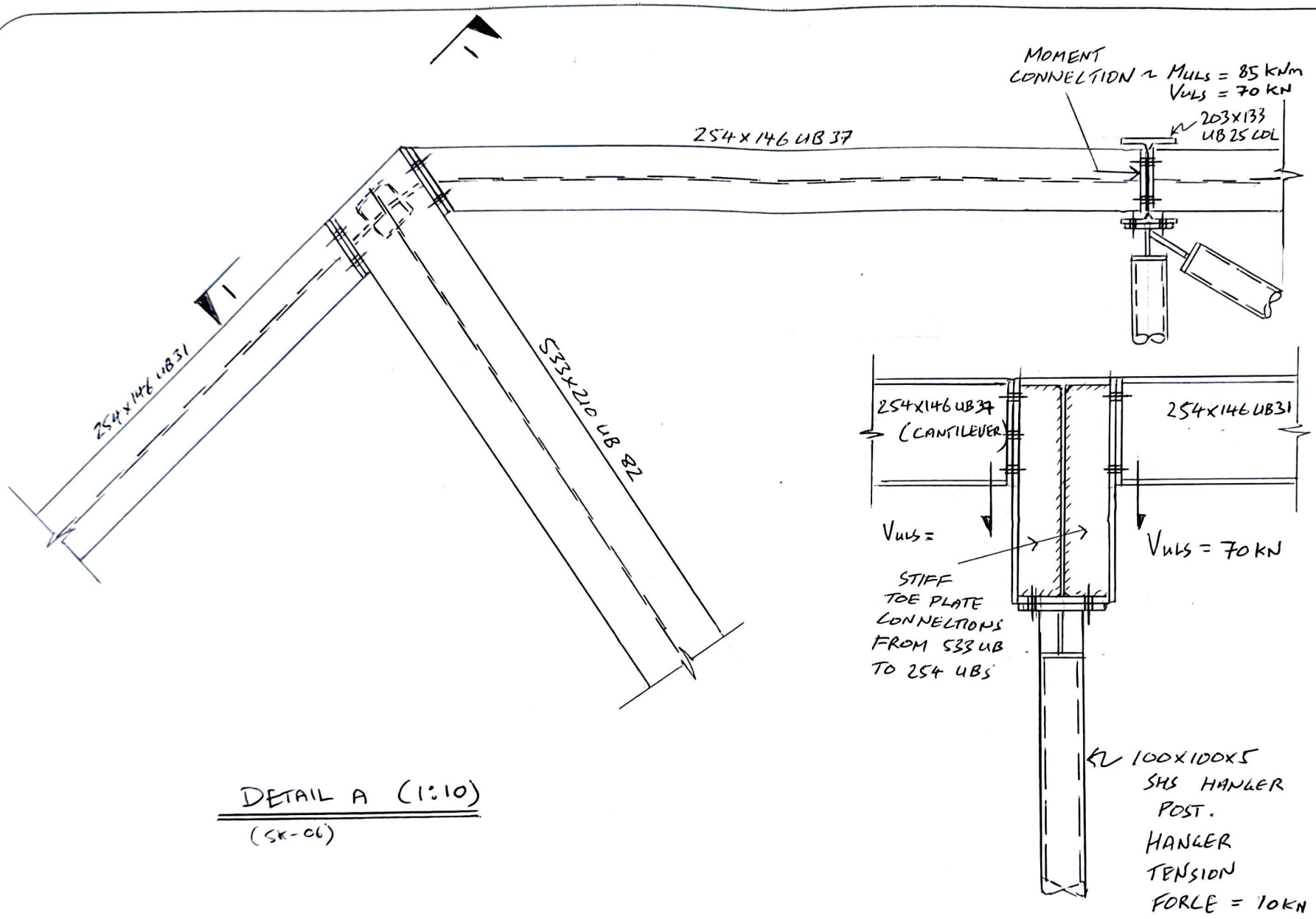
VIKING CENTRE, SPROWSTON

Title
ANNOTATED ARCHITECTURAL ROOF PLAN SHOWING SUPERSTRUCTURE STRUCTURAL REQUIREMENTS

Scale(A3) AS NOTED

Drawing No. SK-06

Issue B1



DETAIL A (1:10)

(SK-06)

SECTION 1-1 (1:10)

Notes:

1) To be read in conjunction with all relevant architectural drawings

Issue	Date	Description
B1		Preliminary Issue

B1 ISSUE

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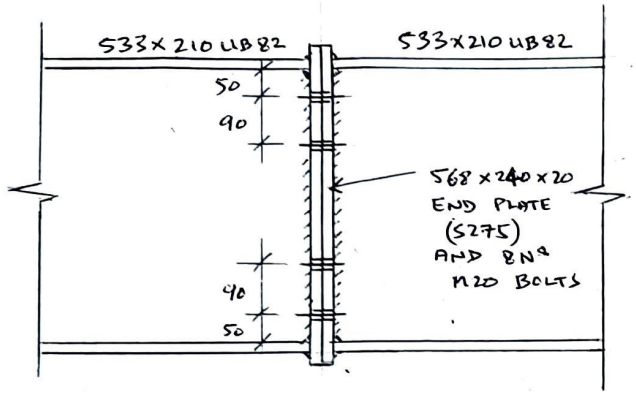
Client: BIDWELLS LLP

Contract: 2022-302
VIKING CENTRE, SPROWSTON

Title: STEELWORK CONNECTIONS DETAILS (1 OF 2)

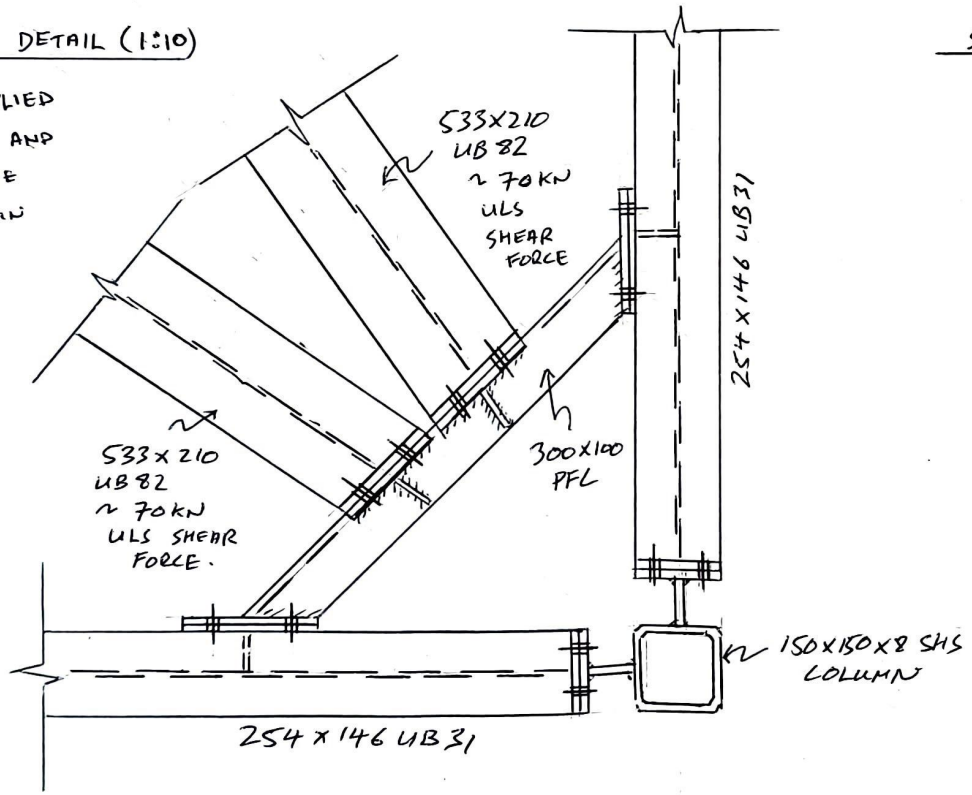
Scale(A3): AS NOTED

Drawing No.	Issue
SK-07	B1

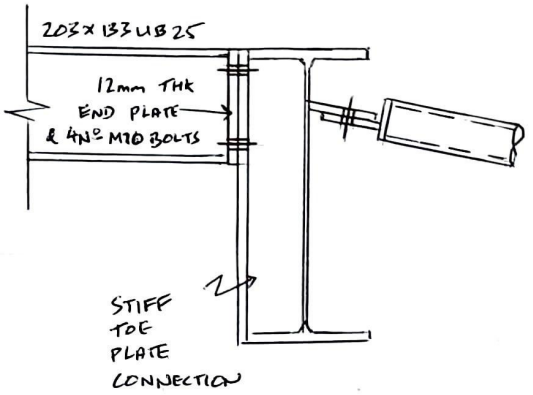


B4 SPLICE JOINT DETAIL (1:10)

NOTE: CAN BE APPLIED AT ANY POSITION AND AT MORE THAN ONE LOCATION ON MAIN RAFTERS. SEE CALCULATIONS FOR FULL DETAIL.



DETAIL B (1:10)
(SK-06)



SECTION A-A (1:10)
(SK-06)

Notes:

1) To be read in conjunction with all relevant architectural drawings

B1		Preliminary Issue
Issue	Date	Description

B1 ISSUE

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Contract: 2022-302
VIKING CENTRE, SPROWSTON

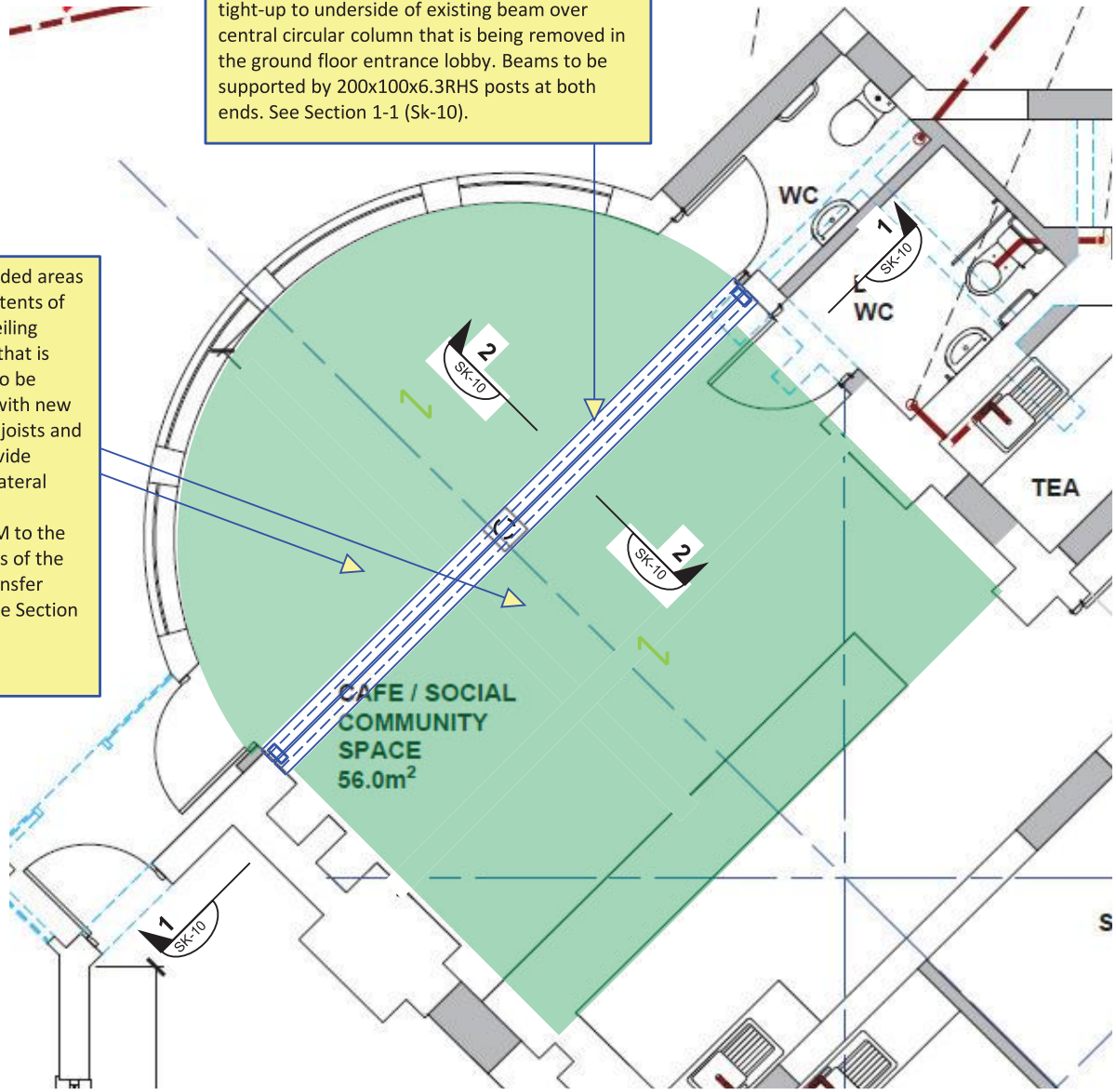
Title: STEELWORK CONNECTIONS DETAILS (2 OF 2)

Scale(A3): AS NOTED

Drawing No.: SK-08
Issue: B1

2No 305x165UB54(S355) transfer beams located tight-up to underside of existing beam over central circular column that is being removed in the ground floor entrance lobby. Beams to be supported by 200x100x6.3RHS posts at both ends. See Section 1-1 (Sk-10).

Green shaded areas denote extents of existing ceiling structure that is required to be replaced with new structural joists and ply to provide effective lateral restraint DIAPRAGM to the top flanges of the 305UB transfer beams. See Section 2-2(SK-10)



ANNOTATED EXTRACT FROM ARCHITECTURAL GROUND FLOOR PLAN SHOWING SRUCTURAL REQUIREMENTS TO FACILITATE REMOVAL OF INTERNAL COLUMN AT GROUND FLOOR LEVEL IN ENTRANCE LOBBY(1:50)

Notes:

1) This drawing is to be read in conjunction with all relevant architectural drawings showing setting out and levels etc, and JPP specifications.

Issue	Date	Description
P01	22/8/23	B2 Issue

B2 ISSUE

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Contract
JPP 2022-302 VIKING CENTRE, SPROWSTON

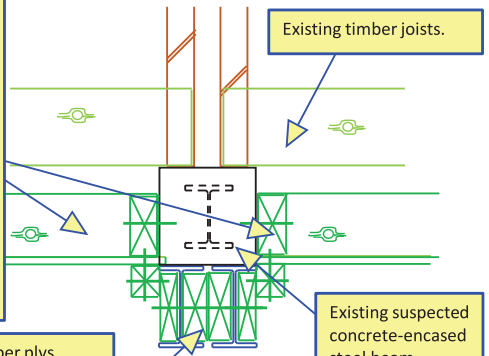
Title
STRUCTURAL REQUIREMENTS TO FACILITATE INTERNAL COLUMN REMOVAL IN ENTRANCE LOBBY (1 OF 2)

Scale(A3) AS NOTED

Drawing No.	Issue
SK-09	B2

CDM Note: 305UB transfer beams have moment splice joints positioned no more than 600mm from the centre-line of the column that is to be removed. See connection splice joint detail provided in the calculations. Beam segments either side of the column to be installed onto RHS posts, dry packed (1:3 cement to sand with just sufficient water to bind) hard up to the underside of the existing first floor beams, and back-propped through to the basement floor prior to removal of the column. In addition, the new(enhanced) ceiling diaphragms are to be constructed and propped down o prior to removal of the column. After column is removed the middle beams segments should be installed and props only released in a controlled manner once dry pack mortar bed as achieved sufficient strength. See also JPP construction sequence. Full temporary propping design and methodology to be submitted to JPP for approval prior to executing the works.

New structural ceiling diaphragms to be constructed to effectively restrain top flanges of 305UBs. As a minimum should comprise 47x200 C24 joists @ 400 c/c, and 12mm thk structural ply fixed to structural timber wall plates at all four edges. Wall plates should be fixed to masonry walls at max 300mm c/c using M12 bolts and Hilti HY-200 injection adhesive.

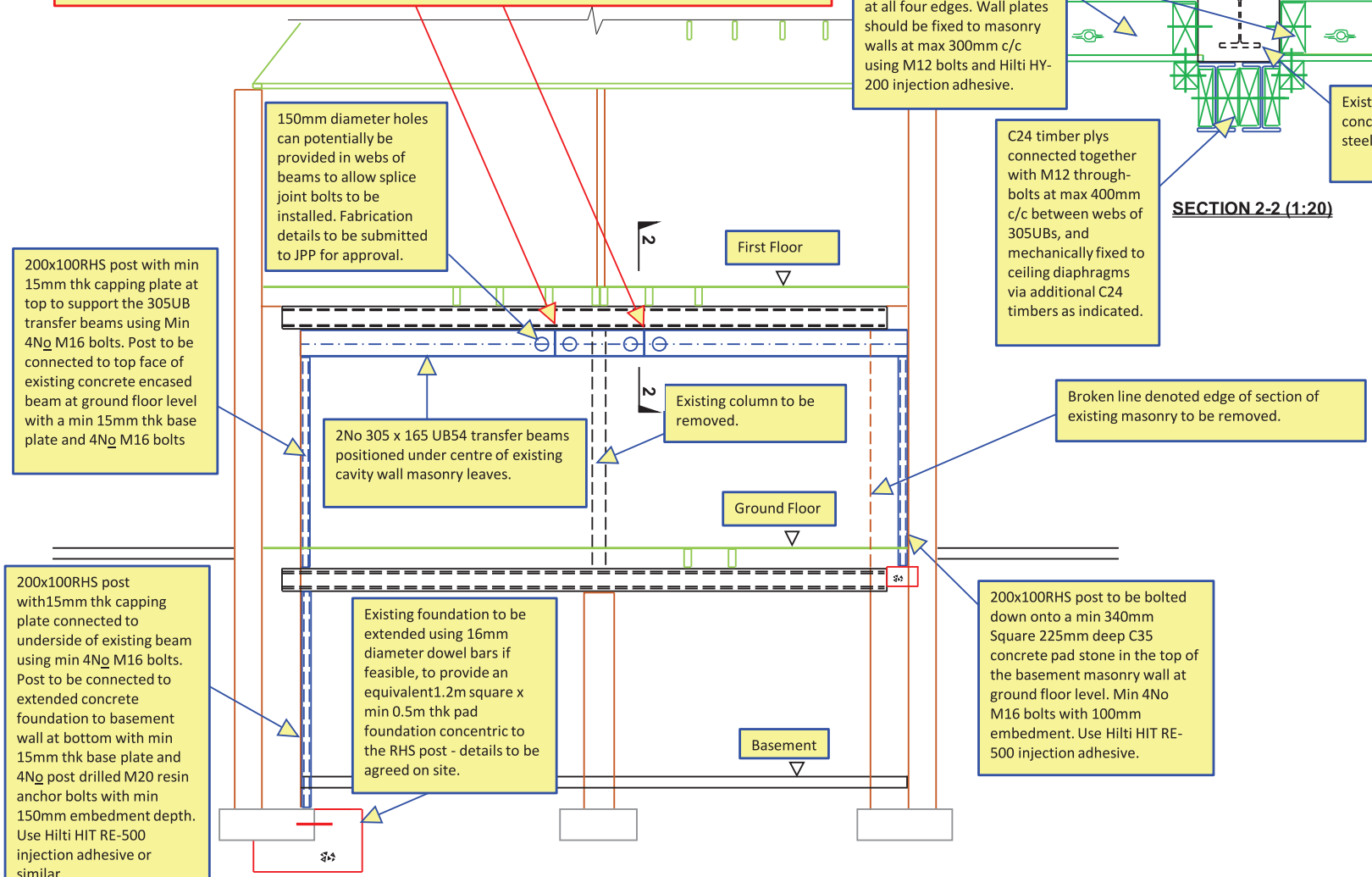


C24 timber plys connected together with M12 through-bolts at max 400mm c/c between webs of 305UBs, and mechanically fixed to ceiling diaphragms via additional C24 timbers as indicated.

SECTION 2-2 (1:20)

150mm diameter holes can potentially be provided in webs of beams to allow splice joint bolts to be installed. Fabrication details to be submitted to JPP for approval.

200x100RHS post with min 15mm thk capping plate at top to support the 305UB transfer beams using Min 4No M16 bolts. Post to be connected to top face of existing concrete encased beam at ground floor level with a min 15mm thk base plate and 4No M16 bolts



SECTION 1-1 (1:50)

Notes:

1) This drawing is to be read in conjunction with all relevant architectural drawings showing setting out and levels etc, and JPP specifications.

Issue	Date	Description
P01	22/8/23	B2 Issue

B2 ISSUE

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Bidwells LLP

Contract
JPP 2022-302 VIKING CENTRE, SPROWSTON

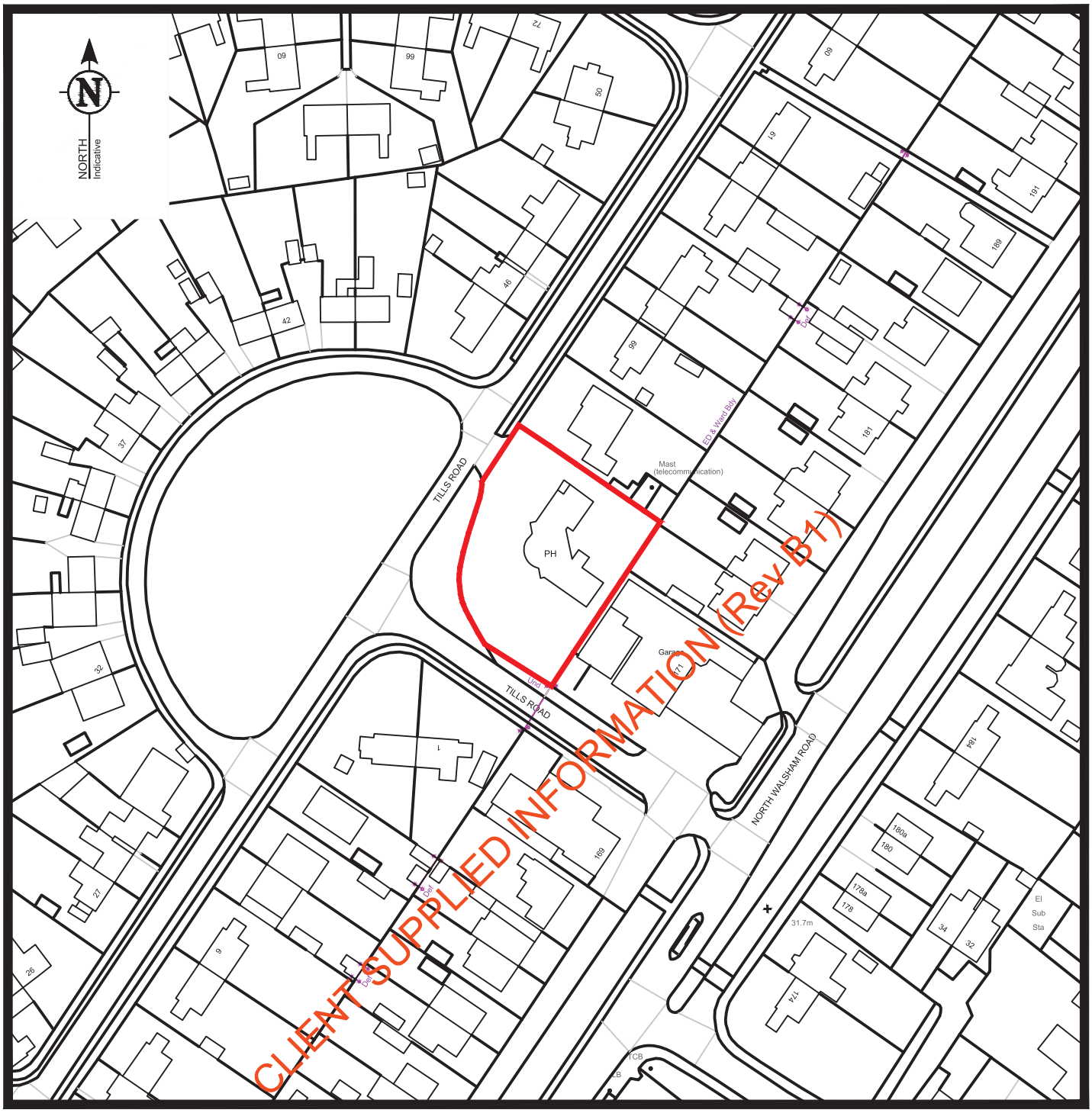
Title
STRUCTURAL REQUIREMENTS TO FACILITATE INTERNAL COLUMN REMOVAL IN ENTRANCE LOBBY (2 OF 2)

Scale(A3) AS NOTED

Drawing No.	Issue
SK-10	B2

APPENDIX B

CLIENT SUPPLIED INFORMATION (rev B1)



10m 0 10 20 30 40 50 60

1:1250

rev:	date:	description:	by:

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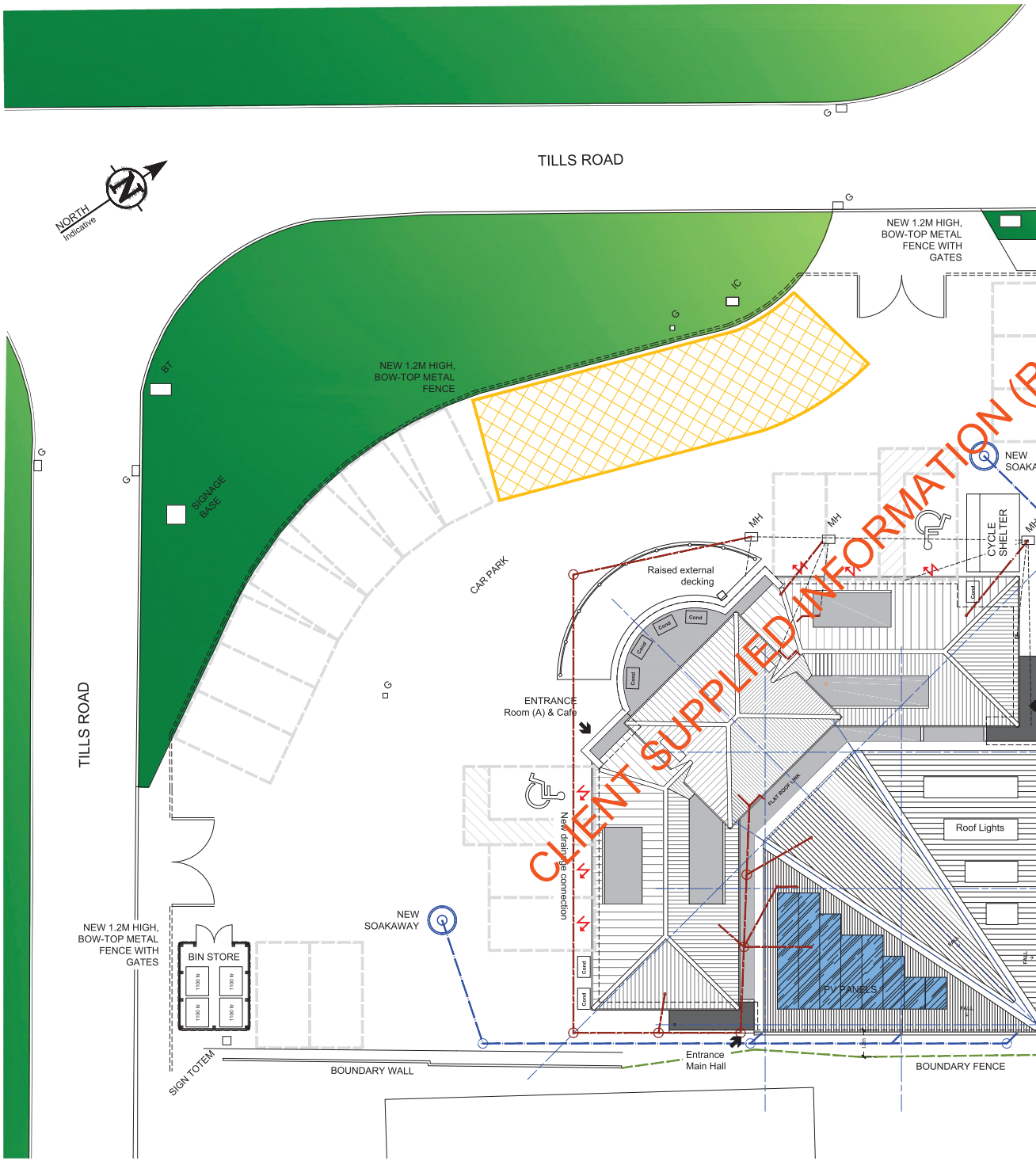
PLANNING

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Site Location Plan

scale @ A4: 1:1250	drawn by: SDL
date: Apr '22	approved: SDL
project no: 8341	dwg no: P01 revision:



Bow-top metal fence

Bi-Store Cycle Shelter

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev.	date:	description:	by:
C	22/11/22	Redesigned to suit access requirements for telecom mast	SDL
B	04/05/22	Issued for PLANNING	SDL
A	17/03/22	Various amendments following public consultation: Issued for COMMENT	SDL

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PLANNING

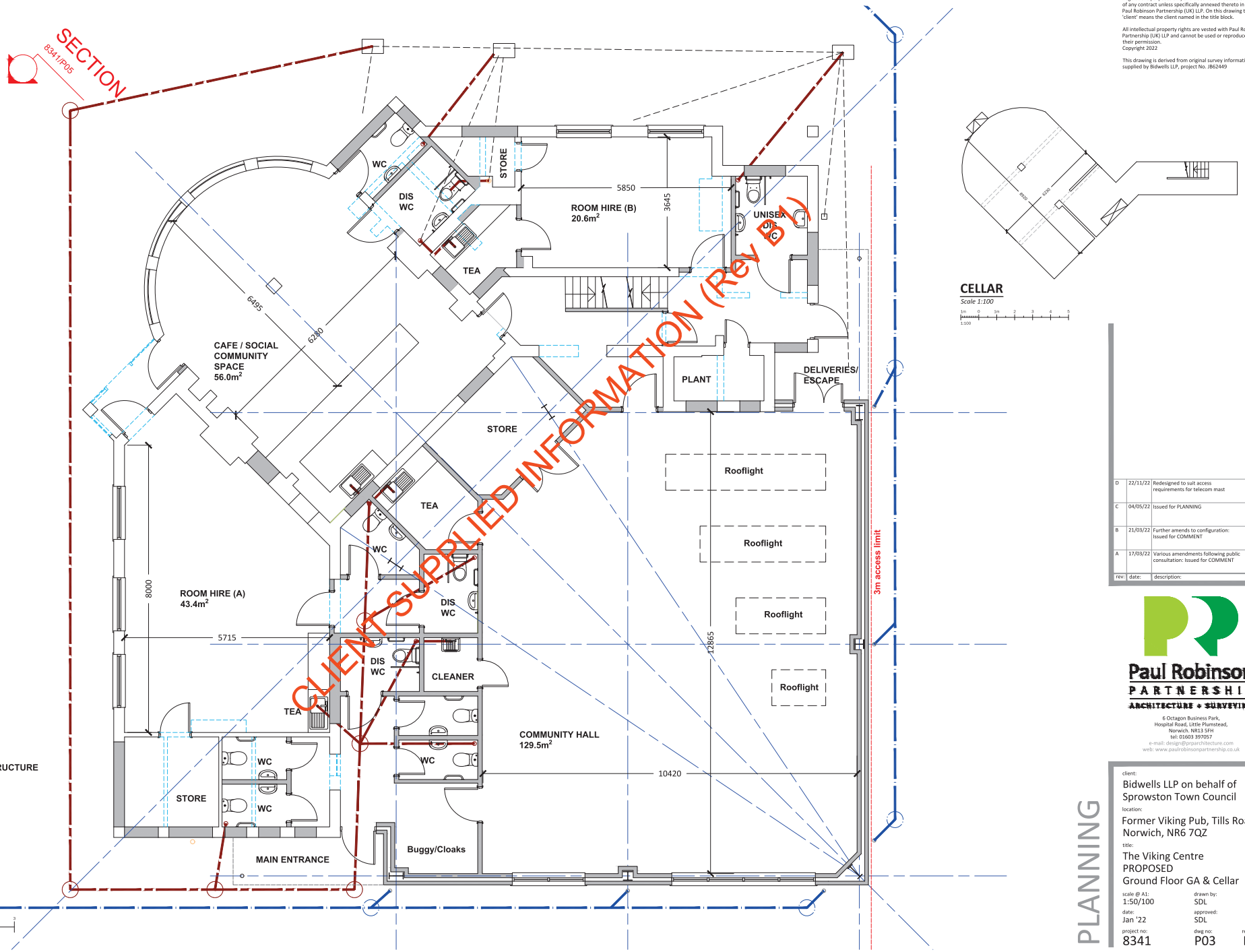
client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
The Viking Centre
PROPOSED
Site Layout Plan

scale @ A1: 1:100	drawn by: SDL
date: Jan '22	approved: SDL
project no: 8341	dwg no: P02
	revision: C

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449



GROUND FLOOR
Scale 1:50

LEGEND

- EXISTING STRUCTURE
- DEMOLISHED
- NEW-BUILD

CELLAR
Scale 1:100

rev:	date:	description:	by:
D	22/11/22	Redesigned to suit access requirements for telecom mast	SDL
C	04/05/22	Issued for PLANNING	SDL
B	21/03/22	Further amends to configuration: Issued for COMMENT	SDL
A	17/03/22	Various amendments following public consultation: Issued for COMMENT	SDL

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PLANNING

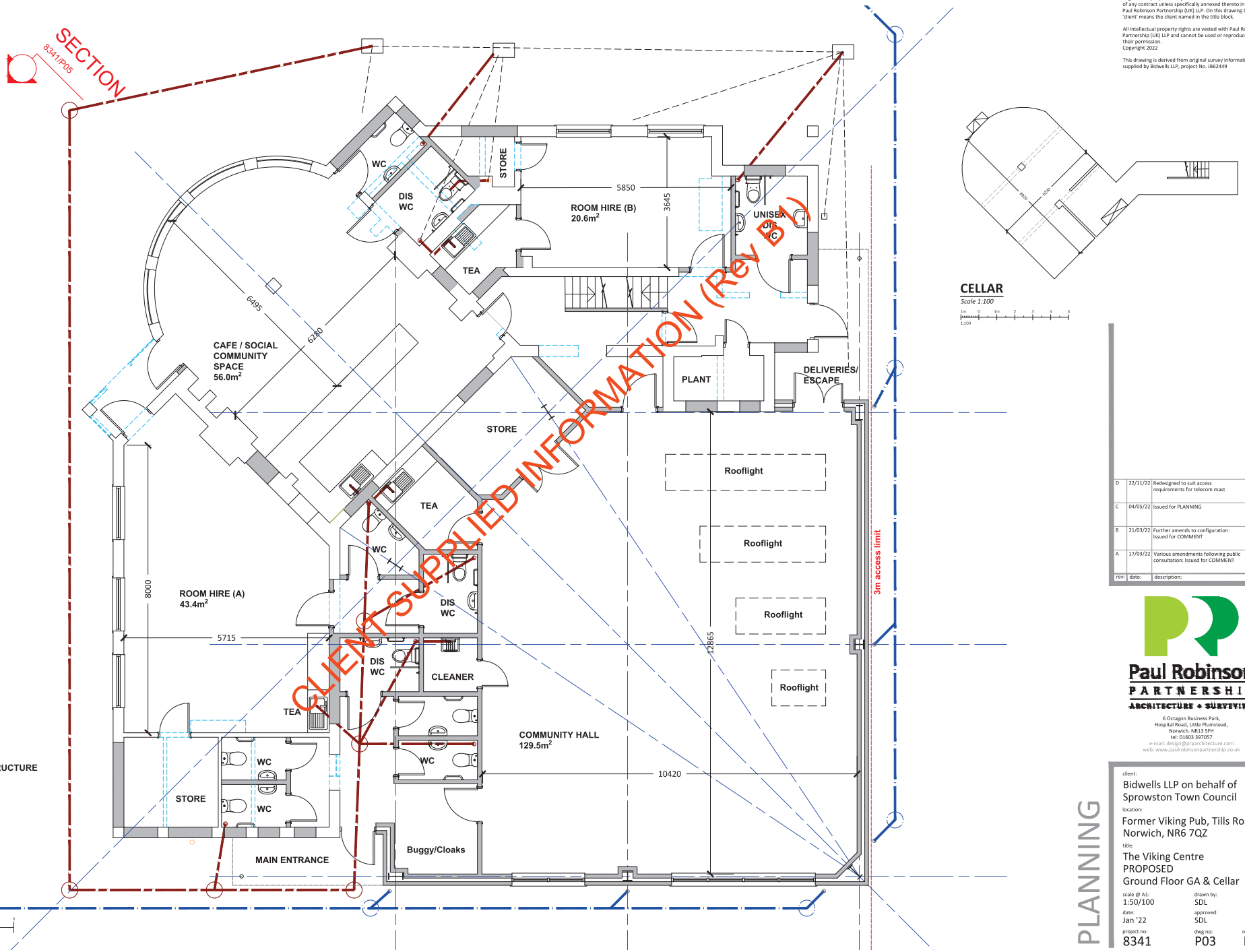
client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
The Viking Centre
PROPOSED
Ground Floor GA & Cellar

scale @ A1: 1:50/100	drawn by: SDL	
date: Jan '22	approved: SDL	
project no: 8341	dwg no: P03	revision: D

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449



GROUND FLOOR
Scale 1:50

1m 0 1 2 3
1:50

CELLAR
Scale 1:100

1m 0 1m 2 3 4 5
1:100

LEGEND

- EXISTING STRUCTURE
- DEMOLISHED
- NEW-BUILD

rev.	date:	description:	by:
D	22/11/22	Redesigned to suit access requirements for telecom mast	SDL
C	04/05/22	Issued for PLANNING	SDL
B	21/03/22	Further amends to configuration: Issued for COMMENT	SDL
A	17/03/22	Various amendments following public consultation: Issued for COMMENT	SDL

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PLANNING

client:
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location:
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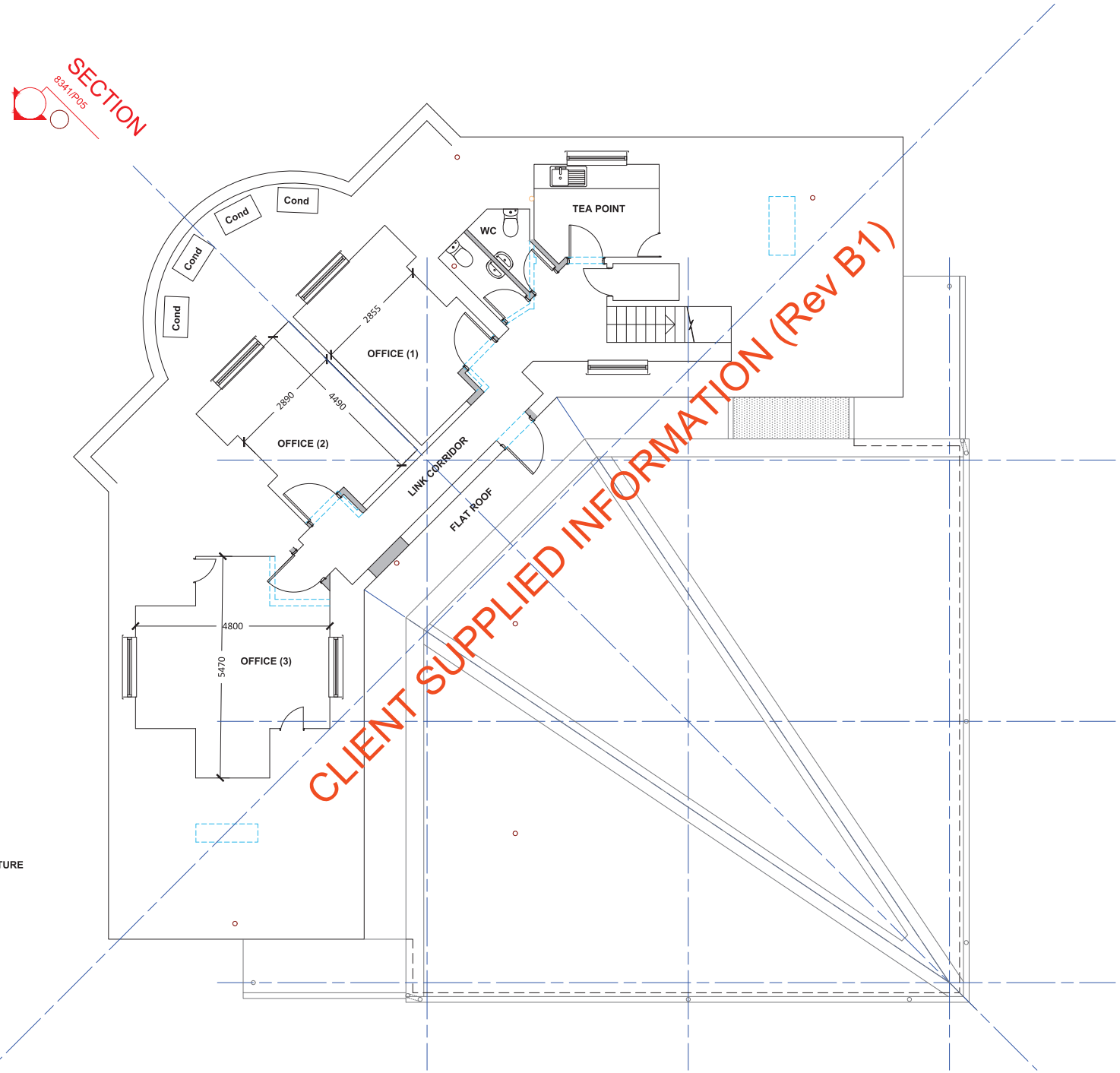
title:
The Viking Centre
PROPOSED
Ground Floor GA & Cellar

scale @ A1: 1:50/100	drawn by: SDL
date: Jan '22	approved: SDL
project no: 8341	dwg no: P03
	revision: D



LEGEND

- EXISTING STRUCTURE
- DEMOLISHED
- NEW-BUILD

FIRST FLOOR

Scale 1:50

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
C	22/11/22	Redesigned to suit access requirements for telecom mast	SDL
B	04/05/22	Issued for PLANNING	SDL
A	17/03/22	Various amendments following public consultation: Issued for COMMENT	SDL

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PLANNING

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location:
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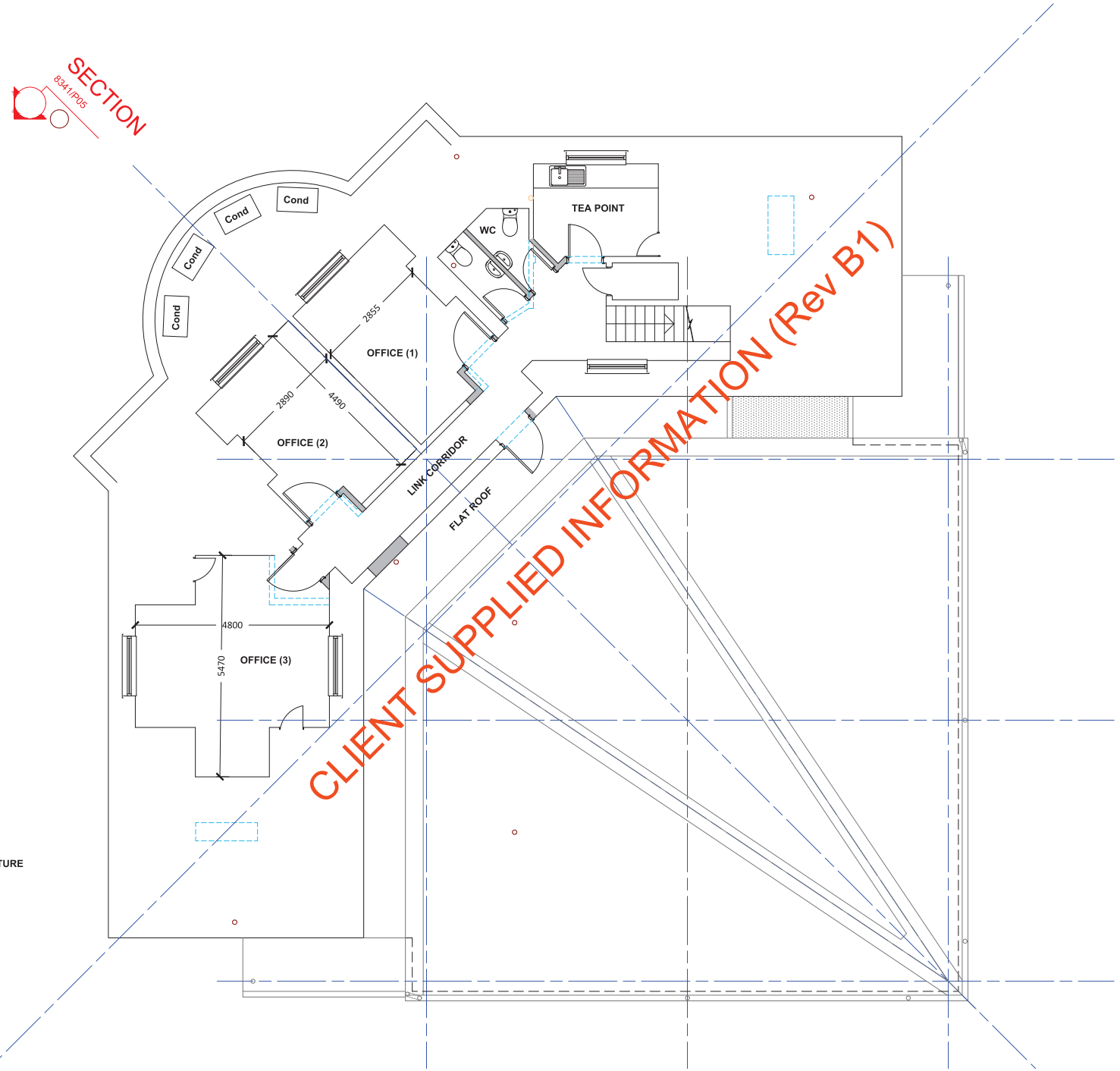
title:
The Viking Centre
PROPOSED
First Floor GA

scale @ A1:	drawn by:
1:50	SDL
date:	approved:
Jan '22	SDL

project no:	dwg no:	revision:
8341	P04	C



LEGEND

- EXISTING STRUCTURE
- DEMOLISHED
- NEW-BUILD

FIRST FLOOR

Scale 1:50

1m 0 1 2 3
1:50

rev.	date:	description:	by:
C	22/11/22	Redesigned to suit access requirements for telecom mast	SDL
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A	17/03/22	Various amendments following public consultation: Issued for COMMENT	SDL

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PLANNING

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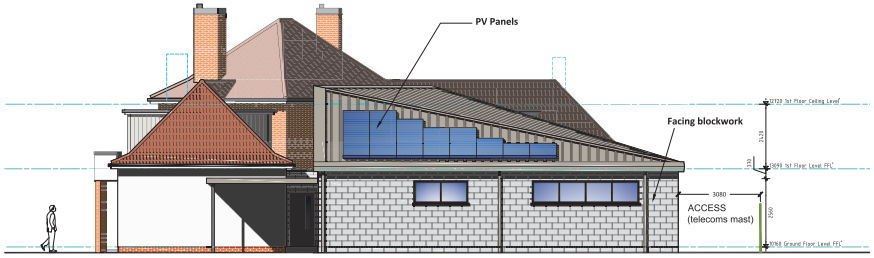
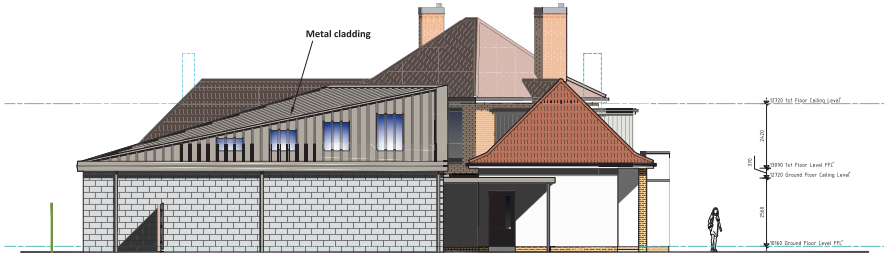
title:
The Viking Centre
PROPOSED
First Floor GA

scale @ A1:	drawn by:	
1:50	SDL	
date:	approved:	
Jan '22	SDL	
project no:	dwg no:	revision:
8341	P04	C

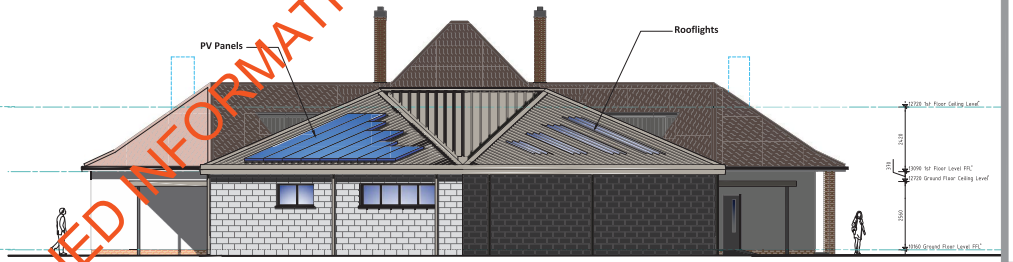


SOUTH-EAST ELEVATION

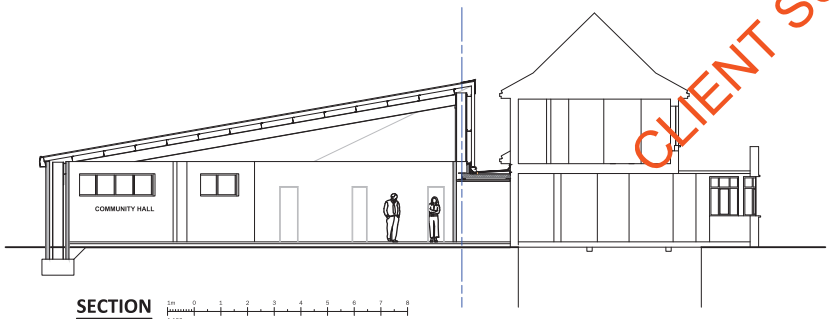
WEST ELEVATION



NORTH-EAST ELEVATION



EAST ELEVATION



SECTION

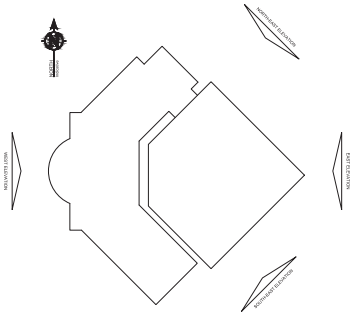
SCHEDULE OF MATERIALS

NEW-BUILD EXTENSION

Roof:	Trapezoidal, metal cladding - colour: Goosewing Grey
Walls:	Facing, concrete blockwork - colour Light Grey
Fenestration:	UPVC: Dark Grey

EXISTING BUILDING

Roof:	Tiles to match existing
Dormer cheeks:	Vertical timber cladding
Walls:	White render to ground floor storey
Fenestration:	UPVC: Dark Grey



rev:	date:	description:	by:
B	22/11/22	Redesigned to suit access requirements for telecom mast	SDL
A	04/05/22	Issued for PLANNING	SDL

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PLANNING

client:
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location:
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title:
The Viking Centre
PROPOSED
Elevations & Section

scale @ A1: 1:100	drawn by: SDL	
date: Jan '22	approved: SDL	
project no: 8341	dwg no: P05	revision: B

APPENDIX C

STRUCTURAL ENGINEERING DESIGN CALCULATIONS

- BASIC LOAD ASSESSMENT (rev B1 & B2)
- WIND LOADING (rev B1)
- STRUCTURAL ANALYSIS (CADS A3D Max) (rev B1)
- STEELWORK DESIGN (rev B1 & B2)
- STEEL CONNECTION DESIGN (rev B1 & B2)
- FOUNDATION DESIGN (rev B1 & B2)

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Job N°.	2022-302
Date	Mar-23
Designer	TM
Sheet N°.	
Revision	B1

Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	BASIC LOADING ALLOWANCES - MASONRY WALLS

BLOCKWORK/BRICKWORK CAVITY WALL

	DEAD (kN/m^2)	LIVE (kN/m^2)	
Outer leaf			
1/2 brick @ 2200 kg/m^3	2.21	0.00	
Inner leaf	0.00	0.00	
100mm thick blockwork @ 1000 kg/m^3	0.98	0.00	
Plaster & skim, allow	0.15	0.00	
TOTAL	3.34	0.00	(kN/m^2)

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Job N°.	2022-302
Date	Aug-23
Designer	TM
Sheet N°.	
Revision	B2

Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	BASIC LOADING ALLOWANCES - MASONRY WALLS

EXISTING (ASSUMED) TWIN SKIN BRICKWORK CAVITY WALL

	DEAD (kN/m^2)	LIVE (kN/m^2)	
Outer leaf			
1/2 brick @ 2200 kg/m^3	2.21	0.00	
Inner leaf	0.00	0.00	
1/2 brick @ 2200 kg/m^3	2.21	0.00	
Plaster & skim, allow	0.15	0.00	
TOTAL	4.57	0.00	(kN/m^2)

EXISTING (ASSUMED) SINGLEL SKIN BRICKWORK PARTITION WALL

	DEAD (kN/m^2)	LIVE (kN/m^2)	
1/2 brick @ 2200 kg/m^3	2.21	0.00	
Plaster & skim, allow	0.30	0.00	
TOTAL	2.51	0.00	(kN/m^2)

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Job N°.	2022-302
Date	Mar-23
Designer	TM
Sheet N°.	
Revision	B1

Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	BASIC LOADING ALLOWANCES - TIMBER STUD WALLS

TIMBER STUD EXTERNAL WALL

	DEAD (kN/m^2)	LIVE (kN/m^2)	
External finishes, allow	0.30	0.00	
9.5mm OSB sheathing @ 700 kg/m^3	0.07	0.00	
Plaster & skim internally	0.15	0.00	
allow 38x140mm timber studs @ 400 c/c	0.07	0.00	
TOTAL	0.59	0.00	(kN/m^2)
plates and rails, allow	0.16	0.00	(kN/m)

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Job N°.	2022-302
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Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	BASIC LOADING ALLOWANCES - PITCHED ROOFS

PITCHED ROOF (vaulted ceiling) - LOADING TO PRIMARY FRAME

pitch angle 16.8 degrees

	DEAD (kN/m^2)	LIVE (kN/m^2)	
Roof cladding & insulation, allow	0.15	0.00	
Services, allow for PV	0.25	0.00	
Purlins, allow	0.10	0.00	
Imposed (for cleaning access only)	0.00	0.57	
Plasterboard ceiling and skim, allow	0.15	0.00	
subtotal	0.65	0.57	
correct for roof pitch	0.68	0.60	
TOTAL	0.68	0.60	(kN/m^2)

Note: loads applied on slope on CADS A3D MAX model

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Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	BASIC LOADING ALLOWANCES - PICHED ROOFS

EXISTING PITCHED TILED ROOF (ceiling separate)

pitch angle 45 degrees

	DEAD (kN/m^2)	LIVE (kN/m^2)	
Rafters (allow 47x120 @ 400 c/c @ 420 kg/m^3)	0.06	0.00	
Tiles, allow	0.70	0.00	
Tiling battens & felt	0.05	0.00	
Imposed (for maintenance access only)	0.00	0.21	
Subtotal	0.81		
correct for roof pitch	1.15	0.30	
TOTAL	1.15	0.30	(kN/m^2)

CEILING (to pitched roof)

	DEAD (kN/m^2)	LIVE (kN/m^2)	
Joists (allow 38x89 @ 400 c/c @ 420 kg/m^3)	0.04	0.00	
Plasterboard and skim ceiling, allow	0.15	0.00	
Insulation and services	0.05	0.00	
Imposed (no storage)	0.00	0.25	
TOTAL	0.24	0.25	(kN/m^2)

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Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	BASIC LOADING ALLOWANCES - FLAT ROOFS

FLAT ROOF (FELTED)

	DEAD (kN/m^2)	LIVE (kN/m^2)	
Roof finishes, allow	0.05	0.00	
Joists (allow 47x195 @ 400 c/c @ 420 kg/m^3)	0.09	0.00	
Plasterboard and skim ceiling	0.15	0.00	
9mm OSB @ 650 kg/m^3	0.06	0.00	
2 layers of 18mm ply @ 600 kg/m^3	0.21	0.00	
Firings and insulation, allow	0.10	0.00	
Services	0.05	0.00	
Imposed (maintenance access)	0.00	1.50	
TOTAL	0.71	1.50	(kN/m^2)

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Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	BASIC LOADING ALLOWANCES - TIMBER FLOORS

EXISTING TIMBER 1st FLOOR (assumed)

	DEAD (kN/m^2)	LIVE (kN/m^2)	
Finishes (allowance)	0.10	0.00	
Joists (allow 47x220 @ 400 c/c @420kg/m^3)	0.11	0.00	
Decking (allow 22mm chipboard @ 750kg/m^3)	0.16	0.00	
Services, allow	0.05	0.00	
Plasterboard and skim ceiling	0.15	0.00	
Partitions	0.00	0.50	
Imposed (general use office space)	0.00	2.50	
TOTAL	0.57	3.00	(kN/m^2)

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Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	WIND LOADING

WIND LOAD ANALYSIS TO BS6399-2

Basic wind speed, V_b = 24.6 ms^{-1}

Site altitude, Δ_s = 27 m AOD

↳ S_a = 1.027

Taking Sd, Ss & Sp as unity

↳ V_s = 25.26 ms^{-1} (site wind speed)

Effective wind speed, V_e = V_s x S_b

Effective structure height, He = 5.6 m

Closest distance to sea = 23.6 km

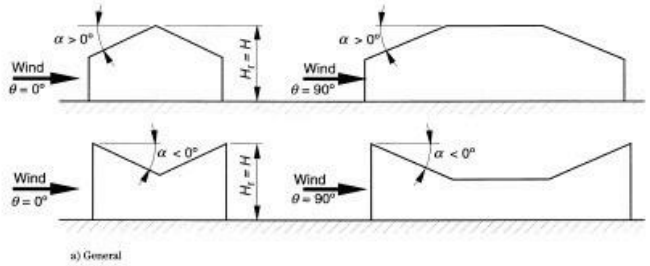
↳ S_b = 1.46 (site in town)

↳ V_e = 36.89 ms^{-1}

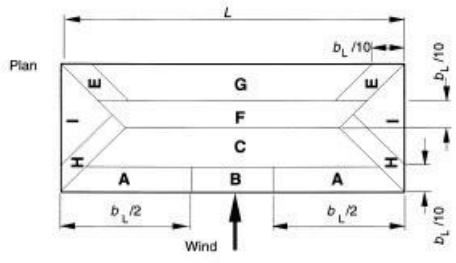
Dynamic wind pressure, q_s = $0.613V_e^2$

= 0.83 kN/m^2

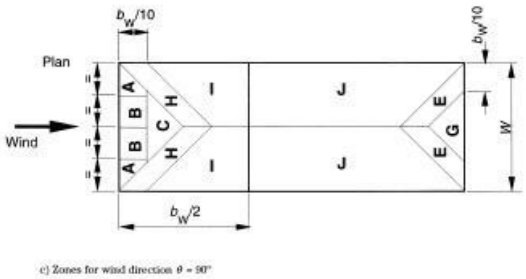
Assessment of external wind pressure coefficients, Cpe:



a) General



b) Zones for wind direction θ = 0°



c) Zones for wind direction θ = 90°

Figure 21 — Key for hipped roofs

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Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	WIND LOADING

WIND LOAD ANALYSIS TO BS6399-2

Table 11 — External pressure coefficients C_{pe} for hipped roofs of buildings

Pitch angle α	Zone for $\theta = 0°$ and $\theta = 90°$								
	A	B	C	E	F	G	H	I	J
−45°	−1.4	−1.0	−1.0	−0.7	−0.4	−0.7	−1.1	−1.0	−0.9
−30°	−2.5	−1.2	−1.0	−1.3	−0.8	−0.7	−1.0	−1.0	−0.8
−15°	−2.6	−1.0	−0.9	−1.4	−1.3	−0.6	−0.9	−0.9	−0.8
−5°	−2.3	−1.1	−0.8	−0.8	−0.6	−0.6	−1.1	−0.8	−0.8
+5°	−1.8	−1.2	−0.6	−0.8	−0.6	−0.6	−1.1	−0.6	−0.6
	+0.0	+0.0	+0.0	−0.8	−0.6	−0.6	+0.0	+0.0	+0.0
+15°	−1.3	−0.8	−0.5	−1.4	−1.3	−0.6	−0.9	−0.6	−0.4
	+0.2	+0.2	+0.2	−1.4	−1.3	−0.6	+0.0	+0.0	+0.0
+30°	−0.5	−0.5	−0.2	−1.3	−0.8	−0.6	−1.0	−0.6	−0.5
	+0.8	+0.5	+0.4	−1.3	−0.8	−0.6	+0.0	+0.0	+0.0
+45°	−0.0	−0.0	+0.0	−0.7	−0.4	−0.4	−1.1	−1.15	−0.4
	+0.8	+0.6	+0.7	−0.7	−0.4	−0.4	+0.0	+0.0	+0.0
+60°	+0.8	+0.8	+0.8	−0.6	−0.3	−0.7	−1.2	−0.7	−0.6
+75°	+0.8	+0.8	+0.8	−0.6	−0.3	−1.2	−1.2	−0.5	−0.6

NOTE 1 At $\theta = 0°$ the pressure changes rapidly between positive and negative values in the range of pitch angles $+5° < \alpha < +45°$. Two sets of values are given at these pitch angles and they should be treated as separate load cases.

NOTE 2 Interpolation for intermediate pitch angles may be used between values with the same sign. Between +5° and −5° interpolation is not permitted and the data for flat roofs in 2.6.1 should be used instead.

roof pitch angle, α = $\tan^{-1}$ (2.68/13.4)

= 11.3 degrees

2 x H = 11.2 m

L = 13.4 m

Hence, b_L = 11.2 m

, and b_L / 10 = 1.12 m

, and b_L / 2 = 5.6 m

Cpe for Zone A = -1.5 or +0.126

Cpe for Zone B = -1.5 or +0.126

Cpe for Zone C = -0.54 or +0.126

Cpe for Zone E = -1.2

Cpe for Zone F = -1.04

Cpe for Zone G = -0.6

These should be considered in conjunction with a Cpi of +0.2 to give the most onerous net pressure in respect to global stability:

$C_{pe.net}$ for Windward face of roof = 0.126 - 0.2 = -0.074

↳ q.net (wind from NE or SE) = -0.06 kN/m^2 (net suction)

$C_{pe.net}$ for top and leeward face of roof = ((0.125 x -1.2)+(0.875 x -0.6)) - 0.2 = -0.68

↳ q.net (wind from NE or SE) = -0.57 kN/m^2 (net suction)

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Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	WIND LOADING

WIND LOAD ANALYSIS TO BS6399-2

External pressure coefficients for walls:

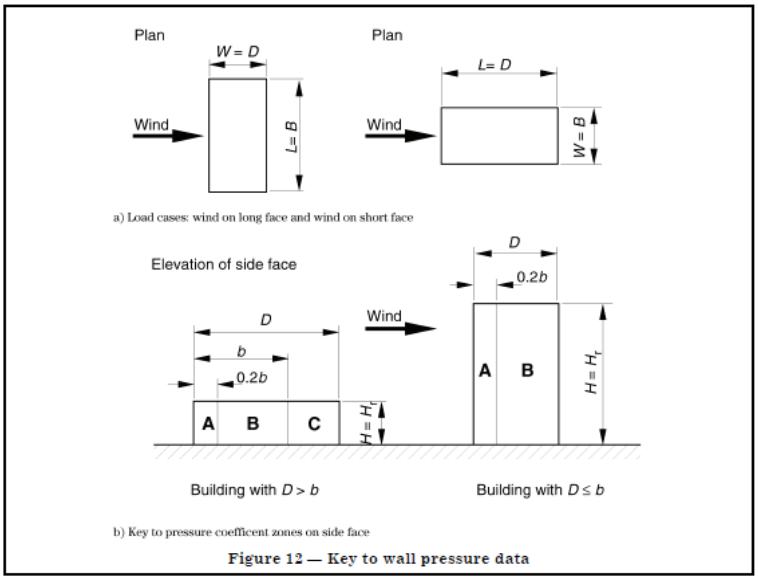

Figure 12 — Key to wall pressure data

Table 5 — External pressure coefficients C_{pe} for vertical walls

Vertical wall face	Span ratio of building		Vertical wall face		Exposure case	
	$D/H \leq 1$	$D/H \geq 4$			Isolated	Funnelling
Windward (front)	+0.85	+0.6	Side	Zone A	–1.3	–1.6
Leeward (rear)	–0.5	–0.5		Zone B	–0.8	–0.9
				Zone C	–0.5	–0.9

NOTE Interpolation may be used in the range $1 < D/H < 4$. See 2.4.1.4 for interpolation between isolated and funnelling.

b = 2H = 11.2 m

Hence, 0.2b = 2.24 m

D/H = 13.4 / 5.6

= 2.39

↳ Windward Cpe = +0.73

Leeward Cpe = -0.5

Zone A Cpe = -1.3 (exposed sides), -1.6 (side facing wall of existing building)

Zone B Cpe = -0.8 (exposed sides), -0.9 (side facing wall of existing building)

Zone C Cpe = -0.5 (exposed sides), -0.9 (side facing wall of existing building)

As there is effectively a wind tunnel around two sides of the building, net pressures acting on the walls assessed as follows (assuming a +0.2 Cpi):

$q_{\text{net. NE wall}}$ (wind from NE)= 0.83 x (0.73 -0.2) = 0.44 KN/m^2

$q_{\text{net. SE wall}}$ (wind from NE)= 0.83 x (-0.84 - 0.2) = -0.87 kN/m^2 Cpe ave -0.84

$q_{\text{net. NW wall}}$ (wind from NE)= 0.83 x (-1.01 - 0.2) = -1 kN/m^2 Cpe ave -1.01

$q_{\text{net. SW wall}}$ (wind from NE)= 0.83 x (-0.9 -0.2) = -0.92 kN/m^2

$q_{\text{net. W facing chamfered wall}}$ (wind from NE)= -(1 + 0.92) / 2 = -0.96 kN/m^2

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Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	WIND LOADING

WIND LOAD ANALYSIS TO BS6399-2

$q_{\text{net. SE wall}}$ (wind from SE)=	0.83 x (0.73 -0.2)	= 0.44 KN/m^2
$q_{\text{net. NE wall}}$ (wind from SE)=	0.83 x (-0.84 - 0.2)	= -0.87 kN/m^2
$q_{\text{net. SW wall}}$ (wind from SE)=	0.83 x (-1.01 - 0.2)	= -1 kN/m^2
$q_{\text{net. NW wall}}$ (wind from SE)=	0.83 x (-0.9 -0.2)	= -0.92 kN/m^2
$q_{\text{net. W facing chamfered wall}}$ (wind from SE)=	-(1 + 0.92) / 2	= -0.96 kN/m^2

Cpe ave -0.84
Cpe ave -1.01

Note: these are identical but handed to NE wind direction due to symmetrical geometry and not considering wind direction coefficient sd

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Date	Mar-23
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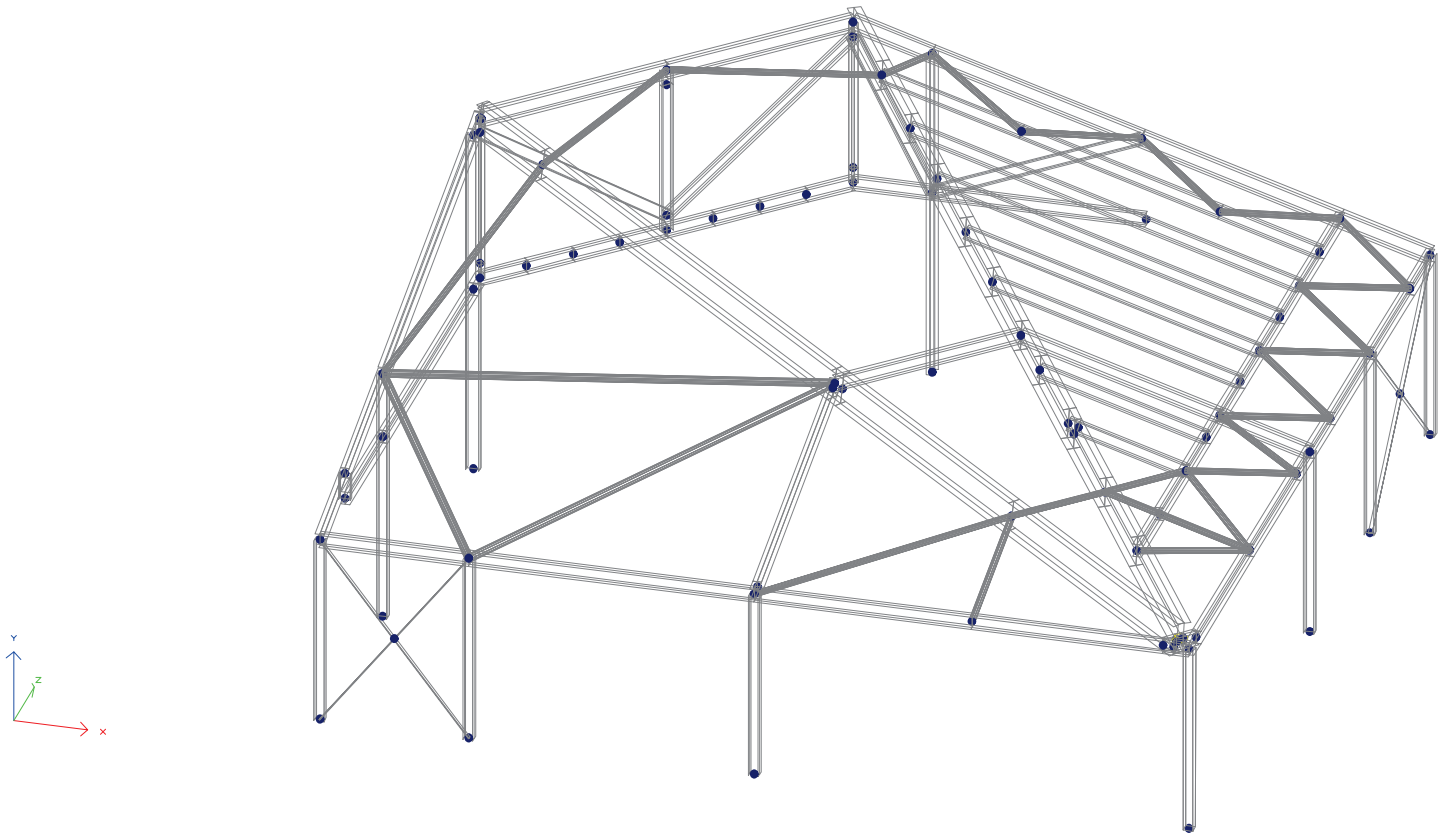
Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	STRUCTURAL ANALYSIS AND STEELWORK DESIGN

STRUCTURAL ANALYSIS AND STEELWORK DESIGN TO BS5950

The steel frame has been analysed and designed using CADS A3D MAX computer software. The modelling input parameters, structural analysis numerical and graphical results, and steel member design results are provided on the following sheets.

Note: Although wind loading has been assessed, by inspection this will not be critical to the design of the steel frame due to it being propped by the existing building via the infill flat roof construction. Hence wind load cases have been omitted from the structural design calculations.

Rendered View (from east corner)



Rendered view (from east corner)

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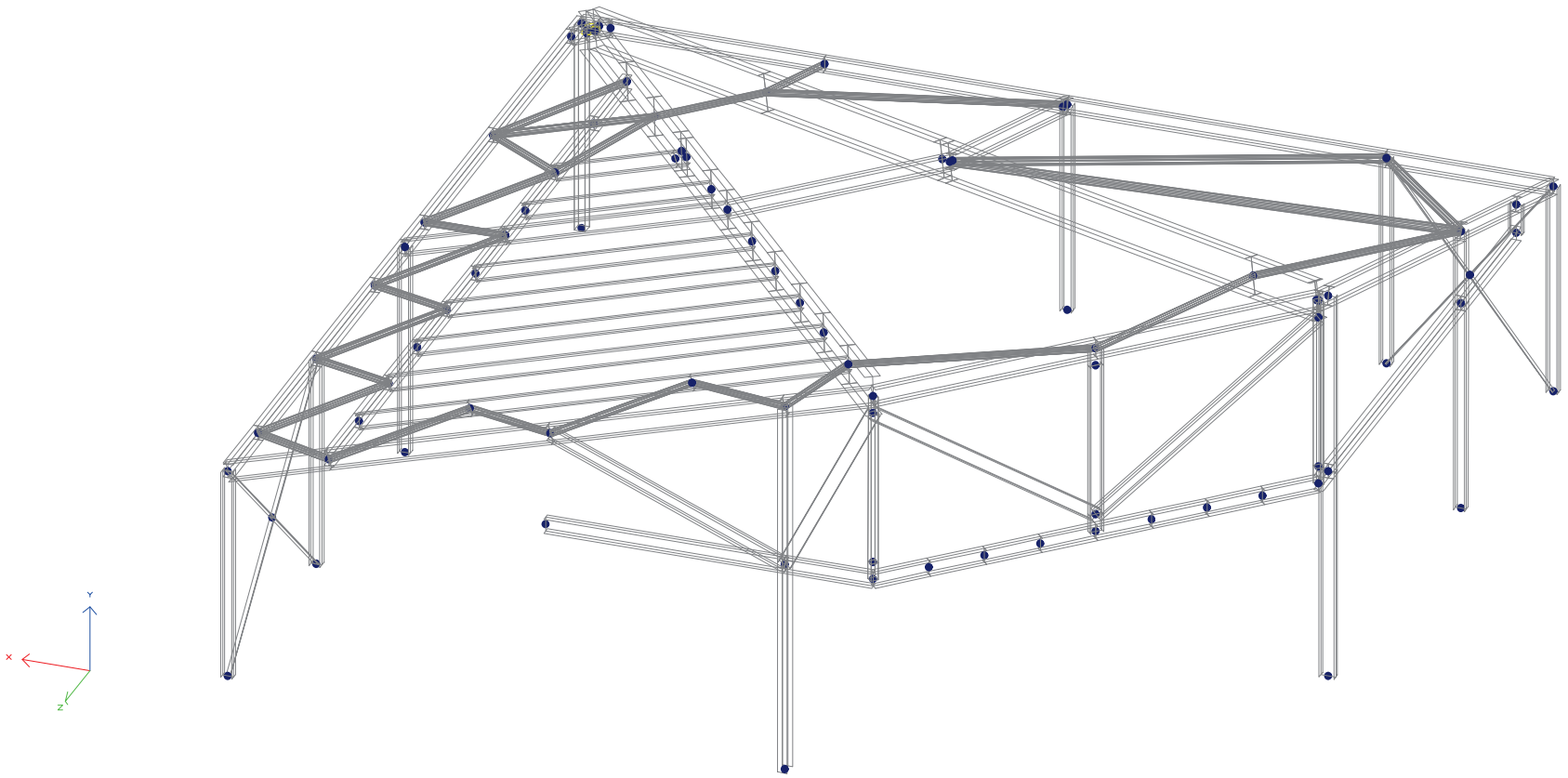
STRUCTURAL MODEL - ULS
MEMBER DESIGN

Job No	2022-302
Job Ref	Viking Centre
Designed By	TM
Checked By	
Date	April 2023
Revision No	0
Calc No	
Page No	

Rendered view (from west side)



Rendered view (from west side)

JOHN PLUMMER PARTNERSHIP	STRUCTURAL MODEL - ULS MEMBER DESIGN	Job No 2022-302 Job Ref Viking Centre Designed By TM Checked By Date April 2023 Revision No 0 Calc No Page No

Design Code

Design code	*Concrete code*	*Steel Code*	*Wind Code*
BS	BS8110-Amd.3	BS5950:2000	BS 6399-2

Members

Mbr ref	*Member type*	*Start joint*	*Start fixity*	*End joint*	*End fixity*	*Orient (°)*	*Directional behaviour*	*Length (m)*	*P-Delta behaviour*	*Slope (°)*
1	col7	29	Fixed	32	Fixed	0.0	Normal	3.000	Normal	90.0
2	col8	30	Fixed	35	Fixed	0.0	Normal	3.000	Normal	90.0
3	col10	31	Fixed	37	Fixed	0.0	Normal	3.000	Normal	90.0
4	col6	28	Fixed	33	Fixed	0.0	Normal	3.000	Normal	90.0
5	col4	27	Fixed	38	Fixed	0.0	Normal	3.000	Normal	90.0
6	beam5	32	Ball	88	Fixed	0.0	Normal	0.400	Normal	0.0
8	beam5	32	Pinned	126	Fixed	0.0	Normal	0.240	Normal	0.0
14	col1	42	Fixed	43	Fixed	90.0	Normal	3.000	Normal	90.0
25	beam5	35	Pinned	407	Fixed	0.0	Normal	1.140	Normal	0.0
26	beam5	33	Pinned	58	Ball	0.0	Normal	4.400	Normal	0.0
27	col3	45	Fixed	46	Fixed	0.0	Normal	3.000	Normal	90.0
38	col3	46	Fixed	57	Fixed	0.0	Normal	1.054	Normal	90.0
43	beam5	58	Pinned	38	Ball	0.0	Normal	2.300	Normal	-0.0
71	beam4	52	Pinned	85	Fixed	0.0	Normal	3.183	Normal	0.0
75	114.3 dia roof bracing	58	Pinned	57	Ball	0.0	Normal	4.319	Normal	14.1
82	col9	74	Fixed	68	Fixed	0.0	Normal	3.000	Normal	90.0
83	x-brace	74	Ball	321	Fixed	0.0	Tension only	2.248	Normal	41.8
89	col5	75	Fixed	58	Fixed	0.0	Normal	3.000	Normal	90.0
92	x-brace	75	Pinned	322	Fixed	0.0	Tension only	1.890	Normal	52.5
94	beam5	77	Fixed	33	Ball	0.0	Normal	3.350	Normal	0.0
112	beam4	85	Fixed	47	Pinned	0.0	Normal	3.183	Normal	0.0
117	beam11	43	Ball	87	Pinned	0.0	Normal	1.219	Normal	0.0
118	hanger1	86	Pinned	380	Fixed	45.0	Normal	0.250	Normal	90.0
119	hanger1	87	Fixed	382	Fixed	45.0	Normal	0.250	Normal	90.0
121	beam5	88	Fixed	81	Fixed	0.0	Normal	2.950	Normal	0.0
122	beam5	89	Fixed	77	Fixed	0.0	Normal	2.950	Normal	0.0
138	beam11	87	Pinned	104	Fixed	0.0	Normal	0.796	Normal	0.0
139	beam11	101	Fixed	105	Fixed	0.0	Normal	0.796	Normal	0.0
140	beam11	102	Fixed	106	Fixed	0.0	Normal	0.796	Normal	0.0
141	beam11	103	Fixed	107	Fixed	0.0	Normal	0.796	Normal	0.0
142	beam11	104	Fixed	102	Fixed	0.0	Normal	0.796	Normal	0.0
143	beam11	105	Fixed	103	Fixed	0.0	Normal	0.796	Normal	0.0
144	beam11	106	Fixed	101	Fixed	0.0	Normal	0.796	Normal	0.0
145	beam11	107	Fixed	86	Pinned	0.0	Normal	0.796	Normal	0.0
170	beam5	126	Fixed	89	Fixed	0.0	Normal	0.160	Normal	0.0
275	beam6	37	Pinned	456	Fixed	0.0	Normal	1.452	Normal	16.8
276	col1	43	Fixed	239	Pinned	90.0	Normal	2.313	Normal	90.0
286	beam8	89	Pinned	255	Fixed	0.0	Normal	0.226	Normal	0.0

Members(continued)

Mbr ref	Member type	Start joint	Start fixity	End joint	End fixity	Orient (°)	Directional behaviour	Length (m)	P-Delta behaviour	Slope (°)
296	DUMMY	255	Pinned	256	Ball	0.0	Normal	0.048	Normal	90.0
298	beam1	256	Fixed	268	Fixed	0.0	Normal	3.784	Normal	9.5
299	beam8	255	Fixed	259	Fixed	0.0	Normal	0.114	Normal	0.0
301	DUMMY	259	Pinned	260	Pinned	0.0	Normal	0.048	Normal	90.0
303	beam7	260	Fixed	457	Fixed	0.0	Normal	2.255	Normal	9.5
304	beam8	259	Fixed	88	Pinned	0.0	Normal	0.226	Normal	0.0
307	beam1	265	Fixed	271	Fixed	0.0	Normal	6.708	Normal	9.5
308	beam9	265	Pinned	303	Fixed	0.0	Normal	0.100	Normal	-16.8
310	beam1	268	Fixed	306	Fixed	0.0	Normal	3.901	Normal	9.5
311	88.9 dia roof bracing	268	Pinned	77	Ball	0.0	Normal	2.323	Normal	-16.8
312	88.9 dia roof bracing	33	Pinned	268	Ball	0.0	Normal	4.077	Normal	9.5
313	114.3 dia roof bracing	58	Pinned	265	Ball	0.0	Normal	6.400	Normal	12.1
314	114.3 dia roof bracing	57	Pinned	265	Ball	0.0	Normal	6.773	Normal	2.4
317	beam1	271	Fixed	327	Fixed	0.0	Normal	1.404	Normal	9.5
318	88.9 dia roof bracing	57	Pinned	271	Ball	0.0	Normal	4.959	Normal	16.3
320	beam7	274	Fixed	433	Fixed	0.0	Normal	1.387	Normal	9.5
323	beam7	277	Fixed	480	Fixed	0.0	Normal	1.508	Normal	9.5
329	beam6	280	Fixed	239	Fixed	0.0	Normal	3.374	Normal	16.8
335	88.9 dia roof bracing	271	Pinned	85	Ball	0.0	Normal	3.229	Normal	4.2
346	beam9	297	Fixed	33	Ball	0.0	Normal	0.167	Normal	-16.8
352	beam9	303	Fixed	297	Fixed	0.0	Normal	4.380	Normal	-16.8
355	beam1	306	Fixed	265	Fixed	0.0	Normal	0.175	Normal	9.5
366	x-brace	27	Pinned	322	Fixed	0.0	Tension only	1.890	Normal	52.5
367	x-brace	31	Pinned	321	Fixed	0.0	Tension only	2.248	Normal	41.8
368	DUMMY	256	Pinned	260	Ball	0.0	Normal	0.114	Normal	0.0
371	x-brace	321	Fixed	37	Pinned	0.0	Tension only	2.248	Normal	41.8
372	x-brace	322	Fixed	38	Ball	0.0	Tension only	1.890	Normal	52.5
374	x-brace	322	Fixed	58	Ball	0.0	Tension only	1.890	Normal	52.5
375	x-brace	321	Fixed	68	Ball	0.0	Tension only	2.248	Normal	41.8
377	beam3	324	Fixed	52	Fixed	0.0	Normal	0.024	Normal	16.8
380	beam1	327	Fixed	52	Pinned	0.0	Normal	0.042	Normal	9.5
383	beam12	265	Pinned	274	Ball	0.0	Normal	3.183	Normal	0.0
384	88.9 dia roof bracing	268	Pinned	277	Ball	0.0	Normal	1.591	Normal	0.0
388	DUMMY	330	Fixed	354	Pinned	0.0	Normal	7.499	Normal	0.0
397	beam11	43	Pinned	347	Fixed	0.0	Normal	3.300	Normal	0.0
399	DUMMY	346	Fixed	349	Fixed	0.0	Normal	4.519	Normal	0.0
400	DUMMY	337	Fixed	365	Pinned	0.0	Normal	6.722	Normal	0.0
401	hanger2	350	Pinned	353	Pinned	0.0	Normal	0.422	Normal	90.0
403	beam2	353	Fixed	57	Ball	0.0	Normal	2.193	Normal	16.8
404	beam11	350	Fixed	46	Pinned	0.0	Normal	2.100	Normal	0.0
406	DUMMY	354	Fixed	366	Fixed	0.0	Normal	0.900	Normal	0.0
414	DUMMY	365	Fixed	373	Fixed	0.0	Normal	1.650	Normal	0.0
416	DUMMY	86	Pinned	372	Fixed	0.0	Normal	1.627	Normal	0.0

Members(continued)

Mbr ref	Member type	Start joint	Start fixity	End joint	End fixity	Orient (°)	Directional behaviour	Length (m)	P-Delta behaviour	Slope (°)
417	DUMMY	87	Pinned	379	Fixed	0.0	Normal	2.333	Normal	0.0
423	DUMMY	372	Fixed	337	Ball	0.0	Normal	0.174	Normal	0.0
429	DUMMY	379	Fixed	346	Ball	0.0	Normal	0.163	Normal	0.0
431	hanger2	101	Pinned	384	Fixed	45.0	Normal	0.250	Normal	90.0
432	hanger1	380	Fixed	381	Fixed	45.0	Normal	2.180	Normal	90.0
433	hanger1	381	Fixed	52	Pinned	45.0	Normal	0.250	Normal	90.0
434	hanger1	382	Fixed	383	Fixed	45.0	Normal	2.180	Normal	90.0
435	hanger1	383	Fixed	47	Fixed	45.0	Normal	0.250	Normal	90.0
436	hanger2	384	Fixed	385	Fixed	45.0	Normal	2.180	Normal	90.0
437	hanger2	385	Fixed	85	Ball	45.0	Normal	0.250	Normal	90.0
438	truss brace	381	Pinned	384	Ball	0.0	Normal	3.858	Normal	-34.4
439	truss brace	384	Pinned	383	Ball	0.0	Normal	3.858	Normal	34.4
444	beam5	387	Fixed	35	Ball	0.0	Normal	0.740	Normal	0.0
454	beam7	405	Fixed	406	Fixed	0.0	Normal	1.387	Normal	9.5
461	beam5	410	Fixed	37	Ball	0.0	Normal	1.140	Normal	-0.0
479	beam7	433	Fixed	434	Fixed	0.0	Normal	1.302	Normal	9.5
482	beam7	434	Fixed	435	Fixed	0.0	Normal	1.387	Normal	9.5
485	beam7	435	Fixed	437	Fixed	0.0	Normal	1.302	Normal	9.5
535	beam6	456	Fixed	280	Fixed	0.0	Normal	3.195	Normal	16.8
539	roof light trimmer primary	456	Pinned	458	Fixed	0.0	Normal	1.140	Normal	0.0
540	roof light trimmer primary	458	Fixed	459	Fixed	0.0	Normal	1.140	Normal	0.0
541	roof light trimmer primary	459	Fixed	460	Fixed	0.0	Normal	1.070	Normal	0.0
542	roof light trimmer primary	460	Fixed	461	Fixed	0.0	Normal	1.140	Normal	0.0
543	roof light trimmer primary	461	Fixed	462	Fixed	0.0	Normal	1.070	Normal	0.0
544	roof light trimmer primary	462	Fixed	463	Pinned	0.0	Normal	1.140	Normal	0.0
545	roof light trimmer primary	463	Pinned	464	Fixed	0.0	Normal	0.740	Normal	0.0
546	roof light trimmer primary	464	Fixed	465	Fixed	0.0	Normal	1.140	Normal	0.0
549	roof light trimmer primary	467	Fixed	457	Ball	0.0	Normal	1.257	Normal	0.0
553	roof light trimmer secondary	465	Pinned	477	Fixed	0.0	Normal	1.731	Normal	16.8
554	roof light trimmer secondary	464	Fixed	406	Ball	0.0	Normal	2.682	Normal	16.8
555	roof light trimmer secondary	462	Fixed	433	Ball	0.0	Normal	3.986	Normal	16.8
556	roof light trimmer secondary	461	Fixed	434	Ball	0.0	Normal	4.728	Normal	16.8
557	roof light trimmer secondary	460	Fixed	435	Ball	0.0	Normal	5.519	Normal	16.8
558	roof light trimmer secondary	459	Pinned	437	Ball	0.0	Normal	6.261	Normal	16.8
559	roof light trimmer secondary	458	Pinned	475	Fixed	0.0	Normal	1.600	Normal	16.8
560	roof light trimmer primary	465	Fixed	467	Fixed	0.0	Normal	1.470	Normal	0.0
563	beam7	437	Fixed	438	Fixed	0.0	Normal	1.387	Normal	9.5
564	beam6	239	Fixed	47	Pinned	0.0	Normal	1.273	Normal	16.8
565	beam7	438	Fixed	47	Pinned	0.0	Normal	1.387	Normal	9.5
566	beam8	35	Pinned	463	Fixed	0.0	Normal	1.452	Normal	16.8
567	beam8	463	Fixed	274	Pinned	0.0	Normal	3.195	Normal	16.8
568	beam7	406	Fixed	274	Fixed	0.0	Normal	0.901	Normal	9.5
576	88.9 dia roof bracing	457	Pinned	81	Ball	0.0	Normal	1.920	Normal	-12.6

Members(continued)

Mbr ref	Member type	Start joint	Start fixity	End joint	End fixity	Orient (°)	Directional behaviour	Length (m)	P-Delta behaviour	Slope (°)
577	88.9 dia roof bracing	81	Pinned	465	Ball	0.0	Normal	2.066	Normal	11.7
578	88.9 dia roof bracing	465	Pinned	387	Ball	0.0	Normal	1.846	Normal	-13.1
579	88.9 dia roof bracing	387	Pinned	463	Ball	0.0	Normal	1.629	Normal	14.9
580	88.9 dia roof bracing	463	Pinned	407	Ball	0.0	Normal	1.846	Normal	-13.1
581	88.9 dia roof bracing	407	Pinned	461	Ball	0.0	Normal	1.803	Normal	13.4
582	88.9 dia roof bracing	461	Pinned	68	Ball	0.0	Normal	1.846	Normal	-13.1
583	88.9 dia roof bracing	68	Pinned	459	Ball	0.0	Normal	1.803	Normal	13.4
584	88.9 dia roof bracing	459	Pinned	410	Ball	0.0	Normal	1.846	Normal	-13.1
585	88.9 dia roof bracing	410	Pinned	456	Ball	0.0	Normal	1.846	Normal	13.1
586	roof light trimmer secondary	475	Fixed	476	Fixed	0.0	Normal	3.200	Normal	16.8
587	roof light trimmer secondary	476	Fixed	438	Ball	0.0	Normal	2.251	Normal	16.8
588	88.9 dia roof bracing	456	Pinned	475	Ball	0.0	Normal	1.965	Normal	13.6
589	88.9 dia roof bracing	475	Pinned	280	Ball	0.0	Normal	1.961	Normal	13.6
590	88.9 dia roof bracing	280	Pinned	476	Ball	0.0	Normal	1.968	Normal	13.6
591	88.9 dia roof bracing	476	Pinned	239	Ball	0.0	Normal	2.105	Normal	14.0
592	88.9 dia roof bracing	239	Pinned	438	Ball	0.0	Normal	1.238	Normal	6.5
593	88.9 dia roof bracing	438	Pinned	85	Ball	0.0	Normal	3.214	Normal	4.1
594	88.9 dia roof bracing	277	Pinned	465	Ball	0.0	Normal	1.709	Normal	-8.5
601	beam7	457	Fixed	277	Fixed	0.0	Normal	1.530	Normal	9.5
602	88.9 dia roof bracing	81	Pinned	467	Ball	0.0	Normal	1.452	Normal	16.8
603	88.9 dia roof bracing	467	Pinned	277	Ball	0.0	Normal	0.872	Normal	16.8
604	beam5	81	Fixed	387	Fixed	0.0	Normal	2.610	Normal	0.0
605	roof light trimmer secondary	477	Fixed	405	Ball	0.0	Normal	0.160	Normal	16.8
608	beam7	480	Fixed	405	Fixed	0.0	Normal	0.281	Normal	9.5
609	beam5	407	Fixed	68	Ball	0.0	Normal	2.210	Normal	0.0
610	beam5	68	Pinned	410	Fixed	0.0	Normal	2.210	Normal	0.0
614	beam11	483	Fixed	86	Pinned	0.0	Normal	0.375	Normal	0.0
615	beam3	484	Fixed	324	Fixed	0.0	Normal	0.368	Normal	16.8
616	col2	481	Fixed	483	Fixed	0.0	Normal	3.000	Normal	90.0
617	col2	483	Fixed	484	Pinned	0.0	Normal	2.567	Normal	90.0
618	beam11	46	Pinned	483	Fixed	0.0	Normal	5.024	Normal	0.0
619	beam3	57	Pinned	484	Fixed	0.0	Normal	5.247	Normal	16.8
620	beam2	38	Fixed	353	Fixed	0.0	Normal	1.462	Normal	16.8
621	truss brace	43	Pinned	383	Ball	0.0	Normal	2.719	Normal	63.4
622	truss brace	43	Pinned	280	Ball	0.0	Normal	3.497	Normal	22.5

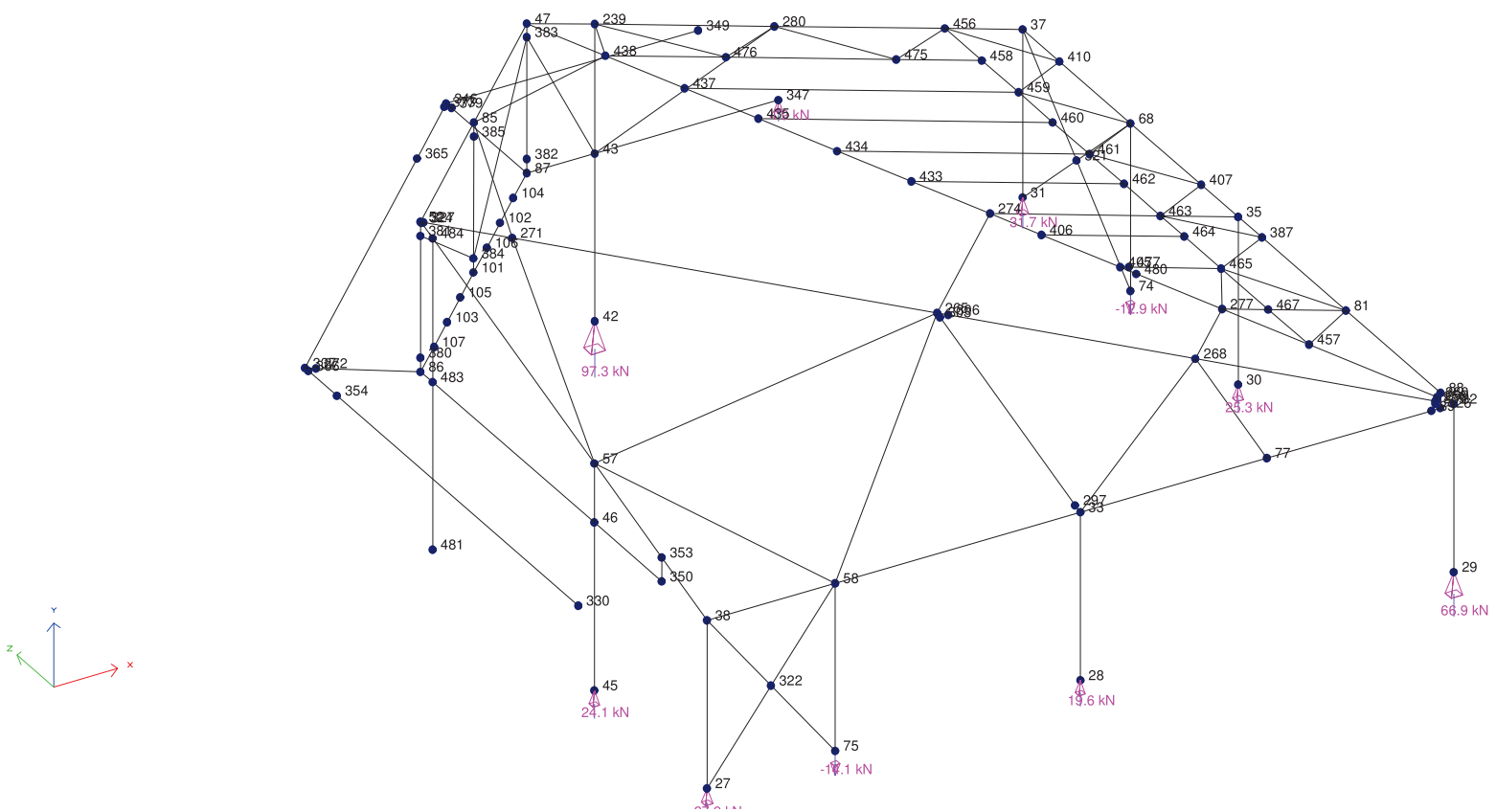
Joints

Joint ref	X pos (m)	Y pos (m)	Z pos (m)	Joint ref	X pos (m)	Y pos (m)	Z pos (m)	Joint ref	X pos (m)	Y pos (m)	Z pos (m)
27	0.000	0.000	0.000	28	6.700	0.000	0.000	29	13.400	0.000	0.000
30	13.400	0.000	6.700	31	13.400	0.000	13.400	32	13.400	3.000	0.000
33	6.700	3.000	0.000	35	13.400	3.000	6.700	37	13.400	3.000	13.400
38	0.000	3.000	0.000	42	5.720	0.000	13.400	43	5.720	3.000	13.400

Joints(continued)

Joint ref	X pos (m)	Y pos (m)	Z pos (m)	Joint ref	X pos (m)	Y pos (m)	Z pos (m)	Joint ref	X pos (m)	Y pos (m)	Z pos (m)
45	0.000	0.000	3.500	46	0.000	3.000	3.500	47	4.501	5.680	13.400
52	0.000	5.680	8.899	57	0.000	4.054	3.500	58	2.300	3.000	0.000
68	13.400	3.000	10.050	74	13.400	0.000	10.050	75	2.300	0.000	0.000
77	10.050	3.000	0.000	81	13.400	3.000	3.350	85	2.251	5.680	11.150
86	0.000	3.000	8.899	87	4.501	3.000	13.400	88	13.400	3.000	0.400
89	13.000	3.000	0.000	101	2.251	3.000	11.150	102	3.376	3.000	12.275
103	1.125	3.000	10.024	104	3.938	3.000	12.837	105	1.688	3.000	10.587
106	2.813	3.000	11.712	107	0.563	3.000	9.462	126	13.160	3.000	0.000
239	5.720	5.313	13.400	255	13.160	3.000	0.160	256	13.160	3.048	0.160
259	13.240	3.000	0.240	260	13.240	3.048	0.240	265	6.700	4.340	4.450
268	10.050	3.670	2.225	271	1.188	5.442	8.110	274	8.951	4.340	6.700
277	11.175	3.670	3.350	280	8.951	4.340	13.400	297	6.700	3.048	0.160
303	6.700	4.311	4.354	306	6.844	4.311	4.354	321	13.400	1.500	11.725
322	1.150	1.500	0.000	324	0.000	5.673	8.876	327	0.035	5.673	8.876
330	-1.500	3.000	1.400	337	-1.500	3.000	9.895	346	4.501	3.000	15.896
347	9.020	3.000	13.400	349	9.020	3.000	15.896	350	0.000	3.000	1.400
353	0.000	3.422	1.400	354	-1.500	3.000	8.899	365	3.253	3.000	14.648
366	-1.500	3.000	9.799	372	-1.355	3.000	9.799	373	4.420	3.000	15.815
379	4.501	3.000	15.733	380	0.000	3.250	8.899	381	0.000	5.430	8.899
382	4.501	3.250	13.400	383	4.501	5.430	13.400	384	2.251	3.250	11.150
385	2.251	5.430	11.150	387	13.400	3.000	5.960	405	10.199	3.964	4.820
406	9.442	4.192	5.960	407	13.400	3.000	7.840	410	13.400	3.000	12.260
433	8.193	4.568	7.840	434	7.483	4.782	8.910	435	6.726	5.010	10.050
437	6.015	5.224	11.120	438	5.258	5.452	12.260	456	12.010	3.419	13.400
457	12.010	3.419	2.093	458	12.010	3.419	12.260	459	12.010	3.419	11.120
460	12.010	3.419	10.050	461	12.010	3.419	8.910	462	12.010	3.419	7.840
463	12.010	3.419	6.700	464	12.010	3.419	5.960	465	12.010	3.419	4.820
467	12.010	3.419	3.350	475	10.478	3.880	12.260	476	7.414	4.803	12.260
477	10.353	3.918	4.820	480	10.353	3.918	4.589	481	0.000	0.000	8.524
483	0.000	3.000	8.524	484	0.000	5.567	8.524				

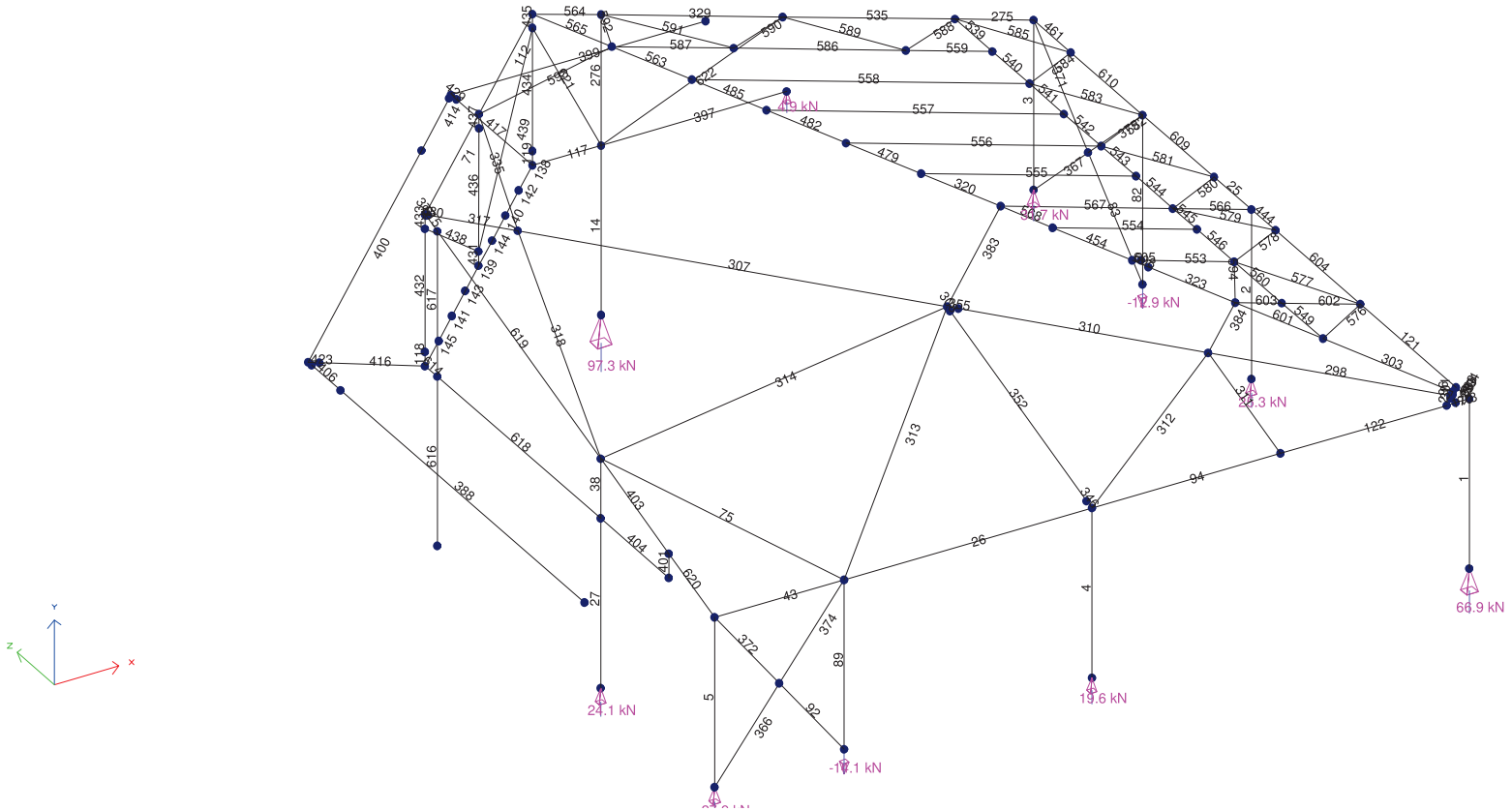
Joint Numbers



Joint Numbers

JOHN PLUMMER PARTNERSHIP	STRUCTURAL MODEL - ULS MEMBER DESIGN	Job No	2022-302
		Job Ref	Viking Centre
		Designed By	TM
		Checked By	
		Date	April 2023
		Revision No	0
		Calc No	
		Page No	

Member Numbers



Member Numbers

JOHN PLUMMER PARTNERSHIP	STRUCTURAL MODEL - ULS MEMBER DESIGN	Job No	2022-302
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		Page No	

Materials

Material reference	*Elastic modulus (kN/mm²)*	*Poisson ratio*	*Density (kN/m3)*	*Thermal expansion (/°Cx10-6)*
UK-S275	205.00	0.30	77.00	12.00
UK-S355	205.00	0.30	77.00	12.00
DUMMY	205.00	0.30	0.00	12.00

Supports

Joint ref	*Support type*	*X Trans. (kN/mm)*	*Y Trans. (kN/mm)*	*Z Trans. (kN/mm)*	*X Rot. (kNm/Rad)*	*Y Rot. (kNm/Rad)*	*Z Rot. (kNm/Rad)*	*Direction control*
27	PINNED	Fixed	Fixed	Fixed	Free	Fixed	Free	Normal
28	PINNED	Fixed	Fixed	Fixed	Free	Fixed	Free	Normal
29	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
30	PINNED	Fixed	Fixed	Fixed	Free	Fixed	Free	Normal
31	PINNED	Fixed	Fixed	Fixed	Free	Fixed	Free	Normal
32	Fixed RotY	Free	Free	Free	Free	Fixed	Free	Normal
42	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
45	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
47	FIXED Y	Free	Free	Free	Free	Fixed	Free	Normal
74	PINNED	Fixed	Fixed	Fixed	Free	Fixed	Free	Normal
75	PINNED	Fixed	Fixed	Fixed	Free	Fixed	Free	Normal
86	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
87	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
101	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
102	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
103	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
104	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
105	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
106	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
107	Fixed trans	Fixed	Free	Fixed	Free	Free	Free	Normal
330	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
337	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
346	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
347	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
349	PINNED	Fixed	Fixed	Fixed	Fixed	Free	Free	Normal
354	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
365	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal
366	PINNED	Fixed	Fixed	Fixed	Free	Free	Fixed	Normal
373	PINNED	Fixed	Fixed	Fixed	Free	Free	Fixed	Normal
481	Pinned	Fixed	Fixed	Fixed	Free	Free	Free	Normal

Sections

Reference	Area (cm²)	Ixx (cm4)	Iyy (cm4)	J (cm4)	Elements (mm)				
					No	Width	Height	Vert. off	Lat. off
305x165 UKB40	51.3	8503	764	14.7					
100x100x5 SHS	18.7	279	279	439					
88.9x4.0 CHS	10.7	96.3	96.3	193					
152x152 UKC23	29	1250	400	4.63					
100x100	100	833.333	833.333	1375	1	100.00	100.00	0.00	0.00
10x60	6	0.5	18	1.770014	1	60.00	10.00	0.00	0.00
152x89 UKB16	20.3	834	89.8	3.56					
457x191 UKB67	85.5	29380	1452	37.1					
203x133 UKB25	32	2340	308	5.96					
203x133 UKB30	38.2	2896	385	10.3					
254x146 UKB37	47.2	5537	571	15.3					
254x146 UKB31	39.7	4413	448	8.55					
178x102 UKB19	24.3	1356	137	4.41					
203x102 UKB23	29.4	2105	164	7.02					
457x191 UKB74	94.6	33319	1671	51.8					
457x152 UKB74	94.5	32674	1047	65.9					
457x191 UKB82	104	37051	1871	69.2					
533x210 UKB82	105	47539	2007	51.5					
150x150x8 SHS	44.8	1490	1490	2350					
114.3x4.0 CHS	13.9	211	211	422					

Member Types

Reference	Shape	Material	Seg no	Start section	End section	Length (m)	Depth (mm)	Placing rule
DUMMY	Elements	DUMMY	1	100x100				
88.9 dia roof bracing	SW Library	UK-S355	1	88.9x4.0 CHS				
beam1	SW Library	UK-S355	1	533x210 UKB82				
beam2	SW Library	UK-S355	1	203x133 UKB25				
beam3	SW Library	UK-S355	1	254x146 UKB31				
beam4	SW Library	UK-S355	1	254x146 UKB31				
beam5	SW Library	UK-S355	1	203x133 UKB25				
beam6	SW Library	UK-S355	1	254x146 UKB31				
beam7	SW Library	UK-S355	1	533x210 UKB82				
beam8	SW Library	UK-S355	1	203x133 UKB25				
beam9	SW Library	UK-S355	1	203x133 UKB25				
beam10	SW Library	UK-S355	1	203x133 UKB25				
col1	SW Library	UK-S355	1	203x133 UKB30				
col2	SW Library	UK-S355	1	203x133 UKB30				

Member Types (continued)

Reference	Shape	Material	Seg no	Start section	End section	Length (m)	Depth (mm)	Placing rule
col3	SW Library	UK-S355	1	152x152 UKC23				
col4	SW Library	UK-S355	1	152x152 UKC23				
col5	SW Library	UK-S355	1	152x152 UKC23				
col6	SW Library	UK-S355	1	152x152 UKC23				
col7	SW Library	UK-S355	1	150x150x8 SHS				
col8	SW Library	UK-S355	1	152x152 UKC23				
col9	SW Library	UK-S355	1	152x152 UKC23				
col10	SW Library	UK-S355	1	152x152 UKC23				
x-brace	Elements	UK-S275	1	10x60				
hanger2	SW Library	UK-S355	1	178x102 UKB19				
beam11	SW Library	UK-S355	1	203x133 UKB25				
truss brace	SW Library	UK-S355	1	178x102 UKB19				
roof light trimmer secondary	SW Library	UK-S355	1	203x102 UKB23				
roof light trimmer primary	SW Library	UK-S355	1	203x133 UKB25				
114.3 dia roof bracing	SW Library	UK-S355	1	114.3x4.0 CHS				
hanger1	SW Library	UK-S355	1	100x100x5 SHS				
beam12	SW Library	UK-S355	1	203x133 UKB25				

Area Loads on Panels

Load reference	Category	Distribution scheme		Direction	Intensity (kN/m2)
		In-plane	Normal		
Loads on P25 (Area 17.06 m2)					
roof dead	dead1	Bearing	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
wall dead	dead1			Vertical (-Y)	0.700
Loads on P36 (Area 14.46 m2)					
roof dead	dead1	One - way (Edge 2	One - way Ribbed	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P37 (Area 50.88 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P46 (Area 3.04 m2)					
wall dead	dead1	Bearing	One - way Ribbed	Vertical (-Y)	0.700
Loads on P48 (Area 11.55 m2)					
flat roof dead	dead1	One - way (Edge 2	One - way Ribbed	Vertical (-Y)	0.660
flat roof live	live1			Vertical (-Y)	1.500
Loads on P49 (Area 11.28 m2)					

Area Loads on Panels (continued)

Load reference	*Category*	*Distribution scheme*		*Direction*	*Intensity*
		In-plane	*Normal*		*(kN/m2)*
flat roof dead	dead1	One - way (Edge 1	One - way Ribbed	Vertical (-Y)	0.660
flat roof live	live1			Vertical (-Y)	1.500
Loads on P50 (Area 0.74 m2)					
flat roof dead	dead1	One - way (Edge 2	One - way Ribbed	Vertical (-Y)	0.660
flat roof live	live1			Vertical (-Y)	1.500
Loads on P62 (Area 7.65 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P63 (Area 9.73 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P64 (Area 2.56 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P65 (Area 2.61 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P66 (Area 2.17 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P67 (Area 4.09 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P68 (Area 4.66 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P69 (Area 5.84 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P70 (Area 6.30 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P71 (Area 7.59 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P72 (Area 8.49 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P73 (Area 11.63 m2)					
wall dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.700
Loads on P74 (Area 11.25 m2)					
flat roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.660
flat roof live	live1			Vertical (-Y)	1.500

Area Loads on Panels (continued)

Load reference	Category	Distribution scheme		Direction	Intensity (kN/m2)
		In-plane	Normal		
Loads on P75 (Area 27.48 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570
Loads on P76 (Area 18.89 m2)					
roof dead	dead1	Two - way	One - way Solid	Vertical (-Y)	0.650
roof live	live1			Vertical (-Y)	0.570

Load Combinations

Load Category			Partial Safety Factors				
No	Name	Type	Sub type	1	2	3	4
	Combination reference			1.0Gk	1.0Qk	1.0Gk+1.0Q	1.4Gk+1.6Q
	Limit state			ULS	ULS	ULS	ULS
	Elastic analysis			Linear	Linear	Linear	Linear
	Plastic analysis			No	No	No	No
1	Self Weight	Permanent	Self weight	1.00		1.00	1.40
2	dead1	Permanent	Self weight	1.00		1.00	1.40
3	live1	Variable	Cat H: roofs		1.00	1.00	1.60

Member Effects for Combination 1.4Gk+1.6Qk

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
Member 1							
0	0.000	98.236	0.000	0.000	0.000	0.000	0.000
1	0.750	97.873	0.000	0.000	0.000	0.000	0.000
2	1.500	97.511	0.000	0.000	0.000	0.000	0.001
3	2.250	97.149	0.000	0.000	0.000	0.000	0.001
4	3.000	96.787	0.000	0.000	0.000	0.000	0.001
Member 2							
0	0.000	37.170	0.000	0.001	-0.001	0.000	0.000
1	0.750	36.935	0.000	0.001	-0.001	0.000	0.001
2	1.500	36.701	0.000	0.001	-0.001	0.000	0.002
3	2.250	36.466	0.000	0.001	-0.001	0.000	0.003
4	3.000	36.232	0.000	0.001	-0.001	0.000	0.004
Member 3							
0	0.000	46.685	0.000	0.000	0.000	0.000	0.000
1	0.750	46.450	0.000	0.000	0.000	0.000	0.000
2	1.500	46.216	0.000	0.000	0.000	0.000	0.000
3	2.250	45.981	0.000	0.000	0.000	0.000	0.000
4	3.000	45.747	0.000	0.000	0.000	0.000	0.000
Member 4							
0	0.000	28.987	0.000	0.000	0.000	0.000	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
1	0.750	28.752	0.000	0.000	0.000	0.000	0.000
2	1.500	28.518	0.000	0.000	0.000	0.000	0.000
3	2.250	28.283	0.000	0.000	0.000	0.000	0.000
4	3.000	28.049	0.000	0.000	0.000	0.000	0.000
Member 5							
0	0.000	41.277	0.000	1.206	0.001	0.000	0.000
1	0.750	41.043	0.000	1.206	0.001	0.000	0.905
2	1.500	40.808	0.000	1.206	0.001	0.000	1.809
3	2.250	40.574	0.000	1.206	0.001	0.000	2.714
4	3.000	40.339	0.000	1.206	0.001	0.000	3.619
Member 6							
0	0.000	4.572	48.471	-5.184	0.000	0.000	0.000
1	0.100	4.572	48.437	-5.184	0.000	4.845	-0.518
2	0.200	4.572	48.402	-5.184	0.000	9.687	-1.037
3	0.300	4.572	48.368	-5.184	0.000	14.526	-1.555
4	0.400	4.572	48.333	-5.184	0.000	19.361	-2.074
Member 8							
0	0.000	5.184	48.316	4.572	-0.001	0.000	0.000
1	0.060	5.184	48.295	4.572	-0.001	2.903	0.275
2	0.120	5.184	48.274	4.572	-0.001	5.805	0.550
3	0.180	5.184	48.253	4.572	-0.001	8.706	0.824
4	0.240	5.184	48.233	4.572	-0.001	11.606	1.099
Member 14							
0	0.000	143.297	0.000	-0.201	0.000	0.000	0.000
1	0.750	142.988	0.000	-0.201	0.000	0.000	-0.151
2	1.500	142.679	0.000	-0.201	0.000	0.000	-0.301
3	2.250	142.370	0.000	-0.201	0.000	0.000	-0.452
4	3.000	142.061	0.000	-0.201	0.000	0.000	-0.602
Member 25							
0	0.000	-200.484	0.799	0.272	0.000	0.000	0.000
1	0.285	-200.484	0.694	0.252	0.000	0.213	0.076
2	0.570	-200.484	0.577	0.190	0.000	0.395	0.140
3	0.855	-200.484	0.450	0.092	0.000	0.541	0.180
4	1.140	-200.484	0.320	-0.012	0.000	0.651	0.192
Member 26							
0	0.000	-54.696	1.234	-1.579	0.000	0.000	0.000
1	1.100	-54.696	0.763	-1.275	0.000	1.116	-1.625
2	2.200	-54.696	0.109	-0.362	0.000	1.612	-2.581
3	3.300	-54.696	-0.729	1.160	0.000	1.288	-2.198
4	4.400	-54.696	-1.583	2.736	0.000	0.000	0.000
Member 27							

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
0	0.000	35.620	0.039	-1.086	0.000	0.000	0.000
1	0.750	35.386	0.039	-1.086	0.000	0.029	-0.814
2	1.500	35.151	0.039	-1.086	0.000	0.058	-1.629
3	2.250	34.917	0.039	-1.086	0.000	0.087	-2.443
4	3.000	34.683	0.039	-1.086	0.000	0.116	-3.258
Member 38							
0	0.000	25.447	-0.111	3.090	0.000	0.117	-3.258
1	0.264	25.364	-0.111	3.090	0.000	0.088	-2.443
2	0.527	25.282	-0.111	3.090	0.000	0.058	-1.629
3	0.791	25.199	-0.111	3.090	0.000	0.029	-0.814
4	1.054	25.117	-0.111	3.090	0.000	0.000	0.000
Member 43							
0	0.000	18.263	0.664	-0.887	0.000	0.000	0.000
1	0.575	18.263	0.290	-0.305	0.000	0.272	-0.335
2	1.150	18.263	-0.033	0.111	0.000	0.343	-0.383
3	1.725	18.263	-0.307	0.360	0.000	0.243	-0.239
4	2.300	18.263	-0.530	0.444	0.000	0.000	0.000
Member 71							
0	0.000	12.736	4.922	-0.254	-0.002	0.000	0.000
1	0.796	12.736	4.568	-0.333	-0.002	3.777	-0.223
2	1.591	12.736	4.188	-0.567	-0.002	7.263	-0.571
3	2.387	12.736	3.781	-0.958	-0.002	10.435	-1.167
4	3.183	12.736	3.347	-1.505	-0.002	13.273	-2.137
Member 75							
0	0.000	-57.300	0.314	0.000	0.000	0.000	0.000
1	1.080	-57.339	0.157	0.000	0.000	0.254	0.000
2	2.159	-57.379	0.000	0.000	0.000	0.339	0.000
3	3.239	-57.418	-0.157	0.000	0.000	0.254	0.000
4	4.319	-57.458	-0.314	0.000	0.000	0.000	0.000
Member 82							
0	0.000	2.448	0.000	0.000	0.000	0.000	0.000
1	0.750	2.214	0.000	0.000	0.000	0.000	0.000
2	1.500	1.980	0.000	0.000	0.000	0.000	0.000
3	2.250	1.745	0.000	0.000	0.000	0.000	0.000
4	3.000	1.511	0.000	0.000	0.000	0.000	0.000
Member 83							
0	0.000	-32.470	0.000	0.000	0.000	0.000	0.000
1	0.562	-32.470	0.000	0.000	0.000	0.000	0.000
2	1.124	-32.470	0.000	0.000	0.000	0.000	0.000
3	1.686	-32.470	0.000	0.000	0.000	0.000	0.000
4	2.248	-32.470	0.000	0.000	0.000	0.000	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
Member 89							
0	0.000	2.896	0.000	0.000	0.000	0.000	0.000
1	0.750	2.662	0.000	0.000	0.000	0.000	0.000
2	1.500	2.428	0.000	0.000	0.000	0.000	0.000
3	2.250	2.193	0.000	0.000	0.000	0.000	0.000
4	3.000	1.959	0.000	0.000	0.000	0.000	0.000
Member 92							
0	0.000	-30.016	0.000	0.000	0.000	0.000	0.000
1	0.473	-30.016	0.000	0.000	0.000	0.000	0.000
2	0.945	-30.016	0.000	0.000	0.000	0.000	0.000
3	1.418	-30.016	0.000	0.000	0.000	0.000	0.000
4	1.890	-30.016	0.000	0.000	0.000	0.000	0.000
Member 94							
0	0.000	-0.974	-3.221	0.254	0.000	12.727	-0.851
1	0.838	-0.974	-3.510	0.254	0.000	9.908	-0.638
2	1.675	-0.974	-3.799	0.254	0.000	6.847	-0.425
3	2.513	-0.974	-4.088	0.254	0.000	3.545	-0.213
4	3.350	-0.974	-4.377	0.254	0.000	0.000	0.000
Member 112							
0	0.000	-25.549	-3.347	1.505	-0.002	13.273	-2.137
1	0.796	-25.549	-3.781	0.958	-0.002	10.435	-1.167
2	1.591	-25.549	-4.188	0.567	-0.002	7.263	-0.571
3	2.387	-25.549	-4.568	0.333	-0.002	3.777	-0.223
4	3.183	-25.549	-4.922	0.254	-0.002	0.000	0.000
Member 117							
0	0.000	-29.669	4.230	0.000	0.000	0.000	0.000
1	0.305	-29.669	2.115	0.000	0.000	0.967	0.000
2	0.610	-29.669	0.000	0.000	0.000	1.289	0.000
3	0.914	-29.669	-2.115	0.000	0.000	0.967	0.000
4	1.219	-29.669	-4.230	0.000	0.000	0.000	0.000
Member 118							
0	0.000	37.656	3.770	0.000	0.000	0.000	0.000
1	0.063	37.641	3.770	0.000	0.000	0.236	0.000
2	0.125	37.623	3.770	0.000	0.000	0.471	0.000
3	0.188	37.601	3.770	0.000	0.000	0.707	0.000
4	0.250	37.575	3.770	0.000	0.000	0.943	0.000
Member 119							
0	0.000	-19.529	-3.998	-3.258	0.000	0.000	0.000
1	0.063	-19.542	-3.998	-3.258	0.000	-0.250	-0.204
2	0.125	-19.554	-3.998	-3.258	0.000	-0.500	-0.407
3	0.188	-19.567	-3.998	-3.258	0.000	-0.750	-0.611

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
4	0.250	-19.580	-3.998	-3.258	0.000	-0.999	-0.815
Member 121							
0	0.000	-0.908	-1.602	0.974	0.000	19.361	-2.074
1	0.737	-0.908	-1.856	0.974	0.000	18.085	-1.356
2	1.475	-0.908	-2.111	0.974	0.000	16.623	-0.637
3	2.212	-0.908	-2.365	0.974	0.000	14.972	0.081
4	2.950	-0.908	-2.620	0.974	0.000	13.134	0.799
Member 122							
0	0.000	-0.974	-1.719	-0.908	0.000	19.300	1.829
1	0.737	-0.974	-1.974	-0.908	0.000	17.938	1.159
2	1.475	-0.974	-2.228	-0.908	0.000	16.389	0.489
3	2.212	-0.974	-2.483	-0.908	0.000	14.651	-0.181
4	2.950	-0.974	-2.737	-0.908	0.000	12.727	-0.851
Member 138							
0	0.000	0.000	15.299	0.000	0.000	0.000	0.000
1	0.199	0.000	13.145	0.000	0.000	2.829	0.000
2	0.398	0.000	10.991	0.000	0.000	5.230	0.000
3	0.597	0.000	8.837	0.000	0.000	7.202	0.000
4	0.796	0.000	6.683	0.000	0.000	8.745	0.000
Member 139							
0	0.000	0.000	19.166	0.000	0.000	-6.153	0.000
1	0.199	0.000	17.012	0.000	0.000	-2.554	0.000
2	0.398	0.000	14.857	0.000	0.000	0.615	0.000
3	0.597	0.000	12.703	0.000	0.000	3.357	0.000
4	0.796	0.000	10.549	0.000	0.000	5.670	0.000
Member 140							
0	0.000	0.000	-1.933	0.000	0.000	10.635	0.000
1	0.199	0.000	-4.087	0.000	0.000	10.036	0.000
2	0.398	0.000	-6.241	0.000	0.000	9.009	0.000
3	0.597	0.000	-8.395	0.000	0.000	7.553	0.000
4	0.796	0.000	-10.549	0.000	0.000	5.669	0.000
Member 141							
0	0.000	0.000	1.933	0.000	0.000	10.635	0.000
1	0.199	0.000	-0.221	0.000	0.000	10.805	0.000
2	0.398	0.000	-2.375	0.000	0.000	10.547	0.000
3	0.597	0.000	-4.529	0.000	0.000	9.861	0.000
4	0.796	0.000	-6.683	0.000	0.000	8.745	0.000
Member 142							
0	0.000	0.000	6.683	0.000	0.000	8.745	0.000
1	0.199	0.000	4.529	0.000	0.000	9.860	0.000
2	0.398	0.000	2.375	0.000	0.000	10.547	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
3	0.597	0.000	0.221	0.000	0.000	10.805	0.000
4	0.796	0.000	-1.933	0.000	0.000	10.635	0.000
Member 143							
0	0.000	0.000	10.549	0.000	0.000	5.670	0.000
1	0.199	0.000	8.395	0.000	0.000	7.554	0.000
2	0.398	0.000	6.241	0.000	0.000	9.009	0.000
3	0.597	0.000	4.087	0.000	0.000	10.036	0.000
4	0.796	0.000	1.933	0.000	0.000	10.635	0.000
Member 144							
0	0.000	0.000	-10.549	0.000	0.000	5.669	0.000
1	0.199	0.000	-12.703	0.000	0.000	3.356	0.000
2	0.398	0.000	-14.857	0.000	0.000	0.615	0.000
3	0.597	0.000	-17.012	0.000	0.000	-2.555	0.000
4	0.796	0.000	-19.166	0.000	0.000	-6.153	0.000
Member 145							
0	0.000	0.000	-6.683	0.000	0.000	8.745	0.000
1	0.199	0.000	-8.837	0.000	0.000	7.202	0.000
2	0.398	0.000	-10.991	0.000	0.000	5.230	0.000
3	0.597	0.000	-13.145	0.000	0.000	2.829	0.000
4	0.796	0.000	-15.299	0.000	0.000	0.000	0.000
Member 170							
0	0.000	5.184	48.233	4.572	-0.001	11.606	1.099
1	0.040	5.184	48.219	4.572	-0.001	13.530	1.281
2	0.080	5.184	48.205	4.572	-0.001	15.453	1.464
3	0.120	5.184	48.191	4.572	-0.001	17.376	1.646
4	0.160	5.184	48.178	4.572	-0.001	19.299	1.829
Member 275							
0	0.000	6.825	22.374	-0.641	0.000	0.000	0.000
1	0.363	6.746	20.105	-0.641	0.000	7.708	-0.233
2	0.726	6.598	17.835	-0.641	0.000	14.593	-0.465
3	1.089	6.450	15.566	-0.641	0.000	20.654	-0.698
4	1.452	6.371	13.296	-0.641	0.000	25.891	-0.930
Member 276							
0	0.000	27.162	0.000	0.260	0.000	0.000	-0.602
1	0.578	26.924	0.000	0.260	0.000	0.000	-0.452
2	1.156	26.686	0.000	0.260	0.000	0.000	-0.301
3	1.735	26.447	0.000	0.260	0.000	0.000	-0.151
4	2.313	26.209	0.000	0.260	0.000	0.000	0.000
Member 286							
0	0.000	-8.229	49.897	0.481	0.002	0.000	0.000
1	0.056	-8.229	49.878	0.481	0.002	2.815	0.027

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
2	0.113	-8.229	49.858	0.481	0.002	5.629	0.054
3	0.169	-8.229	49.839	0.481	0.002	8.442	0.081
4	0.226	-8.229	49.819	0.481	0.002	11.254	0.109
Member 296							
0	0.000	49.711	0.000	0.000	0.000	0.000	0.000
1	0.012	49.711	0.000	0.000	0.000	0.000	0.000
2	0.024	49.711	0.000	0.000	0.000	0.000	0.000
3	0.036	49.711	0.000	0.000	0.000	0.000	0.000
4	0.048	49.711	0.000	0.000	0.000	0.000	0.000
Member 298							
0	0.000	8.041	49.056	-0.641	0.000	0.000	0.000
1	0.946	7.332	44.809	-0.641	0.000	44.397	-0.607
2	1.892	6.633	40.631	-0.640	0.000	84.808	-1.213
3	2.838	5.942	36.522	-0.639	0.000	121.298	-1.818
4	3.784	5.261	32.481	-0.638	0.000	153.934	-2.422
Member 299							
0	0.000	-8.230	0.108	0.477	-0.003	11.254	0.109
1	0.029	-8.230	0.099	0.477	-0.003	11.257	0.122
2	0.057	-8.230	0.089	0.477	-0.003	11.260	0.136
3	0.086	-8.230	0.079	0.477	-0.003	11.262	0.149
4	0.114	-8.230	0.069	0.477	-0.003	11.264	0.163
Member 301							
0	0.000	49.926	0.000	0.000	-0.271	0.000	0.000
1	0.012	49.926	0.000	0.000	-0.271	0.000	0.000
2	0.024	49.926	0.000	0.000	-0.271	0.000	0.000
3	0.036	49.926	0.000	0.000	-0.271	0.000	0.000
4	0.048	49.926	0.000	0.000	-0.271	0.000	0.000
Member 303							
0	0.000	8.077	49.269	0.641	-0.045	0.000	0.268
1	0.564	7.919	46.719	1.038	-0.045	27.052	0.747
2	1.127	7.671	44.181	1.300	-0.045	52.670	1.412
3	1.691	7.335	41.656	1.429	-0.045	76.861	2.188
4	2.255	7.015	39.180	1.569	-0.045	99.637	3.018
Member 304							
0	0.000	-8.229	-49.857	0.479	0.000	11.264	-0.108
1	0.056	-8.229	-49.877	0.479	0.000	8.450	-0.081
2	0.113	-8.229	-49.896	0.479	0.000	5.634	-0.054
3	0.169	-8.229	-49.916	0.479	0.000	2.818	-0.027
4	0.226	-8.229	-49.935	0.479	0.000	0.000	0.000
Member 307							
0	0.000	20.112	7.030	1.283	0.001	198.887	1.210

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
1	1.677	18.735	-5.993	0.062	0.001	199.718	2.226
2	3.354	16.857	-18.743	-0.357	0.001	178.939	1.867
3	5.031	14.500	-31.214	-0.001	0.001	137.007	1.475
4	6.708	12.647	-43.221	0.302	0.001	74.518	1.790
Member 308							
0	0.000	32.983	17.634	0.000	0.000	0.000	0.000
1	0.025	32.986	17.626	0.000	0.000	0.441	0.000
2	0.050	32.988	17.618	0.000	0.000	0.881	0.000
3	0.075	32.990	17.609	0.000	0.000	1.322	0.000
4	0.100	32.993	17.601	0.000	0.000	1.762	0.000
Member 310							
0	0.000	17.448	19.446	0.886	0.001	153.934	-2.421
1	0.975	16.756	15.352	0.888	0.001	170.898	-1.557
2	1.951	16.074	11.331	0.890	0.001	183.904	-0.689
3	2.926	15.402	7.383	0.893	0.001	193.025	0.180
4	3.901	14.739	3.509	0.896	0.001	198.331	1.053
Member 311							
0	0.000	1.175	0.128	0.000	0.000	0.000	0.000
1	0.581	1.195	0.064	0.000	0.000	0.056	0.000
2	1.162	1.214	0.000	0.000	0.000	0.075	0.000
3	1.743	1.233	-0.064	0.000	0.000	0.056	0.000
4	2.323	1.253	-0.128	0.000	0.000	0.000	0.000
Member 312							
0	0.000	-65.341	0.232	0.000	0.000	0.000	0.000
1	1.019	-65.360	0.116	0.000	0.000	0.177	0.000
2	2.038	-65.379	0.000	0.000	0.000	0.236	0.000
3	3.058	-65.399	-0.116	0.000	0.000	0.177	0.000
4	4.077	-65.418	-0.232	0.000	0.000	0.000	0.000
Member 313							
0	0.000	61.770	0.469	0.000	0.000	0.000	0.000
1	1.600	61.720	0.234	0.000	0.000	0.563	0.000
2	3.200	61.670	0.000	0.000	0.000	0.750	0.000
3	4.800	61.620	-0.234	0.000	0.000	0.563	0.000
4	6.400	61.570	-0.469	0.000	0.000	0.000	0.000
Member 314							
0	0.000	34.839	1.026	1.741	0.000	0.000	0.000
1	1.693	34.733	0.589	1.125	0.000	1.419	2.601
2	3.386	34.513	-0.068	-0.228	0.000	1.848	3.322
3	5.080	34.372	-0.574	-1.075	0.000	1.281	2.139
4	6.773	34.317	-0.911	-1.358	0.000	0.000	0.000
Member 317							

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
0	0.000	11.222	-46.548	-1.215	0.001	74.518	1.791
1	0.351	10.978	-48.992	-1.209	0.001	57.753	1.366
2	0.702	10.783	-51.411	-1.223	0.001	40.135	0.939
3	1.053	10.638	-53.807	-1.256	0.001	21.672	0.505
4	1.404	10.543	-56.179	-1.310	0.001	2.372	0.055
Member 318							
0	0.000	-14.899	0.275	0.000	0.000	0.000	0.000
1	1.240	-14.939	0.137	0.000	0.000	0.255	0.000
2	2.479	-14.979	0.000	0.000	0.000	0.340	0.000
3	3.719	-15.019	-0.137	0.000	0.000	0.255	0.000
4	4.959	-15.059	-0.275	0.000	0.000	0.000	0.000
Member 320							
0	0.000	26.942	8.736	-5.407	-0.047	193.154	7.394
1	0.347	26.671	7.343	-5.455	-0.047	195.944	5.513
2	0.694	26.381	5.905	-5.522	-0.047	198.242	3.608
3	1.041	26.101	4.431	-5.563	-0.047	200.036	1.685
4	1.387	25.834	2.923	-5.578	-0.047	201.312	-0.248
Member 323							
0	0.000	-64.326	18.948	1.688	-0.044	148.881	-5.080
1	0.377	-64.553	17.714	1.662	-0.044	155.790	-4.447
2	0.754	-64.796	16.484	1.610	-0.044	162.234	-3.830
3	1.131	-65.028	15.269	1.572	-0.044	168.218	-3.231
4	1.508	-65.245	14.069	1.552	-0.044	173.746	-2.643
Member 329							
0	0.000	-81.563	-4.005	-0.035	0.000	1.882	0.304
1	0.843	-81.919	-5.168	-0.035	0.000	-1.986	0.274
2	1.687	-82.276	-6.331	-0.035	0.000	-6.836	0.245
3	2.530	-82.633	-7.495	-0.035	0.000	-12.667	0.215
4	3.374	-82.989	-8.658	-0.035	0.000	-19.479	0.185
Member 335							
0	0.000	-15.615	0.186	0.000	0.000	0.000	0.000
1	0.807	-15.622	0.093	0.000	0.000	0.112	0.000
2	1.614	-15.629	0.000	0.000	0.000	0.150	0.000
3	2.421	-15.636	-0.093	0.000	0.000	0.112	0.000
4	3.229	-15.643	-0.186	0.000	0.000	0.000	0.000
Member 346							
0	0.000	41.883	-20.806	0.000	0.000	3.551	0.000
1	0.042	41.891	-21.052	0.000	0.000	2.678	0.000
2	0.083	41.897	-21.297	0.000	0.000	1.796	0.000
3	0.125	41.903	-21.543	0.000	0.000	0.903	0.000
4	0.167	41.907	-21.788	0.000	0.000	0.000	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
Member 352							
0	0.000	32.993	17.601	0.000	0.000	1.762	0.000
1	1.095	34.908	10.262	0.000	0.000	17.155	0.000
2	2.190	37.405	1.414	0.000	0.000	23.685	0.000
3	3.285	39.732	-8.942	0.000	0.000	19.701	0.000
4	4.380	41.883	-20.806	0.000	0.000	3.551	0.000
Member 355							
0	0.000	14.739	3.509	0.896	0.001	198.331	1.053
1	0.044	14.710	3.339	0.897	0.001	198.481	1.092
2	0.088	14.681	3.169	0.897	0.001	198.624	1.132
3	0.132	14.652	2.997	0.897	0.001	198.759	1.171
4	0.175	14.622	2.826	0.897	0.001	198.887	1.210
Member 368							
0	0.000	-0.654	0.000	0.001	0.000	0.000	0.000
1	0.029	-0.654	0.000	0.000	0.000	0.000	0.000
2	0.057	-0.654	0.000	0.000	0.000	0.000	0.000
3	0.086	-0.654	0.000	0.000	0.000	0.000	0.000
4	0.114	-0.654	0.000	-0.001	0.000	0.000	0.000
Member 371							
0	0.000	-32.470	0.000	0.000	0.000	0.000	0.000
1	0.562	-32.470	0.000	0.000	0.000	0.000	0.000
2	1.124	-32.470	0.000	0.000	0.000	0.000	0.000
3	1.686	-32.470	0.000	0.000	0.000	0.000	0.000
4	2.248	-32.470	0.000	0.000	0.000	0.000	0.000
Member 372							
0	0.000	-30.016	0.000	0.000	0.000	0.000	0.000
1	0.473	-30.016	0.000	0.000	0.000	0.000	0.000
2	0.945	-30.016	0.000	0.000	0.000	0.000	0.000
3	1.418	-30.016	0.000	0.000	0.000	0.000	0.000
4	1.890	-30.016	0.000	0.000	0.000	0.000	0.000
Member 377							
0	0.000	-12.991	57.665	1.071	-0.002	-1.384	-0.026
1	0.006	-12.991	57.662	1.071	-0.002	-1.038	-0.020
2	0.012	-12.992	57.660	1.071	-0.002	-0.692	-0.013
3	0.018	-12.993	57.657	1.071	-0.002	-0.346	-0.007
4	0.024	-12.994	57.655	1.071	-0.002	0.000	0.000
Member 380							
0	0.000	10.543	-56.179	-1.310	0.001	2.372	0.055
1	0.011	10.541	-56.250	-1.312	0.001	1.780	0.042
2	0.021	10.539	-56.320	-1.314	0.001	1.188	0.028
3	0.032	10.537	-56.391	-1.316	0.001	0.594	0.014

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
4	0.042	10.535	-56.462	-1.318	0.001	0.000	0.000
Member 383							
0	0.000	114.164	0.549	0.000	0.000	0.000	0.000
1	0.796	114.164	0.274	0.000	0.000	0.328	0.000
2	1.591	114.164	0.000	0.000	0.000	0.437	0.000
3	2.387	114.164	-0.274	0.000	0.000	0.328	0.000
4	3.183	114.164	-0.549	0.000	0.000	0.000	0.000
Member 384							
0	0.000	-58.098	0.092	0.000	0.000	0.000	0.000
1	0.398	-58.098	0.046	0.000	0.000	0.027	0.000
2	0.796	-58.098	0.000	0.000	0.000	0.037	0.000
3	1.194	-58.098	-0.046	0.000	0.000	0.027	0.000
4	1.591	-58.098	-0.092	0.000	0.000	0.000	0.000
Member 388							
0	0.000	0.000	9.348	0.000	0.000	0.000	0.000
1	1.875	0.000	4.674	0.000	0.000	13.143	0.000
2	3.749	0.000	0.000	0.000	0.000	17.524	0.000
3	5.624	0.000	-4.674	0.000	0.000	13.143	0.000
4	7.499	0.000	-9.348	0.000	0.000	0.000	0.000
Member 397							
0	0.000	10.960	7.414	0.000	0.000	0.000	0.000
1	0.825	10.960	3.707	0.000	0.000	4.588	0.000
2	1.650	10.960	0.000	0.000	0.000	6.117	0.000
3	2.475	10.960	-3.707	0.000	0.000	4.588	0.000
4	3.300	10.960	-7.414	0.000	0.000	0.000	0.000
Member 399							
0	0.000	0.000	9.374	0.000	0.000	0.000	0.000
1	1.130	0.000	4.687	0.000	0.000	7.943	0.000
2	2.260	0.000	0.000	0.000	0.000	10.590	0.000
3	3.389	0.000	-4.687	0.000	0.000	7.943	0.000
4	4.519	0.000	-9.374	0.000	0.000	0.000	0.000
Member 400							
0	0.000	0.000	9.728	0.000	0.000	0.000	0.000
1	1.680	0.000	4.864	0.000	0.000	12.261	0.000
2	3.361	0.000	0.000	0.000	0.000	16.348	0.000
3	5.041	0.000	-4.864	0.000	0.000	12.261	0.000
4	6.722	0.000	-9.728	0.000	0.000	0.000	0.000
Member 401							
0	0.000	-3.275	0.000	0.000	0.000	0.000	0.000
1	0.105	-3.308	0.000	0.000	0.000	0.000	0.000
2	0.211	-3.352	0.000	0.000	0.000	0.000	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
3	0.316	-3.400	0.000	0.000	0.000	0.000	0.000
4	0.422	-3.435	0.000	0.000	0.000	0.000	0.000
Member 403							
0	0.000	3.643	2.250	0.000	0.000	11.462	-0.001
1	0.548	3.054	-1.444	0.000	0.000	11.689	0.000
2	1.097	2.289	-5.198	0.000	0.000	9.870	0.000
3	1.645	1.354	-8.994	0.000	0.000	5.981	0.000
4	2.193	-0.120	-12.831	0.000	0.000	0.000	0.000
Member 404							
0	0.000	0.000	3.275	0.000	0.000	0.000	0.000
1	0.525	0.000	1.683	0.000	0.000	1.308	0.000
2	1.050	0.000	0.027	0.000	0.000	1.758	0.000
3	1.575	0.000	-1.668	0.000	0.000	1.330	0.000
4	2.100	0.000	-3.403	0.000	0.000	0.000	0.000
Member 406							
0	0.000	0.000	0.784	0.000	0.000	0.000	0.000
1	0.225	0.000	0.286	0.000	0.000	0.118	0.000
2	0.450	0.000	-0.084	0.000	0.000	0.138	0.000
3	0.675	0.000	-0.329	0.000	0.000	0.090	0.000
4	0.900	0.000	-0.446	0.000	0.000	0.000	0.000
Member 414							
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.412	0.000	0.000	0.000	0.000	0.000	0.000
2	0.825	0.000	0.000	0.000	0.000	0.000	0.000
3	1.237	0.000	0.000	0.000	0.000	0.000	0.000
4	1.650	0.000	0.000	0.000	0.000	0.000	0.000
Member 416							
0	0.000	0.000	0.827	0.000	0.000	0.000	0.000
1	0.407	0.000	0.329	0.000	0.000	0.231	0.000
2	0.813	0.000	-0.041	0.000	0.000	0.285	0.000
3	1.220	0.000	-0.286	0.000	0.000	0.214	0.000
4	1.627	0.000	-0.403	0.000	0.000	0.070	0.000
Member 417							
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.583	0.000	0.000	0.000	0.000	0.000	0.000
2	1.167	0.000	0.000	0.000	0.000	0.000	0.000
3	1.750	0.000	0.000	0.000	0.000	0.000	0.000
4	2.333	0.000	0.000	0.000	0.000	0.000	0.000
Member 423							
0	0.000	0.000	-0.403	0.000	0.000	0.070	0.000
1	0.043	0.000	-0.403	0.000	0.000	0.053	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
2	0.087	0.000	-0.403	0.000	0.000	0.035	0.000
3	0.130	0.000	-0.403	0.000	0.000	0.018	0.000
4	0.174	0.000	-0.403	0.000	0.000	0.000	0.000
Member 429							
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.041	0.000	0.000	0.000	0.000	0.000	0.000
2	0.081	0.000	0.000	0.000	0.000	0.000	0.000
3	0.122	0.000	0.000	0.000	0.000	0.000	0.000
4	0.163	0.000	0.000	0.000	0.000	0.000	0.000
Member 431							
0	0.000	-38.331	-29.334	0.000	0.000	0.000	0.000
1	0.063	-38.348	-29.334	0.000	0.000	-1.833	0.000
2	0.125	-38.364	-29.334	0.000	0.000	-3.667	0.000
3	0.188	-38.380	-29.334	0.000	0.000	-5.500	0.000
4	0.250	-38.397	-29.334	0.000	0.000	-7.333	0.000
Member 432							
0	0.000	37.575	3.770	0.000	0.000	0.943	0.000
1	0.545	37.186	3.770	0.000	0.000	2.997	0.000
2	1.090	36.539	3.770	0.000	0.000	5.052	0.000
3	1.635	36.006	3.770	0.000	0.000	7.107	0.000
4	2.180	35.688	3.770	0.000	0.000	9.162	0.000
Member 433							
0	0.000	7.499	-36.647	0.000	0.000	9.162	0.000
1	0.063	7.477	-36.647	0.000	0.000	6.871	0.000
2	0.125	7.457	-36.647	0.000	0.000	4.581	0.000
3	0.188	7.440	-36.647	0.000	0.000	2.290	0.000
4	0.250	7.426	-36.647	0.000	0.000	0.000	0.000
Member 434							
0	0.000	-19.580	-3.998	-3.258	0.000	-0.999	-0.815
1	0.545	-19.689	-3.998	-3.258	0.000	-3.178	-2.590
2	1.090	-19.799	-3.998	-3.258	0.000	-5.357	-4.366
3	1.635	-19.909	-3.998	-3.258	0.000	-7.536	-6.142
4	2.180	-20.019	-3.998	-3.258	0.000	-9.714	-7.917
Member 435							
0	0.000	72.183	39.039	31.713	0.000	-9.714	-7.917
1	0.063	72.170	39.039	31.713	0.000	-7.274	-5.935
2	0.125	72.158	39.039	31.713	0.000	-4.834	-3.953
3	0.188	72.145	39.039	31.713	0.000	-2.394	-1.971
4	0.250	72.133	39.039	31.713	0.000	0.045	0.011
Member 436							
0	0.000	-6.199	3.018	0.000	0.000	-7.333	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
1	0.545	-6.341	3.018	0.000	0.000	-5.689	0.000
2	1.090	-6.484	3.018	0.000	0.000	-4.044	0.000
3	1.635	-6.627	3.018	0.000	0.000	-2.399	0.000
4	2.180	-6.770	3.018	0.000	0.000	-0.754	0.000
Member 437							
0	0.000	-6.770	3.018	0.000	0.000	-0.754	0.000
1	0.063	-6.786	3.018	0.000	0.000	-0.566	0.000
2	0.125	-6.802	3.018	0.000	0.000	-0.377	0.000
3	0.188	-6.819	3.018	0.000	0.000	-0.189	0.000
4	0.250	-6.835	3.018	0.000	0.000	0.000	0.000
Member 438							
0	0.000	-49.275	0.417	0.000	0.000	0.000	0.000
1	0.964	-49.132	0.208	0.000	0.000	0.302	0.000
2	1.929	-48.990	0.000	0.000	0.000	0.402	0.000
3	2.893	-48.847	-0.208	0.000	0.000	0.302	0.000
4	3.858	-48.704	-0.417	0.000	0.000	0.000	0.000
Member 439							
0	0.000	-9.491	0.417	0.000	0.000	0.000	0.000
1	0.964	-9.634	0.208	0.000	0.000	0.302	0.000
2	1.929	-9.777	0.000	0.000	0.000	0.402	0.000
3	2.893	-9.919	-0.208	0.000	0.000	0.302	0.000
4	3.858	-10.062	-0.417	0.000	0.000	0.000	0.000
Member 444							
0	0.000	-199.956	-4.173	0.514	0.000	3.182	-0.380
1	0.185	-199.956	-4.236	0.514	0.000	2.404	-0.285
2	0.370	-199.956	-4.300	0.514	0.000	1.615	-0.190
3	0.555	-199.956	-4.364	0.514	0.000	0.813	-0.095
4	0.740	-199.956	-4.428	0.514	0.000	0.000	0.000
Member 454							
0	0.000	-64.838	11.393	2.823	-0.045	177.583	-2.207
1	0.347	-65.061	10.274	2.775	-0.045	181.342	-1.233
2	0.694	-65.305	9.108	2.709	-0.045	184.704	-0.283
3	1.041	-65.537	7.908	2.668	-0.045	187.656	0.649
4	1.387	-65.757	6.673	2.654	-0.045	190.186	1.571
Member 461							
0	0.000	24.829	-0.215	0.367	0.000	0.531	-0.213
1	0.285	24.829	-0.344	0.263	0.000	0.451	-0.123
2	0.570	24.829	-0.472	0.164	0.000	0.335	-0.063
3	0.855	24.829	-0.589	0.103	0.000	0.183	-0.025
4	1.140	24.829	-0.694	0.083	0.000	0.000	0.000
Member 479							

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
0	0.000	26.796	-0.993	-2.900	-0.047	201.312	-0.248
1	0.326	26.517	-2.453	-2.942	-0.047	200.753	-1.197
2	0.651	26.221	-3.954	-3.002	-0.047	199.711	-2.165
3	0.977	25.934	-5.486	-3.038	-0.047	198.175	-3.149
4	1.302	25.658	-7.049	-3.051	-0.047	196.135	-4.140
Member 482							
0	0.000	29.587	-10.771	3.919	-0.047	196.135	-4.140
1	0.347	29.261	-12.485	3.871	-0.047	192.104	-2.787
2	0.694	28.915	-14.244	3.803	-0.047	187.470	-1.457
3	1.041	28.580	-16.039	3.762	-0.047	182.219	-0.146
4	1.387	28.257	-17.868	3.747	-0.047	176.340	1.156
Member 485							
0	0.000	26.340	-24.469	2.655	-0.047	176.340	1.156
1	0.326	26.010	-26.231	2.612	-0.047	168.089	2.015
2	0.651	25.661	-28.033	2.552	-0.047	159.257	2.855
3	0.977	25.324	-29.866	2.515	-0.047	149.834	3.679
4	1.302	25.020	-31.730	2.506	-0.047	139.809	4.495
Member 535							
0	0.000	-46.014	-5.310	0.386	0.000	25.890	-0.930
1	0.799	-46.267	-6.412	0.386	0.000	21.208	-0.622
2	1.598	-46.605	-7.514	0.386	0.000	15.646	-0.313
3	2.396	-46.943	-8.615	0.386	0.000	9.204	-0.005
4	3.195	-47.280	-9.717	0.386	0.000	1.882	0.304
Member 539							
0	0.000	19.475	18.101	3.688	0.001	0.000	0.000
1	0.285	19.475	17.991	3.729	0.001	5.144	1.055
2	0.570	19.475	17.855	3.852	0.001	10.252	2.133
3	0.855	19.475	17.709	4.011	0.001	15.320	3.254
4	1.140	19.475	17.573	4.136	0.001	20.348	4.416
Member 540							
0	0.000	19.465	11.540	-4.688	0.001	20.348	4.416
1	0.285	19.465	11.404	-4.564	0.001	23.617	3.097
2	0.570	19.465	11.256	-4.398	0.001	26.847	1.819
3	0.855	19.465	11.108	-4.233	0.001	30.033	0.590
4	1.140	19.465	10.972	-4.108	0.001	33.179	-0.598
Member 541							
0	0.000	93.842	1.860	1.185	0.001	33.179	-0.598
1	0.268	93.842	1.733	1.301	0.001	33.660	-0.266
2	0.535	93.842	1.595	1.453	0.001	34.105	0.102
3	0.802	93.842	1.457	1.605	0.001	34.513	0.511
4	1.070	93.842	1.330	1.720	0.001	34.886	0.957

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
Member 542							
0	0.000	93.775	-4.577	0.025	-0.002	34.779	1.311
1	0.285	93.775	-4.712	0.149	-0.002	33.456	1.335
2	0.570	93.775	-4.861	0.315	-0.002	32.092	1.400
3	0.855	93.775	-5.009	0.480	-0.002	30.685	1.514
4	1.140	93.775	-5.145	0.605	-0.002	29.238	1.670
Member 543							
0	0.000	177.129	-9.717	-3.237	-0.011	29.076	2.207
1	0.268	177.129	-9.844	-3.122	-0.011	26.460	1.356
2	0.535	177.129	-9.982	-2.970	-0.011	23.809	0.540
3	0.802	177.129	-10.120	-2.818	-0.011	21.120	-0.233
4	1.070	177.129	-10.247	-2.702	-0.011	18.395	-0.971
Member 544							
0	0.000	176.973	-15.704	0.069	-0.048	18.217	-0.378
1	0.285	176.973	-15.840	0.194	-0.048	13.722	-0.341
2	0.570	176.973	-15.986	0.353	-0.048	9.187	-0.263
3	0.855	176.973	-16.122	0.476	-0.048	4.611	-0.143
4	1.140	176.973	-16.232	0.517	-0.048	0.000	0.000
Member 545							
0	0.000	175.159	5.809	-2.715	0.039	0.000	0.000
1	0.185	175.159	5.740	-2.698	0.039	1.069	-0.501
2	0.370	175.159	5.661	-2.646	0.039	2.123	-0.996
3	0.555	175.159	5.576	-2.577	0.039	3.163	-1.479
4	0.740	175.159	5.492	-2.509	0.039	4.187	-1.950
Member 546							
0	0.000	175.032	1.554	1.777	0.000	4.089	-1.624
1	0.285	175.032	1.411	1.925	0.000	4.512	-1.099
2	0.570	175.032	1.244	2.153	0.000	4.891	-0.520
3	0.855	175.032	1.067	2.415	0.000	5.220	0.132
4	1.140	175.032	0.901	2.637	0.000	5.500	0.853
Member 549							
0	0.000	71.327	-1.945	-0.913	0.000	2.905	0.524
1	0.314	71.327	-2.135	-0.643	0.000	2.264	0.280
2	0.628	71.327	-2.320	-0.390	0.000	1.564	0.118
3	0.943	71.327	-2.497	-0.163	0.000	0.807	0.033
4	1.257	71.327	-2.631	-0.075	0.000	0.000	0.000
Member 553							
0	0.000	1.912	2.824	0.000	0.000	0.000	0.000
1	0.433	1.774	1.306	0.000	0.000	0.885	0.000
2	0.865	1.481	0.023	0.000	0.000	1.164	0.000
3	1.298	1.212	-1.024	0.000	0.000	0.939	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
4	1.731	1.002	-1.835	0.000	0.000	0.312	0.000
Member 554							
0	0.000	5.240	2.535	0.127	0.000	0.039	-0.340
1	0.670	4.968	1.260	0.127	0.000	1.311	-0.255
2	1.341	4.576	-0.014	0.127	0.000	1.729	-0.170
3	2.011	4.208	-1.289	0.127	0.000	1.292	-0.085
4	2.682	3.973	-2.564	0.127	0.000	0.000	0.000
Member 555							
0	0.000	4.227	4.426	0.155	0.000	0.037	-0.619
1	0.996	3.718	2.208	0.155	0.000	3.342	-0.465
2	1.993	3.049	-0.009	0.155	0.000	4.438	-0.310
3	2.989	2.380	-2.227	0.155	0.000	3.324	-0.155
4	3.986	1.912	-4.444	0.155	0.000	0.000	0.000
Member 556							
0	0.000	9.893	5.285	0.119	0.000	0.009	-0.561
1	1.182	9.259	2.641	0.119	0.000	4.693	-0.421
2	2.364	8.465	-0.002	0.119	0.000	6.253	-0.281
3	3.546	7.670	-2.645	0.119	0.000	4.689	-0.140
4	4.728	7.064	-5.288	0.119	0.000	0.000	0.000
Member 557							
0	0.000	0.080	6.144	0.067	0.000	0.004	-0.370
1	1.380	-0.687	3.072	0.067	0.000	6.361	-0.277
2	2.759	-1.614	-0.001	0.067	0.000	8.480	-0.185
3	4.139	-2.541	-3.073	0.067	0.000	6.360	-0.092
4	5.519	-3.266	-6.146	0.067	0.000	0.000	0.000
Member 558							
0	0.000	-17.121	6.996	0.000	0.000	0.000	0.000
1	1.565	-18.012	3.498	0.000	0.000	8.213	0.000
2	3.130	-19.064	0.000	0.000	0.000	10.951	0.000
3	4.696	-20.115	-3.498	0.000	0.000	8.213	0.000
4	6.261	-20.979	-6.996	0.000	0.000	0.000	0.000
Member 559							
0	0.000	-6.709	8.322	0.010	0.000	0.000	0.000
1	0.400	-6.830	7.405	0.010	0.000	3.145	0.004
2	0.800	-7.091	6.488	0.010	0.000	5.924	0.008
3	1.200	-7.367	5.571	0.010	0.000	8.335	0.012
4	1.600	-7.643	4.654	0.010	0.000	10.380	0.016
Member 560							
0	0.000	71.327	-1.314	-0.878	0.000	5.500	0.853
1	0.367	71.327	-1.529	-0.586	0.000	4.978	0.582
2	0.735	71.327	-1.763	-0.229	0.000	4.373	0.430

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
3	1.102	71.327	-1.999	0.131	0.000	3.682	0.413
4	1.470	71.327	-2.227	0.468	0.000	2.905	0.524
Member 563							
0	0.000	13.064	-42.662	-12.547	-0.047	139.809	4.495
1	0.347	12.744	-44.696	-12.584	-0.047	124.661	0.140
2	0.694	12.440	-46.776	-12.632	-0.047	108.799	-4.234
3	1.041	12.185	-48.890	-12.647	-0.047	92.210	-8.619
4	1.387	11.978	-51.039	-12.628	-0.047	74.881	-13.003
Member 564							
0	0.000	-94.286	16.178	-0.146	0.000	-19.479	0.185
1	0.318	-94.418	15.739	-0.146	0.000	-14.399	0.139
2	0.637	-94.527	15.300	-0.146	0.000	-9.460	0.093
3	0.955	-94.608	14.862	-0.146	0.000	-4.660	0.046
4	1.273	-94.661	14.423	-0.146	0.000	0.000	0.000
Member 565							
0	0.000	25.092	-49.507	9.381	-0.047	74.881	-13.003
1	0.347	24.891	-51.706	9.373	-0.047	57.330	-9.749
2	0.694	24.705	-53.950	9.354	-0.047	39.009	-6.502
3	1.041	24.568	-56.229	9.368	-0.047	19.903	-3.256
4	1.387	24.480	-58.542	9.415	-0.047	0.000	0.000
Member 566							
0	0.000	9.172	29.618	-0.529	-0.004	0.000	0.000
1	0.363	8.874	25.453	-0.529	-0.004	9.989	-0.192
2	0.726	8.563	21.431	-0.529	-0.004	18.492	-0.384
3	1.089	8.320	17.552	-0.529	-0.004	25.562	-0.576
4	1.452	8.216	13.817	-0.529	-0.004	31.250	-0.768
Member 567							
0	0.000	123.042	-6.548	0.240	-0.004	31.163	-0.768
1	0.799	122.689	-8.151	0.240	-0.004	25.292	-0.576
2	1.598	122.215	-9.753	0.240	-0.004	18.141	-0.384
3	2.396	121.741	-11.355	0.240	-0.004	9.711	-0.192
4	3.195	121.381	-12.957	0.240	-0.004	0.000	0.000
Member 568							
0	0.000	-63.597	4.982	6.508	-0.045	190.186	1.571
1	0.225	-63.752	4.155	6.488	-0.045	191.215	3.034
2	0.450	-63.915	3.309	6.459	-0.045	192.055	4.492
3	0.675	-64.074	2.448	6.442	-0.045	192.704	5.944
4	0.901	-64.228	1.572	6.436	-0.045	193.157	7.393
Member 576							
0	0.000	-48.248	0.108	0.000	0.000	0.000	0.000
1	0.480	-48.236	0.054	0.000	0.000	0.039	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
2	0.960	-48.224	0.000	0.000	0.000	0.052	0.000
3	1.440	-48.212	-0.054	0.000	0.000	0.039	0.000
4	1.920	-48.200	-0.108	0.000	0.000	0.000	0.000
Member 577							
0	0.000	95.599	0.117	0.000	0.000	0.000	0.000
1	0.516	95.587	0.058	0.000	0.000	0.045	0.000
2	1.033	95.575	0.000	0.000	0.000	0.060	0.000
3	1.549	95.563	-0.058	0.000	0.000	0.045	0.000
4	2.066	95.551	-0.117	0.000	0.000	0.000	0.000
Member 578							
0	0.000	-98.195	0.104	0.000	0.000	0.000	0.000
1	0.461	-98.183	0.052	0.000	0.000	0.036	0.000
2	0.923	-98.171	0.000	0.000	0.000	0.048	0.000
3	1.384	-98.159	-0.052	0.000	0.000	0.036	0.000
4	1.846	-98.147	-0.104	0.000	0.000	0.000	0.000
Member 579							
0	0.000	85.555	0.091	0.000	0.000	0.000	0.000
1	0.407	85.543	0.045	0.000	0.000	0.028	0.000
2	0.815	85.530	0.000	0.000	0.000	0.037	0.000
3	1.222	85.518	-0.045	0.000	0.000	0.028	0.000
4	1.629	85.506	-0.091	0.000	0.000	0.000	0.000
Member 580							
0	0.000	61.178	0.104	0.000	0.000	0.000	0.000
1	0.461	61.190	0.052	0.000	0.000	0.036	0.000
2	0.923	61.202	0.000	0.000	0.000	0.048	0.000
3	1.384	61.214	-0.052	0.000	0.000	0.036	0.000
4	1.846	61.226	-0.104	0.000	0.000	0.000	0.000
Member 581							
0	0.000	-60.199	0.101	0.000	0.000	0.000	0.000
1	0.451	-60.212	0.051	0.000	0.000	0.034	0.000
2	0.902	-60.224	0.000	0.000	0.000	0.046	0.000
3	1.353	-60.236	-0.051	0.000	0.000	0.034	0.000
4	1.803	-60.248	-0.101	0.000	0.000	0.000	0.000
Member 582							
0	0.000	77.272	0.104	0.000	0.000	0.000	0.000
1	0.461	77.284	0.052	0.000	0.000	0.036	0.000
2	0.923	77.296	0.000	0.000	0.000	0.048	0.000
3	1.384	77.308	-0.052	0.000	0.000	0.036	0.000
4	1.846	77.320	-0.104	0.000	0.000	0.000	0.000
Member 583							
0	0.000	-76.533	0.101	0.000	0.000	0.000	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
1	0.451	-76.545	0.051	0.000	0.000	0.034	0.000
2	0.902	-76.557	0.000	0.000	0.000	0.046	0.000
3	1.353	-76.569	-0.051	0.000	0.000	0.034	0.000
4	1.803	-76.581	-0.101	0.000	0.000	0.000	0.000
Member 584							
0	0.000	46.855	0.104	0.000	0.000	0.000	0.000
1	0.461	46.867	0.052	0.000	0.000	0.036	0.000
2	0.923	46.880	0.000	0.000	0.000	0.048	0.000
3	1.384	46.892	-0.052	0.000	0.000	0.036	0.000
4	1.846	46.904	-0.104	0.000	0.000	0.000	0.000
Member 585							
0	0.000	-48.007	0.104	0.000	0.000	0.000	0.000
1	0.461	-48.019	0.052	0.000	0.000	0.036	0.000
2	0.923	-48.031	0.000	0.000	0.000	0.048	0.000
3	1.384	-48.043	-0.052	0.000	0.000	0.036	0.000
4	1.846	-48.055	-0.104	0.000	0.000	0.000	0.000
Member 586							
0	0.000	17.967	4.437	0.014	0.000	10.380	0.016
1	0.800	17.415	2.603	0.014	0.000	13.196	0.028
2	1.600	16.862	0.769	0.014	0.000	14.545	0.039
3	2.400	16.310	-1.065	0.014	0.000	14.427	0.050
4	3.200	15.758	-2.898	0.014	0.000	12.842	0.061
Member 587							
0	0.000	44.106	-3.123	-0.027	0.000	12.842	0.061
1	0.563	43.717	-4.414	-0.027	0.000	10.721	0.046
2	1.126	43.329	-5.704	-0.027	0.000	7.874	0.031
3	1.689	42.978	-6.994	-0.027	0.000	4.300	0.015
4	2.251	42.759	-8.284	-0.027	0.000	0.000	0.000
Member 588							
0	0.000	15.816	0.110	0.000	0.000	0.000	0.000
1	0.491	15.803	0.055	0.000	0.000	0.041	0.000
2	0.982	15.790	0.000	0.000	0.000	0.054	0.000
3	1.473	15.776	-0.055	0.000	0.000	0.041	0.000
4	1.965	15.763	-0.110	0.000	0.000	0.000	0.000
Member 589							
0	0.000	-15.726	0.110	0.000	0.000	0.000	0.000
1	0.490	-15.739	0.055	0.000	0.000	0.040	0.000
2	0.980	-15.752	0.000	0.000	0.000	0.054	0.000
3	1.471	-15.766	-0.055	0.000	0.000	0.040	0.000
4	1.961	-15.779	-0.110	0.000	0.000	0.000	0.000
Member 590							

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
0	0.000	16.569	0.110	0.000	0.000	0.000	0.000
1	0.492	16.556	0.055	0.000	0.000	0.041	0.000
2	0.984	16.542	0.000	0.000	0.000	0.054	0.000
3	1.476	16.529	-0.055	0.000	0.000	0.041	0.000
4	1.968	16.516	-0.110	0.000	0.000	0.000	0.000
Member 591							
0	0.000	-17.732	0.118	0.000	0.000	0.000	0.000
1	0.526	-17.747	0.059	0.000	0.000	0.046	0.000
2	1.052	-17.762	0.000	0.000	0.000	0.062	0.000
3	1.578	-17.776	-0.059	0.000	0.000	0.046	0.000
4	2.105	-17.791	-0.118	0.000	0.000	0.000	0.000
Member 592							
0	0.000	10.575	0.071	0.000	0.000	0.000	0.000
1	0.309	10.571	0.035	0.000	0.000	0.016	0.000
2	0.619	10.567	0.000	0.000	0.000	0.022	0.000
3	0.928	10.563	-0.035	0.000	0.000	0.016	0.000
4	1.238	10.559	-0.071	0.000	0.000	0.000	0.000
Member 593							
0	0.000	23.442	0.185	0.000	0.000	0.000	0.000
1	0.804	23.435	0.092	0.000	0.000	0.111	0.000
2	1.607	23.429	0.000	0.000	0.000	0.149	0.000
3	2.411	23.422	-0.092	0.000	0.000	0.111	0.000
4	3.214	23.416	-0.185	0.000	0.000	0.000	0.000
Member 594							
0	0.000	-29.001	0.097	0.000	0.000	0.000	0.000
1	0.427	-28.994	0.049	0.000	0.000	0.031	0.000
2	0.855	-28.987	0.000	0.000	0.000	0.042	0.000
3	1.282	-28.979	-0.049	0.000	0.000	0.031	0.000
4	1.709	-28.972	-0.097	0.000	0.000	0.000	0.000
Member 601							
0	0.000	-46.843	34.715	-5.452	-0.045	99.637	3.018
1	0.382	-46.984	33.451	-5.345	-0.045	112.671	0.954
2	0.765	-47.147	32.190	-5.271	-0.045	125.222	-1.074
3	1.147	-47.332	30.932	-5.231	-0.045	137.292	-3.081
4	1.530	-47.539	29.677	-5.225	-0.045	148.881	-5.080
Member 602							
0	0.000	-29.187	0.080	0.000	0.000	0.000	0.000
1	0.363	-29.199	0.040	0.000	0.000	0.022	0.000
2	0.726	-29.211	0.000	0.000	0.000	0.029	0.000
3	1.089	-29.223	-0.040	0.000	0.000	0.022	0.000
4	1.452	-29.235	-0.080	0.000	0.000	0.000	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
Member 603							
0	0.000	-30.638	0.048	0.000	0.000	0.000	0.000
1	0.218	-30.645	0.024	0.000	0.000	0.008	0.000
2	0.436	-30.652	0.000	0.000	0.000	0.010	0.000
3	0.654	-30.660	-0.024	0.000	0.000	0.008	0.000
4	0.872	-30.667	-0.048	0.000	0.000	0.000	0.000
Member 604							
0	0.000	-100.479	-3.363	-0.452	0.000	13.134	0.799
1	0.652	-100.479	-3.588	-0.452	0.000	10.866	0.504
2	1.305	-100.479	-3.813	-0.452	0.000	8.452	0.209
3	1.957	-100.479	-4.038	-0.452	0.000	5.890	-0.085
4	2.610	-100.479	-4.263	-0.452	0.000	3.182	-0.380
Member 605							
0	0.000	1.002	-1.835	0.000	0.000	0.312	0.000
1	0.040	0.993	-1.892	0.000	0.000	0.238	0.000
2	0.080	0.985	-1.948	0.000	0.000	0.161	0.000
3	0.120	0.979	-2.004	0.000	0.000	0.081	0.000
4	0.160	0.975	-2.060	0.000	0.000	0.000	0.000
Member 608							
0	0.000	-65.245	14.069	1.552	-0.045	173.746	-2.643
1	0.070	-65.282	13.854	1.551	-0.045	174.728	-2.534
2	0.141	-65.319	13.638	1.551	-0.045	175.695	-2.425
3	0.211	-65.356	13.420	1.551	-0.045	176.646	-2.316
4	0.281	-65.394	13.201	1.551	-0.045	177.583	-2.207
Member 609							
0	0.000	-126.952	0.209	0.317	0.000	0.651	0.192
1	0.552	-126.952	-0.043	0.115	0.000	0.696	0.311
2	1.105	-126.952	-0.294	-0.087	0.000	0.603	0.319
3	1.657	-126.952	-0.546	-0.289	0.000	0.371	0.215
4	2.210	-126.952	-0.797	-0.491	0.000	0.000	0.000
Member 610							
0	0.000	-33.789	0.743	0.308	0.000	0.000	0.000
1	0.552	-33.789	0.492	0.106	0.000	0.341	0.114
2	1.105	-33.789	0.240	-0.096	0.000	0.543	0.117
3	1.657	-33.789	-0.011	-0.298	0.000	0.607	0.008
4	2.210	-33.789	-0.263	-0.500	0.000	0.531	-0.213
Member 614							
0	0.000	-5.065	54.916	-1.988	0.000	-20.377	0.745
1	0.094	-5.065	54.619	-1.988	0.000	-15.242	0.559
2	0.188	-5.065	54.332	-1.988	0.000	-10.135	0.373
3	0.281	-5.065	54.053	-1.988	0.000	-5.055	0.186

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

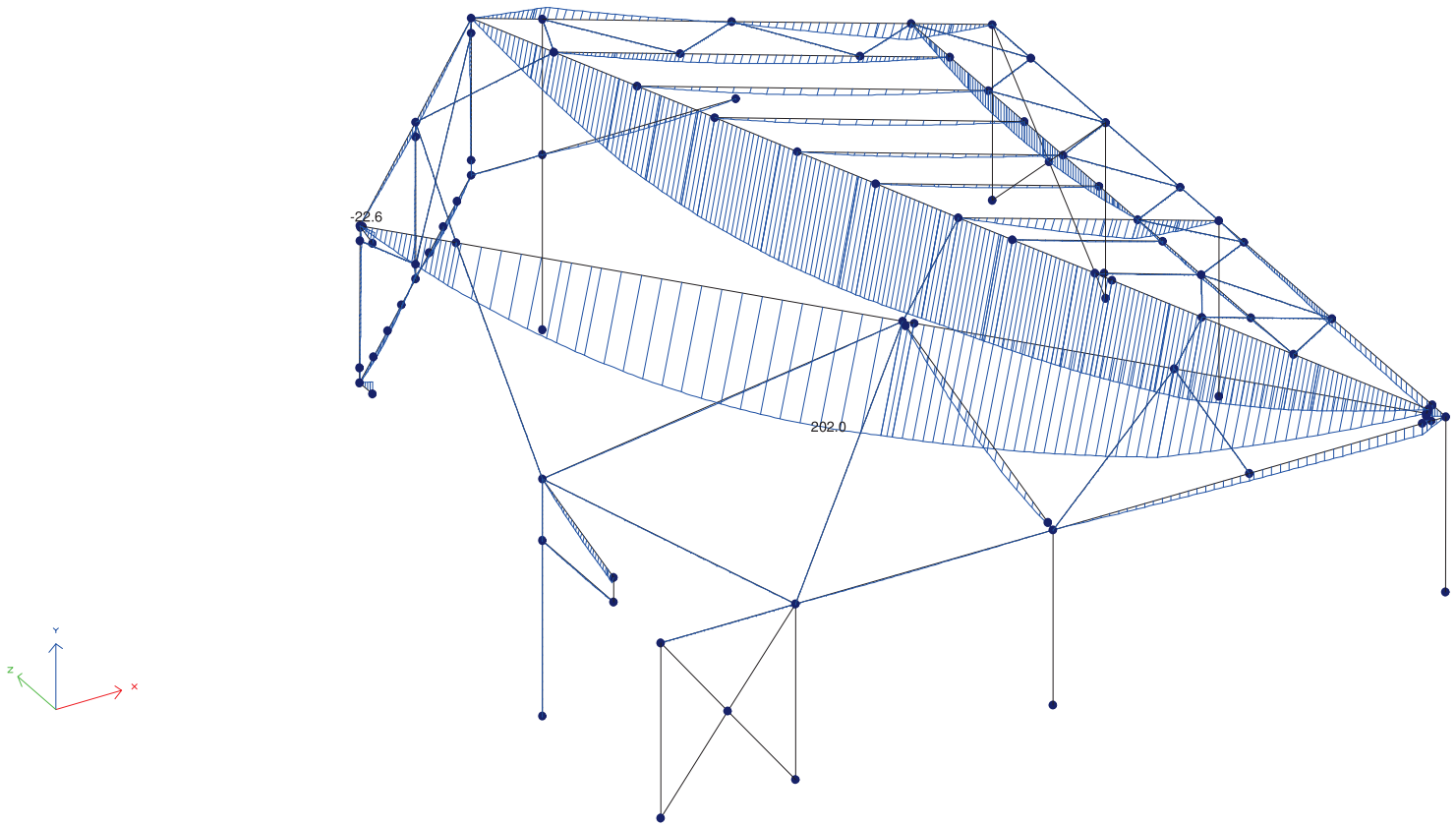
Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
4	0.375	-5.065	53.782	-1.988	0.000	0.000	0.000
Member 615							
0	0.000	-12.907	57.950	1.071	-0.002	-22.628	-0.420
1	0.092	-12.934	57.857	1.071	-0.002	-17.307	-0.321
2	0.184	-12.957	57.778	1.071	-0.002	-11.993	-0.223
3	0.276	-12.976	57.714	1.071	-0.002	-6.686	-0.125
4	0.368	-12.991	57.665	1.071	-0.002	-1.384	-0.026
Member 616							
0	0.000	144.462	-0.986	0.402	0.000	0.000	0.000
1	0.750	144.153	-0.986	0.402	0.000	-0.739	0.302
2	1.500	143.845	-0.986	0.402	0.000	-1.478	0.603
3	2.250	143.536	-0.986	0.402	0.000	-2.218	0.905
4	3.000	143.227	-0.986	0.402	0.000	-2.957	1.206
Member 617							
0	0.000	75.857	1.152	1.291	-0.007	-2.957	-3.315
1	0.642	75.593	1.152	1.291	-0.007	-2.218	-2.486
2	1.284	75.328	1.152	1.291	-0.007	-1.479	-1.657
3	1.925	75.064	1.152	1.291	-0.007	-0.739	-0.829
4	2.567	74.800	1.152	1.291	-0.007	0.000	0.000
Member 618							
0	0.000	-4.176	5.833	0.150	-0.001	0.000	0.000
1	1.256	-4.176	1.520	0.150	-0.001	4.641	0.188
2	2.512	-4.176	-3.021	0.150	-0.001	3.722	0.376
3	3.768	-4.176	-7.789	0.150	-0.001	-3.043	0.564
4	5.024	-4.176	-12.454	0.150	-0.001	-15.856	0.752
Member 619							
0	0.000	-31.156	9.258	-0.081	0.000	0.000	0.000
1	1.312	-31.944	1.167	-0.081	0.000	6.669	-0.107
2	2.623	-33.494	-5.381	-0.081	0.000	3.736	-0.213
3	3.935	-34.886	-10.387	-0.081	0.000	-6.774	-0.320
4	5.247	-35.713	-13.300	-0.081	0.000	-22.628	-0.426
Member 620							
0	0.000	5.341	15.089	0.000	0.000	-3.619	-0.001
1	0.366	5.269	12.702	0.000	0.000	1.461	-0.001
2	0.731	5.127	10.314	0.000	0.000	5.667	-0.001
3	1.097	4.916	7.927	0.000	0.000	9.001	-0.001
4	1.462	4.633	5.540	0.000	0.000	11.462	-0.001
Member 621							
0	0.000	110.616	0.160	0.000	0.000	0.000	0.000
1	0.680	110.457	0.080	0.000	0.000	0.081	0.000
2	1.359	110.298	0.000	0.000	0.000	0.109	0.000

Member Effects for Combination 1.4Gk+1.6Qk (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Axial force (kN)	Shear force (kN)		Moment effects (kNm)		
			Normal	Lateral	Torsion	Normal	Lateral
3	2.039	110.139	-0.080	0.000	0.000	0.081	0.000
4	2.719	109.979	-0.160	0.000	0.000	0.000	0.000
Member 622							
0	0.000	10.231	0.423	0.000	0.000	0.000	0.000
1	0.874	10.144	0.212	0.000	0.000	0.277	0.000
2	1.749	10.056	0.000	0.000	0.000	0.370	0.000
3	2.623	9.968	-0.212	0.000	0.000	0.277	0.000
4	3.497	9.880	-0.423	0.000	0.000	0.000	0.000

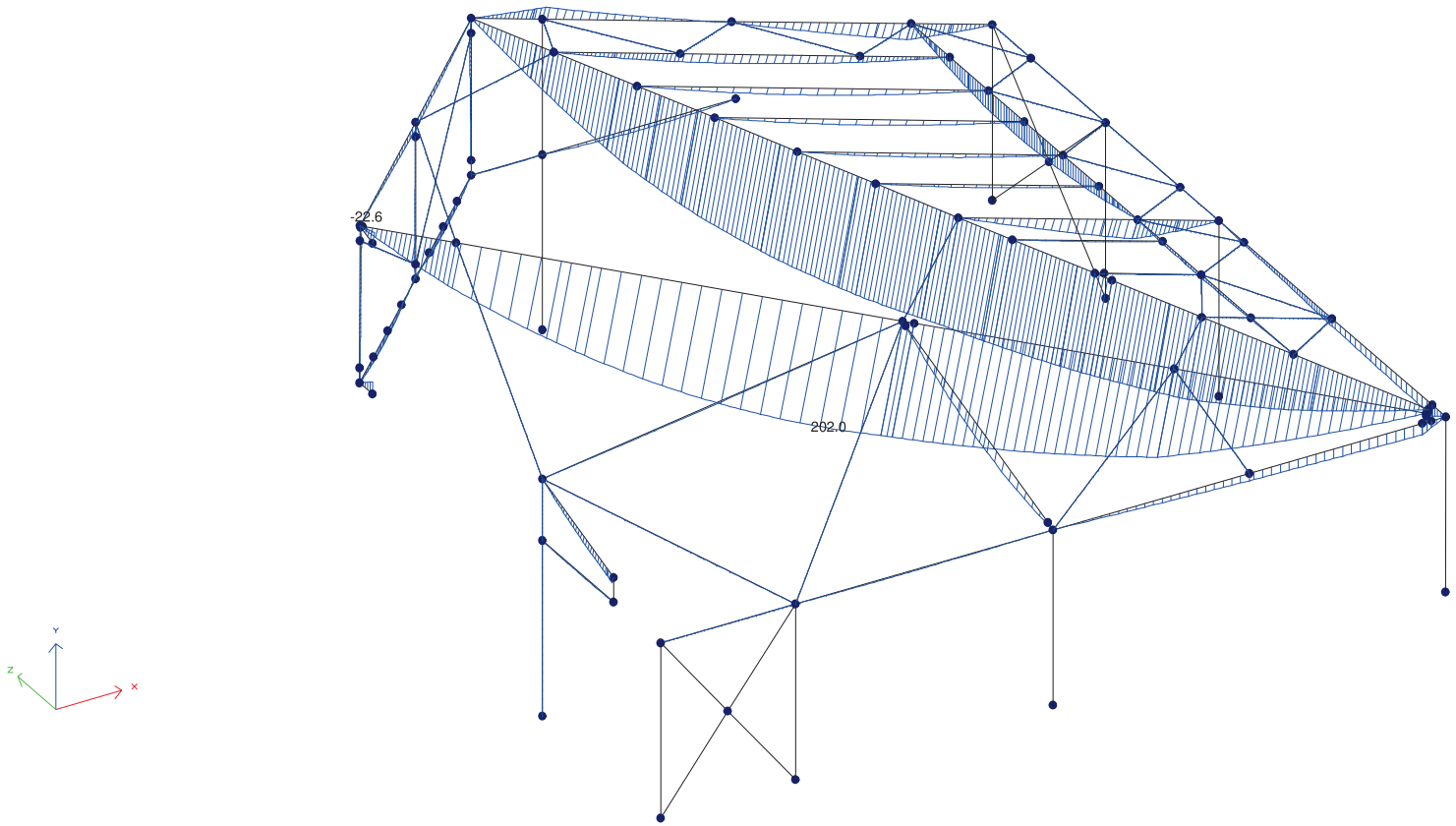
Vertical BM: 1.4Gk + 1.6Qk



Vertical BM: 1.4Gk + 1.6Qk

JOHN PLUMMER PARTNERSHIP	STRUCTURAL MODEL - ULS MEMBER DESIGN	Job No 2022-302 Job Ref Viking Centre Designed By TM Checked By Date April 2023 Revision No 0 Calc No Page No

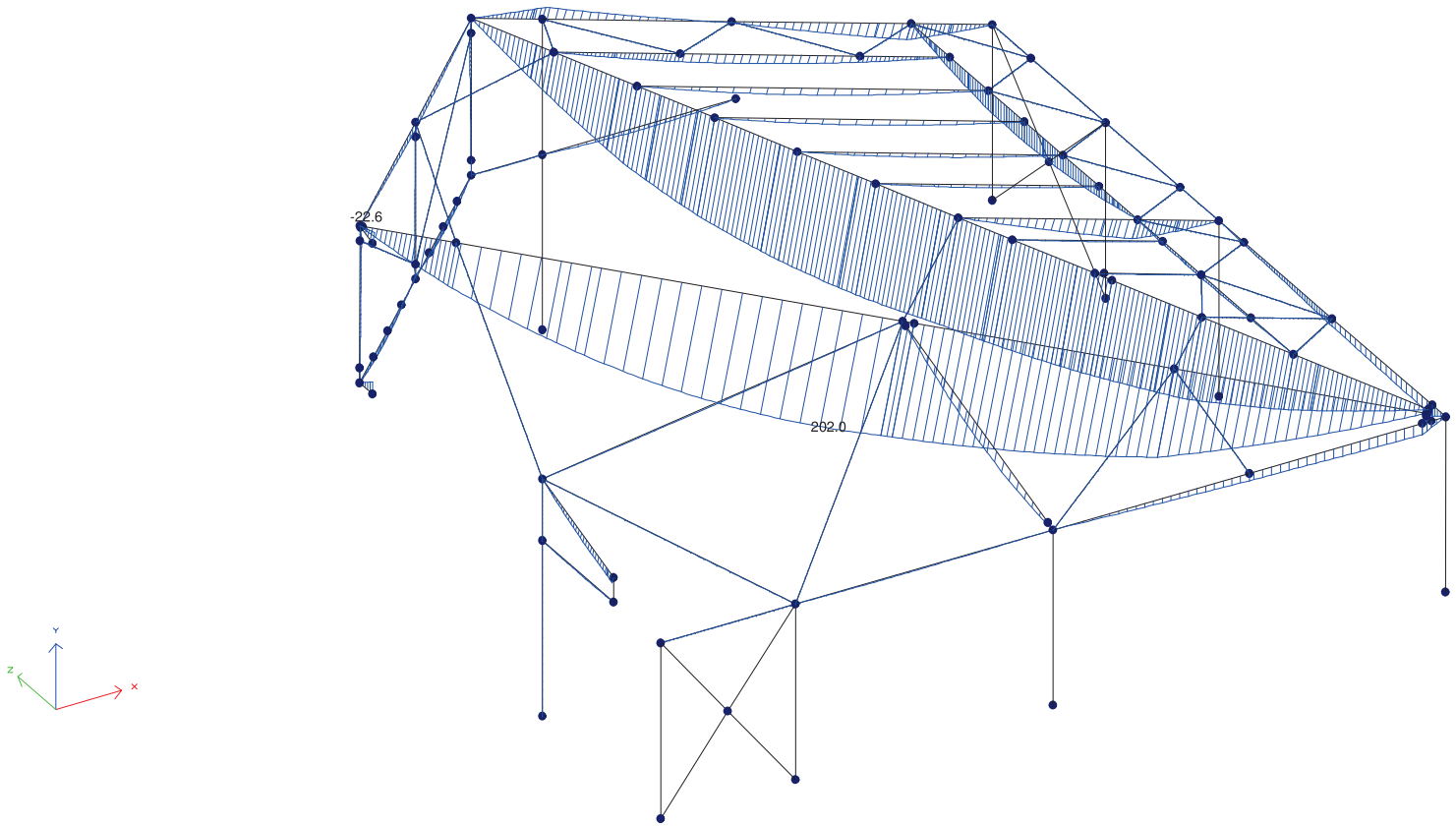
Vertical BM: 1.4Gk + 1.6Qk



Vertical BM: 1.4Gk + 1.6Qk

JOHN PLUMMER PARTNERSHIP	STRUCTURAL MODEL - ULS MEMBER DESIGN	Job No 2022-302 Job Ref Viking Centre Designed By TM Checked By Date April 2023 Revision No 0 Calc No Page No

Vertical BM: 1.4Gk + 1.6Qk



Vertical BM: 1.4Gk + 1.6Qk

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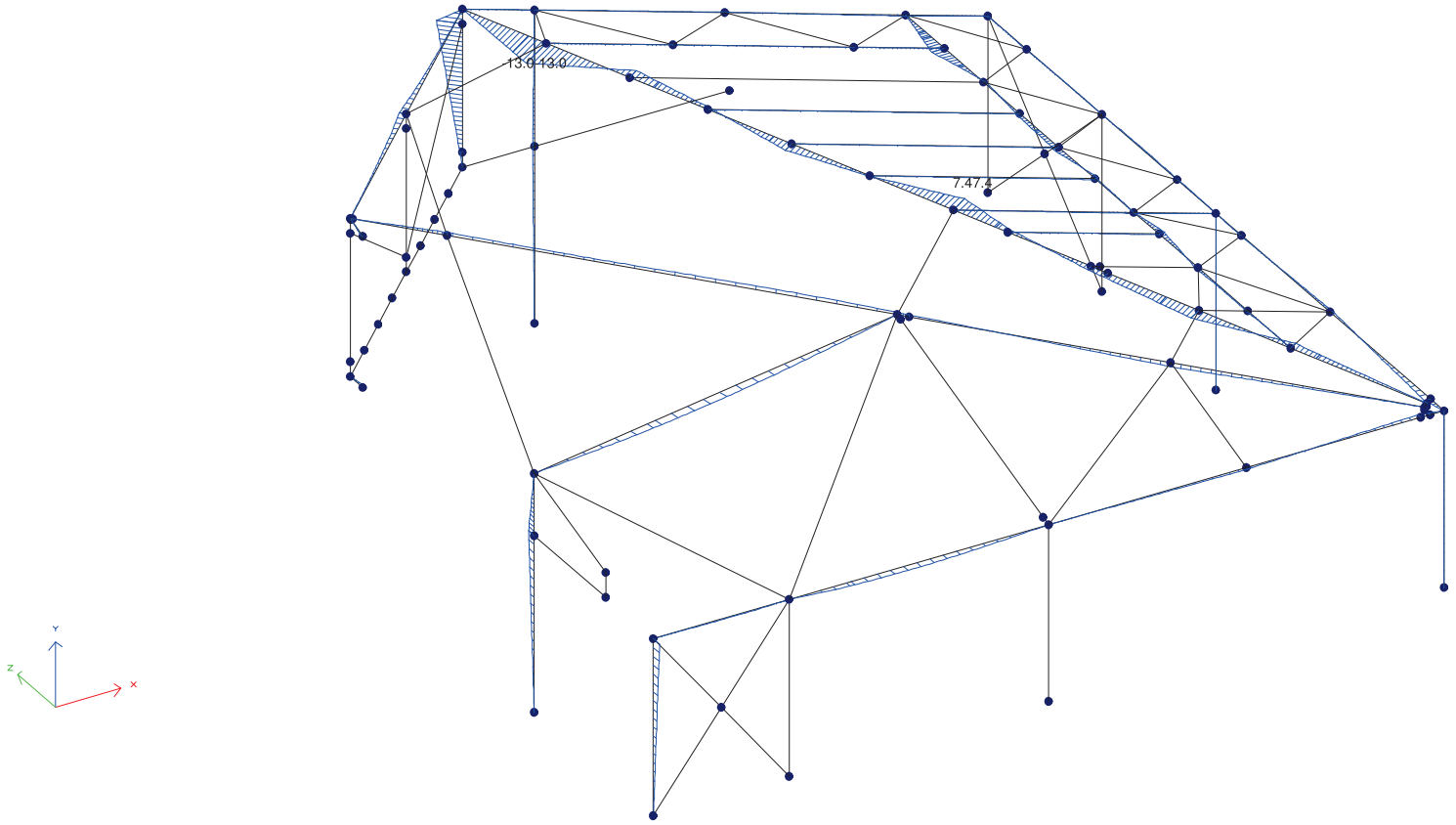
Horizontal BM: 1.4Gk + 1.6Qk



Horizontal BM: 1.4Gk + 1.6Qk

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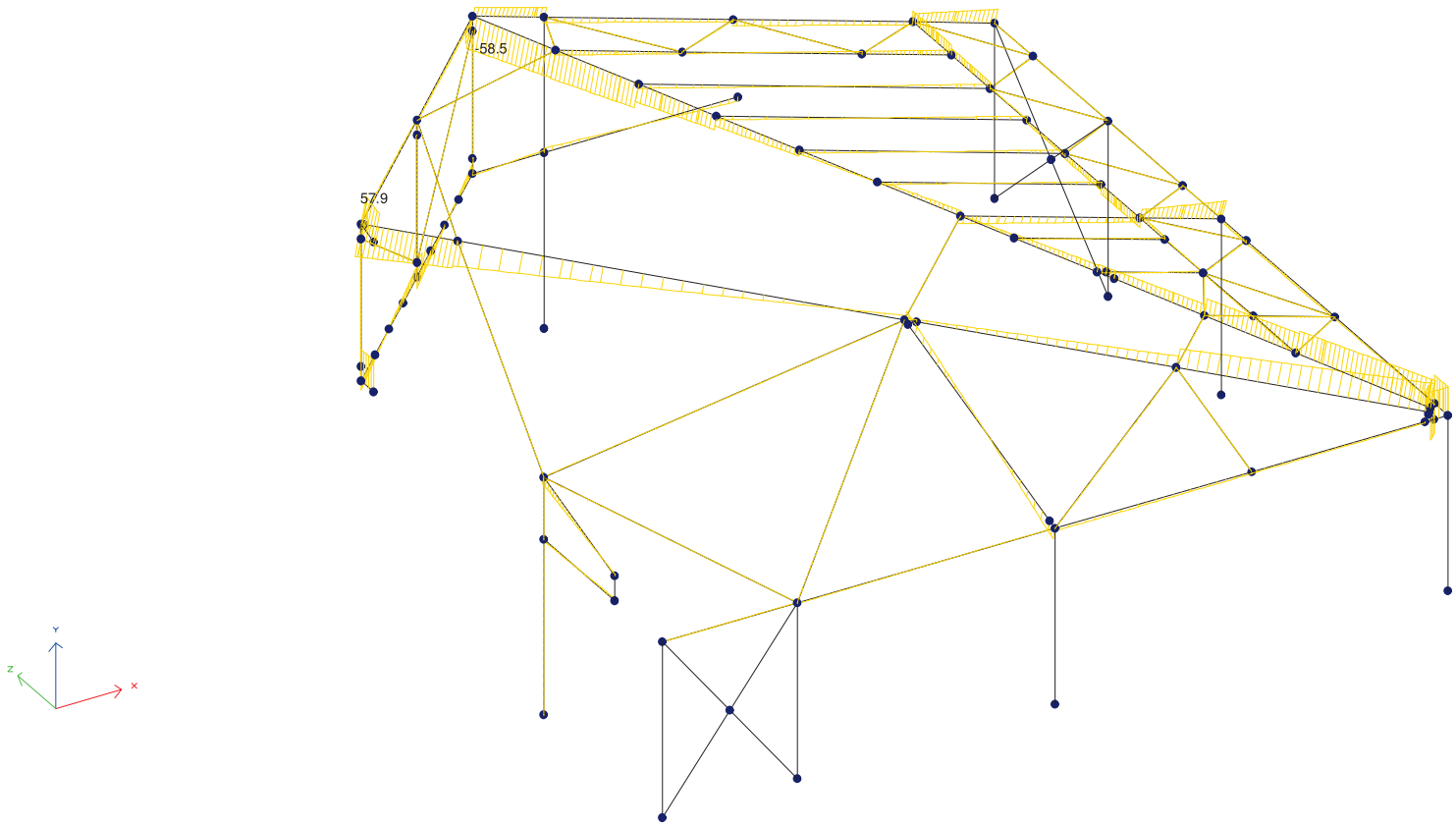
Shear Forces: 1.4Gk + 1.6Qk



Shear Forces: 1.4Gk + 1.6Qk

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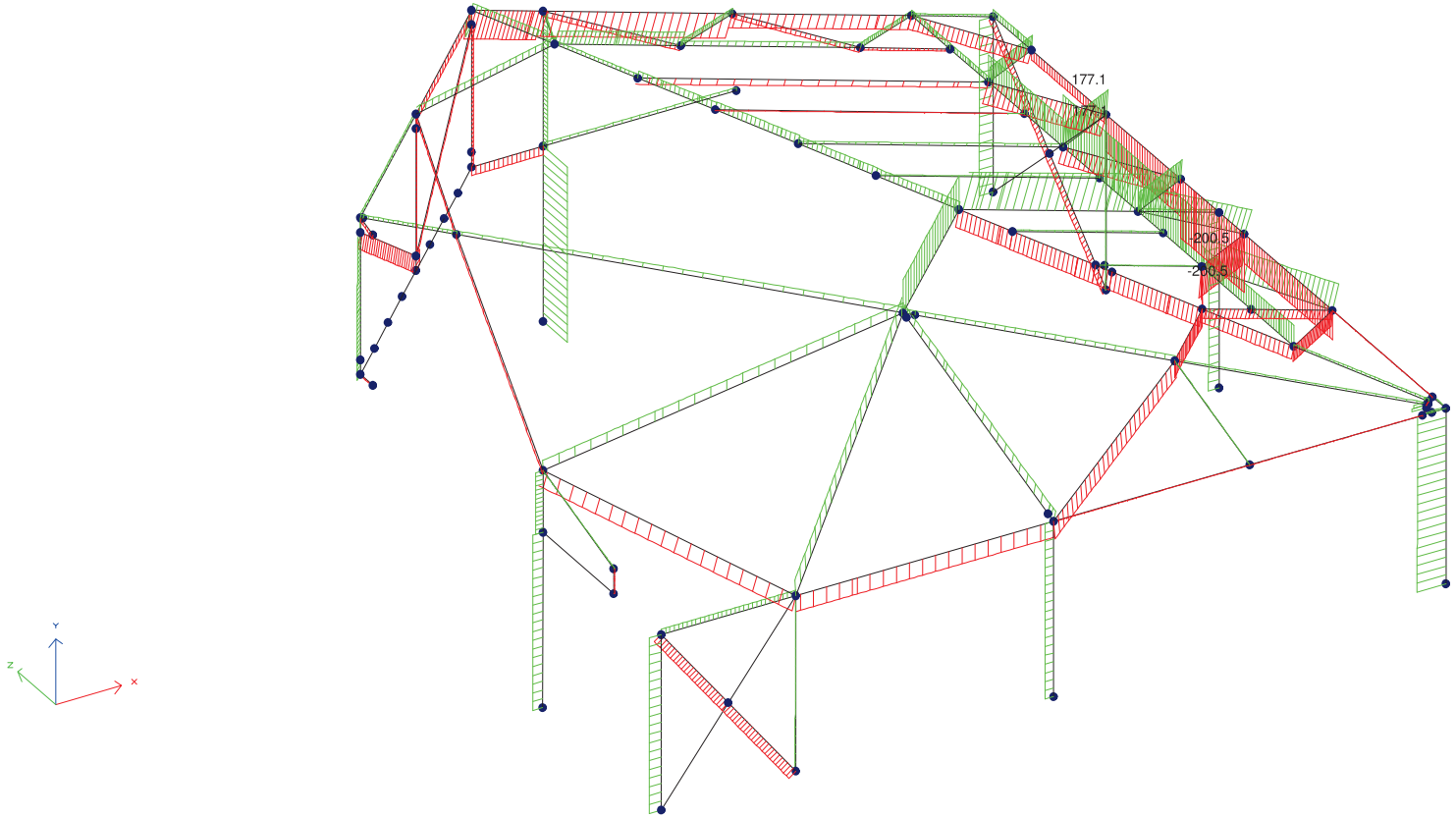
Axial Forces: 1.4Gk + 1.6Qk



Axial Forces: 1.4Gk + 1.6Qk

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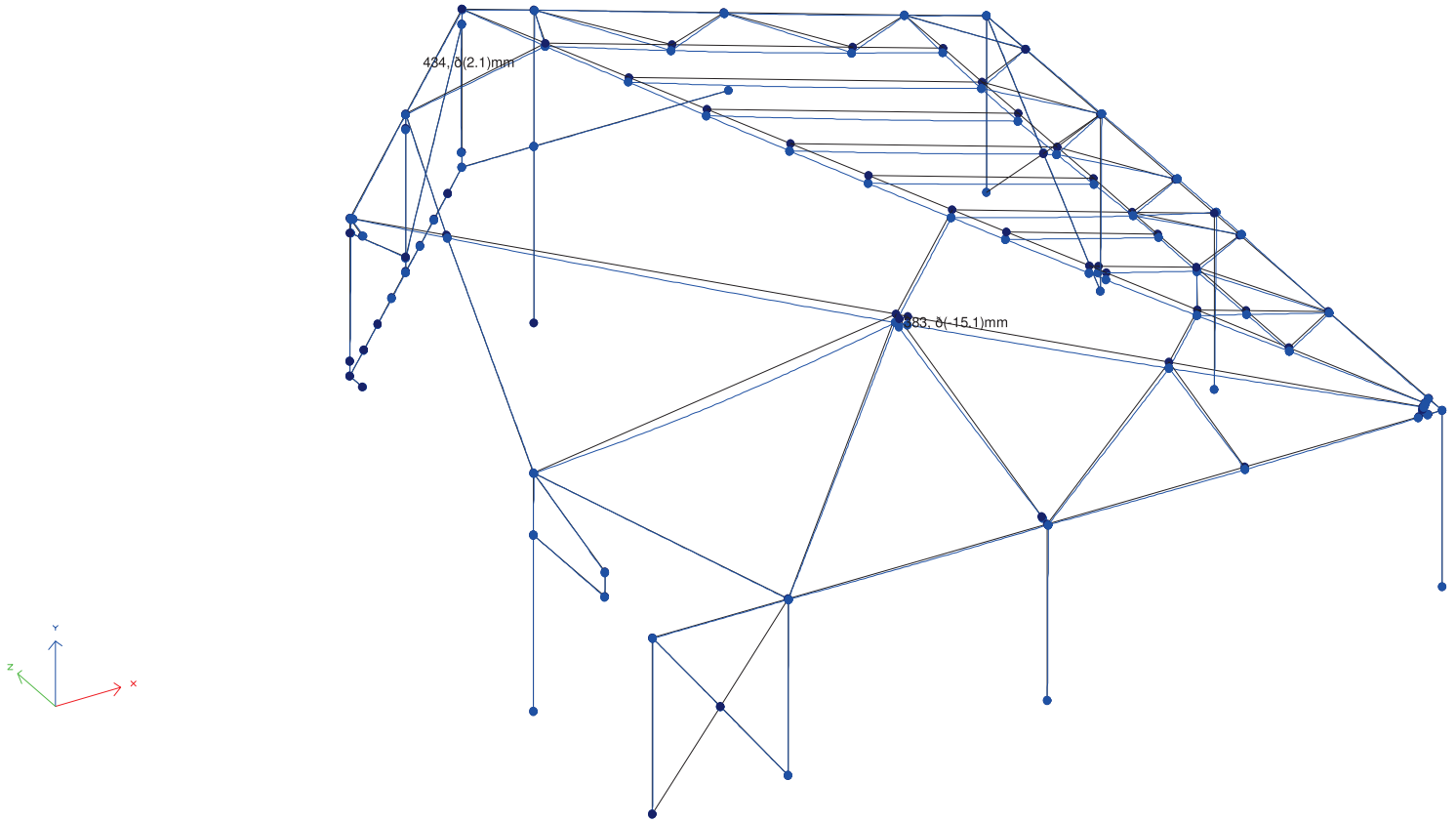
Vertical Def'n: 1.0Qk



Vertical Deflection: 1.0Qk

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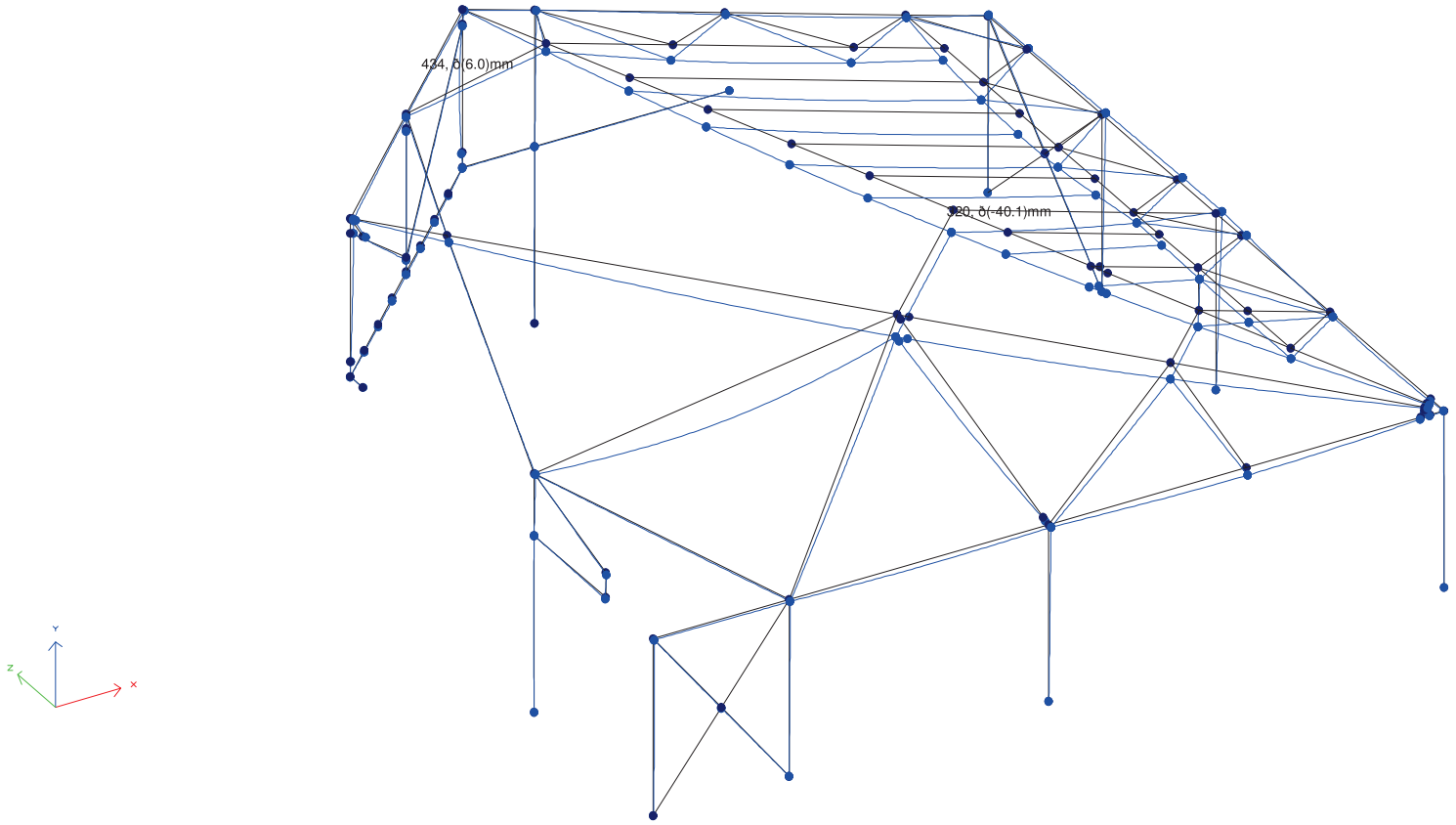
Vertical Def'n: 1.0Gk + 1.0Qk



Vertical Deflection: 1.0Gk + 1.0Qk

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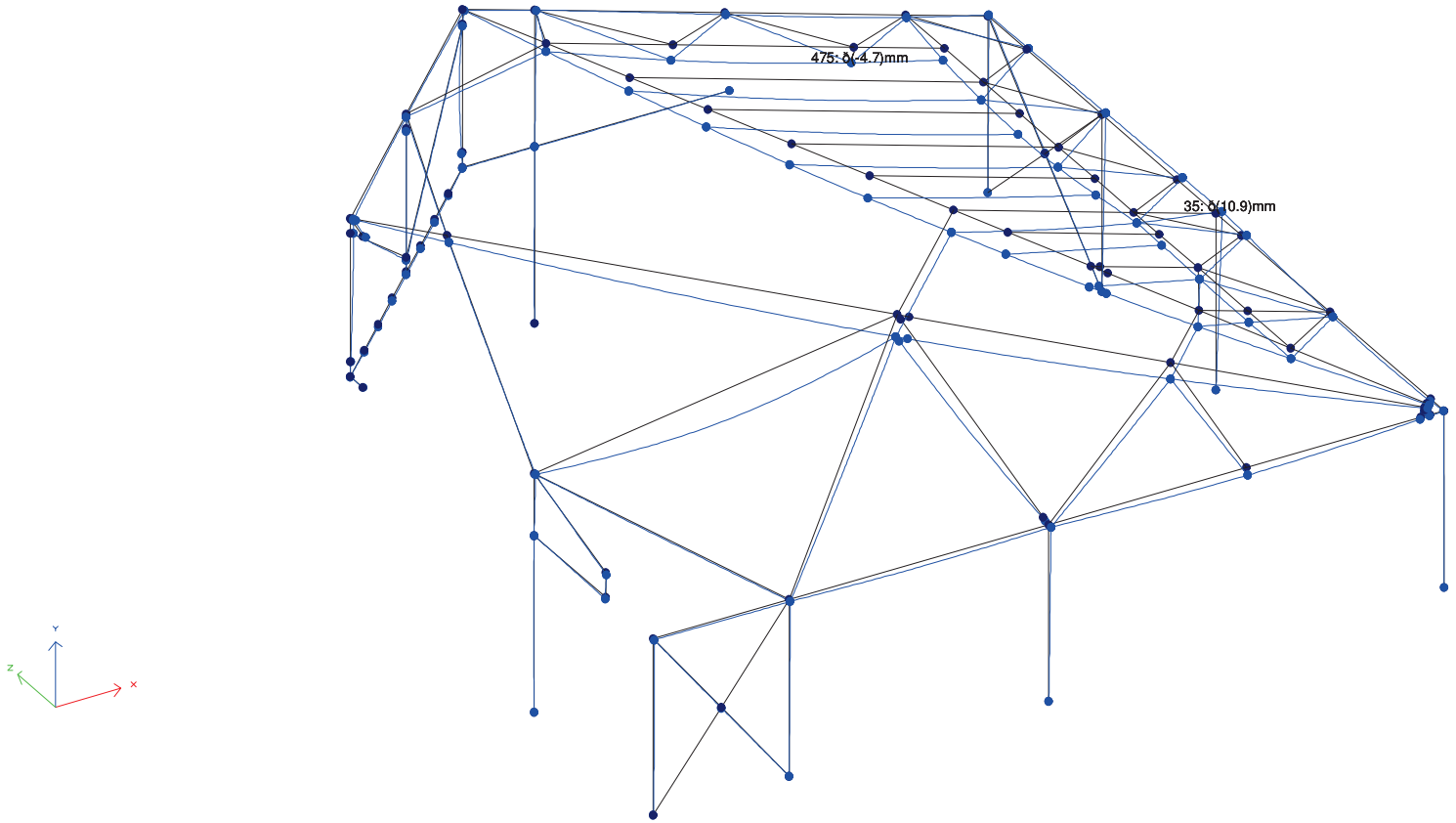
Horizontal Def'n: 1.0Gk+1.0Qk



Horizontal Def'n: 1.0Gk+1.0Qk

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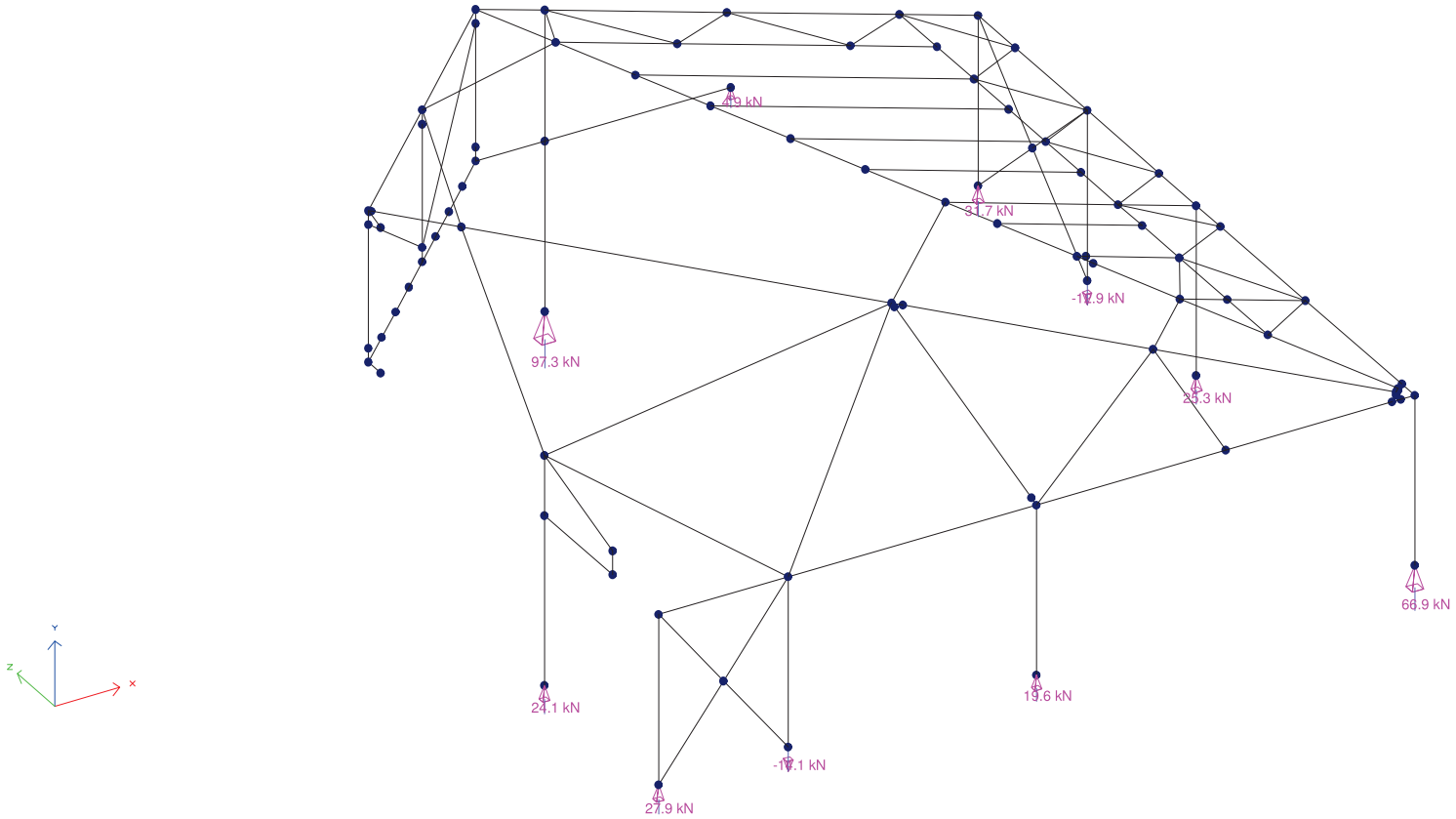
Support Reactions: 1.0Gk + 1.0Q



Support Reactions: 1.0Gk + 1.0Qk

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Steel Group Results Summary

Design Group Reference	Design parameter	Analysis Section	Design Section	Utilisation Factors				Design Status
				Local Capacity	Lateral Buckling	Torsion Buckling	Deflection	
beam1	beam1	533x210 UKB82		0.276	0.935	n / a	n / a	Passed
beam2	beam2	203x133 UKB25		0.129	0.149	n / a	n / a	Passed
beam3	beam3	254x146 UKB31		0.180	0.107	n / a	n / a	Passed
beam4	beam4	254x146 UKB31		0.095	0.443	n / a	n / a	Passed
beam9	beam9	203x133 UKB25		0.260	0.796	n / a	n / a	Passed
beams11	beam11	203x133 UKB25		0.223	0.339	n / a	n / a	Passed
truss braces	trussbrace	178x102 UKB19		0.057	0.033	n / a	n / a	Passed
hangers	hanger	Multiple		0.412	0.598	n / a	n / a	Passed
columns	column	Multiple		0.203	0.612	n / a	n / a	Passed
beam 6	beam6	254x146 UKB31		0.186	0.445	n / a	n / a	Passed
beam 7	beam7	533x210 UKB82		0.275	0.919	n / a	n / a	Passed
roof bracing	defaults	Multiple		0.259	0.737	n / a	n / a	Passed
Roof light primary1	rooflight primary	Multiple		0.381	0.870	n / a	n / a	Passed
Rooflight primary2	rooflight primary	203x133 UKB25		0.154	0.404	n / a	n / a	Passed
beams5	beam5	203x133 UKB25		0.211	0.681	n / a	n / a	Passed
beam8	beam8	203x133 UKB25		0.341	0.718	n / a	n / a	Passed
rooflight trimmers	rooflight trimmers	203x102 UKB23		0.177	0.354	n / a	n / a	Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beam1	120	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beam2	124	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beam3	126	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beam4	128	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beam9	146	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beams11	150	SW Design	BS5950:2000		Passed
	152	SW Design	BS5950:2000		Passed
	153	SW Design	BS5950:2000		Passed
	154	SW Design	BS5950:2000		Passed
	155	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
truss braces	156	SW Design	BS5950:2000		Passed
	157	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
hangers	164	SW Design	BS5950:2000		Passed
	165	SW Design	BS5950:2000		Passed
	166	SW Design	BS5950:2000		Passed
	167	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
columns	172	SW Design	BS5950:2000		Passed
	173	SW Design	BS5950:2000		Passed
	175	SW Design	BS5950:2000		Passed
	176	SW Design	BS5950:2000		Passed
	177	SW Design	BS5950:2000		Passed
	178	SW Design	BS5950:2000		Passed
	179	SW Design	BS5950:2000		Passed
	180	SW Design	BS5950:2000		Passed

Design Results Summary (continued)

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
	181	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beam 6	186	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beam 7	196	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
roof bracing	268	SW Design	BS5950:2000		Passed
	269	SW Design	BS5950:2000		Passed
	270	SW Design	BS5950:2000		Passed
	271	SW Design	BS5950:2000		Passed
	272	SW Design	BS5950:2000		Passed
	273	SW Design	BS5950:2000		Passed
	274	SW Design	BS5950:2000		Passed
	276	SW Design	BS5950:2000		Passed
	277	SW Design	BS5950:2000		Passed
	278	SW Design	BS5950:2000		Passed
	279	SW Design	BS5950:2000		Passed
	280	SW Design	BS5950:2000		Passed
	281	SW Design	BS5950:2000		Passed
	282	SW Design	BS5950:2000		Passed
	283	SW Design	BS5950:2000		Passed
	284	SW Design	BS5950:2000		Passed
	285	SW Design	BS5950:2000		Passed
	286	SW Design	BS5950:2000		Passed
	287	SW Design	BS5950:2000		Passed
	288	SW Design	BS5950:2000		Passed
	289	SW Design	BS5950:2000		Passed
	290	SW Design	BS5950:2000		Passed
	291	SW Design	BS5950:2000		Passed
	292	SW Design	BS5950:2000		Passed
	293	SW Design	BS5950:2000		Passed
	294	SW Design	BS5950:2000		Passed
	295	SW Design	BS5950:2000		Passed

Design Results Summary (continued)

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
	296	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
Roof light	326	SW Design	BS5950:2000		Passed
	327	SW Design	BS5950:2000		Passed
	328	SW Design	BS5950:2000		Passed
	329	SW Design	BS5950:2000		Passed
	330	SW Design	BS5950:2000		Passed
	331	SW Design	BS5950:2000		Passed
	332	SW Design	BS5950:2000		Passed
	333	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
Rooflight	342	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beams5	344	SW Design	BS5950:2000		Passed
	345	SW Design	BS5950:2000		Passed
	346	SW Design	BS5950:2000		Passed
	347	SW Design	BS5950:2000		Passed
	348	SW Design	BS5950:2000		Passed
	349	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
beam8	356	SW Design	BS5950:2000		Passed

Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
rooflight	358	SW Design	BS5950:2000		Passed
	359	SW Design	BS5950:2000		Passed
	360	SW Design	BS5950:2000		Passed
	361	SW Design	BS5950:2000		Passed

Design Results Summary (continued)

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
	362	SW Design	BS5950:2000		Passed
	363	SW Design	BS5950:2000		Passed
	364	SW Design	BS5950:2000		Passed

Steelwork Design Results

Desig object ref	Memb ref	Design parameter	Analysis section	Design section	Utilisation factors				Design status
					Local capacity	Lateral buckling	Torsion	Deflection	
Group Reference - beam1									
120	298-380	*beam1*	533x210 UKB82		0.276	0.935	n / a	n / a	Passed
Group Reference - beam2									
124	403	*beam2*	203x133 UKB25		0.129	0.149	n / a	n / a	Passed
Group Reference - beam3									
126	615-377	*beam3*	254x146 UKB31		0.180	0.107	n / a	n / a	Passed
Group Reference - beam4									
128	71-112	*beam4*	254x146 UKB31		0.095	0.443	n / a	n / a	Passed
Group Reference - beam9									
146	308-346	*beam9*	203x133 UKB25		0.260	0.796	n / a	n / a	Passed
Group Reference - beams11									
150	404	*beam11*	203x133 UKB25		0.019	0.023	n / a	n / a	Passed
152	614	*beam11*	203x133 UKB25		0.223	0.156	n / a	n / a	Passed
153	138-145	*beam11*	203x133 UKB25		0.118	0.339	n / a	n / a	Passed
154	117	*beam11*	203x133 UKB25		0.026	0.014	n / a	n / a	Passed
155	397	*beam11*	203x133 UKB25		0.067	0.140	n / a	n / a	Passed
Group Reference - truss braces									
156	438	*trussbrace*	178x102 UKB19		0.057	0.033	n / a	n / a	Passed
157	439	*trussbrace*	178x102 UKB19		0.012	0.033	n / a	n / a	Passed
Group Reference - hangers									
164	118-433	*hanger*	100x100x5 SHS		0.390	0.396	n / a	n / a	Passed
165	119-435	*hanger*	100x100x5 SHS		0.412	0.598	n / a	n / a	Passed
166	431-437	*hanger*	178x102 UKB19		0.161	0.150	n / a	n / a	Passed
167	401	*hanger*	178x102 UKB19		0.004	0.004	n / a	n / a	Passed
Group Reference - columns									
172	14-276	*column*	203x133 UKB30		0.106	0.612	n / a	n / a	Passed
173	27-38	*column*	152x152 UKC23		0.183	0.231	n / a	n / a	Passed
175	1	*column*	150x150x8 SHS		0.062	0.069	n / a	n / a	Passed

Steelwork Design Results (continued)

Desig object ref	Memb ref	Design parameter	Analysis section	Design section	Utilisation factors				Design status
					Local capacity	Lateral buckling	Torsion buckling	Deflection	
176	2	column	152x152 UKC23		0.036	0.069	n / a	n / a	Passed
177	3	column	152x152 UKC23		0.045	0.086	n / a	n / a	Passed
178	4	column	152x152 UKC23		0.028	0.053	n / a	n / a	Passed
179	5	column	152x152 UKC23		0.203	0.182	n / a	n / a	Passed
180	82	column	152x152 UKC23		0.002	0.016	n / a	n / a	Passed
181	89	column	152x152 UKC23		0.003	0.016	n / a	n / a	Passed
Group Reference - beam 6									
186	275-564	beam6	254x146 UKB31		0.186	0.445	n / a	n / a	Passed
Group Reference - beam 7									
196	303-565	beam7	533x210 UKB82		0.275	0.919	n / a	n / a	Passed
Group Reference - roof bracing									
268	602	defaults	88.9x4.0 CHS		0.077	0.010	n / a	n / a	Passed
269	603	defaults	88.9x4.0 CHS		0.081	0.006	n / a	n / a	Passed
270	75	defaults	114.3x4.0 CHS		0.116	0.022	n / a	n / a	Passed
271	311	defaults	88.9x4.0 CHS		0.008	0.015	n / a	n / a	Passed
272	312	defaults	88.9x4.0 CHS		0.172	0.027	n / a	n / a	Passed
273	313	defaults	114.3x4.0 CHS		0.125	0.692	n / a	n / a	Passed
274	314	defaults	114.3x4.0 CHS		0.214	0.737	n / a	n / a	Passed
276	318	defaults	88.9x4.0 CHS		0.040	0.035	n / a	n / a	Passed
277	335	defaults	88.9x4.0 CHS		0.041	0.022	n / a	n / a	Passed
278	383	defaults	203x133 UKB25		0.100	0.247	n / a	n / a	Passed
279	384	defaults	88.9x4.0 CHS		0.153	0.011	n / a	n / a	Passed
280	576	defaults	88.9x4.0 CHS		0.127	0.013	n / a	n / a	Passed
281	577	defaults	88.9x4.0 CHS		0.252	0.334	n / a	n / a	Passed
282	578	defaults	88.9x4.0 CHS		0.259	0.012	n / a	n / a	Passed
283	579	defaults	88.9x4.0 CHS		0.225	0.262	n / a	n / a	Passed
284	580	defaults	88.9x4.0 CHS		0.161	0.200	n / a	n / a	Passed
285	581	defaults	88.9x4.0 CHS		0.159	0.012	n / a	n / a	Passed
286	582	defaults	88.9x4.0 CHS		0.204	0.251	n / a	n / a	Passed
287	583	defaults	88.9x4.0 CHS		0.202	0.012	n / a	n / a	Passed
288	584	defaults	88.9x4.0 CHS		0.123	0.154	n / a	n / a	Passed
289	585	defaults	88.9x4.0 CHS		0.127	0.012	n / a	n / a	Passed

Steelwork Design Results (continued)

Desig object ref	Memb ref	Design parameter	Analysis section	Design section	Utilisation factors				Design status
					Local capacity	Lateral buckling	Torsion	Deflection	
290	588	*defaults*	88.9x4.0 CHS		0.042	0.058	n / a	n / a	Passed
291	589	*defaults*	88.9x4.0 CHS		0.042	0.013	n / a	n / a	Passed
292	590	*defaults*	88.9x4.0 CHS		0.044	0.060	n / a	n / a	Passed
293	591	*defaults*	88.9x4.0 CHS		0.047	0.014	n / a	n / a	Passed
294	592	*defaults*	88.9x4.0 CHS		0.028	0.032	n / a	n / a	Passed
295	593	*defaults*	88.9x4.0 CHS		0.062	0.161	n / a	n / a	Passed
296	594	*defaults*	88.9x4.0 CHS		0.076	0.011	n / a	n / a	Passed
Group Reference - Roof light primary1									
326	539-544	*rooflight primary*	203x133 UKB25		0.381	0.870	n / a	n / a	Passed
327	553-605	*rooflight primary*	203x102 UKB23		0.014	0.022	n / a	n / a	Passed
328	559-587	*rooflight primary*	203x102 UKB23		0.177	0.361	n / a	n / a	Passed
329	554	*rooflight primary*	203x102 UKB23		0.025	0.060	n / a	n / a	Passed
330	555	*rooflight primary*	203x102 UKB23		0.053	0.118	n / a	n / a	Passed
331	556	*rooflight primary*	203x102 UKB23		0.075	0.150	n / a	n / a	Passed
332	557	*rooflight primary*	203x102 UKB23		0.102	0.183	n / a	n / a	Passed
333	558	*rooflight primary*	203x102 UKB23		0.132	0.228	n / a	n / a	Passed
Group Reference - Rooflight primary2									
342	545-549	*rooflight primary*	203x133 UKB25		0.154	0.404	n / a	n / a	Passed
Group Reference - beams5									
344	6-444	*beam5*	203x133 UKB25		0.211	0.681	n / a	n / a	Passed
345	25-609	*beam5*	203x133 UKB25		0.176	0.028	n / a	n / a	Passed
346	610-461	*beam5*	203x133 UKB25		0.030	0.077	n / a	n / a	Passed
347	8-94	*beam5*	203x133 UKB25		0.211	0.659	n / a	n / a	Passed
348	26	*beam5*	203x133 UKB25		0.134	0.166	n / a	n / a	Passed
349	43	*beam5*	203x133 UKB25		0.020	0.049	n / a	n / a	Passed
Group Reference - beam8									
356	566-567	*beam8*	203x133 UKB25		0.341	0.718	n / a	n / a	Passed
Group Reference - rooflight trimmers									
358	559-587	*rooflight trimmers*	203x102 UKB23		0.177	0.354	n / a	n / a	Passed
359	553	*rooflight trimmers*	203x102 UKB23		0.014	0.020	n / a	n / a	Passed
360	554	*rooflight trimmers*	203x102 UKB23		0.025	0.062	n / a	n / a	Passed
361	555	*rooflight trimmers*	203x102 UKB23		0.053	0.123	n / a	n / a	Passed
362	556	*rooflight trimmers*	203x102 UKB23		0.075	0.160	n / a	n / a	Passed

Steelwork Design Results (continued)

Desig object ref	Memb ref	Design parameter	Analysis section	Design section	Utilisation factors				Design status
					Local capacity	Lateral buckling	Torsion	Deflection	
363	557	rooflight trimmers	203x102 UKB23		0.102	0.173	n / a	n / a	Passed
364	558	rooflight trimmers	203x102 UKB23		0.132	0.224	n / a	n / a	Passed

Support Reactions for Combination 1.4Gk+1.6Qk

Analysis Type : Linear elastic

Joint reference	Support reactions (kN)			Support moments (kNm)		
	Px	Py	Pz	Mx	My	Mz
27	0.000	41.277	1.206	0.000	-0.001	0.000
28	0.000	28.987	0.000	0.000	0.000	0.000
29	0.000	98.236	0.000	0.000	0.000	0.000
30	0.000	37.170	0.001	0.000	0.001	0.000
31	0.000	46.685	0.000	0.000	0.000	0.000
32	0.000	0.000	0.000	0.000	0.000	0.000
42	0.201	143.297	0.000	0.000	0.000	0.000
45	-0.039	35.620	-1.086	0.000	0.000	0.000
47	0.000	0.000	0.000	0.000	-0.008	0.000
74	0.000	-19.213	-24.189	0.000	0.000	0.000
75	18.263	-20.924	0.000	0.000	0.000	0.000
86	-4.654	0.000	2.399	0.000	0.000	0.000
87	-24.539	0.000	0.523	0.000	0.000	0.000
101	20.742	0.000	20.742	0.000	0.000	0.000
102	0.000	0.000	0.000	0.000	0.000	0.000
103	0.000	0.000	0.000	0.000	0.000	0.000
104	0.000	0.000	0.000	0.000	0.000	0.000
105	0.000	0.000	0.000	0.000	0.000	0.000
106	0.000	0.000	0.000	0.000	0.000	0.000
107	0.000	0.000	0.000	0.000	0.000	0.000
330	0.000	9.348	0.000	0.000	0.000	0.000
337	0.000	10.132	0.000	0.000	0.000	0.000
346	0.000	9.374	0.000	0.000	0.000	0.000
347	-10.960	7.414	0.000	0.000	0.000	0.000
349	0.000	9.374	0.000	0.000	0.000	0.000
354	0.000	10.132	0.000	0.000	0.000	0.000
365	0.000	9.728	0.000	0.000	0.000	0.000
366	0.000	0.446	0.000	0.000	0.000	0.000
373	0.000	0.000	0.000	0.000	0.000	0.000
481	0.986	144.462	0.402	0.000	0.000	0.000

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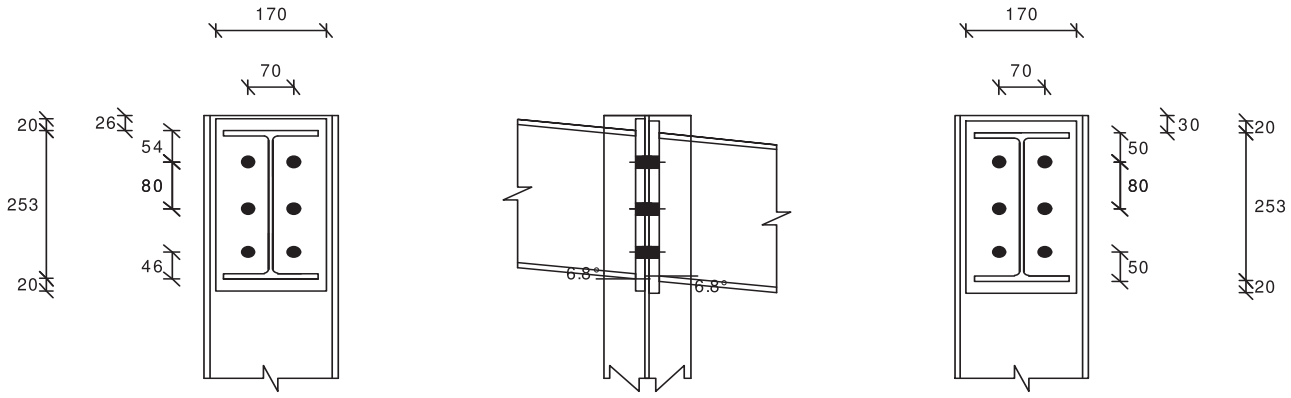
Job No	2022-302
Job Ref	Viking Centre
Designed By	TM
Checked By	
Date	April 2023
Revision No	
Calc No	
Page No	1



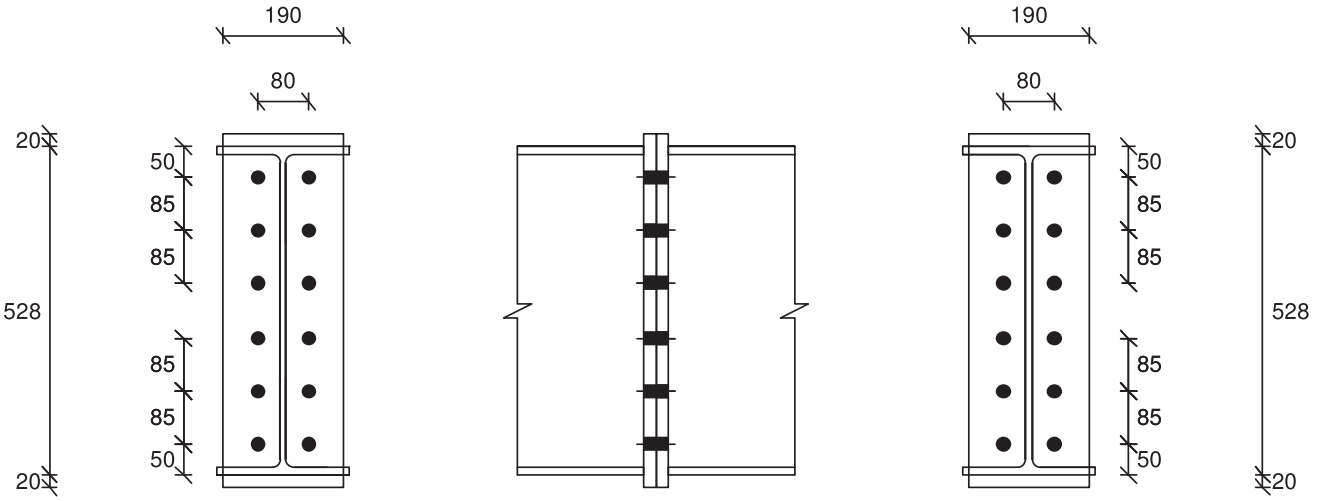
Support member 203x133 UKB30 grade S355

Connected member	254x146 UKB31	grade S355	Connected member	254x146 UKB31	grade S275
End plate	293x170x15	grade S275	End plate	293x170x15	grade S275
	Upper Lower			Upper Lower	
Flange welds	10.0 10.0		Flange welds	8.0 8.0	
Web welds	6.0 6.0		Web welds	5.0 5.0	
			Bolts	6 No. M20 grade 8.8	

Results summary

Effect	*Units*	*Load comb.*	*Required value*	*Resistance value*	*Utilisation ratio*	*Status report*
Connection						Passed
Left shear :	kN	Comb1	22.82	209.44	0.109	Passed
Right shear :	kN	Comb1	22.82	209.44	0.109	Passed
Axial compression :	kN	-	-	-	-	-
Axial tension :	kN	Comb1	22.46	569.61	0.039	Passed
Hogging moment :	kNm	Comb1	30.00	63.05	0.476	Passed
Sagging moment :	kNm	-	-	-	-	-

JOHN PLUMMER PARTNERSHIP		Job No 2022-302 Job Ref Viking Centre Designed By TM Checked By Date Revision No Calc No Page No 1



Connected member	533x210 UKB82	grade S355	Connected member	533x210 UKB82	grade S355
End plate	568x190x20	grade S275	End plate	568x190x20	grade S275
	Upper Lower			Upper Lower	
Flange welds	15.0 15.0		Flange welds	15.0 15.0	
Web welds	10.0 10.0		Web welds	10.0 10.0	
			Bolts	12 No. M20 grade 8.8	

Results summary

Effect	*Units*	*Load comb.*	*Required value*	*Resistance value*	*Utilisation ratio*	*Status report*
Connection						Passed
Left shear :	kN	Comb1	10.00	1080.27	0.009	Passed
Right shear :	kN	Comb1	10.00	1080.27	0.009	Passed
Axial compression :	kN	-	-	-	-	-
Axial tension :	kN	Comb1	70.00	1492.61	0.047	Passed
Hogging moment :	kNm	-	-	-	-	-
Sagging moment :	kNm	Comb1	205.00	290.26	0.706	Passed

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Job N°.	2022-302
Date	Aug-23
Designer	TM
Sheet N°.	
Revision	B2

Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	STRUCTURAL ANALYSIS AND STEELWORK DESIGN

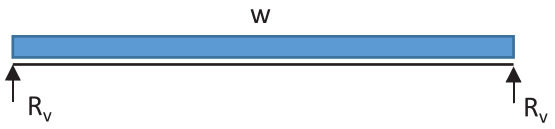
STRUCTURAL ANALYSIS AND STEELWORK DESIGN TO BS5950

Design of Transfer Beam and posts to facilitate ground floor column removal in entrance foyer
Preferred solution for the transfer beam is to provide a pair of UBs (located under leaves of cavity wall over).

1) Transfer Beams:

Load assessment for beam positioned under outer skin of external cavity wall
Assumed (simplified) loading to beam:

L = 6.6 m



O/L masonry; Flat roof; half of exist'g beam self wt (allowance); new beam self wt

$w_{.Gk}$ = (2.5 x 2.21) + (3 x 0.7) + 1.2 + 0.4
= 9.3 kN/m

Flat roof

$w_{.Qk}$ = 3 x 1.5
= 4.5 kN/m

$w_{.SLS}$ = 13.8 kN/m
$w_{.ULS}$ = (1.4 x 9.3) + (1.6 x 4.5)
= 20.2 kN/m

$R_{V.SLS}$ = 13.8 x 6.6/2
= 45.5 kN
$R_{V.ULS}$ = 20.2 x 6.6/2
= 66.7 kN

$M_{.ULS}$ = ($20.2 \times 6.6^2 / 8$)
= 110 kNm

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Job N°.	2022-302
Date	Aug-23
Designer	TM
Sheet N°.	
Revision	B2

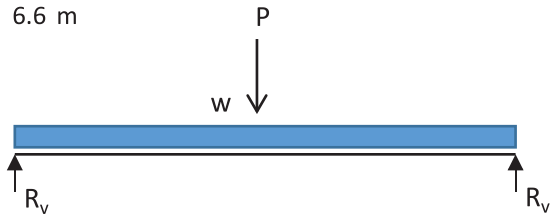
Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	STRUCTURAL ANALYSIS AND STEELWORK DESIGN

STRUCTURAL ANALYSIS AND STEELWORK DESIGN TO BS5950

Load assessment for beam positioned under inner skin of external cavity wall

Assumed (simplified) loading to beam:

L = 6.6 m



I/L masonry; Pitched roof; First floor; half of exist'g beam self wt (allowance); new beam self wt

$w_{.Gk}$ = (2.5 x 2.36) + ((4.25/2) x 1.39) + ((4.25/2) x 0.57) + 1.2 + 0.6

= 11.9 kN/m

Pitched roof; First floor

$w_{.Qk}$ = ((4.25/2) x 0.55)) + ((4.25/2) x 3)

= 7.54 kN/m

$w_{.SLS}$ = 19.44 kN/m

$w_{.ULS}$ = (1.4 x 9.3) + (1.6 x 4.5)

= 28.7 kN/m

Partition wall

$P_{.Gk}$ = (4.25 / 2) x 2.5 x 2.51

= 13.3 kN

$P_{.SLS}$ = 13.3 kN

$P_{.ULS}$ = 1.4 x 13.3

= 18.6 kN

$R_{V.SLS}$ = [(19.44 x 6.6) / 2] + (13.3/2)

= 70.8 kN

$R_{V.ULS}$ = [(28.7 x 6.6) / 2] + (18.6/2)

104 kN

The beam positioned under the inner leaf is carrying more load will therefore govern the design for the paired arrangement.

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Date	Aug-23
Designer	TM

Job Title	VIKING CENTRE, SPROWSTON	Sheet N°.	
		Revision	B2
ELEMENT	STRUCTURAL ANALYSIS AND STEELWORK DESIGN		

STRUCTURAL ANALYSIS AND STEELWORK DESIGN TO BS5950

$M._{ULS}$ = $(28.7 \times 6.6^2 / 8) + (18.6 \times 6.6 / 4)$

= 156.3 kNm

Try a 305 x 165UB54:

If effective lateral restraint is provided to the compression flange using a new structural diaphragme ceiling construction (see detail on SK=10)

↳ Mcx = 300kNm, > 156.3, therefore okay

Interactive blue book

Check deflection:

$$\delta_v = \frac{5 \times 19.24 \times 6600^4}{384 \times 205000 \times 11700 \times 10^4} + \frac{18.6 \times 103 \times 6600^3}{48 \times 205000 \times 11700 \times 10^4}$$

Ixx=11700 cm^4

= 19.8 + 4.64

= 24.5mm = span/270

This is a little high, but considered acceptable on the basis that the same size section is used for the other beam which in reality will take up some of the load and reduce the deflection.

PROVIDE A PAIR OF 305X165UB54'S (S355)

To assist with installation and column removal works, it is proposed that two splice joints are provided close to the middle of both paired beams. See SK-10 and JPP construction sequence for clarification. The splice joint has been designed using CADS Moment connection design software - see output overleaf.

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Job N°.	2022-302
Date	Aug-23
Designer	TM
Sheet N°.	
Revision	B2

Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	STRUCTURAL ANALYSIS AND STEELWORK DESIGN

STRUCTURAL ANALYSIS AND STEELWORK DESIGN TO BS5950

2) Support Posts:

Effective Length for buckling, L_E = 2.5m

$N._{ULS}$ = 66.7 + 104
= 170.7 kN

Mx = (104-66.7) x 0.2 (major axis BM due to out of balance reactions
= 7.46 kNm from transfer beams)

My = 170.7 x 0.02 (minor axis BM due to construction
= 3.5 kNm tolerance)

Try a 200x100x6.3RHS:

P_{cy} = 1060 kN — Interactive
M_{cx} = 78 kNm — Blue book
M_{cy} = 49.1 kNm

↳ Overall buckling check: (170.7 / 1060) + (7.46 / 78) + (3.5 / 49.1) = 0.33, < 1
therefore okay

PROVIDE 200X100X6.3 RHS POSTS (S355)

Padstone Requirement for post bearing onto top of basement wall:

$R_{V.ULS}$ = 170.7

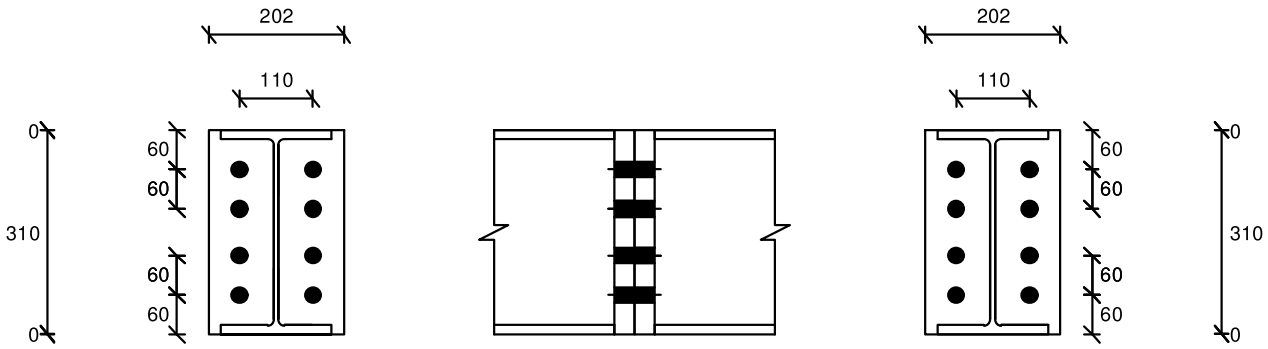
Design compressive strength of brickwork = 5.2/3.5 — Ref: BS6528
= 1.48 N/mm^2 Table 2
& Fig 5

↳ Min padstone bearing area req'd = 170.7 x 10^3 / 1.48 — γm = 3.5
= 115337 mm^2 designation

↳ min length req'd = 115337^0.5 — (iv) mortar
= 340 mm

PROVIDE A 340mm square x 225mm deep C35 CONCRETE PADSTONE.

JOHN PLUMMER PARTNERSHIP		Job No Job Ref Designed By Checked By Date 22 - 8 - 2023 Revision No B2 Calc No Page No 1



Connected member	305x165 UKB54	grade S275	Connected member	305x165 UKB54	grade S275
End plate	310x202x30	grade S275	End plate	310x202x30	grade S275
	Upper Lower			Upper Lower	
Flange welds	FSBW 12.0		Flange welds	FSBW 12.0	
Web welds	6.0 6.0		Web welds	6.0 6.0	
			Bolts	8 No. M24 grade 10.9	

Results summary

Effect	*Units*	*Load comb.*	*Required value*	*Resistance value*	*Utilisation ratio*	*Status report*
Connection						Passed
Left shear :	kN	Comb1	0.00	404.61	-0.000	Passed
Right shear :	kN	Comb1	0.00	404.61	-0.000	Passed
Axial compression :	kN	Comb1	0.00	1741.71	-0.000	Passed
Axial tension :	kN	-	-	-	-	-
Hogging moment :	kNm	Comb1	160.00	173.17	0.924	Passed
Sagging moment :	kNm	-	-	-	-	-

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Job N°.	2022-302
Date	Mar-23
Designer	TM
Sheet N°.	
Revision	B1

Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	FOUNDATION DESIGN

FOUNDATION DESIGN TO BS8004

BGS record information (nearby BH log) is indicating that ground conditions can be expected to be good, i.e. suitable for conventional shallow spread foundations. The nearest borehole record (May Gurney - 1990), identified 0.3m made ground over firm silty clay (N=21) to 1.6m BGL, over dense and medium dense sands and gravels (N>26), to the extent of the BH at 4.5m BGL. Based on this, an allowable ground bearing pressure of **100kPa at 0.9m BGL** is considered to be suitable for foundation design purposes. This should ensure that total foundation settlement will not exceed 25mm.

Highest Column load = 98.1 kN

Try a 1.1m x 1.1m x0.5m thick unreinforced pad:

Weight of cavity wall over pad = 1.1 x 3.34 x 3
= 11 kN
Net weight of pad foundation = (24-18) x 1.1 x 1.1 x 0.5
= 3.63 kN

Hence, total foundation load = 112.73 kN

↳ GBP = 93.2kPa < 100, therefore okay

Maximum wind uplift reaction = 15 kN
(braced bay pads)
Net uplift due to wall self wt = 4 kN

Pad self wt = 1.1 X 1.1 X 0.5 X 24
= 14.6 kN

↳ FOS of 3.65, > 1.5 therefore okay.

Although this seems quite safe, as a precautionary measure the braced bay pad foundations shall be increased to 1.5x1.5x0.6m deep to allow for additional uplift forces that could arise in the temporary condition due to loss of connectivity to the flat roof structure, i.e. during future refurbishment works etc.

ADOPT 1.1 X 1.1 X 0.5m THK PAD FOUNDATIONS UNDER TYPICAL COLUMNS AND 1.5 X 1.5 X 0.6m THK PAD FOUNDATIONS UNDER BRACED BAY COLUMNS

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Job N°.	2022-302
Date	Aug-23
Designer	TM
Sheet N°.	
Revision	B2

Job Title	VIKING CENTRE, SPROWSTON
ELEMENT	FOUNDATION DESIGN

FOUNDATION DESIGN TO BS8004

Pad Foundation required for post in basement required to facilitate the removal of the existing ground floor column in the entrance foyer:

Unfactored column load = 45.5 + 70.8 + 25(allowance for loading at ground floor)
= 141.3 kN

↳ A req'd = 141.3 / 100
= 1.413 m^2

↳ B req'd = (1.143) ^ 0.5
= 1.18 m

PROVIDE A MIN 1.2X1.2X0.5m THK (EQUIVALENT) MASS CONCRETE PAD FOUNDATION

6.0 Final Cost Summary

BIDWELLS

SECTION 6 - FINAL COST SUMMARY

SECTION 3 - SCHEDULE OF WORKS

1.0	Preliminaries	£
2.0	Demolition / Strip Out	£
3.0	Sub-Structure & Superstructure	£
4.0	Roof	£
5.0	Elevations	£
6.0	External Windows	£
7.0	External Doors	£
8.0	External Areas	£
9.0	Ceilings	£
10.0	Walls	£
11.0	Internal Windows	£
12.0	Internal Doors	£
13.0	Joinery	£
14.0	Metalwork	£
15.0	Floors	£
16.0	Mechanical & Electrical	£
17.0	Decorations	£
18.0	Cleaning	£
19.0	Handover	£
	Total	**£**

7.0 Schedule of Rates

BIDWELLS

SECTION 7 - SCHEDUAL OF TRADE RATES

List of basic trade rates to be applied in the calculation of daywork. Charges for works described in the specification and for which provisional sums have been allowed.

Item	Item of work	Unit	Rate (£)
	Specialist Trades		
	Demolition & General Labourer	P/Hr	
	Ground worker	P/Hr	
	Roofer	P/Hr	
	Bricklayer	P/Hr	
	Window & Door Fitter/Glazer	P/Hr	
	Ground Worker - Hard Standing and Soft Landscaping	P/Hr	
	Ceiling Fitter	P/Hr	
	Carpenter/Joiner	P/Hr	
	Metal Worker	P/Hr	
	Floor Layer/Fitter	P/Hr	
	Electrical Engineer/Electrician	P/Hr	
	Mechanical Engineer/Plumber	P/Hr	
	Decorator	P/Hr	
	Cleaner	P/Hr	
	Other Craft Operative	P/Hr	
	Percentage increases required on basic price of labour, materials and plant.		
	Labour	%	
	Materials	%	
	Plant	%	
	Percentage for profit and overheads required on specialist Contractors' invoices	%	

8.0 Form of Tender

SECTION 7 - FORM OF TENDER

Sprowston Town Council
c/o Bidwells LLP
16 Upper King Street
Norwich
NR3 1HA

Repair & Refurbishment Works
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

I/We having read the conditions of contract and specification delivered to me/us, do hereby offer to execute and complete in accordance with the conditions of the contract the whole of the works described in the sum of:

£……..(plus VAT) (in words)……..(plus VAT)

I/We confirm that we will complete the works within …..... weeks of possession.

I/We confirm that if this tender is accepted we could commence on site within……weeks of acceptance.

The employer is not bound to accept the lowest or any offer.

Signed …… Date ……

Position …… Tel Number ……

Company ……

Address ……

……

……

……

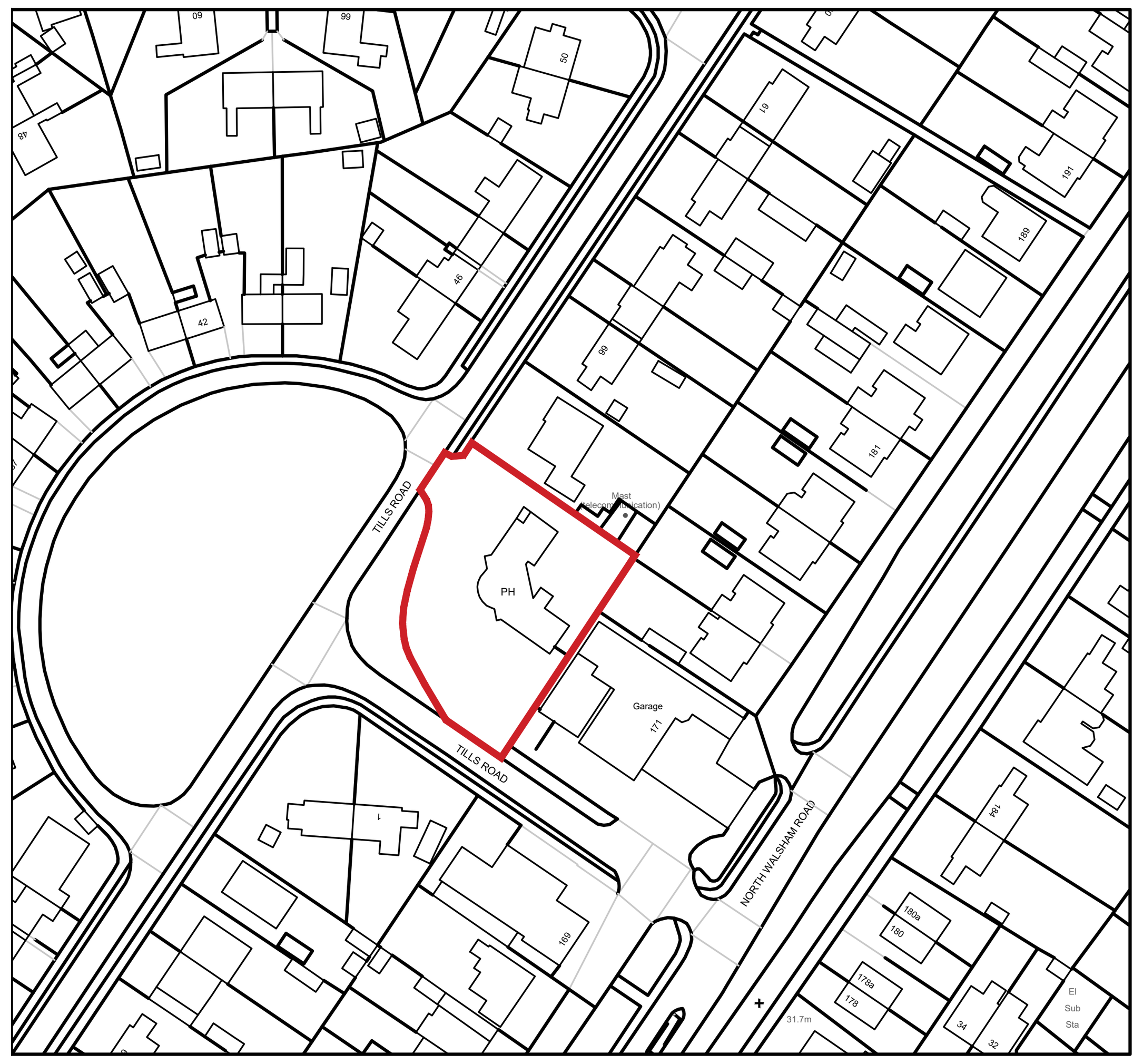
9.0 Tender Submission Checklist

SECTION 9 - TENDER SUBMISSION CHECKLIST

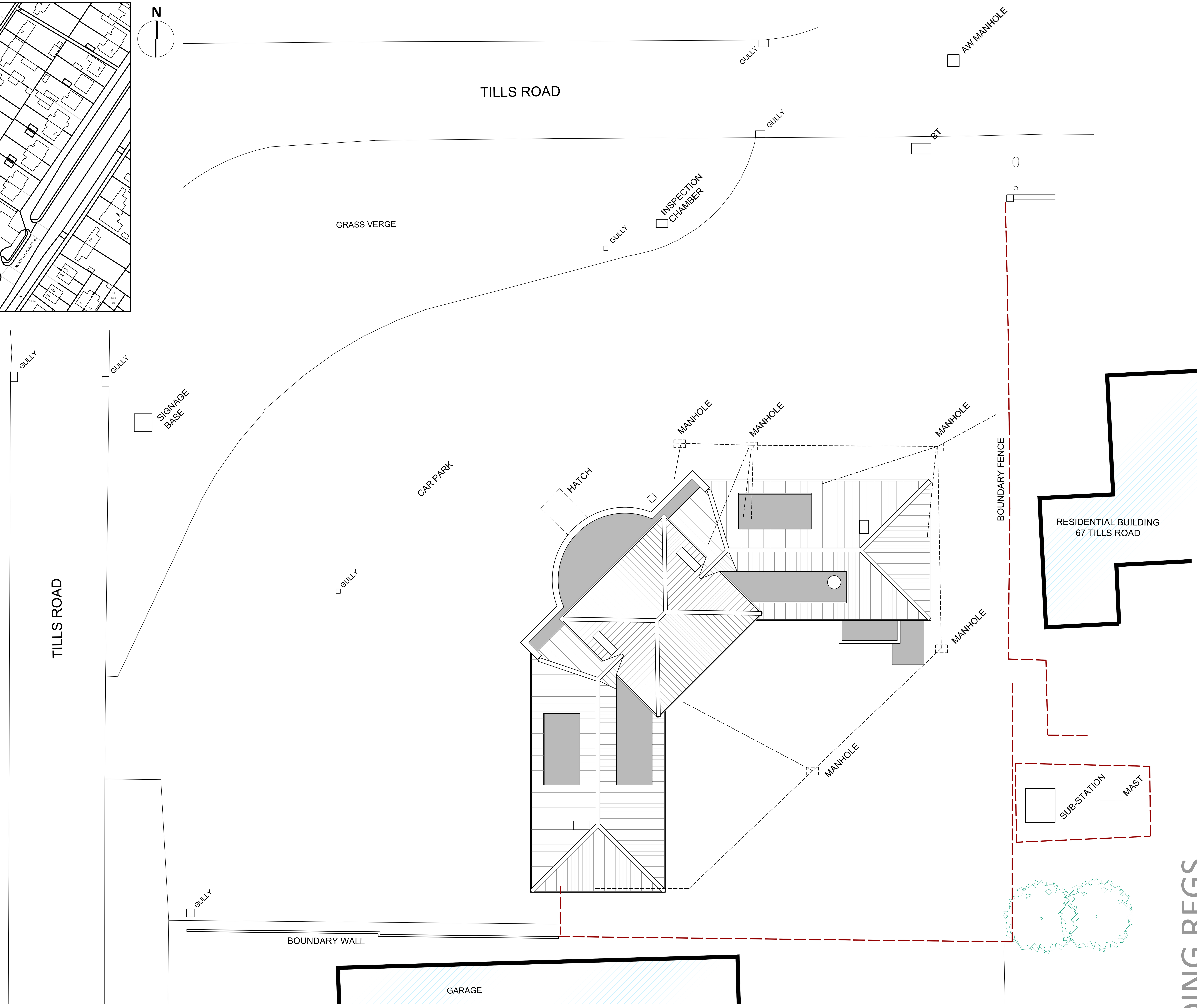
The following is intended to act as a checklist for tenderers and tenderers are advised that failure to submit the following information may prejudice consideration of their submission.

1	Outline programme of works	☐
2	Schedule of staff / sub-contractors to be appointed to the project	☐
3	Form of Tender	☐
4	Current Insurance Certificate(s)	☐
5	CIS Tax Certificate	☐
6	Preliminaries breakdown	☐
7	Priced Schedule of Works	☐
8	Collection	☐
9	Basic Trade Rates	☐
10	Contractors Health & Safety Policy	☐
11	Method statement is required upon completion of the tenders This method statement will be required to demonstrate the contractors proposal for management of the works and outline the method statement for key elements.	☐

APPENDIX 1
DRAWINGS



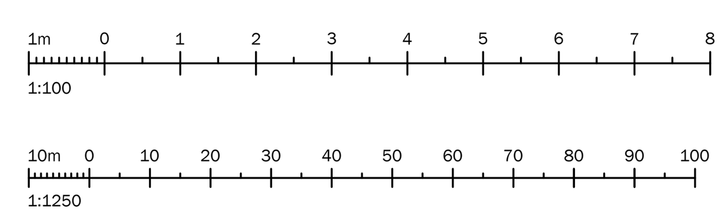
Site Location Plan
Scale - 1:1250



Existing Site Plan
Scale - 1:100

Plan Key

- Existing Site Boundary
- Existing Boundary Fence



This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:

BUILDING REGS

Paul Robinson
PARTNERSHIP
ARCHITECTURE + SURVEYING

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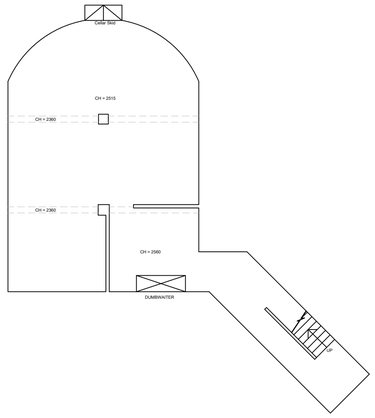
Hospital Road, Little Plumstead,
Norwich. NR13 5FH
tel: 01603 397057
e-mail: design@prparchitecture.com
web: www.paulrobinsonpartnership.co.uk

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

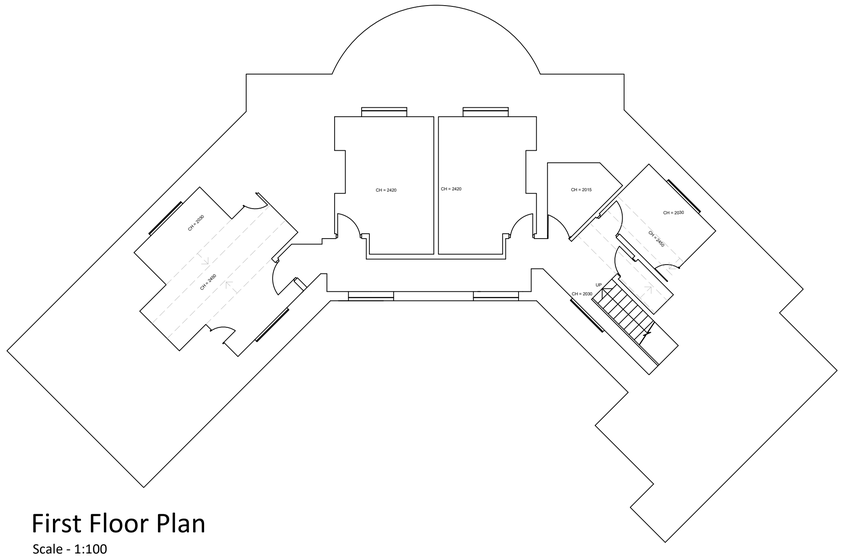
title:
Existing Site Layout Plan

scale @ A1:	drawn by:	
1:100, 1:1250	MR	
date:	approved:	
April '23	SDL	
project no:	dwg no:	revision:
8341	B01	



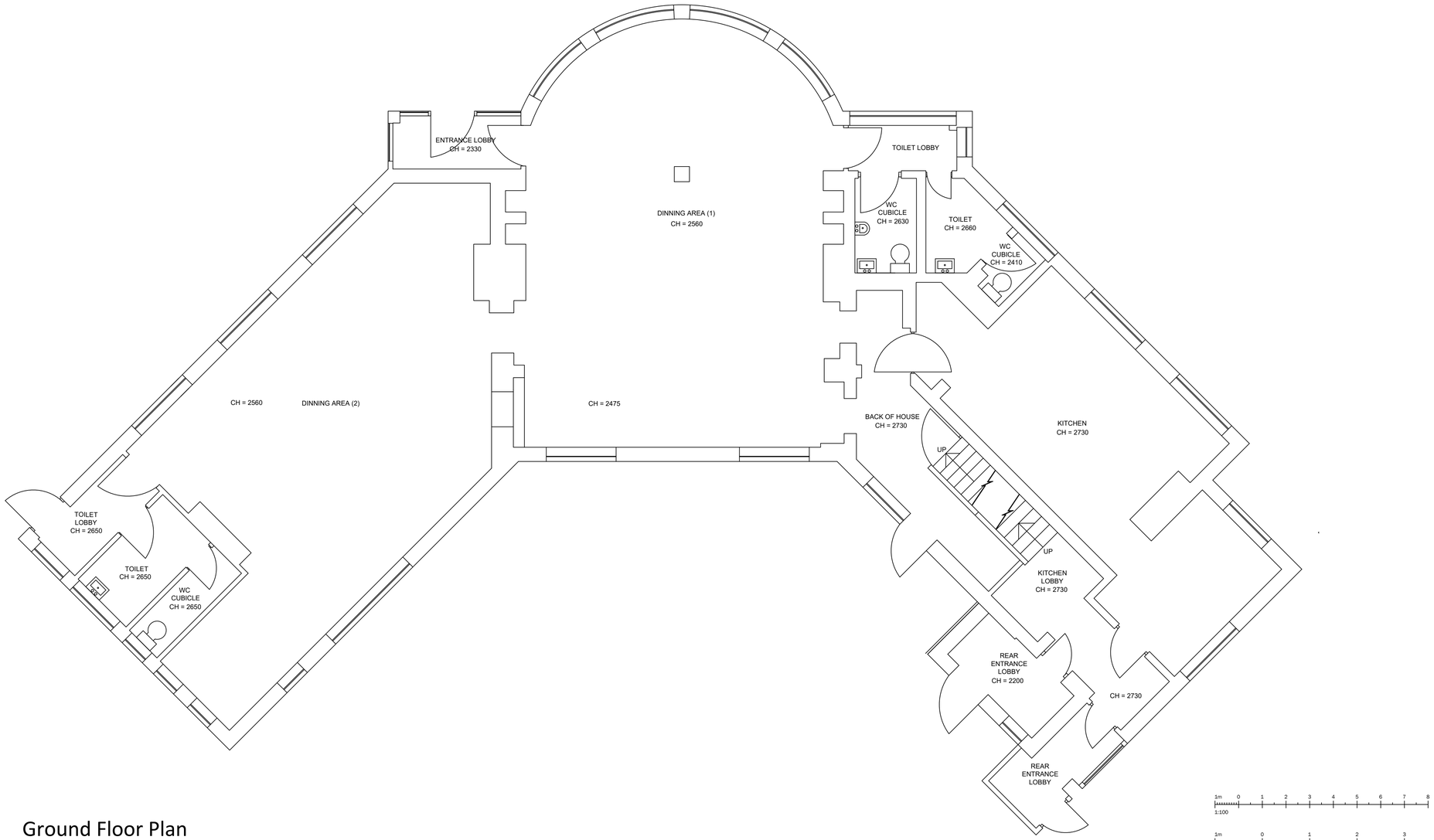
Cellar Floor Plan

Scale - 1:100



First Floor Plan

Scale - 1:100



Ground Floor Plan

Scale - 1:50

1m 0 1 2 3 4 5 6 7 8
1:100

1m 0 1 2 3
1:50

CH = Ceiling Height

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rev:	date:	description:	by:

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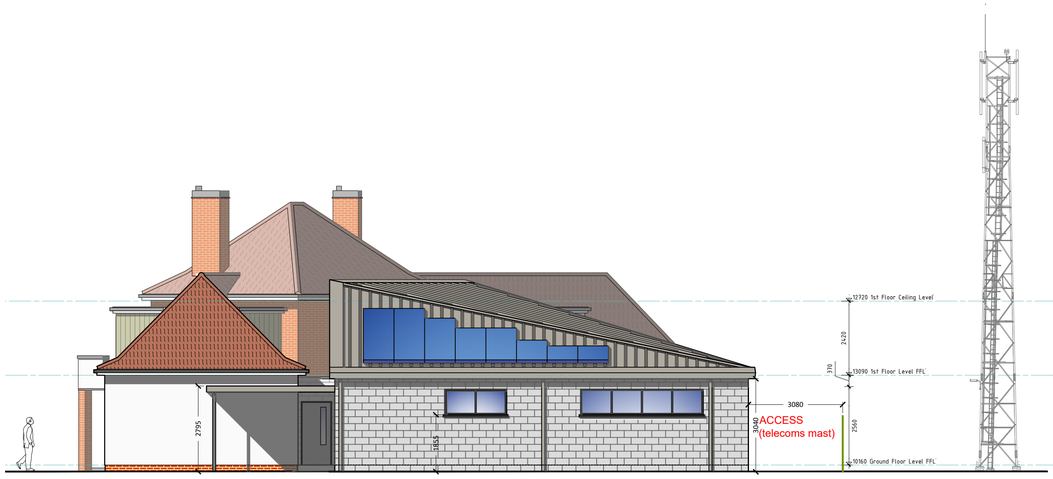
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

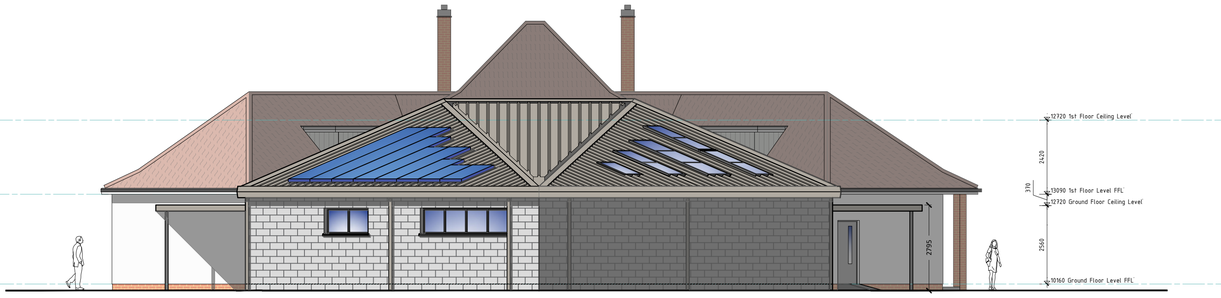
title:
Existing Building Plan

scale @ A1: 1:50, 1:100	drawn by: MR	
date: April '23	approved: SDL	
project no: 8341	dwg no: B02	revision:



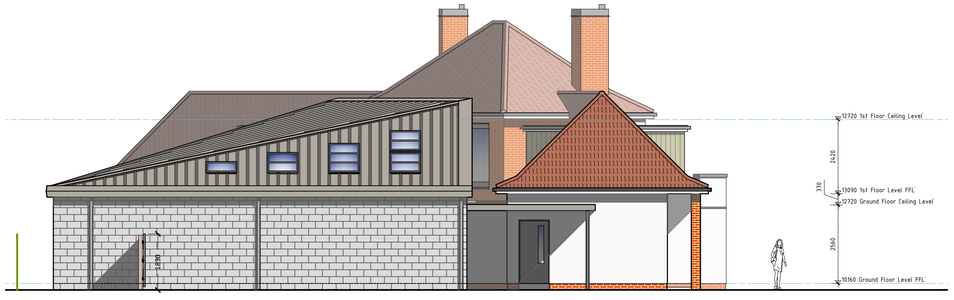
North-East Elevation

Scale - 1:100



East Elevation

Scale - 1:100



South-East Elevation

Scale - 1:100

West Elevation

Scale - 1:100

External Finishes

Existing Building

Roof
As existing, minor repair and replacement work to match existing.

External Walls
K Rend - pure white render

Dormer Roof
Single ply - light grey
See drawing 8341/B11 for specification

Dormer Cheeks
Vertical timber cladding
See drawing 8341/B11 for specification

Fenestration
UPVC dark grey

Doors
Solid: metal powder coated - dark grey
Glazed: aluminum framed powder coated - dark grey
See drawing 8341/B18 for specification

Windows
Aluminum framed powder coated - dark grey
See drawing 8341/B20 for specification

New-Build Extension

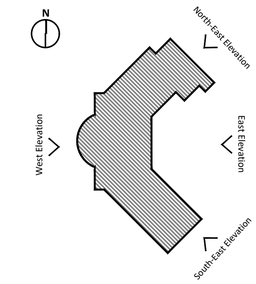
Pitched Roof
Trapezoidal, metal cladding - goosewing grey
See drawing 8341/B5 for specification and 8341/B21 for roof build up

Walls
Facing concrete blockwork
See drawing 8341/B10 for specification and 8341/B21 for build up

Fenestration
Concealed guttering - matching cladding finish
Aluminium downpipe - matching cladding finish
See drawing 8341/B21 for build up

Roof Lights
Modular venting rooflight - dark grey
See drawing 8341/B05 for specification

Elevation Key



1m 0 1 2 3 4 5 6 7 8
1:100

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rev:	date:	description:	by:
A	12.05.23	Rooflights changed as per client request	MR

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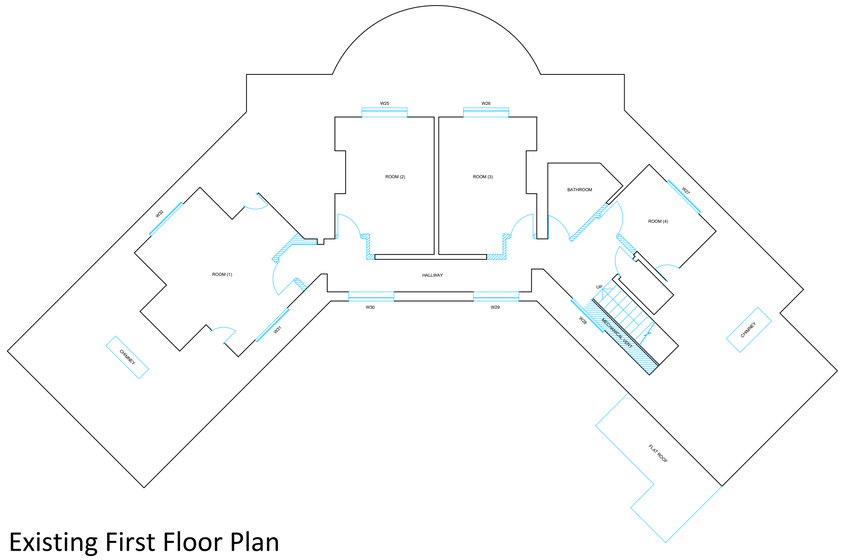
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

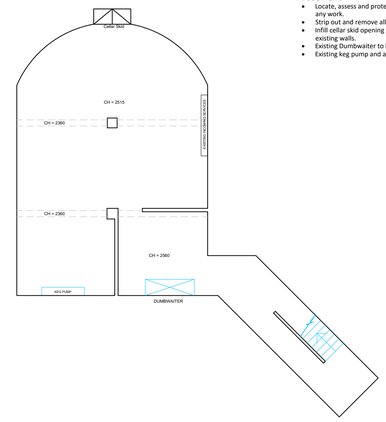
title:
Proposed Elevations

scale @ A1: 1:100	drawn by: SDL	
date: May '23	approved: SDL	
project no: 8341	dwg no: B08	revision: A



Existing First Floor Plan

Scale - 1:100

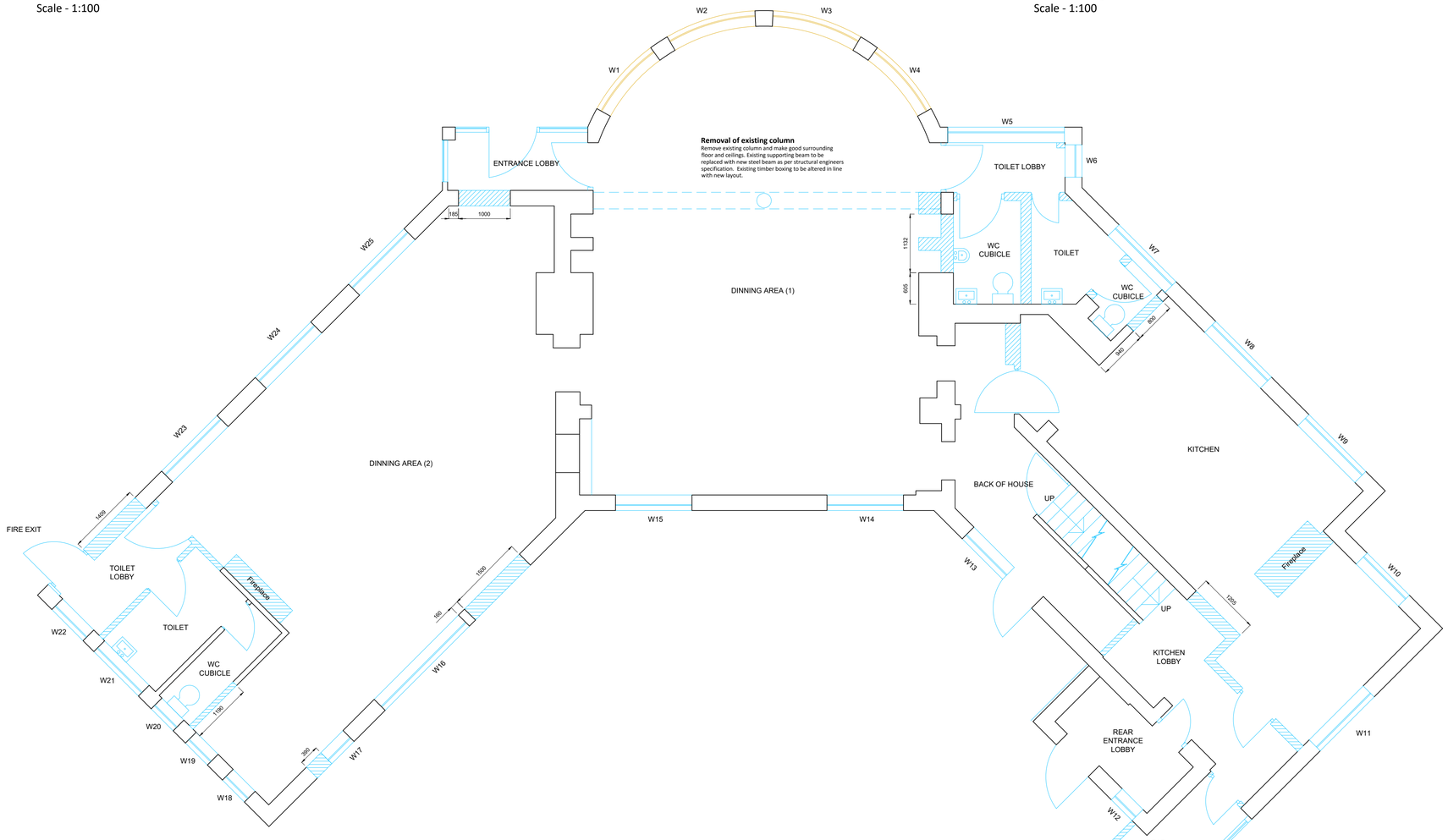


Basement

- Locate, assess and protect existing incoming service prior to undertaking any work.
- Strip out and remove all redundant services
- Infill cellar skid opening with timber stud and OSB. Paint finish to match existing walls.
- Existing Dumbwaiter to be removed.
- Existing keg pump and associated equipment to be removed

Existing Basement Floor Plan

Scale - 1:100



Removal of existing column
Remove existing column and make good surrounding floor and ceilings. Existing supporting beam to be replaced with new steel beam as per structural engineers specification. Existing timber boxing to be altered in line with new layout.

Existing Ground Floor Plan

Scale - 1:50

Key

Items to be demolished

Items to be altered

Items to be retained

Window Key

Window Reference	Comments
W1, W2, W3, W4	Deep clean and minor repairs, remove and replace mastic seals. Remove blinds, repair cills and internal frames
W5, W6, W7, W10, W11, W12, W14, W15, W16, W18, W19, W20, W21, W22, W30	Remove existing window, make good opening, brick infill and prepare for rendered finish.
W8, W9, W23, W24, W25, W26, W27, W31, W32	Remove existing window, make good opening and replace as per window schedule.
W13, W17, W29	Remove existing window and make good opening.

General

- Locate and condition of features of historical, archaeological, geological or ecological importance.
- Locate and condition of adjoining or surrounding premises that might be adversely affected by removal of the structure or structures or by noise, vibration and/ or dust generated during deconstruction/ demolition.
- Identity and location of services above and below ground, including those required for the Contractor's use, and arrangements for their disconnection and removal.
- Form and location of flammable, toxic or hazardous materials, including lead-based paint, and proposed methods for their removal and disposal.
- Form and location of materials identified for reuse or recycling, and proposed methods for removal and temporary storage.
- Proposed programme of work, including sequence and methods of deconstruction/ demolition.
- Details of specific pre-weakening required.
- Arrangements for protection of personnel and the general public, including exclusion of unauthorized persons.
- Arrangements for control of site transport and traffic.

Extent of deconstruction/ demolition
General: Subject to retention requirements specified elsewhere, deconstruct/ demolish structures down to upper level of ground floor slab.

Partly demolished structures
General: Leave in a stable condition, with adequate temporary support at each stage to prevent risk of uncontrolled collapse. Make secure outside working hours.
Temporary works: Prevent overloading due to debris.
Access: Prevent access by unauthorized persons.

Dangerous openings
General: Provide guarding at all times, including outside of working hours. Illuminate during hours of darkness.
Access: Prevent access by unauthorized persons.

Recycled materials
Materials arising from deconstruction/ demolition work: Can be recycled or reused elsewhere in the project, subject to compliance with the appropriate specification and in accordance with any site waste management plan.

Structures to be retained
Extent: As indicated on drawing
Parts which are to be kept in place:
Protect. Give notice and notify service authority or owner of damage arising from the execution of the works.
Interface between retained structures and deconstruction or demolition:
Cut away and strip-out with care to minimize the amount of making good needed

Workmanship
Demolish structures in accordance with BS 6187.

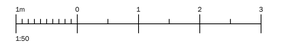
Operatives
Appropriately skilled and experienced for the type of work. Holding, or in training to obtain, relevant CITB Certificates of Competence.
Site staff responsible for supervision and control of work: Experienced in the assessment of risks involved and methods of deconstruction/ demolition to be used.

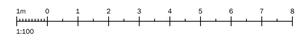
Health hazards
Precautions: Protect site operatives and general public from hazards associated with vibration, dangerous fumes and dust arising during the course of the works.

Asbestos-containing materials – unknown occurrences
Give notice immediately of suspected asbestos-containing materials when discovered during deconstruction/ demolition work. Avoid disturbing such materials.
Removal: Submit statutory risk assessments and details of proposed methods for safe removal.

Unforeseen hazards
Give notice immediately when hazards, such as unrecorded voids, tanks, chemicals, are discovered during deconstruction/ demolition.
Removal: Submit details of proposed methods for filling, removal, etc.

Site condition at completion
Debris: Clear away and leave the site in a tidy condition.





This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Existing basement plan updated, noted added.	MR

Paul Robinson
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web: www.paulrobinsonpartnership.co.uk

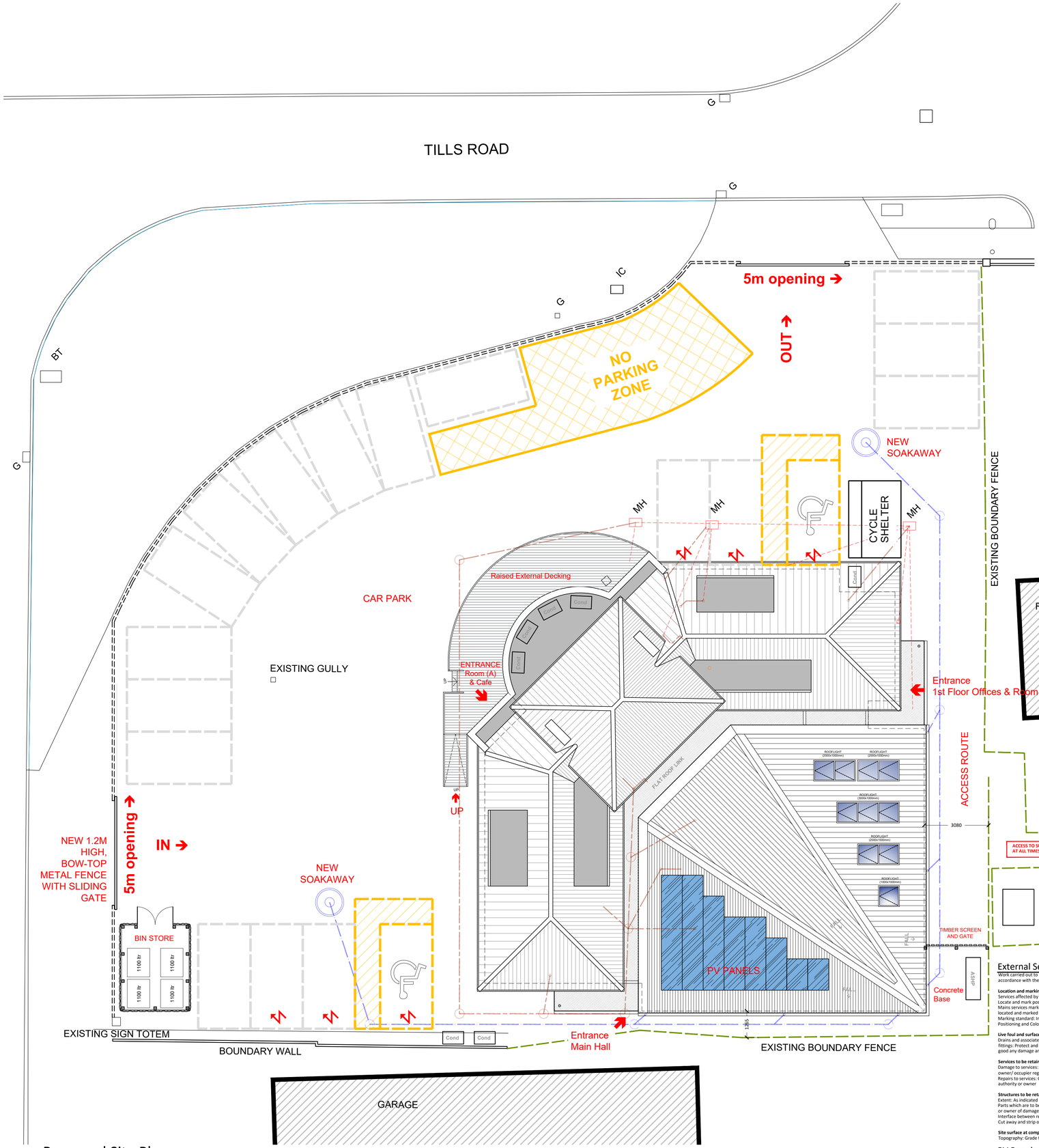
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Existing Building Demolition Plan

scale @ A1: 1:50,1:100	drawn by: MR	
date: May '23	approved: SDL	
project no: 8341	dwg no: B04	revision: A



Proposed Site Plan
Scale - 1:100

Existing Building Roof

Tiled Roof
Remove all damaged roof tiled, substructure, associated flashing details and ridge tiles to be replaced if required. replace with matching.

Flat Roof and Dormers (incl. cheeks)
Sika -Sarnafil, Single ply PVC membrane in Lead Grey (Sika colour no. 9500)
Dormer Cheeks to be clad in Sila Select, Siberain Larch vertical timber cladding.
See drawing 8341,B21-Proposed Sections A-A & B-B for more details
See drawing 8341,B11 for more details of dormer cheeks

Guttering, Downpipes and Hoppers.
All existing guttering, downpipes and hoppers replaced with new PVC fixtures and fitting in anthracite grey.

Fascia and Soffit boards
Replace all fascia and soffit boards, with new timber painted in white finish.

Structural engineer to assess existing roof structure prior to installation of proposed roof buildups.

Proposed Extension Roof

Flat Roof
Sika -Sarnafil, Single ply PVC membrane in Lead Grey (Sika colour no. 9500)
See drawing 8341,B21-Proposed Sections A-A & B-B for more details.

Pitched Roof
Kingspan KS1000RW Trapezoidal Roof Panels - 135mm
Concealed guttering - Kingspan Industrial Highline Gutters or similar. Downpipes in matching finish.
See drawing 8341,B21-Proposed Sections A-A & B-B for more details.

Roofing General

Fittings and accessories: As recommended by tile manufacturer. Do not improvise.
Exposed fittings and accessories: To match tile colour and finish.
Cut tiles: Cut only where necessary, to give straight, clean edges.
Flashings: Fix with or immediately after tiling. Form neatly.

Removing existing tiling
General:Carefully remove tiles, battens, underlay, etc. with minimum disturbance of adjacent retained tiling.
Undamaged tiles: Set aside for reuse.

Basic workmanship
General: Fix tiling and accessories to make the whole sound and weathertight at earliest opportunity.
Setting out: To true lines and regular appearance, with neat fit at edges, junctions and features.
Fixings for accessories: As recommended by tile manufacturer.
Gutters and pipes: Keep free of debris. Clean out at completion.

Local and general fixing areas
Local areas: Bands of tiling around edges or obstructions of each plane of the roof. Calculate extent of each band in accordance with **BS 5534**
General areas: Remaining areas of roof tiling.

Tile fixing
Setting out: Lay each course with tails aligned.
Ends of courses: Use special tiles to maintain bond and to ensure that cut tiles are as large as possible.
Fixing: Mechanically fix all tiles.
Nail-fixed tiles: Use nails recommended by tile manufacturer. Fix through every hole.
Clip-fixed tiles: Use clips recommended by tile manufacturer.

Battens/ counter battens (if required)
Timber: Sawn softwood.
Species: In accordance with **BS 5534**
Permissible characteristics and defects: Not to exceed limits in **BS 5534**
Grading: Contractor's choice
Moisture content at time of fixing and covering (maximum): 22%.
Preservative treatment: Wood Protection Association Commodity Specification C8.
Type: Contractor's choice
Fixing: Into rafters at not more than 300 mm centres.
Batten fixing
Setting out: Align parallel to ridge in straight horizontal lines to gauge of the tile. Align on adjacent areas.
Batten length (minimum): Sufficient to span over three supports.
Joints in length: Square-cut. Butt centrally on supports. Joints must not occur more than once in any group of four battens on one support.
Additional battens: Provide where unsupported laps in underlay occur between battens.
Fixing: Each batten to each support. Splay fix at joints in length.

Mortar bedding/ pointing
Mortar: 1:3 cement:sand, with plasticizing admixtures permitted.
Bond strength providing resistance to uplift: In accordance with **BS 5534**.
Weather: Do not use in wet or frosty conditions or when imminent.
Preparation of tiles and accessories to be bedded: Wet and drain surface water before fixing.
Appearance: Finish neatly as work proceeds and remove residue.

Fire-separating walls
Separating walls: Completely fill space between top of wall and underside of tiles with mineral wool quilt to provide fire-stopping.
Boxed eaves: Boxed eaves: Completely seal air paths in plane of separating wall with wire-reinforced mineral wool, not less than 50 mm thick, and fire-resisting board carefully cut to shape, fixed and sealed to rafters to provide fire-stopping.

Roof Lights

VELUX Commercial
Woodside Way, Glenrothes, Fife, KY7 4ND
+44 (0) 1592 778916, sales@veluxcommercial.co.uk

Product Reference: **Velux Modular Rooflights - Linearlight**
Fire performance
Reaction to fire: To EN 13501-1 Class B, S1 d0
Whole window U-value: 1.6 W/m2K. (minimum)
Frame
Material: Aluminium
Coating: Powder coated
Colour: Traffic grey RAL 7043
Glazing
Type: Toughened outer glass and laminated inner safety glass solution.
Construction: Double glazed
Coating: Low E coating.
Integral kerb: Prefabricated, insulated timber upstand.
Operation
Type: Venting - Powered, electric (chain actuator).
Control: Building Management System.
Accessories: Rain Sensor (WLA 331), Control Unit (WCC103, WCC 310/320), Control Switch (WSK 102/103).
Blinds: Grey RMR 8805.
Operation: Blinds: Open System
Control switch: Blinds: KLI 312 - Wall switch.
Air permeability: To EN 12207 and EN 1026, Class 4.
Light Transmittance (Tv): Manufactures recommendation
Glass units / panels and whole product U-values/G-value: Manufactures recommendation
Wind load resistance: To EN 1210 and EN 12211, Class C5.
Watertightness: To EN 1220B and EN 1027, Class E1200.
Impact resistance: To EN 13049 and EN 13050, Class 4.

Fencing

Perimeter fencing
1.2m High bow-top metal fencing with coated black finish. 2no. double leaf entrance gates.

Existing boundary fence
Replace to match existing where necessary.

Screening
Timber screening to the bin store and air source heat pump (ASHP).
See drawing 8341/C16 for details.

Cycle Shelter
Bi-store cycle shelter with cycle rings (5 place rings), RG665 Clear thermoplastic finish. Open end panels.

External Decking

Millboard Lasta-grip anti slip composite decking - Golden Oak Finish.
Utilise decking suppliers subframe.

External works

Old foundations, slabs and the like: Break out in locations and to the extents stated.
Contaminated material: Remove and dispose of contaminated material to appropriate site
Removal of deleterious material: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil
Ancillary items: Voids to level of surrounding site

Laying generally
Preparation: Remove all loose material, rubbish and standing water.
Adjacent work: Form neat junctions. Do not damage.
Channels, kerbs, inspection covers etc: Keep clean.
Adverse weather
Frozen materials: Do not use.
Suspend laying
During freezing conditions: If the air temperature reaches 0°C, or in calm dry conditions -3°C, on a falling thermometer.
Hot rolled asphalt: During periods of continuous or heavy rain or if there is standing water on the base.
Levels
Permissible deviation from the required levels, falls and cambers (maximum): in accordance with **BS 594987**

New paving
Keep traffic free until it has cooled to prevailing atmospheric temperature.
Do not allow rollers to stand at any time.
Prevent damage.
Lines and levels: With regular falls to prevent ponding.
Overall texture: Smooth, even and free from dragging, tearing or segregation.
State on completion: Clean.

Abutments
Vertical edges of manholes, gullies, kerbs and other abutments: Clean and paint with a thin uniform coating of cold applied thixotropic bitumen emulsion.
Finishing: Tamp surface around projections.
Level: Flush or not more than 3 mm above projections.

Acceptance of surfaces
Surface: Sound, clean and suitably close textured.
Level tolerances: To **BS 594987**
Kerbs and edgings: Complete, adequately bedded and haunched and to the required levels.

Road marking (thermoplastic)
Standard: Road Safety Markings Association standard specification document for road marking and road studs (StanSpec).
Manufacturer: Contractor's choice
Product reference:Contractor's choice
Colour: White - standard parking spaces and yellow - accessible parking spaces (including wheelchair 'symbol') and hatched zone.
Retroreflectivity to BS EN 1436: Not required

External Services

Work carried out to or affecting new and/ or existing services: Carry out in accordance with the by-laws and regulations of the relevant statutory authority

Location and marking of services
Services affected by deconstruction/ demolition work:
Locate and mark positions
Mains services marking: Arrange with the appropriate authorities for services to be located and marked
Marking standard: In accordance with Street Works UK publication 'Guidance on the Positioning and Colour Coding of Underground Utilities' Apparatus'.

Live foul and surface water drains
Drains and associated manholes, inspection chambers, gullies, vent pipes and fittings: Protect and maintain normal flow during deconstruction or demolition.Make good any damage arising from deconstruction or demolition work

Services to be retained
Damage to services: Give notice, and notify relevant service authorities and/ or owner/ occupier regarding damage arising from deconstruction or demolition
Repairs to services: Complete as directed, and to the satisfaction of the service authority or owner

Structures to be retained
Extent: As indicated on drawing
Parts which are to be kept in place: Protect. Give notice and notify service authority or owner of damage arising from the execution of the works.
Interface between retained structures and deconstruction or demolition:
Cut away and strip out with care to minimize the amount of making good needed

Site surface at completion
Topography: Grade the site to follow the levels of adjacent areas

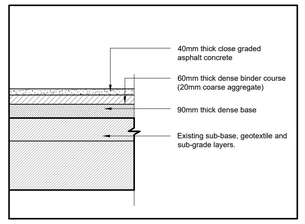
PV Panels (future provision)

16no. 4kW PV panels (approx.) - Electrical engineer to confirm exact quantity.

Site Plan Key

- Proposed Surface Water Drainage
- Proposed Foul Water Drainage
- Existing Foul Water Drainage
- Parking space demarcation
- Accessible Parking Spaces
- Keep Clear Zone
- Proposed Fencing

Wall Mounted Car Charging Point
- 7kW (Minimum)
- Mode 3 charging, smart enabled charging
- Unthethered connections (i.e., type 2 socket, no built-in cable).



Car Park Surface build up
Scale - 1:20

200mm 0 200 400 600 800 1000 1200 1400 1600
1:20

1m 0 1 2 3 4 5 6 7 8
1:100

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
D	12.07.23	Drawing references updated	MR
C	15.05.23	Bin store and cycle shelter relocated	MR
B	12.05.23	Rooflights changed as per client request	MR
A	21.04.23	Amended inline with Council comments. Parking arrangement and entrance gates updated.	MR

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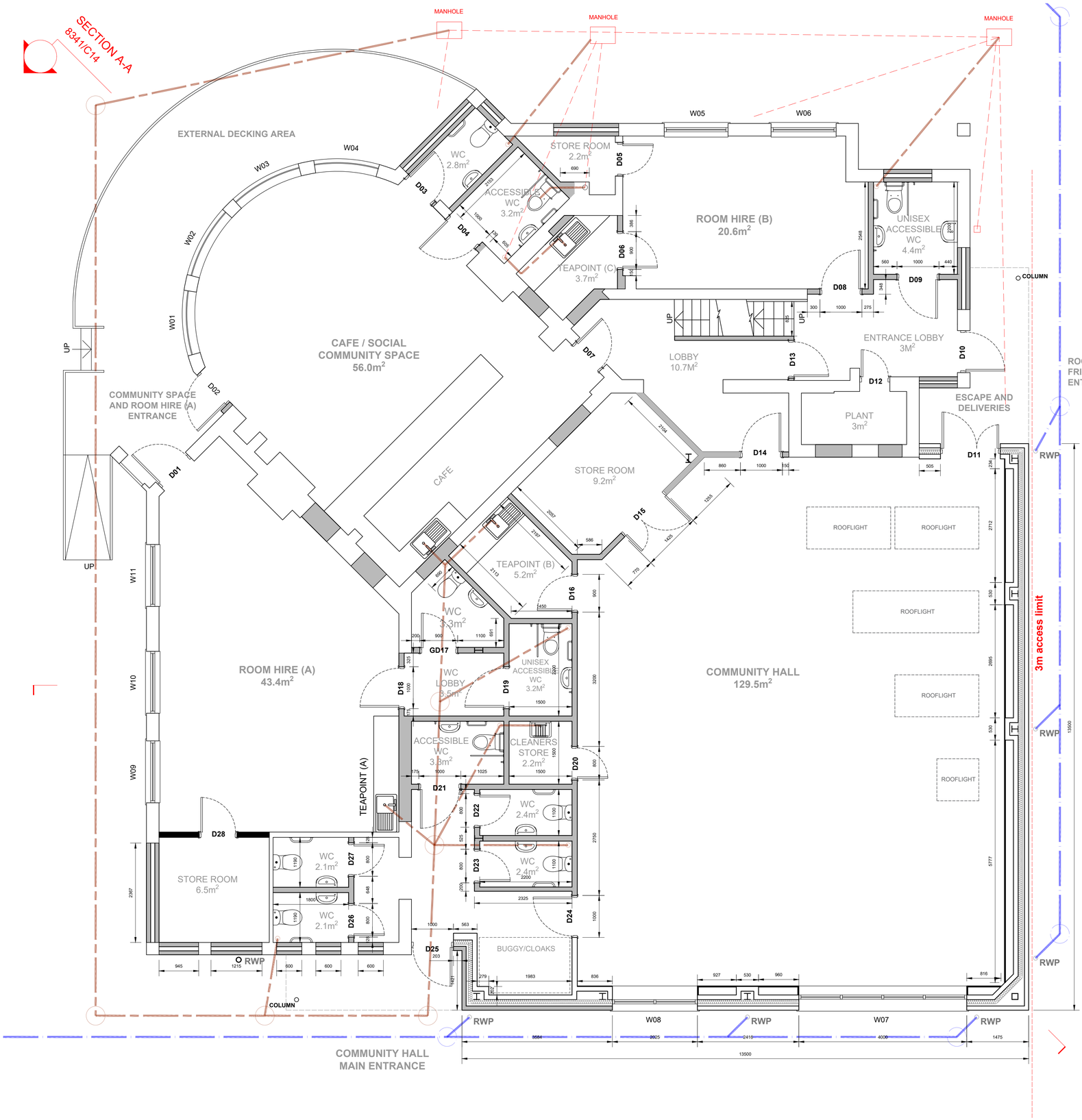
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

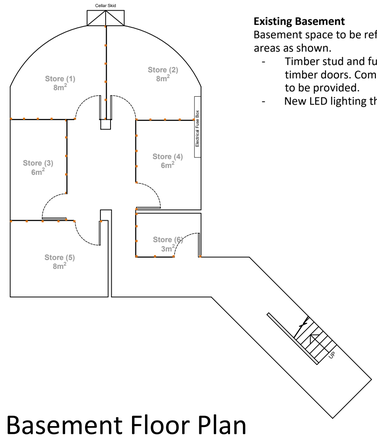
title:
Proposed Site Layout Plan

scale @ A1: 1:20, 1:100	drawn by: MR	
date: July '23	approved: SDL	
project no: 8341	dwg no: B05	revision: D



Ground Floor Plan

Scale - 1:50



Existing Basement

Basement space to be refurbished divided up into storage areas as shown.

- Timber stud and full height mesh fencing cages with timber doors. Combination locks and door signage to be provided.
- New LED lighting throughout.

Basement Floor Plan

Scale - 1:50

Plan Key

- Proposed Foul Water Drainage
- Existing Foul Water Drainage
- Proposed Surface Water Drainage
- Setting Out Grid
- RWP — Rain Water Pipe

1m 0 1 2 3
1:50

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	21.04.23	Amended inline with structural design. Addition of Basement layout.	MR

BUILDING REGS

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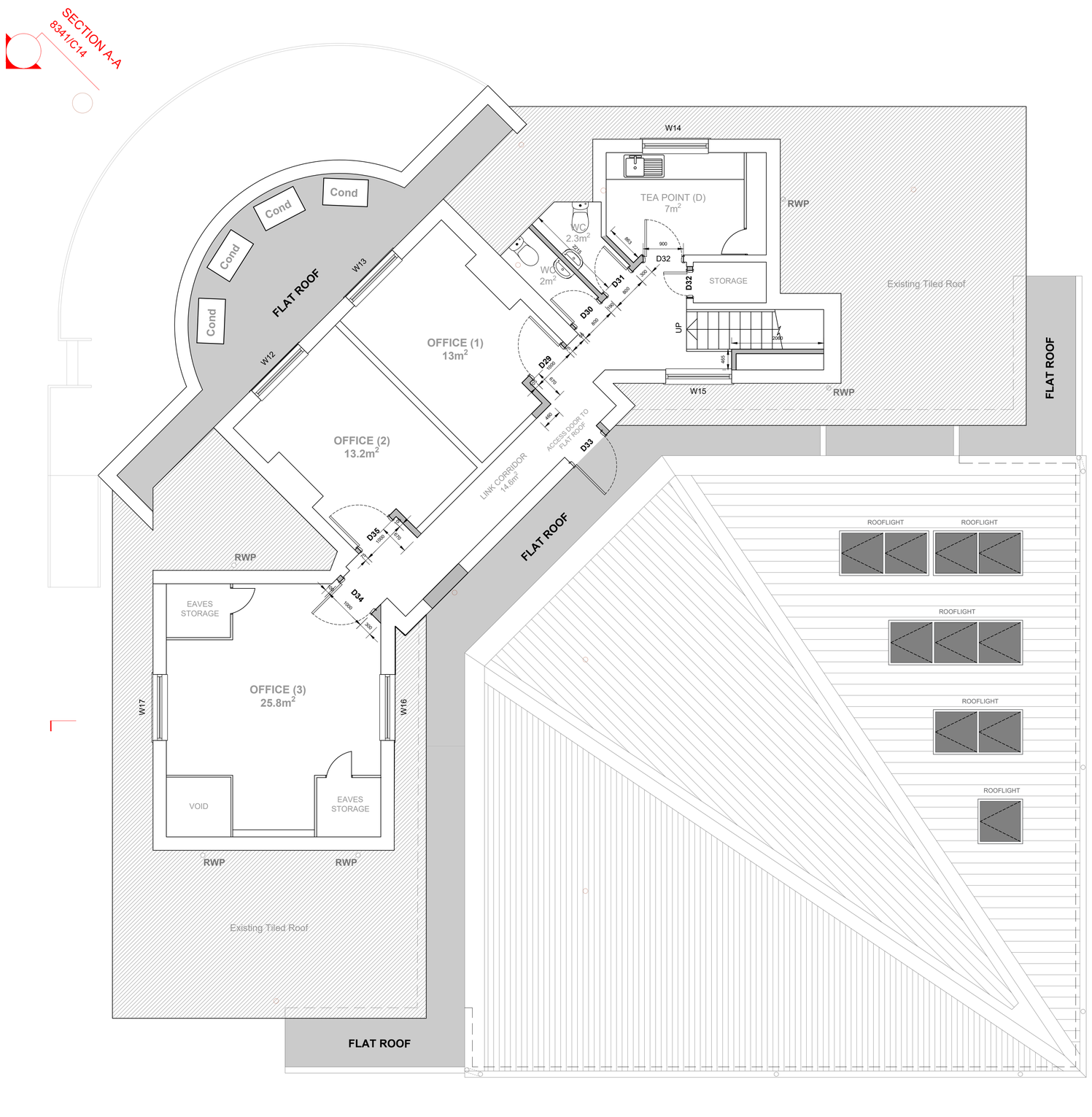
client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Proposed Ground and Basement Floor Plans

scale @ A1:	drawn by:	
1:50	MR	
date:	approved:	
April '23	SDL	
project no:	dwg no:	revision:
8341	B06	A



First Floor Plan

Scale - 1:50

1m 0 1 2 3

1:50

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Rooflights changed as per client request	MR

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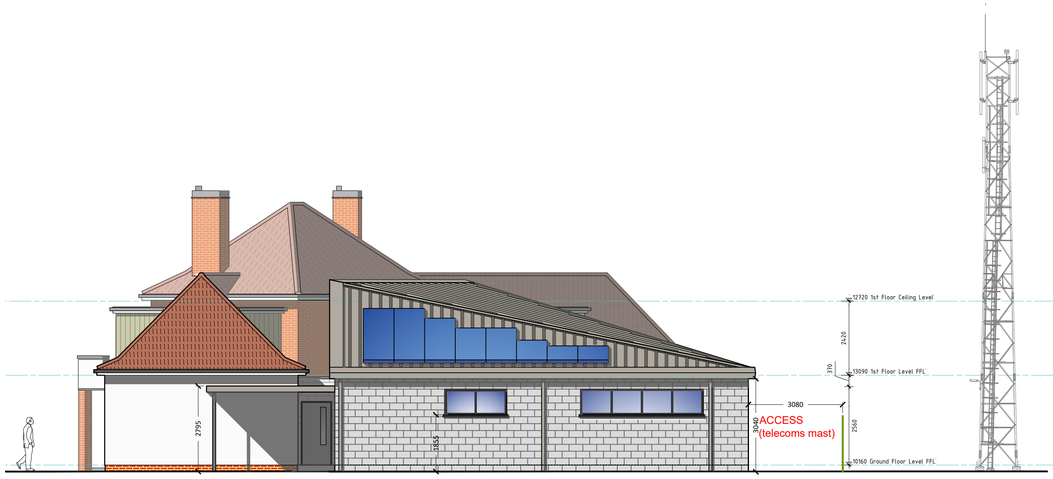
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

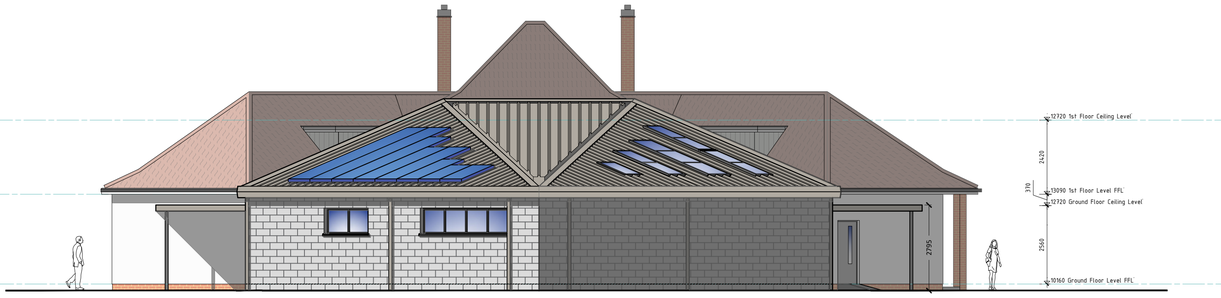
title:
Proposed First Floor Plan

scale @ A1: 1:50	drawn by: MR	
date: May '23	approved: SDL	
project no: 8341	dwg no: B07	revision: A



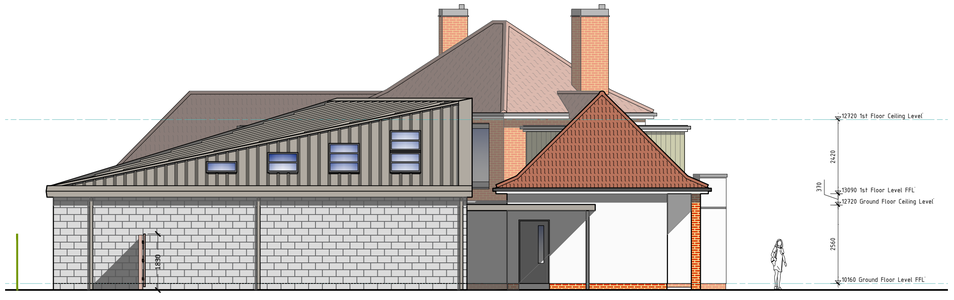
North-East Elevation

Scale - 1:100



East Elevation

Scale - 1:100



South-East Elevation

Scale - 1:100

West Elevation

Scale - 1:100

External Finishes

Existing Building

Roof
As existing, minor repair and replacement work to match existing.

External Walls
K Rend - pure white render

Dormer Roof
Single ply - light grey
See drawing 8341/B11 for specification

Dormer Cheeks
Vertical timber cladding
See drawing 8341/B11 for specification

Fenestration
UPVC dark grey

Doors
Solid: metal powder coated - dark grey
Glazed: aluminum framed powder coated - dark grey
See drawing 8341/B18 for specification

Windows
Aluminum framed powder coated - dark grey
See drawing 8341/B20 for specification

New-Build Extension

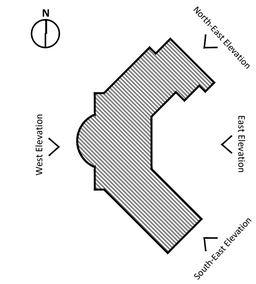
Pitched Roof
Trapezoidal, metal cladding - goosewing grey
See drawing 8341/B5 for specification and 8341/B21 for roof build up

Walls
Facing concrete blockwork
See drawing 8341/B10 for specification and 8341/B21 for build up

Fenestration
Concealed guttering - matching cladding finish
Aluminium downpipe - matching cladding finish
See drawing 8341/B21 for build up

Roof Lights
Modular venting rooflight - dark grey
See drawing 8341/B05 for specification

Elevation Key



1m 0 1 2 3 4 5 6 7 8
1:100

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Rooflights changed as per client request	MR

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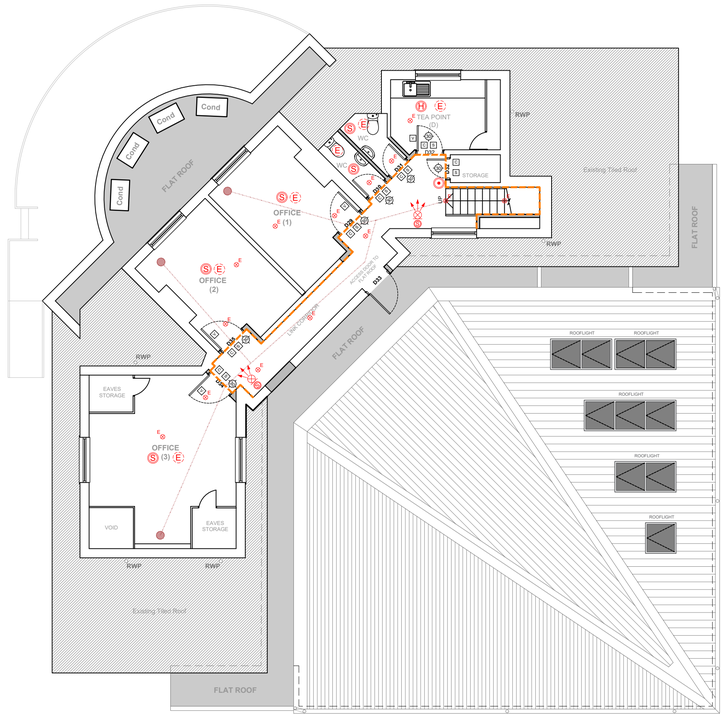
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

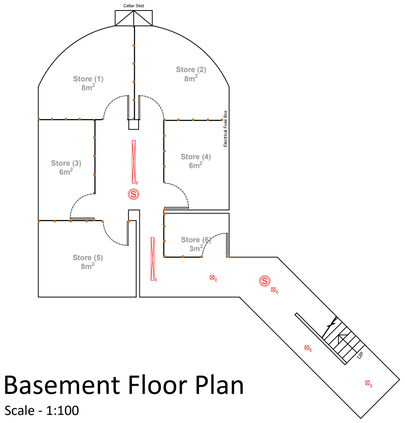
title:
Proposed Elevations

scale @ A1: 1:100	drawn by: SDL	
date: May '23	approved: SDL	
project no: 8341	dwg no: B08	revision: A



First Floor Plan

Scale - 1:100



Basement Floor Plan

Scale - 1:100

Ground Floor Plan

Scale - 1:100

PLAN KEY

- AND ESCAPE ROUTE
- FD60 - 60 MIN FIRE RATED DOORS
- FD30 - 30 MIN FIRE RATED DOORS
- SELF CLOSER
- VISION PANEL WITH 10mm PYRODUR GLASS TO PROVIDE 30 MINUTES FIRE RESISTANCE IN FD30 FIRE DOOR 60 MINUTES FIRE RESISTANCE IN FD60 FIRE DOOR
- INTUMESCENT STRIPS/SMOKE SEALS GROOVED INTO DOORS ON THREE SIDES
- BREAK GLASS CALL POINT
- SMOKE DETECTOR
- HEAT DETECTOR
- ILLUMINATED 'EXIT' SIGN WITH RUNNING MAN LOGO
- WALL MOUNTED SOUNDER AND BEACON
- WALL MOUNTED SOUNDER AND BEACON AND SMOKE DETECTOR
- DENOTES EMERGENCY LIGHTING
- 30MIN FIRE RATED COMPARTMENT
- 60MIN FIRE RATED COMPARTMENT (ABOVE CEILING)

MAXIMUM OCCUPANCIES AND ESCAPE DISTANCE

ROOM	USE	FLOOR AREA (m^2)	Maximum Occupancy	Maximum escape distance (m)	Minimum Width (mm)
GROUND FLOOR					
CAFE /SOCIAL COMMUNITY SPACE	GENERAL PUBLIC	56	56	15	D02 - 900
HIRE ROOM (A)	GENERAL PUBLIC AND/OR PRIVATE HIRE	43	43	11	
HIRE ROOM (B)	GENERAL PUBLIC AND/OR PRIVATE HIRE	20	20	14	
COMMUNITY HALL	GENERAL PUBLIC	129	129	14	
FIRST FLOOR					
OFFICE (1)	PRIVATE SUBLET	13	2	14	
OFFICE (2)	PRIVATE SUBLET	13	2	16	
OFFICE (3)	PRIVATE SUBLET	25	4	18	

INDICATIVE M&E DESIGN - SUBJECT TO FINAL SPECIALIST DESIGN AND CLIENT INPUT

FIRE PENETRATIONS

Fire performance
Resistance to fire: To **BS EN 13501-2**, E30 or better
Reaction to fire: To **BS EN 13501-1**, Class A1
Smoke resistance, air leakage rate (maximum): 3 m^3/m^2-hr
Effective design life: 25 years

Loose fire-stopping
Fire resistance:To match fire resistance of wall
Penetration seal: Contractor's choice
Size: To suite penetration

Pipe collar
Type: Surface mounted intumescent pipe collar
Manufacturer: Contractor's choice
Product reference: Contractor's choice

Sealant
Type: Fire-resisting acrylic
Manufacturer: Contractor's choice
Product reference: Contractor's choice

Applying intumescent foam
New joints: Remove builders' debris, mortar droppings, grease, and other contaminants.
Old joints: Clean and remove existing sealant from each joint.
Priming: Lightly moisten substrate with water.
Application: Fill joint to approximately half its depth, and allow foam to expand to face of joint.
Trimming: Trim excess foam to give a neat, flush appearance

Applying capping sealant
Preparation: De-grease using cleaner recommended by sealant manufacturer
Priming: Primer recommended by sealant manufacturer
Depth of sealant: 10 mm or recommended by sealant manufacturer
Temperature: Do not apply water-based sealants when they could be damaged by frost.
Installing flexible intumescent gap sealer
Fitting of strips: Compress strips and fit into gap so that, as they decompress, the strips wedge themselves in the void.
Shrink wrapping: Do not remove
Joints, Ends of strips: Fit intumescent 'end piece' at both ends of run of fire stop laminate.
Joints between strips: Fit two intumescent 'end pieces' at each butt joint.

Fixing pipe collars
Collar fixing: Contractor's choice
Gap around collar: Seal with gap filler and sealant
Length of wraps: Project 50 mm from each side of the element

Workmanship generally
Gaps: Seal between building elements and services, to provide effective resistance to fire and the passage of smoke. Allow for capping sealants where required. Finish flush with surrounds.
Adjacent surfaces: Prevent overrun of filler, sealant or mortar on to finished surfaces.

Cleaning
Masking tapes: Remove.
Cleaning: Clean off splashes and droppings. Wipe down finishes.

FURTHER INFORMATION AND SPECIFICATION OF:
SITE LAYOUT PLAN - **8314/C05**
WALL TYPES - **8314/C05**(*GROUND FLOOR*) AND **8314/C05**(*FIRST FLOOR*)
CEILING TYPES - **8314/C05**
M&E SERVICES PLAN - **8314/C05**
DOOR SCHEDULE - **8314/C05**

1m 0 1 2 3 4 5 6 7 8
1:100

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Basement plan updated	MR

BUILDING REGS

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client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Proposed Fire Plan

scale @ A1: 1:100	drawn by: MR	
date: May '23	approved: SDL	
project no: 8341	dwg no: B09	revision: A

Proposed Ground Floor Plan

Scale - 1:50

Existing Masonry Walls

Site inspection
Purpose: To confirm type and extent of repair/ renovation/ conservation work shown on drawings and described in survey reports and schedules of work.
Parties involved: Contract administrator and Contractor's representative
Timing: Prior to commencement of masonry works
Instructions issued during inspection: To be confirmed by contractor

Survey of existing cavity walls
Timing: Before starting remedial work covered in this section.
Purpose: To confirm nature and extent of remedial work to wall ties.
Survey report: Submit, stating:
Form of construction, materials used and condition of walls.
Thicknesses of internal and external leaves.
Widths of cavities.
Nature and extent of remedial work including requirements for additional ties at, e.g. sloping verges, movement joints and openings.
Schedule of services, fixtures and finishes requiring removal to facilitate renewal of wall ties.
Any other information considered relevant.

Removal of plant growths from masonry
Plants, root systems and associated soil/ debris:
Carefully remove from joints, voids and facework.
Removal of roots: Where growths cannot be removed completely without disturbing masonry seek instructions.
Unwanted plants close to masonry: Where removal of root system is not possible or desirable, cut through stem as close to the ground as possible. Remove bark from stump and apply herbicide paste. Leave stump to wither.

Protection of masonry units and masonry
Masonry units: Prevent overstressing during transit, storage, handling and fixing. Store on level bearers clear of the ground, separated with resilient spacers. Protect from adverse weather and keep dry. Prevent soiling, chipping and contamination. Lift units at designed lifting points, where provided.
Masonry: Prevent damage, particularly to arrises, projecting features and delicate, friable surfaces. Prevent mortar/ grout splashes and other staining and marking on facework. Protect using suitable nonstaining slats, boards, tarpaulins, etc. Remove protection on completion of the work.

Structural stability
General: Maintain stability of masonry. Report defects, including signs of movement that are exposed or become apparent during the removal of masonry units.

Disturbance to retained masonry
Retained masonry in the vicinity of repair works:
Disturb as little as possible.
Existing retained masonry: Do not cut or adjust to accommodate new or reused units.
Retained loose masonry units and those vulnerable to movement during repair works:
Prop or wedge so as to be firmly and correctly positioned.

Removal of existing wall ties
Internal leaf
Wall ties: Remove carefully and completely.
Internal leaf/ finishes: Minimize disturbance.
External leaf
Flexible wire ties: Crop or bend down against face of internal leaf.
Rigid ties: Crop against face of internal leaf.
Internal leaf/ finishes: Do not disturb.

Making good of cavity wall insulation
Cavities: Clear of dirt and debris.
New insulation: as per new infill specification
Thickness: To match existing.
Installation: Secure. No gaps.

Workmanship
Skill and experience of site operatives: Appropriate for types of work on which they are employed.
Documentary evidence: Submit on request.

Lintels

Precast Concrete: Components manufacturer's 'proprietary' concrete.
Identity: Manufacturer's mix reference
Conformity: To BS 8500-2 and the recommendations of **BS 8500-1**, Annex A.4 for the specified exposure class.
Evidence: Submit third-party certification from a UKAS-accredited laboratory.
Reinforced components: Submit proposals for type of reinforcement and cover.
Matching sample for finish to visible faces: As existing
Standard: To BS EN 845-2.
Verification of performance: Submit calculations or test certificates.

Cavity Insulation

Kingspan Insulation
Kingspan Insulation Ltd, Pembridge, Leominster, Herefordshire, United Kingdom, HR6 9LA
+44 (0)1544 388601, info@kingspaninsulation.co.uk

Product reference: **Kooltherm K108 Cavity Insualtion Board**
Standard: To **BS EN 13166.**
Third party product certification: British Board of Agrément (BBA) certification.
Fire performance: Euroclass B|F F to BS EN 13501-1:2018.
Thermal conductivity (maximum): 0.019 W/m·K.
Cross section: Uniform thickness.
Thickness: 75mm
Face size (length x width): 1200 x 450 mm.
Compressive strength (minimum) at 10% compression: 100 kPa.
Recycled content: 0% (minimum) to BS EN ISO 14021.
Low emissivity composite foil.
Global warming potential: Less than 5.
Ozone depletion potential: Zero.
Core: Rigid thermoset fibre-free phenolic insulant core.

Fixing ties in masonry cavity walls with partial fill cavity insulation
Embedment in mortar beds (minimum): 50 mm.
Placement: Sloping downwards towards outer leaf without bending. Drip centred in the cavity and pointing downwards.
Spacing: Evenly spaced in non-staggered horizontal and vertical rows:
Horizontal centres: 600 mm
Vertical centres: 400 mm
Provision of additional ties: Within 225 mm of reveals of unbonded openings and at the vertical reveals of unsupported masonry At not more than 300 mm centres vertically.

Cavities
Concrete fill to base of cavity
Concrete generally: To **BS EN 206 and BS 8500-2.**
Concrete type: Designated GEN1
Workability: High.
Extent: Maintain 75 mm between top of fill and external ground level and a minimum of 225 mm between top of fill and ground level dpc.
Placement: Compact to eliminate voids.
Cleanliness: Keep cavity faces, ties and dpcs free from mortar and debris.

Cavity closers
Manufacturer: Contractors Choice
Product reference: Contractor's choice
Accessories: To include integral insulation

DPC

Visqueen
Heanor Gate Industrial Estate, Derbyshire, Heanor, Derbyshire, United Kingdom, DE75 7RG
+44 (0) 333 202 6800, enquiries@visqueen.com
Product references and locations: Contractor's choice

Product reference: **Visqueen Preformed Units**
locations: Contractor's choice
Third party certification: British Board of Agrément (BBA) certified / BDA certified.
Types: Water tightness (to EN 1928):
At 2kPa, Pass.
Low temperature resistance: To EN 495-5, -40°C.
Flexibility at low temperature: To **EN 1109**, -15°C.
Tear resistance (to **BS EN 12310-1**):250 N.
Reaction to fire: F class.

Installation of dpcs
Horizontal
Placement: In continuous lengths on full even bed of fresh mortar, with 100 mm laps at joints and full laps at angles.
Width: At least full width of masonry leaf. Edges of dpc not covered with mortar or projecting into cavity.
Overlying construction: Immediately cover with full even bed of mortar to receive next masonry course.
Overall finished joint thickness: As close to normal as practicable.
Ground level dpcs joint with damp-proof membrane: Continuous and effectively sealed. Low level dpcs in external walls: Install not less than 150 mm above adjoining finished ground level.
Sill dpcs form and placement: In one piece and turned up at the back when the sill is in contact with inner leaf.
Dpcs crossing cavity: Provide support to prevent sagging.

Vertical
Form: In one piece wherever possible.
Joints: Upper part overlapping lower not less than 100 mm.
Dpcs to jambs of openings: Fully lap behind cavity tray/ lintel at head and over horizontal dpc at sill. Project not less than 25 mm into cavity and maintain full contact with frames.
Fixing of jamb dpcs to back of built-in timber frames: Secure using galvanized clout nInstallation of horizontal dpcs
Placement: In continuous lengths on full even bed of fresh mortar, with 100 mm laps at joints and full laps at angles.
Width: At least full width of masonry leaf. Edges of dpc not covered with mortar or projecting into cavity.
Overlying construction: Immediately cover with full even bed of mortar to receive next masonry course.
Overall finished joint thickness: As close to normal as practicable.
Ground level dpcs joint with damp-proof membrane: Continuous and effectively sealed. Low level dpcs in external walls: Install not less than 150 mm above adjoining finished ground level.
Sill dpcs form and placement: In one piece and turned up at the back when the sill is in contact with inner leaf.
Dpcs crossing cavity: Provide support to prevent sagging.

Blockwork

Thomas Armstrong (Concrete Blocks) Ltd.

Internal leaf
Product reference: **Ultralite Concrete Block (100mm)**
Standard: To BS EN 771-3:2011; ISO 14001; ISO 9001; BES 6001 'Excellent'.
Block description: Common block.
Appearance: Dark Grey.
Configuration: Group 1.
Compressive strength: 5.2 N/mm².
Category: II.
Freeze/ thaw resistance: Frost resistant.
Thermal conductivity: 0.32 W/mK (protected inner leaf), 0.34 W/mK (exposed outer leaf).
Recycled content: 30%.
Work sizes (length x width x height): 440 x 215 x 100 mm.
Tolerance category: D1.
Net dry density: 950 kg/m³.
Reaction to fire: Class A1 to **BS EN 13501-1.**
Water absorption by capillarity: 90 g/(m2 x √0.5).
Water vapour permeability: 5/15 μ.
BaseMaterial: Low density lightweight aggregate.
Moisture movement: 0.6 mm/m.
Thickness: 100 mm.
Environmental Product Declaration (EPD): ISO 14001.

External leaf and internal infill
Product reference: **Insulite Concrete Block (100mm)**
Standard: To BS EN 771-3:2011; ISO9001; ISO14001; BES 6001 'Excellent'.
Block description: Standard.
Appearance: Dark Grey.
Configuration: Group 1.
Compressive strength: 5.5 N/mm².
Category: II.
Freeze/ thaw resistance: Frost resistant.
Thermal conductivity: 0.49 W/mK (protected inner leaf), 0.54 W/mK (exposed outer leaf).
Recycled content: 90%.
Work sizes (length x width x height): 440 x 215 x 100 mm.
Tolerance category: D1.
Net dry density: 1450 kg/m³.
Reaction to fire: Class A1.
Water absorption by capillarity: 90 g/(m2 x √0.5).
Water vapour permeability: 5/15 μ.
Moisture movement: 0.6 mm/m.
Thickness: 100 mm.
Environmental Product Declaration (EPD): ISO 14001.

Mortar designations
Mix proportions: For a specified designation select a mix from the following:
Designation (i) (BS EN 998-2 M12 equivalent)
1:0-¼:3 (Portland cement:lime:sand with or without air entraining additive).
1:3 (Portland cement:sand and air entraining additive).
Designation (ii) (BS EN 998-2 class M6 equivalent)
1:½-¼:5 (Portland cement:lime:sand with or without air entraining additive).
1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:2½-3½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:3-4 (Portland cement:sand and air entraining additive).
Designation (iii) (BS EN 998-2 class M4 equivalent)
1:1:5-6 (Portland cement:lime:sand with or without air entraining additive).
1:3½-4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:4-5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:5-6 (Portland cement:sand and air entraining additive).
Designation (iv) (BS EN 998-2 class M2 equivalent)
1:2:8-9 (Portland cement:lime:sand with or without air entraining additive).
1:4½ (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
1:5½-6½ (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
1:7-8 (Portland cement:sand and air entraining additive).
Batching:
Mix proportions by volume.
Mortar type: Continuous throughout any one type of masonry work.

Laying
Mortar joints: Fill vertical joints. Lay bricks, solid and cellular blocks on a full bed.
AAC block thin mortar adhesive and gypsum block adhesive joints:
Fill vertical joints. Lay blocks on a full bed.
Thin-layer mortar: Lay blocks on a full bed.
Interlocking perpends: Butted.
Bond where not specified: Half-lap stretcher.
Vertical joints in brick and concrete block facework: Even widths. Plumb at every fifth cross joint.

Accuracy
Courses: Level and true to line.
Faces, angles and features: Plumb.
Permissible deviations
Position in plan of any point in relation to the specified building reference line and/ or point at the same level: 10 mm.
Straightness in any 5 m length: ± 5 mm.
Verticality up to 3 m height: ± 10 mm.
Verticality up to 7 m height: ± 14 mm.
Overall thickness of walls: ± 10 mm.
Level of bed joints up to 5 m (brick masonry): ± 11 mm.
Level of bed joints up to 5 m (block masonry): ± 13 mm.

Levelling of separate leaves
Locations for equal levelling of cavity wall leaves:
As follows: Every course containing vertical twist type ties or other rigid ties.
Every third tie course for double triangle/ butterfly ties.
Courses in which lintels are to be bedded.
560Coursing brickwork
Gauge:
Four brick courses including bed joints to 300 mm.

Support and coursing brickwork with of existing work
Joint above inserted lintel or masonry:Fully consolidated with semidry mortar to support existing structure.
Gauge: Line up with existing brick courses.

Block bonding new walls to existing
Pocket requirements:
Formed as follows:
Width: Full thickness of new wall.
Depth (minimum): 100 mm.

Vertical spacing
Brick to brick: 4 courses high at 8 course centres.
Block to block: Every other course.
Pocket joints: Fully filled with mortar.

Jointing and Pointing
Profile: Consistent in appearance.
Joint preparation: Remove debris. Dampen surface.

Fire-stopping
Avoidance of fire and smoke penetration:
Fit tightly between cavity barriers and masonry. Leave no gaps.

Adverse weather
General: Do not use frozen materials or lay on frozen surfaces.
Air temperature requirements: Do not lay bricks/ blocks:
In cement-gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising.
In hydraulic lime:sand mortars when at or below 5°C and falling or below 3°C and rising, or as manufacturer's/ supplier's recommendations.
In thin-layer mortars when outside the limits set by the mortar manufacturer.
Temperature of walling during curing:
Above freezing until hardened.
Protect at all times from: Rain and snow.
Drying out too rapidly in hot conditions and in drying winds.
Perpend joint weep holes
Form: Open clear perpend joint.
Locations: Through outer leaf, immediately above base of cavity, at cavity trays, stepped dpcs and over openings. 75 mm above top of cavity fill at base of cavity.
Provision: At not greater than 1000 mm centres and not less than two over openings.

Perpend joint plastics weep holes
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Locations: Through outer leaf, immediately above base of cavity at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
Provision: At not greater than 1000 mm centres and not less than two over openings.

Wall Lining

Dry linings generally
General: Use fixing, jointing, sealing and finishing materials, components and installation methods recommended by board manufacturer.
Cutting gypsum boards: Neatly and accurately without damaging core or tearing paper facing.
Cut edges: Minimize and position at internal angles wherever possible. Mask with bound edges of adjacent boards at external corners.
Fixings boards: Securely and firmly to suitably prepared and accurately levelled backgrounds.
Finishing: Neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

Fixing gypsum board with adhesive dabs
Setting out boards: Accurately aligned and plumb.
Fixing to substrates: Securely using adhesive dabs.
Adhesive dab spacings for each board
Horizontally: One row along top edge and one continuous dab along bottom edge.
Vertically: One row along each edge and thereafter at intermediate spacings to suit size of board:

Thickness (mm)	Width (mm)	Dab centres (mm)
9.5	1200	400
9.5/12.5	900	450
12.5	1200	600

Adhesive dab dimensions (width x length): At least 50-75 mm x 250 mm.
Position of dabs from edges/ ends of boards (minimum): 25 mm

Fixing gypsum board to timber
Fixing to timber: Securely at the following centres (maximum): Nails: 150 mm.
Screws to partitions/ wall linings: 300 mm. Reduce to 200 mm at external angles.
Screws to ceilings: 230 mm.
Position of nails/ screws from edges of boards (minimum)
Bound edges: 10 mm.
Cut/ unbound edges: 13 mm.
Position of nails/ screws from edges of timber supports (minimum): 6 mm.

Wall Finishes

Details and specification of wall finishes can be found on drawing 8341/C17

Wall Type Key

External Infill
100mm low density concrete blockwork - inner and outer leaf. Cavity to be filled with 75mm insulation and 25mm cavity void. Internal plasterboard finish, skimm and paint as per proposed finish.
Must achieve improvement U-vaue of 0.3. As per Building Regulations Part L

Infill Internal Existing Walls
100mm low density concrete blockwork, 100mm cavity void. Plasterboard finish, skimm and paint as per proposed finish.

Internal Partitions
100mm Standard medium concrete blockwork. Plasterboard finish, skimm and paint as per proposed finish.

Proposed Extension External Walls
100mm Medium Density Concrete Blockwork - Inner leaf
100mm Splitface concrete Blockwork - Outer leaf
Cavity to be filled with 100mm insulation and 50mm cavity void. Internal plasterboard finish, skimm and paint as per proposed finish.
Masonary tied to steel columns using ancon SD8 Ties.
Must achieve U-vaue of 0.26. As per Building Regulations Part L

Existing Internal and External walls
Make good existing walls, remove any damage elements and prepare surface for final finishes.

30min fire rated compartment
All penetrations, voids and existing wall build-ups to be rectified to ensure a minimum of 30min fire rated compartment (unless specified otherwise).

See drawing 8341/C17 for wall finishes

CONTRACTOR TO TEMPORARY PROP EXISTING STRUCTURE WHILST WORKS ARE UNDERTAKEN TO FORM NEW OPENINGS. STRUCTURAL ENGINEER TO CONFIRM

Wall Label Key

'INFILL' Infill wall recess with 2 layers of 12.5mm plasterboard on metal stud framing. Top layer of plasterboards to run over blockwork to provide flush finish for plaster. Painted wall finish as specified on drawing 8341/B15

'FH' Denotes walls to run full height to underside of roof

60min fire rated compartment
100mm partitioning above ceiling, fixed onto top of blockwork wall. Gypframe 48 550 metal C studs with 2 layers of 12.5mm Fireline - 60min.

All penetrations to be enclosed with the appropriate fire protection matching the fire rating.

1m 0 1 2 3
1:50

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	'infill' to community hall added as per client's request.	MR

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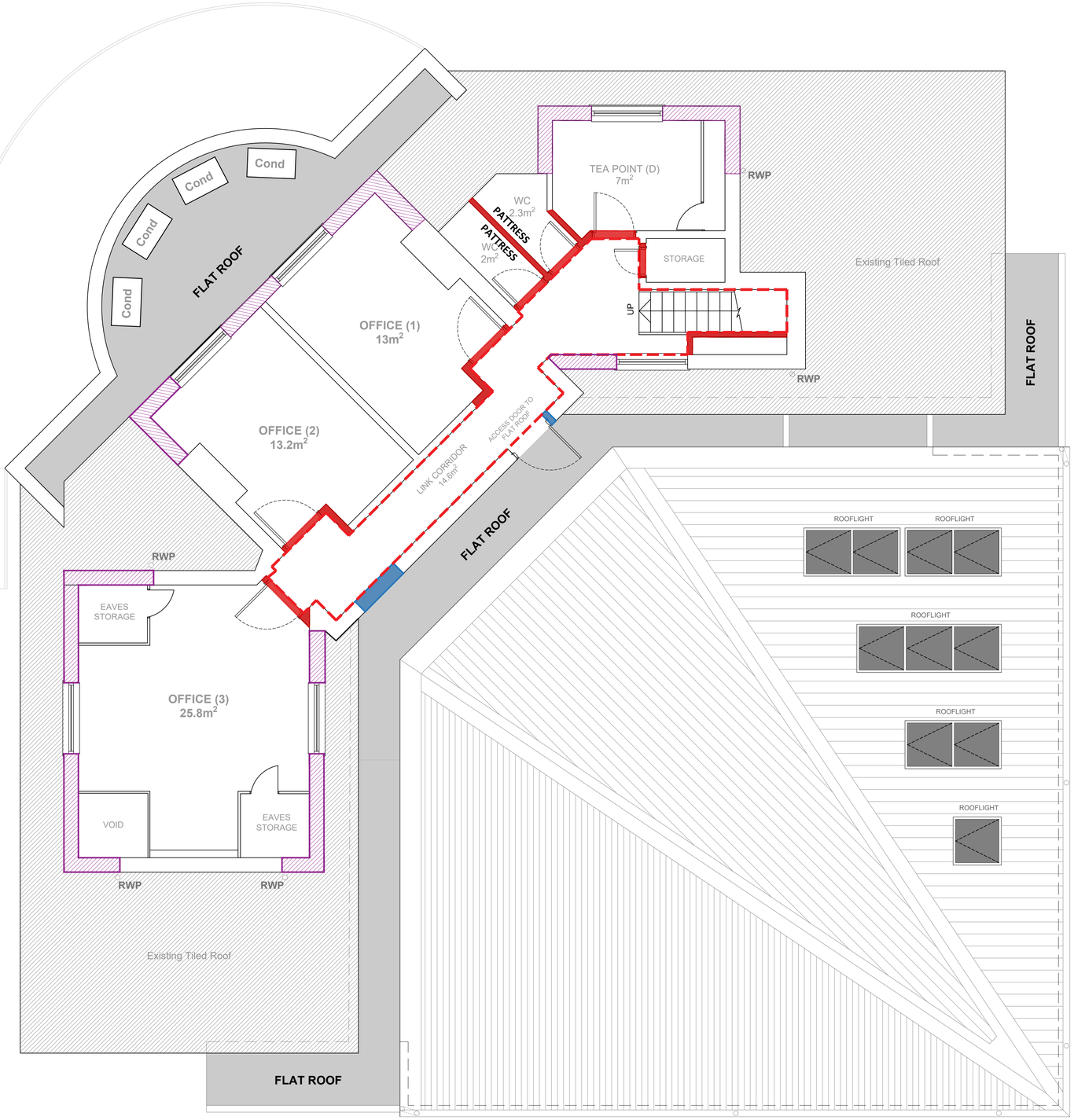
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Ground Floor Wall Specification Plan

scale @ A1: 1:50	drawn by: MR
date: May '23	approved: SDL
project no: 8341	dwg no: B10
	revision: A



Proposed First Floor Plan

Scale - 1:50

Note

Specifications regarding below can be found on drawing 8341/C10.

- Existing Masonry Walls
- Masonry Repairs
- Blockwork
- Lintels
- Cavity & Cavity Insulation
- Wall ties, Cavity closers
- DPC

Existing Plasterboard Repairs

Performance of repairs must match original specified performances.
Filling small areas with broken cores:
Cut away paper facing, remove loose core material and fill with jointing compound.
Finish: Flush, smooth surface suitable for redecoration.
Large patch repairs: Cut out damaged area and form neat hole with rectangular sides.
Replace with matching gypsum board.
Fixing: Use methods to suit type of dry lining, ensuring full support to all edges of existing and new gypsum board.
Finishing: Fill joints, tape and apply jointing compound to give a flush, smooth surface suitable for redecoration.

Wall Lining

Dry linings generally
General: Use fixing, jointing, sealing and finishing materials, components and installation methods recommended by board manufacturer.
Cutting gypsum boards: Neatly and accurately without damaging core or tearing paper facing.
Cut edges: Minimize and position at internal angles wherever possible. Mask with bound edges of adjacent boards at external corners.
Fixings boards: Securely and firmly to suitably prepared and accurately levelled backgrounds.
Finishing: Neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

Fixing gypsum board with adhesive dabs
Setting out boards: Accurately aligned and plumb.
Fixing to substrates: Securely using adhesive dabs.
Adhesive dab spacings for each board
Horizontally: One row along top edge and one continuous dab along bottom edge.
Vertically: One row along each edge and thereafter at intermediate spacings to suit size of board:

Thickness (mm)	Width (mm)	Dab centres (mm)
9.5	1200	400
9.5/12.5	900	450
12.5	1200	600

Adhesive dab dimensions (width x length): At least 50-75 mm x 250 mm.
Position of dabs from edges/ ends of boards (minimum): 25 mm

Fixing gypsum board to timber
Fixing to timber: Securely at the following centres (maximum): Nails: 150 mm.
Screws to partitions/ wall linings: 300 mm. Reduce to 200 mm at external angles.
Screws to ceilings: 230 mm.
Position of nails/ screws from edges of boards (minimum)
Bound edges: 10 mm.
Cut/ unbound edges: 13 mm.
Position of nails/ screws from edges of timber supports (minimum): 6 mm.

Internal Partitioning

British Gypsum
Product reference: **GyWall Single Frame**
Partition type: Internal Partitions only
Centres: 600 mm
Partition height: Approx. 2400mm
Head condition: Existing timber ceiling
Deflection allowance: 15 mm
Insulation: 25mm Isover Acoustic Partition Roll (APR 1200)
Recycled content: Contractor's choice
Thickness: 50mm
Linings: Two layers 12.5mm Gyproc Wallboard with staggered joints
Finishing: Skim coat plaster with seamless jointing
Primer/ Sealer: Primer to painted areas
Accessories: Metal beads/ stops recommended by board manufacturer
Other requirements: Fire-stopping around services.

Metal framing for partitions/ wall linings
Setting out: Accurately aligned and plumb.
Frame/ Stud positions: Equal centres to suit specified linings, maintaining sequence across openings.
Additional studs: To support vertical edges of boards.
Fixing centres at perimeters (maximum): 600mm.
Openings: Form accurately.
Doorsets: Use sleeved or boxed metal studs and/ or suitable timber framing to achieve strength grade requirements for framing assembly and adequately support weight of door.
Services penetrations: Allow for associated fire-stopping.

Staggered stud partitions
Horizontal frame members (noggins, bearers, etc.) and boards: Fix between alternate studs and not touching adjacent offset studs.

Plasterboard and Dry lining

Dry linings generally
Use fixing, jointing, sealing and finishing materials, components and installation methods recommended by board manufacturer.
Cutting gypsum boards: Neatly and accurately without damaging core or tearing paper facing.
Cut edges: Minimize and position at internal angles wherever possible. Mask with bound edges of adjacent boards at external corners.
Fixings boards: Securely and firmly to suitably prepared and accurately levelled backgrounds.
Finishing: Neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

Gypsum boards generally
Gypsum plasterboard to **BS EN 520.**
Gypsum fibre board to **BS EN 15283-2.**

Gypsum - Gyproc WallBoard
To **BS EN 520**
Core density (minimum): 650 kg/m³.
Reaction to fire: Manufacturer's standard
Water vapour resistance factor: Manufacturer's standard
Thermal conductivity: Manufacturer's standard
Recycled content: Contractor's choice
Exposed surface and edge profiles: Clean and undamaged, Suitable to receive specified finish

Gypsum - Glasroc H Tile backer
Type: To **BS EN 15283-2**
Thickness: 12.5 mm
Reaction to fire: Class A2-s1, d0 or better
Water vapour resistance factor: Manufacturer's standard
Thermal conductivity: 0.25 W/(m·K)
Other BS EN 15283-2 characteristics: None
Recycled content: Contractor's choice

Gypsum Gyproc - Moisture Resistant
Type: To **BS EN 520**
Core: Moisture-resistant.
Density (minimum): 710 kg/m³.
Paper facings: Moisture-resistant.
Reaction to fire: Manufacturer's standard
Water vapour resistance factor: Manufacturer's standard
Thermal conductivity: Manufacturer's standard
Recycled content: Contractor's choice
Exposed surface and edge profiles: Clean and undamaged, Suitable to receive specified finish

Installing mineral wool insulation
Fitting insulation: Closely butted joints and no gaps. Use fasteners to prevent slumping or displacement.
Services Electrical cables overlaid by insulation: Sized accordingly.
Ceilings: Cut insulation around electrical fittings, etc.

Joints between boards
Tapered edged gypsum boards
Bound edges: Lightly butted.
Cut/ unbound edges: 3 mm gap.
Square edged plasterboards: 3 mm gap.
Square edged gypsum fibre boards: 5 mm gap.

Vertical joints
Joints: Centre on studs.
Partitions: Stagger joints on opposite sides of studs.
Two layer boarding: Stagger joints between layers.

Horizontal joints
Surfaces exposed to view: Horizontal joints not permitted. Seek instructions where height of partition/ lining exceeds maximum available length of board.
Two layer boarding: Stagger joints between layers by at least 600 mm.
Edges of boards: Support using additional framing.
Two layer boarding: Support edges of outer layer.

Fixing gypsum board to metal framing/ Furrings
Partitions/ Wall linings: Fix securely and firmly at the following centres (maximum): 900mm
Single layer boarding: To all framing at 300 mm centres. Reduce to 200 mm centres at external angles.
Multi-layer boarding: Face layer at 300 mm centres, and previous layers around perimeters at 300 mm centres.
Ceilings: 230 mm. Reduce to 150 mm at board ends and at lining perimeters.
Position of screws from edges of boards (minimum): 10 mm.
Screw heads: Set in a depression. Do not break paper or gypsum core.

Deflection heads
Fixing boards: Do not fix to head channels.

Level of dry lining across joints
Sudden irregularities: Not permitted.
Joint deviations: Measure from faces of adjacent boards using methods and straightedges (450 mm long with feet/ pads) to **BS 8212, clause 3.3.5.**
Tapered edge joints: Permissible deviation (maximum) across joints when measured with feet resting on boards - 3 mm.
External angles: Permissible deviation (maximum) for both faces - 4 mm.
Internal angles: Permissible deviation (maximum) for both faces - 5 mm.

Seamless jointing to gypsum boards
Cut edges of boards: Lightly sand to remove paper burrs.
Filling and taping: Fill joints, gaps and internal angles with jointing compound and cover with continuous lengths of paper tape, fully bedded.
Protection of edges/ corners: Reinforce external angles, stop ends, etc. with specified edge/ angle bead.
Finishing: Apply jointing compound. Feather out each application beyond previous application to give a flush, smooth, seamless surface.
Nail/ screw depressions: Fill with jointing compound to give a flush surface.
Minor imperfections: Remove by light sanding.

Skim coat plaster finish
Plaster type: As recommended by board manufacturer
Thickness: 2-3 mm.
Joints: Fill and tape except where coincident with metal beads.
Finish: Tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.

Rigid beads/stops
Internal: To **BS EN 13658-1.**
External: To **BS EN 13658-2.**

Installing beads/ Stops
Cutting: Neatly using mitres at return angles.
Fixing: Securely using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
Finishing: After joint compounds/ plasters have been applied, remove surplus material while still wet from surfaces of beads exposed to view.

Repairs to existing gypsum board
Performance of repairs must match original specified performances.
Filling small areas with broken cores:
Cut away paper facing, remove loose core material and fill with jointing compound.
Finish:Flush, smooth surface suitable for redecoration.
Large patch repairs: Cut out damaged area and form neat hole with rectangular sides.
Replace with matching gypsum board.
Fixing: Use methods to suit type of dry lining, ensuring full support to all edges of existing and new gypsum board.
Finishing: Fill joints, tape and apply jointing compound to give a flush, smooth surface suitable for redecoration.

Gypsum plaster skim coat on plasterboard
Plasterboard: 12.5 mm
Preparation: Bonding agent recommended by plaster manufacturer
Plaster: Board finish/ finish plaster to **BS EN 13279-1.**
Manufacturer: British Gypsum
Product reference: Thistle plaster
Thickness: 3mm
Finish: Smooth
Accessories: Beads and stops

Cold Weather Work
General: Do not use frozen materials or apply coatings on frozen or frost bound substrates.

Internal work: Take precautions to enable internal coating work to proceed without detriment when air temperature is below 3°C.

Suitability of substrates
Soundness: Free from loose areas and significant cracks and gaps.
Cutting, chasing, making good, fixing of conduits and services outlets and the like: Completed.
Tolerances: Permitting specified flatness/ regularity of finished coatings.
Cleanliness: Free from dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.

Removal and renewal of existing plaster/ render
Location and extent: Agree, at least on a provisional basis, before work commences.
Minimize extent of removal and renewal.
Removing defective existing plaster
Plaster for removal: Detached, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
Stained plaster: Removing defective plaster. Cut back to a square, sound edge.
Faults in substrate (structural deficiencies, damp, etc.): Submit proposals.
Cracks Fine hairline cracking/ crazing: Leave. Dust and loose material: Remove from exposed substrates and edges

Existing damp affected plaster/ render
Plaster affected by rising damp: Remove to a height of 300 mm above highest point reached by damp or 1 m above dpc, whichever is higher.
Masonry units: Submit proposals.
Faults in substrate (structural deficiencies, additional sources of damp, etc.): Submit proposals.
Drying out substrates: Establish drying conditions. Leave walls to dry for as long as possible before plastering.
Dust and loose material: Remove from exposed substrates and edges.

Application generally
Application of coatings: Firmly and in one continuous operation between angles and joints.
Achieve good adhesion.
Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
Drying out: Prevent excessively rapid or localized drying out.

Flatness/ surface regularity
Sudden irregularities: Not permitted.
Deviation of plaster surface: Measure from underside of a straight edge placed anywhere on surface.
Permissible deviation (maximum) for plaster not less than 13 mm thick:
3 mm in any consecutive length of 1800 mm.
718Junction of new plasterwork with existing
New plasterwork: Finish flush with original face of existing plasterwork to form a seamless junction.

Plaster Coats
Projection plaster
Application: Evenly and in one continuous operation between angles and joints.
Finish:A level open textured surface before finishing manually.

Smooth finish
Appearance: A tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks. Avoid water brush, excessive trowelling and over polishing.

Gypsum plasterboard backings
Type: To **BS EN 520 Type A.**
Core density (minimum): 650 kg/m³.
Exposed surface and edge profiles: Suitable to receive specified plaster finish.

Plasterboard joints
Joints and angles (except where coincident with metal beads). Reinforce with continuous lengths of jointing tape.

Wall Finishes

Details and specification of wall finishes can be found on drawing 8341/C17

Wall Key

External Infill
100mm low density concrete blockwork - inner and outer leaf. Cavity to be filled with 75mm insulation and 25mm cavity void. Internal plasterboard finish, skimm and paint as per proposed finish.
Must achieve improvement U-vaue of 0.3W/m²K as per Building Regulations Part L

See drawing 8341/C10 for Specification

Internal Partitioning
130mm metal stud partitions, 2 layers of 12.5mm plasterboard with staggered joints, 3mm skim prepared for final wall finish.

Existing Internal and External walls
Make good existing walls, remove any damage elements and prepare surface for final finishes.

Existing Dormer Cheeks
Take dormer cheeks back to structural timber studs. Remove existing tiling, trims, boarding, battens/ counter battens and internal finishes.
Install new 50mm (minimum)-75mm insulation between existing timber studs, single layer of felt breather membrane on 18mm marine quality plywood. New accoya wood horizontal cladding with the translucent finish on vertical supporting battens.
New build up must achieve improvement U-vaue of 0.3W/m²K as per Building Regulations Part L

TILE **Tiled Walls**
Walls to receive tiling, ensure appropriate tilebacker boarding is utilised.

PATTRESS **Mounted Sanitary Ware**
12mm of marine quality plywood pattressing.

30min fire rated compartment
All penetrations, voids and existing wall build-ups to be rectified to ensure a minimum of 30min fire rated compartment (unless specified otherwise).

See drawing 8341/C17 for wall finishes

CONTRACTOR TO TEMPORARY PROP EXISTING STRUCTURE WHILST WORKS ARE UNDERTAKEN TO FORM NEW OPENINGS.

1m 0 1 2 3
1:50

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Rooflights changed as per client request	MR

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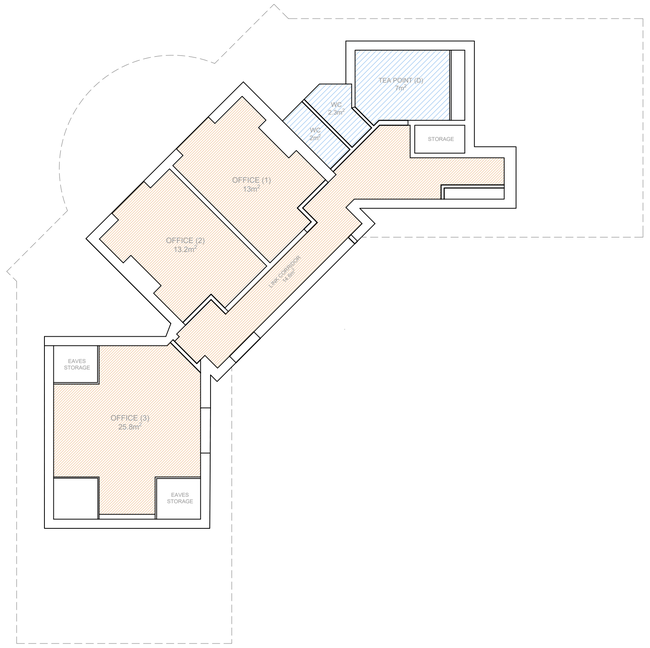
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
First Floor Wall Specification Plan

scale @ A1: 1:50	drawn by: MR	
date: May '23	approved: SDL	
project no: 8341	dwg no: B11	revision: A

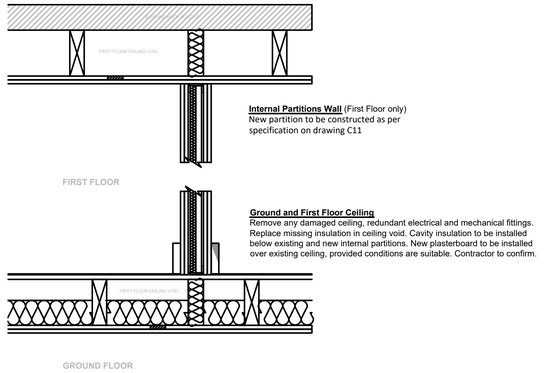


First Floor Reflected Plan

Scale - 1:100

Ground Floor Reflected Plan

Scale - 1:100

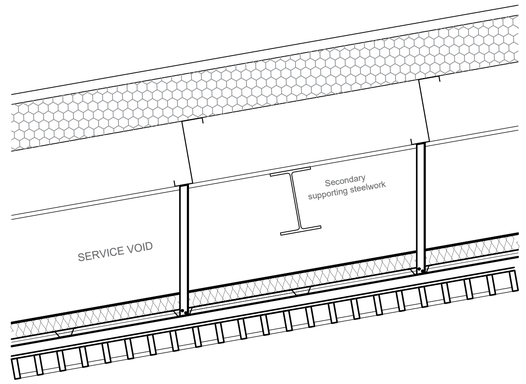


Internal Partitions Wall (First Floor only)
New partition to be constructed as per specification on drawing C11

Ground and First Floor Ceiling
Remove any damaged ceiling, redundant electrical and mechanical fittings. Replace missing insulation in ceiling void. Cavity insulation to be installed below existing and new internal partitions. New plasterboard to be installed over existing ceiling, provided conditions are suitable. Contractor to confirm.

Typical Ceiling Detail - Existing Areas

Scale - 1:20



Suspended Ceiling System
To be fixed above the primary steelwork to roof purlins.
Gypceiling MF suspended ceiling framework.
Gypframe:
MF5 - Ceiling section at 600mm centres
MF7 - Primary supports at 400mm centres
MFEA1 - Steel angles.
150mm - Stone mineral wool

Fixing straps and perimeter channels to suite.

Services Void
To be adjusted to suite proposed M&E services. depth to be confirmed by M&E engineer.

Feature Timber Slat Ceiling
To be installed between primary steel beams, as per manufactures details.

Feature Ceiling Detail - Proposed Extension

Scale - 1:20

Ceiling Finish			
CEILING TYPE	DESCRIPTION	AREA (m^2)	NOTES
MF Ceiling	GYPSUM CASOLINE MF CEILING SYSTEM. 1 LAYERS OF 12.5MM PLASTERBOARD AND 3MM SKIM 2NO. COATS OF DULUX TRADE PAINT - BASICALLY BLACK - 42BB 09/032 TO COMMUNITY HALL. ALL OTHER AREAS TO BE DULUX TRADE OFF WHITE - 30GG 72/008.	167.1	
Plasterboard Ceiling	OVER BOARD EXISTING PLASTERBOARD CEILING 1 LAYERS OF 12.5mm PLASTERBOARD AND 3mm SKIM 2NO. COATS OF DULUX TRADE PAINTED FINISH - BASICALLY BLACK - 42BB 09/032 TO BOTH HIRE ROOMS AND CAFE. ALL OTHER AREAS TO BE DULUX TRADE OFF WHITE - 30GG 72/008.	198.3	EXISTING CEILING TO REMAIN PROVIDED THE IT REMAINS IN ADEQUATE CONDITION. REMOVE DAMAGED CEILING AND REPAIR/REPLACE WITH NEW.
MF Ceiling Moisture Resistant	GYPSUM CASOLINE MF CEILING SYSTEM 1 LAYERS OF 12.5mm PLASTERBOARD AND 3mm SKIM 2NO. COATS OF DULUX TRADE DIAMOND EGGSHELL - OFF WHITE - 30GG 72/008.	23.3	
Moisture Resistant Plasterboard	OVER BOARD EXISTING PLASTERBOARD CEILING WIHT 1 LAYERS OF 12.5mm MOISTURE RESISTANT PLASTERBOARD AND 3mm SKIM 2NO. COATS OF 2NO. COATS OF DULUX TRADE DIAMOND EGGSHELL IN OFF WHITE - 30GG 72/008.	25.4	EXISTING CEILING TO REMAIN PROVIDED THE IT REMAINS IN ADEQUATE CONDITION. REMOVE DAMAGED CEILING AND REPAIR/REPLACE WITH NEW.
Timber Slat Feature Ceiling	SUPAWOOD - SUPASLAT 3 STANDARD RANGE FINISH IN SUPACOLOUR - BLACK SF MF CEILING SUBFRAME SUPPORTED OF PROPOSED STEELWORK.	129.5	STRIP LIGHTING TO BE INTEGRATED INTO FEATURE CEILING AS PER VISUAL.
Exposed/ to remain	EXISTING CEILING TO REMAIN OR EXPOSED.	-	EXISTING CEILING TO REMAIN PROVIDED THE IT REMAINS IN ADEQUATE CONDITION. REMOVE DAMAGED CEILING AND REPAIR/REPLACE WITH NEW.

Internal Visual - Community Hall

Not to Scale

Ceilings General

Sequence: Fix boards to ceilings before installing dry lined walls and partitions.
Orientation of boards: Fix with bound edges at right angles to supports and with ends staggered in adjacent rows.
Two layer boarding: Stagger joints between layers.

Repairs to existing gypsum board
Performance of repairs must match original specified performances.
Filling small areas with broken cores:
Cut away paper facing, remove loose core material and fill with jointing compound.
Finish: Flush, smooth surface suitable for redecoration.
Large patch repairs: Cut out damaged area and form neat hole with rectangular sides.
Replace with matching gypsum board.
Fixing: Use methods to suit type of dry lining, ensuring full support to all edges of existing and new gypsum board.
Finishing: Fill joints, tape and apply jointing compound to give a flush, smooth surface suitable for redecoration.

Ceiling Lining on Timber

Background: Existing ceiling joists
Metal resilient (acoustic) bars: Not required
Reaction to fire: To **BS EN 13501-1**, class B-s3, d2 or better
Fire resistance of complete ceiling lining assembly: To **BS EN 13501-2**. REI 30 or better
Linings: 12.5 mm plasterboard (overboard existing plasterboard)
Fixings: Contractor's choice
Finishing: 3km coat plaster
Primer/ Sealer: As recommended by board manufacturer for vapour control
Accessories: Metal beads/ stops recommended by board manufacturer
Other requirements: Fire-stopping around service penetrations

Board Ceiling Systems

Cut boards: Neat and accurate.
Fixing to grid
Board edges: Fully support. Screw to grid members. Set heads of screws below surface of boards and fill flush with surface.
Boards applied in two or more layers: Stagger joints.
Movement joints: Provide as appropriate for the area of ceiling system and/ or to coincide with movement joints in surrounding structure.

Installing infill units
Perimeter infill units: Trimmed, as necessary, to fully fill space between last grid member and perimeter trim. Prevent subsequent movement.
Deeply textured infill units: Minimize variations in apparent texture and colour. In particular, avoid patchiness.
Concealed grids: Install infill units uniformly, straight and aligned. Avoid dimension creep. Infill units around recessed luminaires and similar openings: Prevent movement and displacement.

Upstands and bulkheads
Vertical ceiling systems: Support and brace to provide alignment and stability.
High upstands: Provide support at base of upstand.
User instructions
Include the following: warranties, data sheets, fire certificates and all relevant manufacture documentation
Correct methods for removing and replacing infill units and other components.
Cleaning methods and materials.
Recommendations for redecoration.
Ceiling systems intended for fire protection:
Limitations placed on subsequent alterations and maintenance procedures, to ensure that their fire performance is not impaired.
Maximum number, position and value of point loads that can be applied to ceiling system after installation.

Plasterboard

Gyproc Wallboard
Type: To **BS EN 520**, type R
Core density (minimum):650 kg/m³
Reaction to fire: Manufacturer's standard
Water vapour resistance factor: Manufacturer's standard
Thermal conductivity: Manufacturer's standard
Recycled content: Contractor's choice
Exposed surface and edge profiles: Clean and undamaged

Gyproc Moisture Resistant plasterboard
Type: To **BS EN 520**, type H1 and F
Core: Moisture-resistant and including fibres and/ or other additives for improved cohesion.
Width: 12.5mm
Density (minimum): 800 kg/m³.
Paper facings: Moisture-resistant.
Reaction to fire: Manufacturer's standard
Water vapour resistance factor: Manufacturer's standard
Thermal conductivity: Manufacturer's standard
Recycled content: Contractor's choice
Exposed surface and edge profiles: Clean and undamaged

Joints between boards
Tapered edged gypsum boards
Bound edges: Lightly butted.
Cut/ unbound edges: 3 mm gap.
Square edged plasterboards: 3 mm gap.
Square edged gypsum fibre boards: 5 mm gap.

Vertical joints
Joints: Centre on studs.
Partitions: Stagger joints on opposite sides of studs.
Two layer boarding: Stagger joints between layers.

Horizontal joints
Surfaces exposed to view: Horizontal joints not permitted. Seek instructions where height of partition/ lining exceeds maximum available length of board.
Two layer boarding: Stagger joints between layers by at least 600 mm.
Edges of boards: Support using additional framing.
Two layer boarding: Support edges of outer layer.

Skim coat plaster finish
Plaster type As recommended by board manufacturer..
Thickness: 2-3 mm.
Joints: Fill and tape except where coincident with metal beads.
Finish: Tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.

Rigid beads/stops
Internal: To **BS EN 13658-1.**
External: To **BS EN 13658-2.**

Installing beads/ Stops
Cutting: Neatly using mitres at return angles.
Fixing: Securely using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
Finishing: After joint compounds/ plasters have been applied, remove surplus material while still wet from surfaces of beads exposed to view.

FINISHES SUBJECT TO CLIENT SUBJECT APPROVAL

200mm 0 200 400 600 800 1000 1200 1400 1600
1:20

1m 0 1 2 3 4 5 6 7 8
1:100

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Rooflights changed as per client request	MR

BUILDING REGS

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client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Reflected Ceiling Plans

scale @ A1: 1:20, 1:50	drawn by: MR	
date: May '23	approved: SDL	
project no: 8341	dwg no: B12	revision: A

Ground Floor Plan

Scale - 1:100

M&E Fittings

- CEILING MOUNTED STRIP LIGHTS
- CEILING MOUNTED TRACK LIGHTS
- DAYLIGHT SENSOR (DIMMING CONTROL)
- PIR — INFRA-RED SENSOR
- INTERNAL INSET LED LIGHTS
- EXTERNAL INSET LED LIGHTS
- DB — DISTRIBUTION BOARD
- 2 — TWIN 13A SOCKET OUTLET
- SWITCH UNIT (FUSED)
- NETWORK POINT
- F — FOB ACCESS DOOR LOCK
- PANEL — WALL MOUNTED PANEL HEATI

Electrical Fittings - Fires

- BREAK GLASS CALL POINT
- S — SMOKE DETECTOR
- H — HEAT DETECTOR
- ILLUMINATED 'EXIT' SIGN WITH RUNNING MAN LOGO
- WALL MOUNTED SOUNDER AND BEACON
- WALL MOUNTED SOUNDER AND BEACON AND SMOKE DETECTOR
- E — DENOTES EMERGENCY LIGHTING

INDICATIVE M&E DESIGN - SUBJECT TO FINAL SPECIALIST DESIGN AND CLIENT INPUT

1m 0 1 2 3
1:50

Services General

Integrated services
Position services accurately, support adequately. Align and level in relation to the ceiling and suspension system. Do not diminish performance of ceiling system.
Small fittings: Support with rigid backing boards or other suitable means. Do not damage or distort the ceiling.
Reaction to fire of additional supporting material: Not less than ceiling material.
Services outlets
Supported by ceiling system: Provide additional hangers.
Independently supported: Provide flanges to support ceiling system.

Electrical installation generally
Standard: In accordance with BS 7671.

Installing connection to incoming supply
Main switchboard/ distribution board: Connect to main incoming metering equipment.
Nature of connection: Liaise with the DNO to ensure the correct size, quantity and type of cable is provided for connection to their equipment.

Electrical Services

Design of low-voltage electrical installation generally
Design and detailing: Complete prior to the electrical installation.
Standards: In accordance with **BS 7671** and the requirements of the electricity distributor.
Distribution circuits
Spare capacity of distribution equipment:
20% of total DB ways free
Protective devices: Coordinate the selection and adjustment of protective device settings to achieve discrimination throughout the fault level range. Grade so that a fault on any outgoing branch circuit is cleared by the switching device installed in the faulted branch circuit without affecting the other outgoing branch circuits.Ceiling-mounted luminaires

Design of low-voltage incoming supply
Design and detailing: Complete for the low-voltage incoming supply.Proposals: Submit drawings showing equipment positions and routes, technical information and calculations.
Evidence of agreement with electricity distributor: Formal submission
Manage and liaise with the electricity distributor and determine: Maximum demand of the installation.
Nature of the supply, its suitability for the installation and type of earthing arrangement.
Location of the incoming supply.
Space requirements and location of the cut-outs, switches, fuses and meters.
Coordination: Liaise with the Electricity Supplier, complete an application for supply of electricity and manage installation of metering equipment

Design of general lighting system
Design and detailing: Complete for the general lighting system.
Standard: To SLL 'Code for lighting'.
Maintained average illuminance: 400 lux
Glare index: 19
Maintenance: Submit proposals for the maintenance/ relamping regime.

Design and lighting calculations
Proposals: Submit drawings, technical information, calculations and manufacturers' literature.
Lighting calculations
Type: Computer generated point calculations.
Submit the following
Luminaire layout drawings.
Luminaire photometric data including flux fraction ratios and polar intensity curves.
Lamp technical information.
Maintenance factor calculations, including proposals for luminaire maintenance and lamp replacement.
Reflectance values used for all wall, ceiling and floor surfaces.
Isolux contour plots for all relevant working planes, horizontal and vertical.
Schedule of design and calculated maintained average illuminance values.
Schedule of design and calculated uniformity values.

Design of emergency lighting system
Design and detailing: Complete for the emergency lighting system.
Emergency escape lighting: In accordance with **BS 5266-1**.
Escape route, open area, high risk task area and standby lighting: To **BS EN 1838** and **BS EN 50172.**

Design of emergency lighting system
Design and detailing: Complete for the emergency lighting system.
Emergency escape lighting: In accordance with BS 5266-1.
Escape route, open area, high risk task area and standby lighting: To **BS EN 1838 and BS EN 50172.**

Nature of connection:
Liaise with the DNO to ensure the correct size, quantity and type of cable is provided for connection to their equipment.

Electrical Fittings

Self-contained emergency luminaires
Standards: To **BS EN 60598-1** and **BS EN 60598-2-22.**

Ceiling-Recessed Luminaires
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Standards: To BS EN IEC 60598-1 and BS EN IEC 60598-2-1
Third-party certification: Kitemark-certified
Photometric performance: To BS EN 13032-1.
Mounting: Ceiling-recessed
Ingress protection (minimum): To BS EN 60529, IP55
Impact protection (minimum): To BS EN 62262, IK08
Lamp: Light-emitting diodes (LEDs)
Wattage: Contractor's choice

Standard socket outlets
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Standard: To **BS EN 1363-2.**
Arrangement: Twin-gang
Type: Double-pole, switched
Switch position: Contractor's choice
Indicator lamp: Contractor's choice
Interlock: Three-pin equal pressure
Mounting: Surface
Features: Two no. 5 V d.c. 2.2 A USB charger ports
Ingress protection (minimum): To **BS EN 60529, IP 20**
Cable termination: Contractor's choice
Plate
Material: Aluminium
Finish: Brushed
Insert colour: Black

Lighting switches
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Standard: To **BS EN 60669-1.**
Current rating: As per final M&E design
Actuating method: Rocker bar
Poles: Double-pole
Arrangement: Single-gang, one-way Contractor's choice
Mounting: Surface
Ingress protection (minimum): To **BS EN 60529, IP 20**
Cable termination: Contractor's choice
Plate
Material: Aluminium
Finish: Brushed
Insert colour: Black

Time switches
Standards: To **BS EN 60730**-1 and **BS EN IEC 60730-2-7**
Third-party certification: BEAB-approved.
Occupancy detectors (PIR)
Manufacturer:Contractor's choice
Product reference: Contractor's choice
Standards:To **BS EN 60669-1** and **BS EN 60669-2-1**
Sensor type: Passive infrared
Features: Adjustable switching delay
Mounting: Surface Ceiling

Cable trays
Standard: To BS EN 61537.

Cable trunking and cable ducting for wall and ceiling mounting
Standards: To **BS EN 50085-1** and **BS EN 50085-2-1.**

Cable trunking and cable ducting for floor mounting
Standards: To **BS EN 50085-1** and **BS EN 50085-2-2.**

Protective conductors
Type: Cable conductors with yellow/ green sheath.

Electrical accessories
General:To **BS 5733.**
Switches: To **BS EN 60669-1**

Electrical installation
Standard: In accordance with BS 7671.
Installing connection to incoming supply
Main switchboard/ distribution board:
Connect to main incoming metering equipment.

Nature of connection:
Liaise with the DNO to ensure the correct size, quantity and type of cable is provided for connection to their equipment.

Installing cable tray
Support: Submit proposals.
Access: Provide space encompassing cable trays to permit access for installing and maintaining cables.
Supports and fasteners: Avoid contact between dissimilar metals.
Use corrosion- resistant components in locations where moisture may occur.
Cutting: Along an unperforated line. Minimize. Make good edges.
Treat surface as the tray.
Earth protection: Ensure that, where utilized, tray jointing pieces are properly fixed and provide satisfactory continuity between the separate sections of containment.
Installing trunking/ ducting systems
Positioning: Accurate with respect to equipment served and parallel with other services, and where relevant, floor level and other building lines.
Access: Provide space encompassing cable trunking to permit access for installing and maintaining cables.
Number of joints: Minimize.
Lengths of trunking/ ducting: Maximize.
Steel systems: Mechanical couplings. Do not weld. Fit a copper link at each joint to ensure that satisfactory electrical continuity is maintained between the separate sections of trunking, equipment and accessories.
Movement: Fix securely. Restrain floor-mounted systems during screeding.
Junctions and changes of direction: Proprietary jointing units.
Cable entries: Fit grommets, bushes or liners.
Internal fire barriers: Provide to maintain integrity of fire compartment.
Protection: Fit temporary blanking plates. Prevent ingress of screed and other extraneous materials.
Service outlet units: Fit when cables are installed.

Cable routes
Cables generally: Conceal wherever possible.
Concealed cable runs to wall switches and outlets: Align vertically or horizontally with the accessory.
Exposed cable runs: Submit proposals.
Orientation: Straight, vertical and/ or horizontal and parallel to walls.
Distance from other services running parallel:
150 mm minimum.
Heating pipes: Position cables below.

Installing cables
General: Install cables neatly and securely. Protect against accidental damage, adverse environmental conditions, mechanical stress and deleterious substances.
Timing: Do not start internal cabling until building enclosure provides permanently dry conditions.
Jointing: At equipment and terminal fittings only.
Cables passing through walls: Sleeve with conduit bushed at both ends.
Cables surrounded or covered by thermal insulation: Derate accordingly.
Cable guards: Fit where cables are vulnerable to mechanical damage

Installing cables in vertical trunking/ ducts
Support: Pin racks or cleats at each floor level or at 5 m vertical centres, whichever is less.
Heat barrier centres (maximum): 5 m.
Heat barriers: Required except where fire resisting barriers are not provided. Installing electrical accessories and equipment
Arrangement: Coordinate with other wall- or ceiling-mounted equipment.
Positioning: Accurately and square to vertical and horizontal axes.
Alignment: Align adjacent accessories on the same vertical or horizontal axis.
Mounting: Surface and Recessed (celling)
Mounting heights (finished floor level to underside of equipment/ accessory):
2300mm (minimum)
Accessory face plates: Free from any traces of plaster, grout and paint or similar.

Installing luminaires
Location: As per final electrical layout design
Orientation: Parallel with ceiling
Supports: Adequate for weight of luminaire.
Installing emergency luminaires
Permanent electrical supplies: Derive from adjacent local lighting circuit.
Charge indicator: Position in a conspicuous location.

Installing emergency luminaires
Permanent electrical supplies: Derive from adjacent local lighting circuit.
Charge indicator: Position in a conspicuous location.

Final connections
Cable: Heat resisting white flex.
Length: Allow for equipment removal and maintenance.

Equipment labelling
Electrical equipment: Install labels indicating purpose.
Voltage warning notices
Location: Apply to equipment in a position where it can be seen prior to gaining access to live parts when the voltage within exceeds 230 V.
Format: To **BS EN ISO 7010**, functional reference number, W012, include warnings of the voltage present.
Distribution boards: Card circuit chart within a reusable clear plastic cover. Fit to the inside of each unit. Include typed information identifying the outgoing circuit references, their device rating, cable type, size, circuit location and details. Label each outgoing way corresponding to the circuit chart.
Sub-main cables: Label at both ends with circuit reference using proprietary cable marker sleeves.

Inspection and testing of emergency lighting systems
Standard: In accordance with BS 5266-1.
Certificate of testing: Submit.
Standard: To BS 5266-1, Annex H
Number of copies: 1
System log book: To BS 5266-1.

Documentation
Timing: Submit at practical completion.
Full technical description of each system installed.
Manufacturers' operating and maintenance instructions for fittings and apparatus including relamping instructions for luminaire types. Identify hazardous lamps that require specialist disposal.
Recommended frequency of testing and inspection, both for electrical safety and for matters such as the corrosion and security of lighting columns and luminaire fixings.
Manufacturers' guarantees and warranties.
As-installed drawings showing circuits and their ratings and locations of fittings and apparatus.
List of normal consumable items.

Data and AV Services

Client to confirm exact requirements for data and AV**.**

Mechanical Services

MECHANICAL SPECIFICATION FOUND ON DRAWING - C16

FURTHER INFORMATION AND SPECIFICATION OF:
WALL TYPES - **C10** *(GROUND FLOOR)* AND **C11** *(FIRST FLOOR)*
CEILING TYPES - **C14**

rev:	date:	description:	by:
A	12.05.23	Layout updated inline with community hall changes.	MR

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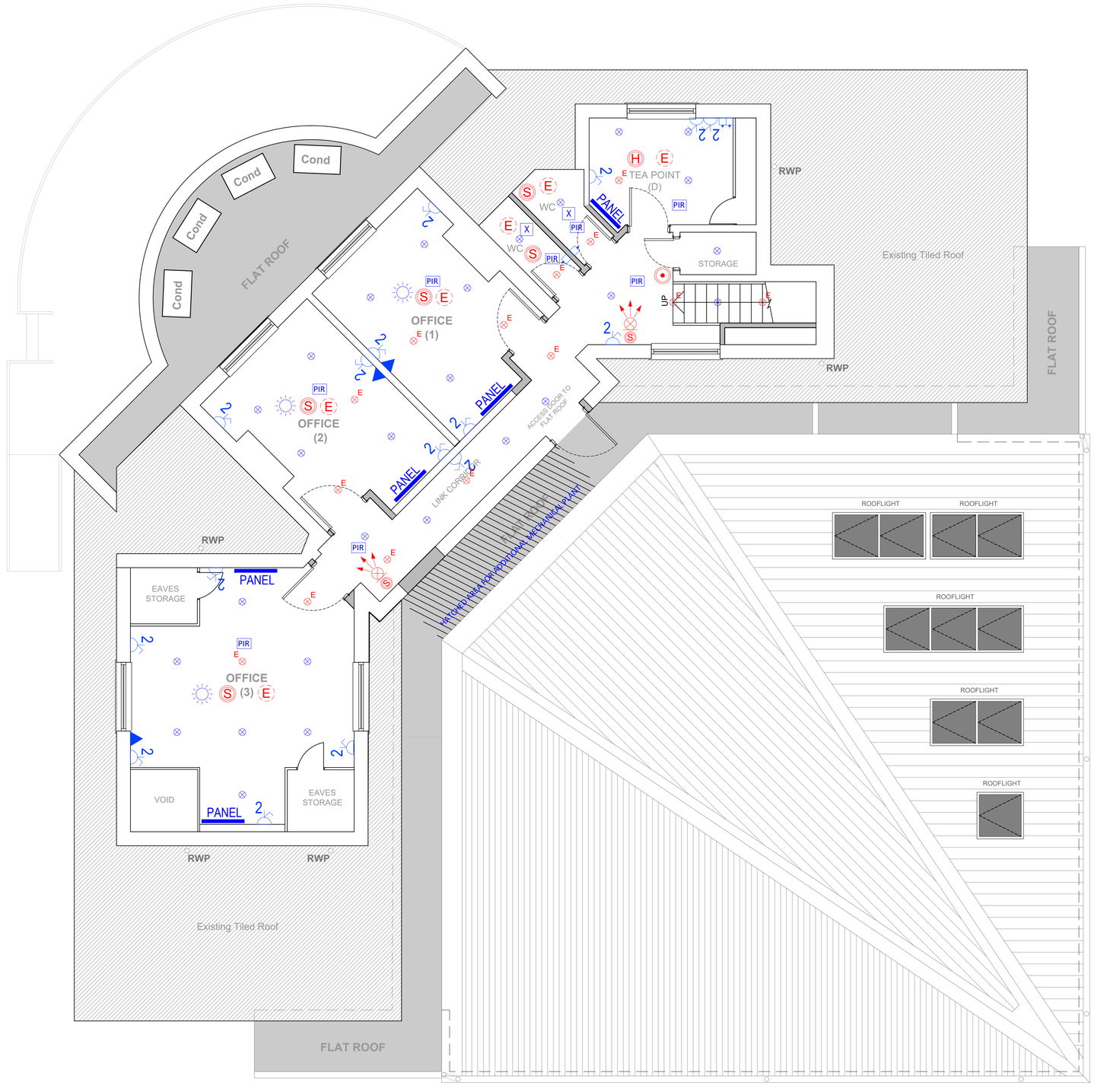
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Ground Floor
M&E Services Plan

scale @ A1: 1:50	drawn by: MR	
date: May '23	approved: SDL	
project no: 8341	dwg no: B13	revision: A



First Floor Plan

Scale - 1:50

Lighting

- CEILING MOUNTED STRIP LIGHTS
- CEILING MOUNTED TRACK LIGHTS
- DAYLIGHT SENSOR (DIMMING CONTROL)
- PIR — INFRA-RED SENSOR
- INTERNAL INSET LED LIGHTS
- EXTERNAL INSET LED LIGHTS

Electrical Fittings

- DB — DISTRIBUTION BOARD
- 2 — TWIN 13A SOCKET OUTLET
- SWITCH UNIT (FUSED)
- NETWORK POINT
- F — FOB ACCESS DOOR LOCK
- PANEL — WALL MOUNTED PANEL HEATERS

Electrical Fittings - Fires

- BREAK GLASS CALL POINT
- S — SMOKE DETECTOR
- H — HEAT DETECTOR
- ILLUMINATED 'EXIT' SIGN WITH RUNNING MAN LOGO
- WALL MOUNTED SOUNDER AND BEACON
- WALL MOUNTED SOUNDER AND BEACON AND SMOKE DETECTOR
- E — DENOTES EMERGENCY LIGHTING

INDICATIVE M&E DESIGN - SUBJECT TO FINAL SPECIALIST DESIGN AND CLIENT INPUT

Mechanical Services

Design
Description: mechanical supply ventilation
Design: Complete the design of the ventilation system.
Proposals: Submit drawings (showing equipment positions and ductwork routes), technical information, calculations and manufacturers' literature.

Mechanical services
Fan coil units
Inlet/ Outlet grilles: Trim ceiling grid and infill units to suit.
Space beneath: Sufficient for ceiling system components.
Suspension and connections: Permit accurate setting out and levelling of fan coil units.
Air grilles and diffusers
Setting out: Accurate and level.
Linear air diffusers: Retain in place with lateral restraint. Provide flanges for support of grid and infill units.
Grille/ Diffuser ceiling joints: Provide smudge rings and edge seals.
Smoke detectors and PA speakers
Ceiling infill units: Scribe and trim to suit.
Independent suspension: Required
Flexible connections: Required.
Sprinkler heads: Carefully set out and level.

Mechanical supply ventilation
Air inlet terminals: External air intake grilles
Fan units: Submit design and cost proposals
Air ductwork: Rigid ductwork
Air ductwork accessories: Submit design and cost proposals
Air supply terminals: Supply air diffusers
Controls: Submit design and cost proposals
Completion: Commissioning and Operation and maintenance

Rigid ductwork generally
Joints: Seal. Provide a robust airtight installation.
Support: Do not distort ductwork or reduce cross-sectional area. Do not strain joints.
Falls: Fall away from fans, dampers and other in-line accessories.
Sleeves: Locate where ducts pass through building fabric. Bed solidly to the surrounding construction. Leave a gap of 10-20 mm between sleeve and duct and fill completely.
Fire-rated ductwork sleeves:
Install in accordance with ASFP Blue book.

Site-applied insulation
Location: Fit insulation to ductwork in unheated spaces.
Installation: Fix securely. Leave no gaps. Make continuous

Commissioning
Standard: In accordance with **BS EN 14134**.
Ventilation system: Balance airflow using methods recommended by the system manufacturer.
Operation: Examine ductwork for leakage. Test the operation of fans, equipment, controls and sensors. Verify correct operation. Submit report.

Operation and maintenance
Operating and maintenance instructions:
Submit copies of manufacturers' operating and maintenance instructions for equipment and controls.
Documents: Include all test and fire certificates.
Tools: Supply tools for operation, maintenance and cleaning purposes, including keys for valves and vents.

Hot and cold water supply systems

Installing cisterns
Outlet positions: Connect lowest outlets at least 30 mm above bottom of cistern.
Access: Fix cistern with a minimum clear space of 350 mm above, or 225 mm if the cistern does not exceed 450 mm in any dimension.

Flush control devices
Manufacturer:Contractor's choice
Product reference: Contractor's choice
Type: Dual flush
Operation: Syphonic

Pipelines installation
Appearance: Install pipes straight, and parallel or perpendicular to walls, floors, ceilings, and other building elements.
Pipelines finish: Smooth, consistent bore, clean, free from defects, e.g. external scratching, toolmarks, distortion, wrinkling, and cracks.
Concealment: Generally conceal pipelines within floor, ceiling and/ or roof voids.
Access: Locate runs to facilitate installation of equipment, accessories and insulation and allow access for maintenance.
Arrangement of hot and cold pipelines: Run hot pipelines above cold where routed together horizontally. Do not run cold water pipelines near to heating pipelines or through heated spaces.
Electrical equipment: Install pipelines clear of electrical equipment. Do not run pipelines through electrical enclosures or above switch gear distribution boards or the like.
Insulation allowance: Provide space around pipelines to fit insulation without compression.

Installing valves
Isolation and regulation valves: Provide on equipment and subcircuits.
Access: Locate where valves can be readily operated and maintained and next to equipment which is to be isolated.
Connection to pipework: Fit with joints to suit the pipe material.

Copper pipelines for general use
Standard: To **BS EN 1057**, Kitemark certified.
Temper: Half hard R250.
Finish: Submit proposals
Colour: Submit proposals
Wall thickness (nominal)
OD 6, 8, 10 and 12 mm: 0.6 mm.
OD 15 mm: 0.7 mm.
OD 22 and 28 mm: 0.9 mm.
OD 35 and 42 mm: 1.2 mm.
Jointing generally: Integral lead free solder ring capillary fittings to **BS EN 1254-1**, Kitemark certified.
Compression fittings: To **BS EN 1254-2**, Kitemark certified.
Fittings with threaded ends: To B**S EN 1254-4**.
Supports: Compatible with pipe material

Joints in copper pipelines
Preparation: Cut pipes square. Remove burrs.
Joints: Neat, clean and fully sealed. Install pipe ends into joint fittings to full depth.
Bends: Do not use formed bends on exposed pipework, except for small offsets. Form changes of direction with radius fittings.
Adaptors for connecting dissimilar materials:
Purpose designed.
Substrate and plastics pipes and fittings:
Do not damage, e.g. by heat when forming soldered joints.
Flux residue: Clean off.

Completion
Flushing and filling
Standard: To **BS EN 806-4.**
System disinfection
Disinfection: To **BS EN 806-4.**

Testing
Standard: To **BS EN 806-4.**
Notice (minimum): Three days.
Preparation: Secure and clean pipework and equipment. Fit cistern and tank covers.
Leak testing: Start boiler and run the system until all parts are at normal operating temperatures and then allow them to cool down to cold condition for a period of three hours.
Pressure testing: At both hot and cold conditions joints, fittings and components must be free from leaks and signs of physical distress when tested for at least one hour as follows: Systems fed directly from the mains, and systems downstream of a booster pump:
Apply a test pressure equal to 1.5 times the maximum pressure to which the installation or relevant part is designed to be subjected in operation.
Systems fed from storage: Apply a test pressure equal to the pressure produced when the storage cistern is filled to its normal maximum operating level.
Inaccessible or buried pipelines: Carry out hydraulic pressure test to twice the working pressure.

Commissioning
Standard: To **BS EN 806-4.**
Equipment: Check and adjust operation of equipment, controls and safety devices.
Outlets: Check operation of outlets for satisfactory rate of flow and temperature.

Testing service pipelines
Test method: Disconnect from the mains, fill with potable water, exclude air, and apply at least twice the working pressure for one hour.
Test criterion: No leakage.

Documentation
Manufacturers' operating and maintenance instructions: Submit for equipment and controls.
System operating and maintenance instructions: Submit for the system as a whole giving optimum settings for controls.
Record drawings: Submit drawings showing the location of circuits and operating controls.

Labels
Valve labels:Provide labels on isolating and regulating valves on primary circuits, stating their function.
Installation generally Installation: To **BS EN 806-4.**
Performance: Free from leaks and the audible effects of expansion, vibration and water hammer.
Fixing of equipment, components and accessories: Fix securely, parallel or perpendicular to the structure of the building.
Preparation: Immediately before installing tanks and cisterns on a floor or platform, clear the surface completely of debris and projections.
Corrosion resistance: In locations where moisture is present or may occur, provide corrosion-resistant fittings/ fixings and avoid contact between dissimilar metals by use of suitable washers, gaskets, etc.

Heating Systems

Basic design temperatures
Room temperatures: Design the system to provide the following temperatures for the specified air change rates and an external air temperature of -4°C:
Kitchens: Temperature: 18°C, for 2 air changes per hour.
Toilets: Temperature: 18°C, for 2 air changes per hour.

Natural convector heaters
Standard: To **BS EN 442-1 and -2**.
Type: Wall mounted
Manufacturer: Submit proposals
Product reference: Submit proposals
Output: To provide design temperatures keeping within limiting dimensions shown on drawings
Sizes: To provide design temperatures keeping within limiting dimensions shown on drawings
Casing finish: Powder coated aluminium

Underfloor heating System (Extension Only)

Air-to-air heat pumps
Safety and environmental: To **BS EN 378-1** and **-2.**
Test requirements: To **BS EN 14511-2, -3** and **-4.**
Electrical safety: To **BS EN 60335-2-40.**

System control
Temperature and time control: Fully automatic and independent.
Controls: Compatible with each other and with central heating boiler.

Valves generally
Types: Approved for the purpose by local water supply undertaker and of appropriate pressure and temperature ratings.
Control of valves: Fit with handwheels for isolation and lockshields for isolation and regulation of circuits or equipment.

Testing
Standard: To **BS EN 14336**.
Notice (minimum): 3 days.
Preparation: Secure and clean pipework and equipment. Fit cistern/ tank covers.
Leak testing: Start boiler and run the system until parts are at normal operating temperatures and then allow to cool to cold condition for a period of 3 h.
Pressure testing: At both hot and cold conditions joints, fittings and components must be free from leaks and signs of physical distress when tested for at least 1 h as follows: Systems fed directly from the mains and systems downstream of a booster pump:
Apply a test pressure equal to 1.5 times the maximum pressure to which the installation or relevant part is designed to be subjected in operation.
Systems fed from storage: Apply a test pressure equal to the pressure produced when the storage cistern is filled to its normal maximum operating level.
Inaccessible or buried pipelines: Carry out hydraulic pressure test to twice the working pressure.

Setting to work and commissioning
Equipment: Check and adjust operation of equipment, controls and safety devices.
Outlets: Check operation of outlets for satisfactory rate of flow and temperature.

Testing gas pipelines
Testing and purging:To **BS 6891**.

Documentation
Manufacturers' operating and maintenance instructions: Submit for equipment and controls.
System operating and maintenance instructions: Submit for the system as a whole giving optimum settings for controls.
Record drawings: Submit drawings showing the location of circuits and operating controls.

Labels
Valve labels: Provide labels on isolating and regulating valves on primary circuits, stating their function.

Electrical Services

ELECTRICAL SPECIFICATION FOUND ON DRAWING - C15

FURTHER INFORMATION AND SPECIFICATION OF:
WALL TYPES - **C10** *(GROUND FLOOR)* AND **C11** *(FIRST FLOOR)*
CEILING TYPES - **C14**

1m 0 1 2 3
1:50

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Rooflights changed as per client request	MR

Paul Robinson
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Hospital Road, Little Plumstead,
Norwich. NR13 5FH
tel: 01603 397057
e-mail: design@prparchitecture.com
web: www.paulrobinsonpartnership.co.uk

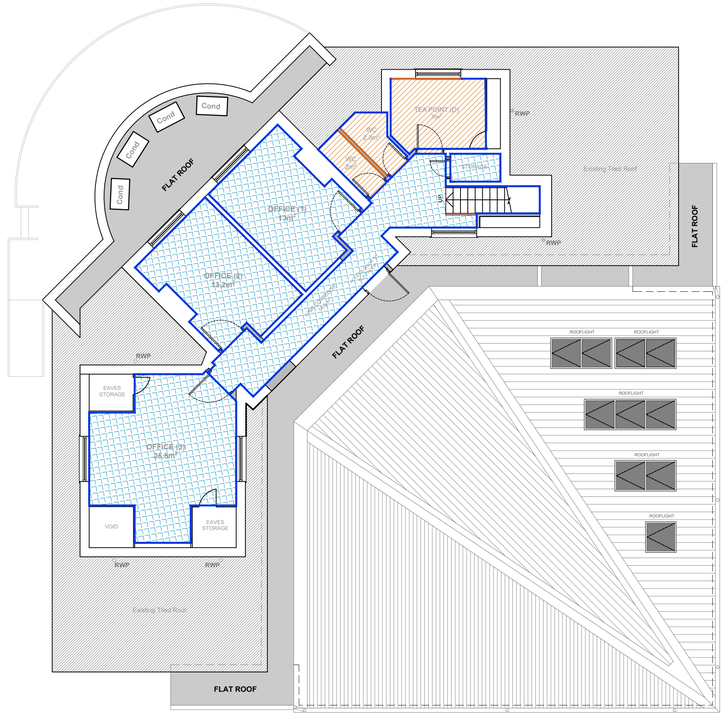
BUIDLING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

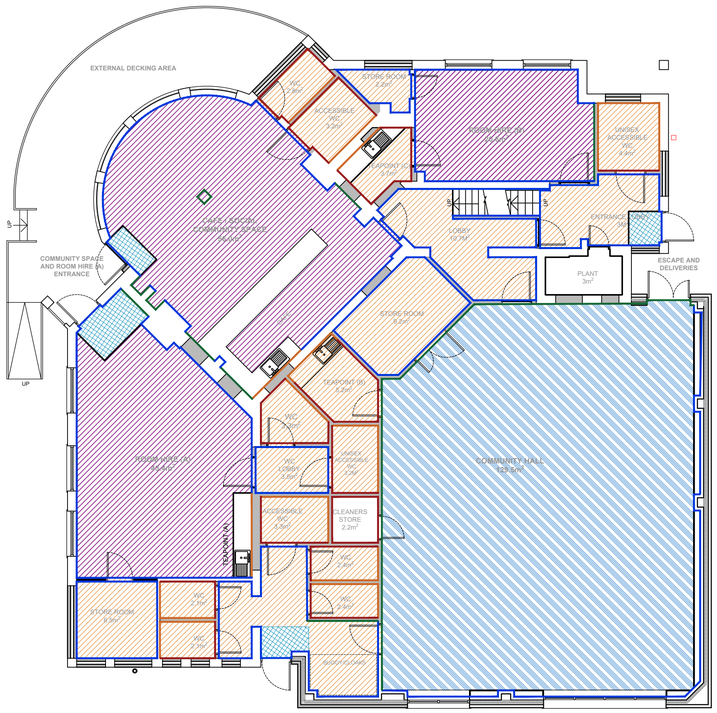
title:
First Floor
M&E Services Plan

scale @ A1: 1:50	drawn by: MR	
date: May '23	approved: SDL	
project no: 8341	dwg no: C14	revision: A



First Floor Finishes Plan

Scale - 1:100



Ground Floor Finishes Plan

Scale - 1:100

WALL FINISHES

FINISH TYPE	DESCRIPTION	LOCATIONS	REF IMAGE	Notes
WALL FINISH 1	2NO. Coats of Dulux Trade diamond emulsion in White Cotton (off white)	ALL AREAS		
WALL FINISH 3	2NO. Coats of Dulux Trade Emulsion Green - 40GY 18/372	CANTEEN, BOOT ROOM AND TOILET		
Wall Finish 4	2NO. Coats of Dulux Trade Diamond Eggshell White Cotton	WC'S, TEA POINTS, CLEANERS STORE		
Wall Finish 4	Altro Whiterock - Rigid PVC Wall Sheeting Echo - Satin	WC'S, TEA POINTS, COMMUNITY SPACE		150mm (minimum) height coving to all wc's, cleaners store and tea point with aluminum skirting cap.
SKIRTING, DOOR FRAMES & ARCHITRAVES	2no. Coats Dulux Trade Diamond Satinwood Almost Black 09BB/008	TO ALL INTERNAL AREAS		

FLOOR FINISHES

FINISH TYPE	DESCRIPTION	LOCATIONS	FLOOR AREA (m^2)	REF IMAGE	Notes
FLOOR FINISH 1 ENTRANCE FLOORING	2050x3000mm - ROLL FORBO CORAL CLASSIC 4751 SILVER GREY	COMMUNITY HALL LOBBY, ROOM HIRE (A), ROOM HIRE (B) AND FIRST FLOOR LOBBY	3		
FLOOR FINISH 2 CARPET	500x500x6.7mm FORBO, TESSERA INFUSED CARPET TILE 4500 MAGIC MOOD (GREY)	FIRST FLOOR OFFICES 1,2 & 3	175		
FLOOR FINISH 3 VINYL	FORBO, LAGUNA SURESTEP 181922 CONCRETE	ROOM HIRE (A) WC'S & LOBBIES, STORE ROOMS, TEA POINTS	84		150mm (MINIMUM) HEIGHT COVING TO ALL VINYL FLOOR FINISHES WITH ALUMINUM SKIRTING CAP.
FLOOR FINISH 4 VINYL	FORBO, SURESTEP WOOD 18952 DARK GREY OAK	COMMUNITY SPACE, ROOM HIRE (A), ROOM HIRE (B),	7		
FLOOR FINISH 5 HARDWOOD WOOD	BOEN BOFLEX OLYMPIA (SPRUNG) TIMBER FLOOR BEECH FINISH	COMMUNITY HALL	124		

Self Leveling Screed

Ground floor only

Proprietary self smoothing levelling screeds
Sika Limted
Watchmead, Welwyn Garden City,
Hertfordshire,AL7 1BQ
+44 (0)1707 394444
www.sika.co.uk
enquiries@uk.sika.com
Product reference: Sikafloor Level-30

Design life of screeds
Duration: Subject to reasonable wear and tear.
Condition of use: Subject to correct loading and traffic usage throughout duration.

Suitability of substrates
Suitable for specified levels and flatness/ regularity of finished surfaces. Consider permissible minimum and maximum thicknesses of screeds.
Sound and free from significant cracks and gaps.
Concrete strength: In accordance with **BS 8204-1**, Table 2.
Cleanliness: Remove plaster, debris and dirt.
Moisture content: To suit screed type. New concrete slabs to receive fully or partially bonded construction must be dried out by exposure to the air for minimum six weeks.

Mixing
Water content: Minimum necessary to achieve full compaction, low enough to prevent excessive water being brought to surface during compaction.
Mixing: Mix materials thoroughly to uniform consistency. Mixes other than no-fines must be mixed in a suitable forced action mechanical mixer. Do not use a free fall drum type mixer.
Consistency: Use while sufficiently plastic for full compaction.
Ready-mixed retarded screed mortar: Use within working time and site temperatures recommended by manufacturer. Do not retemper.

Flatness/ Surface regularity of floor screeds
Standard: In accordance with **BS 8204-1,** Table 5.
Test: In accordance with **BS 8204-1,** Annex C.
Sudden irregularities: Not permitted.

Finishes General

Preparation
Standard: In accordance with BS 6150.
Refer to any pre-existing CDM Health and Safety File.
Refer to CDM Construction Phase Plan where applicable.
Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
Substrates: Sufficiently dry in depth to suit coating.
Efflorescence salts: Remove.
Dirt, grease and oil: Remove. Give notice if contamination of surfaces/ substrates has occurred.
Surface irregularities: Remove.
Joints, cracks, holes and other depressions: Fill flush with surface, to provide smooth finish.
Dust, particles and residues from preparation: Remove and dispose of safely.
Water based stoppers and fillers
Apply before priming unless recommended otherwise by manufacturer.
If applied after priming: Patch prime.
Oil based stoppers and fillers: Apply after priming.
Doors, opening windows and other moving parts
Ease, if necessary, before coating.
Prime resulting bare areas.

Application standard: In accordance with **BS 6150**
Conditions: Maintain suitable temperature, humidity and air quality during application and drying.
Surfaces: Clean and dry at time of application.
Thinning and intermixing of coatings: Not permitted unless recommended by manufacturer.
Overpainting: Do not paint over intumescent strips or silicone mastics.
Priming coats
Thickness: To suit surface porosity.
Application: As soon as possible on same day as preparation is completed.
Finish
Even, smooth and of uniform colour.
Free from brush marks, sags, runs and other defects. Cut in neatly. Doors, opening windows and other moving parts: Ease before coating and between coats.

Previously painted window frames
Paint encroaching beyond glass sight line: Remove.
Loose and defective putty: Remove.
Putty cavities and junctions between previously painted surfaces and glass: Clean thoroughly.

Finishing
Patch prime, reputty as necessary, and allow to set. Seal and coat as soon as fully set.

Uncoated plasterboard
Depressions around fixings: Fill with stoppers/ fillers
Joints: Fill, tape and feather out with materials recommended by textured coating manufacturer.

Existing Wall coverings
Retained wall coverings: Check that they are in good condition and well adhered to substrate.
Previously covered walls: Wash down to remove paper residues, adhesive and size

Previously coated wood
Degraded or weathered surface wood: Take back to provide suitable substrate.
Degraded substrate wood: Repair with sound material of same species.
Exposed resinous areas and knots: Apply two coats of knotting.

Flooring and Wall Finish

Existing floor covering removed
Substrate:Clear of covering and as much adhesive as possible. Skim with smoothing compound to give smooth, even surface.

Carpet tiling
Base: Existing concrete floor (ground floor), timber floor (first floor)
Preparation: Remove existing floor finish
Fabricated underlay: Carpet tiles to **BS EN 14041** and **BS EN 1307**
Evidence of compliance: Submit.
Reaction to fire classification: Class A1fl or better
Manufacturer: See floor finishes table
Product reference: See floor finishes table
Recycled content: Contractor's choice
Colour/ pattern:See floor finishes table
Method of laying: Fully adhere all tiles with release adhesive recommended by tile manufacturer.

Vinyl Floor Tiles
Description: To office area
Base: Existing concrete floor
Preparation: Clean and repair base
Fabricated underlay: Tiles
Standard: To **BS EN 14041.**
Evidence of compliance: Submit.
Reaction to fire classification to **BS EB 13501-1:**
Material: See finishes table
Manufacturer: See finishes table
Product reference: See finishes table
BS EN ISO 10874 class: 21
Slip resistance value (SRV) (minimum)/ Pendulum test value (PTV) (minimum) to BS 7976-1, -2 and -3: 36 dry
Recycled content: Contractor's choice
Size: 101x914mm
Thickness: 2mm
Colour/ pattern: See finishes table
Adhesive: As recommended by manufacturer

Setting out tiles
Method: Set out from centre of area/ room so that wherever possible:
Tiles along opposite edges are of equal size.
Edge tiles are more than 50% of full tile width.

Vinyl Sheeting
Description: To canteen, toilets and boot room
Base: Existing concrete floor
Preparation: Clean and repair base, ready for self levelling compound
Fabricated underlay: Flooring roll
Standard: To **BS EN 14041.**
Evidence of compliance: Submit.
Reaction to fire classification: Class A1fl or better
Material: See finishes table
Manufacturer: See finishes table
Product reference: See finishes table
BS EN ISO 10874 class: 21
Slip resistance value (SRV) (minimum)/ Pendulum test value (PTV) (minimum) to BS 7976-1, -2 and -3: 36 dry
Recycled content: Contractor's choice
Width: 2000 mm
Thickness: 2-2.5mm
Colour/ pattern: See finishes table
Adhesive (and primer if recommended by manufacturer): As recommended by manufacturer
Seam welding: Hot welding with complimentary coloured rod
Accessories: 100mm cover former
Laying coverings
Base/ substrate condition: Rigid, dry, smooth, free from grease, dirt and other contaminants.
Use a primer where recommended by adhesive manufacturer. Allow to dry thoroughly.
Adhesive: As specified, as recommended by covering manufacturer or, as approved.
Conditioning of materials prior to laying: As recommended by manufacturer.
Environment: Before, during and after laying, provide adequate ventilation and maintain temperature and humidity approximately at levels which will prevail after building is occupied.
Finished coverings: Accurately fitted, tightly jointed, securely bonded, smooth and free from air bubbles, rippling, adhesive marks, stains, trowel ridges and high spots.

Waste
Spare covering material: Retain suitable material for patching. On completion submit pieces for selection. Hand over selected pieces to Employer.

Skirting

100mm Bullnose MDF Skirting
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Fixing: Securely fix with mitred corners.
Corners: Mitre joints.
Finish: Painted finish in Dulux trade Diamond Satinwood - Dark grey Colalt Night.

COLOUR SCHEME AND FINISHES SUBJECT TO CLIENT SUBJECT APPROVAL

1m 0 1 2 3 4 5 6 7 8
1:100

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Rooflights changed and floor finish to community hall as per client request.	MR

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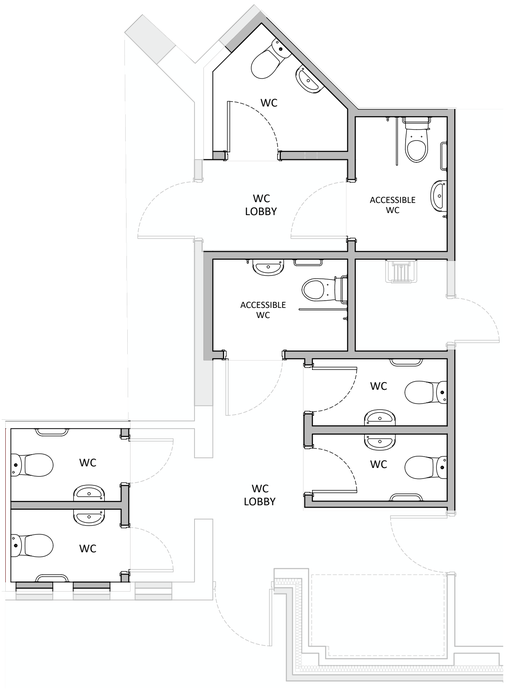
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

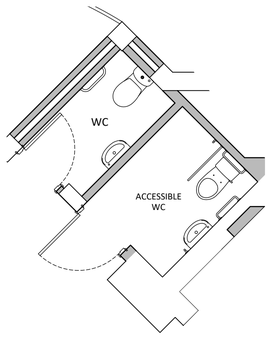
title:
Proposed Finishes Plan

scale @ A1:	drawn by:	
1:100	MR	
date:	approved:	
May '23	SDL	
project no:	dwg no:	revision:
8341	B15	A



Ground Floor (GF) Room Hire (A) and Community Space

Scale - 1:50



Cafe and Social Space

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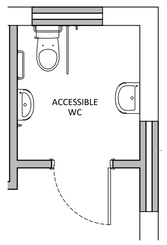
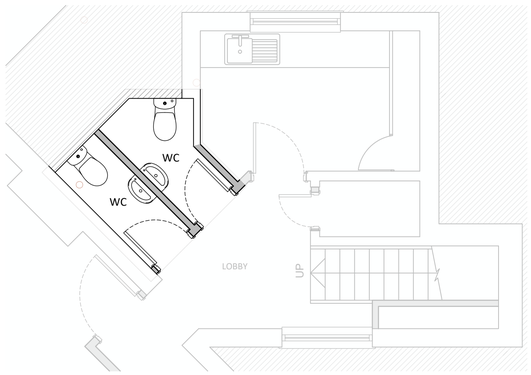


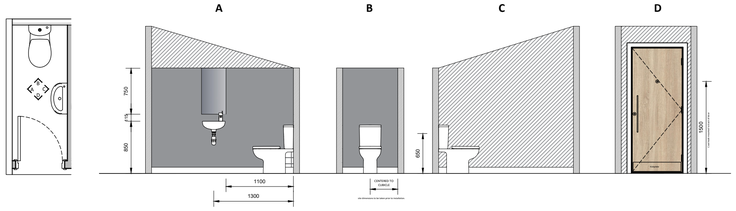
Hire Room (B)

Scale - 1:50



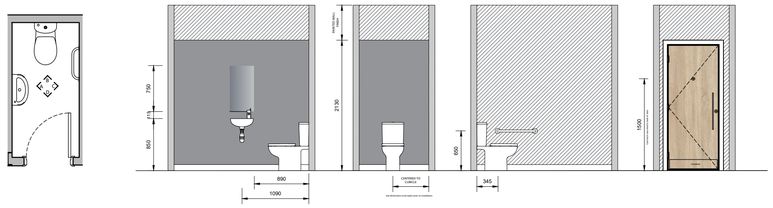
First Floor (FF) Offices

Scale - 1:50



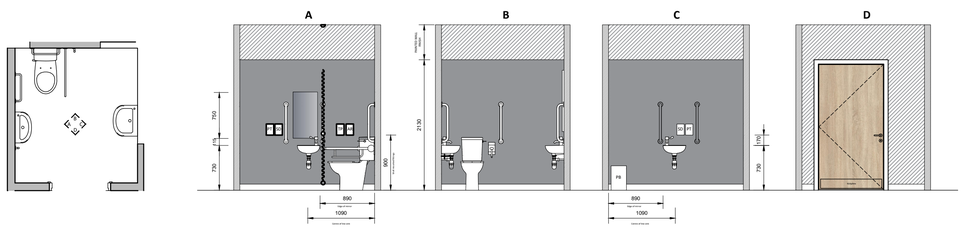
FF Typical WC Plan and Elevations

Scale - 1:50



GF Typical WC Plan and Elevations

Scale - 1:50



Typical Accessible WC Plan and Elevations

Scale - 1:50

Elevation Key

Wall Finish 1
Painted wall finish see finishes drawings C17 for spec

Wall Finish 2
PVC Wall panel finish see finishes drawings C17 for spec

SD	**Soap Dispenser**
PT	**Paper Towel Dispenser**
PB	**Pedal Bin**
AR	**Alarm Reset**
TP	**Toilet Paper Dispenser**

Sanitary Ware General

Installation generally
Standards: In accordance with **BS 6465**-1, -2 and -3.
Assembly and fixing: Surfaces designed to falls to drain as intended.
Fasteners: Non-ferrous or stainless steel.
Fixing: Fix appliances securely to structure. Do not support on pipework.
Jointing and bedding compounds: Recommended by manufacturers of appliances, accessories and pipes being jointed or bedded.
Appliances: Do not use. Do not stand on appliances.
Supply and discharge pipework: Fix before appliances.
On completion: Components and accessories working correctly with no leaks.
Labels and stickers: Remove

Installing WC pans
Floor-mounted pans: Screw fix and fit cover caps over screw heads. Do not use mortar or other beddings.
Seat and cover: Stable when raised.

Installing cisterns
Cistern operating components: Obtain from cistern manufacturer.
Inlet and flushing valves: Match to pressure of water supply.
Internal overflows: Into pan, to give visible warning of discharge.
External overflows: Fix pipes to falls and locate to give visible warning of discharge. Agree location where not shown on drawings.

Installing taps
Fixing: Secure against twisting.
Seal with appliance: Watertight.
Positioning: Hot tap to left of cold tap as viewed by user of appliance.

Installing wastes and overflows
Bedding: Waterproof jointing compound.
Fixing: With resilient washer between appliance and backnut.

Compatibility of components
General: Each sanitary assembly must consist of functionally compatible components, preferably obtained from a single manufacturer.
Exceptions: Water supply fittings, wastes and traps

Noggings and bearers
Noggings, bearers, etc. to support sanitary appliances and fittings: Position accurately. Fix securely.

Tiled backgrounds other than splashbacks
Timing:Complete before fixing appliances.
Fixing appliances: Do not overstress tiles.

Sealant for pointing
Standard: **BS EN ISO 11600**
Class: F20 HM
Type: Silicone
Manufacturer:Contractor's choice
Product reference: Contractor's choice
Colour: White

Installing cisterns
Cistern operating components: Obtain from cistern manufacturer.
Inlet and flushing valves: Match to pressure of water supply.
Internal overflows: Into pan, to give visible warning of discharge.
External overflows: Fix pipes to falls and locate

WC and Cisterns

WC standard: To Defra WC suite performance specification or equivalent approved by relevant water company
Type:Close-coupled cistern
Pan
Standards: To BS EN 33 and BS EN 997, Class 2
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Material: Glazed fireclay, white
Seat and cover
Standard: To **BS 1254**
Form: Seat and cover
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Material: Plastics
Finish/ colour: White
Duty: Heavy
Pillars: Contractor's choice
Soft close: Required
Pan connector
Standard: To **BS 5627**.
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Colour: To match pan
Cistern
Standard: To BS 1125
Manufacturer: As pan
Product reference: Contractor's choice
Material: Vitreous china
Finish/ colour: To match pan
Inlet valve: Cistern manufacturer's standard
Manufacturer: As cistern
Product reference: As cistern
Water supply connection: Bottom
Flushing arrangement: Cistern manufacturer's standard
Manufacturer: As cistern
Product reference: Contractor's choice
Operating control: Lever handle, chrome-plated
Flush volume: 6 L
Flush pipe: Concealed
Manufacturer: As cistern
Product reference: Contractor's choice
Material: Plastics, white
Accessories: None

Unisex accessible WC Equipment Packages (Document M)

Armitage Shanks
Armitage, Old Road, Rugeley, Staffordshire, WS15 4BT
+44 (0)870 122 8822
www.idealspec.co.uk
info@thebluebook.co.uk

Product reference:
Standards: In accordance with Approved Document M.
Form: Complete accessible WC Doc M package and fittings.
Arrangement: Close-coupled pack.
Transfer handing: Left-hand.
Material and colour
WC pans: Vitreous china to **BS EN 997**, white.
WC cisterns: Vitreous china to **BS EN 997**, white.
WC seats: Plastics, no cover.
Washbasins
Material: Vitreous china to **BS EN 14688**, white.
Handrails: Powder-coated.
Water supply fittings: Lever-operated thermostatic mixer tap.
Integral accessories: Toilet roll holder.
Finish/ colour
Pan: Vitreous china, white
Cistern: Plastics, white (concealed)
Seat: Plastics, grey
Basin: Vitreous china, white
Handrails and grab bars: Coated steel, dark grey
Transfer handing: As per drawing
Water supply fittings (basin): Lever-operated thermostatic basin mixer tap
Water supply temperature (maximum): 43°C
Accessories: Clothes hooks, Soap dispenser, Mirror

Washbasins

Armitage Shanks
Armitage, Old Road, Rugeley, Staffordshire, WS15 4BT
+44 (0)870 122 8822
www.idealspec.co.uk
info@thebluebook.co.uk

Product reference:**HBN 00-10 HTM65 (LB G M) Contour 21 + 50cm Back Outlet Washbasin.**
Standard: To **BS EN 14688**.
Form: Wall-hung wash basin.
Connecting dimensions: **To BS EN 31**.
Materials
Body: Vitreous china.
Finish and colour: White, SmartGuard (HY).
Size: 500 x 400 mm.
Water supply, overflow and waste holes
Water supply: Single tap hole.
Overflow: Rear overflow hole.

WC Fittings

Mirror
Manufacture: Contractor's choice
Product reference: Contractor's choice
Quantity: 12no.
Materials and standards
Materials: Stainless steel.
Dimensions: 700 x 450 mm.
Thickness: 6 mm.
Finish: Highly polished to give maximum reflection.
Backing: Masonite.
Provision for fixing: Four holes within rear frame for concealed fixing.
Execution: Installing mirrors
Type: Contractor's choice
Size: As per elevations
Edge treatment: 6 mm polished bevel

Paper Roll Dispenser
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Quantity: 12no.
Fixing: Wall mounted
Material: Plastic
Finish/ colour: White

Paper Towel Dispenser
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Quantity: 12no.
Fixing: Wall mounted
Material: Plastic
Finish/ colour: White

Soap Dispenser
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Quantity: 12no.
Fixing: Wall mounted
Material: Plastic
Finish/ colour: White

Sanitary Disposal Bin
Manufacturer: Contractor's choice
Product reference: hands-free Pedal bin
Quantity: 12no.
Material: Plastic
Finish/ colour: Grey

Toilet brushes
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Quantity: 3
Material: Plastic
Finish/ colour: White

Hand-cleansing gel dispensers
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Quantity: 3
Material: Plastic
Finish/ colour: White

Washbasins

Armitage Shanks
Armitage, Old Road, Rugeley, Staffordshire, WS15 4BT
+44 (0)870 122 8822
www.idealspec.co.uk
info@thebluebook.co.uk

Product reference:**HBN 00-10 HTM65 (LB G M) Contour 21 + 50cm Back Outlet Washbasin.**
Standard: To **BS EN 14688**.
Form: Wall-hung wash basin.
Connecting dimensions: **To BS EN 31**.
Materials
Body: Vitreous china.
Finish and colour: White, SmartGuard (HY).
Size: 500 x 400 mm.
Water supply, overflow and waste holes
Water supply: Single tap hole.
Overflow: Rear overflow hole.

WC Fittings

Design: Complete the design of the above ground foul drainage system.
Standards: To BS EN 12056-1 and BS EN 12056-2, and in accordance with BS EN 12056-2 National Annexes NA-NG.
System type to BS EN 12056-2:
System III.
Proposals: Submit drawings, technical information, calculations and manufacturers' literature.
Collection and distribution of foul water
General: Quick, quiet and complete, self-cleansing in normal use, without blockage, crossflow, backfall, leakage, odours, noise nuisance or risk to health.
Pressure fluctuations in pipework (maximum): ±38 mm water gauge.
Water seal retained in traps (minimum): 25 mm.

1m 0 1 2 3
1:50

200mm 0 200 400 600 800 1000 1200 1400 1600
1:20

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Wall finish changed to white rock as per client request.	MR

Paul Robinson PARTNERSHIP
ARCHITECTURE + SURVEYING
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Hospital Road, Little Plumstead,
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tel: 01603 397057
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web: www.paulrobinsonpartnership.co.uk

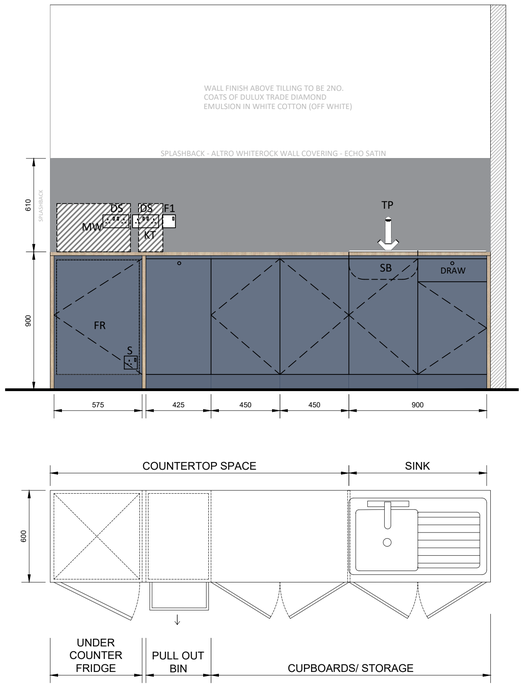
BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

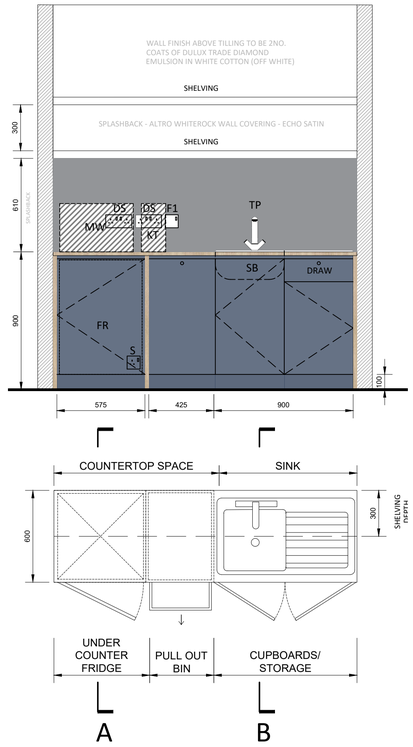
title:
Proposed WC Details

scale @ A1: 1:50	drawn by: MR	
date: May '23	approved: SDL	
project no: 8341	dwg no: B16	revision: A



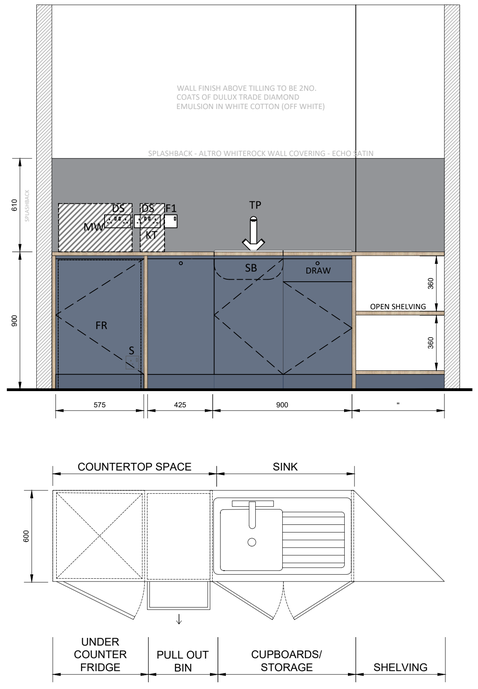
Teapoint (A) Elevation and Plan

Scale - 1:20



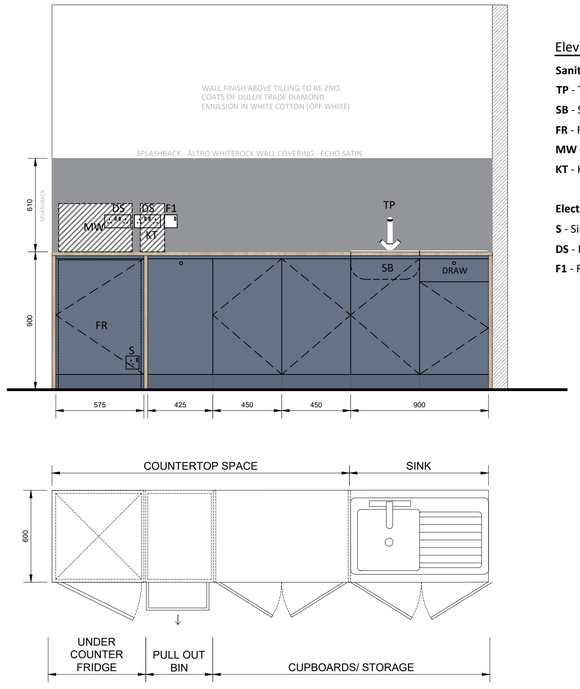
Teapoint (B) Elevation and Plan

Scale - 1:20



Teapoint (C) Elevation and Plan

Scale - 1:20



Teapoint (D) Elevation and Plan

Scale - 1:20

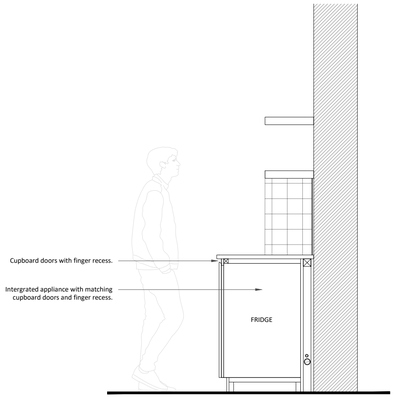
Elevation Key

Sanitary Fittings and Appliance

TP - Tap
SB - Sink Basin
FR - Fridge
MW - Microwave
KT - Kettle

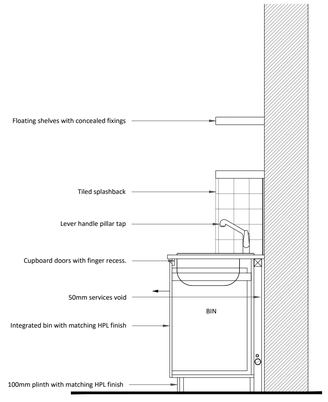
Electrical

S - Single Socket
DS - Double Socket
F1 - Fuse



Typical Sections A-A

Scale - 1:20



Typical Sections B-B

Scale - 1:20

TEAPOINT SCHEDULE

REF	Location	Dimensions W x D (mm)	Sink	Fridge	Bin	Microwave	Shelving	Bin size	Sanitary ware Finish	Worktop Finish
GROUND FLOOR										
A	Room Hire (A)	2760 x 600	✓	✓	✓	-	-	✓	Chromed Plated	Polyrey HPL Bonded Laminate Chene Bastude C129 (Natural Woods, Oak) - FA
B	Community Hall	1980 x 600	✓	✓	✓	-	✓	✓		
C	Room Hire (B)	2565/1965 x 600	✓	✓	✓	-	-	✓		
FIRST FLOOR										
D	Offices	3090 x 600	✓	✓	✓	✓	-	✓	Chromed Plated	Polyrey HPL Bonded Laminate Chene Bastude C129 (Natural Woods, Oak) - FA

General

Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

Moisture content of wood and wood-based boards
Control and monitoring: Submit method statement

Installing units and worktops
General: Well-fitting, stable and secure.
Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

Installing appliances
Connections: Provide to electric, gas, and hot and cold water services.

Installing sinks, taps and wastes
Water supply: To **BS EN 806-2** and -4.
Taps
Fixing: Secure, watertight seal with the appliance.
Positioning: Hot tap to left of cold tap as viewed by the user of the appliance.
Wastes
Bedding: Waterproof jointing compound.
Fixing: With resilient washer between appliance and backnut.

Completion
Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.
Appliance commissioning
Appliance operation, functions and controls: Verify.
Documentation: Submit guarantees, instruction manuals, etc

Kitchen Sanitary Ware

Sinks
Standard: To BS EN 13310.
Manufacturer:
Product reference: Contractor's choice
Configuration: Sink-and-a-half with double-drainer
Overall size: 1000 x 600
Material: Stainless steel
Colour and finish: Brushed steel

Taps
Tap/ chainstay/ overflow holes: One tap hole, centre.
Taps: Pillar
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Operation: Lever handle
Material: Chromed finish

Waste
Wastes: Pop-up
Standard: To **BS EN 274-1**, -2 and -3.
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Size: To fit sink
Material: Chromed finish
Tail: Slotted

Traps
Traps: Tubular, P-type
Standard: To **BS EN 274-1**, -2 and -3.
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Size: To fit waste
Material: Plastic
Depth of seal (minimum): 75 mm.
Accessories: Standing tube overflow
Water supply: To **BS EN 806-2** and -4.

Taps
Fixing: Secure, watertight seal with the appliance.
Positioning:Hot tap to left of cold tap as viewed by the user of the appliance.
Wastes
Bedding: Waterproof jointing compound.
Fixing: With resilient washer between appliance and backnut.

Appliance

Under Counter Intergrated Refrigerator
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Colour and finish: Contractors choice
Service connections: Mains electricity

LININGS TO WALLS:

Extruded semi-rigid PVCu sheet, EU Grade
Maximum service temp: 60°C
Fire rating: BS 476 Part 7 (1987) surface spread of flame - Class 1
BS 476 Part 6 (1989) fire propagation - Class 0*
(*when fixed to a non-combustible substrate)
EN13501-1 B-s3, d0
Manufacturer / Product reference:
Altro Whiterock™ White W103/W104
Altro Whiterock™ Satins W136/W137
hygienic wall cladding by Altro Limited,
telephone +44(0)1462 707600,
fax +44 (0)1462 707515, email enquiries@altro.com
Width: 1220 mm
Length: 2500 (W103 and W136) or 3000mm (W104 and W137)
Thickness: 2.5 mm
Surface finish: Satin
Colour: White and various for Satins
Light reflectance values: 68-93 (ask for details)
Adhesive: AltroFix™ W139

Kitchenette Finishes

Fitted base units
Standard:To **BS EN 14749.**
Manufacturer:Contractor's choice
Product reference: Contractor's choice
Structural performance: To **BS 6222-2,** test level H.
Dimensions: To **BS EN 1116.**
Surface finishes:To **BS 6222-3.**
Doors and drawer fronts
Material: High Pressure Laminate (HPL)
Finish and colour: As seen on section A-A
Edges: Matching HPL edge
Side panels, plinths and shelves
Material: HPL
Finish and colour: As seen on section A-A
Edges: Matching HPL edge
Accessories: Legs and plinths

Worktops
Standard: To **BS 6222-3**
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Material: HPL Polyrey - Basalte B135
Exposed edges: Matching HPL edge
Support: Pattering and timber framing supports

Sealant
Standard:To **BS EN ISO 11600**, Class F20 HM
Type: One-part silicone
Manufacturer:Contractor's choice
Product reference: Contractor's choice
Colour: Dark Grey

Fitted Units

Base units
Standard: To BS EN 14749.
Manufacturer: Howdens or similar
Product reference: Contractor's choice
Structural performance: To **BS 6222-2**, test level H.
Dimensions: To **BS EN 1116**.
Surface finishes: To **BS 6222-3**.

Doors and drawer fronts
Material: High Pressure Laminate (HPL)
Finish and colour: As per elevations
Edges: Matching HPL edge
Other requirements: Concealed door hinges

Side panels, plinths and shelves
Material: High Pressure Laminate (HPL)
Finish and colour: White
Edges: Matching HPL edge
Accessories: Bins

Worktop
Standard: To **BS 6222-3**
Manufacturer:Contractor's choice
Product reference: Contractor's choice
Material: High pressure laminate-covered particleboard type
Exposed edges: Matching HPL edge
Support: Timber supports where necessary

FINISHES SUBJECT TO CLIENT SUBJECT APPROVAL

1m 0 1 2 3
1:50

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Wall finish changed as per client request	MR

BUILDING REGS

Paul Robinson
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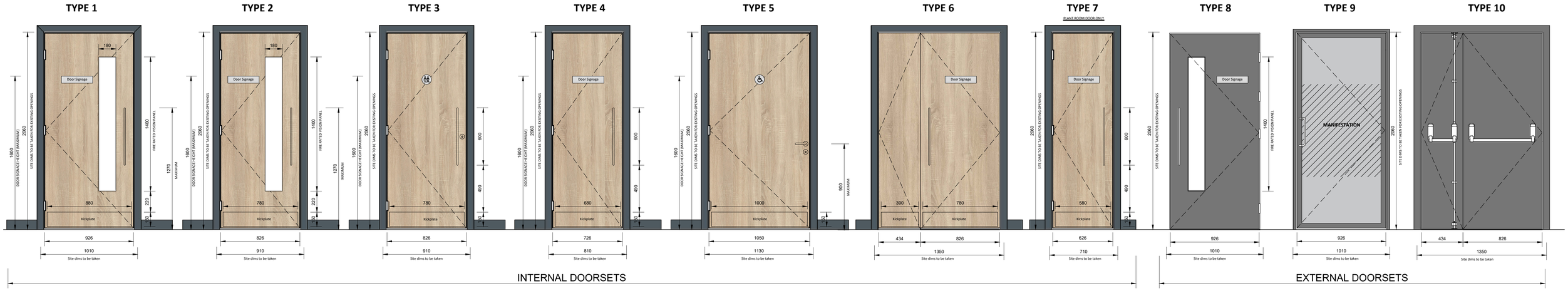
e-mail: design@prparchitecture.com
web: www.paulrobinsonpartnership.co.uk

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Teapoint Details

scale @ A1: 1:20	drawn by: MR
date: May '23	approved: SDL
project no: 8341	dwg no: B17
	revision: A



Proposed Door Elevations

Scale - 1:20

DOOR SCHEDULE

Ref	Location	Internal/External	Type	Structural Opening (mm)	Lintel (mm)	Leaf Size W x H (mm)	Thickness (mm)	Fire Rating (minutes)	Fire/smoke Seals	Vision Panel	Fob Access	Door Finish	Frame and Architrave Finish	Comments
GROUND FLOOR														
DO1	Entrance Door - Room Hire (A)	External	8	1010 x 2100	Steel Thermally Broken Standard Duty	926 x 2060	44	30	✓	✓	✓	Powder coated finish - RAL 9011	Match Door Finish	
DO2	Entrance Door - Cafe/Social Space	External	9	1010 x 2100	Reuse Existing	926 x 2060	As per manufacture	-	-	-	✓	Glazed Door	Powder Coated Finish - RAL 9011	Fully glazed door with glazing manifestation
DO3	WC Cubicle - Cafe/Social Space	Internal	3	910 x 2100	Steel box Standard Duty	826 x 2060	44	30	✓	-	-	Polyrey HPL Laminate Chene Bastude C129 (Natural Woods, Oak) - FA	Painted finish to match proposed skirting see finishes drawing - C17 for specification	
DO4	Accessible WC - Cafe/Social Space	Internal	5	1130 x 2100	Steel box Standard Duty	1050 x 2060	44	30	✓	-	-			
DO5	Store Room - Room Hire (B)	Internal	4	810 x 2100	Reuse Existing	726 x 2060	44	-	-	-	-			
DO6	Tea Point - Room Hire (B)	Internal	2	910 x 2100	Steel box Standard Duty	826 x 2060	44	30	✓	✓	-			
DO7	Access - Lobby	Internal	2	910 x 2100	Reuse Existing	826 x 2060	44	30	✓	✓	✓			
DO8	Access - Room Hire (B)	Internal	1	1010 x 2100	Steel box Standard Duty	926 x 2060	54	60	✓	✓	✓			
DO9	Accessible WC - Entrance Lobby	Internal	5	1130 x 2100	Steel box Standard Duty	1050 x 2060	44	-	✓	-	-			
D10	Entrance Door - Entrance Lobby (Room Hire (B) and First Floor Entrance access)	External	8	1010 x 2100	Reuse Existing	926 x 2060	44	30	✓	✓	✓	Powder Coated Finish - RAL 9011	Match Door Finish	
D11	Entrance Door - Entrance Lobby (Room Hire (B) and First Floor Entrance access)	External	10	1350 x 2100	Steel Thermally Broken Standard Duty	826/434 x 2060	44	-	✓	✓		Polyrey HPL Laminate Chene Bastude C129 (Natural Woods, Oak) - FA	Painted finish to match proposed skirting see finishes drawing - C17 for specification	
D12	Plant Room	Internal	7	710 x 2100	Reuse Existing	626 x 2060	54	60	✓	-	-			
D13	Access - Lobby (Room Hire (B) and First Floor Entrance Lobby)	Internal	2	910 x 2100	Steel box Standard Duty	826 x 2060	44	30	✓	✓				
D14	Access - Lobby (Community Hall)	Internal	2	910 x 2100	Steel box Standard Duty	826 x 2060	44	30	✓	✓				
D15	Store Room - Community Hall	Internal	6	1350 x 2100	Steel box Standard Duty	826/434 x 2060	44	30	✓	-	-			
D16	Teapoint - Community Hall	Internal	2	910 x 2100	Steel box Standard Duty	826 x 2060	44	30	✓	✓	-			
D17	WC Cubicle - Room Hire (A)	Internal	3	910 x 2100	Steel box Standard Duty	826 x 2060	44	-	-	-	-			
D18	WC Lobby - Room Hire (A)	Internal	5	1130 x 2100	Steel box Standard Duty	1050 x 2060	44	30	✓	✓	-			
D19	Accessible WC - Room Hire (A)	Internal	5	1130 x 2100	Steel box Standard Duty	1050 x 2060	44	-	-	-	-			
D20	Cleaners Store - Community Hall	Internal	4	810 x 2100	Steel box Standard Duty	726 x 2060	44	-	-	-	-			
D21	Accessible WC - Room Hire (A)	Internal	5	1130 x 2100	Steel box Standard Duty	1050 x 2060	44	-	-	-	-			
D22	WC - Community Hall	Internal	3	910 x 2100	Steel box Standard Duty	826 x 2060	44	-	-	-	-			
D23	WC - Community Hall	Internal	3	910 x 2100	Steel box Standard Duty	826 x 2060	44	-	-	-	-			
D24	Access - Lobby (Community Hall)	Internal	1	1010 x 2100	Steel box Standard Duty	926 x 2060	44	30	✓	✓	✓			
D25	Entrance Door - Entrance Lobby (Community Hall)	External	8	1010 x 2100	Reuse Existing	926 x 2060	44	-	✓	✓	✓	Powder Coated Finish - RAL 9011	Match Door Finish	
D26	WC - Community Hall	Internal	3	910 x 2100	Steel box Standard Duty	826 x 2060	44	-	-	-	-	Polyrey HPL Laminate Chene Bastude C129 (Natural Woods, Oak) - FA	Painted finish to match proposed skirting see finishes drawing - C17 for specification	
D27	WC - Community Hall	Internal	3	910 x 2100	Steel box Standard Duty	826 x 2060	44	-	-	-	-			
D28	Store Room - Room Hire (B)	Internal	4	810 x 2100	Reuse Existing	726 x 2060	44	-	-	-	-			
FIRST FLOOR														
D29	Office (1)	Internal	3	1010 x 2100	-	926 x 2060	44	30	✓	✓	-	Polyrey HPL Laminate Chene Bastude C129 (Natural Woods, Oak) - FA	Painted finish to match proposed skirting see finishes drawing - C17 for specification	
D30	WC Cubicle	Internal	5	810 x 2100	-	726 x 2060	44	30	✓	-	-			
D31	WC Cubicle	Internal	5	810 x 2100	-	726 x 2060	44	30	✓	-	-			
D32	Teapoint (D)	Internal	3	910 x 2100	-	826 x 2060	44	30	✓	✓	-			
D33	Roof Access	External	5	1010 x 2100	Reuse Existing	910 x 2060	44	30	✓	✓	-	Powder Coated Finish - RAL 9011	Match Door Finish	
D34	Office (2)	Internal	3	1010 x 2100	-	926 x 2060	44	30	✓	✓	-	Polyrey HPL Laminate Chene Bastude C129 (Natural Woods, Oak) - FA	Painted finish to match proposed skirting see finishes drawing - C17 for specification	
D35	Office (3)	Internal	3	1010 x 2100	-	926 x 2060	44	30	✓	✓	-			

STRUCTURAL ENGINEER TO CONFIRM LINTEL SPECIFICATION

COLOUR SCHEME AND FINISHES SUBJECT TO CLIENT SUBJECT APPROVAL

Doors General

All internal doors, with mortice cylinder locks to have thumbturn operation, to internal side, to aid occupant's escape in event of emergency.
All door closers should be capable of operating with an opening force of not more than 30N, for the first 30° of opening, and 22.5° for remainder of swing.
Ensure that all existing and relocated doors meet requirements in terms of fire-rating and suitability of ironmongery.
Consideration must be made when selecting door frame colours to ensure contrasting effect in line with Equality Act requirements.
Site measurements required before manufacturing.

Site dimensions
Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication

Timber procurement
Timber (including timber for wood-based products): Obtain from well managed forests and/ or plantations in accordance with: The laws governing forest management in the producer country or countries. International agreements such as the 'Convention on International Trade in Endangered Species of wild fauna and flora (CITES)'.
Documentation: Provide either in accordance with chain of custody certification scheme requirements: Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied, or
Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.

Fire-resisting and smoke control/ door assemblies/ doorsets
UKCA/ UKNI/ CE marked fire-resisting and smoke control pedestrian doorsets:
To **BS EN 16034** and in conjunction with **BS EN 13241, BS EN 14351-1** and **BS EN 14351-2**.
Door products: As defined in **BS EN 12519**.
Evidence of fire performance: Provide certified evidence, in the form of a product conformity certificate, directly relevant fire test report or engineering assessment, that each door/ door assembly/ doorset supplied will comply with the specified requirements for fire-resisting and/ or smoke control if tested to **BS 476-22, BS EN 1634-1, BS EN 1634-3** or is UKCA/ UKNI/ CE marked to **BS EN 16034**. Specified values should not be a combination of both standards. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.
Components, assemblies or sets will be marked to the relevant UKCA/ UKNI/ CE marking European product standard (hEN), national product standard and/ or third-party certification rating.

Fixing of loose thresholds
Spacing of fixings: Maximum 150 mm from each end and at 600 mm maximum centres.
Installation of emergency exit devices
Standard: Unless specified otherwise, install panic bolts/ latches in accordance with **BS EN 1125.**

Sealant and Jointing
Manufacturer: Contractor's choice .
Product reference: Contractor's choice .
Colour: Grey.
Application: Triangular fillets finished to a flat or slightly convex profile.

Fire-resisting and smoke control doors/ door assemblies/ doorsets
Installation: By a firm currently registered under a third-party-accredited fire door installer scheme in accordance with instructions supplied with the product conformity certificate, test report or engineering assessment.
Gaps between frames and supporting construction: Filled as necessary in accordance with requirements for certification and/ or door/ doorset manufacturer's instructions.
Installation: By manufacturer or their approved installers, in accordance with requirements of BS EN 16034 and in conjunction with BS EN 13241, including the Declaration of Performance (DoP) certification for the UKCA/ UKNI/ CE marked doorset.

Protection of components
General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry, floored and covered storage.

Stored components: Stacked on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

Priming/ sealing
Wood surfaces inaccessible after installation:
Primed or sealed as specified before fixing components.

Fixing doorsets
Timing: After associated rooms have been made weathertight and the work of wet trades is finished and dried out.

Building in
General: Not permitted unless indicated on drawings.

Damp-proof courses in prepared openings
Location: Correctly positioned in relation to door frames. Do not displace during fixing operations.

Fixing of wood frames
Spacing of fixings (frames not predrilled):
Maximum 150 mm from ends of each jamb and at 600 mm maximum centres.

Fixing of loose thresholds
Spacing of fixings: Maximum 150 mm from each end and at 600 mm maximum centres.

External Doorsets

Glazed
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Door leaf: As per schedule
Finish as delivered: Polyester powdercoated
Frame and architraves: Manufacturer's standard
Finish as delivered: Polyester powdercoated
Glazing/ infill details: Clear double glazing
Manifestation: Required
Beading: Internal
Ironmongery: As ironmongery schedule
Perimeter seals: Fire and smoke seal (as per schedule)
Fire performance
Fire resistance: Manufacturer's standard
Smoke leakage: Manufacturer's standard
Thermal performance (U-value): 1.6 W/m²K (minimum)
Fixing: Plugged and screwed

Solid
Manufacturer: Product reference: Contractor's choice
Door leaf: As per schedule
Finish as delivered: Polyester powdercoated
Frame and architraves:Polyester powdercoated
Finish as delivered: Polyester powdercoated
Beading: Internal
Ironmongery: As ironmongery schedule
Perimeter seals: Fire and smoke seal (as per schedule)
Fire resistance: Manufacturer's standard
Smoke leakage: Manufacturer's standard
Reaction to fire: To **BS EN 13501-1**, Class B or better
Thermal performance (U-value): 1.6 W/m²K (minimum)
Fixing: Plugged and screwed

Internal Doorsets

Solid
Materials: Generally to **BS EN 942.**
Finish as delivered: Polyrey HPL, Wenege Blanc Ceruse - FA
Adhesive: Manufacturer's standard
Joinery workmanship accuracy: To **BS 4787-1.**
Preservative treatment: Manufacturer's standard
Glazing/ infill details: Clear fire-resisting glazing (FR rating to match door)
Beading: External
Fire resistance: Manufacturer's standard
Smoke leakage: Manufacturer's standard
Reaction to fire: To **BS EN 13501-1**, Class B or better

200mm 0 200 400 600 800 1000 1200 1400 1600
1:20

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:

Paul Robinson
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web: www.paulrobinsonpartnership.co.uk

BUILDING REGS

client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Door and Ironmongery Schedule

scale @ A1:	drawn by:
1:20	MR
date:	approved:
April '23	SDL
project no:	dwg no: revision:
8341	B18

IRONMONGERY SCHEDULE

Door Ref	Location	Internal/External	Push Plate	Pull Handle	Kick Plate	Overhead Closer	Door Stop	Door Holders	Door Mounted Coat Hooks	Mortice cylinder key lock	Thumbturn operation to mortice cylinder on internal side	Thumbturn Privacy indicator	Ironmongery Finish	Signage	Signage Finish	Comments
GROUND FLOOR																
DO1	Entrance Door - Room Hire (A)	External	✓	✓	-	✓	✓	✓	-	-	-	-	To match door finish. Powder coated finish - RAL 9011	External door signage	Satin Stainless Steel	
DO2	Entrance Door - Cafe/Social Space	External	✓	✓	-	✓	✓	✓	-	-	-	-		-	-	Power assisted opener/closer
DO3	WC Cubicle - Cafe/Social Space	Internal	✓	✓	✓	✓	-	-	✓	-	✓	✓	Satin Stainless Steel	Unisex Sign, Round - face fixed	To match Ironmongery	
DO4	Accessible WC - Cafe/Social Space	Internal	-	✓	✓	-	-	-	✓	✓	✓	✓		Accessible WC sign, Round - face fixed		Part M compliant door mounted grab rail in contrasting finish to door finish.
DO5	Store Room - Room Hire (B)	Internal	✓	✓	✓	-	-	-	✓	✓	-	-		'Store' Sign, face fixed		
DO6	Tea Point - Room Hire (B)	Internal	✓	✓	✓	✓	-	-	-	-	-	-		'Teapoint' Sign, face fixed		
DO7	Access - Lobby	Internal	✓	✓	✓	✓	-	-	-	-	-	-		'Private No Access' Sign, face fixed		
DO8	Access - Room Hire (B)	Internal	✓	✓	✓	✓	✓	✓	-	-	-	-		'Store' Sign, face fixed		
DO9	Accessible WC - Entrance Lobby	Internal	-	-	✓	✓	-	-	✓	✓	✓	✓		Accessible WC sign, Round - face fixed		Part M compliant door mounted grab rail in contrasting finish to door finish.
D10	Entrance Door - Entrance Lobby (Room Hire (B) and First Floor Entrance access)	External	✓	✓	-	✓	✓	✓	-	-	-	-	To match door finish. Powder coated finish - RAL 9011	External door signage	Satin Stainless Steel	
D11	Entrance Door - Entrance Lobby (Room Hire (B) and First Floor Entrance access)	External	✓	✓	-	✓	✓	✓	-	-	-	-		'Emergency Exit Keep Clear' Sign, face fixed	Satin Stainless Steel	
D12	Plant Room	Internal	✓	✓	✓	-	-	-	✓	✓	✓	-	Satin Stainless Steel	'Store' Sign, face fixed	To match Ironmongery	
D13	Access - Lobby (Room Hire (B) and First Floor Entrance Lobby)	Internal	✓	✓	✓	✓	-	-	-	-	-	-		'Private No Access' Sign, face fixed		
D14	Access - Lobby (Community Hall)	Internal	✓	✓	✓	✓	-	-	-	-	-	-		'Private No Access' Sign, face fixed		
D15	Store Room - Community Hall	Internal	✓	✓	✓	-	-	-	✓	✓	✓	-		'Store' Sign, face fixed		
D16	Teapoint - Community Hall	Internal	✓	✓	✓	✓	-	-	-	-	-	-		'Teapoint' Sign, Round - face fixed		
D17	WC Cubicle - Room Hire (A)	Internal	✓	✓	✓	✓	-	-	✓	-	✓	✓		Unisex Sign, Round - face fixed		
D18	WC Lobby - Room Hire (A)	Internal	✓	✓	✓	✓	-	-	✓	-	✓	✓		'Toilet' Sign, face fixed		
D19	Accessible WC - Room Hire (A)	Internal	-	-	✓	-	-		✓	✓	✓	✓		Accessible WC sign, Round - face fixed		Part M compliant door mounted grab rail in contrasting finish to door finish.
D20	Cleaners Store - Community Hall	Internal	✓	✓	✓	✓	-	-	✓	✓	✓	-		'Store' Sign, face fixed		
D21	Accessible WC - Room Hire (A)	Internal	-	-	✓	-	-	-	✓	✓	✓	✓		Accessible WC sign, Round - face fixed		Part M compliant door mounted grab rail in contrasting finish to door finish.
D22	WC - Community Hall	Internal	✓	✓	✓	✓	-	-	✓	-	-	✓		Unisex Sign, Round - face fixed		
D23	WC - Community Hall	Internal	✓	✓	✓	✓	-	-	✓	-	-	✓		Unisex Sign, Round - face fixed		
D24	Access - Lobby (Community Hall)	Internal	✓	✓	✓	✓	✓	-	-	-	-	-		-	-	
D25	Entrance Door - Entrance Lobby (Community Hall)	External	✓	✓	-	✓	✓	✓	-	-	-	-	To match door finish. Powder coated finish - RAL 9011	External door signage	Satin Stainless Steel	
D26	WC - Community Hall	Internal	✓	✓	✓	✓	-	-	✓	-	✓	✓	Satin Stainless Steel	Unisex Sign, Round - face fixed	To match Ironmongery	
D27	WC - Community Hall	Internal	✓	✓	✓	✓	-	-	✓	-	✓	✓		Unisex Sign, Round - face fixed		
D28	Store Room - Room Hire (B)	Internal	✓	✓	✓	-	-	-	✓	✓	✓	-		'Store' Sign, face fixed		
FIRST FLOOR																
D29	Office (1)	Internal	✓	✓	✓	✓	✓	-	-	-	-	-	Satin Stainless Steel	-	-	
D30	WC Cubicle	Internal	✓	✓	✓	✓	✓	-	✓	-	✓	✓		Unisex Sign, Round - face fixed	To match Ironmongery	
D31	WC Cubicle	Internal	✓	✓	✓	✓	✓	-	✓	-	✓	✓		Unisex Sign, Round - face fixed		
D32	Teapoint (D)	Internal	✓	✓	✓	✓	✓	-	-	-	-	-		'Teapoint' Sign, Round - face fixed		
D33	Roof Access	External	✓	✓	-	✓	-	-	-	-	-	-	To match door finish. Powder coated finish - RAL 9011	'Private No Access' Sign, face fixed		
D34	Office (3)	Internal	✓	✓	✓	✓	✓	-	-	-	-	-	Satin Stainless Steel	-	-	
D35	Office (2)	Internal	✓	✓	✓	✓	✓	-	-	-	-	-		-	-	

FINISHES SUBJECT TO CLIENT SUBJECT APPROVAL

Ironmongery General

Ironmongery range selected by Contractor
Source: Single co-ordinated range.
Notification: Submit details of selected range, manufacturer and/ or supplier.
Principal material/ finish: Satin stainless steel, grade 1.4301 (304)
Items unavailable within selected range: Submit proposals.

Sample boards
General: Before placing orders with suppliers submit a sample board, containing labelled samples of ironmongery and showing methods of fixing.
Conformity: Retain board on site in an approved location for the duration of the Contract. Ensure conformity of ironmongery as delivered with labelled samples.

Ironmongery for fire doors
Relevant products: Ironmongery fixed to, or morticed into, the component parts of a fire resisting door assembly.
Compliance: Ironmongery included in successful tests to BS 476-22 or BS EN 1634-1 on door assemblies similar to those proposed.
Certification: Submit CERTIFIRE certificates
Melting point of components (except decorative non-functional parts):

Location of hinges
Primary hinges: Where not specified otherwise, positioned with centre lines 250 mm from top and bottom of door leaf.
Third hinge: Where specified, positioned with centre line 250 mm below centre line of top hinge .
Hinges for fire-resisting doors: Positioned in accordance with door leaf manufacturer's recommendations.
Installation of emergency exit devices
Standard: Unless specified otherwise, install panic bolts/ latches in accordance with BS EN 1125.

Installation

Fixing ironmongery generally
Fasteners: Supplied by ironmongery manufacturer.
Finish/ corrosion resistance: To match ironmongery.
Holes for components: No larger than required for satisfactory fit/ operation.
Adjacent surfaces: Undamaged.
Moving parts: Adjusted, lubricated and functioning correctly at completion.

Fixing ironmongery to fire-resisting door assemblies
General: All items fixed in accordance with door leaf manufacturer's recommendations ensuring that integrity of the assembly, as established by testing, is not compromised.
Holes for through fixings and components: Accurately cut.
Clearances: Not more than 8 mm unless protected by intumescent paste or similar.
Lock/ latch cases for fire doors requiring > 60 minutes integrity performance: Coated with intumescent paint or paste before installation.

Installation of emergency exit devices
Standard: Unless specified otherwise, install panic bolts/ latches in accordance with **BS EN 1125.**
working conditions.

Single Axis Door Hinges

Internal Doors
Standard: To BS EN 1935.
Minimum classification grades
Category of use: 2 - Medium duty
Durability: 4 - Medium
Suitability for use on fire/ smoke doors: 1 -Yes
Safety: 1
Corrosion resistance: 1 - Mild resistance
Hinge grade: As recommended by door manufacture
Type: Double ball bearing butt
Size: As recommended by door manufacture
Material/ finish: Satin stainless steel, grade 1.4301 (304)

External Doors
Standard: To BS EN 1935.
Minimum classification grades
Category of use: 3 - Heavy duty
Durability: 7 - Medium/heavy duty
Suitability for use on fire/ smoke doors: 1 - yes
Safety: 1
Corrosion resistance: 2 - Moderate
Security - Burglar resistance: 1 - Yes
Hinge grade: As recommended by door manufacture
Type: Double ball bearing butt
Size: As recommended by door manufacture
Material/ finish: Satin stainless steel, grade 1.4301 (304)
Strength class or category of duty for door ironmongery
Requirement: To **BS EN 1192**, Class 1.
General: Durability of ironmongery components to be compatible with stated category of duty of each door leaf.
Exclusions: Ironmongery with specific duty or 'category of use' defined elsewhere.
Documentation: Before placing orders with suppliers submit documentation showing product compliance with stated category of duty.

Door Operating Devices

Overhead door closers
Standard: To **BS EN 1154**.
Minimum classification grades
Category of use: 4
Durability: 8.
Door closer power size: 3 - widths up to 950mm
Suitability for use on fire/ smoke doors: 1
Safety: 1
Corrosion resistance: 1
Type: Face fixed
Other functions: Delayed closing
Casing finish: As schedule
Variable power: Matched to the sizes and weights of doors.
Latched doors: Override latches and/ or door seals when fitted.
Unlatched doors: Hold shut under normal working conditions.
Closing against smoke seals of fire doors:
Positive. No gaps.

Performance specification for electromagnetic hold open/ swing Free devices
Standard: To BS EN 1155.
Type: Hold open, separate wall mounted
Minimum classification grades
Category of use: 3.
Durability: 8 Medium/heavy duty
Hold open power size:
Suitability for use on fire/ smoke doors: 1 - yes
Safety: 1.
Corrosion resistance: 1
Material/ finish: As schedule
Means of release: Alarm system and/ or failure of power supply.
Test switch: Located in a convenient position adjacent to door.
Operational adjustment of integral closer
Variable power: Matched to size, weight and location of doors.
Latched doors: Override latches and/ or door seals when fitted.
Unlatched doors: Hold shut under normal working conditions.

Performance specification for emergency exit devices
Standard: To **BS EN 179**.
Minimum classification grades
Category of use: 3 -
Durability: 6 -
Door mass: 5 -
Suitability for use on fire/ smoke doors: 1 -
Safety: 1 -
Corrosion resistance: 3 -
Security: 2 -
Projection of operating element: 2 -
Type of operation: B - Push pad operation
Material/ finish: Satin stainless steel
Additional requirements: External locking attachment to be suited with other locks

Privacy indicator bolts
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Type: Rotary, internal thumbturn
Material/ finish: Satin stainless steel, grade 1.4401 (316)
Emergency release facility: Required.

Door Furniture

Kick plates
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Size: As schedule
Material/ finish: Satin stainless steel, grade 1.4401 (316)
Mounting: Face fix
Additional requirements: Screw heads colour matched to plate

Door stops
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Type: Floor mounted rubber buffer on stainless steel shoe for concrete fixing
Usage: To doors opening against walls other than those fitted with closers with a back check facility

Performance specification for panic exit devices
Standard: To **BS EN 1125**.
Minimum classification grades
Category of use: 3
Durability: 6
Door mass: 5
Suitability for use on fire/ smoke doors: 1
Safety: 1.
Corrosion resistance:
Security: 2
Projection of bar: 1
Type of bar operation: A - Push bar operation
Material/ finish: Satin stainless steel
Additional requirements: None

Performance specification for lever handle sets
Standard: To **BS EN 1906**.
Minimum classification grades
Category of use: 2
Durability: 6
Fire resistance: 0
Safety: 0
Corrosion resistance: 1
Security: 0
Type of operation: A
Size: 20 mm diameter
Material/ finish: Satin stainless steel, grade 1.4301 (304)
Mounting:Screw fixed plate with fixed spindle

Push plates
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Size: 330 x 90 mm
Material/ finish: Satin stainless steel, grade 1.4401 (316)
Mounting: Face fix
Additional requirements: Screw heads colour matched to plate

Performance specification for pull handles
Standard: To **BS 8424**.
Minimum classification grades
Category of use: 2
Durability: 2
Suitability for use on fire/ smoke doors: 1
Safety: 1
Corrosion resistance: 1
Shape: D handle
Diameter: 22 mm
Distance between centres: 300 mm
Material/ finish: Satin stainless steel, grade 1.4401 (316)
Mounting: Concealed fixings

Door mounted coat hooks
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Type: Coat hook, rubber buffered
Material/ finish: Satin stainless steel, grade 1.4401 (316)

Accessories

Threshold weatherstrip
Manufacturer:
Product reference: Contractor's choice
Type: Neoprene wiping strip on door with low profile metal threshold
Size: To suit door
Material/ finish: Powder coated aluminium, colour to match door finish

Weatherstrip to door head and jambs
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Type: Elastomeric wiping strip in metal carrier
Size: To suit door
Material/ finish: Powder coated aluminium, colour to match door finish

Door seals
Manufacturer: Contractor's choice
Product reference: Contractor's choice
Type: Rebated elastomeric wiping strip
Size: To suit door
Material/ finish: Powder coated aluminium, colour to match door finish

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:

Paul Robinson
PARTNERSHIP
ARCHITECTURE + SURVEYING

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Hospital Road, Little Plumstead,
Norwich. NR13 5FH
tel: 01603 397057
e-mail: design@prparchitecture.com
web: www.paulrobinsonpartnership.co.uk

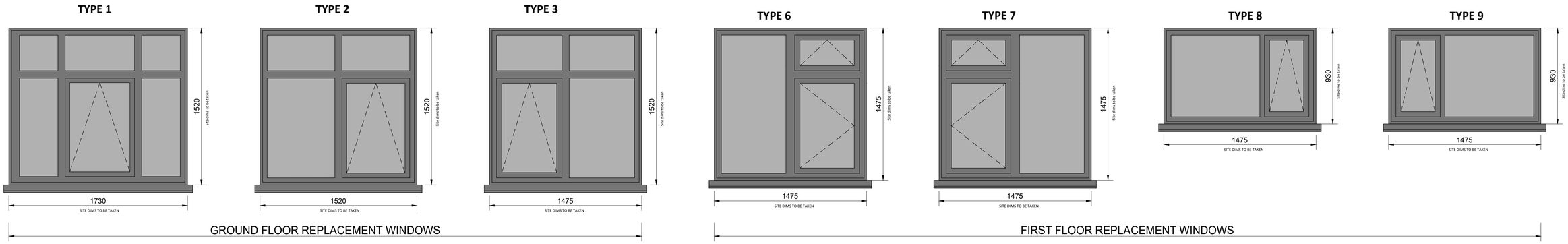
BUILDING REGS

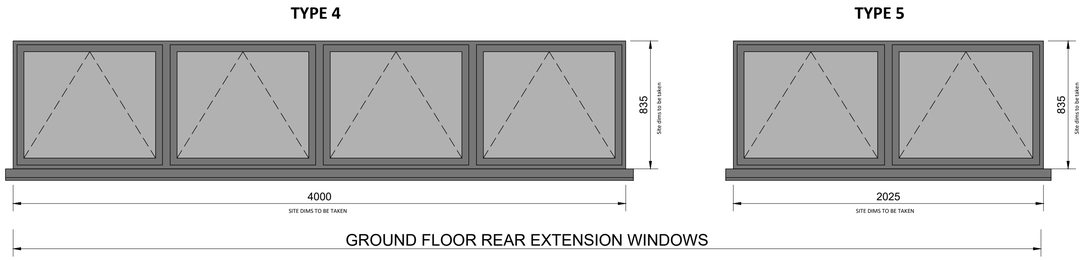
client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Ironmongery Schedule

scale @ A1: -	drawn by: MR
date: April '23	approved: SDL
project no: 8341	dwg no: B19
	revision:





Proposed Window Elevations

Scale - 1:20

WINDOW SCHEDULE

Ref	Location	Type	Opening	Structural Opening W x H (mm)	Lintel (mm)	Frame Finish	Acoustic Rating (STC)	Locks	Restrictor	Trickle Vents	Internal Sill Finish	Comments
GROUND FLOOR												
WO1	Cafe/Social Community Space	1	Outwards	Remain as Existing	Reuse Existing	Powder Coated Finish - RAL 9011	26+	✓	✓	✓	Painted finish to match proposed skirting see finishes drawing - C17 for specification	
WO2	Cafe/Social Community Space	1						✓	✓	✓		
WO3	Cafe/Social Community Space	1						✓	✓	✓		
WO4	Cafe/Social Community Space	1						✓	✓	✓		
WO5	Room Hire (B)	2		Remain as Existing	Reuse Existing		30+	✓	-	✓		Blackout Roller Blinds - dark grey to match window frames.
WO6	Room Hire (B)	2		Remain as Existing	Reuse Existing			✓	-	✓		
WO7	Community Hall	4	Outwards	4000 x 835	Steel Thermally Broken 4100		26+	✓	-	✓		
WO8	Community Hall	5	Outwards	2025 x 835	Steel Thermally Broken 2100			✓	-	✓		
WO9	Room Hire (B)	5	Outwards	Remain as Existing	Reuse Existing		30+	✓	-	✓		
W10	Room Hire (B)	5						✓	-	✓		
W11	Room Hire (B)	5						✓	-	✓		
FIRST FLOOR												
W12	Office (2)	7	Outwards	Remain as Existing	No lintel Timber Frame Dormas	Powder Coated Finish - RAL 9011	40+	✓	✓	✓	Painted finish to match proposed skirting see finishes drawing - C17 for specification	Existing window openings may require replacement of timber framing or additional strengthening. Top fixed Roller blinds - dark grey to match window frames.
W13	Office (1)	6						✓	✓	✓		
W14	Teapoint (D)	8					26+	-	✓	✓		
W15	Above Stair/ Corridor	9						-	✓	✓		
W16	Office (3)	8					40+	✓	✓	✓		
W17	Office (3)	9						-	✓	✓		

STRUCTURAL ENGINEER TO CONFIRM LINTEL SPECIFICATION

COLOUR SCHEME AND FINISHES SUBJECT TO CLIENT SUBJECT APPROVAL

Window General

All windows must achieve a minimum U-Value calculation of 1.6W/m²K in accordance with Part L of the Building Regulations standards. The deign specification will be subject to approval of building control.

All structural openings of must be measured prior to ordering of windows. Remedial works will be required for existing openings.

Evidence of performance
Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

Timber procurement
Timber (including timber for wood-based products): Obtained from well managed forests and/ or plantations in accordance with:
The laws governing forest management in the producer country or countries.
International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
Documentation: Provide either in accordance with chain of custody certification scheme requirements: Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.

Pre-construction survey
Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
Primary support structure: Carry out survey sufficient to verify that required accuracy and security of erection can be achieved.
Timing: Before fabrication.

Replacement window installation
Standard: In accordance with **BS 8213-4**.

Ironmongery
Fixing: In accordance with any third-party certification conditions applicable. Assemble and fix carefully and accurately using fasteners with matching finish supplied by ironmongery manufacturer. Do not damage ironmongery and adjacent surfaces. Checking/ adjusting/ lubricating: Carry out at Completion and ensure correct functioning.

Backfilling of steel-frame sections
Windows fixed direct into openings: After fixing, fill back of steel frame with waterproof cement fillet.

Damp-proof courses in prepared openings
Location: Ensure correct positioning in relation to window frames. Do not displace during fixing operations.

Protection of components
General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry floored and covered storage.
Stored components: Stack vertical or near vertical on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

Priming/ sealing
Wood surfaces inaccessible after installation:
Prime or seal as specified before fixing components.

Corrosion protection
Protective coating: Two coats of bitumen solution to BS 6949 or an approved mastic-impregnated tape.
Timing of application: Before fixing components.

Building in
General: Not permitted unless indicated on drawings.
Brace and protect components to prevent distortion and damage during construction of adjacent structure.

Nailed timber fixing
Penetration: Drive fully in without splitting or crushing timber.
Surfaces visible in completed work: Punch nail heads below wrot surfaces.
Nailed timber joints: Two nails per joint (minimum), opposed skew driven.

Screw fixing
Finished level of countersunk screw heads
Exposed: Flush with timber surface.
Concealed (holes filled or stopped): Sink minimum

Adhesives
Hot-setting phenolic and aminoplastic: To BS 1203.
Thermosetting wood adhesives: To **BS EN 12765**.
Thermoplastic adhesives: To **BS EN 204**.

Window Units

Aluminium window units
AluK (GB) Ltd
Newhouse Farm Industrial Estate, Mathern, Chepstow, NP16 6UD
+44 (0)1291 639739
info.uk@aluk.com
Product reference: Akluk C70S Open Out Themally Broken Whindow System. (Top Hung Vent: Polyester Powder Coated)

Dimensions and configurations: Top hung vent.
Weather performance
Air permeability: Class 4 (600 Pa).
Watertightness: E1500 (1500 Pa).
Resistance to wind load: E2400 (2400 pa).
Safety
Security level: Secured By Design certification and to PAS 24.
Thermal
Whole window U-value: 1.3 W/m²K.
Frame
Aluminum Thermally Broken
Thickness: 70mm.
Finish as delivered Coating: Polyester powder coated.
Colour: Matt.
Ventilator: Trickle Vents.
Glazing or infill Requirements: Glazing.
Operation
Type: Manual.
Execution: Fixing of aluminium frames.
Texture: Matt.
Bead: Square.

200mm 0 200 400 600 800 1000 1200 1400 1600
1:20

This drawing is derived from original survey information supplied by Bidwells LLP, project No. JB62449

rev:	date:	description:	by:
A	12.05.23	Roller blinds added.	MR

Paul Robinson
PARTNERSHIP
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BUILDING REGS

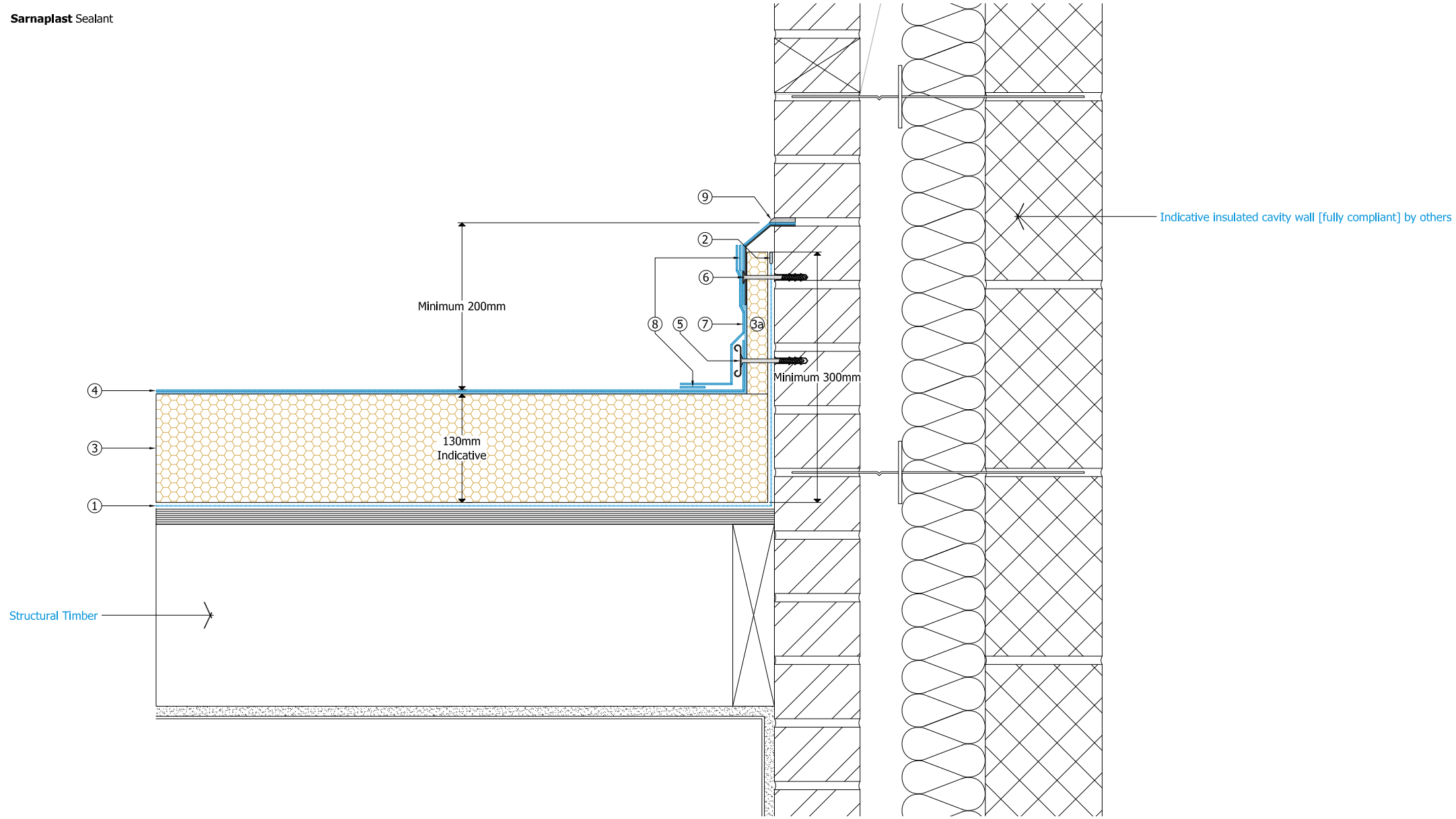
client:
Bidwells LLP on behalf of Sprowston Town Council

location:
Former Viking Pub, Tills Road, Norwich, NR6 7QZ

title:
Window Schedule

scale @ A1: 1:20	drawn by: MR
date: May '23	approved: SDL
project no: 8341	dwg no: B20
	revision: A

① **Sarnavap Air Vapour Control Layer**
② Air Vapour Control Layer sealed with **Sarnavap Jointing Tape**
③ **SarnaTherm** PIR Insulation [thickness as required to achieve target U-Value]
3a Indicative 25mm thick **SarnaTherm** PIR Insulation [thickness as required to achieve target U-Value]
④ Fully adhered **Sarnafil Membrane**
⑤ Mechanically fixed **Sarnafil Peel Stop**
⑥ Mechanically fixed **Sarnametal Roof Trim**
⑦ Fully adhered **Sarnafil Membrane**
⑧ **Hot Air Welds**
⑨ **Sarnaplast** Sealant



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1:5 0mm 50 100 200 / 25 75 150 250

rev.	date	description	drn	chk'd
-	--/--/--	-	-	-

NOTES
Do not scale from this drawing, use figured dimensions only.
All dimensions to be checked on site.
All drawings to be read in conjunction with other contract documentation.
Any discrepancies to be reported to the Contract Administrator before any work commences.

client: SPROWSTON TOWN COUNCIL
project: FORMER VIKING PUB, TILLS ROAD, NORWICH, NR6 7QZ
dwg title: **FLAT ROOF UPSTAND DETAIL**

discipline	drawn	chk'd	date:	scale @ A3
BUILDING SURVEYING	BS	JM	16/10/2023	1:5

project no.	dwg no.	rev.	status.
JB62449	**DT01**		DESIGN

BIDWELLS
Trumpington Road
Cambridge CB2 9LD
t: 01223 841841
f: 01223 845150
bidwells.co.uk

① **Sarnavap Air Vapour Control Layer**

② Air Vapour Control Layer sealed with **Sarnavap Jointing Tape**

③ Mechanically fixed **Tanalised Timber Hard Edge**

④ Mechanically fixed **Galvanised Support Bracket**

⑤ **SarnaTherm** PIR Insulation [thickness as required to achieve target U-Value]

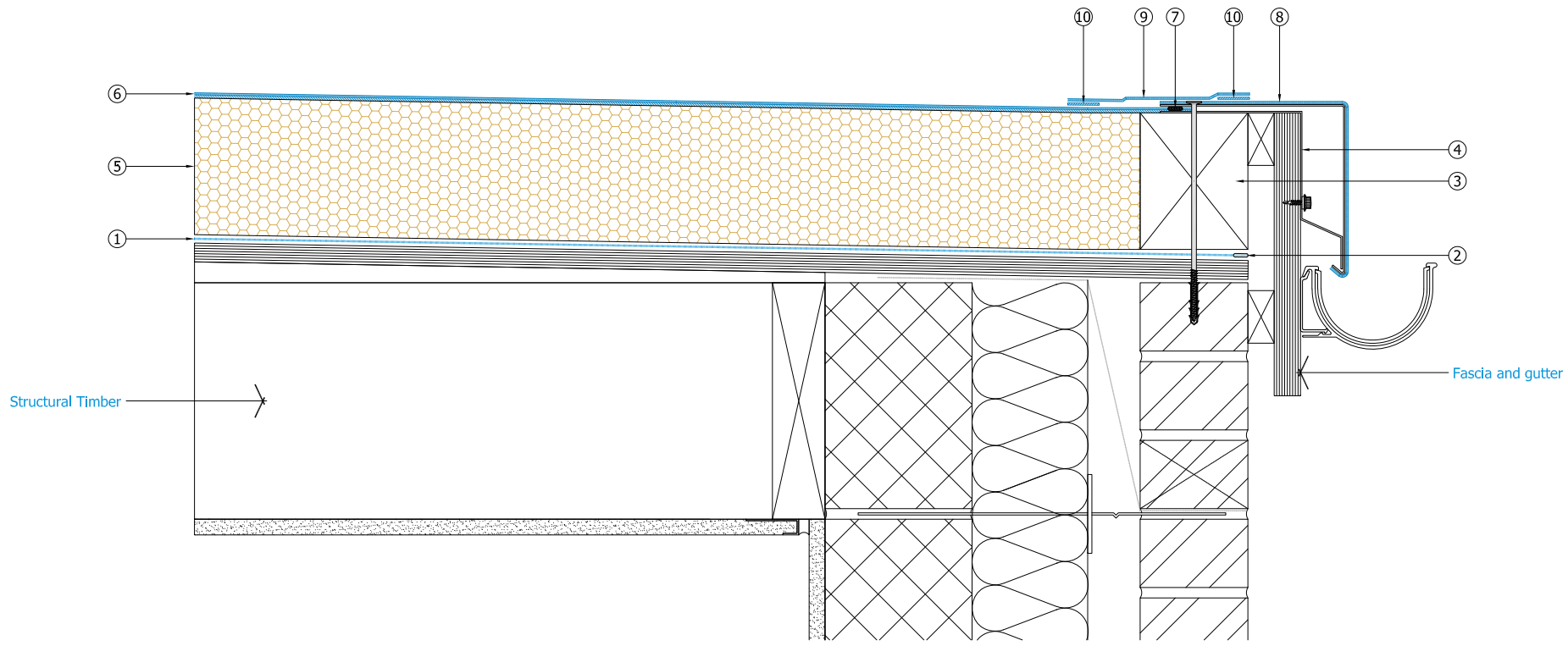
⑥ Fully adhered **Sarnafil Membrane**

⑦ Self adhesive **Foam Sealing Strip**

⑧ Mechanically fixed **Sarnametal Roof Trim**

⑨ **Sarnafil Membrane** coverstrip

⑩ **Hot Air Welds**



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1:5 0mm 50 100 200 / 25 75 150 250

rev.	date	description	drn	chk'd
-	–/–/–	-	-	-

NOTES

Do not scale from this drawing, use figured dimensions only.

All dimensions to be checked on site.

All drawings to be read in conjunction with other contract documentation.

Any discrepancies to be reported to the Contract Administrator before any work commences.

client: SPROWSTON TOWN COUNCIL

project: FORMER VIKING PUB, TILLS ROAD, NORWICH, NR6 7QZ

dwg title: **GUTTER DETAIL**

discipline	drawn	chk'd	date:	scale @ A3
BUILDING SURVEYING	BS	JM	16/10/2023	1:5

project no.	dwg no.	rev.	status.
JB62449	**DT02**		DESIGN

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bidwells.co.uk

① **Sarnavap Air Vapour Control Layer**

② Air Vapour Control Layer sealed with **Sarnavap Jointing Tape**

③ Mechanically fixed **Tanallsed TImber Hard Edge**

④ Mechanically fixed **Galvanised Support Bracket**

⑤ **SarnaTherm** PIR Insulation [thickness as required to achieve target U-Value]

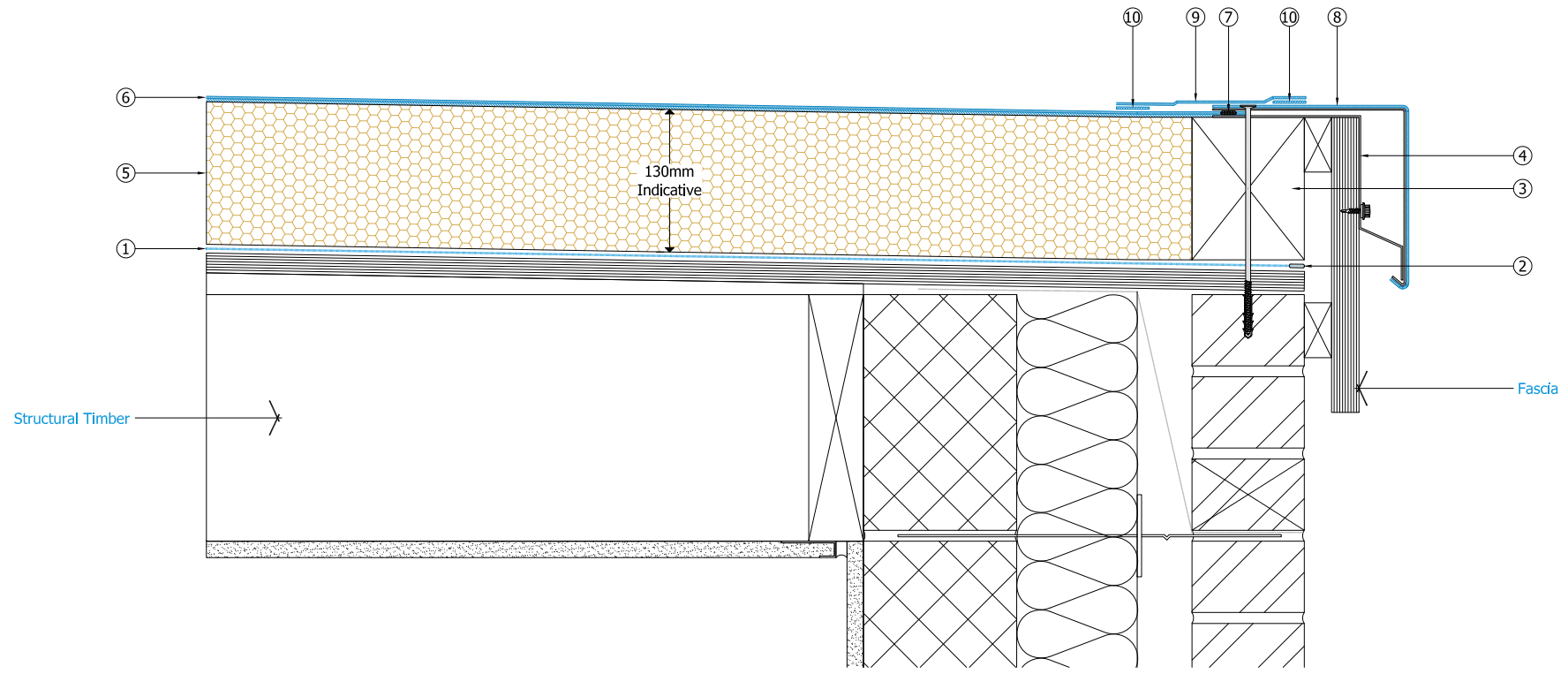
⑥ Fully adhered **Sarnafil Membrane**

⑦ Self adhesive **Foam Sealing Strip**

⑧ Mechanically fixed **Sarnametal Roof Trim**

⑨ **Sarnafil Membrane** coverstrip

⑩ **Hot Air Welds**



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1:5

0mm 50 100 200

25 75 150 250

rev.	date	description	drn	chk'd
-	--/--/--	-	-	-

NOTES

Do not scale from this drawing, use figured dimensions only.

All dimensions to be checked on site.

All drawings to be read in conjunction with other contract documentation.

Any discrepancies to be reported to the Contract Administrator before any work commences.

client: SPROWSTON TOWN COUNCIL

project: FORMER VIKING PUB, TILLS ROAD, NORWICH, NR6 7QZ

dwg title: **DRIP DETAIL**

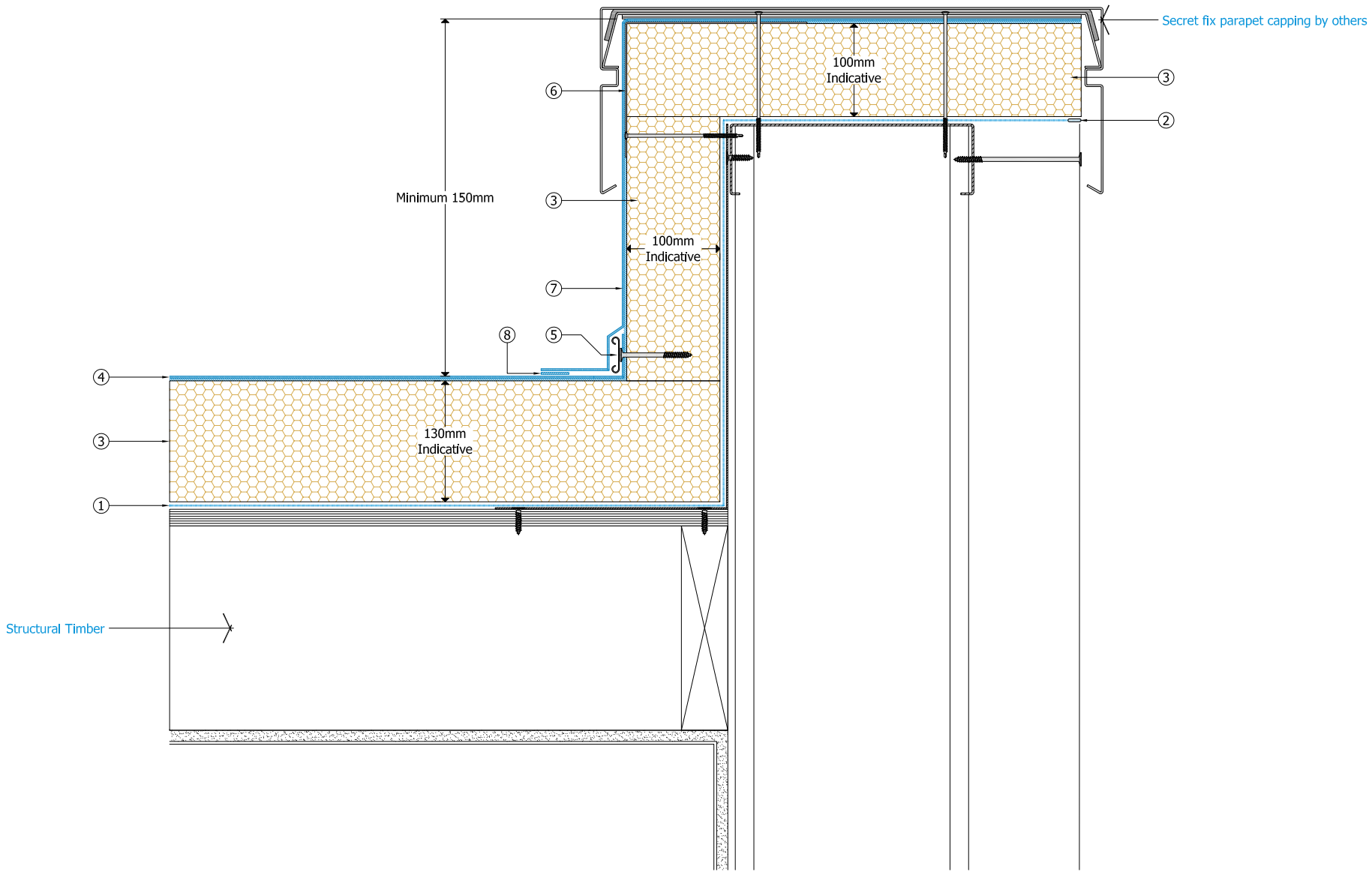
discipline	drawn	chk'd	date:	scale @ A3
BUILDING SURVEYING	BS	JM	16/10/2023	1:5

project no.	dwg no.	rev.	status.
JB62449	**DT03**		DESIGN

BIDWELLS

Trumpington Road
Cambridge CB2 9LD
t: 01223 841841
f: 01223 845150
bidwells.co.uk

① **Sarnavap Air Vapour Control Layer**
② Air Vapour Control Layer sealed with **Sarnavap Jointing Tape**
③ **SarnaTherm** PIR Insulation [thickness as required to achieve target U-Value]
④ Fully adhered **Sarnafil Membrane**
⑤ Mechanically fixed **Sarnafil Peel Stop**
⑥ Mechanically fixed **Galvanised Steel Hard Edge**
⑦ Fully adhered **Sarnafil Membrane**
⑧ **Hot Air Welds**



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1:5 0mm 50 100 200 / 25 75 150 250

rev.	date	description	drn	chk'd
-	–/–/–	-	-	-

NOTES
Do not scale from this drawing, use figured dimensions only.
All dimensions to be checked on site.
All drawings to be read in conjunction with other contract documentation.
Any discrepancies to be reported to the Contract Administrator before any work commences.

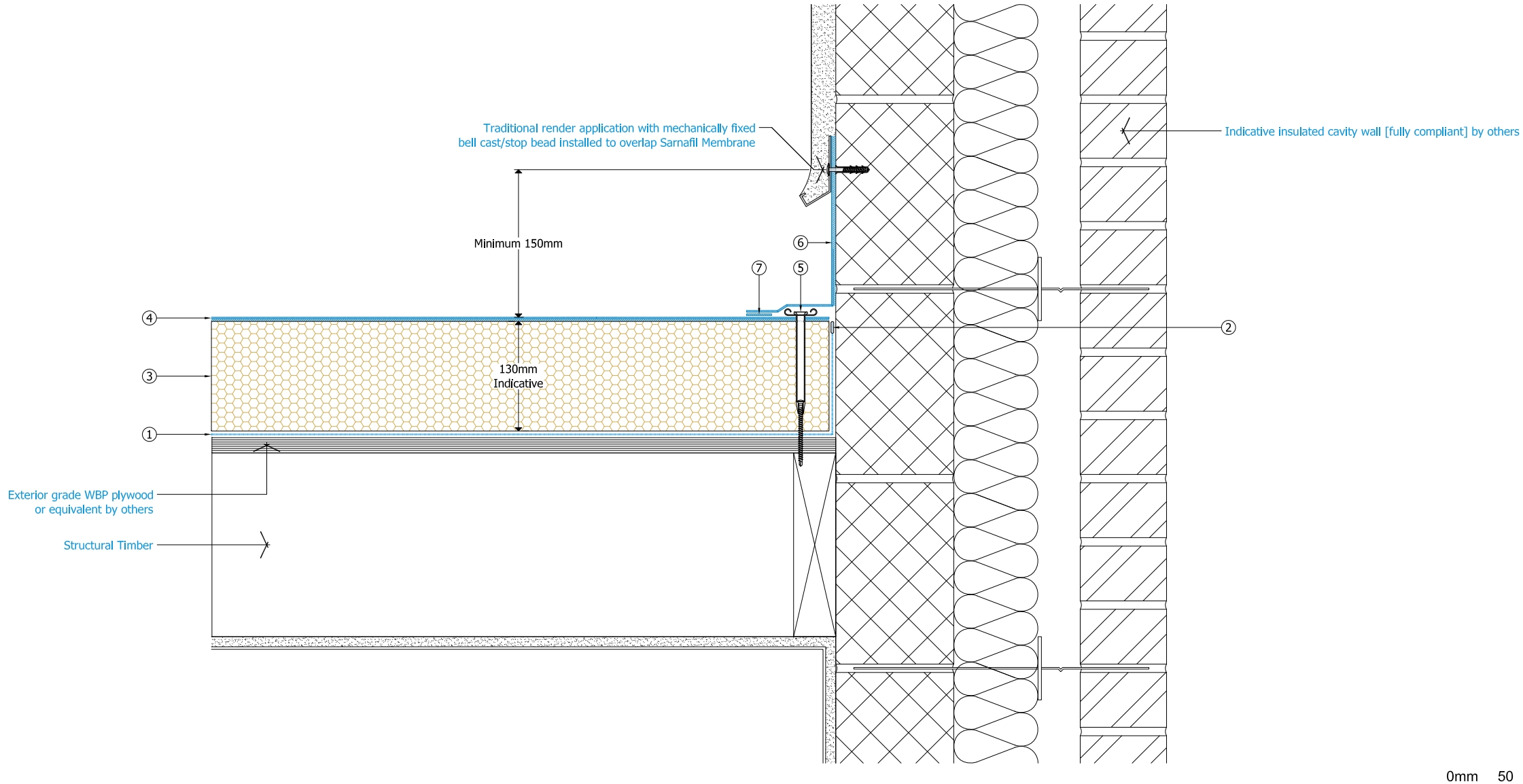
client: SPROWSTON TOWN COUNCIL
project: FORMER VIKING PUB, TILLS ROAD, NORWICH, NR6 7QZ
dwg title: **PARAPeT WALL DETAIL**

discipline	drawn	chk'd	date:	scale @ A3
BUILDING SURVEYING	BS	JM	16/10/2023	1:5

project no.	dwg no.	rev.	status.
JB62449	DT04		DESIGN

BIDWELLS
Trumpington Road
Cambridge CB2 9LD
t: 01223 841841
f: 01223 845150
bidwells.co.uk

① **Sarnavap Air Vapour Control Layer**
② Air Vapour Control Layer sealed with **Sarnavap Jointing Tape**
③ **SarnaTherm** PIR Insulation [thickness as required to achieve target U-Value]
④ Fully adhered **Sarnafil Membrane**
⑤ Mechanically fixed **Sarnafil Peel Stop**
⑥ Fully adhered **Sarnafil Membrane**
⑦ **Hot Air Welds**



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1:5 0mm 25 50 75 100 150 200 250

rev.	date	description	drn	chk'd
-	--/--/--	-	-	-

NOTES

Do not scale from this drawing, use figured dimensions only.
All dimensions to be checked on site.
All drawings to be read in conjunction with other contract documentation.
Any discrepancies to be reported to the Contract Administrator before any work commences.

client: SPROWSTON TOWN COUNCIL
project: FORMER VIKING PUB, TILLS ROAD, NORWICH, NR6 7QZ
dwg title: **RENDER DETAIL**

discipline	drawn	chk'd	date:	scale @ A3
BUILDING SURVEYING	BS	JM	16/10/2023	1:5

project no.	dwg no.	rev.	status.
JB62449	**DT05**		DESIGN

BIDWELLS
Trumpington Road
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bidwells.co.uk

APPENDIX 2
PRODUCT DATA SHEETS

552000

Tork Xpress® Multifold Hand Towel Dispenser

The Tork Xpress® Multifold Hand Towel Dispenser in Elevation Design is suitable for environments that demand both comfort and hygiene. This slim, attractive dispenser reduces consumption and waste with one-at-a-time dispensing. Tork Elevation dispensers have a functional, modern design, that makes a lasting impression on your guests.

- One-at-a-time dispensing for reduced consumption and increased hygiene
- Bundles can be topped up easily to avoid paper run-outs

Tork Xpress® Multifold Hand Towel Dispenser

Product & Delivery data

System	**Material**	**Length**
H2	Plastic	30.2 cm
Width	**Height**	**Colour**
10.2 cm	44.4 cm	White

Compatible products

120289
Tork Xpress® Soft Multifold Hand Towel

100289
Tork Xpress® Soft Multifold Hand Towel

100297
Tork Xpress® Extra Soft Multifold Hand Towel

130289
Tork Xpress Soft Multifold HT Adv 2p Z

130299
Tork Xpress® Soft Natural Multifold Hand Towel Advanced

471074
Tork Xpress Multifold Hand Towel Universal Zfold

Delivery data

	Consumer units (CON)	Transport Units (TRP)	pallet (PAL)
EAN	7322540349122	7322540349122	7322540748833
Packaging material	Carton	Carton	
Pieces	1	1 (1 CON)	60 (60 TRP)
Gross weight	1428 g	1.4 kg	85.68 kg
Height	458 mm	458 mm	1077 mm
Length	114 mm	314 mm	1200 mm
Width	314 mm	114 mm	1000 mm
Net weight	1205 g	1.2 kg	72.3 kg
Volume	16.4 dm3	16.4 dm3	0.98 m3

557500

Tork Twin Mid-Size Toilet Roll Dispenser

The Tork Twin Mid-size Toilet Roll Dispenser in Elevation Design is ideal for medium- to high-traffic washrooms with a high focus on guest satisfaction. It ensures high efficiency and that toilet paper is always available for guests by holding up to six times more paper than two conventional toilet rolls. Elevation dispensers have a functional and modern design, that makes a lasting impression on your guests.

- Automatic roll shift that makes it easy for guests to access the new roll
- Compact and space saving design that fits smaller washrooms
- Easy to refill: less maintenance
- High capacity: less maintenance and reduced risk of paper shortage
- Closed dispenser that keeps rolls protected for better hygiene

Tork Twin Mid-Size Toilet Roll Dispenser

Product & Delivery data

System
T6

Material
Plastic

Length
18.4 cm

Width
14 cm

Height
34.4 cm

Colour
White

Compatible products

127520
Tork Soft Mid-Size Toilet Roll Premium

127530
Tork Mid-Size Toilet Roll Advanced

127540
Tork Mid-Size Toilet Roll Universal - 1 Ply

Delivery data

	Consumer units (CON)	Transport Units (TRP)	pallet (PAL)
EAN	7322540382112	7322540366730	7322540749014
Packaging material	Carton	Carton	
Pieces	1	4 (4 CON)	108 (27 TRP)
Gross weight	1211 g	5.3 kg	141.83 kg
Height	358 mm	373 mm	1280 mm
Length	147 mm	391 mm	1200 mm
Width	191 mm	303 mm	1000 mm
Net weight	1006 g	4 kg	108.65 kg
Volume	10.05 dm3	44.19 dm3	1.19 m3

560000

Tork Liquid and Spray Soap Dispenser

The Tork skin care dispensers for soap and sanitisers are suitable for all kinds of washrooms - even in tough and demanding environments. The dispenser is available with an armlever for use in areas where extra hygiene is of critical importance. The system offers quick and easy refilling proven by Easy to Use certification by the Swedish Rheumatism Association

- For all: proven Easy to use design by third-party certificate* – promotes good hand hygiene for all users, including children and the elderly
- Certified effortless cleaning and intuitive refilling saves time
- Carbon neutral- reduced and compensated

For all: proven Easy to use design by third-party certificate* – promotes good hand hygiene for all users, including children and the elderly

**Certified by the Swedish Rheumatism Association, tested according to The Design for All Test, published in the Swedish Design Research Journal, 2011.*

Tork Liquid and Spray Soap Dispenser

Product & Delivery data

System
S11, S1

Material
Plastic

Length
11.2 cm

Width
11.4 cm

Height
29.6 cm

Colour
White

Compatible products

420810
Tork Hand Washing Liquid Soap

420710
Tork Antimicrobial Hand Washing Liquid Soap

420709
Tork Antimicrobial Hand Washing Liquid Soap

420401
Tork Oil & Grease Liquid Soap

420501
Tork Mildly Scented Liquid Soap

420701
Tork Sensitive Liquid Soap

Delivery data

	Consumer units (CON)	Transport Units (TRP)	pallet (PAL)
EAN	7322540355031	7322540355048	7322540749069
Packaging material	Carton	Carton	
Pieces	1	12 (12 CON)	264 (22 TRP)
Gross weight	513 g	6.6 kg	145.53 kg
Height	308 mm	626 mm	1413 mm
Length	118 mm	366 mm	1200 mm
Width	121 mm	256 mm	1000 mm
Net weight	382 g	4.6 kg	100.85 kg
Volume	4.4 dm3	58.65 dm3	1.29 m3

Altro Whiterock™ hygienic wall systems

Data sheet

Altro Whiterock Standard White

February 2023

Economical standard grade for general purpose use. Also suitable where sheet may come into contact with food.

Description

Extruded semi-rigid PVCu sheet.

Colour:	White
Surface finish:	Satin
Thickness:	2.5mm
Size:	2100 x 1220mm (W103/2100)
	2500 x 1220mm (W103)
	2750 x 1220mm (W103/2750)
	3000 x 1220mm (W104)
Weight:	3.6 kg/m^2
Maximum service temp:	60°C

Altro Whiterock W103/104 PVCu extruded sheet is supplied with a protective film on its face which can be left in place until the room is ready for use.

This also helps to protect the surface from dust while other trades are in the area. It is ideal for applications requiring a hygienic easy-to-clean, almost maintenance free wall finish, which conforms to UK and European hygiene requirements.

This is the most economical standard grade which can be used for the majority of installations.

Fixing

The sheets can be fixed directly to most dry substrates depending on its surface suitability, using one of the following methods:

1. AltroFix™ W139 fully bonded system
2. AltroFix™ W157 fully bonded system

Cutting

Cutting to be carried out using a fine tooth circular saw with TCT cutting blades and pressure guide, fine tooth blade jigsaw, a fine tooth handsaw, a high speed TCT router.

Jointing

- see relevant detailed drawings

1. A high impact extruded PVCu ‘H’ joint trim (available in two part or single part for use in secure units), incorporating a watertight seal at the mouth of the joint, which is unique to Altro.
2. Colour coordinated Altro Whiterock FlexiJoint™. (Not for use in secure units).
3. Hot welded joint colour coordinated w/rod.
4. Silicone sealant 3mm joint.
5. A powder coated aluminium “H” joint used for extra impact or heat resistance.

Internal / external corners

- see relevant detailed drawings, available on the Altro Website; www.altro.com

Altro Whiterock is normally thermoformed on-site, internal and external corners including window and door reveals are neatly clad, omitting the need for corner trims. However, profiles are available for these junctions if the need arises. Vulnerable external corners are usually over-clad with stainless steel corner protectors, to a height of 1200mm.

Cleaning

Regular cleaning using a soft cloth and a suitably diluted mild detergent is all that is normally required. Stubborn marks can be removed with Altro Cleaner A859 or nonabrasive domestic type cream bath cleaner.

Do not use abrasive pads or wire wool. Do not clean above 60°C. Cleaning cards are available on request.

Chemical resistance

Resistant to a wide range of chemicals, specific details on request.

Availability

Ex-stock.

Storage & conditioning (on-site)

Sheets should be stored flat, fully supported and left for 24 hours to attain the ambient room temperature prior to installation (min 14°C).

Limitations of use

Altro Whiterock has a maximum working temperature of 60°C. For temperatures above this use stainless steel. Stainless steel must be used for all open flame areas (available cut to size) must be extended to min 300 mm past heatsource. If a layout showing the position of equipment can be supplied, we will provide specific advice as to the best combination of materials to use.

Typical applications

- commercial kitchens
- laboratories
- pharmaceutical areas
- food manufacturing areas
- shower / toilet / changing room areas

Our Technical Services Department is available for advice on 01462 707600.

Technical data

Property	Standard	Value
Surface finish		Satin
Thickness		2.5 mm
Size		2100 mm x 1220 mm 2500 mm x 1220 mm 2750 mm x 1220 mm 3000 mm x 1220 mm
Weight		3600 g/m^2
Density	ISO 1183	1.44 g/cm^3
Maximum service temperature		60°C
Hardness (Shore D)	ISO 868	75
Fire resistance	EN 13501-1 BS 476 pt 6 BS 476 pt 7	B- s3, d0 Class 0 (when fixed to a non-combustible substrate) Class 1
Notched Impact resistance	ISO 179/1ea	11.8 KJ/m^2
Impact resistance	ISO 179/1eU	+20°C without breakage 0°C without breakage -20°C without breakage
Flexural strength	ISO 178	70-77 MPa
Tensile strength	ISO 527	52 MPa
E-modulus of elasticity	ISO 527	2880 MPa
Compressive strength	DIN 53421	68 N/mm^2
Vicat softening point VST/B	ISO 306	72-74°C
Expansion coefficient	DIN 53752	0.07 mm/mK
Heat distortion temperature	ISO 75-2	60 °C
Water Absorption	ISO 62	≤ 0.1%
Thermal Conductivity	EN 12524	0.17 W/mK
“U” value (bonded to 100mm block wall)	DIN 52612	1.8 W/m^2 °C
Moisture Vapour Transmission rate (MVTR)	ASTM E96	≤ 0.12g/m^2/24hrs
Water vapour resistivity	ASTM E96	3.82 x 10^{5}GN.S/Kg.m
Light reflectance values (LRV)	D65 artificial daylight	89

For further information or technical advice
tel: 01462 707600
email: enquiries@altro.com or www.altro.com

Altro Limited, Works Road, Letchworth Garden City, Hertfordshire SG6 1NW.

Issue No.3 Issue Date 13/02/2023

Fitting guide
Altro PVCu wall system

Altro Ltd, Works Road, Letchworth Garden City, Herts, England SG6 1NW.

01462 707600 enquiries@altro.com www.altro.co.uk

Issue No.1 Issue Date 02/03/2022

Altro wall system fitting guide

This fitting guide, whilst compiled to the best of our knowledge is for guidance only, and Altro cannot be held responsible for any faults which may occur. If in any doubt, contact the technical services department to answer any queries you may have. Tel: 01462 707600.

Altro Whiterock semi rigid extruded PVCu wall sheet can be used in hygienic environments and areas subject to wet usage. The walling system has excellent adhesion properties to all sound substrates used for internal wall construction. It is suitable for new and refurbishment building projects. A range of sheets are available in White, Satins, Decorative, High Gloss finish and the bespoke Altro Digiclad (Ciustom) range.

Altro Fortis Titanium semi rigid extruded PVCu wall sheet can be used in busy public areas subject to impact and scuff damage. The walling system has excellent adhesion properties to all sound substrates used for internal wall construction. It is suitable for new and refurbishment building projects.

The walling systems incorporate a range of colour coordinated jointing systems, including two part joint trims, flexi joint, welded and single part trims for use in secure environments.

AltroFix adhesives are supplied to fix all types of sheet.

Altro sanitary sealant are food-safe and available in co-ordinating colours.

Altro wall products:

Altro Whiterock Digiclad (Custom) - Custom print option utilising UV cured inks onto an Altro Whiterock sheet from a design or photographic image.

Altro Whiterock Whiteboard - Wall mounted note board to capture non-permanent ideas. Dry wipe clean for repeated use.

Altro Whiterock Imagination Wall - 2.5mm thick PVCu panels with preprinted designs for colouring in by children.

Altro Whiterock wall designs - Altro Whiterock wall sheet in a range of natural wood, metal, stone and linen designs

Altro Whiterock Satins - 2.5mm PVCu sheet in a colourful, satin finish.

Altro Whiterock Chameleon - High gloss 2.5mm PVCu sheet for high-end public areas, durable and hygienic.

Altro Whiterock hand wash stations - A choice of four convenient pre-fabricated modular hand wash units clad with Altro Whiterock products.

Altro Whiterock recessed shelf - An integrated shower shelf insert to match Altro Whiterock wall sheets.

Altro Tegulis - Tile-effect wall panels with innovative etched grout lines.

Altro Fortis Titanium - 2.5mm PVCu textured sheet providing durable protection for walls, doors and corners.

Altro Fortis corner protection - Ready-made piece for added protection along the wall's vulnerable corner.

Altro Walls ShowerKit - A pre-packaged Altro Whiterock wall cladding system for shower, bath and ensuites.

Altro Whiterock White - Impact-resistant, impermeable, grout-free, easy maintenance 2.5mm PVCu sheet which is a hygienic alternative to ceramic tiles.

Altro Whiterock Splashbacks - Pre-cut or custom-sized hygienic alternative to tiles made from Altro Whiterock Satins or Altro Whiterock Chameleon sheets.

Altro Whiterock Hygienic doorsets - Fully encapsulated hygienic integrated doorset made with Altro Whiterock PVCu sheet.

Altro Fortis doorsets - Fully encapsulated integrated doorset made with Altro Fortis Titanium sheet.

Description

Sheets are 2.5mm thick and are available in 2500mm or 3000mm height x 1220mm width for Altro Whiterock and in 3000mm length x 1220mm height for Altro Fortis Titanium. Altro Whiterock Digiclad (Custom) sheets are trimmed prior to preparation of pattern application.

The sheets are supplied with a protective film on the face which can be left in place until the area is ready for use. This also helps protect the new surface from dust while other trades are working in the area.

Altro PVCu wall sheets have a maximum service temperature of 60ºC.

Although the sheets can be applied in most areas, they should never be installed near to a direct heat source (cookers, oven ranges, wall mounted griddles etc) where naked flame or severe heat would cause distortion or damage to the surface. It is recommended that sheets are installed at least 30 cm from a heat source.

For these situations, Altro recommends using stainless steel sheets.

Please ensure you follow the installation guidelines carefully to ensure best results.

Surface preparation

All surfaces must be smooth, sound, dry and free of contamination. If necessary, the walls should be cleaned down prior to the Altro wall sheet installation, and primed using 10 parts water to 1 part PVA. - do not use AltroFix W165.

The working environment must also be clean and dust free. Failure to comply with these conditions will reduce the bond strength between adhesive and substrate, and may cause the sheets to de-bond.

- All substrates to be dry to 16% WME (Wood Moisture Equivalent) on Protimeter 'Surveymaster' equipment.
- All loose flaking paint and dust to be removed.
- Friable surfaces to be removed or made sound using proprietary surface treatment as advised by Altro.
- All surfaces to be free from grease. Ceramic tiles must be securely bonded to the substrate, thoroughly cleaned and degreased using a suitable degreasing agent and scouring pad, fully rinsed with clean water and allowed to dry. Abrade the surface with a diamond abrasive disc to scratch through the tile glaze and remove all dust. Tiles should be rinsed for a second time and allowed to dry. Use a grinder or sanding equipment fitted with a captive dust bag or vacuum.
- Loose tiles to be removed and the area made good using Ardurapide 45 rapid repair mortar, sand and cement with Unibond mix (if drying time permits), Hardwall gypsum render coat or a comparable thickness plywood infill.
- Depressions in the substrate should be filled with Ardurapide 45 rapid repair mortar, sand and cement with Unibond mix, or Hardwall gypsum render coat if drying time permits.
- All electrical switches, power points etc should be in a first fix state where possible. All electrical equipment should only be moved or altered by a qualified electrician.
- If possible, plumbing and pipework should be removed to be at first fix state and "tails" left protruding from the substrate. Sheets can then be drilled and slid over the pipe "tails". All holes should be drilled 3mm oversize to allow for expansion. Plumbing should always be carried out by a qualified plumber.
- Hot pipes and steam pipes should be insulated and a 3-5mm expansion gap should be created when installing sheets around these pipes.
- All pipes, screw fixings, bolts etc: fixed through the sheet should have minimum 3mm expansion gaps and be sealed using Altro sanitary sealant.

AltroFix W139

The sheets can be fixed directly to most sound and dry substrates with AltroFix W139, two-part polyurethane adhesive.

The adhesive is available in two tub sizes:-

- 6.5kg unit (ref: A814/25) for 2500mm sheets
- 8.0kg unit (ref: A814/30) for 3000mm sheets

Part A is a viscous cream coloured paste supplied in a plastic tub. Part B is a catalyst (hardener) supplied in a foil bag (separated within the tub).

Pour the liquid contents of the foil bag (Part B) into the plastic container holding Part A and mix thoroughly for approximately 2-3 minutes until a uniform consistency is obtained throughout.

A low speed electric drill with mixing paddle attachment should be used to ensure complete mixing.

Once mixed, the adhesive should be applied to the (pre-cleaned) back of the sheet with a 5mm x 5mm square notched trowel.

Health and Safety Advice

Before using this adhesive, users must refer to the SDS (Safety Data Sheet) for correct safety advice and carry out a COSHH (Control of Substances Hazardous to Health) assessment and risk assessment.

Always wear appropriate PPE (Personal Protective Equipment) and RPE (Respiratory Protective Equipment) when handling adhesives and ensure the area is adequately ventilated.

In the case of contact with eyes or skin, rinse immediately with plenty of water and seek medical advice.

Product for professional use

As from 24 August 2023 adequate training is required before industrial or professional use.

Please ensure you follow the installation guidelines carefully to ensure best results.

AltroFix W157

The sheets can be fixed to most smooth, sound, dry and porous substrates with AltroFix W157 single part Acrylic water based synthetic polymer emulsion adhesive.

The adhesive is available in three tub sizes:

- 3kg unit (ref: A818/03) for 2500mm sheets
- 4kg unit (ref: A818/04) for 3000mm sheets
- 12kg unit (ref: A818/12) for 2500mm / 3000mm sheets

A low speed electric drill with mixing paddle attachment should be used to ensure the adhesive has a smooth creamy consistency for easier troweling.

Once mixed, the adhesive should be applied to the (pre-cleaned) back of the sheet with a 3mm x 3mm square notched trowel.

Note: AltroFix W157 is not suitable for fixing to non-porous substrates or for use in wet environments such as showers and wet rooms.

Health and Safety Advice

Before using this adhesive, users must refer to the SDS (Safety Data Sheet) for correct safety advice and carry out a COSHH (Control of Substances Hazardous to Health) assessment add and risk assessment.

Always wear appropriate PPE (Personal Protective Equipment) and RPE (Respiratory Protective Equipment) when handling adhesives and ensure the area is adequately ventilated.

In the case of contact with eyes or skin, rinse immediately with plenty of water and seek medical advice.

Please ensure you follow the installation guidelines carefully to ensure best results.

Suitable fixing methods

Substrate	AltroFix W139	AltroFix W157
Gypsum Board 12.5mm (e)	✳	✳
Minimum 9mm WBP Plywood*	✳	✳
Metal	✳	
Ceramic Tiles (a)	✳	
Plaster (b)	✳	✳
Cement Render (b)	✳	✳
Brickwork (b & c)	✳	
Blockwork (b & c)	✳	
Painted (d)	✳	

(a) = Provided tiles are firmly bonded to the substrate and free from surface contamination, grease etc:

(b) = Surface should be dry. If in doubt test with a Protimeter, which should give a maximum reading of 16% wood moisture equivalent (WME). Plastered surfaces must be sealed with diluted PVA (or similar) before installation of the Altro wall sheet.

(c) = Brickwork and Blockwork should be of good quality and joints should be flush and dry.

(d) = A bond test is advisable to check adhesive does not react with paint.

(e) = AltroFix W157 should not be used for bonding to moisture resistant substrates

* = Plywood must comply to EN 13986: 2004
BS EN 636: 2003
BS EN 315
BS EN 314-2
Glue bond quality class 3 ‘s’ grade

Please ensure you follow the installation guidelines carefully to ensure best results.

Suitable substrates

- Good quality fair-faced brick or blockwork with well aligned joints all bagged up flush and all cement snots removed. They must be straight to within 3mm over 2 metres and brick / blocks flush with those adjacent. Not a suitable substrate for welding, please contact Altro for advice.
- Sand and cement rendering 1:3 mix with a steel trowelled finish.
- 12.5mm thick plasterboard.
- Minimum 9mm see specification details resin bonded plywood.
- Minimum 9mm MDF dense wood based sheets.
- Ceramic tiles which must be securely bonded to the substrate, thoroughly cleaned and degreased using a suitable degreasing agent and scouring pad, fully rinsed with clean water and allowed to dry. Abrade the surface with a diamond abrasive disc to scratch through the tile glaze and remove all dust. Tiles should be rinsed for a second time and allowed to dry. Use a grinder or sanding equipment fitted with a captive dust bag or vacuum.
- Most sound painted surfaces (an adhesive test is advisable to ascertain suitability).
- New pink finishing plasters. These surfaces are generally dusty. They should be brushed and thoroughly sealed with diluted PVA primer (1:10), or Altro Consolidating Primer dry to 16% WME.

Installation temperatures

Altro recommends the PVCu wall sheets are installed at approximately the same ambient ‘service temperature’ at which the area will be used when commissioned.

A minimum temperature of 14ºC/57ºF is recommended for all installation areas.

AltroFix adhesive must never be used below +5ºC.

Sheets should stored flat and be pre-conditioned for up to 24 hours to attain the ambient room temperature prior to the installation.

The sheets must be stored on a level flat surface off the ground (risk of condensation on the sheets if stored on damp surfaces).

Storage on un-even surfaces could cause the sheets to distort prior to installation.

Tools and equipment

In general, the main tools required are similar to carpentry hand tools. Below is a list of tools that you may find an advantage to have for the installation.

- 1 metre & 2 metre spirit levels
- stanley knife
- square
- chalk line
- laser level
- adjustable block plane
- 5m tape measure
- hammer
- carpenters bevel
- cold chisel
- rubber mallet
- carpenters 19/25mm wood chisels
- screwdrivers
- files (round & square)
- hole cutters
- hacksaw
- sharpening stone
- Scrapers
- metal snips
- 50mm paint brush
- good quality mastic gun
- mixing paddle
- 5mm x 5mm square notch steel trowel
- biro pens and pencils
- water based markers
- hand roller
- 3000mm rigid straight edge
- electric Jigsaw (with ‘fine tooth’ cutting blades)
- plunge saw with T.C.T blade and pressure guide for cutting
- 750 watt electric drill (for mixing adhesive)
- if required (on site) - 110 transformer (including 110v leads)

Ensure all electrical equipment is PAT tested.

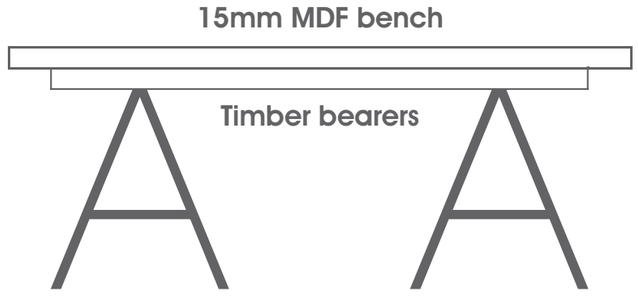
Please ensure you follow the installation guidelines carefully to ensure best results.

Safety equipment:

- barrier cream
- goggles / safety glasses
- protective gloves
- face mask (nose / mouth protection)
- hard hat
- safety boots
- hi-viz safety vest

Other essential equipment:

You will also need a 2.5 x 1.22m workbench made from 15mm MDF board (or similar), with support bearers to prevent the MDF from bowing in the middle. The bench provides an excellent work surface for the sheets which are 1.220m x 3.000m.



A-frame trestles

Safety information

Apart from the normal health and safety rules employed within the construction industry, the following points should be noted:-

- Safety information displayed on the tubs and containers supplied by Altro must be strictly adhered to.
- Safety eye wear must be worn during cutting of materials, mixing of adhesive, cleaning and preparation of site, and where necessary to adhere to site regulations.
- Use face masks
- Display prominent safety signs when using hazardous materials, and to warn of a working area.
- Ensure good ventilation within the work area.
- Remove and dispose of all waste sensibly and carefully as per site instructions. Contact Altro on 01462 707600 for all MSDS (Material Safety Data Sheets).
- Apply barrier creams, and wear protective gloves when mixing and applying AltroFix adhesives.
- Keep the working area clean and tidy.

Before starting work, users must refer to the relevant MSDS (Material Safety Data Sheet) for correct safety advice and carry out COSHH (Control of Substances Hazardous to Health) assessments where necessary. Contact Altro on 01462 707600 for further advice.

Workstation

Set up a ‘workstation’ in close proximity to the area to be clad. A minimum area of 4m x 3m will be required to set up your work bench area.

Adjacent to the workstation, set up a ‘glue-station’, where all the mixing of adhesive takes place. The floor area in this location needs to be protected with cardboard (or similar) to prevent splashes of adhesive getting onto the floor.

If an existing or new floor has been laid prior to the installation of the wall sheets, it is essential to protect the floor around the work bench and the ‘glue-station’ where adhesive may get spilt.

The ‘glue-station’ is also where the trowels and mixing paddles are cleaned regularly to prevent a build up of excessive adhesive on the tools.

Please note: If the adhesive gets on the floor and is allowed to set, removal can be difficult, if not impossible. Therefore if a spillage or splashes occur, they should be wiped up immediately.

Setting out

- Firstly, check out the room which is to be clad, paying particular attention to the corners, window reveals, and door entrances. These need to be inspected to ensure they are straight, and free of any building waste which could prevent the sheets laying flat to the substrate after the adhesive has been applied and the sheet is installed.
- The wall surface must be clean prior to installation (if necessary, contact Altro Technical for specific recommendations on cleaning and preparation).
- Once preparation has been completed a datum line must be installed. The datum line is used for the calculation of measurements to ceiling height, sockets and pipes etc: and to ensure the sheets are ‘plum’ as the installation proceeds.
- The datum line should be installed at approximately ‘eye level’ on the wall and should be done with a laser for accuracy.
- The datum line height (from subfloor) should be calculated to allow for the appropriate skirting height where the bottom of the PVCu sheet meets the specific floor finish (sheet pvc flooring, quarry tiles, pvc sit-on skirting etc). **Note:** Quarry tile coving must always be installed before the wall sheet is fitted.
- A series of ‘check measurements’ should be taken around the room from datum to subfloor to ascertain the ‘average’ height of the datum line.
- The datum height (minus the appropriate floor skirting height) will eventually be transferred on to the face of the PVCu wall sheet. This will enable all subsequent measurements to be processed from the datum line on the sheet.
- Once all measurements have been taken from the wall, they can then be transferred on to the sheet. When the sheet is eventually fitted to the wall, the datum line on the sheet must line up with the datum line on the wall.
- After installing the datum line and calculating the average height, you must then plan the ‘layout’ of the PVCu sheets. This ensures the best layout of the sheets and minimises the number of joints used in the system.
- If hidden transition detail to be used apply to substrate prior to application of sheets.

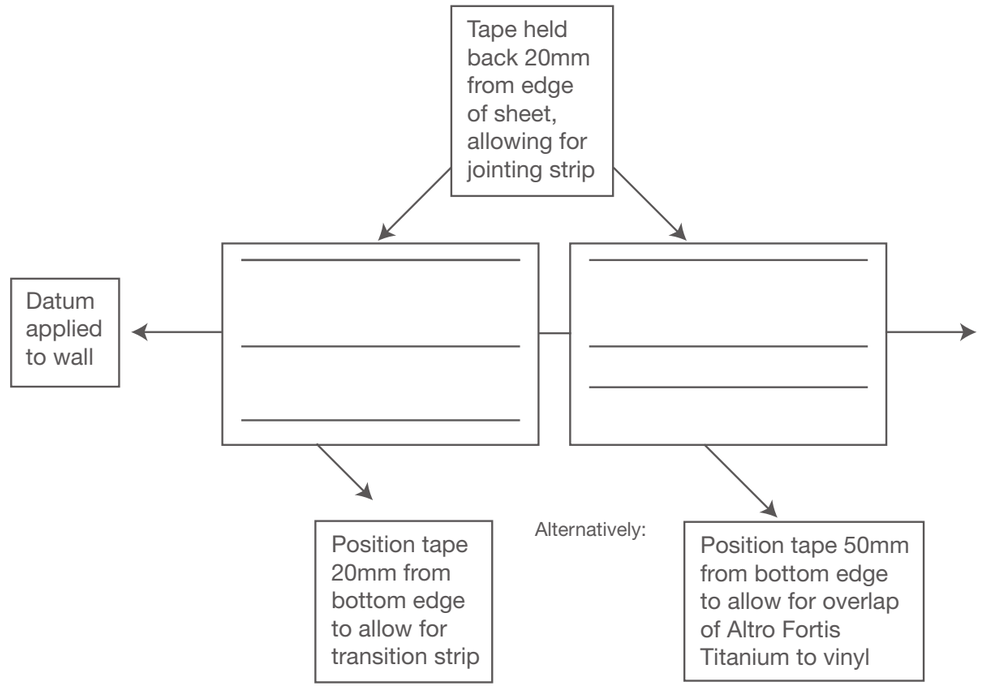
Please ensure you follow the installation guidelines carefully to ensure best results.

Altro double sided tape primer application (REF: W165)

- Prior to the installation of Altro wall sheets, Altro W165 ‘tape primer’ should be applied in three locations to the substrate with a 50mm paint brush. The primer ‘lines’ should correspond to the double sided tapes which will subsequently be fitted on the reverse side of the sheet - at the top, the middle (normally just below datum height) and at the bottom of the sheet. The double sided tapes hold the sheet firmly to the substrate whilst the AltroFix adhesive cures. Allow the ‘tape primer’ to dry to a tacky finish, (approximately 10 minutes). **Note:** The tape primer remains permanently tacky and never dries out totally.
- Before priming, the type of floor finish must be taken into account. With a sheet vinyl floor finish incorporating a self-coved skirting, the ‘tape primer’ (and subsequent double sided tape) must be applied high enough (i.e. min 20mm) to allow for a PVCu ‘transition strip’ to be fitted at the bottom of the sheet*. In the case of the sheet overlapping a sheet vinyl floor skirting (such as shower areas) where the vinyl has been installed first, a minimum height of 50mm from the bottom of the sheet is required. See diagram showing the double sided tape layout on the back of the sheet.
- When using two-part (snap-on) internal / external corner profiles, prime the wall corners with Altro W165 ‘tape primer’ sufficiently enough to cover the area that the corners are to be installed. This should be done at the same time as the priming out for the double sided tape, allowing primer to dry to provide a tacky surface.
- When the walls are ready for application, double sided tape should be applied to the back of the PVCu corners in four strips of approximately 150mm long down the corner length. Remove the protective cover from the tape and apply the corner to the substrate.
- If a PVCu ‘transition strip’ is to be fitted (at a later stage) to the bottom of the sheet (where wall sheets meet the sheet vinyl floor skirting), the corner profile ‘back section’ must be fitted 20mm shorter than the overall length.
- **Never use AltroFix W165 as a full cover primer.**

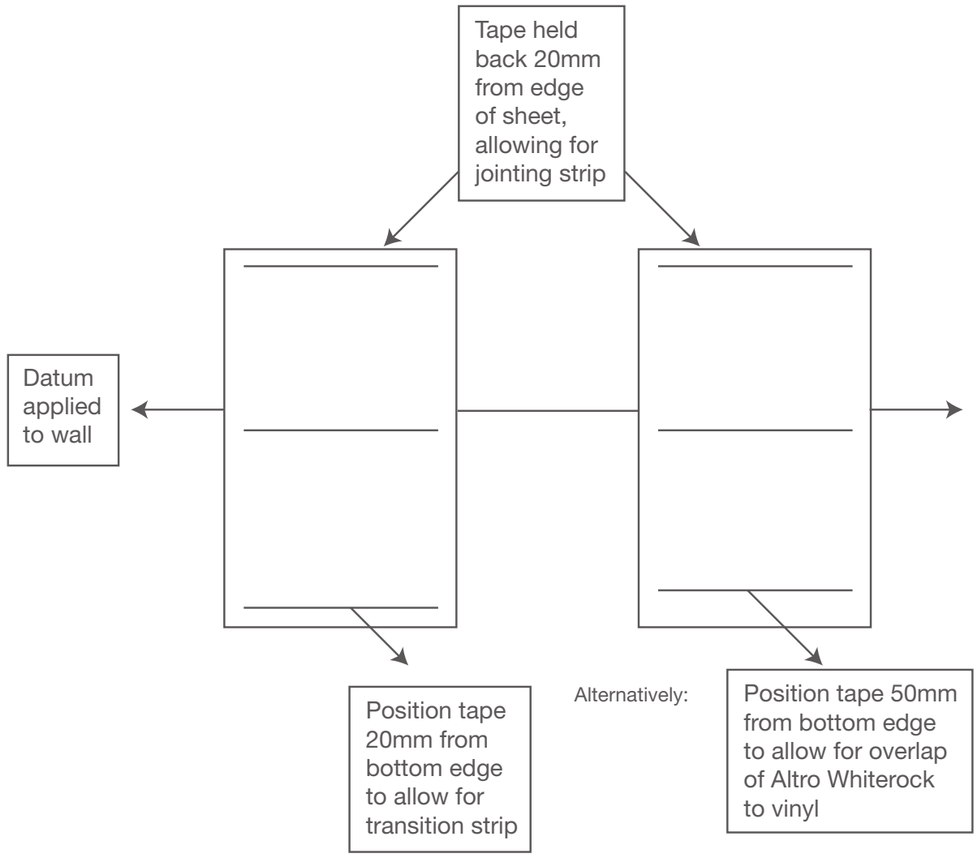
* Note: The transition trim A832 should never be used in wet areas such as showers and wet room adaptations.

Altro double sided tape positioning (REF: A815) - Altro Fortis Titanium



Please ensure you follow the installation guidelines carefully to ensure best results.

Altro double sided tape positioning (REF: A815) - Altro Whiterock



Installation procedure

Once all preparation has been carried out, walls are cleaned and free from dust, any possible contamination from grease (in kitchen and shower areas) has been removed, the datum line and 'tape primer' (Altro W165) have been applied, you are now ready to install the Altro PVCu wall sheets.

- Place sheet on the workbench and inspect for any damage. Carefully, on the front face (with the protective film), mark your datum with a biro pen, taking care not to press too hard, thus damaging the surface of the sheet.
- Take measurements from the wall, and then transfer these to the sheet. Cut the sheet making sure the sheet is well supported to reduce any risk of stress in the material when being cut.
- After the final cutting, plane the edges with your adjustable block plane to remove burrs and to leave a clean smooth finish.
- Offer the sheet to the substrate to check your work (dry fitting), ensuring you have a 2-3mm expansion joint at all abutments and pipe work.
- When the sheet has finally been made to suit the required wall finish detail, lay this face-down on the workbench and clean the back of the sheet.
- Apply double sided tapes at the top, middle and bottom of the sheet - to correspond with the Altro W165 primer (DO NOT remove the tapes' protective paper at this time).

Applying AltroFix adhesive

- Wear appropriate safety equipment before handling materials.
- For two-part Altrofix adhesives carefully mix parts A and B together using a large mixing drill and paddle for a minimum of 3 minutes, until an even colour is acquired.
  Note: Adhesive must be mechanically mixed.
- Apply the adhesive to the back of the sheet, using the recommended 5mm x 5mm notched trowel. The adhesive should be applied approximately 15mm from the edge of the sheet (where joint strips are to be fitted), and right up to the double sided tapes.
- The working time of AltroFix W139 adhesive is approximately 40 minutes depending on the ambient temperature of the room.
- The trowel must be held so that the adhesive is applied to an even finish, and the trowel notches are replicated to the same depth over the sheet.

Health and Safety Advice

Before using this adhesive, users must refer to the SDS (Safety Data Sheet) for correct safety advice and carry out a COSHH (Control of Substances Hazardous to Health) assessment and risk assessment.

Always wear appropriate PPE (Personal Protective Equipment) and RPE (Respiratory Protective Equipment) when handling adhesives and ensure the area is adequately ventilated.

In the case of contact with eyes or skin, rinse immediately with plenty of water and seek medical advice.

Please ensure you follow the installation guidelines carefully to ensure best results.

Fitting the Altro wall sheets

Altro Whiterock (REF: W103/104, W136/137, W140/141, W160/161), WDS25 and WDS30.
Altro Fortis Titanium (REF: FT/XXX).

- After applying the adhesive, carefully remove the double sided tape ‘protective film’ and place into a rubbish container. Lift the sheet and install to the required location, ensuring the datum line on the sheet corresponds to the datum line on the wall.
- Once fitted to the substrate, apply pressure to the whole of the sheet face to ensure the adhesive has been transferred and will be fully bonded to the substrate (this is normally done with a hand roller or block of timber covered with a material to prevent the surface being damaged).
- Failure to ensure a good transfer of adhesive to the substrate could result in the sheet debonding.
- Ensure any adhesive residue is thoroughly cleaned off the surface of the sheet or joint trims (and other adjacent surfaces). This must be done immediately, before the adhesive sets.
  Note: Altro Fortis Titanium should be installed with all of the sheets in the same orientation. There is an arrow printed on the protective foil to aid with alignment.

Fitting two part PVCu joint trims (REF: A831)

- Once the sheet is in position, the ‘back’ section of the two-part PVCu vertical joint strip should be fitted. This should be slid behind the leading edge of the sheet until it is approximately 3mm from the central spine.
- If a PVCu ‘transition strip’ is to be used to create a joint between the sheet and the sheet vinyl floor finish, the back part of the vertical strip should be cut back (by 20mm) to allow the horizontal transition strip to be fitted at the base of the sheet (at a later stage). To find the correct length of the vertical section required, use a small piece of transition strip (as a template) and fit this to the bottom of the sheet.
- When fitting the next sheet, ensure the datum lines are aligned correctly and then position the sheet on top of the back section of the PVCu joint strip, approximately 3mm from the central spine.
- A 2-3 mm gap either side of the central spine will allow the sheets adequate room to expand and contract underneath the ‘front’ face of the two-part (snap-on) cover trim.
- Carry out this procedure throughout the installation and then finish by installing the ‘front’ face of the two-part (snap-on) cover trim, cut to the appropriate length. **Note:** the ‘front’ face cover trims can be installed as the work proceeds, or left until all sheets have been installed.
- The ‘front’ face joint strip covers should initially be positioned by hand pressure. They can then be fully located by tapping with a rubber mallet or small hammer and wooden block.

Fitting single part PVCU joint trims (REF: G831)

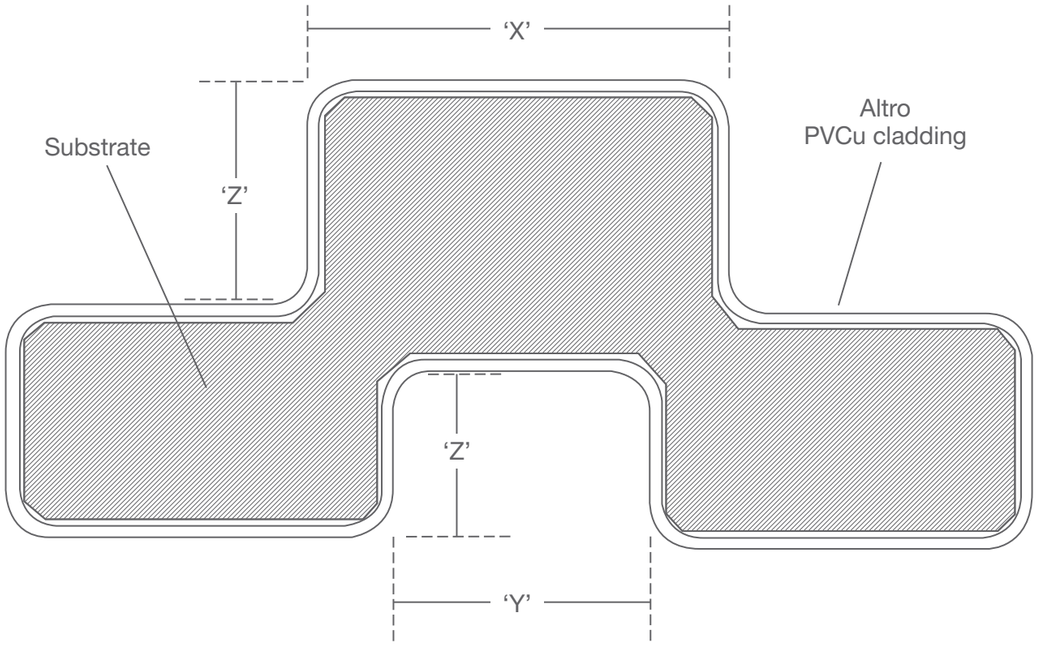
- The process of the single part joint strip is much the same as the two-part trim except, during the preparation of the sheet a small chamfer will need to be applied to the edges of the sheet. This will enable the single part joint strip to be fitted more easily to the sheet. The joint trim has a moisture resistant gasket seal on the inner edges which could be damaged if forced onto the sheet.
- Once the first sheet has been installed, the single part joint strip is fitted onto the ‘leading’ edge which meets the next sheet. After the next sheet has been prepared and adhesive applied, a bead of Altro sanitary sealant should be applied alongside the joint strip prior to that subsequent sheet being installed. The joint strip must then be knocked over the second sheet edge to achieve a sealed joint detail. By applying Altro sanitary sealant to the back edge of the joint strip, it prevents the strip being moved at a later stage and the sheet edge becoming visible and open.

Please ensure you follow the installation guidelines carefully to ensure best results.

Thermoformed corner detail

Altro recommends, wherever possible, to use a thermoformed internal / external corner detail when installing the sheets. This is achieved by heating the sheet on a thermoformer unit and manually forming the sheet to the desired angle.

Altro wall sheets thermoformed corners



'X' - External to External corners = + 8mm
'Y' - Internal to Internal corners = –8mm
'Z' - Internal to External / or External to Internal corners - Is the same measurement as substrate
All measurements to be marked on 'face' of PVCu sheets and taken from outside of previous corner

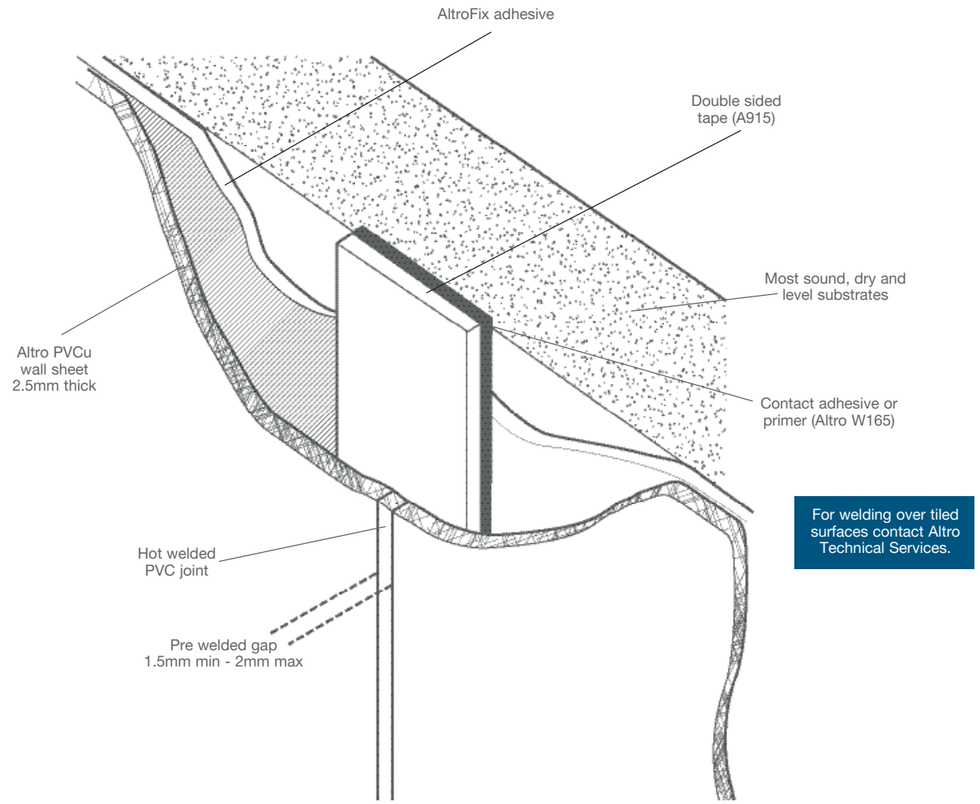
Please ensure you follow the installation guidelines carefully to ensure best results.

Welded Joints

Substrates - when installing Altro PVCu sheets with welded joints, it is imperative the substrate is to a very high standard. Surfaces should be true and level to + or – 2mm over a 3m straight edge. Recommended substrates include plasterboard, plywood*, finishing plaster and most types of sand & cement render. We recommend all plastered surfaces are sealed with Unibond PVA sealer (or similar) diluted 1:10 parts water before fitting sheets.

Planning layout - when planning the layout of the sheets it is important to minimise the number of joints in the walling system. Ensure joints do not fall too close to corners.
We suggest joints should not be formed any closer than 300mm from a corner. This will avoid any possible risk of mis-alignment between the joint when the next sheet is fitted.

Preparing the joint - Before installing the sheets, you must fit the white 'Foam Double Side Tape" (A915) to the substrate at the centre point where the two sheets meet. The double side tape is impregnated with a 'contact adhesive'. Therefore, all substrates must be primed before fitting the tapes. The primer is only required where the 50mm wide tapes are to be fitted.



For welding over tiled surfaces contact Altro Technical Services.

Please ensure you follow the installation guidelines carefully to ensure best results.

Sheet preparation - ensure all sheet edges (where joints are to be formed) are clean, smooth, true and level.

Always inspect new sheet edges are undamaged or scored. If necessary, cut and plane to a square edge.

Check there are no ‘fines’ left on the edge of the sheet. These ‘fines’ could burn when hot welding the joint and will leave a blemish which can not be removed from the joint.

When preparing the fitting of the sheet, always ensure there is an adequate gap (2-3mm) between the sheet and any rigid abutments (ceiling, windows, doors, services etc) to allow for expansion.

These ‘isolation’ joints must be sealed with Altro sanitary sealant.

Application methods - after priming and fitting the Foam Double Side tapes, leave the protective top film in place (this will be removed at a later stage).

Once the sheets have been prepared and dry fitted to check everything is correct, apply the adhesive to the back of the sheet in the normal way. Mark a line 25mm in from the sheet edge and apply the adhesive to this point, this ensures full coverage up to the tape applied to the substrate. Failure to apply the adhesive to meet the tape may lead to excessive sheet movement once installed.

Install the sheet in the normal way, ensuring the sheet is temporarily supported on timber blocks (or similar) to prevent slipping.

Check the sheet is aligned with the datum line before rolling the sheet to achieve a transfer of the adhesive to the substrate. When rolling the sheet, start in the middle and work outwards. At this stage do not roll right to the edge where double side tape is located.

Once the sheet has been rolled (almost to the edge), carefully cut down the edge of the sheet where the tape is located, to cut through the protective top film.

Carefully ease out the edge of the sheet to facilitate the removal of that half of the protective top film. Once this has been removed, press the sheets firmly onto the tape to achieve a full bond.

Finally, complete the full rolling of the sheet right up to the edge to ensure good transfer of the adhesive.

Make sure the exposed edge of the sheet is clean and free of any adhesive residue.
If necessary, clean thoroughly before the adhesive cures.

Prepare the next sheet in the same way as described above. Before fitting this sheet you must fit a series of “spacer pins” against the edge of the previous sheet. This is to provide the correct ‘gap spacing’ between each sheet. The spacer pins should be 2mm thickness. Do not exceed 2mm thickness.

Fit the next sheet as described above, ensuring the sheet is butted tightly to the spacer pins.

Once the sheet has been rolled almost to the edge, remove the spacer pins and then remove the final part of the double side tape protective cover. Press the sheet firmly onto the foam tape and then complete the rolling of the sheet.

Check all edges are clean and free of adhesive residue.

Once the installation of the sheets is complete, you are then ready to weld the joints.
On larger jobs, you can weld the sheets ‘as you go’. However, we recommend welding does not take place until the adhesive has completely set up. (Usually the next day).

Hot welding - firstly, ensure your weld rod and the joint gap to be welded is clean and free of dust and contamination.

The hot welding technique used to weld Altro PVCu sheets is basically identical to that used in vinyl floor laying. The same type of tools and welding gun can be used. (See attached tools list). A Leister 5 mm round speed weld nozzle with small air slide (105.433) **MUST** be used for welding all Altro Whiterock wall designs installations - see separate welding instructions for Altro Whiterock wall designs.

The Altro ‘welding rod’ is also very similar to that which is used in flooring.

Whilst most floor layers use the large ‘Leister’ Hot welding gun, this can be slightly cumbersome and heavy in the hand when welding 3 metres up a ladder.

The preferred welding gun is the ‘Leister’ Hot-Jet “S” welding gun, which is smaller and more compact.

The weld rod is passed through a standard 5mm ‘speed weld nozzle” which softens the weld rod and sheet edges simultaneously to fuse the materials together under heat.

The temperature of the weld gun can be regulated and the settings depend on the speed at which you travel along the sheet.

This is something each individual must practice to ascertain what suits your method of working.

In most floor laying work the typical speed would be approximately 2 metres per minute. However, this is not always practical when working vertically, so you must **practice** to gain experience of different situations.

Please ensure you follow the installation guidelines carefully to ensure best results.

Trimming off - this is often the part of the job which can be most difficult. Unlike flooring, you are welding a plain, smooth wall finish, which can highlight any imperfections in your work.

Whilst many fitters choose to use their ‘own’ pre-fabricated trimmers, at the end of the day – you need to have a trimming tool that you are confident in using and **practice extensively** with to get the live jobs right.

In our opinion, the range of trimming tools currently available to the flooring trade will achieve good results if care is taken.

After completing the welded joint you should pre-cut the joint, the Mozart trimming knife is the preferred knife of most fitters.

Pre-cutting must be done by using the ‘trimming guide’ and spatula to take off approximately half of the weld rod. This allows the weld rod to ‘settle’ and will prevent sinking into the joint once the rod has cooled.

During this process, apply a liberal amount of Altro ‘Antistatic solution’ sprayed on to the joint before any trimming takes place. This will reduce any friction between the cutting blade and the sheet and minimise the risk of scratching the sheet.

After pre-cutting the weld rod, allow the rod to cool down sufficiently before completing the final trimming.

Once the rod has cooled down (cold) you can commence final trimming with the spatula (or your personal trimming tool).

Take care not to scratch or damage the surface of the wall sheets while undertaking this final part of the operation... **“Practice makes perfect”.**

Please ensure you follow the installation guidelines carefully to ensure best results.

Welded joint instructions for Altro Whiterock wall designs

The technique used to weld Altro Whiterock wall designs is different to the one used to weld standard Altro Whiterock. Installers must read these instructions fully before commencing to weld Altro Whiterock wall designs sheets and it is strongly advised to carry out a test weld before welding the final installation.

Specialist tool - A Leister 5 mm round speed weld nozzle with small air slide (105.433) **MUST** be used for welding all Altro Whiterock wall designs installations.

Preparation - Ensure all sheet edges (where joints are to be formed) are clean, smooth, true and level. Always inspect new sheets and ensure the edges are undamaged. Damaged edges will need re-trimming. Do not bevel, profile or chamfer the edges of the wall designs sheets at seam locations. Chamfering the edges will expose the base colour of the sheet. When hot welding this could leave the exposed sheet being visible on the finished detail and make a welded joint more challenging to achieve an aesthetically pleasing seam. Check there is no debris left on the edges of the sheet. Any debris could burn when hot welding the joint and will leave a blemish which cannot be removed. When fitting the sheet, always ensure there is an adequate gap (2 mm) between the sheet and any rigid abutments (ceiling, windows, doors, services etc.) to allow for expansion. Clean both the seam area and the weldrod prior to welding.

Heat Welding - Ensure the welding equipment is clean especially the nozzle which may contain debris and carbon build up. The use of a wire brush and pipe cleaners will maintain the nozzle. **A Leister 5 mm round speed weld nozzle with small air slide** (105.433) must be used for welding all Altro Whiterock wall designs installations. The speed required to weld Altro Whiterock wall designs may be different compared to a standard Altro Whiterock sheet due to the foil used which gives the design. As a result it is essential that the correct welding speed is achieved on practice sections using off-cuts of the sheet prior to attempting an initial live weld. This will allow the installer to gauge the correct speed and heat of the welding gun to ensure acceptable weldrod adhesion and help eliminate any potential burning of the sheet. Each site will require new settings for the weld gun which depend on site electrical supply. Check for proper fusion of the weld by trying to roll the bead left to right with your finger after it has been welded. Pulling on the end of the weldrod will be a good indicator that you have successfully fused to the sheets. The temperature of the weld gun can be regulated, and the settings depend on the speed at which the gun is pulled along the sheet. This is something each individual must practice to ascertain what speed best suits their method of working. Care must be taken not to scorch the sheets, as this will be extremely difficult to repair.

Trimming off excess weldrod - When trimming the weldrod two passes are key to the process to ensure a flat weld. Choice of tools to trim the weld are installer lead, but care must be taken all chosen tools are free from rust and are smooth. Failure to follow these guidelines could result in surface defects alongside the joint. The first pass should be done while the weldrod is warm. Spray a soapy water solution or Altro anti-static solution to the sheet along the weld to help lubricate the trimming knife, blade and sledge, if using the Mozart trimming tool leave a final cut thickness of 0.5 - 0.7 mm. Once the rod has cooled down, final trimming can commence with a trimming knife and soapy water.

Take extra care not to scratch or damage the Altro Whiterock wall designs surface while undertaking this final part of the procedure. When heat welding, a small mock up must be done and inspected for the client’s approval before proceeding with the entire installation.

Trimming off Installation tools and equipment for welded Altro PVCu wall sheets sheets

Leister Hot-Jet - "S"
110 V. Welding Gun

Light and compact welding gun for walls and other detailed welding work.

Rapid Nozzle
ø 5mm

Super Rapid Nozzle
ø 5mm

For welding PVCu wall PVCu wall sheets. The hot air outflow is very tight and directed into the groove.

Mozart knife

Used for trimming of cold weld.

Quarter
Moon Knife

Used for flush trimming of the cold weld rod.

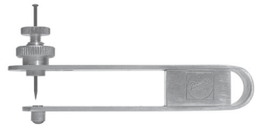
Triming
Guide

Used with the quarter moon knife for pre-trimming of the weld rod.

Rounded Blades
ø 6mm

Flat Blades

Pajarito No. 401 Scriber



For exact scribing of one sheet edge to the next sheet.

Multipurpose
Paring Gouge

Multipurpose gouge paired with either round or flat blades. To be used when the weld rod is cold.

FlexiJoint

Substrates - when installing Altro sheets with the PVC FlexiJoint profile, it is imperative the substrate is to a very good standard.

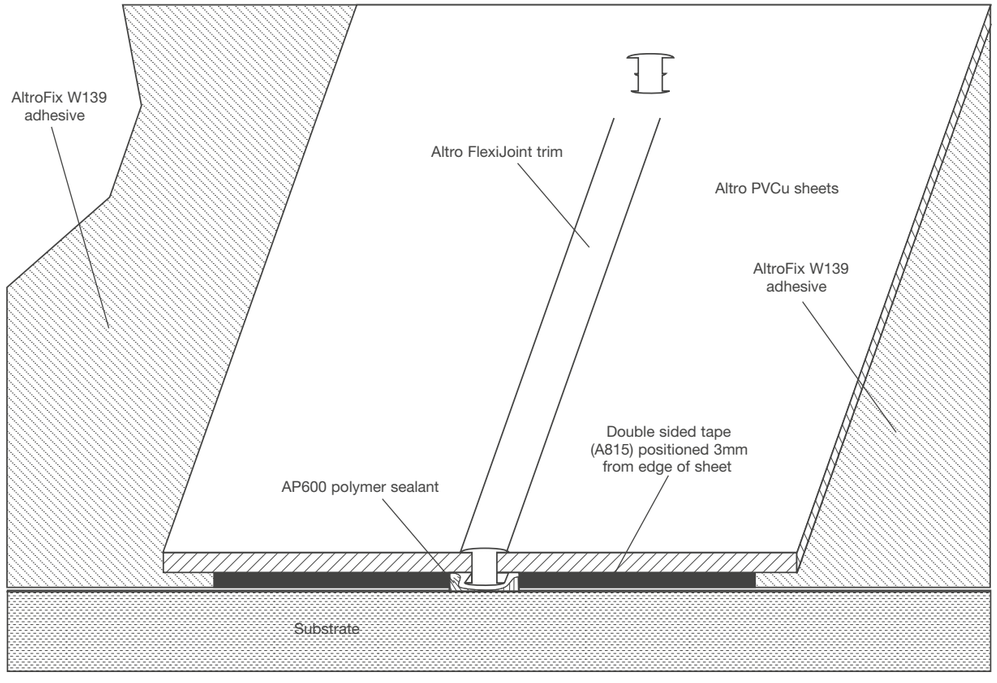
Surfaces should be true and level to + or – 3mm over a 2.00m straight edge.

Recommended substrates include plasterboard, plywood, finishing plaster and most types of steel trowelled sand and cement render.

We recommend all plastered surfaces are sealed with Unibond PVA sealer (or similar) diluted 1:10 parts water before fitting sheets and left to dry before installation process.

Planning layout - when planning the layout of the sheets it is important to minimise the number of joints in the walling system. Ensure joints do not fall too close to corners.
We suggest joints should not be formed any closer than 300mm from a corner. This will avoid any possible risk of mis-alignment between the joint when the next sheets are fitted.

Preparing the joint - before installing the sheets, plan out where the joints will fall in the installation operation. Mark a vertical line on the substrate to indicate the centre of the joint. You must then prime the substrate either side of the vertical line with Altro W165 primer, using a small paint brush.



Please ensure you follow the installation guidelines carefully to ensure best results.

Sheet preparation - ensure all sheet edges (where joints are to be formed) are clean, smooth, true and square.

Always inspect new sheet edges to see they are not damaged or scored. If necessary, cut and plane to a clean square edge.

Check there are no ‘fines’ left on the edge of the sheet.

Altro PVCu sheets can also be cut with a circular saw (with fine tooth cutting blade), or a router (with a straight edge router bit suitable for plastics and laminates).

When preparing the fitting of the sheet, always ensure there is an adequate gap (2-3mm) between the sheet and any rigid abutments, (ceiling, windows, doors, services etc) to allow for expansion.

The edges of the sheets must be chamfered to the front and back this will allow the FlexiJoint to be inserted into the produced gap, failure to manufacture the chamfered edges could prevent the FlexiJoint being inserted smoothly.

These ‘isolation’ joints must be sealed with Altro sanitary sealant after completing the installation.

Once the sheet has been prepared for fitting, apply Altro double sided tapes (A815) to the back of the sheet approximately 3mm in from each edge which forms the joint for the PVC profile.

Adhesives - Altro recommends AltroFix W139 adhesive for all FlexiJoint installations.

Note: AltroFix W157 acrylic adhesive can also be used; however, this must be applied with a 5mm x 5mm square notch trowel, (increasing consumption).

Application methods - once the first sheet has been prepared and dry fitted to check everything is correct, fix the double side tapes (A815) and leave the protective top covers in place, (these will be removed later).

Apply AltroFix W139 adhesive to the back of the sheet in the normal way. Trowel the adhesive up to the edge of the double side tapes.

Install the first sheet in the normal way.

Check the sheet is aligned with the datum line before rolling the sheet to achieve a transfer of the adhesive to the substrate. Whilst the sheet is held in situ carefully ease the sheet edge away and remove cover tape, once complete remove other tape edge. Roll the sheet again to ensure adhesive transfer.

When rolling the sheet, start in the middle and work outwards.

Prepare the next sheet exactly the same as before. Dry fit this sheet to check the joint between both sheets is true and parallel. Once this check has been completed, temporarily fix three metal spacer bars (available from Altro Walls) tight against the leading edge of the previous sheet – (position at the top, middle and bottom). Altro ‘spacer bars’ are manufactured with the precise measurement to form a 3.4mm gap between the sheets.

Apply the double sided tapes and adhesive as previously described. Leave the protective cover on the strip of double sided tape which fits against the metal spacer bars, (it will be removed later). This will allow for easier fitting and manoeuvrability when butting up tight to the metal spacer bars.

Install the sheet in the normal way, ensuring the edge is fitted against each of the metal spacer bars.

Once the sheet has been fully rolled, remove the metal spacer bars. Carefully ease out the edge of the sheet to facilitate the removal of the protective cover from the back of the double sided tape. When this has been removed, press the sheet firmly back onto the substrate to achieve a full bond.

Finally, complete full rolling of the sheet right up to the edge to ensure good transfer of the adhesive.

Make sure the exposed edges of the sheet are clean and free of any adhesive residue.

Repeat this process for all subsequent sheets.

Note: Altro Walls recommends the FlexiJoint profile is inserted and fitted to the joint as work progresses.

(This will avoid any risk of the joint closing up as the adhesive cures).

Please ensure you follow the installation guidelines carefully to ensure best results.

Installing the FlexiJoint PVC profile - prior to fitting the Altro FlexiJoint PVC profile, clean and prime the joint. Apply a uniform bead (2mm max: thickness) of Altro AP600 polymer sealant to the substrate in between the joint gap.

Caution: Do not overfill this joint with AP600 sealant, as this will prevent the FlexiJoint profile from seating correctly into the gap.

Cut a suitable length of the FlexiJoint profile (allow for trimming off) and then press firmly into the joint gap.

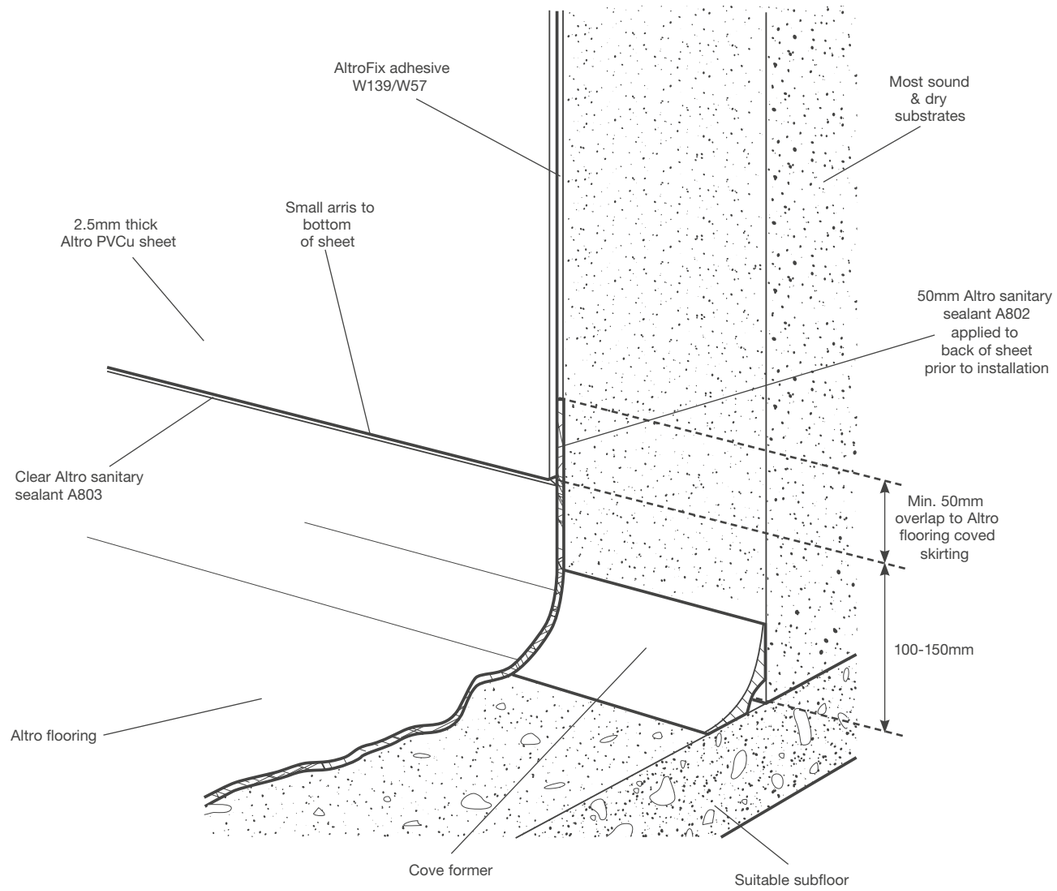
Once the profile has been fully fitted to the joint, roll the joint thoroughly with a small hand roller, (wooden wallpaper seam rollers are ideal for this task).

Finally, trim off the surplus as required.

Door heads, window heads and sill sections - door heads, window heads and sill sections need to be carefully scribed and cut to adjacent sheets to ensure a gap of 3.4mm is maintained for the FlexiJoint profile.

Floor to wall joint detail - the Altro FlexiJoint profile can be used in conjunction with all current types of Altro PVCu transition trims.

The most aesthetically pleasing method, (where appropriate), is to opt for the standard 50mm ‘overlap’ detail, which has the Altro PVCu sheet fitted over the top of the self-coved PVC floor finish.



Please ensure you follow the installation guidelines carefully to ensure best results.

Fitting two-part internal / external corners (REF: F837 / F836)

Internal and external two-part corner sections are manufactured in coordinating colours to match the range of Altro walling systems. When ordering colour coordinated corners, remember to include the ‘part number’ with the specific ‘colour reference number’ on your order. F837 / F836 only refer to ‘White’ corner sections. For all other colours, add a suffix to the specific part number with the correct ‘colour reference number’.

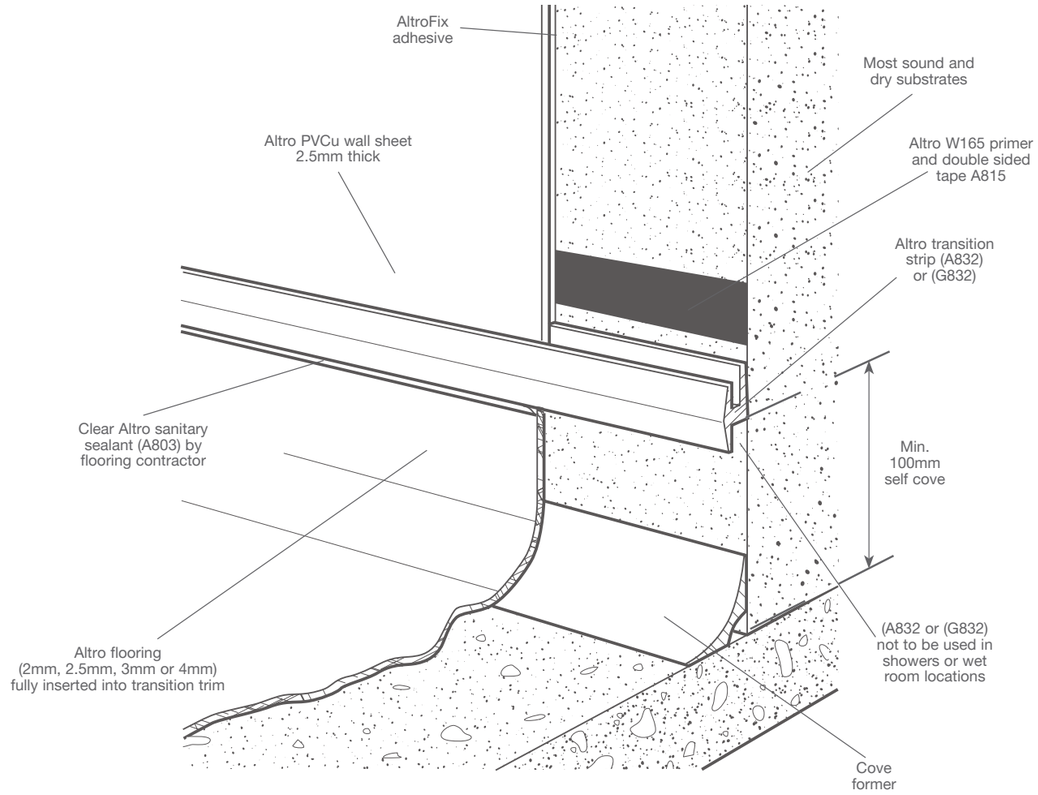
Example: F837/25/41 – This is an Internal corner section, 2.5m length, in colour Linen.

- Preparation - prime the wall corners with the Altro W165 ‘tape’ primer sufficiently enough to cover the area that the corners are to be installed. This should be done at the same time as the priming out for the double sided tape, allowing primer to dry to provide a tacky surface.
- When the walls are ready for application, double sided tape should be applied to the back of the PVCu corners in four strips of approximately 150mm long down the corner length. Remove the protective cover from the tape and apply the corner to the substrate.
- If a PVCu ‘transition strip’ is to be fitted (at a later stage) to the bottom of the Altro PVCu sheet (where wall sheets meet the sheet vinyl floor skirting), the corner profile ‘back section’ must be fitted accordingly.
- Prior to the Altro PVCu sheet being installed, a bead of Altro sanitary sealant should be applied to both sides of the corner profile (on the inner faces). This will prevent the sheet from having a void where the adhesive stops short of the sheet edge.
- When fitting the Altro PVCu sheet on to the corner profile ‘back section’, ensure the sheets are positioned approximately 5mm short of the central spine (to allow for expansion and contraction).
- After the sheets have been fitted, the front covers of the two-part (snap-on) corner profiles can be installed.
- The front covers should initially be positioned by hand pressure. They can then be fully located by tapping with a rubber mallet. Use a small clean, smooth section of softwood timber and place over the cover before tapping with the rubber mallet.

Fitting the PVCu transition joint strip (REF: A832)

- The PVCu transition strip is fitted at the bottom of the Altro wall sheet to provide a suitable detail for the ‘sheet to sheet vinyl floor’ skirting detail. As described previously, the vertical joint strips must be cut accordingly to allow the PVCu transition strip to fit properly.
- Prior to fixing the transition strip to the base of the sheet, a bead of Altro sanitary sealant should be applied to the substrate (just below the sheet). When the ‘back’ section of the two-part PVCu transition strip is installed it beds into the sealant and maintains a tight hold during installation of the floor.

Altro wall sheet to vinyl sheet flooring cove skirting detail



- Carry out this procedure throughout the area and then finish by installing the front cover section of the two-part (snap-on) joint strip.
- When forming the front cover around internal and external corners, the back of the trim should be carefully undercut (along the spine) to allow the trim to bend around the angles.
- The front joint strip covers should initially be positioned by hand pressure. They can then be fully located by tapping with a rubber mallet or small hammer with a block of wood.
- The front transition strip joint covers must be ‘run’ continuously around the perimeter of the room, including around internal and external angles. DO NOT mitre or butt into corners. The cover trim should meet up accurately with the front covers of the vertical joint strips and the internal / external corner profiles.

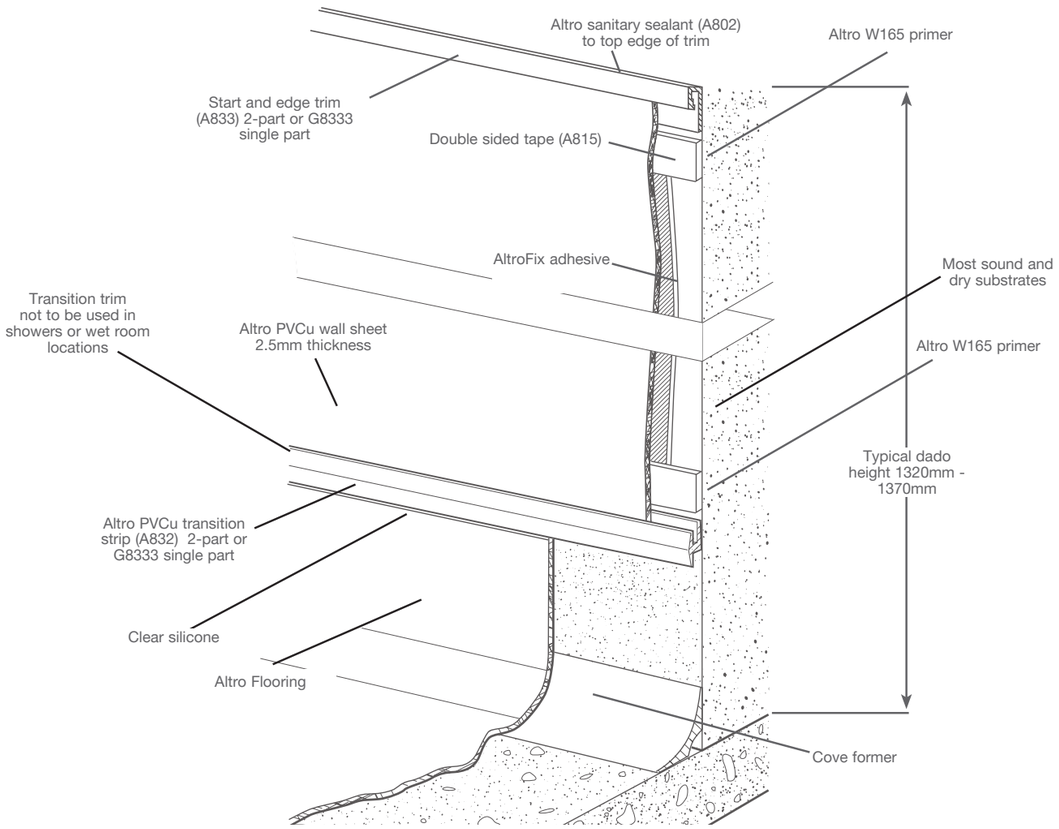
Please ensure you follow the installation guidelines carefully to ensure best results.

Fitting the PVCu start & edge joint strip (REF: A833)

Altro A833 is a two-part (snap-on) PVCu start and edge trim, which is generally used to close any exposed edges (i.e. top or side edges) of the Altro PVCu sheet. This is usually fitted when the sheet is installed lower than the ceiling line, or when the sheet terminates along a wall before reaching a corner or abutment.

- Prior to fixing the start & edge trim to the exposed edge of the sheet, a bead of Altro sanitary sealant should be applied to the substrate (adjacent to the sheet). When the 'back' section of the two-part PVCu start & edge trim is installed it beds into the sealant and maintains a tight hold to the substrate.

Start and edge and cut tile transition detail



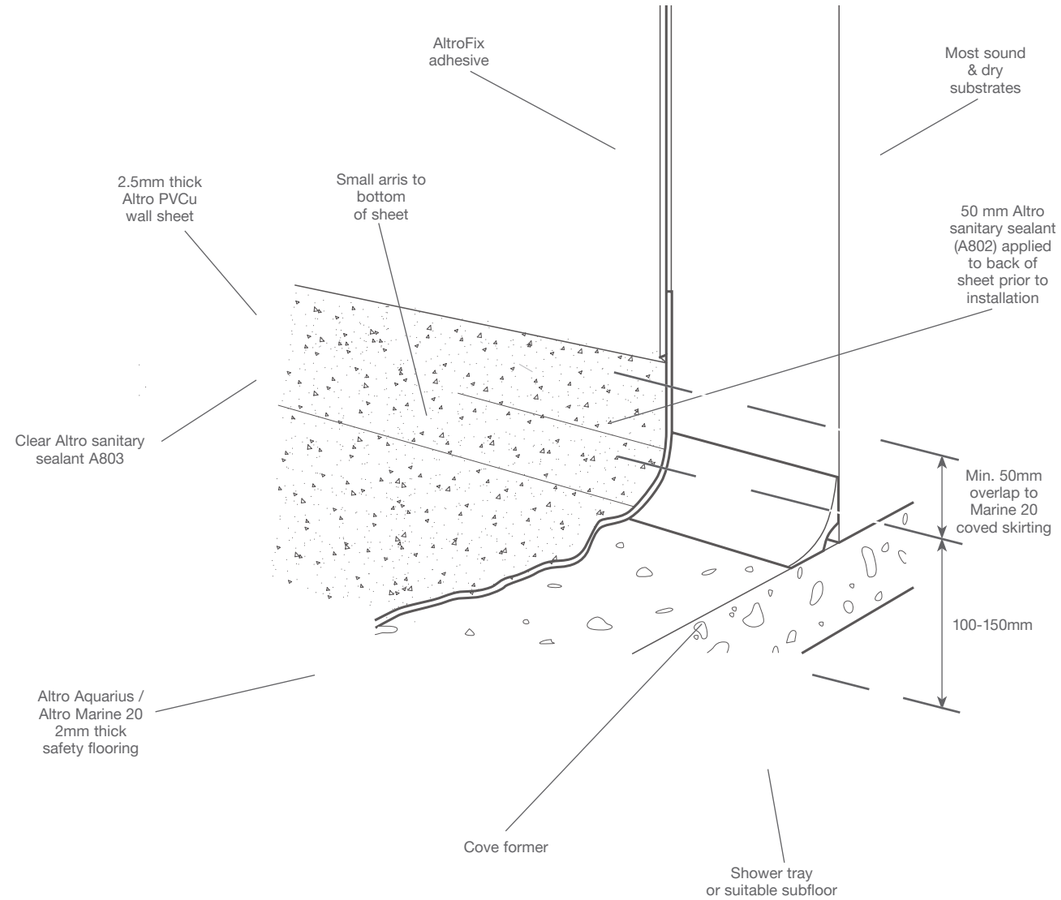
- Continue this procedure as necessary throughout the area and then finish by installing the front cover section of the two-part (snap-on) joint strip.
- The front cover strip should initially be positioned by hand pressure, and then be fully located by tapping with a rubber mallet or small hammer and block of wood.

Other joint treatment detail

If specified, or specifically recommended by the client, Altro wall sheets can be installed with a silicone joint detail.

- The sheets should be installed with a 3-4 mm gap.
- Altro double sided tapes must be fitted approximately 3mm in from the vertical edge of each sheet to ensure the sheets meet accurately at the joint.
- Altro recommends using masking tape on the front face of the sheets to prevent overspill.
- The edges of the sheets must be cleaned prior to siliconing.
- Ensure sufficient silicone is pumped into the joint so that it forms up against the double side tapes on the reverse of the sheet.
- Once completed, tool off the surplus to leave a neat, flush, sealed joint. (Remove masking tape immediately sealant is tooled off)
- In wet areas such as wet room adaptations,etc. Altro specifies the 50mm Overlap detail.

The Overlap Detail

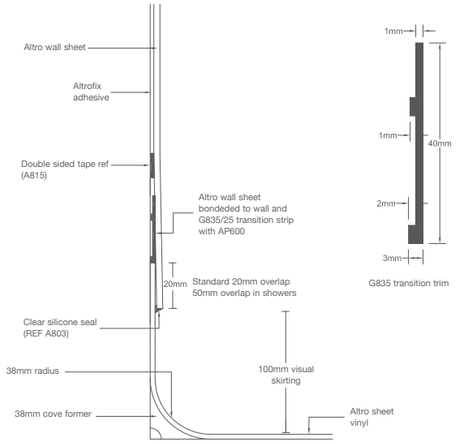


Please ensure you follow the installation guidelines carefully to ensure best results.

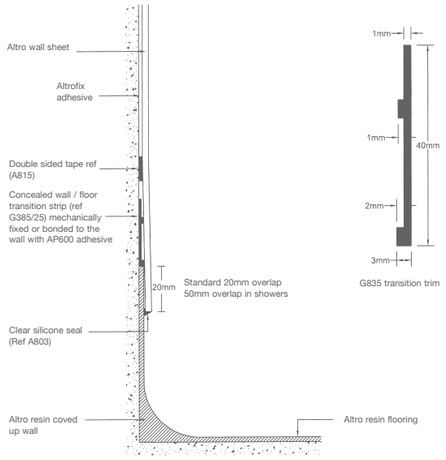
The Hidden Transition trim allows the Altro wall sheet installation first and the flooring to be fitted at a later stage.

The Trim is situated behind the Altro wall sheet (see diagram WHTT2 and WHTT3) enabling the Altro flooring to run up behind the Altro wall sheet and create the overlap detail, another advantage is it enables easier removal and replacement of the flooring from behind the sheet.

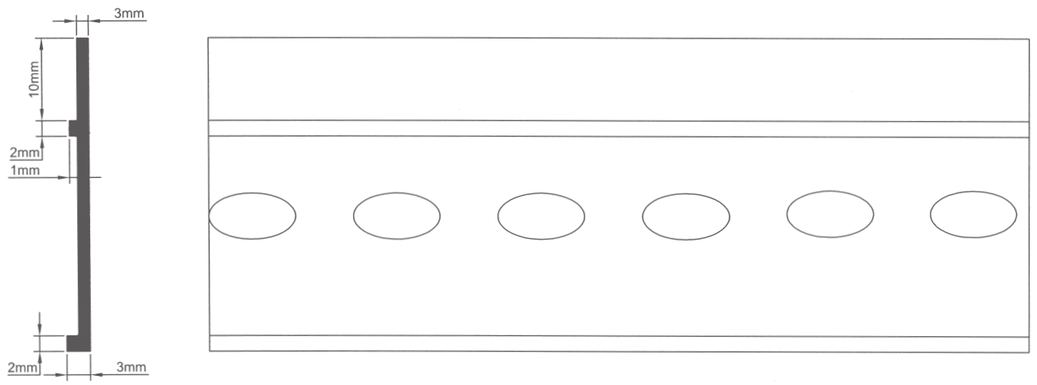
WHTT2



WHTT3



WHTT4



The hidden transition strip has been designed to maintain the overlap detail when replacing flooring without the need to replace the sheet, for installation guidance contact the Altro technical team on 01462 707600.

Please ensure you follow the installation guidelines carefully to ensure best results.

Fitting and sealing up to abutments

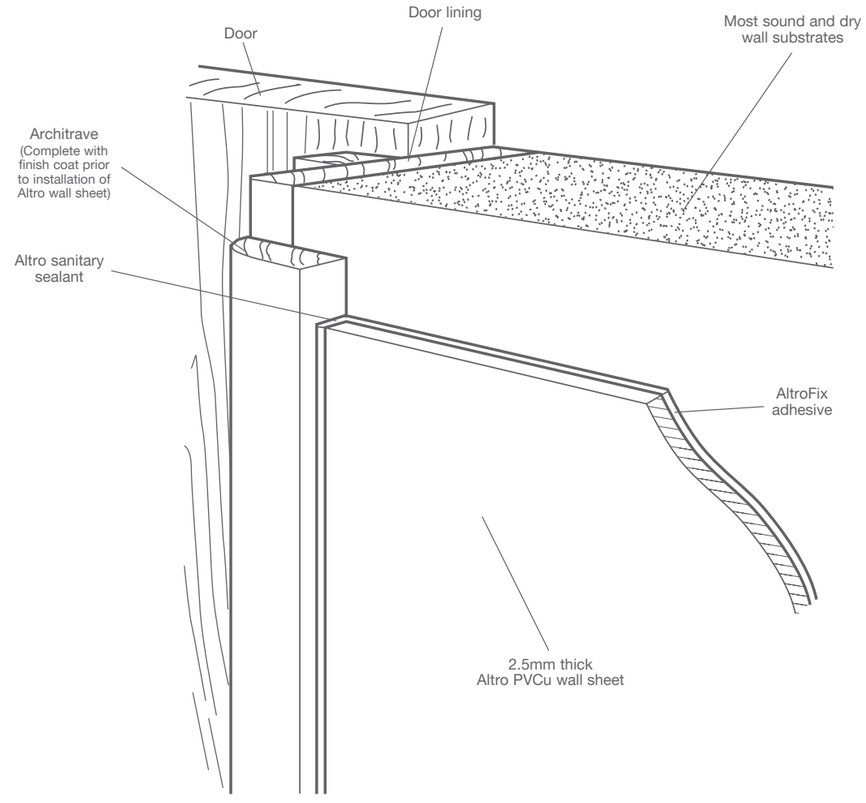
Altro wall sheets should be fitted to within 3mm of rigid abutments such as window frames, door frames, architraves, ceilings, quarry tile skirtings etc. Thus ensuring a 2-3mm gap at these points.

This will allow for expansion and contraction to take place.

Prior to sealing the joint, clean the sheet and adjacent surfaces.

All ‘isolation’ joints must be sealed with colour coordinated Altro sanitary sealant.

Detail Altro wall sheets to abutments eg. architrave



Please ensure you follow the installation guidelines carefully to ensure best results.

Completion

Once all sheets and joint strips are installed and silicone has been completed, remove the protective film and clean all surfaces down with Altro antistatic solution (A809). This is required as the sheet may have static build up and any dust in the atmosphere will adhere to the surface of the sheet.

Cleaning

Regular cleaning using a soft cloth and suitably diluted mild detergent is all that is normally required. For heavy grease contamination use Altro 44 alkaline cleaner (or similar). Stubborn marks can be removed with Altro cleaner (ref: A859) cream (not to be used on Altro Whiterock Digiclad, Altro Whiterock Chameleon or Altro Whiterock wall designs), or use a non-abrasive domestic type cream bath cleaner.

When cleaning the Altro wall sheet surface, we recommend the temperature of water does not exceed 60° Centigrade.

If cleaning with hot water lance, temperatures must be regulated to a maximum of 60° Centigrade and not to be localised.

Do not use cleaning materials of an abrasive nature.

Cleaning cards are available on request.

Contact

Altro technical services department for any query regarding materials, installation or cleaning and maintenance instructions:

Tel: 01462 707600

E-mail: enquiries@altro.com

Visit the Altro website at www.altro.com for technical data sheets and technical drawings in pdf format for downloading.

February 2022

Please ensure you follow the installation guidelines carefully to ensure best results.

Notes

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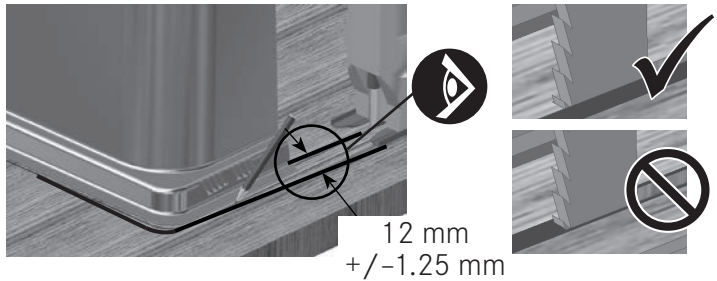
FRANKE

1



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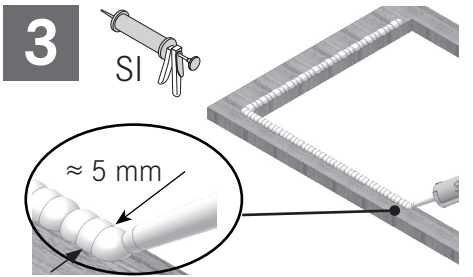

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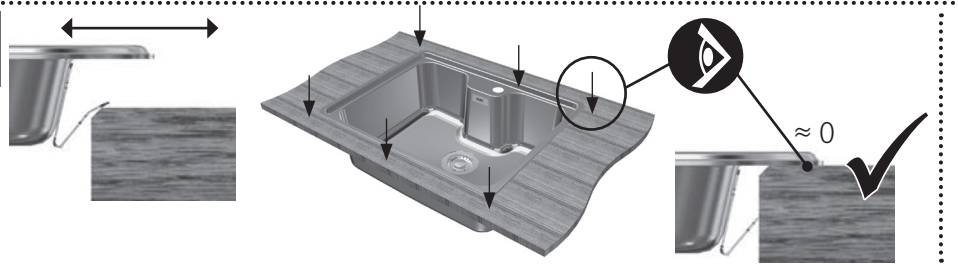
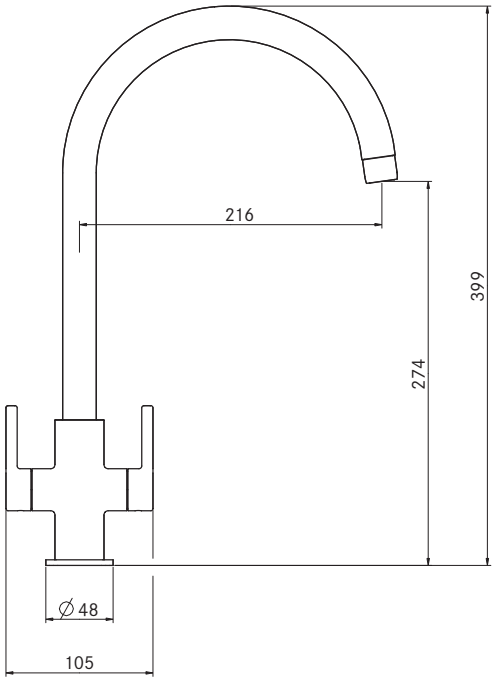


FRANKE LINA TAP

Installation instructions



Make it wonderful

FRANKE

Technical data

Minimum water pressure: 7.25PSI (0.5 bar)
Maximum water pressure: 75PSI (5 bar)
Maximum hot water temperature: 70°C
Recommended hot water temperature: 65°C

Note: Exceeding these temperatures or water pressures can result in damage to the tap.

A pressure reducing valve may be required to be fitted in high water pressure situations.

Attention

Before installing the new mixer it is essential that you thoroughly flush through the supply pipes in order to remove any remaining swarf, solder or other impurities.

Failure to carry out this simple procedure could cause problems or damage to the workings of the mixer.

Having first checked all new connections, turn on the mains stopcock, close all taps except the new mixer and as the system starts to refill check for leaks.

Once you have satisfied yourself that there are no leaks, switch on the water heating.

Preparation

First shut off your water heating system then, with your mains stopcock closed, open the lowest hot and cold taps in the house and allow to run until the cold storage tank and pipes are empty (the hot water storage cylinder always remains full).

Installation

First screw the threaded stud into the mixer body. Screw the tails into the mixer body and fully hand tighten.

After making any necessary alterations to existing pipework, pass the plinth over the tails and fit in position.

The shaped upstand on the plinth will locate in the tap body and the 'O' ring should be placed in the recess to make a seal with the sink.

When the tap is in position (with the cold side on the right when viewed from the front) slide the nylon bracing plate up to the underside of the sink together with the retaining plate, and secure by screwing the fixing nut finger tight.

Check that the mixer body and plinth are correctly positioned and fully tighten fixing nut.

It is recommended that 15mm x 15mm compression fittings be used to connect mixer to supply pipes. Cold is connected to the right and hot on the left when viewed from the front.

Warning

These hints have been prepared for your guidance, you must exercise due care at all times. We do not accept responsibility for any problems that may occur through incorrect installation.

NB: If for any reason the spout is removed from the tap, care must be taken when reinserting the spout into the body to ensure that the Grub Screw is located in the split of the white PTFE ring.

How to care for your tap

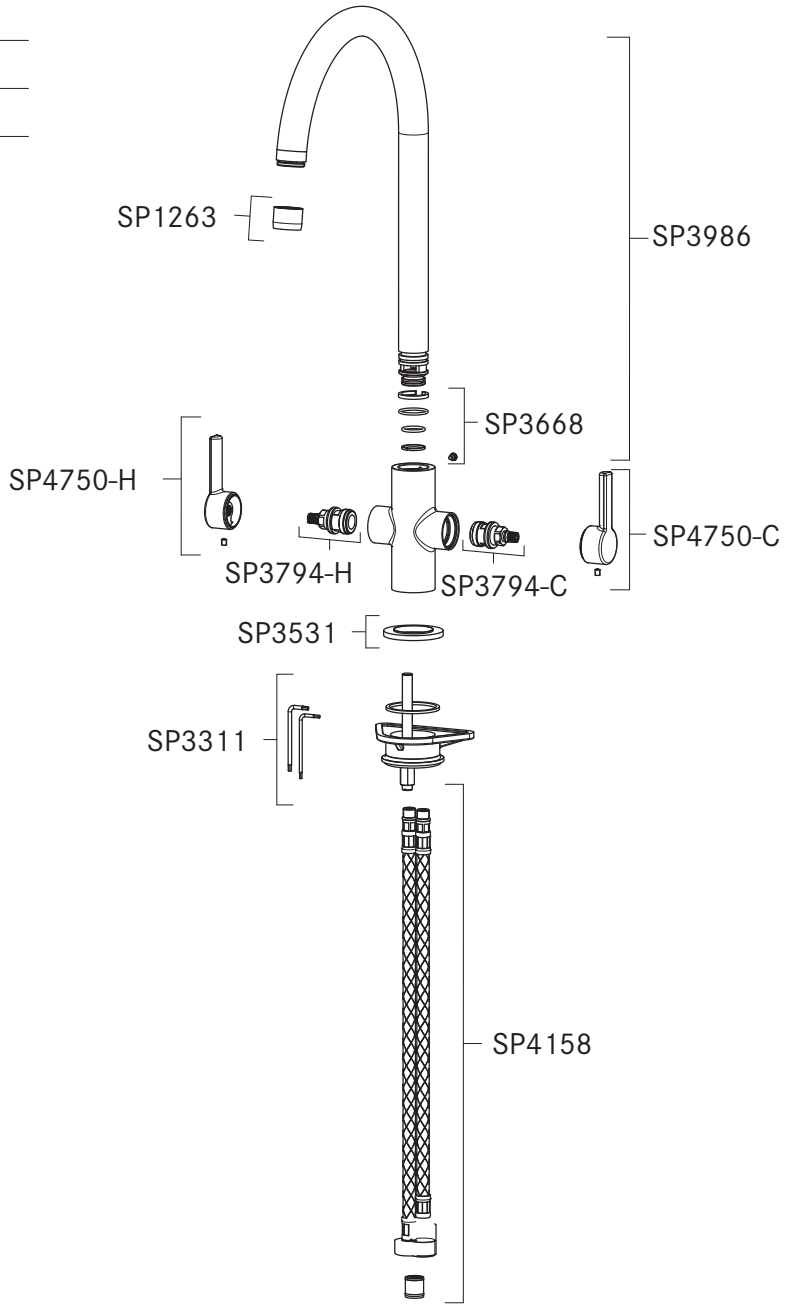
To maintain the appearance of this tap, ensure it is cleaned only using a clean, soft damp cloth. A solution of warm water and mild liquid detergent may be used where necessary, and then the fitting rinsed thoroughly. Abrasive cleaners or acidic cleaners MUST NOT BE USED under any circumstances. Avoid contact with all solvents.

Available finish

115.0627.532 Chrome

Parts list as follows

FUN number	Part name	Part code
133.0068.761	Antisplash Chrome	SP1263 CH
133.0358.051	Spout Chrome	SP3986 CH
133.0277.067	'O' ring kit	SP3668
133.0653.315	Hot handle Chrome	SP4750-H CH
133.0653.316	Cold handle Chrome	SP4750-C CH
133.0358.053	Hot valve	SP3794-H
133.0358.055	Cold valve	SP3794-C
133.0153.220	Base plinth Chrome	SP3531 CH
133.0150.221	Fixing kit	SP3311
133.0437.470	Flexi-tails	SP4158



Guarantee

Your Franke mixer has been manufactured to the high standard you would expect of any Franke product but in the unlikely event that you should experience any defect in the materials or workmanship within one year of purchase, we will replace the faulty part free of charge. This is provided the mixer has only been used for normal domestic purposes in the UK and that the care, installation and maintenance instructions have been observed.

You should also retain your dated invoice as proof of purchase to validate any claims under our guarantee.

This one year guarantee is extended to five years in the case of the valve mechanism.

Normal wear and tear is excluded from the guarantee.

Decorative surface finishes are guaranteed for one year from the date of purchase provided our advice concerning care has been observed and no scouring agents have been used.

Scuffs and scratches caused by improper installation or accidental damage are not covered by this guarantee. Neither are slight shade variations or any damage or defect caused by incorrect installation or abuse of the fitting.

Service

For spare parts, servicing or any other queries, visit **www.franke.co.uk**

Optional tap brace

A large or heavy tap fitted to a stainless steel inset sink may occasionally flex the sink. To counteract this, Franke has developed an innovative tap brace that can be purchased separately. The tap brace connects the tap to the worktop and not just to the sink, offering additional support to the tap and much more stability when fitted. The tap brace has a variable collar to ensure it will fit most models of tap and can be used on any inset stainless steel sink.

The Franke tap brace is available on request from most kitchen retailers.

Franke UK Limited
West Park, MIOC
Styal Road
Manchester
M22 5WB
Tel: +44 (0)161 436 6280
Fax: +44 (0)161 436 2180
Email info.uk@franke.com

For spare parts, servicing or any other queries, visit **www.franke.co.uk**

TECHNICAL DATA

Boflex

OLYMPIA

Building height: 30mm
Board: 30 x 137 x 2200mm
(incl. 5mm Evazote Foam)
Format: 2-strip

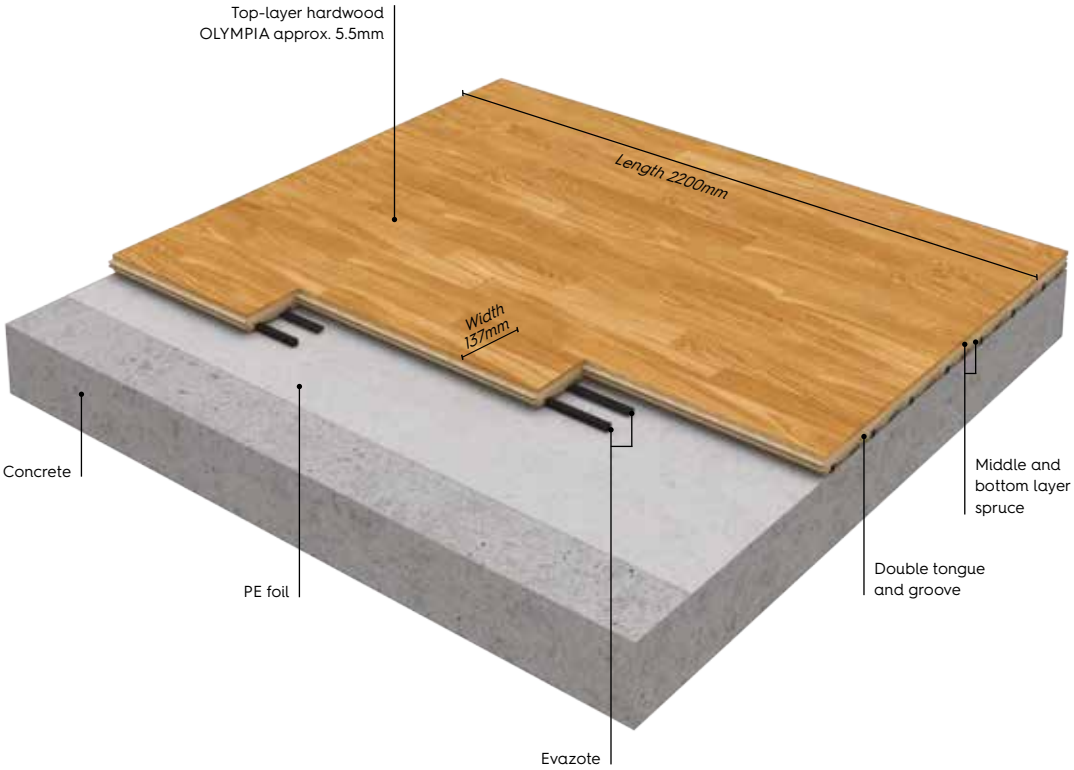
CE

Weight Load

Low Floor Elevation

Floor Heating

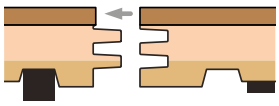
- Education
- Arena
- Studio & Gym
- Hotel & Health



Performance according to EN14904		Shock absorption		Deformation		Friction	Ball bounce	Rolling load
		TYPE 3: ≥ 40% ≤ 55%	TYPE 4: ≥ 55% ≤ 75%	TYPE 3: ≥ 1.8mm ≤ 3.5mm	TYPE 4: ≥ 2.3mm ≤ 5.0mm	80 - 110	≥ 90%	Min. 1500N
Boflex	OLYMPIA		56%		2.3mm	89	99%	OK

BOEN SPORT

2-strip



Double tongue & groove

Wood species / Grading	Package overview
Ash Sport Beech Sport Maple Can. Sport Oak Sport	Pack size: 6 boards = 1.81 m² (21 kg) Pallet size: 49 packs = 88.69 m² (1029 kg) Supplied: Boflex adhesive and perimeter support battens. We reserve the right to deliver up to 10 % in lengths from 70cm to 150cm.

Boflex Olympia Construction Details (from the top to the edge of concrete/subfloor)		Height
Boflex Olympia • Hardwood top-layer 5.5mm • Middle layer and bottom layer • 2 strips of Evazote 50 are glued into the board	Boflex size: 30 x 137 x 2200mm Boflex Olympia board 25mm + Evazote 5mm (Board dimensions: 25 x 137 x 2200mm + Evazote dimensions: 10 x 10mm and 3.5 x 20mm)	30mm
Perimeter strips	4.4 x 22 x 1800mm	✓
PE foil (ordered separately)	Special requirement for new buildings: 2 layers of 0.2mm. It is not a moisture barrier, but gives to the floor an extra protection.	0.4mm
Construction height		30mm

MAINTENANCE
We recommend starting a regular system of maintenance from day one. The amount of maintenance your floor requires will depend on how you use and treat it. For more information: boensport.com

ENVIRONMENT
BOEN Sport flooring is a product of natural materials. Respect for nature is reflected in our processing and management of raw materials. BOEN constantly seeks methods for processing the raw materials in the most gentle and sustainable manner possible.

FSC™ (Forest Stewardship Council) is a global non-profit organization, which promotes worldwide environmentally appropriate, socially beneficial, and economically viable management of the world's forests.

FSC™-certified products are controlled along the whole supply chain in order to separate it from non-certified wood. They are made from wood sourced from responsibly managed forests and other controlled sources.
The FSC™-trademark ensures that the wood has been harvested in a responsible way for animals, people and the environment. Buying such products helps to save our forests. More information on: www.fsc.org.

Read more on boensport.com

FSC
www.fsc.org
FSC® C009732
The mark of responsible forestry

REAL WOOD
www.realwood.eu

Product data sheet

Gypframe® 48 S 50 'C' Stud

Gypframe 'C' studs are cold-rolled steel studs with a 'C' section profile. They include sight lines down the flanges and service cut-outs in the web.

Where to use

These studs provide vertical framing support in British Gypsum partitions and linings, as defined by the system design. They're available in a range of lengths depending on project requirements.

Certifications

Environmental Product Declaration (EPD) available Click here.

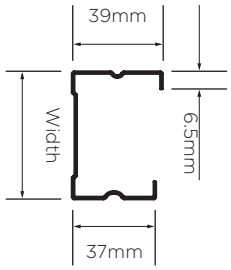
Product information

Composition
Gypframe studs are cold-roll formed from DX51D + Z140 NA-C galvanised steel using the patented UltraSTEEL® process.

Colour
Steel.

Where to buy
Click here.

DIMENSIONS AND WEIGHTS	
Lengths available (mm)	2400, 2700, 3000, 3600
Bespoke length available	Yes
Width (mm)	48
Gauge (mm)	0.50
Weight (kg/lm)	0.52



Performance

Here we only provide performance information related to the product. Please see the White Book online for system-dependent performance.

Standards
EN 14195:2005.

Declarations of Performance (DoP) available Click here.

Reaction to fire	A1
Yield strength (N/mm²)	210

Installation guidance

Please see our White Book online for more information about installing and handling British Gypsum systems and Gypframe profiles. See the Gypframe Safety Data Sheet for guidance on health and safety, handling and storage.

Fixing compatibility

Check the system specification for the required British Gypsum screw type.

Product data sheet

Gypframe® 48 S 50 'C' Stud

Sitework

Safety Data Sheet

Gypframe metal components Safety Data Sheet (SDS) available. Click here.

Packaging overview

These components are supplied in packs banded together with nylon strapping.

Quantity per pack	10

Environmental

Recyclability

Gypframe components are 100% recyclable.

Disposal

Waste from Gypframe metal framing components is fully recyclable. The European Waste Catalogue code is 12 01 01.

BES 6001 classification

Excellent.

British Gypsum
Head Office, East Leake,
Loughborough,
Leicestershire, LE12 6HX
T: 0115 945 1000

bsi. ISO 9001 Quality Management FM550533 | ISO 45001 Occupational Health and Safety Management OHS550586 | ISO 14001 Environmental Management EMS543324 | ISO 50001 Energy Management ENMS606206

THOMAS ARMSTRONG
(CONCRETE BLOCKS) LTD

INSULITE STANDARD

Medium Density Aggregate Blocks

Insulite blocks are the perfect versatile all-round building blocks. These medium density aggregate blocks consist of up to 90% recycled raw materials, making them among the most environmentally friendly and sustainable building blocks available.

Insulite blocks are manufactured to BS EN 771-3 and are ISO 9001 Quality Assured, ISO 14001 Environmentally Certified and hold BES 6001 Responsible Sourcing certification.

Note:
Medium-Dense aggregate blocks manufactured at our Sellite Blocks Limited division are known as 'Thermal' blocks whose details and properties are encompassed by this datasheet.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	440mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Gross Dry Density (BS EN 772-13):	1450 - 1550 kg/m³
Mean Compressive Strength (BS EN 772-1):	3.6, 4.2, 7.3 & 10.4 N/mm²
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	0.49 W/mK (inner leaf) 0.54 W/mK (outer leaf)
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 reaction to fire
Configuration (BS EN 1996-1-1):	Solid - Group 1
Available Texture, Finish:	Standard

bsi. ISO 9001 Quality Management FS 665648 · ISO 14001 Environmental Management EMS 665649 · BES 6001 Responsible Sourcing of Construction Products BES 665651 BES 665634

APPLICATIONS

- Manufactured to BS EN 771-3.
- Inner & outer leaf of external cavity walls.
- Internal partition walls.
- Block & beam floor infill (7.3N/mm² or above).
- Foundation walls below dpc (7.3N/mm² or above).
- Acoustic separating party walls to Part E of the Building Regulations and Robust Details.
- Standard texture finish provides an excellent surface for mortars, renders and plasters.
- Robust, accepts most standard fixings.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m^2k/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
75	0.18	108	43	11.5	2
90	0.21	124	45	13.8	3
100	0.24	138	46	15.3	4
140	0.33	193	49	19.7	4
190	0.45	262	52	26.5	4

1. Walled weight is for a single-leaf wall, plastered both sides.
2. Sound reduction R_w values are based on wall assuming a plastered finish both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the moisture content.
4. Fire resistance periods to BS 5628-3 for a single-leaf, non-loadbearing plastered wall.

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
75	96	9.6
90	80	8.0
100 (Void Pack)	72 or 90 (84 or 86)	7.2 or 9.0 (8.4 or 8.6)
140 (Void Pack)	60 (56)	6.0 (5.6)
190	40	4.0

Pack details may vary slightly between manufacturing locations. Always check details with your nearest sales office.

INSULITE STANDARD Medium Density Aggregate Blocks

We are Part of the Thomas Armstrong Group

Thermal

The table below shows examples of how cavity walls built with a solid Insulite block inner leaf can meet a range of u-value targets. For specific calculations, please contact our technical department.

U Value W/m²K	Partially Filled Cavity Brick outer leaf | 50mm clear cavity | plasterboard on dabs	Fully Filled Cavity Brick outer leaf | Fully filled cavity | plasterboard on dabs
0.28	40mm PIR/PU @ 0.018 50mm PIR/PU @ 0.022	100mm batt @ 0.034
0.25	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022	100mm batt @ 0.030 125mm batt @ 0.037
0.22	60mm PIR/PU @ 0.018 70mm PIR/PU @ 0.022	125mm batt @ 0.032
0.20	65mm PIR/PU @ 0.018 80mm PIR/PU @ 0.022	100mm batt @ 0.021
0.18	75mm PIR/PU @ 0.018 95mm PIR/PU @ 0.022	150mm batt @ 0.030
0.15	95mm PIR/PU @ 0.018 115mm PIR/PU @ 0.022	100mm batt @ 0.021 + 30mm insulated drylining

Acoustic

Insulite blocks are suitable for use in acoustic separating party walls between dwellings and for internal partitions in accordance with Part E of the Building Regulations. They are also suitable for a range of Robust Standard Detail party walls. The figures below are predicted sound reduction ratings based on wall mass:

Block Thickness mm	Walled Weight kg/m²	Predicted Sound Reduction, Rw		
		Unfinished	Plastered	Dry Lined
75	108	42	43	43
90	124	44	45	45
100	138	45	46	46
140	193	48	49	49

Below Ground

All of our aggregate and dense concrete blocks are durable products which are suitable for use in soil conditions up to Design Sulphate class DS-3 as defined in BRE Digest Special Digest 1. Insulite blocks of 7.3N/mm² or above can be used below dpc; lower strengths are not suitable.

Suspended Block & Beam Floors

Insulite blocks of 7.3N/mm² or above can be used as infill blocks in block and beam suspended floors and can be laid either 440mm wide or 215mm wide.

Fire Resistance

Insulite blocks are non-combustible with zero spread of flame and are classed as Class 'A1' in accordance with BS EN 13501-1. Notional fire resistance periods are:

Block mm	Loadbearing Wall		Non-loadbearing Wall	
	No Finish	VG Plaster	No Finish	VG Plaster
90	1 hour	2 hours	3 hours	3 hours
100	2 hours	4 hours	4 hours	4 hours
140	3 hours	4 hours	4 hours	4 hours

"VG" = vermiculite / gypsum plaster or pearlite plaster 13mm thick applied to both faces of single leaf walls.

NBS Clauses for our concrete block products can be found on **www.source.thenbs.com**

Mortars

Insulite Standard blocks offer an excellent surface for accepting mortars and no pre-treatment is required other than ensuring that all dirt and debris is removed. Generally, in order to avoid unsightly cracking, the weakest mortar mixture appropriate to the structural requirements should be selected as per BS 5628-3. For most applications, we recommend that grade iii mortar is used.

	BS 5628-3 Mortar Class	Recommended mix proportions of materials by volume (as per BS 5628-3)	
Above dpc	iii	1 : 1 : 5 to 6 1 : 5 to 6 1 : 4 to 5 1 : 3½ to 4	Cement : Lime : Sand Cement : Sand Masonry Cement : Sand (with non-lime filler) Masonry Cement : Sand (with lime filler)
Below dpc	iii	*A stronger (class ii) mix is preferred - see below*	
	ii	1 : ½ : 4 to 4½ 1 : 3 to 4 1 : 2½ to 3½ 1 : 3½ to 4	Cement : Lime : Sand Cement : Sand Masonry Cement : Sand (with non-lime filler) Masonry Cement : Sand (with lime filler)

External Rendering

Insulite Standard blocks have a surface which provides an excellent key for adhesion. These blocks have low - moderate suction and no special pre-treatment of the wall is required other than ensuring that all dirt and debris is removed from the surface. It is important that blocks are protected from the weather prior to and during rendering.

Traditional renders should be applied in 2 coats. The first coat should not exceed 15mm and the second coat 5 - 7mm. The first coat should be slightly stronger than the second coat. Render designation iii/M4 should be used, recommended proportions:

Cement : Lime : Sand With or without air entrainment	Cement : Sand With or without air entrainment	Masonry Cement : Sand With non-lime filler	Masonry Cement : Sand With lime filler
1 : 1 : 5 or 6	1 : 5 or 6	1 : 4 or 5	1 : 3½ to 4

Wall Ties & Movement Joints

Generally under normal conditions, wall ties should be embedded 50mm into the mortar on each leaf, staggered in alternate courses and spaced in accordance with the following:

Leaf Thickness mm	Cavity Width mm	Horizontal Spacing mm	Vertical Spacing mm	Ties per m²
Less than 90mm	50 - 75	450	450	4.9
Over 90mm	50 - 150	900	450	2.5

For unreinforced masonry panels, the typical recommended spacing between vertical movement joints is as follows:

Internal Walls: 8m – 12m External Walls: 6m – 9m

Good Site Practice & Safe Handling

- Packs should be stored on firm, level ground no more than 2 packs high and protected from severe weather to preserve their quality. Care must be taken when removing the plastic bands as individual blocks may fall out. Never un-band packs above shoulder height.
- In the absence of a revised version of the HSE guidance given in their withdrawn Construction Sheet 37 ' Handling Building Blocks' the following principles should be followed: There is a risk of injury in the repetitive handling of blocks heavier than 20kg. Repetitive manual handling of blocks over 20kg should be subject to a risk assessment and a safe system of work should be established before block-laying commences.
- Blocks should not be laid if the temperature is at or below 3°C and falling.
- Blocks should always be laid on a full bed of mortar and vertical joints filled.

August 2021

Product details and availability may vary between manufacturing locations. Please contact your nearest regional sales office for sales, product and technical advice.

North East Region :	Tel: 01207 544 214	Fax: 01207 541 800	blocks@thomasarmstrong.co.uk
Cumbria, North Lancashire and Borders Region :	Tel: 01900 68114	Fax: 01900 66136	cumbriablocksales@thomasarmstrong.co.uk
Yorkshire, Humber and Lincolnshire Region :	Tel: 0113 232 0022	Fax: 0113 287 0839	stocks.sales@thomasarmstrong.co.uk
North West, Cheshire, Staffordshire and West Midlands Region :	Tel: 0151 525 5991	Fax: 0151 530 1676	wrsales@thomasarmstrong.co.uk

www.thomasarmstrongconcreteblocks.co.uk

THOMAS ARMSTRONG
(CONCRETE BLOCKS) LTD

ULTRALITE

Low Density Lightweight Aggregate Blocks

Ultralite blocks are designed to offer the builder a low-weight, loadbearing block with enhanced thermal properties suitable for a wide range of applications.

Ultralite blocks are manufactured to BS EN 771-3 and are ISO 9001 Quality Assured, ISO 14001 Environmentally Certified and hold BES 6001 'Excellent' Responsible Sourcing.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	440mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Gross Dry Density (BS EN 772-13):	950 - 1050 kg/m³
Mean Compressive Strength (BS EN 772-1):	3.6 & 7.3 N/mm²
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	0.32 W/mK [inner leaf] 0.34 W/mK [outer leaf]
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 reaction to fire
Configuration (BS EN 1996-1-1):	Solid - Group 1
Available Texture, Finish:	Standard

bsi. ISO 9001 Quality Management FS 665648 · ISO 14001 Environmental Management EMS 665649 · BES 6001 Responsible Sourcing of Construction Products BES 665651 BES 665634

APPLICATIONS

- Manufactured to BS EN 771-3.
- Inner & outer leaf of external cavity walls. Not suitable for unfinished external applications.
- Internal partition walls.
- Acoustic separating party walls to Part E of the Building Regulations.
- Standard texture finish provides an excellent surface for mortars, renders and plasters.
- Low weight, robust, accepts most standard fixings.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m^2k/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
90	0.36	86	42	9.8	3
100	0.40	96	43	10.7	4
140	0.56	134	46	14.6	4

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
90	80	8.0
100	72/90	7.2/9.0
140	48/60	4.8/6.0

1. Walled weight is for a single-leaf wall, plastered both sides.
2. Sound reduction R_w values are based on wall assuming a plastered finish both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

Pack details may vary slightly between manufacturing locations. Always check details with your nearest sales office.

ULTRALITE Low Density Lightweight Aggregate Blocks

We are Part of the Thomas Armstrong Group

Thermal

The table below shows examples of how cavity walls built with an Ultralite block inner leaf can meet a range of u-value targets. For specific calculations, please contact our technical department.

U Value W/m²K	Partially Filled Cavity Brick outer leaf | 50mm clear cavity | plasterboard on dabs	Fully Filled Cavity Brick outer leaf | Fully filled cavity | plasterboard on dabs
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0.25	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022	100mm batt @ 0.030 125mm batt @ 0.037
0.22	60mm PIR/PU @ 0.018 70mm PIR/PU @ 0.022	125mm batt @ 0.032
0.20	65mm PIR/PU @ 0.018 80mm PIR/PU @ 0.022	100mm batt @ 0.030
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0.15	95mm PIR/PU @ 0.018 115mm PIR/PU @ 0.022	100mm batt @ 0.021 + 25mm insulated drylining

Acoustic

Ultralite blocks are suitable for use in acoustic separating party walls between dwellings and for internal partitions in accordance with Part E of the Building Regulations. They are also suitable for a range of Robust Standard Detail party walls. The figures below are predicted sound reduction ratings based on wall mass:

Block Thickness mm	Walled Weight kg/m²	Predicted Sound Reduction, Rw		
		Unfinished	Plastered	Dry Lined
90	86	41	42	42
100	96	42	43	43
140	134	45	46	46

Below Ground

All of our aggregate and dense concrete blocks are durable products which are suitable for use in soil conditions up to Design Sulphate class DS-3 as defined in BRE Digest Special Digest 1. Only 7.3N/mm² strength Ultralite blocks are suitable for use below dpc.

Suspended Block & Beam Floors

Ultralite blocks are not recommended for use as infill in block and beam floors. Insulite or Dense blocks with a strength of 7.3N or above are suitable for use in block and beam floors.

Fire Resistance

Ultralite blocks are non-combustible with zero spread of flame and are classed as Class 'A1' in accordance with BS EN 13501-1. Notional fire resistance periods are:

Block mm	Loadbearing Wall		Non-loadbearing Wall	
	No Finish	VG Plaster	No Finish	VG Plaster
90	1 hour	2 hours	3 hours	3 hours
100	2 hours	4 hours	4 hours	4 hours
140	3 hours	4 hours	4 hours	4 hours

"VG" = vermiculite / gypsum plaster or pearlite plaster 13mm thick applied to both faces of single leaf walls.

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Ultralite blocks offer an excellent surface for accepting mortars and no pre-treatment is required other than ensuring that all dirt and debris is removed. Generally, in order to avoid unsightly cracking, the weakest mortar mixture appropriate to the structural requirements should be selected as per BS 5628-3. For most applications, we recommend that grade iii mortar is used.

	BS 5628-3 Mortar Class	Recommended mix proportions of materials by volume (as per BS 5628-3)	
Above dpc	iii	1 : 1 : 5 to 6 1 : 5 to 6 1 : 4 to 5 1 : 3½ to 4	Cement : Lime : Sand Cement : Sand Masonry Cement : Sand (with non-lime filler) Masonry Cement : Sand (with lime filler)
Below dpc	iii	*A stronger (class ii) mix is preferred - see below*	
	ii	1 : ½ : 4 to 4½ 1 : 3 to 4 1 : 2½ to 3½ 1 : 3½ to 4	Cement : Lime : Sand Cement : Sand Masonry Cement : Sand (with non-lime filler) Masonry Cement : Sand (with lime filler)

External Rendering

Ultralite blocks have an open texture which provides an excellent key for adhesion. These blocks have low - moderate suction and no special pre-treatment of the wall is required other than ensuring that all dirt and debris is removed from the surface. It is important that blocks are protected from the weather prior to and during rendering.

Traditional renders should be applied in 2 coats. The first coat should not exceed 15mm and the second coat 5 - 7mm. The first coat should be slightly stronger than the second coat. Render designation iii/M4 should be used, recommended proportions:

Cement : Lime : Sand With or without air entrainment	Cement : Sand With or without air entrainment	Masonry Cement : Sand With non-lime filler	Masonry Cement : Sand With lime filler
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For unreinforced masonry panels, the typical recommended spacing between vertical movement joints is as follows:

Internal Walls: 8m – 12m External Walls: 6m – 9m

Good Site Practice & Safe Handling

- Packs should be stored on firm, level ground no more than 2 packs high and protected from severe weather to preserve their quality. Care must be taken when removing the plastic bands as individual blocks may fall out. Never un-band packs above shoulder height.
- In the absence of a revised version of the HSE guidance given in their withdrawn Construction Sheet 37 'Handling Building Blocks' the following principles should be followed: There is a risk of injury in the repetitive handling of blocks heavier than 20kg. Repetitive manual handling of blocks over 20kg should be subject to a risk assessment and a safe system of work should be established before block-laying commences.
- Blocks should not be laid if the temperature is at or below 3°C and falling.
- Blocks should always be laid on a full bed of mortar and vertical joints filled.
- Do not wet the blocks before laying. Where necessary, adjust the consistency of the mortar to suit the suction of the block.

November 2020

Product details and availability may vary between manufacturing locations. Please contact your nearest regional sales office for sales, product and technical advice.

North East Region :	Tel: 01207 544 214	Fax: 01207 541 800	blocks@thomasarmstrong.co.uk
Cumbria, North Lancashire and Borders Region :	Tel: 01900 68114	Fax: 01900 66136	cumbriablocksales@thomasarmstrong.co.uk
Yorkshire, Humber and Lincolnshire Region :	Tel: 0113 232 0022	Fax: 0113 287 0839	stocks.sales@thomasarmstrong.co.uk
North West, Cheshire, Saffordshire and West Midlands Region :	Tel: 0151 525 5991	Fax: 0151 530 1676	wrsales@thomasarmstrong.co.uk

Technical support: +44 (0) 333 202 6800

Date Published: 24/10/2022

Visqueen Preformed Units

Features and benefits

- Factory manufactured - reduces the risk of water ingress
- Three dimensional shapes - simplifies complex detailing
- Flexible materials - easy to install on site
- Extensive range - ideal for built-in and surface fixed cavity tray applications
- Versatile - suitable for both damp and gas proofing applications
- BBA/BDA certified - third party certifications
- Cost effective - speeds up installation on site
- Multi-functional - compatible with all Visqueen damp and gas proof courses and membranes

Product description

Visqueen Preformed Units (PFUs) are factory manufactured three dimensional shapes. The units are formed from either Visqueen Zedex CPT High Performance DPC (Zedex Units) or Visqueen Ultimate Gas DPC (Ultimate Units).

Approvals and standards

- Third party accreditation (BBA 94/3059) for Zedex Units
- Third party accreditation (BDA BAF-18-051-P-A-UK) for Ultimate Units
- Conforms to the specification requirements of NHBC Amber 1 applications (Zedex Units)
- Conforms to the specification requirements of NHBC Amber 2 applications (Ultimate Units)
- Conforms to the specification requirements of BR 211:2015 (Zedex Units)
- CE Mark EN 14909:2012 (Zedex Units)
- CE Mark EN 13967:2017 (Ultimate Units)
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 45001:2018
- Environmental Management System ISO 14001:2015

Usage

Visqueen Preformed Units are suitable for detailing complex or awkward junctions in masonry wall applications including residential, commercial and multi storey buildings. The units can also be used for complex junctions associated with membrane applications within floor constructions, e.g. door thresholds and corners etc. The units can also be used to prevent harmful ground gases from entering into the building at the above junctions.

System components

- Visqueen Zedex Jointing Tape, 100mm x 15m
- Visqueen Zedex DPC Surface Fixing System

Find your local stockist

Heanor Gate Road, Heanor, Derbyshire, DE75 7RG
+44 (0) 333 202 6800 I enquiries@visqueen.com I www.visqueen.com

Visqueen Preformed Units

Storage and handling

Visqueen Preformed Units should be stored under cover in their original packaging.

Care should be taken when handling the product in line with current manual handling regulations.

Preparation

Where necessary Visqueen Preformed Units should be cut with a sharp retractable safety knife or robust scissors.

Installation

When used for sealing complex junctions in cavity tray applications, VIsqueen Preformed Units should be installed prior to the main run of the cavity tray material, and the lap joints bonded with Visqueen Zedex DPC Jointing Tape.

Where the Visqueen Preformed Unit is required to be surface fixed to the inner leaf of a cavity wall construction the vertical portion of the unit should be bonded to the inner leaf with Visqueen Zedex DPC Jointing Tape, the substrate having been previously primed with Visqueen High Performance Tanking Primer and allowed to dry.

Visqueen Zedex DPC Fixing Strip should be used to secure the upper edge of the unit using appropriate Visqueen Fixing Pins (or alternative approved) to provide a permanent mechanical fix.

When used for sealing complex junctions in floor membrane applications, VIsqueen Preformed Units should be bonded and sealed with the same taping system as used for the membrane lap joints.

Usable temperature range

It is recommended that Visqueen Preformed Units and all associated system components should not be installed below 5°C.

Additional information

Regarding cavity tray applications, for built-in internal and external corners see PFU-553 (90° unit) or PFU-501 (sloping unit)
For surface fixed internal and external corners see PFU-554 (90° unit) or PFU-502 (sloping unit)
For membrane corners see PFU-554 (box unit) or PFU-553 (inner leaf unit)
For door thresholds see PFU-206
For information on other available Visqueen Preformed Units, contact Visqueen Technical Services +44 (0) 333 202 6800

The information in this datasheet was correct at the time of publication. It is the user's responsibility to obtain the latest version of the datasheet as it is updated on a regular basis. The information contained in the latest datasheet supersedes all previously published editions.

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Date Published: 24/10/2022

Visqueen Preformed Units

Property	Test method	Units	Compliance criteria	Zedex Unit results	Ultimate Unit results
Thickness	EN 1849-2	mm	-10%/+10%	0.8	0.5
Weight	EN 1849-2	g/m^2	-10%/+10%	750	470
Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass	Pass
Resistance to low temperatures	EN 495-5	°C	MDV	-40	-40
Flexibility at temperatures	EN 1109	°C	MDV	-15	-15
Foldability	EN 495-5	°C	MDV	-40	-40
Durability (artificial ageing)	EN 1296 and EN 1928	-	Pass/Fail	Pass	Pass
Durability chemical resistance	EN 1847	-	Pass/Fail	Pass	Pass
Durability against alkali - Annex C	EN 14909	-	Pass/Fail	Pass	Pass
Resistance to static loading	EN 12730	kg	MLV	20	20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	372	1034
Water vapour transmission - permeability	EN 1931	$g/m^2/d$	MDV	0.4	0.13
Radon permeability	SP Method no. 3873	m^2/s	MDV	8.30×10^{-12}	-
Carbon dioxide permeability	ISO 2782:1995	$m^2/sec/Pa$	MDV	1.58×10^{-16}	-
Methane permeability	ISO 15105-1	$ml/m^2/d/atm$	<40	-	1.3
Benzene, toluene, ethyl benzene, m p xylene (BTEX)	ISO 15105-2	$ml/m^2/d$	MDV	-	<0.11
Reaction to Fire	EN 13501-1	Class	MDV	F	F

Health and safety information

Refer to the Visqueen Preformed Units material safety datasheet (MSDS).

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Visqueen Preformed Units

About Visqueen

The Visqueen name has long been recognised as one of the leading manufacturers of high quality advanced membrane technologies and design based solutions by specifiers, distributors, builders merchants and contractors throughout the UK and Europe.

For further guidance on the Visqueen services shown below, please refer to the relevant section of the Visqueen website (www.visqueen.com) or contact Visqueen Technical Services on +44 (0) 333 202 6800 or enquiries@visqueen.com

Complete Range, Complete Solution

Structural Waterproofing | Gas Protection | Damp Proof Membrane | Tapes | Damp Proof Course | Stormwater | Vapour Control

Visqueen Technical Support

Visqueen combine an extensive product portfolio with industry leading levels of service and support which includes guidance over the phone, bespoke CAD drawings to help with complex detailing, electronic NBS specifications and access to a dedicated team of highly knowledgeable and experienced field based Technical Support Managers.

Visqueen Technical Support is available to all our customers including architects, specifiers, distributors, builders merchants, contractors and end users. All of our technical team have been awarded the industry recognised qualification Certificated Surveyor in Structural Waterproofing (CSSW).

Visqueen CPD Seminars

The Visqueen Continuing Professional Development (CPD) Seminars provide up-to-date information on changes within Building Regulations/Building Standards and nationally recognised industry guidance affecting damp proofing, water vapour control, hazardous ground gas protection and below ground structural waterproofing.

The one hour seminars have been produced for design specialists within the construction sector and are delivered by our team of Technical Support Managers.

Visqueen PI designs and special projects

From initial design to the completed project, Visqueen are with you every step of the way. Whether it be hazardous ground gas protection and/or below ground waterproofing protection employing barrier, structurally integral or drained systems, Visqueen can offer professional indemnity (PI) insurance for bespoke Visqueen design solutions.

Visqueen Technical Support Managers work with all stakeholders to provide cost effective Visqueen solutions offering complete peace of mind throughout the construction phase and beyond.

Visqueen Training Academy

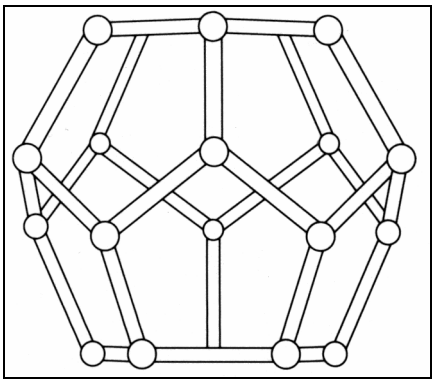
Based at our manufacturing facility in Derbyshire, the Visqueen Training Academy is available to support Visqueen customers throughout the UK by providing a wide range of both theory and practical skills related training.

Courses include one day product awareness training for our distributors and builders merchants to help them in their day-to-day jobs, through to intensive three day courses giving detailed hands-on training in the practical skills required for safe and robust product installation.

Heanor Gate Road, Heanor, Derbyshire, DE75 7RG
+44 (0) 333 202 6800 I enquiries@visqueen.com I www.visqueen.com

Evazote® EV50

Ethylene Vinyl Acetate Copolymer Foam Property Data Sheet



Evazote® is a closed cell, cross-linked EVA copolymer foam manufactured using Zotefoams unique production process. This data sheet characterises Evazote foam EV50 which is available in sheet form and is fabricated by modern techniques and can be thermoformed into shapes.

Property	Test Procedure	Units	EV50
Nominal Density - Skin/Skin	BS ISO 7214 1998	kg/m³	50
Cell Size – Typical Diameter	Internal	mm	0.35
Compression Stress-Strain	BS ISO 7214 1998		
10% compression		kPa	30
25% compression		kPa	51
40% compression		kPa	82
50% compression		kPa	115
Compression Set	BS ISO 7214 1998		
25% comp., 22hr, 23°C	25 mm cell-cell		
½ hr recovery		% set	10.5
24hr recovery		% set	3
50% comp., 22hr, 23°C			
½ hr recovery		% set	23.5
24hr recovery		% set	13
Tensile Strength	ISO 7214 1998	kPa	840
Tensile Elongation		%	245
Tear Strength	BS EN ISO 8067 1995	N/m	1055
Shore Hardness OO Scale	ISO 868 1985		47
10mm cell/cell thickness		OO	
Recommended operating temperature range*	Internal	°C	+65 max -70 min
Thermal Conductivity	ISO 8302 1991	W /m.K	0.0404
mean temp of 10°C			
Flammability			
Automotive	FMVSS.302 – Burn rate	<100mm/min.	Pass: 4 mm and thicker
Horizontal Burn Rate	ISO 7214 1998		
5mm thick		mm/sec	1.0
13mm thick		mm/sec	0.8

*** RECOMMENDED OPERATING TEMPERATURE RANGE**
The maximum operating temperature shown is defined as the temperature which will typically cause a linear shrinkage of 5% after a 24hr exposure period, using sample dimensions of 100mm x 100mm x 25mm. This figure is provided for general guidance only. The actual level of shrinkage the foam will undergo at any particular temperature is dependant on a number of system variables such as, sample dimensions, cell size, loading conditions and exposure period. Please refer to Technical Bulletin T2 for more detailed information.

HEALTH & SAFETY
A separate data sheet (T5) entitled “Health and Safety Information” should be consulted.

PRODUCT SPECIFICATION
This Property Data Sheet provides typical properties on representative samples of material. For a product specification please refer to data sheet T7.

Zotefoams plc
675 Mitcham Road
Croydon
CR9 3AL
United Kingdom
Telefon: +44 (0) 20 8664 1600
Telefax: +44 (0) 20 8664 1616

Installation Guidance Note: Coral Entrance Flooring System Products

General

Sub-floor Preparation
The appearance, performance and durability of the installed floorcovering will be determined to a large extent by the quality of the prepared subfloor and the conditions in which they are laid.

The installation of Coral sheet, tile and plank products should be carried out in accordance with BS5325:2021 Code of practice for the installation of textile floor coverings. Areas to receive flooring should be clean, free from other trades, fully enclosed and weather tight. Subfloors should be clean and free of contaminants, smooth, sound and permanently dry.

Particular attention should be paid to the following:

- Problems associated with plasticizer migration from PVC materials can lead to dimensional instability in carpet tiles. All subfloors of this type must be removed before installation.

- It is impossible to ensure that wood block floors are not loose or contain latent defects through aging. It is therefore strongly recommended that these are removed and that the subfloor is correctly prepared and, if necessary, a surface damp proof membrane or an asphalt screed applied before installation of Coral tiles/planks.

- Raised access flooring panels tend to settle shortly after installation and this should be considered when assessing the appearance of the tile/plank installation fitted onto such flooring systems. Ridges between uneven raised access floor panels will telegraph through to the finished tile installation. Uneven or loose floor panels should be levelled or re-fixed before installing Coral tiles/planks. For Coral Sheet products, raised access floors should be overlaid with 5.5mm nominal plywood such as Hanson SP101 or products of equal specification.

The open time of the adhesive will depend on site conditions and porosity of the base. It is best practice to conduct an adhesive bond test before starting the installation. Bond testing will assist in identifying both the working characteristics of the adhesive (waiting and working time) for the site conditions, and also any potential bonding problems.

Always conduct moisture tests on **all** substrates. All ground-based level floors should have an effective moisture barrier.

Areas to receive flooring shall be adequately lit to allow for proper inspection of the substrate, installation and for final inspection.

It is essential that the laying area is at a steady temperature of 18 to 27°C for 48 hours prior to, during, and for 24 hours after installation.

Prior to installation, Coral tiles/sheet must be allowed to acclimatise in opened boxes for at least 24 hours in the above conditions. Rolls and cuts of Coral sheet products should be stored horizontally and allowed to acclimatise for at least 24 hours prior to installation. This is particularly important if the tiles/planks or sheet have been stored or delivered in conditions of extreme temperature and/or humidity. Where the floorcoverings have been stored or transported

immediately prior to delivery in temperatures below 10°C, the acclimatisation period should be extended to 48 hours.

Ensure that all recommendations for substrate and jobsite conditions are met prior to beginning the installation. Beginning the installation is an implied acceptance of site conditions by the parties involved and liability for any failure directly related to inadequate site conditions becomes the responsibility of the installer and/or flooring contractor.

When ordering sheet or tiles/planks, each floor area (plus any spares material) must be specified from the same batch. The batch number is clearly marked on the packaging and on the reverse side of rolls and tiles and must be checked before commencement of installation.

Rolls and tiles should be checked to ensure that the correct, colour, batch number and quantity have been received and are in good condition. No claim will be accepted for incorrect colour, pattern or obvious damage if the product has been fitted.

Any carpet tile can be susceptible to a certain amount of pile distortion when they are taken out of their boxes. This may result in visual differences in appearance between tiles/plankls during, and immediately following, installation.

After fitting and assuming normal prevailing conditions (under dynamic foot movement) this visual differential will diminish as the pile recovers to its natural position. Recovery will normally take place soon after installation. However, in some cases it can take up to six weeks for the pile to fully condition and develop a uniform visual appearance. Pile distortion is not a manufacturing defect,

Underfloor Heating

Coral Textile entrance systems are suitable for use with underfloor heating systems (Tog Values 1 to 1.5). When used with underfloor heating systems the temperature at the surface of the subfloor must not exceed 27^0 C.

A separate guidance note: "**Installation of Forbo Floor Coverings on Underfloor Heating Systems"** provides more information on the conditions for installation in such circumstances.

Installation – sheet products

Coral sheet products should always be fully adhered.

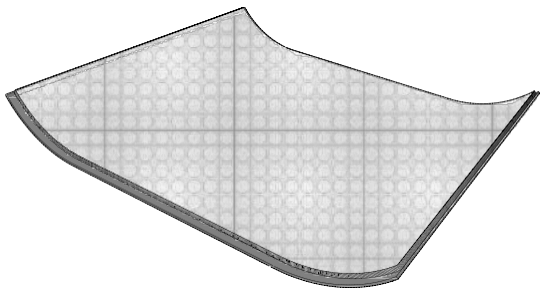
The recommended adhesive for use with Coral is Eurocol 640 Eurostar Special (EC1 – low VOC)

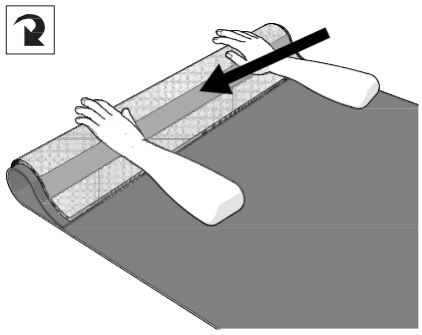
Use a 1.5mm x 5mm V notched trowel to apply the adhesive.

Note: Trowels will wear during use, check the trowel both before and during use to ensure that the proper, specified trowel notch is used and maintained.

Note: the adhesive must be spread evenly over the entire floor area with particular attention to edges – this will ensure that the sheet is fully bonded at the perimeters.

Coral sheet products should be back rolled to relax the material before installing.





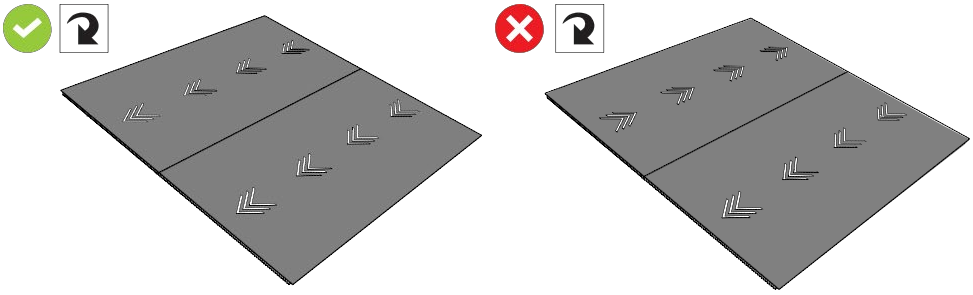
Place the material into wet adhesive, after the appropriate waiting time, and roll or press afterwards with a 68kg roller or carpet glider, rolling or pressing in all directions to ensure a firm bond. It is important to only spread sufficient adhesive that can be covered within the open time of the adhesive.

Areas that cannot be rolled with the large roller e.g. abutments such as door frames or skirting boards should be rolled with a hand roller or pressed into the adhesive with a rubbing hammer.

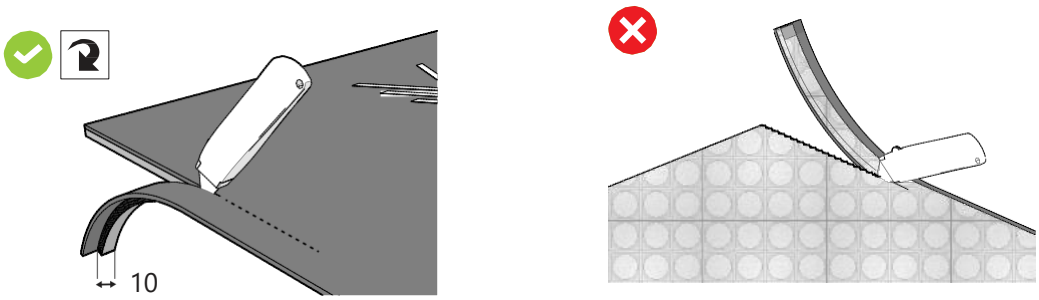
Always clean away excess adhesive with a damp cloth before it dries.

If alternative adhesives are to be used consult with the supplier for usage information, guidance and warranty.

There is an arrow indicating pile direction on the reverse of every backed sheet product. Install sheets with arrows running in the same direction.



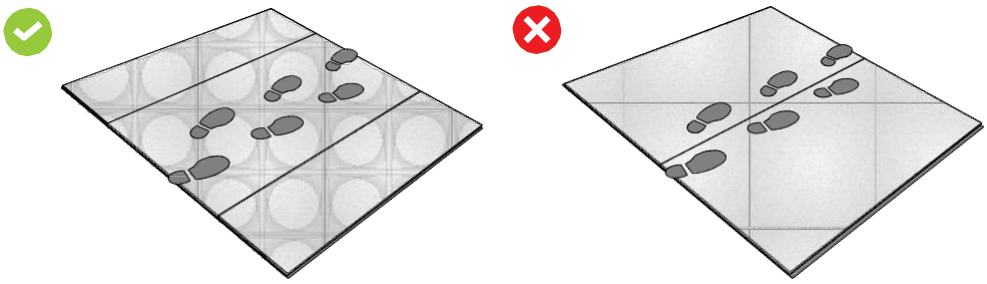
For all Coral textile products (except Coral duo) with an Everfort vinyl backing, trim with a straightedge and knife from the back of the sheet. Remove the 2.5cm edge border plus an additional 1cm to provide a suitable edge for butt jointing.



For Coral duo (Everfort vinyl backing) multiple width application, trim from the top with a straight edge and knife. Remove the 2.5cm edge border from all edges and any further material as necessary to maintain a continuous rib design between sheets.

Note: The direction of manufacture of Coral duo is not the traffic direction – ensure the ribs are running at right angles to the walking direction.

Note: Seams in the main footfall area e.g. in the centre of a doorway should be avoided.



Installation – Coral tiles and planks

Coral tiles and planks must be adhered using a high grab, all-over tackifier adhesive system; Forbo Eurocol 542 Eurofix Tack Plus is recommended.

The tackifier adhesive must be spread evenly over the entire floor area with particular attention to edges – this will ensure any perimeter tile cuts are fully bonded. Failure to fully bond all full tiles and tile cuts may result in individual tiles/planks shifting and lifting

Where perimeter tiles/planks are not constrained by fixtures e.g. walls, edge strips etc., it is recommended that such tiles/planks are adhered using a permanent adhesive; Forbo Eurocol 640 Eurostar Special is recommended.

Adhesives must be applied according to the manufacturer's instructions and it is essential that tackifier adhesives are allowed to dry to a clear, tacky finish before laying the carpet tile. Failure to do so could result in a permanent non-release bond.

The arrow marks on the reverse of every tile indicate the direction of pile lay. The preference of the specifier as to "broadloom", "tessellated" or other visual effects must be confirmed before tiles are installed.

When laying tiles in a monolithic format follow the direction of the arrows, which should, where possible, point towards the main light source.

Note: the term 'broadloom' is often used as an alternative description of monolithic. Whichever term is used, it refers to the installation direction of the carpet tiles. It does not mean that the installation will be viewed as seamless. Tile edges are most visible in new installations. The quality of Coral carpet tiles' construction will help to reduce the visibility of tile edges over time (with traffic and regular vacuuming) however, tile edges may remain visible during the life of the product in non or low trafficked areas.

Pile trapping – Ensure that each tile/plank butts up to its neighbour as tightly as possible without causing it to peak or "dome" off the subfloor. It is essential that no pile material becomes entrapped between tiles. Any trapped pile will distort the overall tile adhesion bond which may affect the long-term tile bonding as well as negatively affecting the tile edge aesthetic.

The location of the starting point of an installation is usually determined by the fitter to maximize the yield.
This may be anywhere in the room but would normally be located as near to the true centre as possible. Small cuts in either the field or perimeter should be avoided.

Having established the starting point for the installation, making some check measurements or dry laying a few rows of tiles and planks will help to identify any potential problems or necessary adjustments to avoid small perimeter cuts.

Note: Coral Interior (tiles and planks) is specially developed to install it in random order to give it is special design. Pile direction is not an issue in this kind of installation but as the design of each tile or plank can be different it is advisable to check the lay out before starting the installation.

It is important when fitting Coral Interior tiles and planks to ensure that they are each carefully placed against the adjacent tiles – do not slide the tiles and planks into place.

Fitting to stair treads and risers
All Coral sheet, tile and plank products are recommended for use on stairs. Appropriate stair nosings must be used for every tread. Coral sheet must be bonded securely to the stair tread using a permanent bond adhesive (Forbo Eurocol 640 Eurostar Special). Fitted to risers the sheet, tile and planks should be permanently bonded using a suitable contact adhesive.
Note: It important that sheet, tile or planks are fitted to treads with the pile direction (arrows) facing inwards towards the riser and fitted to risers with the pile direction (arrows) facing downwards towards the tread.

Note: As Coral products are available in a variety of sheet backing and tile/plank options, the product is tufted and held as unbacked *stock before manufacture to the selected product type. The tufting production number is printed on the back of each tile/plank whilst the tile production batch number is printed on the box. Please* ensure the same *box batch number is used in each location as mixed box batch numbers may result in shade variations.*

Installation – Coral loose lay mats

Loose lay Coral mats may be used on smooth resilient flooring surfaces either as a temporary solution (in accordance with HSE guidance) or in areas where a fitted Coral zone is impractical. In any location or use, it is important to check that the Coral PVC backed mat is compatible with the existing flooring. For example, vinyl flooring may permanently discolour, due to the effect known as plasticiser migration between the two PVC surfaces.

In some instances, with compatible very smooth floors, some slippage of the mat may still occur. If this is experienced, the mat should be secured using PMR (Plasticiser Migration Resistant) double sided tape.

Please note:

- The use of Coral mats on top of any type of textile flooring is not recommended due to the high likelihood of the mat moving on the textile products surface pile with the resultant potential to cause a trip hazard.
- Always ensure that the Coral mat is flat during use (and storage) to avoid edges curl.

On completion of the installation

First impressions may have more impact on the client than hours of skilled fitting.

The completed installation should be cleared of scrap material and debris, the floor vacuumed and any traces of adhesive residues removed from the floor and skirtings.

Note: *Upright vacuum cleaners with a mechanically powered brush should be used on all Coral products.*

If the floor covering is to be protected from other trades or site traffic prior to project completion, a protection product should be chosen that is appropriate for the type and level of traffic likely to be experienced.

Note: some protective sheet products with a tacky film in contact with textile floor coverings can leave an adhesive residue when removed. This can be difficult to remove and attract dirt when the floor covering is put into use. The potential for this effect should be checked with the protection product manufacturer before use and advice on suitability confirmed. Forbo will not accept any claims for soiling problems associated with the use of such products.

If the optimum performance of any new floor covering is to be achieved, it is important that the correct cleaning and maintenance procedures are used from day one. Cleaning and maintenance guides for all Forbo Flooring Coral ranges are available for download at: www.forbo-flooring.co.uk/downloads

Cleaning and maintenance guides should be passed onto the main contractor, client or end user as appropriate on completion of the installation, and before any hand over clean is started.

Any questions please contact us:
Forbo Flooring UK Ltd
Tel: 0800 121 4780
Samples: 0800 731 2369
Info.flooring.uk@forbo.com www.forbo-flooring.co.uk

Additional Reference documents and Information:

- BS5325:2021
- The CFA Guide to Contract Flooring (Tel: 01159 411126)

Installation Guidance Note: Tessera Carpet Tiles and Planks

General advice

Sub-floor preparation

The quality of the finished installation will depend on the quality of the sub floor. Irregularities in the subfloor will be apparent in the finished flooring. All subfloors should be smooth, sound clean and permanently dry in accordance with BS5325. Particular attention should be paid to the following:

Subfloor preparation should be carried out in accordance with BS5325:2001 Code of practice for the installation of textile floor coverings. Areas to receive flooring should be clean, free from other trades, fully enclosed and weather tight. Subfloors should be clean and free of contaminants, smooth, sound and permanently dry.

- All cementitious floors must have a residual moisture content of less than 75%, when measured according to Annex A of the standard.
- Irregularities or undulations in the subfloor can result in the bond of tiles or planks drifting during installation. Particular attention should be given to the preparation of the subfloor and surface regularity. Surface regularity should be within the SR1 surface regularity standard - 3mm under a 2m straightedge (BS8204-1:2003 +A1: 2009 Annex C).
- Problems associated with plasticizer migration from PVC materials can lead to dimensional instability in carpet tiles. All subfloors of this type must be removed before installation.
- It is impossible to ensure that wood block floors are not loose or contain latent defects through aging. It is therefore strongly recommended that these are removed and that the subfloor is correctly prepared and, if necessary, a surface damp proof membrane or an asphalt screed applied before installation of carpet tiles.
- Raised access flooring panels have a tendency to settle shortly after installation and this should be taken into account when assessing the appearance of the tile/plank installation fitted onto such flooring systems. Ridges between uneven raised access floor panels will telegraph through to the finished tile installation. Uneven or loose floor panels should be levelled or re-fixed before installing Tessera tiles or planks.

Areas to receive flooring shall be adequately lit to allow for proper inspection of the substrate, installation and for final inspection.

It is essential that the laying area is at a steady temperature of 18 to 27˚C for 48 hours prior to, during, and for 24 hours after installation. Prior to installation, the carpet tiles must be allowed to acclimatise in opened boxes, no more than six boxes high, for at least 24 hours in the above conditions. This is particularly important if the tiles have been stored or delivered in conditions of extreme temperature and/or humidity. Where the floor coverings have been stored or transported immediately prior to delivery in temperatures below 10˚C the acclimatisation period should be extended to 48 hours.

Ensure that all recommendations for substrate and jobsite conditions are met prior to beginning the installation. Beginning the installation is an implied acceptance of site conditions by the parties involved and liability for any failure directly related to inadequate site conditions becomes the responsibility of the installer and/or flooring contractor.

Underfloor Heating

Carpet tiles are excellent thermal insulators (Tog value typically 0.7 – 2.0) and this should be taken into account when using with underfloor heating systems. When used with underfloor heating systems the temperature at the surface of the subfloor must not exceed 27˚C. A separate guidance note **"Installation of Forbo Floor Coverings on Underfloor Heating Systems"** provides more information on the conditions for installation in such circumstances.

Inspection

As with any floor covering, the use of different production batches will always result in visible shade differences. It is essential that different batches are not mixed in the same area. When ordering tiles, each floor area (plus spares) must be specified from the same batch.

Prior to installation, boxes should be checked to ensure that the correct tile type, colour, batch number and quantity have been received and that the tiles are in good condition. No claim will be accepted for incorrect colour, pattern or obvious damage if the tiles have been fitted.

The batch number is clearly marked on the packaging and on the reverse side of each carpet tile and must be checked before commencement of installation.

Adhesive Recommendations and Application

Carpet tiles must be adhered using a high grab, all-over tackifier adhesive system; Forbo Eurocol 542 Eurofix Tack Plus is recommended.

The tackifier adhesive must be spread evenly over the entire floor area with particular attention to edges – this will ensure any perimeter tile cuts are fully bonded. Failure to fully bond all full tiles and tile cuts may result in individual tiles shifting and lifting.

Where perimeter tiles are not constrained by fixtures e.g. walls, edge strips etc., it is recommended that such tiles are adhered using a permanent adhesive; Forbo Eurocol 540 Eurosafe Special is recommended.

Adhesives must be applied according to the manufacturer's instructions and it is essential that tackifier adhesives are allowed to dry to a clear, tacky finish before laying the carpet tile. Failure to do so could result in a permanent non-release bond.

Highly absorbent subfloors such as sand/cement screeds and plywood etc. should be primed with Forbo Eurocol 044 Europrimer Multi. The primer should be allowed to dry fully before proceeding with the application of Eurocol 542.

Installation

The following instructions are intended to draw the fitter's attention to current "Best Practice", and must be followed for the relevant product guarantees to be valid. Installation must be carried out in accordance with the requirements of BS 5325:2001 or any subsequent revision and the guidelines contained in the Contract Flooring Association "Guide to Contract Flooring" manual.

General

Any carpet tile can be susceptible to a certain amount of pile distortion when they are taken out of their boxes. This may result in visual differences in appearance between tiles, during, and immediately following, installation. Tile edges may also be more evident immediately after installation.

Note: *these are not manufacturing defects, and after fitting and assuming normal prevailing conditions (under dynamic foot movement) this visual differential will diminish as the pile recovers to its natural position. Recovery will normally take place soon after installation. However, in some cases it can take up to six weeks for the pile to fully condition and develop a uniform visual appearance.*

As with any cut pile carpet, cut pile carpet tiles may be subject to some pile shedding following installation. This is not a product fault and if any pile shedding does occur, it will effectively cease after several cycles of vacuum cleaning and normal use.

Floor protection

Tiles should be protected from dirt and dust before, during and after installation. Failure to do so may affect the performance warranty. When using protective sheeting ensure that all edges are sealed to prevent building debris and dust settling on the carpet tiles. Ensure that any adhesive tape residues on the carpet tile pile surface are removed before use.

Conditioning

Prior to installation, the carpet tiles must be allowed to acclimatise in opened boxes in the laying area at a steady temperature of 18 to 27˚C, no more than six boxes high, for at least 24 hours. This is particularly important if the tiles have been stored or delivered in conditions of extreme temperature and/or humidity.

Setting Out

The location of the starting point in an installation is usually determined by the fitter to maximize the yield. This may be anywhere in the room, but would normally be located as near to the true centre as possible. Small cuts in either the field or perimeter should be avoided.

Having established the starting point for the installation, making some check measurements or dry laying a few rows of tiles will help to identify any potential problems or necessary adjustments to avoid small perimeter cuts.

Pile Direction

The arrow marks on the reverse of every tile indicate the direction of pile lay. The preference of the specifier as to "monolithic", "tessellated" or other visual effects must be confirmed before tiles are installed.

Options for the direction of tile and plank installation will vary between product designs. The installation options are indicated on product sample books and below, but if there is any doubt check with Forbo Flooring prior to installation.

Note: *the term 'broadloom' is often used as an alternative description of monolithic. Whichever term is used, it refers to the installation direction of the carpet tiles. It does not mean that the installation will be viewed as seamless. Tile edges are most visible in new installations. The quality of Tessera carpet tiles' construction will help to reduce the visibility of tile edges over time (with traffic and regular vacuuming) however, tile edges may remain visible during the life of the product in non or low trafficked areas.*

When laying tile or planks in a monolithic format follow the direction of the arrows, which should, where possible, point towards the main light source.

Fitting tiles

Ensure that each tile butts up to its neighbour as tightly as possible without placing the tile under any pressure which may cause peaking.

Fitting edge tiles and cuts

It is important when fitting tiles and cuts to skirting boards or other fixed perimeters that the tile/cut is fitted to any fixed perimeter without exerting any pressure. Any tiles/cuts fitted under pressure may be subject to lifting from the tackifier adhesive – this will cause loss of bond to that tile/cut and the surrounding installation area.

Pile trapping – ensure that each tile butts up to its neighbour as tightly as possible without causing peaks. It is essential that no pile material becomes entrapped between tiles.

Fitting to stair treads and risers

Appropriate stair nosings must be used for every tread. Tiles must be bonded securely to the stair tread using a permanent bond adhesive (Forbo Eurocol 540 Eurosafe Special).

Tiles to risers should be permanently bonded using a suitable contact adhesive.

It important that tiles are fitted to treads with the pile direction (arrows) facing inwards towards the riser and fitted to risers with the pile direction (arrows) facing downwards towards the tread.

Tiles with Resilient Backings e.g. Softbac®

These should be installed according to the general instructions outlined above, but special note must be taken of the following:

(i) Prior to installation, carpet tiles with resilient backings (e.g. Softbac®) should be removed from their boxes as part of the conditioning process and stacked not more than 12 tiles high. The stacked tiles must be allowed to acclimatise for at least 24 hours in the atmospheric conditions which will prevail during use. This is particularly important if the tiles have been stored or delivered in conditions of extreme temperature and/or humidity.

(ii) Because of the potential "spring-back" effect which can lead to gapping, it is essential that resilient backed tiles are tightly fitted. It is essential that no pile material becomes entrapped between tiles.

Note: *Softbac® tiles should be firmly placed against adjacent tiles. Do not slide or force Softbac® tiles into place.*

On completion of the installation

First impressions may have more impact on the client than hours of skilled fitting.

The completed installation should be cleared of scrap material and debris, the floor vacuumed and any traces of adhesive residues removed from the floor and skirtings.

Note: *Upright vacuum cleaners with a mechanically powered brush should be used on all carpet tiles.*

If the floor covering is to be protected from other trades or site traffic prior to project completion, a protection product should be chosen that is appropriate for the type and level of traffic likely to be experienced.

Note: *some protective sheet products with a tacky film in contact with the textile floor coverings can leave an adhesive residue when removed. This can be difficult to remove and attract dirt when the floor covering is put into use. The potential for this effect should be checked with the protection product manufacturer before use and advice on suitability confirmed. Forbo will not accept any claims for soiling problems associated with the use of such products.*

If the optimum performance of any new floor covering is to be achieved, it is important that the correct cleaning and maintenance procedures are used from day one. Cleaning and maintenance guides for all Forbo Flooring Tessera ranges are available for download at: **www.forbo-flooring.co.uk/tesseradownloads**

Cleaning and maintenance guides should be passed onto the main contractor, client or end user as appropriate on completion of the installation, and before any hand over clean is started.

Performance and Construction

These details vary according to carpet selection. Refer to Forbo Flooring Product Literature for Further information.

If in any doubt contact us:

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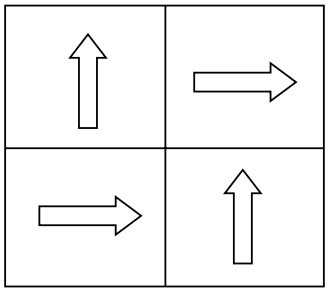
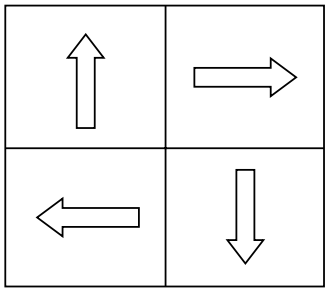
Additional Reference documents and information:

Forbo Floor Coverings Installation Guide: www.forbo-flooring.co.uk
BS8203:2017
The CFA Guide to Contract Flooring (Tel: 01159 411126)

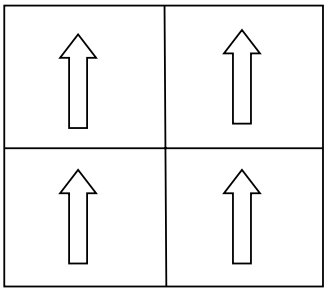
Tessera tile installation options: –
Refer to product brochures for suitable options by product range.



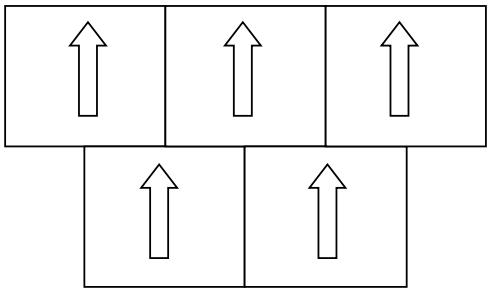
Tessellated



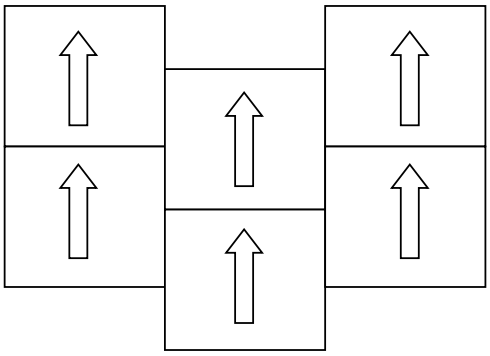
Quarter Turn



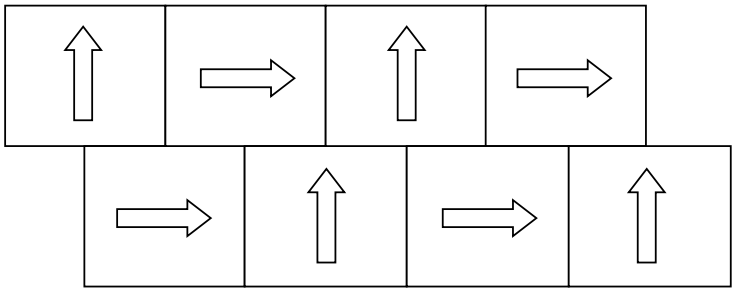
Monolithic



Brick

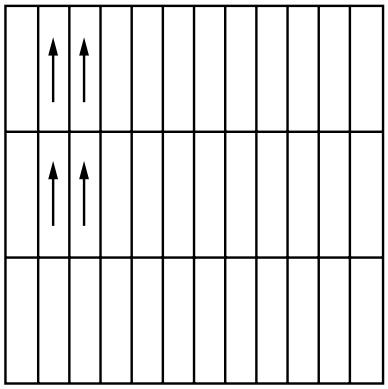


Half drop

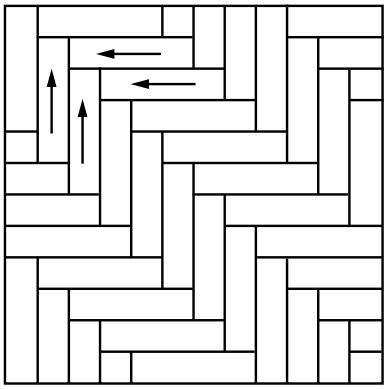


Quarter Brick

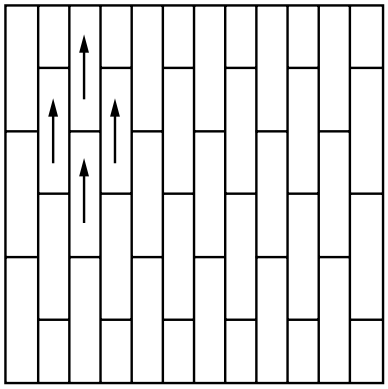
Tessera Plank installation options: –
Refer to product brochures for suitable options by product range.



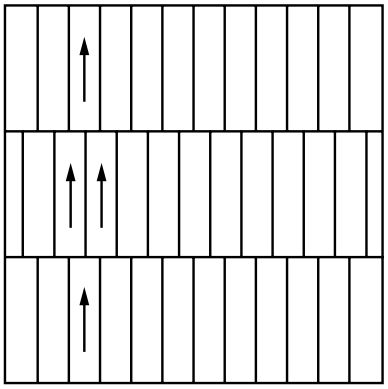
Monolithic



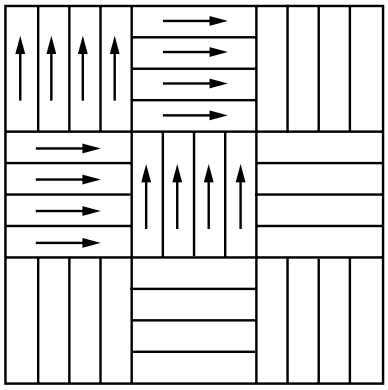
Herringbone



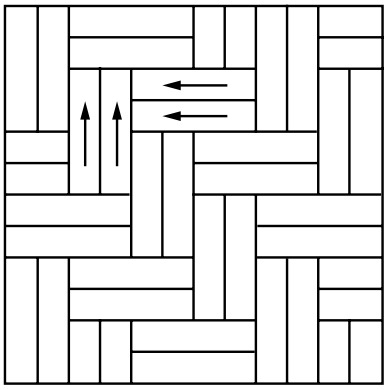
Half Drop



Brick



Weave



Double Herringbone

Roll, Twinroll and Rollbatt

Thermal and acoustic solutions for roof and loft spaces

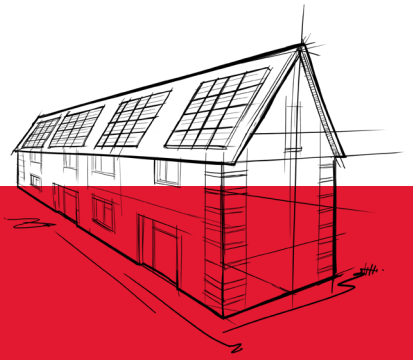
ROCKWOOL provides three variations of Roll to deliver products that are quick and easy to install, in roof and loft spaces for a variety of building types.

ROCKWOOL Roll consists of a single thickness of 1200mm wide roll, which can be cut to fit as required.

Twinroll is pre-split into 2 x 100mm thick layers in a pack, for quick and easy installation. 100mm is installed between the rafters, and then 200mm over the rafters.

Rollbatt is pre-split into either 2 x 600mm widths or 3 x 400mm widths.

- Thermal conductivity of 0.044 W/mK
- Non-combustible - Euroclass A1 classification as defined in EN 13501-1
- Multi-application for roof and loft spaces
- Available as a complete roll, pre-cut widths, or pre-split, for easy installation
- Durability – will not sag or slump



ROCKWOOL Roll, Twinroll and Rollbatt are medium density thermal insulation products with acoustic properties and Euroclass A1 fire resistance.

Just like stone, ROCKWOOL stone wool insulation is durable by nature. Its energy saving power is persistent, which makes it a wise choice in terms of energy costs over the life time of a building.

Pencoed, Bridgend CF35 6NY
Tel: (+44) 1656 862 621 • technical.solutions@rockwool.com

Roll, Twinroll and Rollbatt

Figure 1 - ROCKWOOL Roll

APPLICATIONS

ROCKWOOL Roll products are suitable for a wide range of applications including roof spaces in all types of building and as an overlay for ceiling tiles in suspended ceilings.

Roll, Twinroll and Rollbatt

PERFORMANCE

Thermal performance

ROCKWOOL Roll, Twinroll and Rollbatt products achieve a thermal conductivity lambda (λ) value of 0.044 W/mK, in accordance with BS EN 13162:2012 + A1:2015.

Fire performance

ROCKWOOL Roll products are non-combustible achieving a reaction to fire classification of A1, as defined in EN13501-1.

Acoustic performance

The incorporation of ROCKWOOL Roll, Twinroll and Rollbatt within suitably designed constructions provides improved levels of sound reduction.

The non-directional fibre orientation and density of stone wool means that sound waves are trapped, and vibrations dampened which can significantly reduce outside sources of noise when used in an external wall.

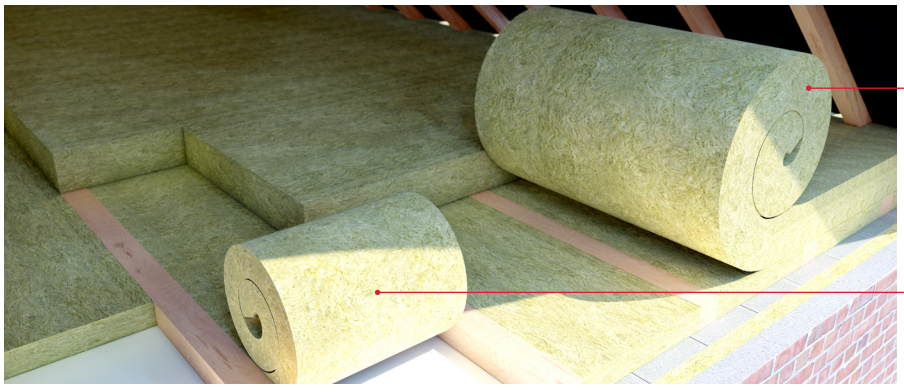
ROCKWOOL insulation retains its shape and thickness for the lifetime of the building, which means it performs acoustically decade after decade.

TYPICAL U-VALUES

Loft insulation - U-values

To comply with Thermal Building Regulations across the devolved nations, new pitched roofs with loft spaces need to achieve U-values of between 0.13 and 0.09 W/m²K. The table below shows different approaches to achieve a range of U-values in a loft application.

U-value (W/m^2K)	Between joists (mm)	Plus	Over joists (mm)	Total thickness (mm)
0.17	100	+	150	250
0.16	100	+	170	270
0.14	100	+	200	300
0.12	100	+	250 (2 x 150)	350
0.11	100	+	300	400
0.09	100	+	400	500



ROCKWOOL Roll/Twinroll/Rollbatt over the joists, cross laid over the joists

ROCKWOOL Roll/Twinroll/Rollbatt laid between the joists

Roll, Twinroll and Rollbatt

TYPICAL U-VALUES

Product information

The following table details the product information and formats for the ROCKWOOL Roll products:

Product	Frame	Thickness (mm)	Width (mm)	Length (mm)	Area (m^2 per pack)	Lambda (W/mK)	R-value (W/m^2K)
Twinroll	Pre-split (2 x 100mm thickness), not pre-cut	200 (2 x 100)	1200	2750	6.60	0.044	2.27
Roll	Single thickness, not pre-cut	150	1200	3200	3.84	0.044	3.41
Roll	Single thickness, not pre-cut	170	1200	3200	3.84	0.044	3.86
Rollbatt	Single thickness, pre-cut	100	1200 (2 x 600)	4800	5.76	0.044	2.27
Rollbatt	Single thickness, pre-cut	100	1200 (3 x 400)	4800	5.76	0.044	2.27
Rollbatt	Single thickness, pre-cut	150	1200 (2 x 600)	3200	3.84	0.044	3.41
Rollbatt	Single thickness, pre-cut	150	1200 (3 x 400)	3200	3.84	0.044	3.41

INSTALLATION

- Water tanks: Insulation should not be placed directly under cold water tanks. Where access is required to water tanks etc, supports should be provided for a raised walkway
- Loft hatches: To preserve the continuity of insulation, loft hatch covers should be insulated with a minimum 100mm thickness of ROCKWOOL Roll. Double-sided adhesive tape may be used to hold the insulation in place
- Electrical Cables: The IEE Wiring Regulations, 17th edition and British Standard BS 7671: 2008 provide guidance on the correction factors to be applied in down-rating cables according to the situation
- Each case should be separately assessed. Where possible, all cables should be lifted free of the insulation

To meet this thermal performance and minimise heat loss through the timbers, ROCKWOOL Roll, Twinroll or Rollbatt should be cross-layered between and over the ceiling joists.

The first layer (generally of 100 mm thickness) is rolled between the ceiling joists, which are normally spaced at 400mm or 600mm centres.

A second layer of ROCKWOOL Roll/Rollbatt (e.g. 170 and 220mm thick) or Twinroll (200mm thick) is then cross-layered to cover the first layer of insulation and the ceiling joists.

Roll, Twinroll and Rollbatt

ADDITIONAL INFORMATION

Durability

ROCKWOOL stone wool is durable by nature. Sample testing from existing buildings shows that ROCKWOOL stone wool retains its performance for at least 65 years* without being affected by compression or temperature and humidity changes.

**FIW, Durability Project Mineral Wool (2016).*

Condensation

ROCKWOOL stone wool insulation allows the construction to breathe, reducing the risk of condensation, which can lead to rot, mould and humidity damage.

STANDARDS AND APPROVALS

Certificate
ROCKWOOL Roll products satisfy the requirements of BS EN 13162 "Thermal insulation products for buildings. Factory made mineral wool (MW) products".
Manufactured under ISO 14001 Environmental Management Systems, and ISO 9001 Quality Management Systems.

CE

INSTALLATION

The product must be installed in accordance with the current ROCKWOOL guidelines. For further information please visit **www.rockwool.com/uk** or contact our Technical Solutions Team on 01656 868490.

SPECIFICATION CLAUSES

The following NBS clauses include ROCKWOOL Roll products:

K10:115, K10:155, K10:165, K10:185, K11:215, K11:225, K11:235, P10:40, P10:45, P10:120, P10:125, P10:130, P10:135, P10:140, P10:210, P10:240, P10:250

Roll, Twinroll and Rollbatt

BUILDING SAFETY AND PRODUCT USE

LEGAL NOTICES

General safety requirements – Building Safety Act 2022

ROCKWOOL Limited is committed to supporting specifiers, resellers and users of ROCKWOOL products for the full life cycle of the product to comply with the obligations and responsibilities set out in the Building Safety Act 2022. With regard to the general safety requirements of the Act, ROCKWOOL Limited cannot control or foresee every situation where its products might be used. We therefore strongly advise that specifiers, resellers and users contact us where use of ROCKWOOL products is contemplated in applications different from those explicitly described in the latest, relevant ROCKWOOL product datasheets; especially in applications that can be reasonably foreseen as critical to safety.

ROCKWOOL Limited reserves the right to amend the specification of its products without notice. Changes to the ROCKWOOL manufacturing process, or to pertinent regulations, may be reflected in changes to tested and certified product performance. Whilst ROCKWOOL Limited endeavours to keep its publications up to date, readers will appreciate that between publications there may be pertinent changes in the law or other developments affecting the accuracy of the information contained in our publications.

ROCKWOOL Limited does not accept responsibility for the consequences of using (including testing or certifying) its products in applications different from those explicitly described in the relevant ROCKWOOL product datasheets. Expert advice should be sought, and ROCKWOOL Limited should be contacted, where such different use is contemplated, or where the extent of any use described by ROCKWOOL Limited is in doubt.

The ROCKWOOL Trademark

ROCKWOOL® - our trademark

The ROCKWOOL trademark was initially registered in Denmark as a logo mark back in 1936. In 1937, it was accompanied with a word mark registration; a registration which is now extended to more than 60 countries around the world.

The ROCKWOOL trademark is one of the most important assets of the ROCKWOOL Group, and is therefore well-protected and defended by ROCKWOOL throughout the world.

If you require permission to use the ROCKWOOL logo for your business, advertising or promotion, you must apply for a Trade Mark Usage Agreement.

To apply, write to:
marketcom@rockwool.com

Trademarks

Registered trademarks of the ROCKWOOL Group include but are not limited to:

ROCKWOOL®, RockClose®, RainScreen Duo Slab®, HardRock®, RockFloor® Flexi®, RockFall®, FirePro®, DuctRock®, BeamClad®, NyRock®

Photography and illustrations

The product illustrations are the property of ROCKWOOL Limited and have been created for indicative purposes only.

Unless indicated below, the photography and illustrations used in this guide are the property of ROCKWOOL Limited. We reserve all rights to the usage of these images.

If you require permission to use ROCKWOOL images, you must apply for a Usage Agreement.

To apply, write to:
marketcom@rockwool.com

ROCKWOOL stone wool - safe to install and live alongside

There are no hazardous classifications associated with stone wool insulation manufactured by ROCKWOOL-UK according to EU REACH and UK REACH regulations on health and the environment.

ROCKWOOL safe use instruction sheets and material safety data sheets (where applicable) can be downloaded **here**.

Sustainability

ROCKWOOL products are used to enrich modern living, creating safer, healthier and more climate-resilient communities.

We transform abundant, natural volcanic rock into stone wool insulation products that are used to reduce energy demand, lower fuel bills and help address society's climate change challenges.

ROCKWOOL stone wool insulation is recyclable and can be transformed into new ROCKWOOL products. Please contact us for details of how we can work together to recycle waste ROCKWOOL stone wool material that may be generated during on-site installation.

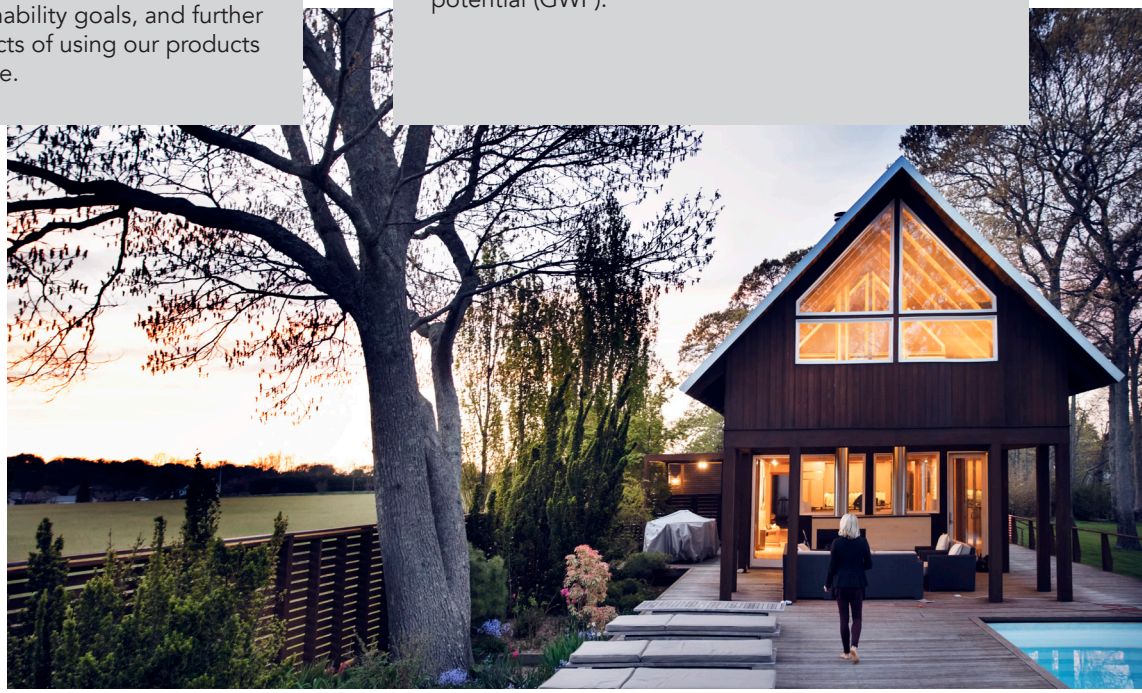
Our annual sustainability reports, which set out progress against our sustainability goals, and further details of the positive impacts of using our products can be found on our website.

Environment

ROCKWOOL takes a fact-based, auditable approach to documenting our progress in maximising our products' positive impact and minimising the effect our operations have on the environment, backed by third-party references and methodologies. Further details can be found online in our annual sustainability report.

Our high-tech production process uses filters, pre-heaters, after-burners and other cleaning and collection systems that help to reduce the effects of our manufacturing operations on the environment.

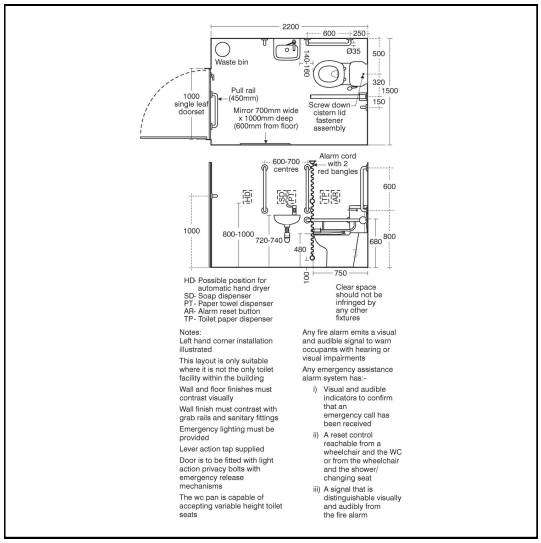
ROCKWOOL stone wool insulation does not contain (and has never contained) gases that have ozone depletion potential (ODP) or global warming potential (GWP).



Doc M Contour 21+ Close Coupled Pack LH

ILLUSTRATED

S0683 Doc M Contour 21+ close coupled left hand corner pack, WC pan, water saving delay fill cistern with spatula lever, basin, grab rails, hinged support rail with toilet roll holder, seat no cover with retaining buffers, copper tails on TMV3 mixer tap



ILLUSTRATED PRODUCT DETAILS

Weights

S0683 69.65 KG

Materials

S0683 Mixed Material

Finishes

S0683 White (AC)

Capacity

S0683 5 litres

Flow rates

S0683 4 Litres per minute @ 3 bar pressure

FINISH OPTIONS

(AC) White

(LI) Blue

(LJ) Grey

(MY) Stainless Steel finish

(RN) Charcoal

Standards

Vitreous china to BS 3402

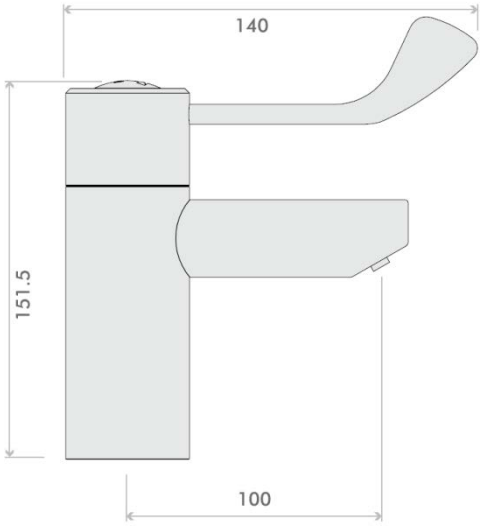
BS8300 compliant

Special Notes

Doc M packs are available both right and left hand corner arrangement, illustrated is left hand arrangement. Supplied with layout drawings, detailing the fixing positions necessary for Doc M compliance

ACCREDITATIONS

FEATURES



Sequential Thermostatic Basin Mixer Tap

Code
SCBW120

Description
Lever operated sequential thermostatic deck mounted mixer tap.

Features
- Simple smooth operation
- Safe touch body
- TMV3 approved integrated thermostatic mixing valve
- HTM compliant.
- HBN compliant.
- WRAS approved.
- Supplied with flexi tails
- Self draining spout.

Technical Specification:
Max operating pressure: 10.0 bar static
Min operating pressure: 0.2 bar dynamic
Max inlet temperature: 85°C
Pre-set factory temperature: 43°C

Compatible extra:
SCBW115: Copper tail pack for HBN compliance

Finish:
Chrome

Flow Rate (Bar – Ltr/Min):

Bar	0.2	0.5	1.0	1.5	2.0	3.5
Un-regulated	8	8	12	15	17	22

BUILDING TRUST

PRODUCT DATA SHEET

Sikafloor® Level-30

HIGH PERFORMANCE, SELF LEVELLING AND FAST DRYING, CEMENTITIOUS SCREED FOR INTERIOR OR EXTERIOR IN 4 – 30 MM

PRODUCT DESCRIPTION

Sikafloor® Level-30 is a polymer modified, pumpable, self levelling fast drying cementitious screed for higher thickness interior or exterior floors, meeting the requirements of class R3 according to EN 1504-3.

USES

Sikafloor® Level-30 is an floor self levelling screed to level or smooth screeds and concrete floors at a thickness between 4–30mm in one working step.
Sikafloor® Level-30 is useable as screed for industrial service conditions when sealed with a PU or EP resin top coat from medium to high load (heavy-traffic + forklift pallet truck with impact load)
Sikafloor® Level-30 is also suitable for filling, smoothing and levelling of suitable substrates before applying parquet, ceramic tiles, seamless resinfloors, textile, elastic floor coverings
Sikafloor® Level-30 is useable as screed for exterior areas when sealed with a covering e.g. a coating.

- Suitable for restoration work (Principle 3, method 3.1 of EN 1504-9).
- Suitable for structural strengthening (principle 4,method 4.4 of EN 1504-9).
- Suitable for preserving or restoring passivity (Principle7, method 7.1 and 7.2 of EN 1504-9).

CHARACTERISTICS / ADVANTAGES

- Self smoothing and highly fluid
- Easy to place by pump or manual application
- Ready for use.
- Low shrinkage.
- Maintains good workability and joint healing throughout its pot life
- Fast setting and drying
- 3-4 hours walk on time (+20 °C)
- Good surface appearance and hardness
- Excellent freeze-thaw salt resistance. (R3)
- Casein and Formaldehyde free
- Suitable for use with under floor heating systems

ENVIRONMENTAL INFORMATION

- EC 1plus R: Very low emissions.

APPROVALS / STANDARDS

- Cement based screed CT-C40-F10-A12 according to EN 13813, declaration of performance 90432755, and provided with CE marking
- Cement based screed A1/A1fl according to EN 13813, declaration of performance 90432755, assessed by notified laboratory 1140, and provided with CE marking
- Cement based screed class R3 for the principles 3 (CR), 4 (SS) and 7 (RP) according to EN 1504-3, declaration of performance 36581792, assessed by notified laboratory 1139, and provided with CE marking

PRODUCT INFORMATION

Chemical Base	Polymer modified rapid hardening cement.
Packaging	25 kg bags
Appearance / Colour	Powder - beige-grey

Shelf Life	9 months from date of production
Storage Conditions	stored properly in original, unopened and undamaged packaging in dry conditions at temperatures between +5 °C and +30 °C.
Density	~ 2.0 kg/l
Bulk Density	~ 1.25 kg/l

TECHNICAL INFORMATION

Abrasion Resistance

Class	Value	Method	
A12	12 cm^3 / 50 cm^2	Böhme	(EN 13892-3)
AR 0.5	< 50 µm	BCA	(EN 13892-4)
RWA 100	< 100 cm^3	RWA	(EN 13892-5)

Compressive Strength (EN 13892-2)

Time	Temperature	Value
24 hours	20 °C	~ 20 N/mm^2
28 days	20 °C	≥ 40 N/mm^2

Flexural Strength (EN 13892-2)

Time	Temperature	Value
24 hours	20 °C	~ 3 N/mm^2
28 days	20 °C	≥ 10 N/mm^2

Tensile adhesion strength (EN 13892-8)

Time	Temperature	Value
28 days	+20 °C	≥ 1.5 N/mm^2

Coefficient of Thermal Expansion
α ~ 16.3x10^{-6} / °C (EN 1770)
(for temperature range -20 °C and +40 °C)

Water Absorption
W ~ 0.5 kg / (m^2 x $h^{0.5}$) (EN 13057)

SYSTEM INFORMATION

System Structure

Priming	See substrate pre-treatment
Levelling	Apply to the required thickness 4–30 mm
Sealer	Sikafloor®-304W, -305W and -2540W
Coatings	All kinds Sikafloor® EP and PU coatings
Adhesives	Sikabond® -T52, -T54 , -T54FC eg. SikaCeram® product range for the tile adhesives

APPLICATION INFORMATION

Mixing Ratio	5 to 5.25 L water for 25 kg Sikafloor® Level-30
Consumption	~ 1.8 kg/m^2/mm
Layer Thickness	4 - 30 mm
Ambient Air Temperature	≥ +10 °C and ≤ +25 °C
Relative Air Humidity	< 75 %
Substrate Temperature	≥ +10 °C and ≤ +25 °C

Substrate Pre-Treatment

Normal intended use of the floor
The one part acrylic primer Sikafloor®-01 Primer is recommended for a pore free surface with very good surface adhesion. Refer to the relevant PDS for the recommended application details etc.
High loads intended use of the floor
Priming with epoxy resins such as Sikafloor® -155WN, Sikafloor® -150 or Sikafloor® -151 fully broadcast with quartz sand 0.3–0.8 mm.

Pot Life

Temperature and Relative Air Humidity	Time
+23 °C / 50%	~ 25 minutes

The temperature will affect the pot life.
Application at temperatures above +23 °C will reduce the pot life and the working time. Temperatures below +23 °C will increase the pot life and extend the working time.

Waiting Time / Overcoating

Covering	Layer Thickness	Waiting Time
Impermeable or moisture sensitive coatings	≤ 15 mm	24 hours[1]
Impermeable or moisture sensitive coatings	≤ 30 mm	48 hours[1]
Cermanic covering	≤ 30 mm	24 hours

1. Times are approximate and at +23 °C and 50% r.h. and thus will be affected by changing substrate and ambient conditions, particularly the temperature and relative humidity.

When overcoating Sikafloor® Level-30 always ensure the moisture content has achieved the required value for the coating product, as the waiting time will vary with the application thickness and ambient humidity. (Refer to the coating product data sheet)

Applied Product Ready for Use

At +20 °C and 50% r.h.

Foot traffic	~ 3 hours
Lightly serviceable	~ 24 hours

Note: Times are approximate and will be affected by changing substrate and ambient conditions, particularly the temperature and relative humidity.

SUBSTRATE QUALITY / PRE-TREATMENT

- The concrete substrate must be sound and of sufficient compressive strength (> 25 N/mm²) with a minimum pull off strength of 1.5 N/mm².
- The surface must be clean, dry and free of all contaminants e.g. dirt, oils, grease, coatings and surface treatments etc.
- If in doubt apply a test area first.
- Weak concrete must be removed and surface defects such as blow holes and voids must be fully exposed.
- Cement laitance, paints or other surface treatment agents must be completely removed.
- Suitable methods for surface preparation are high pressure water jetting or abrasive blast cleaning. Other pretreatments such as scarifying , milling, etc. must necessarily another post with a Jet/blast method to eliminate the remaining structural faults, this to remove cement laitance and achieve an open and sound textured surface.
- Prerequisite for a good bond between the substrate and levelling screed is an appropriate roughness of the substrate. The mean surface roughness should be as large as possible, but at least 1mm.
- Repairs to the substrate, filling of blowholes/voids must be carried out using appropriate products from the SikaTop®, Sika® MonoTop®, Sikafloor®, SikaDur® and Sikagard® range of materials.
- All dust, loose and friable material must be completely removed from all surfaces before application of the product, preferably by brush and/or vacuum.
- Dewpoint: Beware of condensation!
  The substrate and uncured floor must be at least 3 °C above dew point to reduce the risk of condensation, blooming or laitance on the floor finish.
- A suitable one part acrylic primer such as Sikafloor® -01 Primer.
- High mechanical forces on the floor, a floor placed on soil or poor weak substrates must be primed with Sikafloor®-150 or Sikafloor® -151 fully broadcast with quartz sand 0.3 – 0.8 mm. Remarks; quartz sand not aplied in excess and grains must not be fully sealed with the resin.
- Do not apply on substrates with rising moisture. If rising moisture can occure an effective damp proof membrane must be applied and be in compliance with the relevant national standard.

MIXING

By Hand
For 25 kg Sikafloor® Level-30 is required 5 to 5.25 l water. When mixing manually add the dry powder (25 kg) into a container with the clean water.
Mix thoroughly for a minimum of 3 minutes, by use of an electric stirrer, recommended is the use of a double disc stirring paddle or a spiral mix paddle (< 500 rpm).
maturing time: After mixing leave the material to stand in the container for ~ 2 minutes until the majority of air bubbles have dispersed.

Pumping
When using a mortar pump with appropriate equipment (Putzmeister MP 20/25, DuoMix 2000 or PFT G5 FE) set the machine in a way that a uniform mixture is achieved. The use of a remixer is recommended.
Control the water dosage to achieve the required flow, measuring the final average flow diameter on a flat, clean, dry flow table.

Tool	Flow	Standard
Ø = 30 mm H = 50 mm	130 mm ± 5 mm	EN 12706
Ø 70 / 100 mm H = 60 mm	355 mm ± 10 mm	ASTM C 230-90 EN1015-3
Ø = 60 mm H = 120 mm	290 mm ± 10 mm	Sika AT method

APPLICATION

Pour the mixed material onto the primed surface and apply by trowel or pin screed rake to the required thickness. Roll thoroughly with a spiked roller in two directions to remove any entrapped air. Best application time would be during falling temperatures.

CLEANING OF TOOLS

Clean all tools and application equipment with water immediately after use. Hardened / cured material can only be removed mechanically.

LIMITATIONS

- Very absorbent substrates must be primed or saturated with water to prevent loss of the mixing water into the substrate and which can cause problems such as shrinkage, the appearance of surface pores or weak and dusty surfaces etc.
- Do not mix with other cements or cement based screeds.
- No loading for at least 3 hours.
- Freshly applied Sikafloor® Level-30 must be protected from damp, condensation and water for at least 24 hours.
- Do not exceed the recommended water dosage. Do not add more water when the product is starting to set.
- Do not exceed the recommended thicknesses.
- Raw material-related variations in the color, texture, pores on the surface are in mineral systems (floor leveling compounds) normal and no reason for complaint. Also under certain circumstances (drafts, sunlight, low humidity, etc.) fine "hairline cracks" can be expected.
- To ensure optimum of colour consistency, it is essential that the floor laying operation is as clean and protected from the environment as possible.
- The surface must be sealed for a final floor finish for best curing and aesthetic appearance.
- Temperatures below +20 °C extend the drying times.
- Not suitable for slopes or inclines > 0.5%.
- Protect from direct sunlight, hot or strong winds and extremes of temperature to avoid cracking or crazing. These small superficial hairline cracks or crazing is normal occurrence under these conditions and do not constitute a reason for claim.
- When overcoating with SikaCeram® or Sikabond® adhesives (or others), additional mechanical preparation may be required to remove any cement laitance which may have formed during application.
- A preliminary test area is recommended when other products are used for covering.
- Contact with vertical structures should be avoided by putting in a perimeter isolating strip.
- The thickness of the levelling mortar has to be at least 4mm when using water-based adhesives under impermeable or vapour tight floor finishes.
- When used as R3 repair for carbonation protection, Sikafloor® Level-30 must always be used in combination with a suitable coating.

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

ECOLOGY, HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall

refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data.

GISCODE

ZP-1 - cement products, low in chromate.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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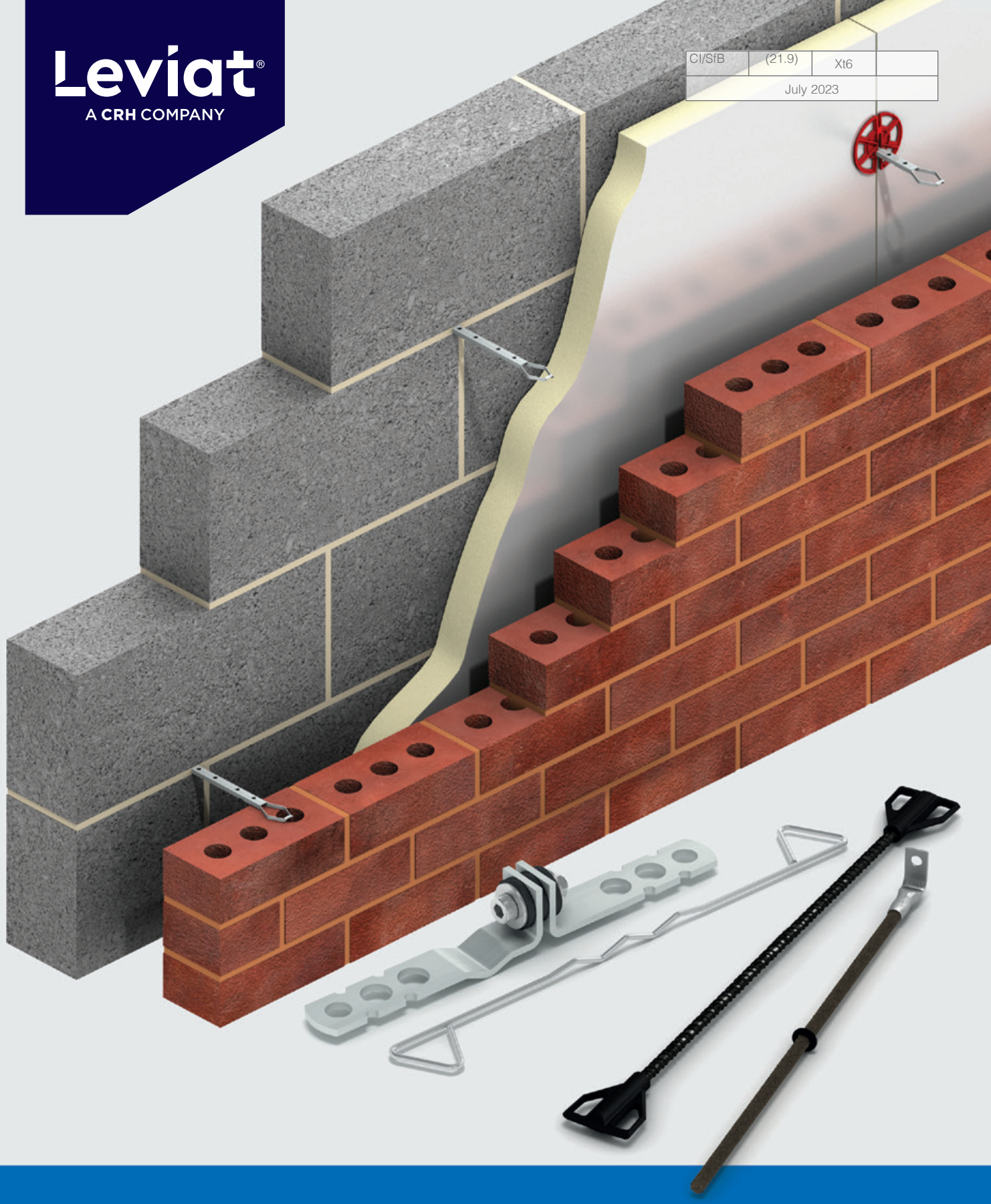
Leviat®
A CRH COMPANY

CI/SfB	(21.9)	Xt6	
July 2023			



Ancon®

Wall Ties & Restraint Fixings

for the Construction Industry

We are one team.
We are Leviat.

Leviat is the new name of CRH's construction accessories companies worldwide.

Under the Leviat brand, we have united the expertise, skills and resources of Ancon and its sister companies to create a world leader in fixing, connecting and anchoring technology.

The products you know and trust will remain an integral part of Leviat's comprehensive brand and product portfolio. As Leviat, we can offer you an extended range of specialist products and services, greater technical expertise, a larger and more agile supply chain and better, faster innovation.

By bringing together CRH's construction accessories family as one global organisation, we are better equipped to meet the needs of our customers, and the demands of construction projects, of any scale, anywhere in the world.

This is an exciting change. Join us on our journey.

Read more about Leviat at Leviat.com

Our product brands include:

Ancon

HALFEN

HELIFIX

ISEDIO

PLAKA

Imagine. Model. Make.

Leviat.com

Product Approvals & Certifications

From the 1st January 2021 there are a number of changes to the product approvals on our products due to changes to product marking.

The table below highlights the relevant markings for each of our Wall Tie & Restraint Fixings range. Full DoPs can be downloaded from our website at: www.ancon.co.uk/approvals

UKCA Marking

The UKCA (UK Conformity Assessed) marking is the new UK product marking that will be used for goods being placed on the market in Great Britain.

CE UKNI Marking

The UKNI marking is a new conformity marking for products placed on the market in Northern Ireland which will be used on products that have undergone mandatory third-party conformity assessment by a body based in the UK.

CE Marking

For products used in Europe the existing CE mark will still remain. Our DoPs have been updated, please visit www.ancon.co.uk/approvals for the latest version for the products highlighted below.

Product	UKCA	CE UKNI	CE	NBS Plus	CAD Details	BIM
HRT4	✓	–	✓	✓	✓	✓
RT2	✓	–	✓	✓	✓	✓
ST1	✓	–	✓	✓	✓	✓
Two-Part Tie	✓	✓	–	✓	✓	✓
SDB 125-300mm	✓	–	✓	✓	–	✓
SDB 301-450mm	✓	✓	–	–	–	–
SDS 150-525mm	✓	✓	–	–	–	–
SPB 75-300mm	✓	–	✓	✓	✓	✓
PPS 150-300mm	✓	–	✓	✓	✓	✓
PPB 125-225mm	✓	–	✓	✓	✓	✓
SPV 75-300mm	✓	✓	–	✓	✓	–
PPV 125-225mm	✓	✓	–	✓	✓	–
Staifix Cavity Starter Tie	✓	✓	–	✓	✓	–
Staifix Frame Tie	✓	✓	–	✓	✓	–
Staifix StarterTie	✓	✓	–	✓	✓	–
STF6 50mm, 75mm, 100mm	✓	✓	–	✓	✓	–
TJ2 205, 230, 255, 280, 305mm long	✓	✓	–	✓	✓	–
Acoustic Tie 175-300mm	✓	✓	–	✓	✓	–
SD21,25,28 125-300mm	✓	–	✓	✓	–	21,25
SP21,28,30,38,36 75-200mm	✓	✓	–	✓	–	21
DT 150-300mm	✓	✓	–	✓	–	–
SPS 150-300mm	✓	–	✓	✓	–	–
SPS CJ 150mm	✓	–	✓	✓	–	–
TFMT7 50-150mm cavity	✓	✓	–	✓	–	–
Tim6 175, 200, 225, 250mm	✓	✓	–	✓	–	–
PP21 125-225mm	✓	✓	–	✓	–	–
PP28,30,36,38 125mm-300mm	✓	✓	–	✓	–	–
SD30,38,40 125mm-300mm	✓	✓	–	✓	–	–
SDV 125-300mm	✓	✓	–	✓	–	–
Briclok	✓	✓	–	✓	–	–
Column Tie 125mm - 300mm	✓	✓	–	✓	–	–
HiT Tie	✓	✓	–	✓	–	–
Internal Column Tie 179, 186, 224 and 232mm	✓	✓	–	✓	–	–
WHX 150-200mm	✓	✓	–	✓	–	–
Y,M,L,D,Z End Ties	✓	✓	–	✓	✓	–

Ancon®

Wall Ties and Restraint Fixings

For building with brick, block and stone

Wall ties and restraint fixings are an essential element in the stability of masonry panels.

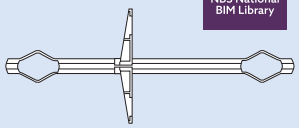
Leviat manufactures Ancon restraint ties in a variety of lengths and types for restraining brickwork, blockwork and stonework. Restraints can be fixed to a variety of substrates including concrete, structural steelwork, SFS, timber and all types of masonry.

Products are manufactured from stainless steel unless stated otherwise.

The range of standard ties provides a solution for all types of wall construction and many products can be delivered in 24 hours. These items are shown in ***red italics***.

BIM

A number of Ancon wall ties are available as BIM Objects for use in a 3D building model and its associated component database. Visit www.ancon.co.uk/BIM or the NBS National BIM Library to download our objects in Revit, IFC, ArchiCAD, Vectorworks and Bentley file formats.



Dedicated sales and technical support

Distributors nationwide

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Webinars available online

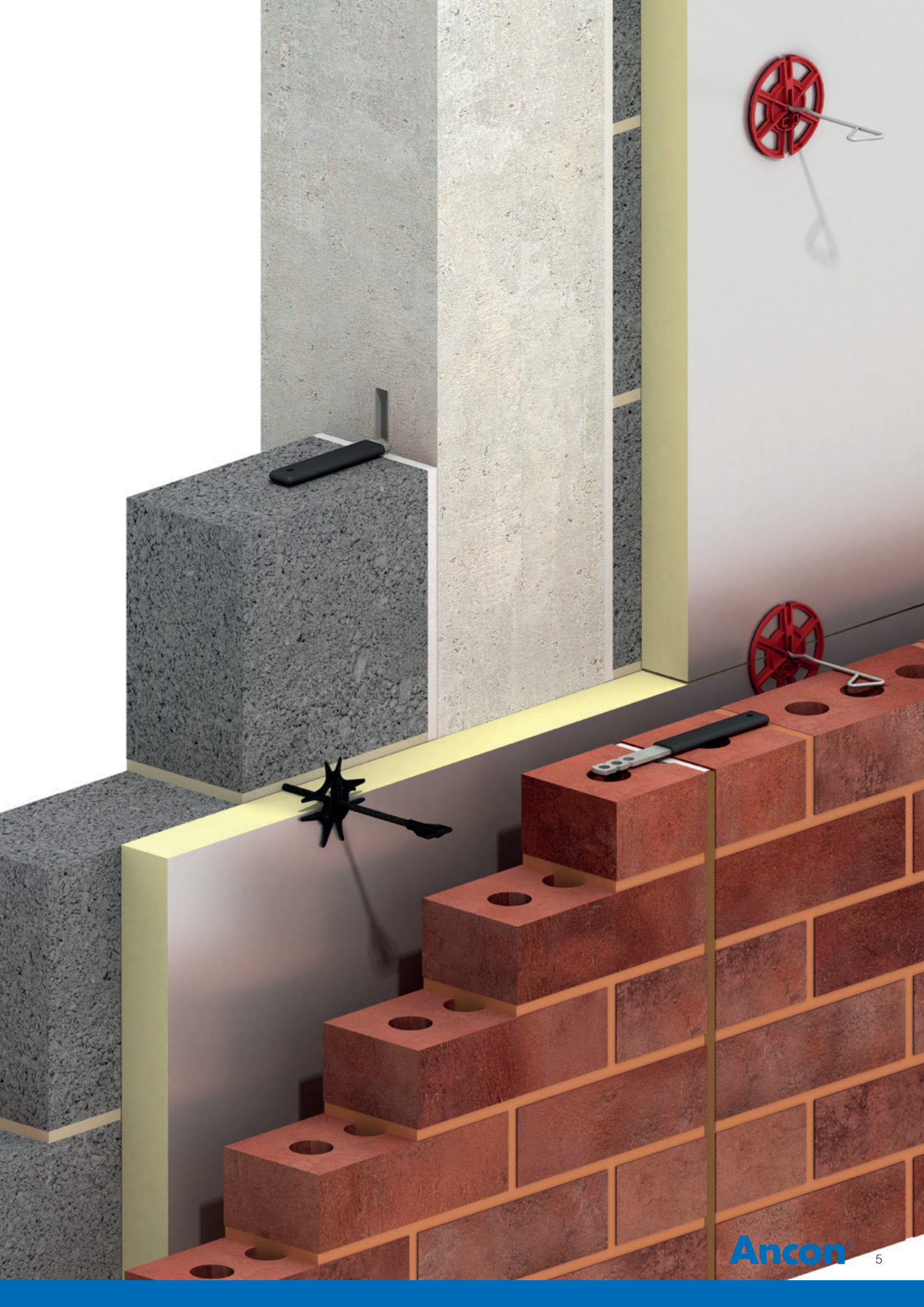
Product information in NBS format

ISO 9001, ISO 14001 & ISO 45001

BIM Objects available

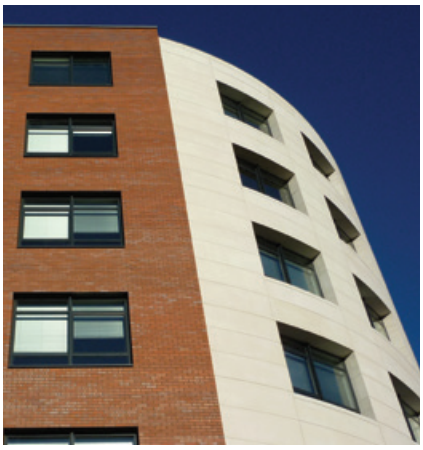
UKCA and CE or CE UKNI Compliance

Contents



Wall Ties and Restraint Fixings

© Hazle McCormack Young



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Cavity Wall Tie Selection

The selection and spacing of wall ties depend on many factors. These include type of masonry to be tied, cavity width, type and height of building and geographical location. There are several documents which need to be consulted and are summarised here.

Eurocode 6 – Design of Masonry Structures (BS EN 1996-1-1: 2005)

In 2010, Eurocode 6 became the main code for the design of reinforced and unreinforced masonry. Eurocode 6 refers to EN 845-1 for wall ties and sets the density of ties per square metre based on the declared value of the tie. The material factor of 3.0 for detailed calculations is specified in the UK National Annex.

BS EN 845-1: 2013 Specification for Ancillary Components for Masonry – Part 1: Wall Ties, Tension Straps, Hangers and Brackets

This European Standard specifies the requirements for wall ties used for interconnecting masonry and for connecting masonry to beams, columns or other parts of the building. Materials, tolerances, tie variations and the requirements for declared values, are all covered in this standard. For tie Types and qualifying criteria refer to PD 6697: 2019.

PD 6697: 2019 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2

Published Document 6697 contains non-contradictory, complementary information from the withdrawn British Standard BS 5628, which was not included in the BS EN 1996 series.

It includes recommendations on tie lengths, embedment, density, material and positioning. Masonry-to-masonry ties are classified as Types 1 to 4; the relevant classification is determined by strength, function and use. Minimum declared values for tension and compression are listed on page 7 for each tie Type.

Approved Document E: Resistance to the Passage of Sound

This document specifies the acoustic performance requirements of ties suitable for use in separating walls (Type A) and external walls (Type B) of new build dwellings.

Type A ties must have a measured dynamic stiffness of <4.8MN/m³ for the specified minimum cavity, at a standard density. Type A ties in this literature are indicated by this logo e.g. Staifix HRT4, page10.

All Ancon ties which cross a cavity meet the requirements of Type B.

BS 5628, Code of Practice for the Use of Masonry

BS 5628 was withdrawn when the Eurocode became the accepted National code in March 2010. The majority of information in this British Standard has been reproduced in PD 6697: 2019.

BS 5268-6.1: 1996 (Incorporating Amendments No. 1 and 2): Structural use of timber – Dwellings not exceeding seven storeys

BS 5268 provides recommendations for wall ties for timber framed buildings. Information is provided for the type of structure, location, embedment, density and positioning. These ties are classified as Types 5 to 7; minimum declared values in tension and compression are listed for Types 5 and 6.

Although BS 5268 was officially withdrawn on the full implementation of Eurocodes in March 2010, timber frame wall ties should continue to be selected from Types 5 to 7 as given in Annex B of BS 5268 Part 6.1: 1996, until further guidance is made available.

Wind Code Variations

Masonry wall ties should be selected from the Types in PD 6697: 2019 and timber frame wall ties should be selected from the Types in BS 5268. These two documents use different Wind Codes.

The maximum wind speeds referred to in PD 6697: 2019 are based on ten minute return periods according to the current Wind Code BS EN 1991-1-4: 2005.

The geographical locations in BS 5268-6.1 are based on hourly return period wind speeds according to BS 6399-2: 1997.

Wall tie types and appropriate wind speed maps relevant to each wind code are shown on page 7. However we encourage specifiers to refer to the relevant code for complete information prior to making a specification.

Wall Tie Product Selector

Available on our Ancon website, this easy to use product selector enables selection of the most appropriate wall ties for your application. Simply answer a series of multiple choice questions about wall type, inner leaf construction, building type and height, insulation and cavity width, to arrive at the required solution.

Minimum Requirements for Wall Ties to PD 6697: 2019 (Table 12) and BS 5268-6.1: 1996 (Annex B)

Type of Tie	Minimum Mortar Class and Designation	Tensile Load Capacity (N)	Compressive Load Capacity (N)
1	M2 (iv)	2500	2000
2	M2 (iv)	1800	1050
3	M2 (iv)	1100	650
4	M2 (iv)	650	350
5	M4 (iii)	600	425
6	M4 (iii)	630	440
7	M4 (iii)	To be declared by the Wall Tie Manufacturer	

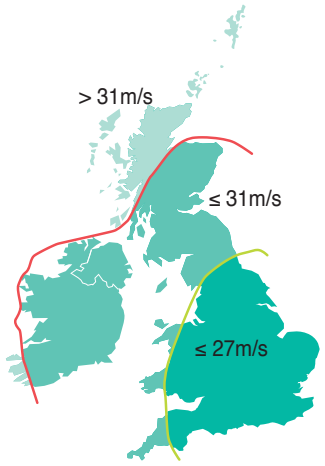
Lime Mortars

Ancon stainless steel wall ties and Teplo-BF wall ties are suitable for use with lime mortars (minimum strength HLM2); tie selection should be based on the general guidance given here.

Masonry-to-Masonry Wall Tie Types to PD 6697: 2019

Type	Application	Density	Maximum Building Height	Geographical Location
Type 1	Heavy duty tie suitable for most building sizes and types. Not very flexible and not recommended for applications where there is expected to be excessive differential movement between leaves	2.5 ties/m² 3-4 ties/m² at unbonded edges	Any Height	Suitable for most sites. However, for relatively tall or unusually shaped buildings in vulnerable areas such as coastal sites, the tie provision should be calculated
Type 2	General purpose tie for domestic and small commercial buildings made with box-form masonry walls	As Type 1	15m	Suitable for flat (less than 1 in 20) open sites where the fundamental basic wind velocity does not exceed 31m/s and altitude is not more than 150m above sea level. Could be adequate for higher altitudes and sloping sites exceeding 1 in 20, if calculated.
Type 3	Basic wall tie generally as Type 2 above	As Type 1	15m	As Type 2 but fundamental basic wind velocity limited to 27m/s
Type 4	Light duty wall tie suitable for box-form domestic dwellings with leaves of similar thickness	As Type 1	10m	Suitable for flat sites (less than 1 in 20) in towns and cities where the fundamental basic wind velocity does not exceed 27m/s and altitude is not more than 150m above sea level

Note: Fundamental basic wind velocity must be calculated for the specific altitude of the site, refer to Clause NA.2.4 in NA to BS EN 1991-1-4:2005. The table above provides only a brief summary of information. Refer to PD 6697:2019 and NA to BS EN 1991-1-4:2005 for complete information.

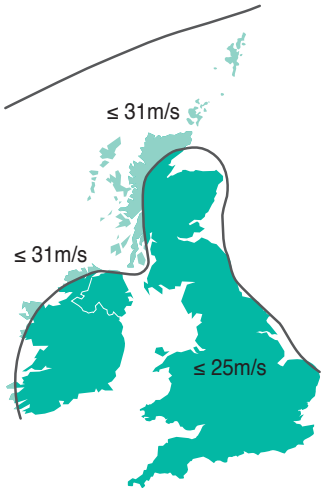


Information adapted from NA to BS EN 1991-1-4:2005 for use with PD 6697:2019, calculating c_{alt} for an altitude of 150m above sea level. For some projects this may be conservative. Contact Leviat for further details.

Masonry-to-Timber Tie Types to BS 5268-6.1: 1996

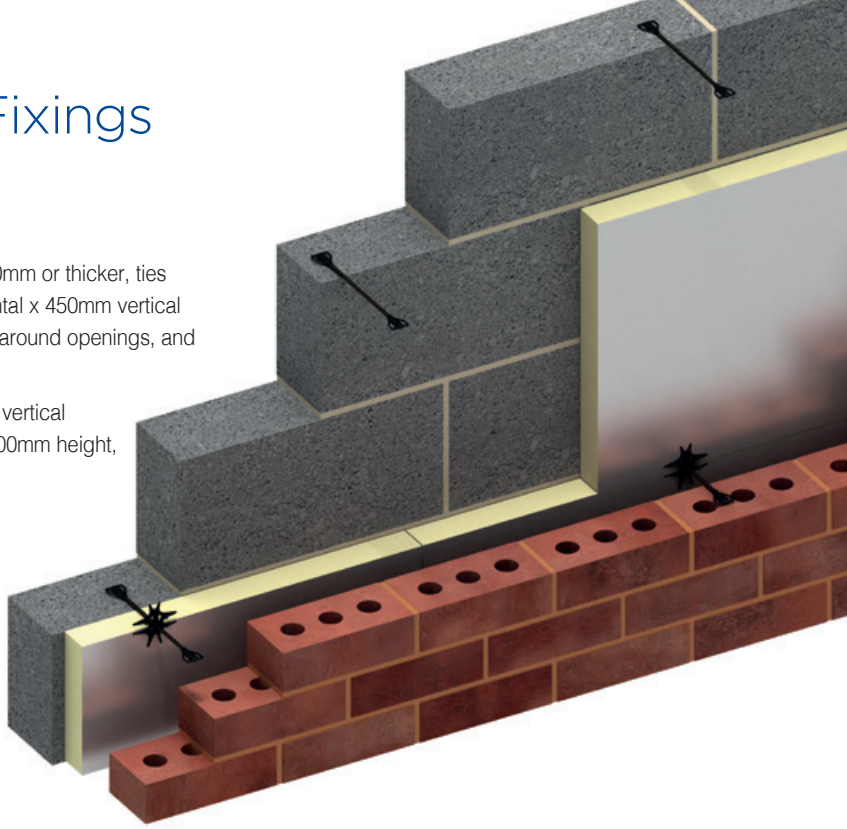
Type	Application	Density	Maximum Building Height	Geographical Location
Type 5	Timber frame tie suitable for domestic houses and industrial/ commercial developments of up to three storeys	4.4 ties/m² 3-4 ties/m at unbonded edges	15m	Suitable (at a density of 4.4 ties/m²) for buildings on flat sites in towns and cities where the basic wind speed does not exceed 25m/s and altitude is not more than 150m above sea level. In more severe situations the tie density should be increased to 7 ties/m²
Type 6	As Type 5 but suitable for developments of up to four storeys	As Type 5	15m	Suitable (at a density of 4.4 ties/m²) for buildings on flat sites in towns and cities where the basic wind speed does not exceed 25m/s and altitude is not more than 150m above sea level. In more severe situations the tie density should be increased to 7 ties/m²
Type 7	As Type 5 but suitable for developments of between five and seven storeys, being designed to accommodate the increased vertical differential movement	Calculated for actual performance required for each site location	15m	Calculated for actual performance required for each site location

Note: Refer to BS 5268-6.1: 1996 and BS 6399-2: 1997 for complete information.



Wind speed information taken from BS 6399-2:1997 Code of Practice for Wind Loads for use with BS 5268-6.1:1996.

Wall Ties and Restraint Fixings



Density & Positioning of Ties

PD 6697: 2019 recommends that for walls in which both leaves are 90mm or thicker, ties should be used at not less than 2.5 per square metre (900mm horizontal x 450mm vertical centres). Ties should be evenly distributed over the wall area, except around openings, and should preferably be staggered.

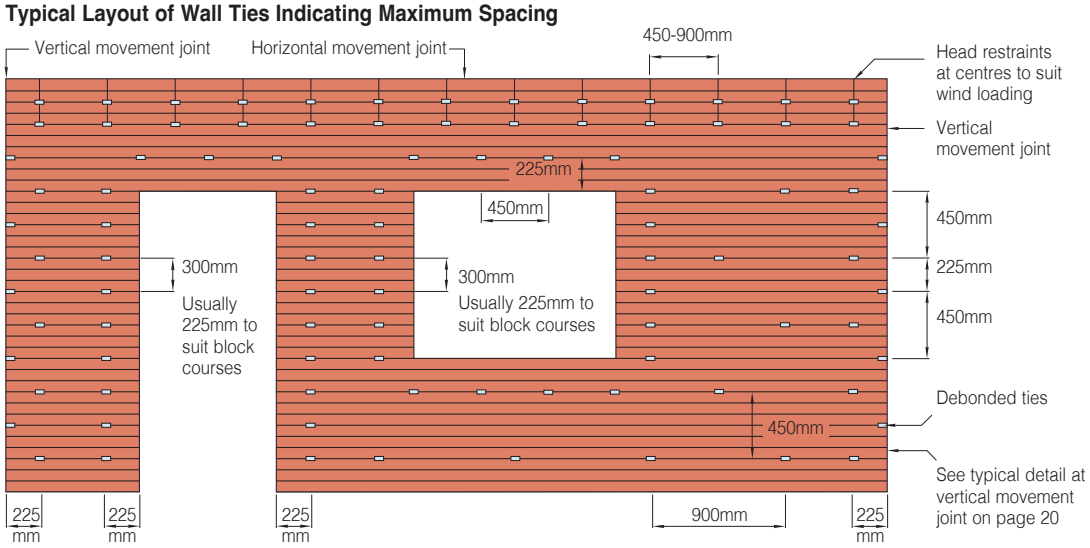
At vertical edges of an opening, unreturned or unbonded edges, and vertical expansion joints, additional ties should be used at a rate of one per 300mm height, located not more than 225mm from the edge.

A typical layout is shown below. Various details incorporating debonding ties at vertical movement joints are shown on page 20.

Lime Mortars

Ancon stainless steel wall ties and Teplo-BF wall ties are suitable for use with lime mortars (minimum strength HLM2). Tie length, spacing and density should be the same as for cement mortars where the performance is based on M2 (iv).

Typical Layout of Wall Ties Indicating Maximum Spacing



Standard spacing for cavity brickwork 900mm x 450mm centres in a staggered pattern (2.5 ties per square metre)
Refer to PD 6697 : 2019 for complete information.

Length of Tie & Embedment

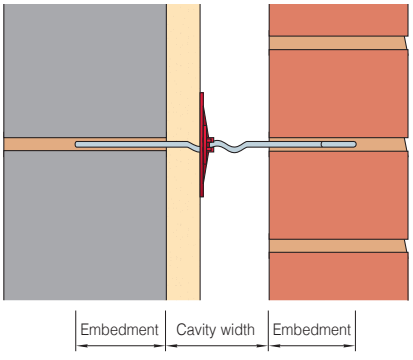
Wall ties should be of the correct length to ensure they are properly embedded in the masonry.

Masonry-to-masonry wall ties are typically symmetrical and should be centred from the middle of the cavity to ensure equal embedment in each leaf.

The minimum embedment of symmetrical Ancon wall ties, i.e. ST1, RT2, HRT4 and Teplo-BF, is 50mm in each leaf and the PD 6697: 2019 Tie Types declared by us are backed by independent testing at this minimum embedment.

However, we recommend tie lengths which achieve a design embedment of between 62.5mm and 75mm in each leaf (see table), to allow for site tolerance in both cavity width and centring of the ties.

Cavity width on site should be monitored to ensure the correct wall tie length is used. If the cavity width grows to such an extent that the embedment range of the wall tie is exceeded, longer wall ties will be required. Please contact us for guidance.



Embedment of Wall Ties

Recommended Lengths of Masonry / Masonry Wall Ties

Cavity Width (mm)	Length of Wall Tie (mm)
50-75	200
76-100	225
101-125	250
126-150	275
151-175	300
176-200	325
201-225	350
226-250	375
251-275	400
276-300	425
301-325	450
326-350	475
351-375	500
376-400	525
401-425	550
426-450	575

Installation Guidance

Wall ties are important to the stability of masonry and failure to install them correctly may lead to damp penetration, cracking or even the collapse of walls.

Wall ties should be pressed down in fresh mortar. They should be surrounded by mortar and not simply positioned directly onto masonry with mortar placed around them. To ensure cavity wall ties are effective at tying the leaves together they should be installed as the inner leaf is constructed and not simply pushed into a joint.

Ideally, ties should be installed level or with a slight fall to the outer leaf, not towards the inner leaf as this could provide a path for moisture to cross the cavity.

The drip part of the tie should point downward and be positioned near the centre of the open cavity. Ties with multiple drips, like the Ancon Staifix and Ancon ST1, should be positioned centrally as a drip will normally be near the centre of the open section of a partial fill cavity.

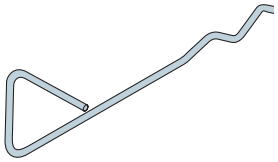
Installed ties should be clear of mortar droppings to allow the drip to function and prevent water from crossing to the inner leaf of masonry.

The practice of bending up installed wire ties should be discouraged. This can adversely affect the performance of the tie and weaken the embedment in the inner leaf. Rigid ties like the Ancon SDS and ST1 should never be bent on site.

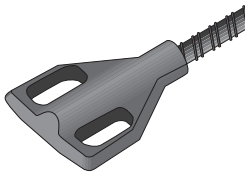
There is a risk of injury if wall ties are left protruding from a single wall leaf before the second leaf is constructed. Site managers should make all workers and visitors aware of this risk.

Installation guides can be downloaded from www.ancon.co.uk

To reduce the risk of injury, Ancon wall ties feature rounded safety ends, however, we recommend both leaves of a cavity wall are built simultaneously to eliminate any risk of injury from protruding ties.

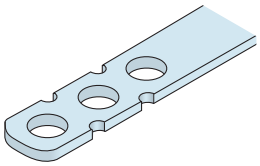


Staifix Safety End

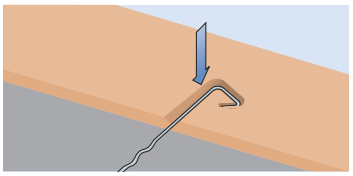


Teplo-BF Moulded Safety End

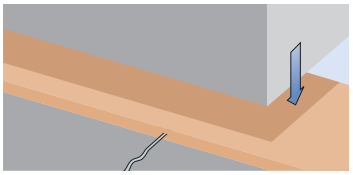
Ancon frame ties and channel ties are manufactured with a non-spread safety end allowing the use of a debonding sleeve. This type of safety end reduces the variety of ties required on site.



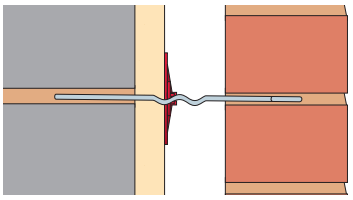
Ancon Non-Spread Safety End



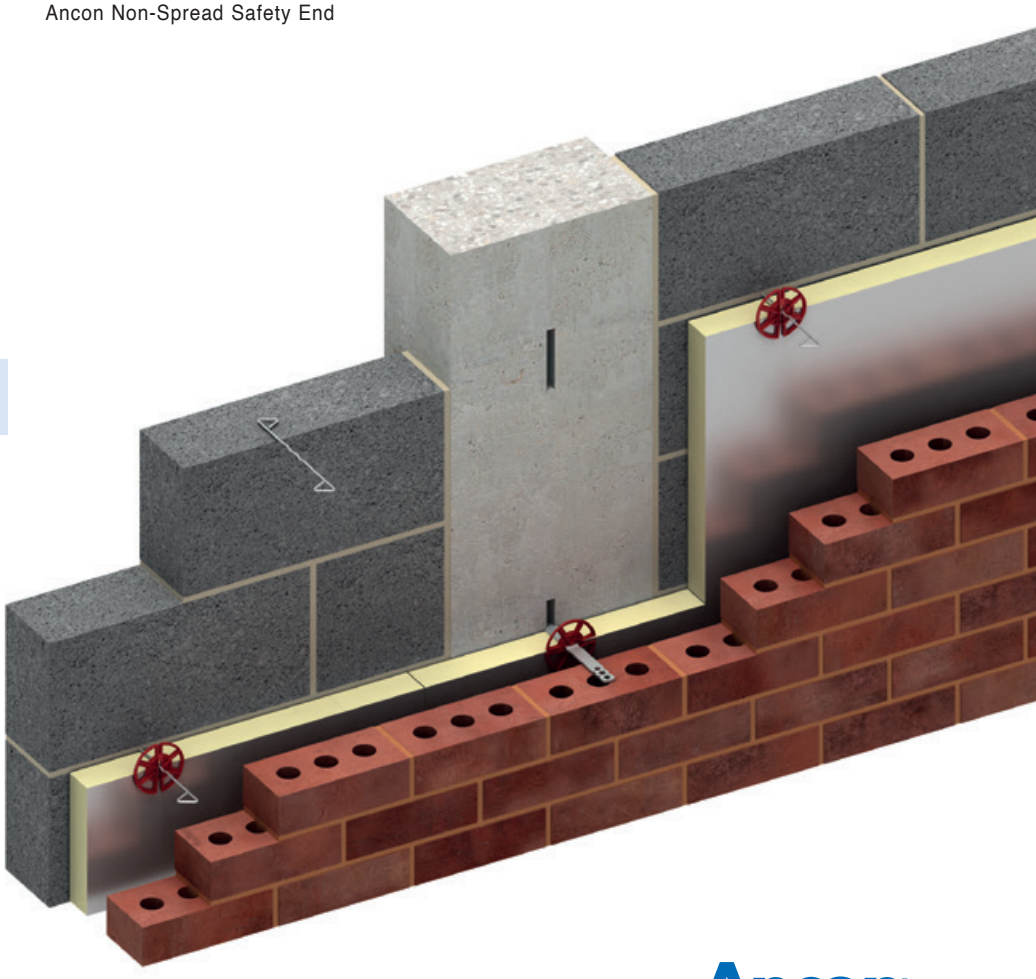
Wall ties should be pressed down in, and then surrounded by, fresh mortar.



To ensure cavity wall ties are effective at tying the leaves together they should be installed as the inner leaf is constructed and not simply pushed into a joint.



Ties should be installed with a slight fall to the outer leaf, never towards the inner leaf as this could provide a path for moisture to cross the cavity.



Wall Ties with Insulation Retaining Clips

Wall Ties and Restraint Fixings

Low Thermal Conductivity Wall Ties to PD 6697: 2019 for Brick-to-Block Construction

Ancon ST1 Type 1 Tie
(Masonry Heavy Duty)

The Ancon ST1 is suitable for cavities from 50mm to 225mm and can be used for all types of buildings of any height, anywhere in the British Isles. The section that spans the cavity has a series of holes to provide water drips. The ST1 has a measured dynamic stiffness of <113MN/m^3 that meets the performance requirement of Approved Document E for use in external masonry walls. For internal separating walls of new-build attached dwellings see HRT4. Type 1 performance is declared in M2 mortar.

Ancon Staifix RT2 Type 2 Tie
(Masonry General Purpose)

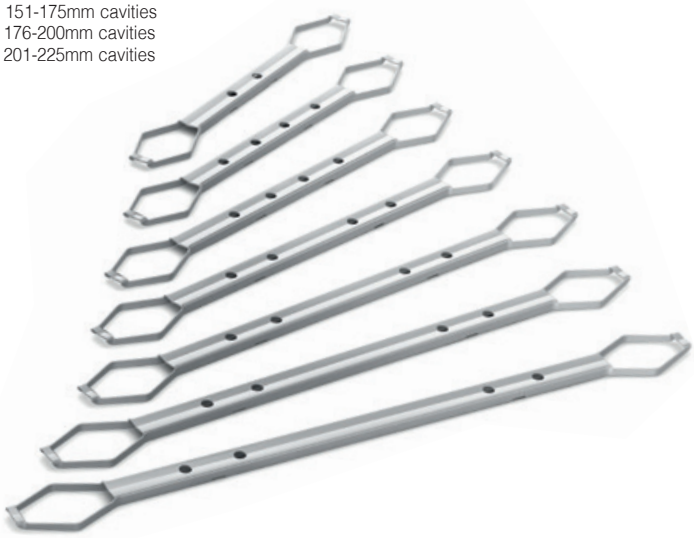
The Staifix RT2 is a general purpose tie. It is suitable for cavities from 50mm to 150mm and can be used for domestic houses and small commercial buildings up to 15 metres in height (see page 7 for geographical restrictions). In many cases, Staifix RT2 wall ties can be used in buildings greater than 15 metres if shown to be adequate by calculation. For further information please contact our Technical Services Team. The RT2 has a measured dynamic stiffness of <113MN/m^3 that meets the performance requirement of Approved Document E for use in external masonry walls. For internal separating walls of new-build attached dwellings see HRT4.

Ancon Staifix HRT4 Type 4 / Type A Tie
(Masonry Light Duty)

The Staifix HRT4 is available for cavities from 50mm to 150mm. As a Type 4 tie it is suitable for use in external walls of domestic houses up to 10 metres in height (see page 7 for geographical restrictions).

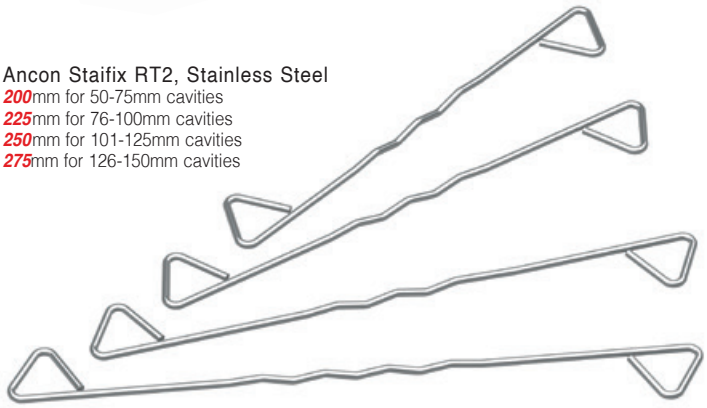
The HRT4 is a Type A tie for separating walls of any height. Independent tests have proven the Staifix HRT4 has a measured dynamic stiffness of <4.8MN/m^3 when installed at a standard 2.5 ties/m^2 spacing and is therefore suitable for internal separating (party) walls of new-build attached dwellings with cavities from 50mm to 150mm. The HRT4 can be used with all approved robust details for cavity masonry separating walls, whether traditional or thin-joint blockwork (suitable for thin-joint construction with 3mm thick joints). Use of these details eliminates the need for pre-completion sound testing. For wall ties with greater acoustic resilience, see page 28.

Ancon ST1, Stainless Steel
200mm for 50-75mm cavities
225mm for 76-100mm cavities
250mm for 101-125mm cavities
275mm for 126-150mm cavities
300mm for 151-175mm cavities
325mm for 176-200mm cavities
350mm for 201-225mm cavities



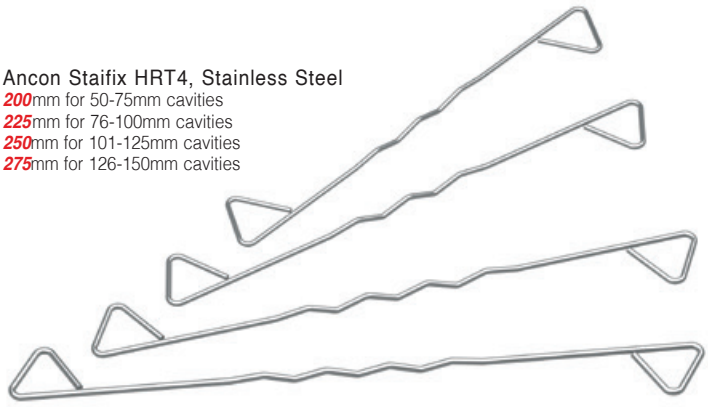
NBS National BIM Library

Ancon Staifix RT2, Stainless Steel
200mm for 50-75mm cavities
225mm for 76-100mm cavities
250mm for 101-125mm cavities
275mm for 126-150mm cavities



NBS National BIM Library

Ancon Staifix HRT4, Stainless Steel
200mm for 50-75mm cavities
225mm for 76-100mm cavities
250mm for 101-125mm cavities
275mm for 126-150mm cavities



Part E TYPE A

NBS National BIM Library

Ancon Teplo-BF

The Ancon Teplo-BF is suitable for cavities from 50mm to 450mm and is manufactured from pultruded basalt fibres. This material has a thermal conductivity of only 0.7W/mK which can be shown in U-value calculations to reduce insulation thickness and wall footprint.

The Ancon Teplo-BF range comprises Teplo-BF1 (Type 1), Teplo-BF2 (Type 2), Teplo-BF3 (Type 3) and Teplo-BF4 (Type 4). Please refer to page 7 for further details on the suitability of each wall tie at the standard spacings. Decreasing wall tie centres can increase performance level e.g Type 3 to Type 2. Contact us for more information.

The Ancon Teplo range has BBA approval and can be used in line with NHBC standards. It also meets the performance requirement of Approved Document E for use in external masonry walls. For internal separating walls of new-build attached dwellings use HRT4.

Plain-ended Teplo-R ties, inspired by the original basalt-fibre wall tie, are ideal for resin-fixed remedial/ retrofit projects.

Also available is the Teplo-BFR featuring a plain end for anchoring with resin and a moulded safety end for building into a bed joint. This product is ideal for use when mortar joints do not align or when a new leaf of masonry is being added to an existing masonry or concrete structure.
Visit www.ancon.co.uk to download a product datasheet.

Low Thermal Conductivity Wall Ties

Wall ties are an essential element in the strength and stability of cavity walls, but by crossing the cavity they act as a thermal bridge between the internal and external leaves. The ties featured here on pages 10-11 form our Low Thermal Conductivity range; cavity ties which minimise heat loss and improve the energy-efficiency of a masonry wall. With a thermal conductivity of only 0.7W/mK, Ancon Teplo wall ties are the most thermally-efficient products in the range and are excluded from U-value calculations to BS EN ISO 6946.

For the accurate calculation of a wall's U-value it is important to use the correct information for the wall ties. Using the actual cross-sectional area and thermal conductivity value of a wall tie, rather than allowing a program to apply default values, can make a considerable difference to the calculated U-value. Default values will over-estimate the effect of an Ancon Wall Tie. The effect our high tensile wire wall ties have on heat transfer is negligible.

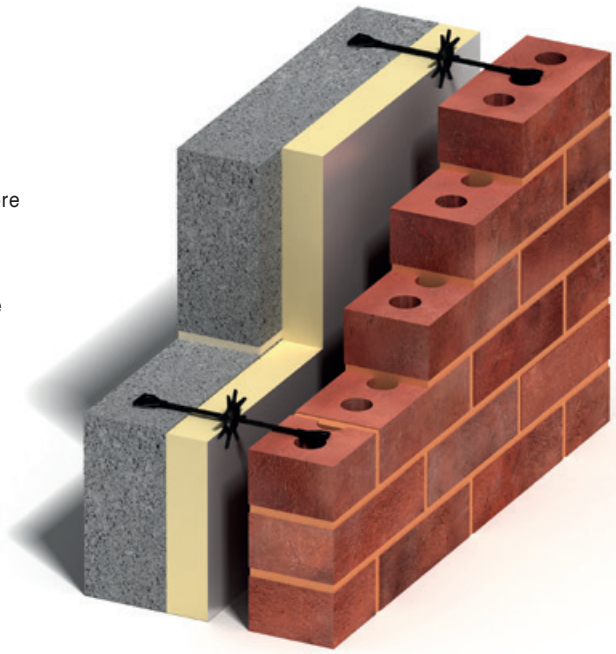
Ancon Teplo-BF1/2/4, Basalt-Fibre
200mm for 50-75mm cavities
225mm for 76-100mm cavities
250mm for 101-125mm cavities

Ancon Teplo-BF1/2, Basalt-Fibre
275mm for 126-150mm cavities

Ancon Teplo-BF2, Basalt-Fibre
300mm for 151-175mm cavities
325mm for 176-200mm cavities
350mm for 201-225mm cavities
375mm for 226-250mm cavities
400mm for 251-275mm cavities
425mm for 276-300mm cavities

Ancon Teplo-BF3, Basalt-Fibre
450mm for 301-325mm cavities
475mm for 326-350mm cavities
500mm for 351-375mm cavities
525mm for 376-400mm cavities

Ancon Teplo-BF4, Basalt-Fibre
550mm for 401-425mm cavities
575mm for 426-450mm cavities



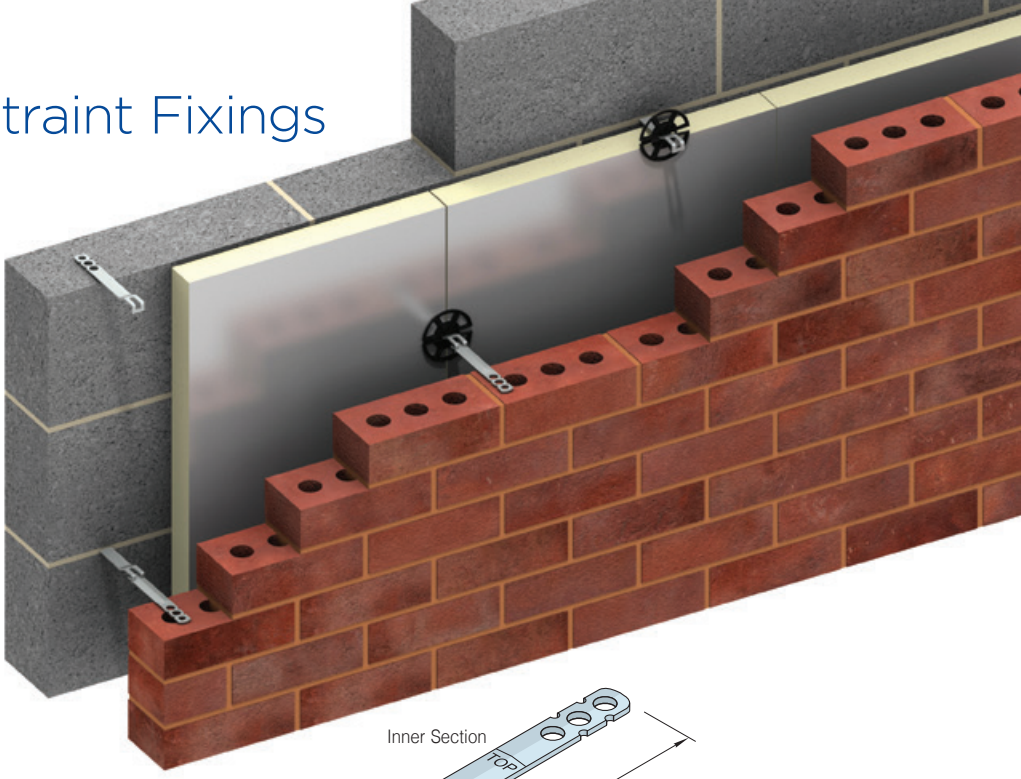
Teplo-BF is available in a range of diameters and lengths to suit cavities from 50mm to 450mm

Cross-Sectional Areas and Thermal Conductivity of Ancon Wall Ties

Tie Reference	Tie Length (mm)	Cavity Width (mm)	Tie Type to PD 6697: 2019	Area (mm^2)	Thermal Conductivity* (W/mK)
ST1	200	50-75	1	19.5	17
	225	76-100	1	19.5	17
	250	101-125	1	19.5	17
	275	126-150	1	23.4	17
	300	151-175	1	23.4	17
	325	176-200	1	23.4	17
	350	201-225	1	23.4	17
RT2	200	50-75	2	8.6	17
	225	76-100	2	8.6	17
	250	101-125	2	8.6	17
	275	126-150	2	10.2	17
HRT4	200	50-75	4	3.5	17
	225	76-100	4	4.2	17
	250	101-125	4	6.2	17
	275	126-150	4	6.2	17
Teplo-BF1	200	50-75	1	38.5	0.7
	225	76-100	1	38.5	0.7
	250	101-125	1	38.5	0.7
	275	126-150	1	38.5	0.7
Teplo-BF2	200	50-75	2	19.6	0.7
	225	76-100	2	19.6	0.7
	250	101-125	2	19.6	0.7
	275	126-150	2	28.3	0.7
	300	151-175	2	28.3	0.7
	325	176-200	2	28.3	0.7
	350	201-225	2	38.5	0.7
	375	226-250	2	38.5	0.7
	400	251-275	2	38.5	0.7
	425	276-300	2	38.5	0.7
Teplo-BF3	450	301-325	3	38.5	0.7
	475	326-350	3	38.5	0.7
	500	351-375	3	38.5	0.7
	525	376-400	3	38.5	0.7
Teplo-BF4	200	50-75	4	12.6	0.7
	225	76-100	4	12.6	0.7
	250	101-125	4	12.6	0.7
	550	401-425	4	38.5	0.7
	575	426-450	4	38.5	0.7

Note: BS EN ISO 6946 permits the corrections due to wall ties, air gaps etc to be omitted, if the corrections amount to less than 3% of the uncorrected U-value of the element. *Wall Ties with a thermal conductivity of less than 1.0W/mK e.g. Teplo, are excluded from U-value calculations to BS EN ISO 6946, irrespective of cross-sectional area.

Wall Ties and Restraint Fixings

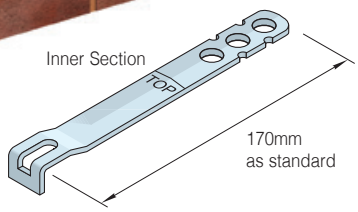


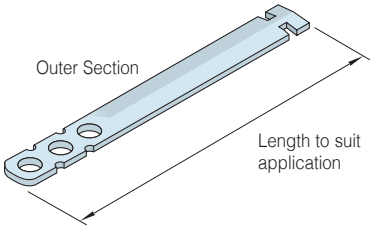
Ancon Two-Part Tie

Long ties for cavities of 150mm and above can often be difficult to balance and keep horizontal when built into the inner leaf. As an alternative, our Ancon Two-Part Tie has one section built into the blockwork and a second section is then fixed as the outer leaf is built. An embedment of 75mm is required at each end. The inner tie is usually manufactured in lengths of 170mm with variation in the cavity width being accommodated by the length of the outer section. Where insulation thickness is in excess of 60mm, the inner section should be longer than the standard 170mm to ensure the connection between the two parts is made in the open cavity.

To specify or order this tie simply quote 'Ancon Two-Part Tie to suit _ _ _mm cavity with an insulation thickness of _ _ _mm'. The black TJ Insulation Retaining Clip is recommended for use with the inner section.

Using the standard inner section, Ancon Two-Part Ties sustain loads which excee the requirements for a Type 2 tie to PD 6697: 2019 for cavities up to 400mm.

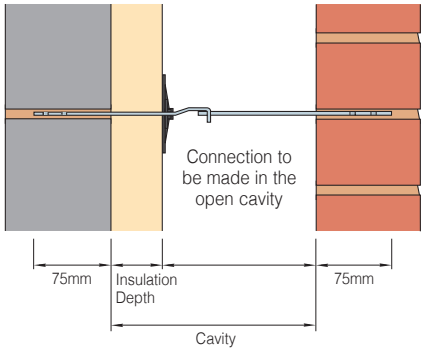




Recommended Fixing Centres for Two-Part Ties

Inner Section (mm)	Cavity (mm)	Type 1	Type 2	Type 3
170	150-400	600x450	900x450	900x450
171-230	150-400	375x450	750x450	900x450

Notes: Centres shown achieve equivalent tie type performances to PD 6697: 2019. See page 7 for details.

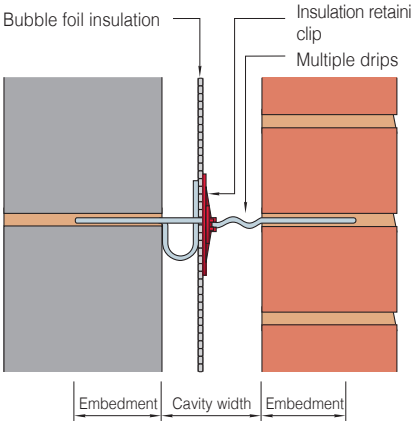


Ties for Bubble Foil Insulation

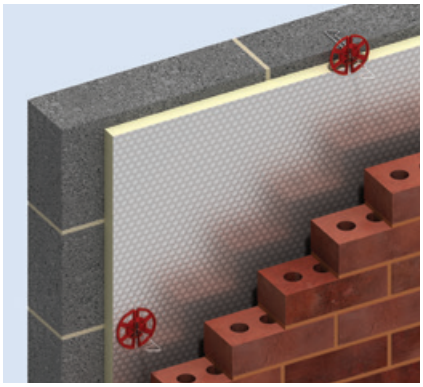
A range of ties are manufactured under license from Thermal Economics Ltd for use with Bubble Foil Insulation. These ties are available as Type 2, Type 3 and Type 4 ties to PD 6697: 2019. CB referenced ties enable the insulation material to be installed flush to the blockwork. AF referenced ties position the insulation 25mm away from the block. These ties can be used in line with NHBC standards.

Wall Tie Reference	PD 6697 Type	Length (mm)	Cavity Range (mm)
WT4-CB-185	4	185	50-60
WT4-CB-200	4	200	60-75
WT4-CB-225	4	225	85-100
WT4-CB-250	4	250	110-125
WT4-AF-200	4	200	60-75
WT4-AF-225	4	225	85-100
WT2-CB-185	2	185	50-60
WT2-CB-200	2	200	60-75
WT2-CB-225	2	225	85-100
WT2-AF-200	2	200	60-75
WT2-AF-225	2	225	85-100
WT3-AF-250	3*	250	110-125

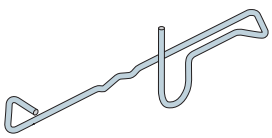
Notes: Refer to page 7 for more information on Type 4, Type 3 and Type 2 ties. * Type 2 tie at 450mm vertical x 850mm horizontal centres.



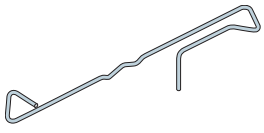
Installation of WT2-AF Wall Ties



WT2-CB Wall Ties shown with Alreflex Ultratherm



WT2-AF



WT4-CB
*Lengths 185, 200mm

Ancon 25/14 Restraint System

The Ancon 25/14 system is designed to tie masonry cladding to an in-situ structural frame, through a layer of insulation. It is suitable for use with steel, timber or concrete frames and any type of insulation.

The system comprises 25/14 Channel, SD25 or Teplo-BF-CT 25 Wall Ties, HT high thread (for fixing to steel/timber) or CFS (for fixing to concrete) Fixing Screws, and Compression Sleeves when required.

Ancon 25/14 channel features alternate 5.3mm and 9.5mm diameter holes to accept the two fixing types. Vertical centres vary for both fixing screws and wall ties, depending on the Tie Type performance required (see page 7 and table below).

We recommend that wall ties for the 25/14 system are designed to achieve a minimum embedment of 55mm in the masonry. SD25 ties are available in lengths from 100mm to 300mm to suit open cavities up to 259mm. Teplo-BF-CT 25 are available in lengths from 150mm to 375mm to suit open cavities up to 334mm.

The 25/14 system has been independently tested at Lucideon and is UKCA and CE marked to EN 845-1.

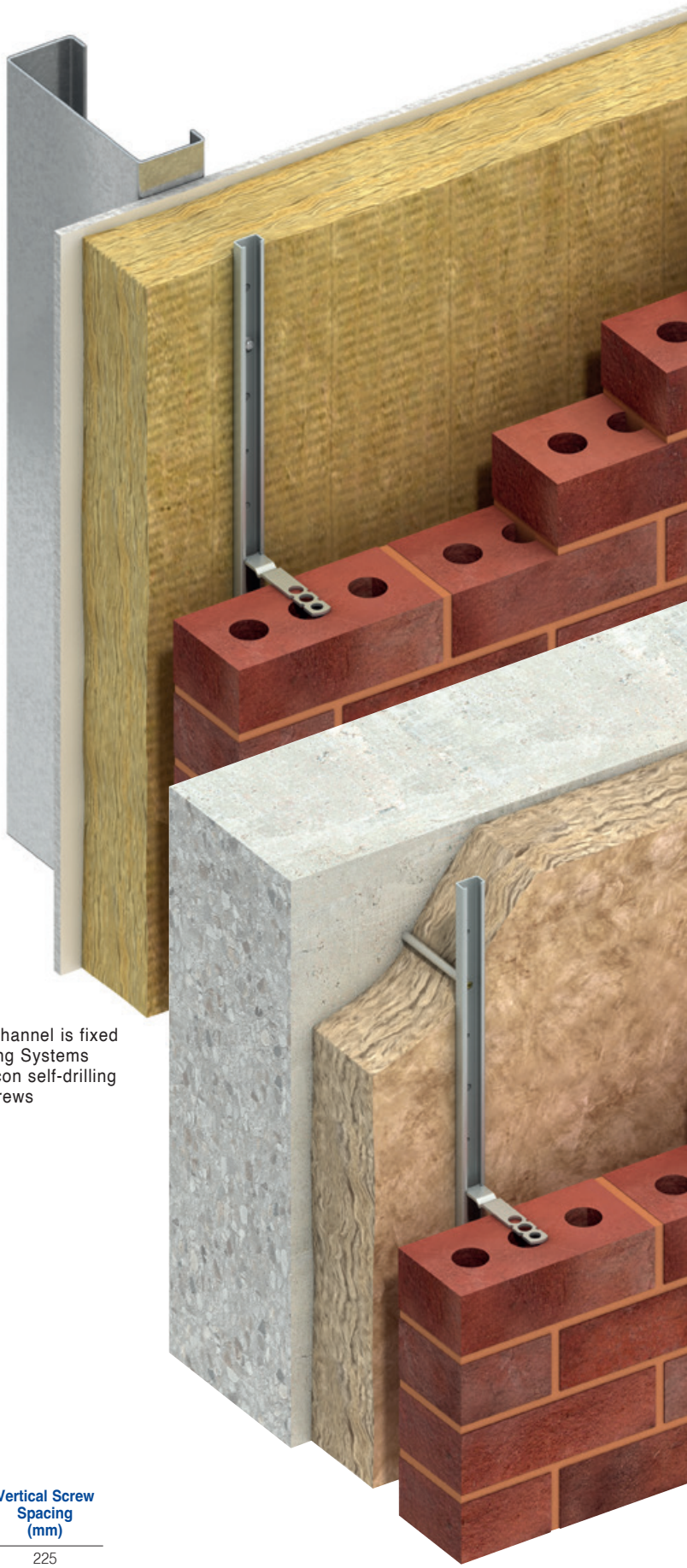
Fixing to Steel/Timber

Self-drilling high-thread screws fix through the channel and the insulation and into the steel or timber framing system. These fixings are available for a combined backing board and insulation thickness of up to 220mm. They can be installed directly through the insulation when using any thickness of rigid insulation or when using ROCKWOOL Rainscreen Duo Slab®, Isover Polterm Max Plus, Kingspan Facades K-Roc Rainscreen Slab, Knauf Insulation Rocksilk® Rainscreen Slab, Xtratherm Stonewool and ROCKWOOL Nyrock® Rainscreen 032 with a maximum thickness of 180mm. When using more flexible insulation materials up to 220mm thick, an Ancon Compression Sleeve is required around the fixing screws.

Fixing to Concrete

Ancon CFS screws fix through the channel and a stainless steel Ancon Compression Sleeve, located in the insulation, and into a pilot hole in the concrete. This system is suitable for all insulation types up to a thickness of 270mm.

CFS screws are also available for fixing the channel directly back to concrete where no insulation is present, for further information please contact us. Note: concrete strength increases with age and care should be taken when fixing CFS screws into older concrete. Concrete screws are not recommended for use with concrete grades greater than C35/45. For further information and additional guidance on embedment depths and torque settings, please refer to our installation guide.



Ancon 25/14 Channel is fixed to Steel Framing Systems (SFS) with Ancon self-drilling high-thread screws

Ancon 25/14 Channel is fixed to concrete with Ancon CFS screws, through an Ancon Compression Sleeve located in the insulation

Recommended Vertical Centres for Wall Ties & Fixing Screws

Tie Type	Maximum Backing Board & Insulation Thickness (mm)			Vertical Tie Spacing (mm)	Vertical Screw Spacing (mm)
	Steel	Timber	Concrete		
1	220	186	270	300**	225
2				450	337.5
3				450	337.5/450*
4				450	337.5/450*

Notes: Based on 25/14 Channel at 600mm horizontal centres. Centres shown achieve equivalent tie type performances to PD 6697: 2019, Table 12 (M2 mortar). See page 7 for more details on Tie Types. *337.5mm centres for insulation thickness >114mm. **225mm vertical tie spacing for Teplo-Channel Ties 300mm and longer.

Datasheets featuring wall tie and fixing screw references are available to help with specification. Visit www.ancon.co.uk or contact us.

Wall Ties and Restraint Fixings

Ties for Thin-Joint Blockwork

Staifix-Thor Helical TJ2 Wall Tie

The TJ2 wall tie hammers directly into aerated concrete blocks, through insulation material, and is built into the bed joints of the outer leaf of brickwork. It is ideal for thin-joint blockwork and other applications where the joints in the inner and outer leaves are not aligned.

This tie can be used in line with NHBC standards and meets the requirements of PD 6697: 2019 as a type 2 or 3 wall tie depending on the block used and the cavity width. The TJ2 has a cross-sectional area of 8.8mm².

The helix of the Staifix-Thor Helical range differs from other helical fixings; each rotation interlocks perfectly down its length guaranteeing maximum performance. Tools are available to simplify installation.

The black Teplo Clip is designed for use with TJ2 wall ties.

Staifix HRT4 Wall Tie

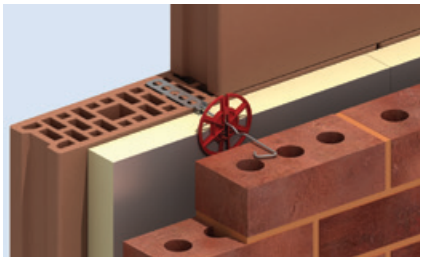
For thin-joint to thin-joint separating walls (min. joint thickness 3mm) use the Ancon Staifix HRT4 (see page 10).

Ties for Cellular Clay Blocks

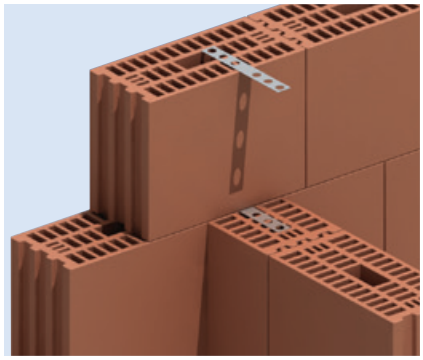
We developed an innovative range of wall ties for use with cellular clay blockwork, where the horizontal bed joints are just 1mm.

The range includes cavity wall ties for use with external brickwork, cavity wall ties for internal separating walls to Approved Document E and ties for connecting perimeter walls to internal walls.

Installation of the component parts of cavity wall ties in this range are phased which eliminates any danger of injury from wall ties projecting from a part-built cavity wall.



Ancon CCB4 Wall Tie

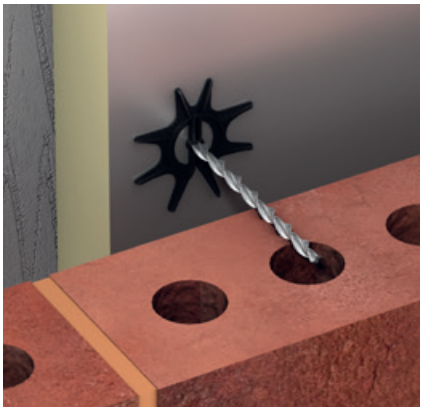


Ancon CCB-IWJ Ties for Internal Wall Junctions

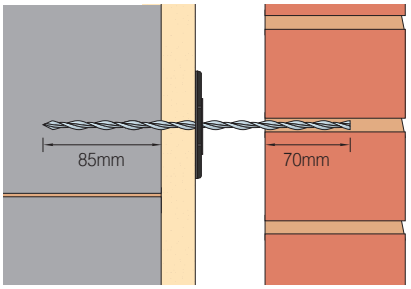
TJ2 to PD 6697: 2019

Block Strength (N/mm²)	Cavity Width (Tie Length) 50mm (205mm)	75mm (230mm)	100mm (255mm)	125mm (280mm)	150mm (305mm)
2.8	Type 3	Type 3	Type 3	Type 3	Type 3
3.5	Type 3	Type 3	Type 3	Type 3	Type 3
7.0	Type 2	Type 2	Type 2	Type 2	Type 2
10.0	Type 2	Type 2	Type 2	Type 2	Type 2

Note: For maximum building height and restrictions based on geographical location please refer to page 7.



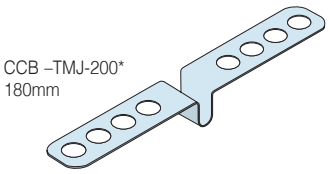
Staifix-Thor Helical TJ2 Thin-Joint Tie
European Patent No. 1307303



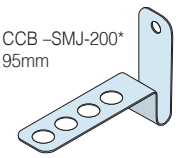
Embedment Depths

TJ2 Recommended Lengths

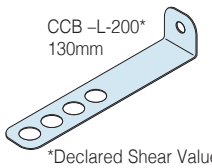
Cavity Width (mm)	Tie Length (mm)
50	***205***
75	***230***
100	***255***
125	280
150	305



**Declared Shear Value 280N*



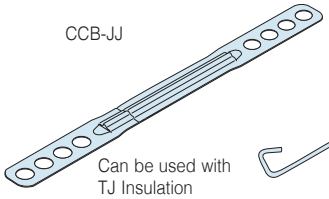
**Declared Shear Value 280N*



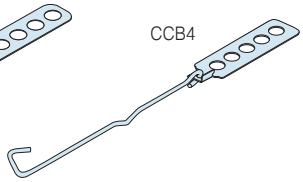
**Declared Shear Value 690N*

CCB-JJ Ties (all 80mm embedment)

Product Ref.	Cavity Width (mm)	Tie Type
CCB-JJ-210	50	2
CCB-JJ-235	75	2
CCB-JJ-260	100	2
CCB-JJ-285	125	3
CCB-JJ-310	150	3
CCB-JJ-360	200	3



Can be used with TJ Insulation Retaining Clip



Cellular Clay Block to Traditional Masonry

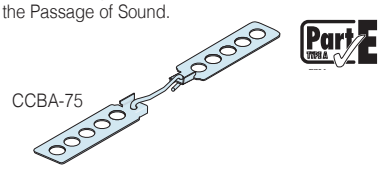
Product Reference	Cavity Width (mm)	Type 4 Performance	Type 3 Performance	Type 2 Performance
		Horizontal x Vertical Spacings (mm)		
CCB4-100	100	900 x 450	600 x 450	450 x 450
CCB4-125	125	900 x 450	600 x 450	375 x 400
CCB4-150	150	900 x 450	450 x 450	-

Notes: At vertical edges of an opening, unreturned or unbonded edges, additional ties should be used at a rate of one per 300mm height, located not more than 225mm from the edge. For complete information on tie types refer to PD 6697: 2019.

Cellular Clay Block to Cellular Clay Block for Internal Separating (Party) Walls

Cavity Width (mm)	Product Reference	Horizontal x Vertical Spacings (mm)
75	CCBA-75	900 x 450
100	CCBA-100	900 x 450

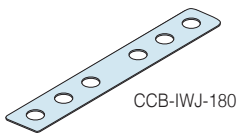
Note: Type A tie suitable for use in internal separating walls of any height to Approved Document E: Resistance to the Passage of Sound.



Flat Tie for connecting perimeter walls to internal walls

Product Reference	Length (mm)
CCB-IWJ-180	180

Note: For block widths greater than 140mm, two ties should be used per course.



Ties for Timber Frames

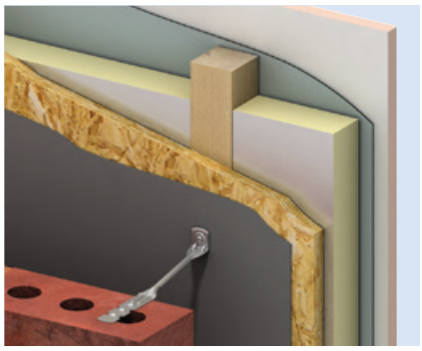
There is a choice of three Ancon Type 6 Timber Frame Ties designed to fix brickwork or blockwork to timber-framed structures up to 4 storeys in height and accommodate maximum differential movement of 24mm; the Type 7 Ancon TFMT wall tie is available for other timber frame applications.

Ancon Staifix Timber Frame Tie, STF6 (Type 6)

The Staifix STF6 tie is available in three lengths to suit 50mm, 75mm and 100mm cavities.

It is supplied complete with an annular ring shank nail. The tie is cranked to simplify correct installation and to prevent moisture from crossing the cavity. The STF6 has a cross-sectional area of 12mm^2 and stainless steel has a thermal conductivity of 17W/mK; this information is provided to aid U-value calculations.

The Staifix STF6 tie has been independently tested for use with 15mm OSB (Oriented Strand Board) SIPS Panel. The standard annular ring shank nail should be replaced with a 4 x 30mm stainless steel Spax® screw.

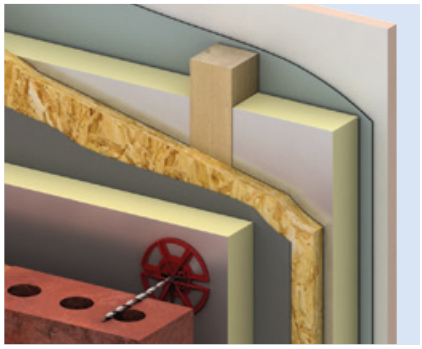


Ancon Staifix STF6 Timber Frame Tie
Available to suit ***50***mm, ***75***mm and ***100***mm cavities.

Ancon Staifix-Thor Helical Timber Tie, TIM6 (Type 6)

The Staifix-Thor Helical TIM6 is available in four standard lengths. It is suitable for cavities from 50mm to 150mm and can be used with the red Staifix Universal Clip where insulation is to be retained in the cavity. An installation tool is required to hammer the tie into the timber frame. The TIM6 has a cross-sectional area of 6.6mm^2 and stainless steel has a thermal conductivity 17W/mK; this information is provided to aid U-value calculations.

We recommend a minimum embedment depth of 35mm in the timber frame and 65mm in the masonry leaf.



Ancon Staifix-Thor Helical TIM6 Tie

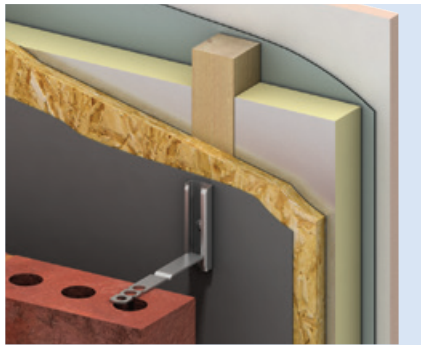
TIM6 (Type 6) Recommended Lengths

Tie Length (mm)	Cavity Width (mm)
175	50-75
200	76-100
225	101-125
250	126-150

Ancon Timber Frame Movement Tie, TFMT7 (Type 7)

Where standard Type 6 Timber Frame Ties are unsuitable, our recommendation is the use of the Timber Frame Movement Tie. Manufactured to suit any cavity from 50mm to 150mm, the Ancon Timber Frame Movement Tie comprises a channel, a strip tie and a screw. This system accommodates maximum differential movement of 60mm; the tie should be positioned 15mm from the bottom of the channel. The tie is suitable for use with the Universal Insulation Clip.

The TFMT complies with BS 5268-6.1 as a Type 7 tie. The product has a declared value of 970N. See page 7 for more information on Type 7 ties.



Ancon TFMT7 Timber Frame Movement Tie

Ancon Teplo-L-Tie (Type 6)

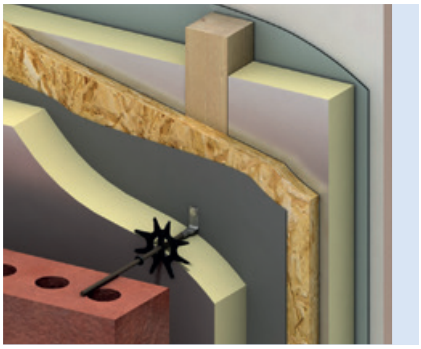
The Teplo-L-Tie is ideal where a low thermal conductivity restraint fixing is required between a masonry outer leaf and an in-situ timber frame. The body is manufactured from basalt fibres set in a resin matrix and features a stainless steel upstand at one end with a 7mm diameter fixing hole. When fixing to timber, we recommend a 5mm x 30mm countersunk wood screw.

This tie is suitable for cavities from 100mm to 300mm, features a moveable o-ring drip to prevent water crossing the cavity and can be used with the black Teplo-Clip where insulation is to be retained.

The Teplo-L-Tie has been independently tested, is approved by the BBA and can be used in line with NHBC standards.

A Lambda value (W/mK) is normally given for Ancon wall ties which expresses the thermal conductivity of the material i.e. 17W/mK for stainless steel ties and 0.7W/mK for basalt fibre Teplo ties, however, as the Teplo-L-Tie comprises both materials a Lambda value is not applicable. Instead, to aid with U-value calculations, the table below provides the Chi value of an individual Teplo-L-Tie and the U-value correction (ΔU_f) if Teplo-L-Ties were installed at the standard 4.4 ties per square metre. BS EN ISO 6946 permits the corrections due to wall ties and air gaps between insulation boards etc, to be omitted from U-value calculations if the corrections amount to less than 3% of the uncorrected U-value of the element.

The Teplo-L-Tie is suitable for fixing to a range of substrates. For more information, see page 17.



Ancon Teplo-L-Tie (Type 6)

Teplo-L-Tie Type 6 Range and Chi Values

Product Code	Length mm	Cavity mm	BS5268 Type	Chi-value W/K	ΔU_f (if 4.4 ties/m^2) W/m^{2}K
TEPLO-L-5-165	165	100	6	**0.000335**	0.00147
TEPLO-L-5-190	190	125	6	**0.000260**	0.00114
TEPLO-L-5-215	215	150	6	**0.000215**	0.00095
TEPLO-L-5-240	240	175	6	**0.000175**	0.00077
TEPLO-L-5-265	265	200	6	**0.000150**	0.00066
TEPLO-L-7-290	290	225	6	**0.000210**	0.00092
TEPLO-L-7-315	315	250	6	**0.000190**	0.00084
TEPLO-L-7-340	340	275	6	**0.000165**	0.00073
TEPLO-L-7-365	365	300	6	**0.000150**	0.00066

Wall Ties and Restraint Fixings

Frame Cramps

Frame cramps are an ideal solution where a restraint is required between masonry and in-situ structures. They can be fixed to a range of materials including concrete, steelwork and masonry. Frame cramps referenced _P_ have a plain shank, while those referenced _D_ feature an integral drip for use across a cavity.

Ancon SDB

Ancon SDB Frame Cramps used as cavity wall ties exceed the requirements of a Type 2 tie to PD 6697: 2019 for lengths up to 450mm. They have a 7mm diameter hole to suit a range of fixings. Ancon M6 expansion bolts are recommended for fixing to concrete and M6 set screws or SDTSS-38-5PT self-drilling screws for fixing to steelwork. Frame cramps can be fixed to masonry with suitable plugs and screws or resin anchors. Poor substrates will limit the capacity of fixings and site testing is advisable in such applications. All fixings should be used in conjunction with a DIN washer.

Ancon SDV

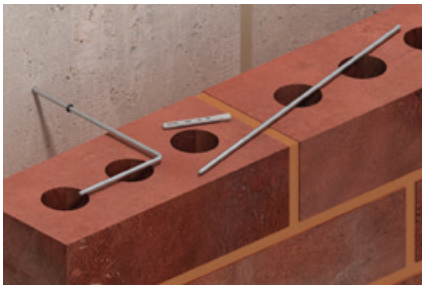
Ancon SDV Frame Cramps have an 8mm x 30mm vertical slot that allows vertical fixing position adjustment where required. Their load capacity is limited when fixed in the top of the slot therefore they are not recommended for applications where tension is a consideration.

Ancon HiT - Hammer-in Tie

The Ancon HiT fixes masonry to dense blocks (≥7N/mm²), non-perforated brick or hard stone. It can reduce the variety of tie lengths required on site and speed the rate of construction.

The HiT is available in a standard length of 310mm that is bent on site with a special installation tool to suit all cavities up to 150mm. Unlike conventional frame cramps it does not require a mechanical fixing, but is hammered into a plug.

The Ancon HiT meets the requirements of PD 6697: 2019 as a Type 2 tie. A neoprene 'O' ring must be installed on the tie to prevent moisture crossing the cavity.



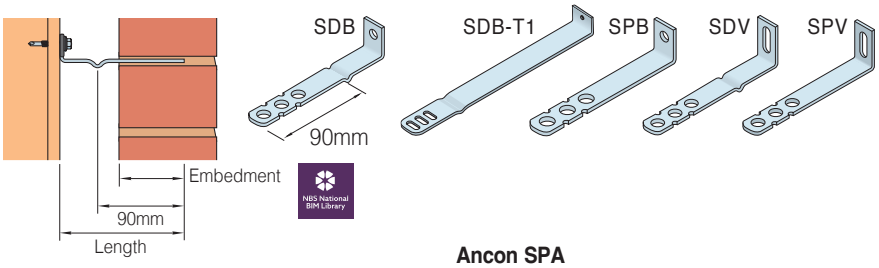
Ancon Hammer-in Tie (***310***mm)

Recommended Tie Lengths and Fixing Centres for SDB Frame Cramps

Cavity Width (mm)	Length of Wall Tie (mm)	Recommended Spacing (mm) Type 1	Type 2
20-44*	100	600 x 450	900 x 450
45-69	125	600 x 450	900 x 450
70-94	150	600 x 450	900 x 450
95-119	175	900 x 450	900 x 450
120-144	200	900 x 450	900 x 450
145-169	225	900 x 450	900 x 450
170-194	250	900 x 450	900 x 450
195-219	275	900 x 450	900 x 450
220-244	300	900 x 450	900 x 450

Cavity Width (mm)	Length of Wall Tie (mm)	Recommended Spacing (mm) SDB-T1	SDB-T2
245-269	325	900 x 450	900 x 450
270-294	350	900 x 450	900 x 450
295-319	375	900 x 450	900 x 450
320-344	400	900 x 450	900 x 450
345-369	425	900 x 450	900 x 450
370-394	450	900 x 450	900 x 450

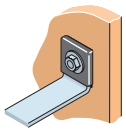
Note: *Due to limited length of tie a water drip would not be provided. Centres shown achieve equivalent tie type performances to PD 6697: 2019. See page 7 for details.



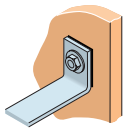
SDB Frame Cramp Fixed to Steel with Self-Drilling Screw

Isolation

Ancon isolation sleeves and pads are supplied blank for use with self-drilling screws to isolate stainless steel frame cramps from mild steel. Self-adhesive isolation pads are also available for _ _B (20 x 30mm) and _ _ V (25 x 50mm) referenced frame cramps, up to 300mm long.



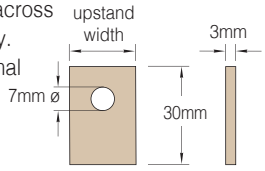
Isolation Sleeve



Adhesive Isolation Pad

Thermal Breaks

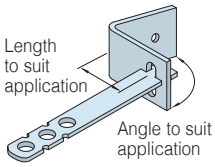
Ancon Frame Cramps can be supplied with Thermal Breaks to be located between the upstand and the structural frame to reduce thermal bridging across an insulated cavity. They have a thermal conductivity of just 0.3 W/mK.

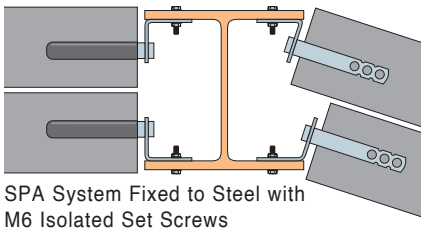


Frame Cramp Thermal Break

Ancon SPA

Where masonry is in line with a column flange, a notched wall tie is used in conjunction with a bespoke angle section to allow the mechanical fixing to be suitably located. This system is referenced SPA. The angle section features a 7mm fixing hole as standard and a slot to accept the wall tie. The slot provides vertical tolerance in the position of the tie allowing the angles to be fixed in advance of the masonry if required. Ties can be used with debonding sleeves when used at vertical movement joints. The thickness, size and shape of the angle are designed to suit each application. Contact our Technical Department or download the online design sheet.





SPA System Fixed to Steel with M6 Isolated Set Screws

Pre-Fixing Aids

The practice of pre-fixing frame cramps in advance of masonry can accelerate the speed of construction and provides an opportunity to check that wall restraints have been located correctly and are securely fixed.

Ancon Gauge Tape (Pre-fix Patent 2 256 223)

Gauge Tape illustrates the standard 225mm brick/block gauge and the fixing position of frame cramps. It is applied directly to the structural frame (steel, concrete, timber or masonry) to facilitate the pre-fixing of frame cramps and to maintain accurate masonry coursing.

Ancon ISO-TW Washer

The ISO-TW washer enables Ancon slot-ended frame cramps to be vertically adjusted within the 30mm range of the slot to suit the exact location of mortar joints without affecting the integrity of the fixing. In addition, this washer prevents bi-metallic corrosion by separating the frame cramp from the structural frame and fixing screw.

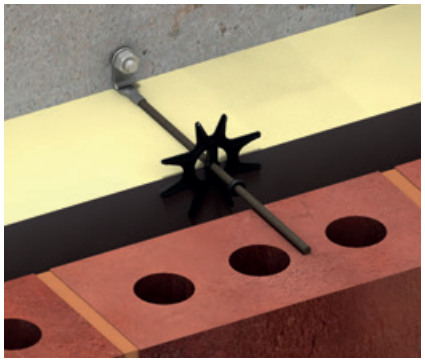
Ancon ISO-TW and Gauge Tape

Teplo-L-Tie

The Teplo-L-Tie is ideal where a low thermal conductivity restraint fixing is required between a masonry outer leaf and an in-situ structure. It offers the same thermal benefit as Teplo basalt fibre cavity wall ties (page 11), with an additional stainless steel upstand which is mechanically and chemically bonded to one end of the tie to allow for a secondary fixing.

The 7mm diameter hole in the upstand suits a variety of fixings, typically an M6 expansion bolt for concrete, a plug and screw for either masonry or concrete, and either an M6 set screw or SDTSS-38-5PT self-drilling screw for steelwork. The load performance will depend on the substrate and on-site pull out tests are recommended to confirm the strength of uncertain or old substrates. For fixing to timber frames, see page 15.

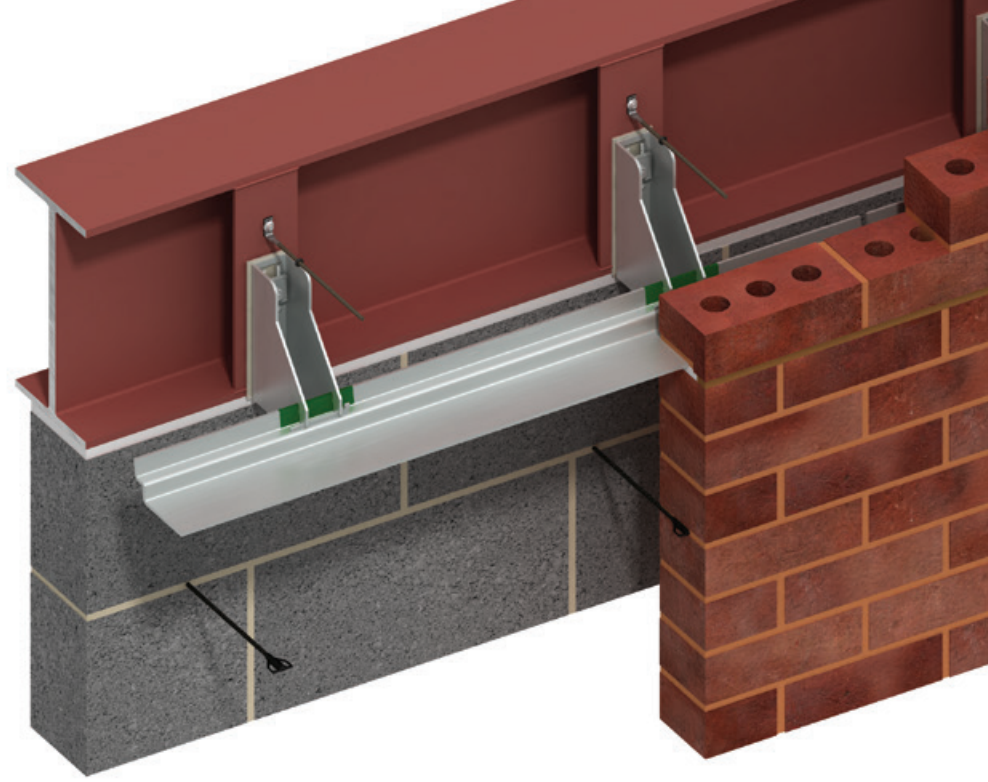
Teplo-L-Ties are suitable for cavities from 100mm to 300mm. The range comprises 14 standard products which meet the performance of Tie Types 2, 3 or 4 when installed at a standard spacing of 2.5 ties per square metre; decreasing wall tie centres can increase the performance level as shown in the table.



Teplo-L-Tie can be fixed to concrete, masonry, steel and timber

An o-ring drip prevents water crossing the cavity and the Teplo-L-Tie can be used with the black Teplo-Clip where insulation is to be retained.

A Lambda value (W/mK) is normally given for Ancon wall ties which expresses the thermal conductivity of the material i.e. 17W/mK for stainless steel ties and 0.7W/mK for basalt fibre Teplo ties, however, as the Teplo-L-Tie comprises both materials a Lambda value is not applicable. Instead, to aid with U-value calculations, the table provides the Chi value of an individual Teplo-L-Tie and the U-value correction (ΔU_f) if Teplo-L-Ties were installed at the standard spacing of 2.5 ties per square metre (900mm x 450mm centres). BS EN ISO 6946 permits the corrections due to wall ties and air gaps between insulation boards etc, to be omitted from U-value calculations if the corrections amount to less than 3% of the uncorrected U-value of the element.



Teplo-BF cavity wall ties and Teplo-L-Tie frame cramps used with an Ancon stainless steel brick support system featuring a thermal break

The BBA-approved Teplo-L-Tie is available to suit cavities from 100mm to 300mm

Teplo-L-Tie Product Codes and Recommended Fixing Centres

Product Code	PD 6697 Tie Type	Cavity mm	Tie Length mm	Recommended Spacing (mm) Type 1*	Type 2	Type 3	Type 4
TEPLO-L-7-165	2	100	165	500 X 450	900 X 450	-	-
TEPLO-L-7-190	2	125	190	500 X 450	900 X 450	-	-
TEPLO-L-7-215	2	150	215	500 X 450	900 X 450	-	-
TEPLO-L-7-240	2	175	240	500 X 450	900 X 450	-	-
TEPLO-L-7-265	2	200	265	500 X 450	900 X 450	-	-
TEPLO-L-7-290	2	225	290	500 X 450	900 X 450	-	-
TEPLO-L-7-315	2	250	315	500 X 450	900 X 450	-	-
TEPLO-L-7-340	2	275	340	500 X 450	900 X 450	-	-
TEPLO-L-7-365	2	300	365	500 X 450	900 X 450	-	-
TEPLO-L-5-165	3	100	165	380 X 450	710 X 450	900 X 450	-
TEPLO-L-5-190	3	125	190	380 X 450	710 X 450	900 X 450	-
TEPLO-L-5-215	3	150	215	380 X 450	710 X 450	900 X 450	-
TEPLO-L-5-240	4	175	240	230 X 450	450 X 450	740 X 450	900 X 450
TEPLO-L-5-265	4	200	265	230 X 450	450 X 450	740 X 450	900 X 450

Note: Centres shown achieve equivalent tie type performances to PD 6697: 2019: Table 12. See page 7 for details.
*Type 1 based on M2 mortar and a strength requirement of 2500N (PD 6697: 2019) in Tension and Compression.

Teplo-L-Tie Chi Values

Product Code	Tie Length mm	PD 6697 Tie Type	Chi value W/K	ΔU_f (if 2.5 ties/m²) W/m²K
TEPLO-L-7-165	165	2	**0.000515**	0.00129
TEPLO-L-7-190	190	2	**0.000405**	0.00101
TEPLO-L-7-215	215	2	**0.000340**	0.00085
TEPLO-L-7-240	240	2	**0.000280**	0.00070
TEPLO-L-7-265	265	2	**0.000245**	0.00061
TEPLO-L-7-290	290	2	**0.000210**	0.00053
TEPLO-L-7-315	315	2	**0.000190**	0.00048
TEPLO-L-7-340	340	2	**0.000165**	0.00041
TEPLO-L-7-365	365	2	**0.000150**	0.00038
TEPLO-L-5-165	165	3	**0.000335**	0.00084
TEPLO-L-5-190	190	3	**0.000260**	0.00065
TEPLO-L-5-215	215	3	**0.000215**	0.00054
TEPLO-L-5-240	240	4	**0.000175**	0.00044
TEPLO-L-5-265	265	4	**0.000150**	0.00038

Wall Ties and Restraint Fixings

Available Lengths of Ancon 21/18 Omega Channel
100, ***3000***mm

Ancon 21/18 Omega Channel with Ancon SD21 Tie

Channel Ties

Ancon 21/18 Omega Channel

Ancon 21/18 Omega Channel is a high performance, self-anchoring, cast-in channel slot suitable for use with Ancon wall ties to provide the necessary restraint to the outer leaf of masonry. The section is only 18mm deep and can be used where there is reduced cover to reinforcement and concrete as thin as 75mm. Available in 100mm and 3000mm lengths, Ancon 21/18 Omega Channel is filled with polystyrene to help prevent the ingress of concrete. Nail holes aid the fixing of the slot to timber formwork.

Ancon 25/14, 28/15, 30/20, 38/17, 36/8 and 40/25 Channels

Ancon wall ties can also be used with our 25/14, 28/15, 30/20, 38/17, 36/8 and 40/25 channels.

30/20 Channel is supplied with anchors for casting into concrete. 25/14 and 36/8 Channels are supplied plain-backed for surface fixing. 28/15, 38/17 and 40/25 Channels are available with or without anchors for casting in or surface fixing. Data shown below applies to cavity wall ties into 21/18, 28/15, 30/20, 38/17 and 40/25 cast-in channels. 36/8 channels are only suitable for shear applications, see pages 20 and 29. For 25/14 channels see page 13. Maximum safe working loads of surface-fixed channels will be subject to suitable fixings, and appropriate fixing centres. Consult our Technical Department for advice.

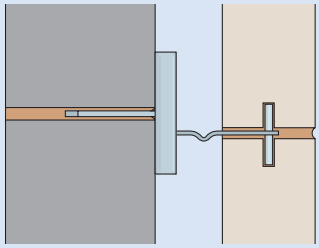
Recommended Tie Spacing for Cast-in Channel Stainless Steel Ties for Masonry Cavity Applications

Tie Length (mm)	Cavity Width (mm)	Type 1	Type 2
125	45-69	600x450	900x450
150	70-94	600x450	900x450
175	95-119	750x450	900x450
200	120-144	750x450	900x450
225	145-169	750x450	900x450
250	170-194	750x450	900x450
275	195-219	750x450	900x450
300	220-244	300x450	600x450

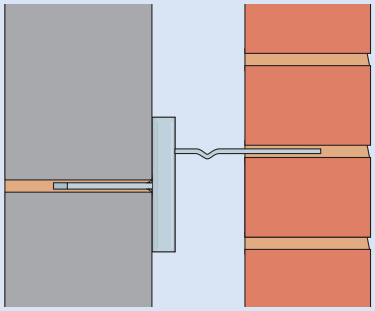
Note: Centres shown achieve equivalent tie type performances to PD 6697: 2019. See page 7 for details.

Fixing of Channel

Fixing Method	Omega 21/18	25/14	28/15	30/20	38/17	36/8	40/25
Cast-in	✓	✗	✓	✓	✓	✗	✓
Surface Fixed	✗	✓	✓	✗	✓	✓	✓



Fastrack used with DD28 Tie for Stonework



Fastrack used with SD28 Tie for Brickwork

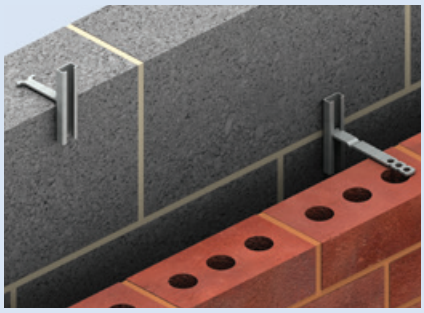
Ancon Fastrack

Building one leaf of the cavity wall in advance of the other is often beneficial but can create problems with coursing. Buildings which incorporate imperial or continental bricks and standard metric blocks present even greater difficulties.

Ancon Fastrack Channel is built into the inner leaf of blockwork ready to take an Ancon SD28 or similar tie for the outer leaf. This method of construction avoids the dangers of projecting ties.

Ancon Fastrack Channels and Ties suit cavities from 50mm to 250mm and can also be used for tying stonework to blockwork if DD28 or similar Ancon Ties are used.

The recommended tie length for use with a fastrack channel is 'cavity width plus 50mm'.



Ancon Fastrack Channels 100mm long with SD28 Tie

Ancon 28/15 Fastrack Channels and Ties sustain loads which exceed the requirements for a Type 2 tie to PD 6697: 2019. This system can also be manufactured in a 36/8 channel which also offers Type 2 performance and accepts wall ties referenced _ _ 36.

Tie Reference	Type 1	Type 2	Type 3	Type 4
28/15 Fastrack	450x450	900x450	900x450	900x450
36/8 Fastrack	450x450	900x450	900x450	900x450

Note: Centres shown achieve equivalent tie type performances to PD 6697: 2019. See page 7 for details.

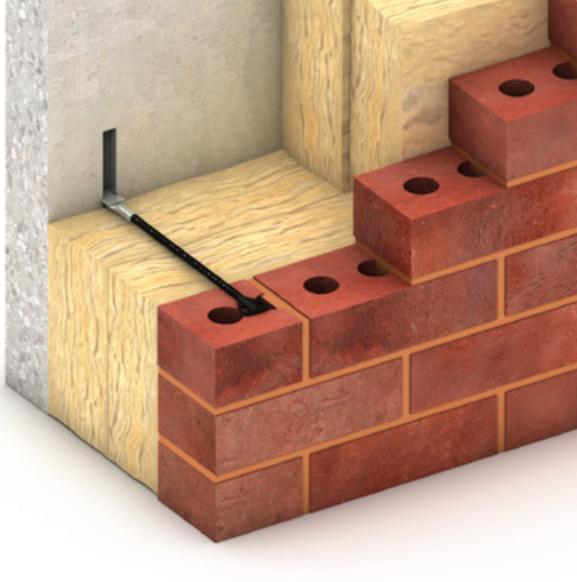
Teplo-Channel Ties

The Ancon Teplo-Channel tie range has been specifically designed to provide a low thermal conductivity wall tie for use with our popular Omega 21/18, 25/14 and 28/15 channel profiles. Ancon Teplo-Channel ties provide unlimited adjustment along the length of the channel and are ideal for use with SFS and concrete frames.

The tie body uses the same combination of basalt fibres set in a resin matrix as the Teplo cavity wall tie and has a moulded safety end for building into the outer leaf bed joint. On the opposite end is a profiled stainless steel head which is shaped to suit each individual channel and is mechanically fixed in place.

Teplo-Channel ties are suitable for cavities from 70mm to 344mm and meet the performance of Tie Types 1, 2 or 3 depending on tie spacing; please see data table for more information. The unique ribbed shank acts as a drip and prevents water crossing the cavity. Where insulation is to be retained, the black Teplo-Clip can be used and is compatible with the full range of Teplo-Channel ties.

A Lambda value (W/mK) is normally given for Ancon wall ties which expresses the thermal conductivity of the material i.e. 17W/mK for stainless steel ties and 0.7WmK for basalt fibre Teplo ties. However, as the Teplo-Channel ties comprise both materials, a Lambda value is not applicable. Instead, to aid with U-value calculations, the tables provide the Chi value of the individual Teplo-Channel ties and the U-value correction (ΔU_f) if Teplo-Channel ties were installed at the standard spacing of 2.5 ties per square metre (900mm x 450mm centres). For Teplo-BF-CT 25 ties (for use with the Ancon 25/14 system) a standard tie spacing of 3.7 ties per square metre is used (600mm x 450mm centres).



BS EN ISO 6946 permits the corrections due to wall ties and air gaps between insulation boards etc., to be omitted from U-value calculations if the corrections amount to less than 3% of the uncorrected U-value of the element.

The Teplo-Channel tie range has been independently tested and is BBA approved; a British Board of Agrément certificate is available to download online.

Ancon Teplo-Channel Tie Chi Values

Product Code	Tie Length (mm)	PD 6697 Tie Type	Chi value (W/K)	ΔU_f 2.5 ties/m² (W/m²K)
Teplo-BF-CT 21 - 150	150	2	0.0009	0.00225
Teplo-BF-CT 21 - 175	175	2	0.0006	0.00150
Teplo-BF-CT 21 - 200	200	2	0.0004	0.00100
Teplo-BF-CT 21 - 225	225	2	0.0003	0.00075
Teplo-BF-CT 21 - 250	250	2	0.0003	0.00075
Teplo-BF-CT 21 - 275	275	2	0.0002	0.00050
Teplo-BF-CT 21 - 300	300	2	0.0002	0.00050
Teplo-BF-CT 21 - 325	325	3	0.0002	0.00050
Teplo-BF-CT 21 - 350	350	3	0.0001	0.00025
Teplo-BF-CT 21 - 375	375	3	0.0001	0.00025
Teplo-BF-CT 28 - 150	150	2	0.0009	0.00225
Teplo-BF-CT 28 - 175	175	2	0.0006	0.00150
Teplo-BF-CT 28 - 200	200	2	0.0004	0.00100
Teplo-BF-CT 28 - 225	225	2	0.0003	0.00075
Teplo-BF-CT 28 - 250	250	2	0.0003	0.00075
Teplo-BF-CT 28 - 275	275	2	0.0002	0.00050
Teplo-BF-CT 28 - 300	300	2	0.0002	0.00050
Teplo-BF-CT 28 - 325	325	3	0.0002	0.00050
Teplo-BF-CT 28 - 350	350	3	0.0001	0.00025
Teplo-BF-CT 28 - 375	375	3	0.0001	0.00025
Teplo-BF-CT 28 - 400	400	3	0.0001	0.00025

Data based on thermal modelling using mineral wool in a full fill cavity with channel cast into concrete and Teplo-BF-CT ties bridging the insulation zone.
Note: Thermal values will vary for other wall build-ups. For more information please contact Leviat.

Product Code	Tie Length (mm)	PD 6697 Tie Type	Chi value (W/K)	ΔU_f 3.7 ties/m² (W/m²K)
Teplo-BF-CT 25 - 150	150	2	0.0008	0.00289
Teplo-BF-CT 25 - 175	175	2	0.0007	0.00250
Teplo-BF-CT 25 - 200	200	2	0.0006	0.00216
Teplo-BF-CT 25 - 225	225	2	0.0005	0.00191
Teplo-BF-CT 25 - 250	250	2	0.0005	0.00167
Teplo-BF-CT 25 - 275	275	2	0.0004	0.00150
Teplo-BF-CT 25 - 300	300	3	0.0004	0.00133
Teplo-BF-CT 25 - 325	325	3	0.0003	0.00122
Teplo-BF-CT 25 - 350	350	3	0.0003	0.00109
Teplo-BF-CT 25 - 375	375	3	0.0003	0.00100

Data based on thermal modelling using 100mm thick mineral wool in a partial fill cavity with channel fixed to front of insulation and Teplo-BF-CT ties bridging the remaining clear cavity.
Note: Thermal values will vary for other wall build-ups. For more information please contact Leviat.

Ancon Teplo-Channel Tie Product Codes and Recommended Fixing Centres

Product Code	PD 6697 Tie Type	Cavity Range (mm)	Tie Length (mm)	Recommended Spacing (mm)	
				Type 1*	Type 2
Teplo-BF-CT 21 - 150	2	70 - 94	150	600x375	600x450
Teplo-BF-CT 21 - 175	2	95 - 119	175	600x375	600x450
Teplo-BF-CT 21 - 200	2	120 - 144	200	600x375	600x450
Teplo-BF-CT 21 - 225	2	145 - 169	225	600x375	600x450
Teplo-BF-CT 21 - 250	2	170 - 194	250	600x375	600x450
Teplo-BF-CT 21 - 275	2	195 - 219	275	600x375	600x450
Teplo-BF-CT 21 - 300	2	220 - 244	300	600x375	600x450
Teplo-BF-CT 21 - 325	3	245 - 269	325	600x225	600x450
Teplo-BF-CT 21 - 350	3	270 - 294	350	600x225	600x450
Teplo-BF-CT 21 - 375	3	295 - 319	375	600x225	600x450
Teplo-BF-CT 25 - 150	2	85 - 109	150	600x300	600x450
Teplo-BF-CT 25 - 175	2	110 - 134	175	600x300	600x450
Teplo-BF-CT 25 - 200	2	135 - 159	200	600x300	600x450
Teplo-BF-CT 25 - 225	2	160 - 184	225	600x300	600x450
Teplo-BF-CT 25 - 250	2	185 - 209	250	600x300	600x450
Teplo-BF-CT 25 - 275	2	210 - 234	275	600x300	600x450
Teplo-BF-CT 25 - 300	3	235 - 259	300	600x225	600x450
Teplo-BF-CT 25 - 325	3	260 - 284	325	600x225	600x450
Teplo-BF-CT 25 - 350	3	285 - 309	350	600x225	600x450
Teplo-BF-CT 25 - 375	3	310 - 334	375	600x225	600x450
Teplo-BF-CT 28 - 150	2	70 - 94	150	600x375	600x450
Teplo-BF-CT 28 - 175	2	95 - 119	175	600x375	600x450
Teplo-BF-CT 28 - 200	2	120 - 144	200	600x375	600x450
Teplo-BF-CT 28 - 225	2	145 - 169	225	600x375	600x450
Teplo-BF-CT 28 - 250	2	170 - 194	250	600x375	600x450
Teplo-BF-CT 28 - 275	2	195 - 219	275	600x375	600x450
Teplo-BF-CT 28 - 300	2	220 - 244	300	600x375	600x450
Teplo-BF-CT 28 - 325	3	245 - 269	325	600x225	600x450
Teplo-BF-CT 28 - 350	3	270 - 294	350	600x225	600x450
Teplo-BF-CT 28 - 375	3	295 - 319	375	600x225	600x450
Teplo-BF-CT 28 - 400	3	320 - 344	400	600x225	600x450

Note: Centres shown achieve equivalent tie type performances to PD 6697:2019 Table 12. See page 7 for details.
*Type 1 based on M2 mortar and 2500N Tensile/ 2000N Compressive capacity (PD 6697:2019). Cavity range values refer to cast-in applications for 21 and 28 ends. For surface-fixed 28/15 applications, cavity values should be increased by 15mm. Cavity range values given for 25 ends refer to channels fixed to front of insulation i.e. remaining clear cavity.

Wall Ties and Restraint Fixings

Vertical Movement Joints

Debonding sleeves are used on plain-ended wall ties, such as the Ancon PP21 or PPB, at vertical movement joints that abut columns. The tie will restrain the masonry against lateral wind loads whilst the sleeve allows the masonry to expand and contract.

These shear ties are available either to suit cast-in channels or as frame cramps to be post-fixed on site. Channel ties are available to suit Ancon 21/18, 28/15, 30/20, 36/8, 38/17 and 40/25 channels. Frame cramps are available as a PPB with a single hole or as a PPV with a vertical slot. PPS ties are used across movement joints in masonry walls. PPB-HD is a heavy duty version of the PPB.

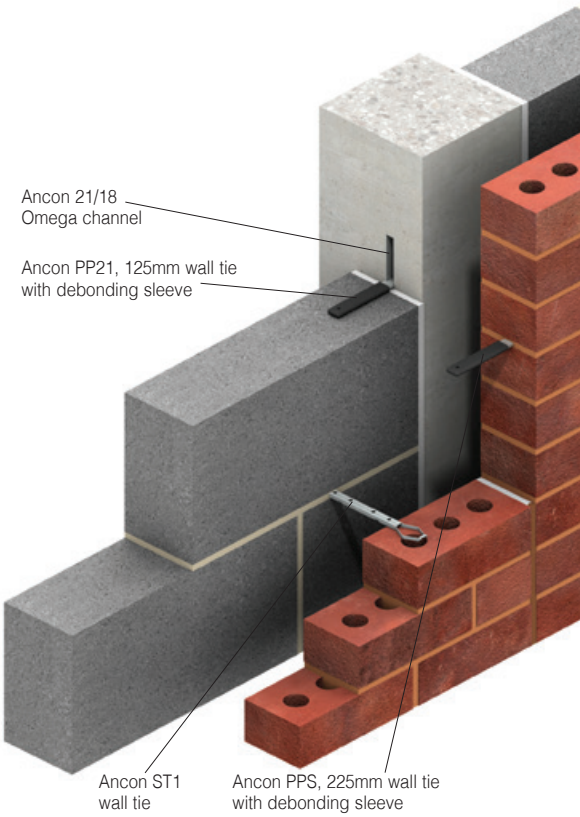
These ties are subject to shear rather than tensile / compressive forces and can be selected from the following table. The design resistances shown should be used with factored wind loads.

Ancon shear ties are suitable for a standard 10mm joint and require a minimum embedment of 100mm. Debonding sleeves should be installed with a 10mm gap at the end to allow for expansion of the masonry. The ties are also available with a bonded safety end for applications where a debonding sleeve is not required.

Design Resistances for Shear Ties

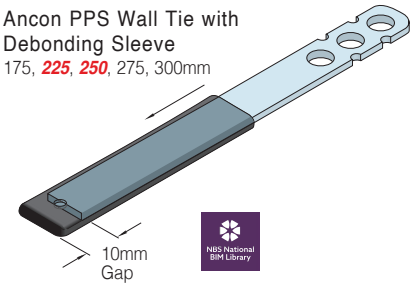
Tie	Design Resistance (N)	Design Resistance per metre (N/m) 450mm centres	225mm centres
Channel Ties	900	2000	4000
PPV	463	1028	2056
PPB	663	1474	2948
PPB-HD	896	1991	3982
PPS	896	1991	3982

Note: Design resistances shown use a material factor, γ_m of 3.0 as given in the UK National Annex to BS EN 1996-1-1:2005



Intermediate Column with Vertical Movement Joint in Brickwork and Blockwork

Ancon PPS Wall Tie with Debonding Sleeve
175, ***225***, ***250***, 275, 300mm

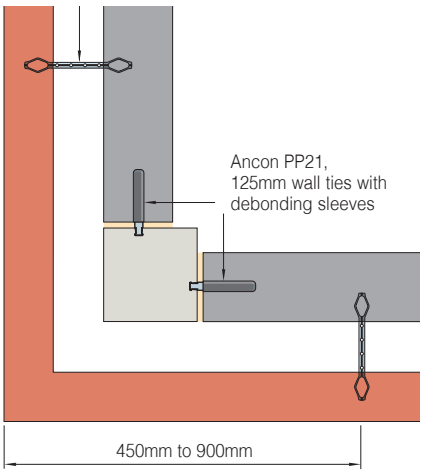


Debonding sleeves should be pulled back 10mm to allow expansion as well as contraction of brickwork

Ancon PPB Wall Tie with Debonding Sleeve
Lengths ***125***, ***150***, ***175***, ***200***, ***225***mm

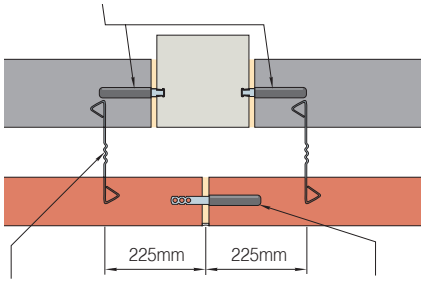
Ancon PPV Wall Tie with Debonding Sleeve
Lengths ***125***, ***150***, ***175***, ***200***, 225mm

Ancon ST1 wall tie



External Corner with Fully Bonded Brickwork

Ancon PP21, 125mm wall ties with debonding sleeves



Ancon Staifix RT2 wall ties at 450mm vertical centres in alternate courses to PPS ties

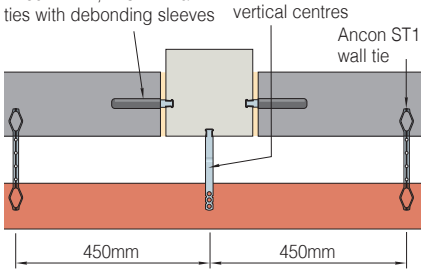
Ancon PPS, 225mm wall ties with debonding sleeves, at 450mm vertical centres

Intermediate Column with Vertical Movement Joints in both Brickwork and Blockwork

Ancon PP21, 125mm wall ties with debonding sleeves

Ancon SD21 wall ties at 450mm vertical centres

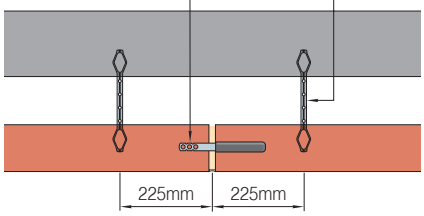
Ancon ST1 wall tie



Intermediate Column with Vertical Movement Joints in Blockwork

Ancon PPS, 225mm wall ties with debonding sleeves, at 450mm vertical centres

Ancon ST1 wall tie at 450mm vertical centres in alternate courses to PPS ties



Cavity Wall with Vertical Movement Joint in Brickwork

Note: All spacings are maximums. The type of cavity wall tie and spacing will be determined by the cavity width, height of brickwork, wind loading and type of building. See page 7 for further information.

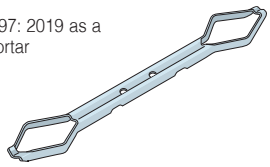
Standard Wall Ties

Lengths shown in ***red italics*** refer to items normally available at all times.

Our Technical Services Team will be pleased to advise on the correct selection and use of our wall ties.

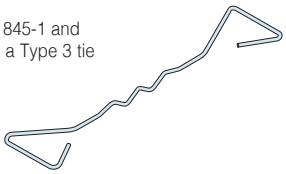
ST1

Lengths ***200***, ***225***, ***250***, ***275***, ***300***, ***325***, ***350***mm
Conforms to PD 6697: 2019 as a Type 1 tie in M2 mortar



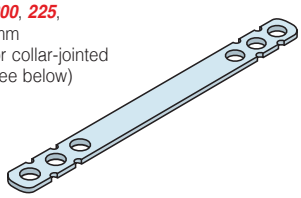
DT (Double Triangle)

Lengths ***150****, ***200****, ***225****, ***250****, ***300****mm
*Conforms to EN 845-1 and PD 6697: 2019 as a Type 2 tie
**Conforms to EN 845-1 and PD 6697: 2019 as a Type 3 tie



SPS

Lengths ***150***, ***200***, ***225***, ***250***, ***275***, ***300***mm
(Not suitable for collar-jointed construction. See below)

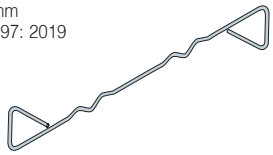


Teplo-BF1

Lengths ***200***, ***225***, ***250***, ***275***mm
Conforms to PD 6697: 2019 as a Type 1 tie.

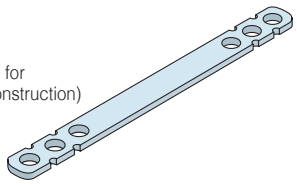
RD3

Lengths ***250***, ***275***mm
Conforms to PD 6697: 2019 as a Type 3 tie



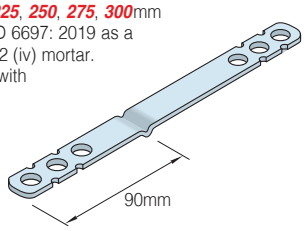
SPS CJ

Length ***150***mm
(3mm thickness for collar-jointed construction)



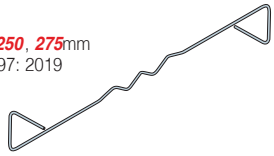
SDS

Lengths ***200***, ***225***, ***250***, ***275***, ***300***mm
Conforms to PD 6697: 2019 as a Type 1 tie in M2 (iv) mortar.
Also available with a central drip



HRT4

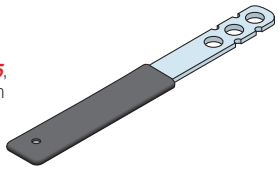
Lengths ***200***, ***225***, ***250***, ***275***mm
Conforms to PD 6697: 2019 as a Type 4 tie



Suitable for party walls with 50-100mm and 125-150mm cavities

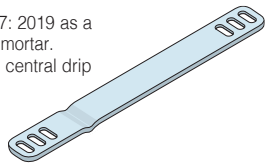
PPS

Lengths 175, ***225***, ***250***, 275, 300mm



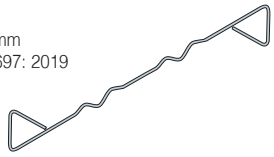
SDS-T1, SDS-T2

Lengths ***325***, ***350***, ***375***, ***400***, ***425***, ***450***, ***475***, ***500***, ***525mm***
Conforms to PD 6697: 2019 as a Type 1 tie in M2 (iv) mortar.
Also available with a central drip



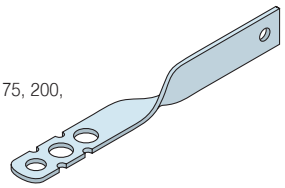
HRD4

Lengths ***250***, ***275***mm
Conforms to PD 6697: 2019 as a Type 4 tie



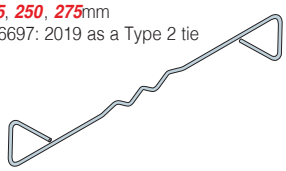
SHX

Lengths 150, 175, 200, 225mm



RT2

Lengths ***200***, ***225***, ***250***, ***275***mm
Conforms to PD 6697: 2019 as a Type 2 tie

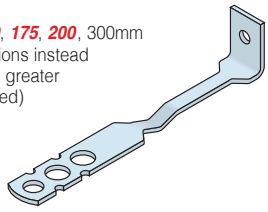


Teplo-BF4

Lengths ***200***, ***225***, ***250***, 550, 575mm
Conforms to PD 6697: 2019 as a Type 4 tie

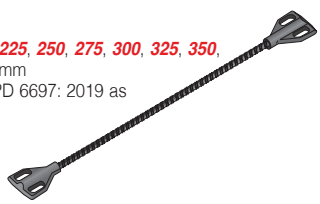
SRB

Lengths ***125***, ***150***, ***175***, ***200***, 300mm
(Used in applications instead of the SDB where greater flexibility is required)



Teplo-BF2

Lengths ***200***, ***225***, ***250***, ***275***, ***300***, ***325***, ***350***, ***375***, ***400***, ***425***mm
Conforms to PD 6697: 2019 as a Type 2 tie



Recommended Lengths for Masonry/Masonry Wall Ties

Cavity Width (mm)	Tie Length (mm)
50-75	200
76-100	225
101-125	250
126-150	275
151-175	300
176-200	325
201-225	350
226-250	375

Cavity Width (mm)	Tie Length (mm)
251-275	400
276-300	425
301-325	450
326-350	475
351-375	500
376-400	525
401-425	550
426-450	575

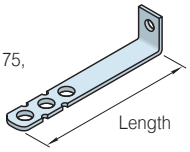
Wall Ties and Restraint Fixings

Standard Wall Ties

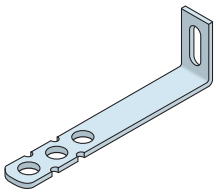
Lengths shown in ***red italics*** refer to items normally available at all times.

Our Technical Services Team will be pleased to advise on the correct selection and use of our wall ties.

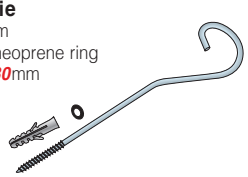
SPB
Lengths 75, ***100***, ***125***, ***150***,175, ***200***, 225, 250, 275, 300mm (Heavy duty version also available)



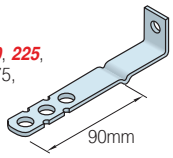
SPV
Lengths 75, ***100***, ***125***,***150***, ***175***, ***200***, 225, 250, 275, 300mm



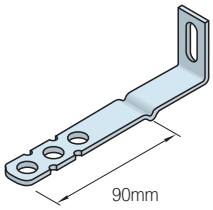
Cavity Starter Tie
Supplied with an 8mm nylon wall plug and neoprene ring
Lengths ***180***, ***200***, ***230***mm



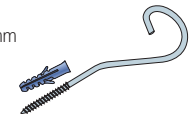
SDB
Lengths ***125***, ***150***, ***175***, ***200***, ***225***, 250, 275, 300, 325, 350, 375, 400, 425, 450mm



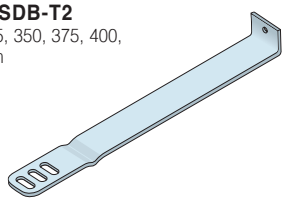
SDV
Lengths ***125***, ***150***, ***175***, ***200***, 225, 250, 275, 300mm



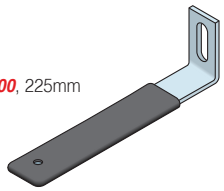
Starter Tie
Supplied with an 8mm nylon wall plug
Length ***135***mm



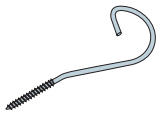
SDB-T1, SDB-T2
Lengths 325, 350, 375, 400, 425, 450mm



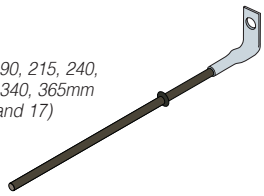
PPV
Lengths ***125***, ***150***, ***175***, ***200***, 225mm



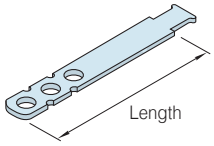
Frame Tie
Length ***115***mm



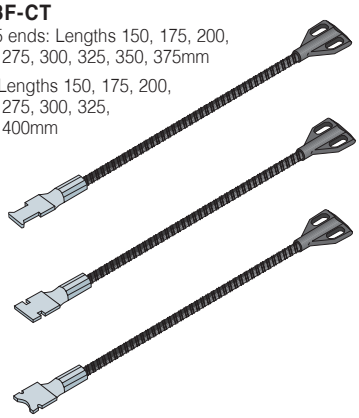
Teplo-L-Tie
Lengths *165, 190, 215, 240, 265, 290, 315, 340, 365mm*
(See page 15 and 17)



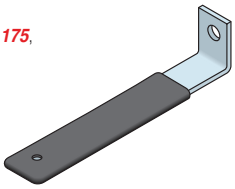
SP21
Lengths ***75***, ***100***, ***125***, ***150***, ***175***, ***200***mm
For use with 21/18 Omega Channel
*see Channels, Bolts and Fixings brochure for more information



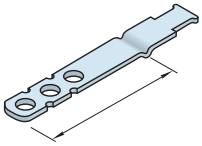
Teplo-BF-CT
21 and 25 ends: Lengths 150, 175, 200, 225, 250, 275, 300, 325, 350, 375mm
28 ends: Lengths 150, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400mm



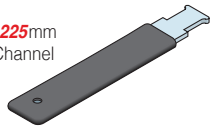
PPB
Lengths ***125***, ***150***, ***175***, ***200***, ***225***mm



SD21
Lengths ***125***, ***150***, ***175***, ***200***, 225, 250, 275, 300mm
For use with 21/18 Omega Channel
*see Channels, Bolts and Fixings brochure for more information



PP21
Lengths ***125***, ***150***, ***175***, ***200***, ***225***mm
For use with 21/18 Omega Channel
*see Channels, Bolts and Fixings brochure for more information



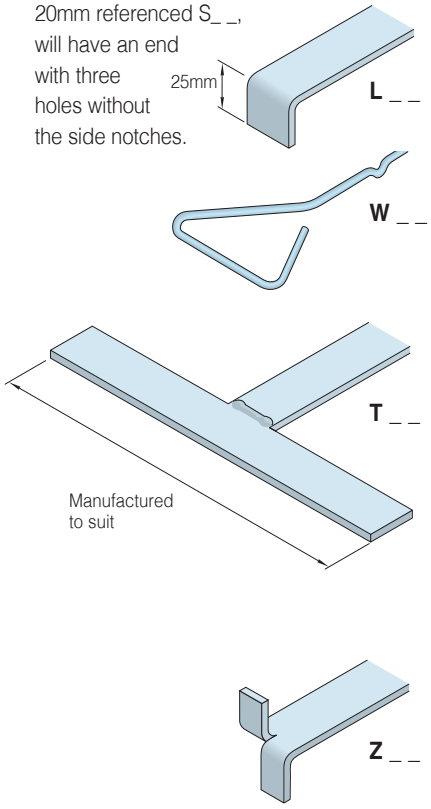
For recommended lengths, please refer to page 16 for frame cramps and page 18 for channel ties.

References for Wall Ties

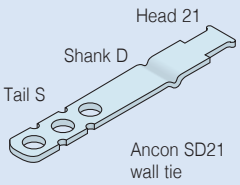
Many variations are available in addition to the standard ties. Wall ties for special applications may be specified and ordered with ease by using a reference letter for the tail, shank and head of the tie.

These bespoke ties are manufactured to order, typically for use on a single unique project and therefore are not tested to EN 845 and do not carry CE marking.

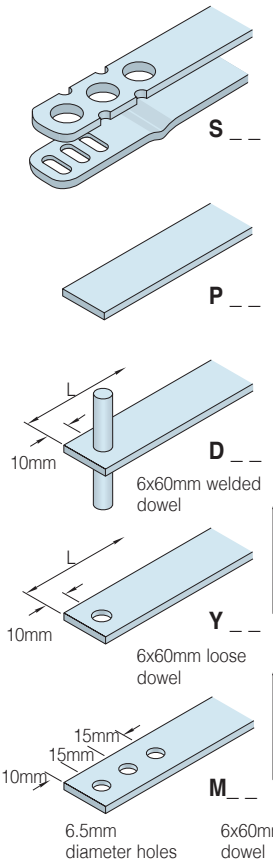
Ancon ties are produced in lengths from 150mm for masonry-to-masonry ties, and 75mm for masonry-to-concrete ties, in increments of 25mm. Drips will usually be positioned 90mm from the outer end of the tie (first reference letter). Masonry-to-masonry ties can also be supplied with a central drip. Special wall ties with a section wider than 20mm referenced S_ _, will have an end with three holes without the side notches.



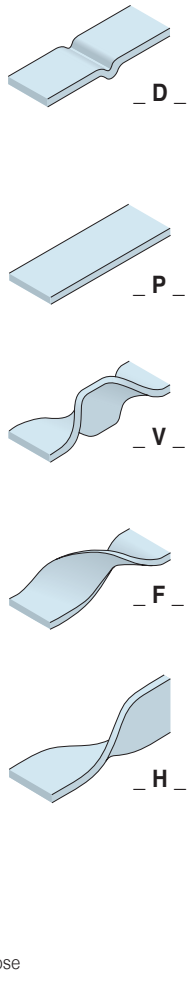
Example using Reference System



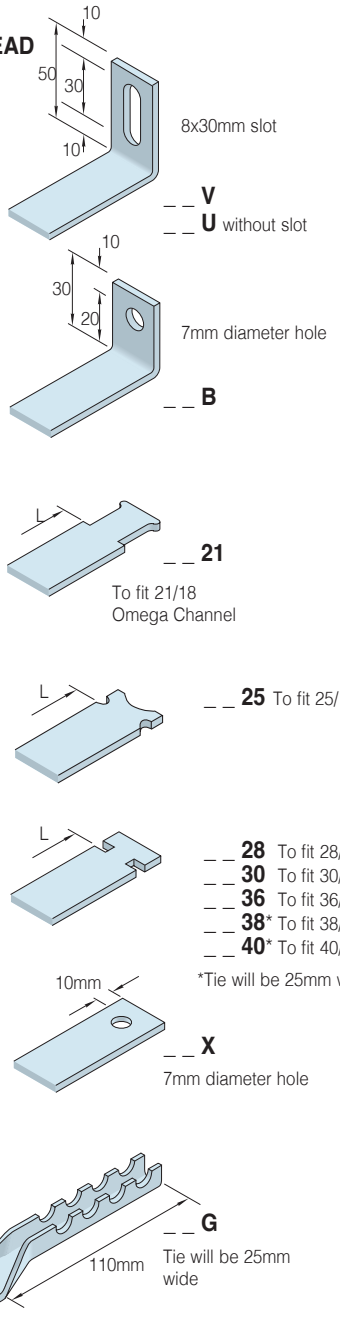
TAIL
Most can be used at either end of tie



SHANK

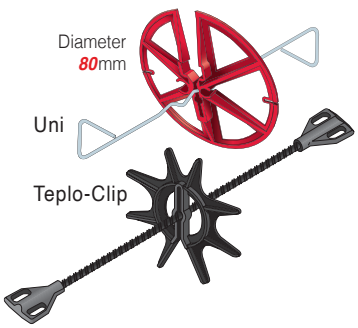


HEAD



Insulation Retaining Clips

The red Ancon Staifix Universal Insulation Retaining Clip (Eco Clip) will fit all the standard stainless steel ties shown on page 21. The black Teplo-Clip should be used with the Teplo range and the TJ2 wall tie (see page 14).

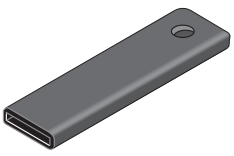


Stainless Insulation Retainer

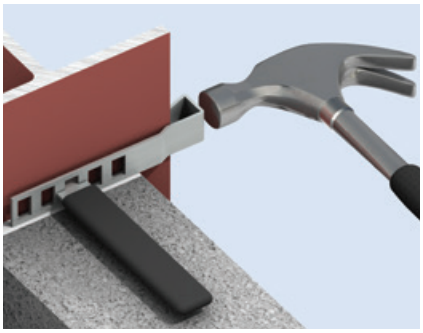
The DHM Stainless Insulation Retainer is for securing fire-resistant soft or pressure-resistant insulating materials to concrete, blockwork and brickwork. The DHM has Fire Resistance Classification R120 and guarantees a secure fixing of fire resistant insulation.

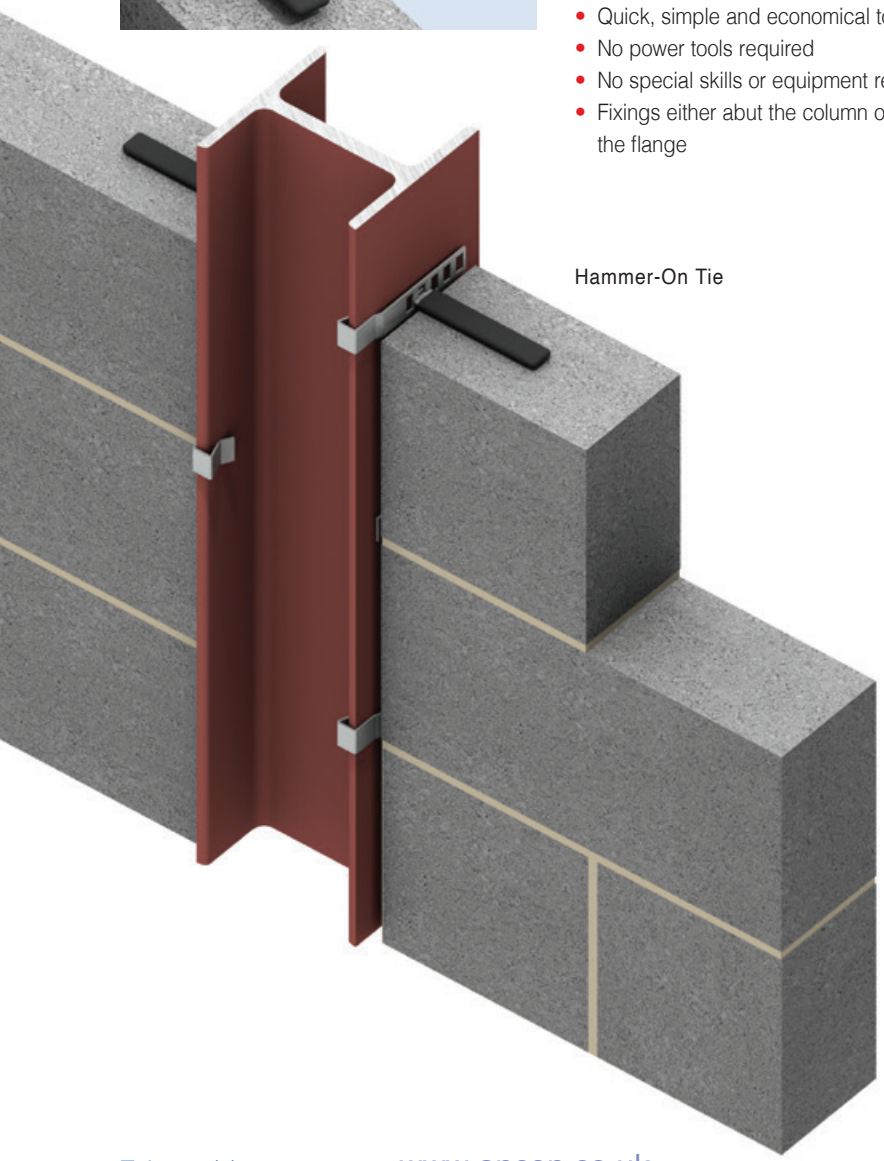
Debonding Sleeves

Debonded Ties require 100mm embedment. A ***120***mm long sleeve will provide an allowance for movement and tolerance, and will be suitable for most applications. Other lengths and sizes available to special order.



Wall Ties and Restraint Fixings





Non-Drill Fixings for Steelwork

The Ancon range of 'NON-DRILL' masonry-to-steel fixing solutions was developed to address the safety concerns of the Industry.

Driven by customer demand for masonry restraint fixings with an alternate installation method from either shot-firing or drilling, our company engineered the innovative solutions detailed here. These fixings do not require the use of power tools and can reduce installation times and costs. In all instances they simply abut the column or attach to the flange to restrain the wall against lateral wind loads.

Design Sheets

Contact us on +44 (0) 114 275 5224 or visit www.ancon.co.uk for a Non-Drill Fixings Design Sheet. This sheet summarises all the information we require to specify/quote for the most appropriate non-drill fixing to suit your application.

Ancon NON-DRILL fixings:

- Eliminate the dangers associated with shot-firing and drilling
- Quick, simple and economical to install
- No power tools required
- No special skills or equipment required
- Fixings either abut the column or attach to the flange

Hammer-On Tie

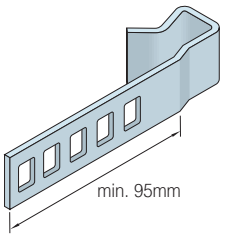
Hammer-On Section

Available in five sizes to accommodate a steel thickness from 6.8mm to 25mm, this fixing is simply hammered onto the flange. It can be utilised either on a column with a tie (HOS-TIE) or on a beam with an internal head restraint (IHR-H).

Hammer-On Section Size	Flange Thickness Accommodated
XS	6.8-10mm
S	10-13mm
M	14-17mm
L	18-21mm
XL	22-25mm

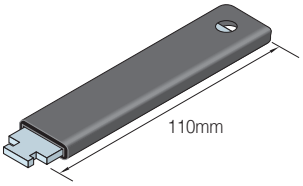
The wall tie (HOS-TIE) or head restraint (IHR-H) should be positioned central to the masonry leaf when located in one of the five fixing slots. The Hammer-On section is available in three lengths. Hammer-On Ties should be installed at 225mm vertical centres and Hammer-On Head Restraints at 450mm horizontal centres. For more information on the IHR-H Head Restraint see page 24.

The Hammer-On Section resists load in one direction only and should be installed on alternate sides of the flange.



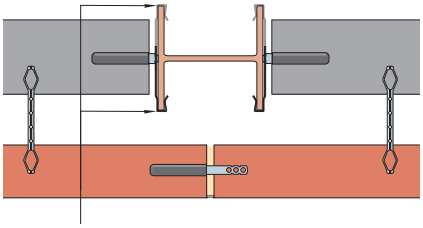
Hammer-On Section

Lengths 95mm, 155mm, 215mm



Hammer-On Tie (Debonded HOS-TIE, pictured above, supplied complete with Hammer-On Section)

Hammer-On Ties used at 225mm centres provide a design resistance of 1993N per metre.

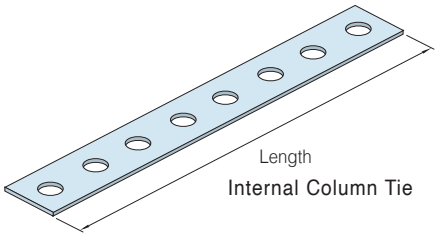


Hammer-On Ties installed to alternate sides of the column at 225mm vertical centres

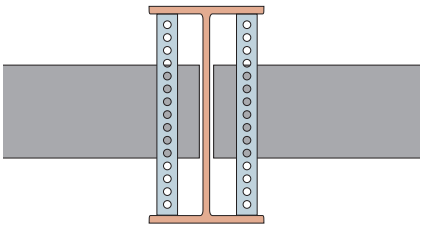
Internal Column Tie

Available in seven lengths, this tie fits between the flanges of a column. It should be installed at 225mm vertical centres, providing a design resistance of 6355N per metre.

Length (mm)	Beam/Column Accommodated
179	203 x 203 UC
186	203 x 133 UB
224	254 x 254 UC
232	254 x 146 UB
275	305 x 305 UC
281	305 x 127 & 165 UB
330	356 x 127 & 171 UB

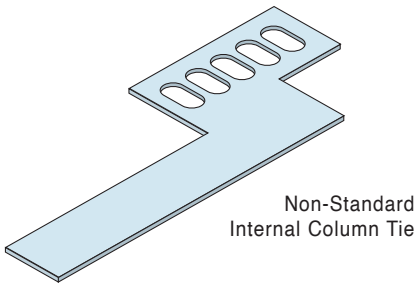


Internal Column Tie

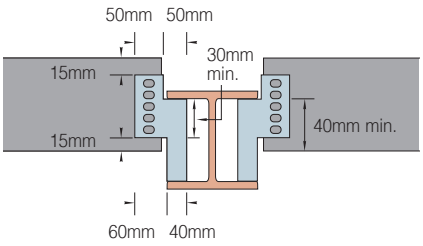


Non-Standard Internal Column Tie

Special internal column ties can be designed to suit applications where the masonry does not sit inside the flanges of a column. The drawing provides some guidance on dimensions; contact us for more information.



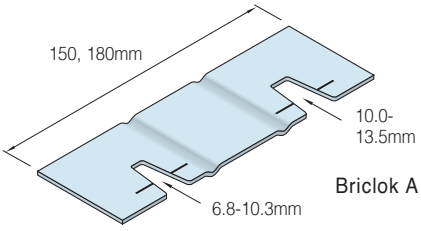
Non-Standard Internal Column Tie



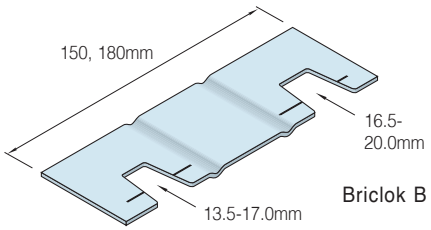
New Briclok

The Briclok fits to a column flange and can be used either across a cavity or back into the inner leaf. It should be positioned with the appropriate notch around the flange and installed at 225mm vertical centres. The tie must not be forced onto the column and should have no less than 10mm engagement. Two types (A and B) accommodate a steel thickness from 6.8mm to 20mm and are available in two lengths to suit an open cavity from 20mm to 80mm.

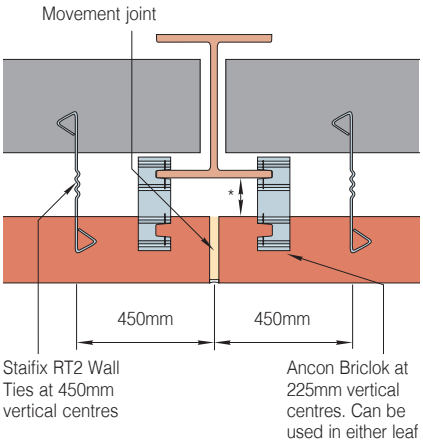
Briclok ties exceed the requirements for a Type 1 tie to PD 6697: 2019 in type M2 (iv) mortar.



Briclok A



Briclok B



Staifix RT2 Wall Ties at 450mm vertical centres

Ancon Briclok at 225mm vertical centres. Can be used in either leaf

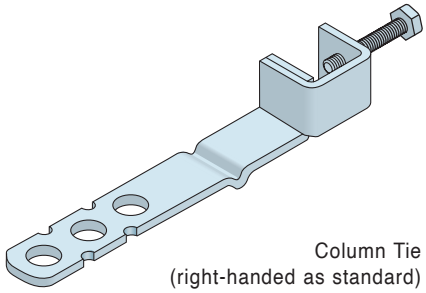
Product Code	Length	Open Cavity*	Flange Thickness
Briclok150A	150mm	20-50mm	6.8-13.5mm
Briclok180A	180mm	50-80mm	6.8-13.5mm
Briclok150B	150mm	20-50mm	13.5-20.0mm
Briclok180B	180mm	50-80mm	13.5-20.0mm

* Open cavity at column face.

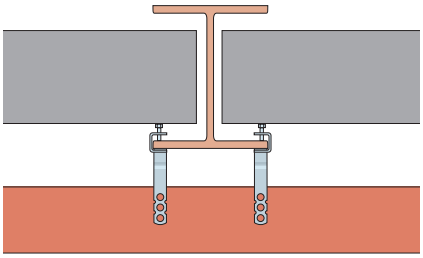
Column Tie

The Column Tie clamps to the flange of a column. It accommodates a steel thickness from 6mm to 25mm and should be installed at 225mm vertical centres. Manufactured in lengths to suit the application, it can feature a drip for use across the cavity or a plain shank for installation back into the inner leaf.

The clamp-on Column Tie is supplied right-handed as standard and can be manufactured left-handed on request.



Column Tie
(right-handed as standard)

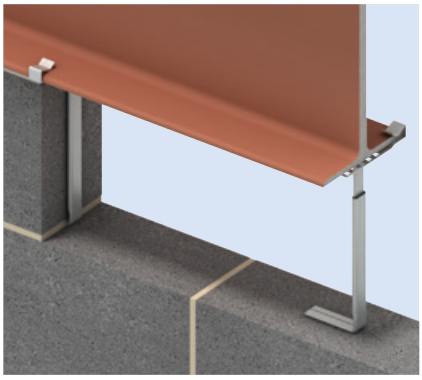


Avoiding Bi-Metallic Corrosion

Bi-metallic corrosion may occur in a damp environment where stainless steel fixings are in contact with a structural steel frame. This will not affect the stainless steel but may cause slight surface corrosion to the mild steel. Best practice is to isolate the two dissimilar metals. Bitumen paint or some other form of isolation e.g. adhesive tape, applied at the point of contact will prevent this corrosion.

Wall Ties and Restraint Fixings

Ancon IHR - B Bolted to Concrete, Restraining Top of Inner Block Wall



Ancon IHR-H Hammer-On Head Restraint

Ancon Head Restraints

Ancon Head Restraints provide the necessary restraint to the top of masonry walls. They allow for vertical movement to accommodate shrinkage or thermal movement of the wall or structural frame, while restraining lateral loads.

Where head restraints are to be connected to a concrete frame, we will provide fixings suitable for cracked concrete.

Ancon IHR - Internal Head Restraint

The Ancon IHR is designed to restrain the top of internal walls or the top of the inner leaf of a cavity wall. It comprises an L-shaped channel stem and a top section available in a variety of designs to suit different fixing methods and substrates; the top section slides in the channel to accommodate vertical movement between the blockwork and the structure.

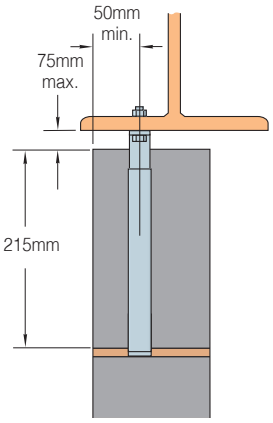
An IHR comprises a siding top section and a stem. The standard length of an IHR sliding top section will accommodate a gap of up to 50mm. Longer top sections are available to accommodate gaps of up to 75mm, ideal when a fire stop is being incorporated at the wall head or where greater deflection is expected in the floor.

The channel stem is closed at the front to prevent mortar ingress. The base of the stem should be built into the bed joint with the centre of the stem no closer than 50mm from the edge of the block. The vertical joint should be filled with mortar each side of the stem.

The standard height of an IHR will suit a 215mm block. Other stem lengths are available to suit cut blocks with a minimum height of 140mm.

The tables provide the design resistance per metre for the IHRs when installed with a 25mm, 50mm and 75mm gap, at 900mm and 450mm centres, in full and cut blocks.

The sliding tie can be provided with either a hole (IHR - B) or slot (IHR - V) to suit M8 bolts, with a notch end to fix directly into a 38/17 or 30/20 cast-in channel (IHR - C) and with a notch end to suit the Hammer-On Section (page 22) that attaches to a 6.8mm - 25mm steel flange without site drilling (IHR - H). It is also available to suit the SDTSS-38-5PT self-tapping screw (IHR-S).



Example IHR Specification

(*Delete/Amend* as appropriate)

Ancon *IHR-B / IHR-V / IHR-S / IHR-H / IHR-C30 / IHR-C38* internal head restraint to suit a *215*mm block and a *25-50 / 51-75*mm gap.

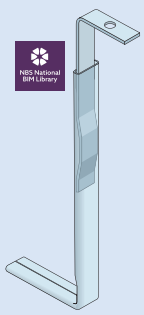
Design Resistances - Full Block (215mm)

		Design Resistances		
Product Reference	**Spacing**	**25mm Gap**	**50mm Gap**	**75mm Gap**
IHR-B, IHR-V, IHR-C and IHR-S	900mm	1.78kN/m	1.22kN/m	1.06kN/m
	450mm	3.56kN/m	2.44kN/m	2.11kN/m
IHR-H	900mm	0.57kN/m	0.57kN/m	0.53kN/m
	450mm	1.13kN/m	1.13kN/m	1.06kN/m

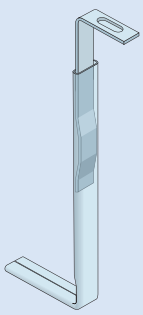
Design Resistances - Cut Blocks (min. 140mm)

		Design Resistances		
Product Reference	**Spacing**	**25mm Gap**	**50mm Gap**	**75mm Gap**
IHR-B, IHR-V, IHR-C and IHR-S	900mm	1.39kN/m	0.96kN/m	0.83kN/m
	450mm	2.79kN/m	1.92kN/m	1.66kN/m
IHR-H	900mm	0.44kN/m	0.44kN/m	0.42kN/m
	450mm	0.89kN/m	0.89kN/m	0.84kN/m

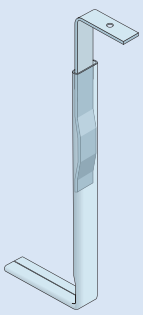
Ancon IHR-B with 9mm dia. hole



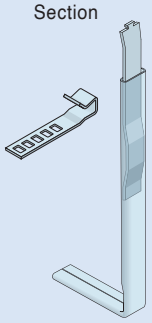
Ancon IHR-V with 9mm x 25mm slot



Ancon IHR-S with 6mm dia. hole



Ancon IHR-H supplied with Hammer-On Section



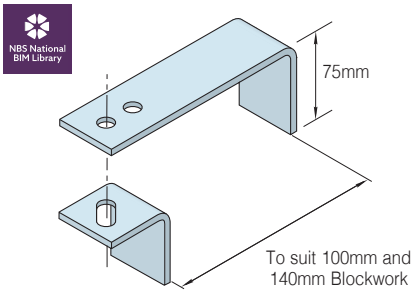
Ancon IHR-C to suit cast-in channel

IHR - C 38 to suit 38/17

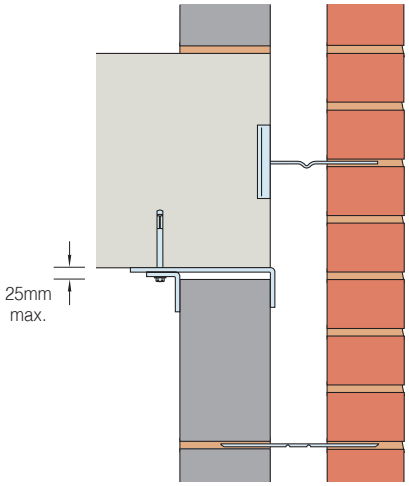
IHR - C 30 to suit 30/20

Ancon FHR - Head Restraint

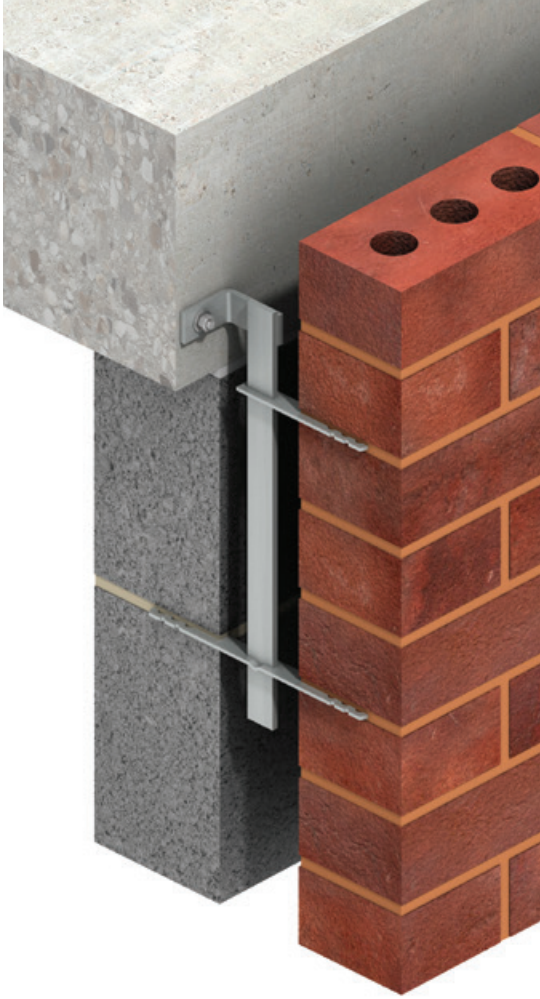
The Ancon FHR Head Restraint is used for restraining the top of internal walls or the internal leaf of a cavity wall. The two angles clamp the top of the wall and have 10mm diameter holes to suit M8 bolts. They are supplied with two holes in the longer angle to allow the restraint to fit 100mm and 140mm blockwork. Each restraint provides a design resistance of 1890N.



Ancon FHR Head Restraint - other sizes available



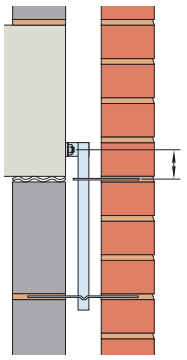
Ancon FHR Head Restraint Fixed to Underside of Floor Slab, Restraining Head of Inner Leaf of Cavity Wall



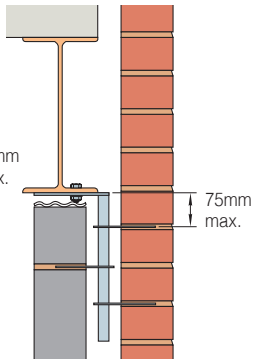
Ancon SAH - Sliding Anchors

Ancon SAH Sliding Anchors have stems which fit within the cavity and accept ties that slide to accommodate vertical movement. Available with five different head options as standard, they can be supplied with one-way or two-way ties with safety ends.

The standard fixing hole is 12mm diameter to suit Ancon M10 Expansion Bolts (concrete), Ancon M10 Set Screws (steel) or M10 T-Head Bolts to fit Ancon 28/15 Channel. When fixing the Sliding Anchor to hollow steelwork (e.g. RHS), a non-standard Ø7mm hole is required in the head to suit an SDTSS-38-5PT self-drilling self-tapping screw. Ancon SAH Sliding Anchors have a design resistance of 755N per stem when the upper tie is within 75mm of the fixing. Ties should be spaced at a minimum of 150mm and at least two ties should be used per stem.



SAH - UF

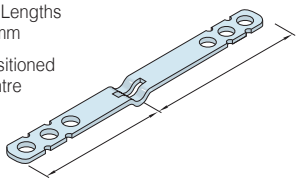


SAH - UO with Extended Head

SIS

Standard Lengths
200, ***230***mm

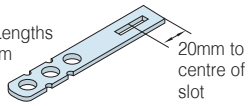
Slot is positioned at the centre of the tie



Other lengths and slot positions available to suit application

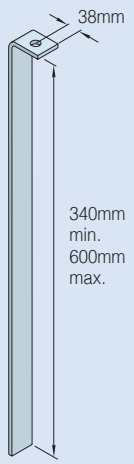
SPI

Standard Lengths
135, ***150***mm

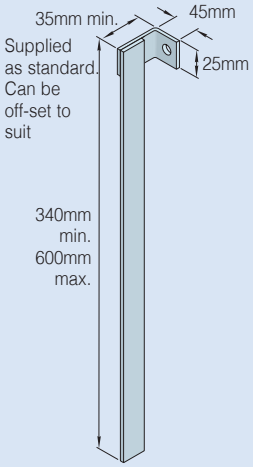


Other lengths available to suit application

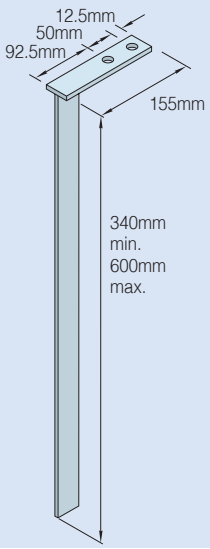
SAH - U



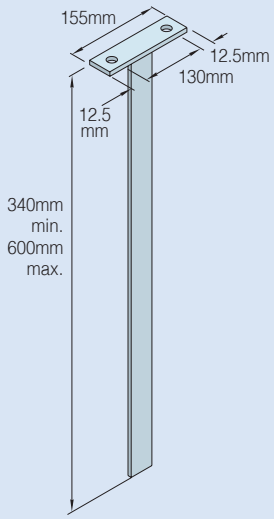
SAH - UF



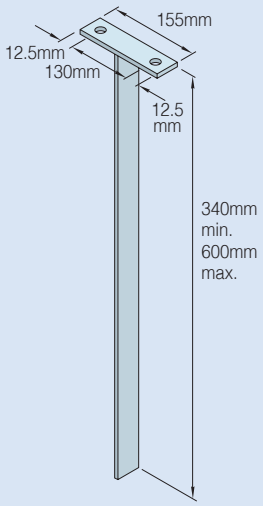
SAH - UO



SAH - UT



SAH - UC



Head dimensions and hole positions are variable.

Note: These drawings are examples only. All sliding anchors are manufactured to suit individual requirements.
Where sliding anchors are to be connected to a concrete frame, Ancon will provide fixings suitable for cracked concrete.

Wall Ties and Restraint Fixings

Acoustic Wall Ties

Ancon Acoustic Wall Ties feature a highly engineered, pre-compressed, acoustic isolation element. Products in this range provide the necessary structural performance, while minimising the transfer of airborne noise and vibration. Typical applications include: music rooms, recording studios, cinemas, nightclubs, industrial units, residential developments and mixed-use developments.

The acoustic performance of this range is far superior to other wall tie types and is the result of a carefully engineered balance between mechanical stiffness and high acoustic resilience. See table for comparisons.

Dynamic Stiffness

Dynamic stiffness, as featured in Approved Document E of the Building Regulations, allows comparisons to be made between ties of different types and lengths. Research has shown that the dynamic stiffness of a wall tie featuring an acoustic isolator is determined by this element alone and is independent of the tie length and cavity width in which it is used (Robin Wilson, Heriot Watt University, 1992).

Approved Document E specifies the use of Type A ties in separating/party walls of new build residential developments in England and Wales. Type A ties must have a dynamic stiffness of less than 4.8 MN/m^3. The dynamic stiffness of most Type 4 wire wall ties is only marginally below this threshold at a standard tie density of 2.5 ties/m^2. In contrast, the Ancon Type 3 Acoustic Wall Tie range, with a comparable dynamic stiffness of just 2.15 MN/m^3, offers a significant improvement over other Type A wall ties.

Frequency

When considering sound insulation in buildings, the range of frequencies considered are generally between 50Hz and 5000Hz and these are normally banded into the low frequency range [50 – 200Hz], mid-frequency range [201 – 1000Hz] and high frequency range [1001 – 5000Hz].

Ancon Acoustic Wall Ties have been designed to fall within the lowest band.

Structural Performance

All products in this range offer Type 3 wall tie performance to PD 6697: 2019 at a standard tie spacing of 2.5 ties/m^2 and are available in incremental lengths of 25mm to suit the cavity range stated. The table shows the calculated tie density to achieve other wall tie types and how this affects the dynamic stiffness (NM/m^3). Contact us for more information. A CE declaration of performance is available online.

Comparison of Acoustic Performance of Various Ancon Wall Tie Types

Wall Tie	PD 6697 Type	Cavity	Frequency*	Dynamic Stiffness**
ST1	1	50 mm	848 Hz	75.8 MN/m^3
RT2	2	50 mm	500 Hz	25.5 MN/m^3
HRT4	4	50 mm	208 Hz	4.7 MN/m^3
Acoustic Tie	**3**	**-**	**139 Hz**	**2.15 MN/m^3**

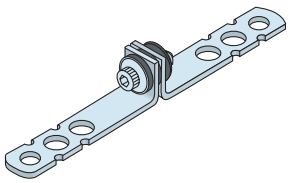
*Mean axial mass-spring-mass resonance frequency of the tie
**At a standard tie density of 2.5 ties per sq.m. Test regime described in BRE information paper IP3/01.

Ancon ACOU Acoustic Range Calculated Tie Density per Wall Tie Type

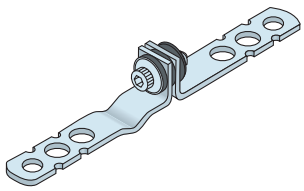
Equivalent Wall Tie Type	Tie Density (Spacing)	Dynamic Stiffness	Type A
Type 4 Light Duty	**2.5 ties/m^2** (900mm x 450mm)	**2.15 MN/m^3**	✓
Type 3 Basic	**2.5 ties/m^2** (900mm x 450mm)	**2.15 MN/m^3**	✓
Type 2 General Purpose	**3.9 ties/m^2** (565mm x 450mm)	**3.35 MN/m^3**	✓
Type 1* Heavy Duty	**7.4 ties/m^2** (300mm x 450mm)	**6.36 MN/m^3**	–

For more information on wall tie types, refer to page 7. * Type M2 (iv) mortar only

Acoustic Cavity Wall Ties

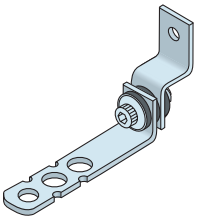


ACOU SP-SP
Plain shank cavity tie
Suits 50-175mm cavities
Available with either a central or offset isolator

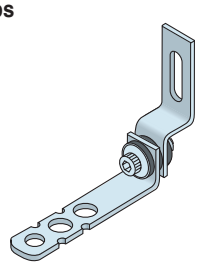


ACOU SP-SD
Cavity tie with integral drip
Suits 75-175mm cavities
Available with either a central or offset isolator

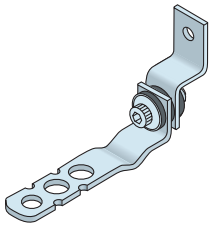
Acoustic Frame Cramps



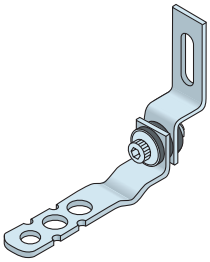
ACOU SP-ZB
Plain shank frame cramp with 7mm fixing hole
Suits 50-175mm cavities



ACOU SP-ZV
Plain shank frame cramp with 8mm x 30mm fixing slot
Suits 50-175mm cavities



ACOU SD-ZB
Frame cramp with integral drip and 7mm fixing hole
Suits 100-175mm cavities



ACOU SD-ZV
Frame cramp with integral drip and 8mm x 30mm fixing slot
Suits 100-175mm cavities

Other variations are available. Please contact us with details of your application.

Wall Starter Systems

36/8 Wall Extension System

The 36/8 Wall Extension System can be supplied with either SP36 ties or, where some longitudinal movement must be accommodated at the joint, PP36 ties complete with debonding sleeves. The channel can be supplied in lengths of up to 3.4 metres with each length having a series of holes to allow fixing to the existing wall. The system is available as a kit comprising ten ties, a length of 36/8 channel 2400mm long and ten plugs and screws for fixing at 300mm vertical centres. It is suitable for fixing to blockwork or concrete and has a design resistance of 1.6kN per metre.

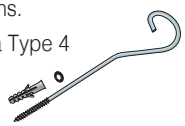
Ancon Staifix Universal Wall Starter System

This system includes all necessary fixings to join a single skin of masonry, 2400mm high, to an existing brickwork or blockwork wall and is suitable for wall widths from 60mm to 250mm. Each pack includes 2 fixing strips, 5 plugs, 5 washers, 5 screws and 10 wall ties. Wall Ties slide within the fixing strip to course with the bed joints of any masonry unit. This Universal Wall Starter System has a design resistance of 1.7kN per metre and can be used in line with NHBC standards.

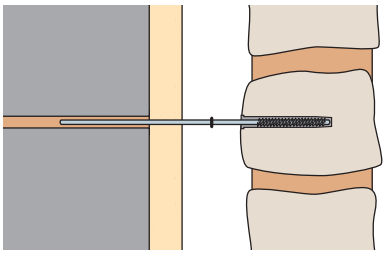
Ancon Staifix Cavity Starter Tie

This tie simplifies the building of an inner leaf of blockwork within an existing structure. It is ideal for barn conversions.

The cavity starter tie is a Type 4 tie to PD 6697: 2019.



Length mm	Cavity mm	Embedment mm
180	50-70	65-85
200	75-95	65-85
230	100-120	65-85

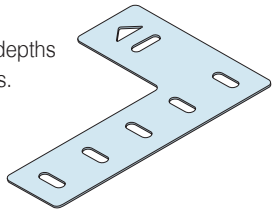


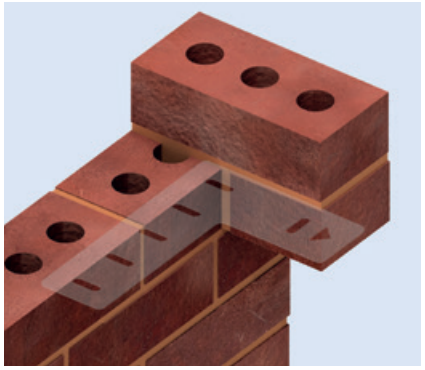
Reveal Support Plate

The Ancon Reveal Support Plate is designed to support the first few bricks of a full brick (215mm deep) window reveal during construction. The plate will bond into the bed joint of the outer leaf providing a stable bearing for the reveal brick.

The long leg of the plate is built into the bed joint of the external leaf with the arrow pointing inwards. To ensure stability, the outer leaf should be built at least one brick high on top of the plate prior to the reveal brick being placed.

For other reveal depths please contact us.

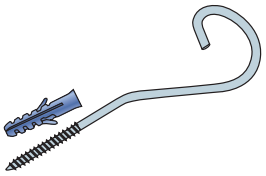




Ancon Staifix Starter Tie

This tie is quick and simple to install. It is suitable for use in brickwork and blockwork of up to 3 storeys or 8 metres in height and can be used in line with NHBC standards.

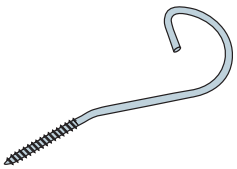
Supplied complete with an 8mm nylon wall plug, the Starter Tie is fixed into the existing wall at an angle of 30° to the horizontal and bent into the bed joints of the new brickwork. Ties should be fixed at 225mm vertical centres and be central toeach leaf of the new wall.



Ancon Staifix Frame Tie

The Staifix Frame Tie is used to join timber door and window frames directly to brickwork. It is designed for use on buildings of up to 15 metres in height, and can be used in line with NHBC standards. The ties are screwed horizontally into the frame, surrounded by mortar and built into the bed joints of the new brickwork.

The vertical spacing of frame ties depends on the application. Please contact us or your local Staifix stockist for more information.



Wall Ties and Restraint Fixings

Restraints for Stone Cladding

Reference should be made to BS 8298-2: 2020 “Design and installation of natural stone cladding and lining”, when selecting ties for restraining stone cladding. Restraints should be designed to resist wind loads and any imposed loads from, for example, window cleaning equipment.

Each stone will normally be restrained in four places, two at the top and two at the bottom. These are usually situated in the horizontal joints. The restraints should be located in pre-formed mortises or holes positioned in the centre of the thickness of the stone panel, and located at 1/4 points for half bonded stones and 1/5 points for stack bonded stones. Restraints should be kept at least 75mm from any corner with the peripheral distances between any two restraints not exceeding 1200mm.

The embedment of restraint dowels and lips into the stone should be at least 20mm. To achieve this, lipped ties (LPBs) have a 25mm downstand and dowelled ties (DPBs and YPBs) have 60mm long dowels.

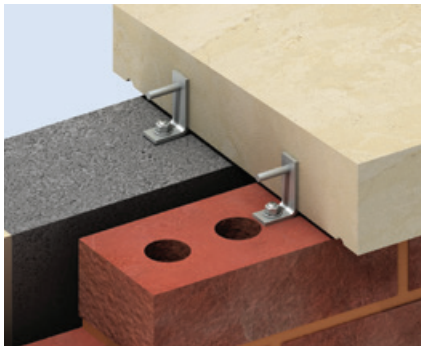
The actual capacity of the restraints will normally be restricted by the breaking load of the stone and/or the restraint fixing bolt. Breaking loads at the fixing should be determined in accordance with BS EN 13364.

Frame cramps with a B end have a 7mm diameter hole to suit a range of fixings. Ancon M6 expansion bolts are recommended for fixing to concrete and M6 set screws or SDTSS-38-5PT self-drilling screws for fixing to steelwork. Frame cramps can be fixed to masonry with suitable plugs and screws or resin anchors. Poor substrates will limit the capacity of fixings and site testing is advisable in such applications. All fixings should be used in conjunction with a DIN washer.

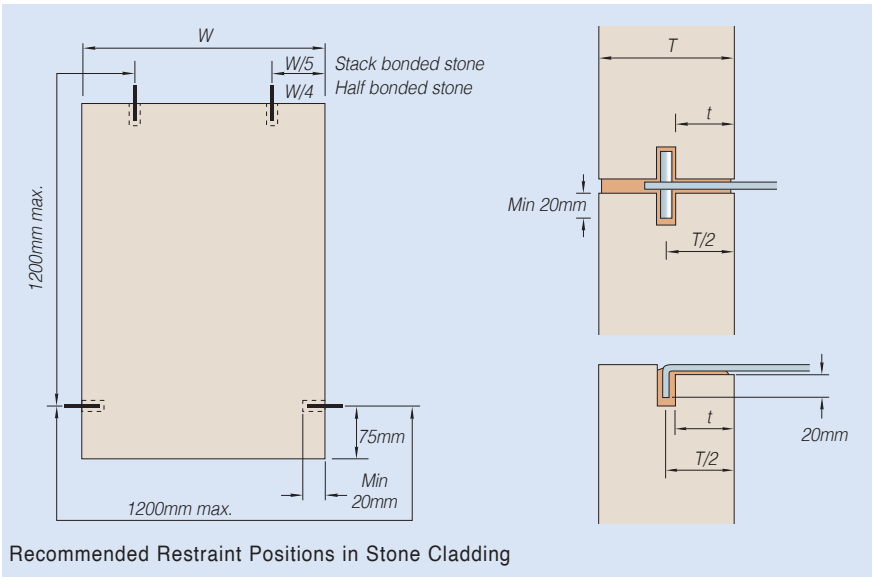
Ancon YDB Ties Fixed to Blockwork

Coping Stones

For restraining horizontal coping stones, YPB ties may be used as pictured to provide nominal restraint. For copings on a slope e.g. gable ends, restraint fixings are designed to suit the requirements of the application, including the slope and size of stone. For applications involving abseiling loads or other loading arrangements, please contact our Technical Services team with details of your project for help with product selection.



Two Ancon YPB Ties Restraining Coping Stone



Recommended Restraint Positions in Stone Cladding

Minimum Stone Thickness ‘T’ and Minimum Dimension Behind Restraint ‘t’

	More than 3.7m above ground - including facias		Soffits - including inlined soffits		Sills, copings and supported reveals	
Type of Stone	**T (mm)**	**t (mm)**	**T (mm)**	**t (mm)**	**T (mm)**	**t (mm)**
Granite, slate, white marble, quartzites	40	15	40	15	30	12
Hard limestone, travertines	40	15	40	15	30	12
Limestone, sandstone	75	30*	75	30*	50	302

** t = T/2 if stone thickness (T) is greater than 75mm*

Buchanan Galleries, Glasgow

Section of Ties

Restraints for large stones and for use where cavities are in excess of 100mm may require special attention. They may need a much bigger section than standard 20 x 2.5mm; ties formed from 20 x 3mm, 25 x 3mm, 30 x 3mm and 30 x 4mm are frequently used for restraining stone cladding.

Minimum Section of Dowels

Stone Thickness	Minimum Diameter of Dowels
30mm and below	3mm
40mm	5mm
50mm and above	6mm

Drip Position

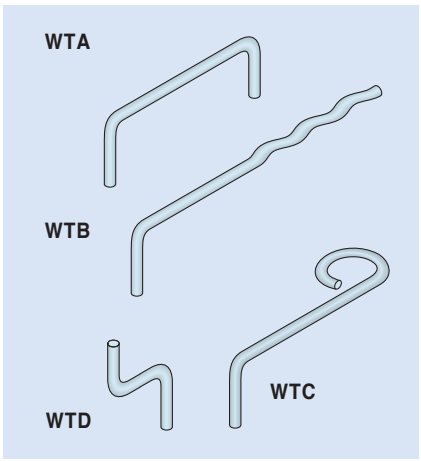
If a drip is required (e.g. YDB) please specify the position, indicating from which end of the tie the measurement is taken.

Dowels

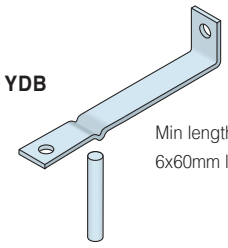
Standard dowels are 6mm in diameter and 60mm long. These will be welded into the tail end of ties referenced D__, and supplied loose with ties referenced Y__ and the multi-holed M__. 8mm and 10mm diameter dowels are also available upon request, as are longer lengths.

Wire Ties

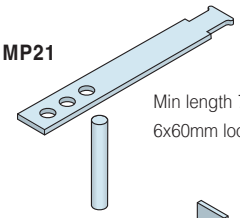
The traditional method of fixing thin marble, particularly for internal linings and low rise cladding is with wire ties and plaster or mortar dabs. Wire ties are manufactured from 3mm and 5mm diameter wire.



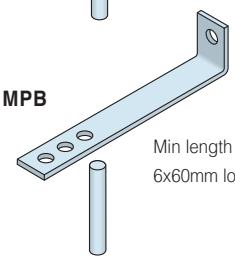
Ancon LD21 Ties Fixed into 21/18 Omega Channel, Restraining Top of Stone



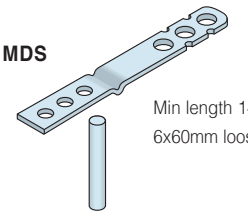
YDB
Min length 120mm
6x60mm loose dowel



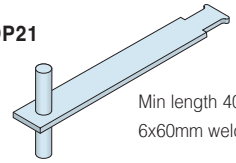
MP21
Min length 70mm
6x60mm loose dowel



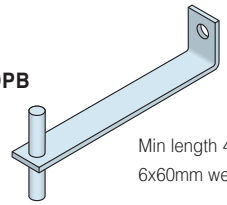
MPB
Min length 70mm
6x60mm loose dowel



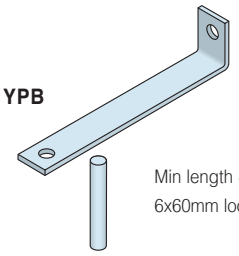
MDS
Min length 140mm
6x60mm loose dowel



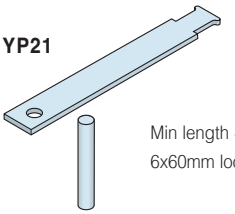
DP21
Min length 40mm
6x60mm welded dowel



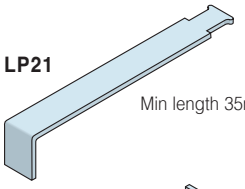
DPB
Min length 40mm
6x60mm welded dowel



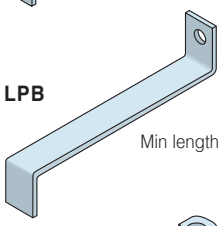
YPB
Min length 40mm
6x60mm loose dowel



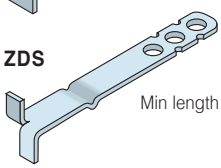
YP21
Min length 40mm
6x60mm loose dowel



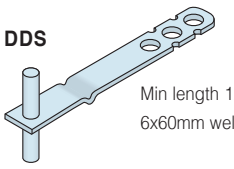
LP21
Min length 35mm



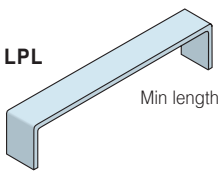
LPB
Min length 40mm



ZDS
Min length 110mm



DDS
Min length 120mm
6x60mm welded dowel

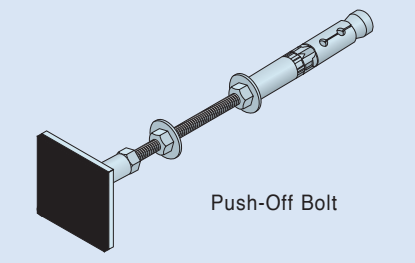


LPL
Min length 75mm

Wall Ties and Restraint Fixings

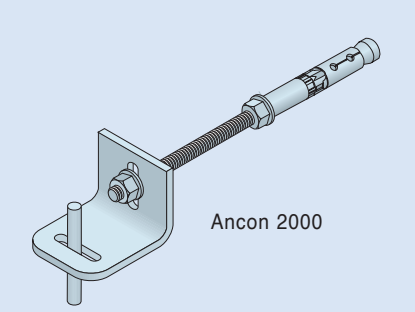
Ancon Push-Off Bolt

The Push-Off Bolt provides the centre of stone panels with additional resistance to the effects of impact loads, blast loads and positive wind pressure. The Bolt features a mechanical expander at one end which fixes securely into the inner leaf. The external stone panel is positioned with its inner face flush to the bolt's neoprene pad, which cushions the surface and prevents any rattling. The Push-Off Bolt is supplied in a variety of lengths to suit cavities from 100 to 200mm and can be fixed to both concrete and blockwork.

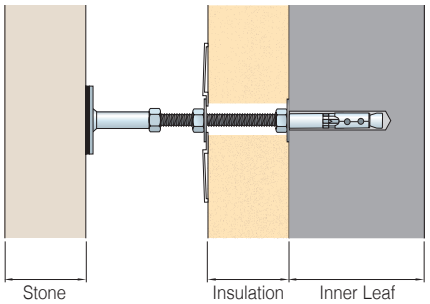


Ancon 2000

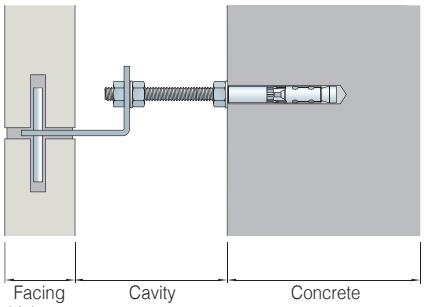
Ancon 2000 restraint fixings are a simple and secure method of fixing thin facing slabs. Installation is quick and easy and can be verified using a setting torque or visual inspection. Vertical and lateral adjustment is provided by the slotted holes in the fixing clip. Resin-fixed options are available for fixing to masonry on request.



Museum of Scotland, Edinburgh



Ancon Push-Off Bolt



Ancon 2000

Ancon 2000 Thin Facing Restraints

Reference	Facing Thickness (mm)	Cavity Min.* (mm)	Cavity Max. (mm)	Drill Hole Size (mm)	Setting Torque** (Nm)	Safe Working Load*** (N)
2000/A	20	25	70	12 x 85	15	600
	25	22	67			
2000/B	30	30	75	12 x 85	15	600
	40	25	70			
2000 - 75	20	60	105	12 x 85	15	600
	25	57	102			
	30	55	100			
	40	50	95			

Other sizes are available to suit cavities up to 180mm - please contact Leviat.
*Studding will require cutting down on site to accommodate some cavity sizes.
**Correct setting can also be confirmed by visual check - refer to installation instructions.
***Based on C20/25 cracked concrete. For other substrates e.g. blockwork or steel, please refer to Leviat's Technical team.


Corroded Steel Wall Tie

Remedial Wall Ties

Corrosion of Cavity Wall Ties

Wall ties are an essential element in the stability of masonry panels. Prior to 1978, wall ties were usually manufactured from galvanised mild steel. These ties were expected to last the lifetime of the building, but it has now been recognised that these wall ties can corrode after only 15 or 20 years.

When these ties corrode, they can expand to seven times their original thickness. This causes the brickwork to crack at the mortar joints and can result in major damage and sometimes the collapse of walls.

It is crucial that the problem is identified as quickly as possible and the correct remedial action undertaken.

Testing and Tie Performance

The '63 range, Staifix R/R and Teplo-R have been independently tested in a variety of materials; a summary of the results is given in the tables. The failure loads noted are obtained from standard tests in brick couplets and provide indicative values of tie performance. The couplet test produces results of a conservative nature compared to actual wall tests. Due to the variability of materials, it is advisable to undertake a pull-out test on site to verify the selection of an appropriate tie. Ancon remedial wall ties do not carry product marking as the test regime in the European Standard EN 845-1 is inappropriate for remedial applications.

Tie Spacing

Accepted practice is to follow PD 6697: 2019; that is maximum 900mm horizontally and 450mm vertically in a staggered pattern with 300mm vertical centres around openings within 225mm of the opening. Spacing should be determined by site testing of ties with a minimum density of 2.5 ties per m^2.

Fischer FIS VL 410 C Resin

This CE-marked, two part system of vinylester and hardener that we supply, is quick setting and suitable for a wide range of applications. An extension nozzle will be required when resin fixing remedial wall ties in the inner leaf of a cavity wall. Dispenser guns and additional static mixing nozzles are available.

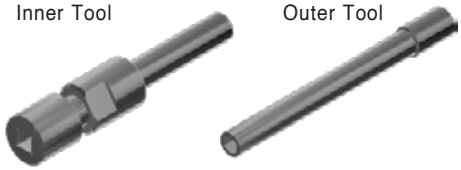
Installation of Remedial Wall Ties

Mechanical ties are easily installed by means of a Setting Tool which expands the brass ends in a drilled hole.

To install RM, Staifix Resin/Resin and Teplo-R remedial wall ties an extension nozzle and tube is required to pump resin across the cavity and into the inner leaf. The extension tube is supplied in a standard length of 1000mm and is cut to suit on site.

Installation guides are available to download from www.ancon.co.uk.


Ancon 63 Setting Tool


Ancon MM63 Setting Tools

Inner Tool

Outer Tool

Ancon RM 63 Range (Resin/Mechanical)

				Ultimate Tensile Load (kN)					
Drill (mm)	Drill Depth (Inner Leaf) (mm)	Tie Length (mm)	Nominal Cavity Width (mm)	Stock or Accrington Brick	Common Brickwork	Dense Concrete Block-work	Light-weight Concrete Block-work	40N Concrete	30N Concrete
11	70-75	200	35-60	3.3	3.0	2.6	2.1	3.2	2.9
11	70-75	225	61-85	3.3	3.0	2.6	2.1	3.2	2.9
11	70-75	250	86-110	3.3	3.0	2.6	2.1	3.2	2.9
11	70-75	300	135-160	3.3	3.0	2.6	2.1	3.2	2.9

Note: For cavities in the range 111mm to 134mm we recommend a Resin/Resin tie. Ties should not be positioned less than 10mm from the weather side of the outer leaf. Minimum embedment to the inner leaf is 70mm.

Ancon MM 63 Range (Mechanical/Mechanical)

				Ultimate Tensile Load (kN)		
Drill (mm)	Drill Depth (Inner Leaf) (mm)	Tie Length (mm)	Nominal Cavity Width (mm)	Common Brickwork	Dense Concrete Blockwork	30N Concrete
12	55-65	200	45-70	6	3	8
12	55-65	225	70-95	6	3	8
12	55-65	250	100-125	6	3	8

Failure Loads (Pull-Out) for Staifix R/R

Base Material	Compressive Strength (N/mm^2)	Failure Load (kN)
Dense Concrete Block	7.0-10.5	5.78
Lightweight Concrete Block	2.8-3.5	2.87
Mortar Bed Joint, 1:1:6 Type (iii) PD 6697: 2019	-	5.37

Ancon Teplo-R

Cavity Widths (mm)	Tie Lengths (mm)	Drill Diameter (mm)	Tie Diameter (mm)
75-450	215-590	10	7

Note: For applications outside those shown above, please contact us.

Failure Loads (Pull-Out) for the Ancon Teplo-R

Base Material	Embedment (mm)	Ø7mm Tie Failure Load (kN)
Brick ($20N/mm^2$)	70	4.73
Aerated Concrete Block ($3.6N/mm^2$)	70	2.27
Foundation Concrete Block ($7.3N/mm^2$)	70	2.29
Dense Concrete Block (C25/30)	70	11.90

Note: The failure loads given are pull-out tests only. The overall performance of the tie may be limited by other factors. For reduced embedment or alternative substrates, we recommend a site tensile test is conducted to ascertain actual performance. For further information please contact our Technical team to confirm suitability for specific applications.

Wall Ties and Restraint Fixings

Ancon 63 Mechanical/Mechanical
Used when tying together two leaves of solid materials, this tie has mechanical expanders at each end. Requires 12mm Ø holes.

Ancon 63 Resin/Mechanical
For use when the material in the inner leaf is perforated, of low-density or a friable material. A resin fixing may be used to eliminate any imposed stress. Requires 11mm Ø holes.

Ancon Staifix Resin/Resin
Used where mechanical expanders are unusable. Normally inserted into a 10mm Ø hole, but if test facilities are required, a 12mm Ø hole must be used. A plastic sieve can be used to retain resin and is particularly useful in perforated brick or hollow blockwork. A 12mm Ø hole is required to fit the sieve.

Ancon Stairib Bar
Stainless steel ribbed bar, resin-grouted into the inner and outer leaves. Requires 10mm Ø hole (6mm dia. bar) or 12mm Ø hole (8mm dia. bar).

Ancon AC 31
Used where bricks are removed then replaced in the outer leaf. The wavy end is resin-bonded into the inner leaf in a 10mm Ø hole.
The triangular end sits in the bed joint. Ancon AC 31 is supplied with a moveable neoprene o-ring that acts as a drip.

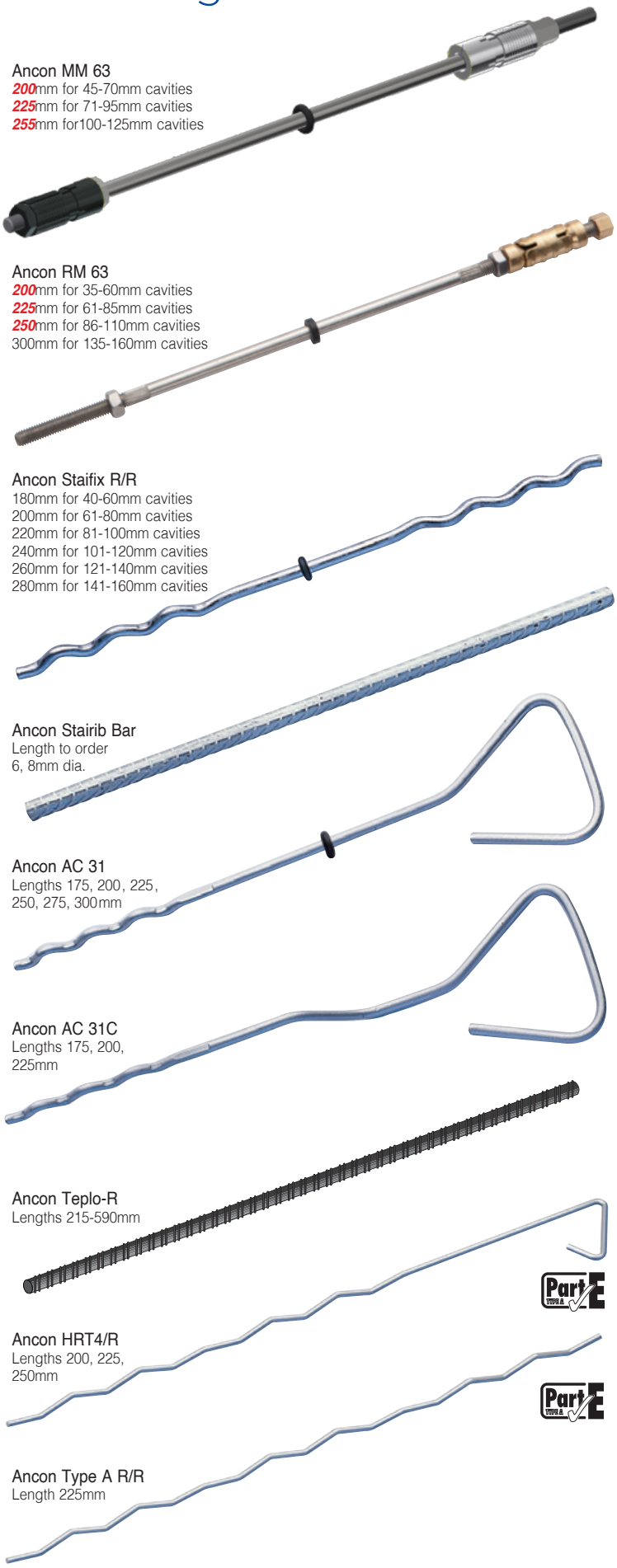
Ancon AC 31C
Similar to the AC 31 but cranked by 25mm to aid fixing to the inner leaf. Requires 10mm Ø holes.

Ancon Teplo-R
This plain-ended basalt fibre wall tie can be resin-fixed in remedial and retrofit applications. This tie has a thermal conductivity of only 0.7 W/mK. Requires Ø10mm hole (to suit Ø7mm bar).

Ancon HRT4/R
Used for tying the two leaves of a cavity wall or separating wall where the first leaf has already been built. The wavy end is resin-bonded into the existing wall in a 10mm Ø hole. The tie is based on the Staifix HRT4 and has similar properties.

Ancon Type A R/R
This is designed as a remedial tie for a separating wall. It will normally be inserted in 10mm Ø holes and resin-bonded into both leaves. It meets the requirements of a Type A wall tie to Approved Document E.

Note: For both the Ancon HRT4/R and Type A R/R, the presence and spacing of any existing ties needs to be carefully considered to ensure Type A is still achieved.



Ancon MM 63
200mm for 45-70mm cavities
225mm for 71-95mm cavities
255mm for100-125mm cavities

Ancon RM 63
200mm for 35-60mm cavities
225mm for 61-85mm cavities
250mm for 86-110mm cavities
300mm for 135-160mm cavities

Ancon Staifix R/R
180mm for 40-60mm cavities
200mm for 61-80mm cavities
220mm for 81-100mm cavities
240mm for 101-120mm cavities
260mm for 121-140mm cavities
280mm for 141-160mm cavities

Ancon Stairib Bar
Length to order
6, 8mm dia.

Ancon AC 31
Lengths 175, 200, 225, 250, 275, 300mm

Ancon AC 31C
Lengths 175, 200, 225mm

Ancon Teplo-R
Lengths 215-590mm

Ancon HRT4/R
Lengths 200, 225, 250mm

Ancon Type A R/R
Length 225mm

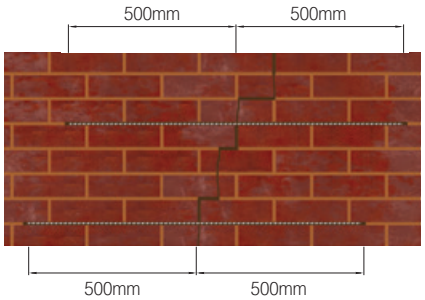
Ancon Staifix-Thor Helical Crack Stitching Kit

The Staifix-Thor Helical Crack Stitching Kit is a high strength, non-disruptive solution for the permanent repair of cracked masonry. It is available from builders merchants and specialist distributors.

Ideal for either the remedial specialist or the contractor with a one-off repair job, the kit contains 10 Staifix-Thor Helical reinforcing bars (6mm x 1000mm), masonry repair grout (3 litres), a paddle for grout mixing, a grout applicator gun with a flat nozzle and a finger trowel.

Purchase of the kit, in preference to obtaining all the components individually, guarantees the correct specification and compatibility of reinforcement, grout and tools for this specific application. The kit is supplied in a single box with full installation instructions.

The stainless steel helical bars are chemically bonded into bed joints to stitch cracks, redistributing tensile forces and stabilising the structure. On completion, the bar and grout are concealed, retaining the original character of the wall.



Please note it is essential that the cause of the cracking is established and eliminated prior to the installation of this system.

Other Ancon Products

Masonry Support Systems

Masonry cladding on concrete or steel frames is normally supported from stainless steel support systems. AnconOptima and Ancon MDC Systems create a continuous angle to support the outer leaf of masonry. Ancon Individual Brackets support masonry features such as curves and arches. A full design service is available to specifiers and users of Ancon systems.

Masonry Reinforcement

Ancon AMR masonry reinforcement improves the structural performance of a wall by providing additional resistance to lateral loads. Located in the bed joint, it has a flattened profile to maintain good mortar cover even when lapped or used with wall ties. It is available in various standard configurations to suit a range of loading conditions and wall widths.

Windposts and Parapet Posts

Large panels of masonry or panels with openings can often be difficult to justify structurally. Ancon Windposts are designed to provide additional lateral support for panels of brickwork. The range is manufactured from stainless steel and includes Windposts which can be installed into the inner leaf of blockwork and Windposts for installation into the cavity, which leave the blockwork undisturbed. Parapet Posts are used as vertical support for brickwork in either parapet or spandrel panels.

Insulated Balcony Connections

Ancon thermally insulated connectors minimise heat loss at balcony locations while maintaining structural integrity. They provide a thermal break and, as a critical structural component, transfer moment, shear, tension and compression forces. Standard solutions are available for concrete-to-concrete, steel-to-concrete and steel-to-steel interfaces.

Tension and Compression Systems

The use of tie bars in structures and buildings as an architectural as well as a structural element is increasing. Ancon Tension Systems comprise a range of components which can be supplied in carbon steel or stainless steel in a variety of sizes and finishes. The system looks particularly impressive when used with large areas of glazing or timber trusses.

For BIM objects of the above products visit www.ancon.co.uk/BIM or www.NationalBIMLibrary.com/Ancon

NBS National BIM Library

Ancon®

Leviat®

A CRH COMPANY

Innovative engineered products and construction solutions that allow the industry to build safer, stronger and faster.

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Email: info@leviat.com

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For sales enquiries:
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For technical enquiries:
Email: tech.ancon.uk@leviat.com

Ancon.co.uk
Leviat.com

Structural Products
UK & Ireland

Multibeam & Multichannel Service Brackets

Product Data Sheet

Multibeam Purlins & Rails / Multichannel

Kingspan®

Multibeam & Multichannel Service Brackets
Product Data Sheet

Clip Attached to the Lip - Purlins

Service loads supported by a clip hung on the lip of the Multibeam or Multichannel should be limited to the value shown in the tables below. All are allowable loads (SLS).

Table 1.1: Multibeam (65mm flange) and Multichannel (70mm flange).

Section Gauge (mm)	Total Load (kg)	Total Load (kN)
1.2	10	0.098
1.3	10	0.098
1.4	15	0.147
1.5 and above	20	0.196

Table 1.2: Multibeam and Multichannel (90mm flange).

Section Gauge (mm)	Total Load (kg)	Total Load (kN)
1.5 and above	7	0.069

Table 1.3: Multibeam (95mm flange).

Section Gauge (mm)	Total Load (kg)	Total Load (kN)
1.5 and above	6	0.059

Clips supporting the above loads should not be positioned closer than 400 mm along the lip.

The applied load on the clips must always be within the capacity of the section to support. This will normally be the service load applied in the design to select the section.

The service load must always be applied in a way to avoid causing the purlin section to twist. This may include additional uni-strut or similar components supplied by the service contractor to stabilise the supports.

Kingspan do not recommend using lip supported clip service brackets where there is cyclic loading or vibration in the load supported.

Other Service Attachments

Where the service load exceeds the capacity of the lip supported clips, other means of attaching the service loads should be adopted.

1 **Wrap around service brackets.** These are available from several third-party suppliers, Lindapter, Kaddie, Gripple and others. Capacities and load factors should be sought from the manufacturer.

2 **Direct bolting.** Holes can be drilled in the purlin to facilitate attachment of services. We recommend that site drilled holes are limited to 10 mm diameter.

3 **Self-drill self-tapping screws.** These may be utilised to produce an attachment point – the manufacturer of the fixing performance values should be consulted.

4 **Shot fired nails.** Not normally recommended with cold formed Multibeam and Multichannel sections, but check with the manufacturer of the system for specific guidance.

General

The applied load on the attachment must always be within the capacity of the section to support. This will normally be the service load applied in the design to select the section.

The service load must always be applied in a way to avoid causing the purlin section to twist. This may include additional uni-strut or similar components supplied by the service contractor to stabilise the supports.

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Second Issue | 02/2022

APPENDIX 3
PRE-CONSTRUCTION INFORMATION

Former Viking Centre, Tills Road, Norwich, NR6 7QZ
Sprowston Town Council
October 2023

BIDWELLS

PRE-CONSTRUCTION INFORMATION (DESIGN & MANAGEMENT REGULATIONS) 2015

Table of Contents

1.0 Description of Project

REF	TOPIC	PROJECT SPECIFICATION INFORMATION	OTHER COMMENTS/LOCATION
1.01	Project description and programme details	The existing building will be fully refurbished internally including the removal of all existing redundant plant and equipment. On the ground floor, two self-contained function rooms, will be formed, each containing storage, toilets and tea-making facilities. In addition to the function rooms a café bar will be created in the central rotunda of the building, which again will be self-contained, having its own toilet facilities and services along with a stock room allocated within the cellar. A steel framed extension will be built to create a new community hall with separate storage, toilets and kitchen. The first-floor layout will be converted into 3no. small, office units, serviced by toilet and tea-making facilities.	Design package
	Key dates		
	Minimum time between appointment of Principal Contractor/Instruction to commence work on site	3 weeks	Client appointment
	Construction start	February 2024	Client appointment
	Construction finish	TBC	Client appointment
1.02	Details of Client, Designers, Principal Designer and other consultants	See Project Directory at Appendix 1	
1.03	Is the structure to be used as a workplace when complete? Designers to apply the relevant requirements of the Workplace (Health, Safety and Welfare) Regulations 1992	The first floor spaces will be converted into office spaces. The Client & Designer shall give consideration to how the Workplace Regulation will be addressed for those engaged to work on the site following completion.	
1.04	Extent and location of existing records and plans inc. Building Files prepared under CDM 2015.	Geo-technical survey Land Contamination Assesment	Survey not required to carry out works.
		Topographical survey	Survey not required to carry out works.

		Asbestos Surveys	Design package
		Building Record drawings	Design package
		Service Records	Survey not required to carry out works.

2.0 Clients Considerations & Management Regulations

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
2.01	Arrangements for planning for and managing the construction work, including any health and safety goals for the project	The Client will satisfy the Regulations by appointing a Principal Contractor and Principal Designer. Aims are to execute the work without affecting the health of site users or Construction Team. Formal risk assessments and method statement required to maintain safe system of work.	Design package
	Communication and liaison between Client and others	General correspondence and meetings to ensure all parties are aware of the works in hand and their responsibilities.	Design package
	Security of the site	Principal Contractor to take responsibility for enclosing the full extent of the site and maintaining security. All unauthorised persons to be excluded.	Design package
	Welfare provision	Commensurate with scale of operation. Provide facilities for all construction personnel in accordance with the regulations.	Design package
2.02	Requirements relating to the H&S of the Client's employees or customers or those involved in the project		
	Site hoarding requirements	Principle Contractor will erect hoarding the perimeter of the site and ensure no unauthorised personnel enter the site.	Design package
	Site transport arrangements or vehicle movement restrictions	The site in accessed via Tills road. Principle Contractor is to provide sufficient safety warning signage and comply with Highway Authorities requirements.	Design package
	Client permit-to-work systems	Review specification to omit or reduce use of hot working. If hot working remains ensure hot work permit system instigated. Provide specific Risk Assessment/Method Statement for working in confined spaces.	No specific permits of work required for day works.
	Fire precautions	The Principal Contractor will put into place a fire plan and emergency procedure for evacuation in the event of a fire. To be set out in CSH&SP. Other areas of work to be co-ordinated with existing Tenants. Local work within existing facility in use to be reviewed.	Design package
	Emergency procedures and means of escape.	The Principle Contractor is to manage within site areas and provide details within CPH&SP. All existing routes are always to be kept clear.	Design package
	Excluded areas or other authorisation requirements for those involved in the project	Not Applicable	Design package

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
	Any areas the Client has designated as confined spaces	Not Applicable	
	Smoking and parking restrictions	No smoking on site or in close vicinity of the property. Principle Contractor to manage parking arrangements on site.	Design Package

3.0 Environmental Restrictions & Existing on Site Risks

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
3.01	Safety hazards, including:		
	Boundaries and access, including temporary access – for example narrow streets, lack of parking, turning or storage space	Access to site is via public roads and therefore normal highway regulations and traffic laws apply.	Design Package
	Any restrictions on deliveries or waste collection or storage	Contractor is to ensure that adequate space is always available on site to facilitate for a skip or other means of waste disposal and deliveries. Allow for adequate safety signage.	Design Package
	Adjacent land uses – for example schools, railway lines/busy roads	Surrounding land use consists of residential and commercial properties.	Design Package
	Existing storage of hazardous materials	Current hazardous materials stored on site include but are not limited to: Chemical waste Sharps and needles	Design Package
	Location of existing services particularly those that are concealed e.g. water, electricity, gas etc	Obtain utility company records prior to site set up. Assume the following: Electricity cables Gas Water main	Site

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
		Drainage pipework Telecoms	
	Ground conditions, underground structures or water courses where this might affect the safe use of plant, for example cranes, or the safety of groundworks.	Principle Contractor to asses ground conditions on site.	Site
	Information about existing structures – stability, structural form, fragile or hazardous materials, anchorage points for fall arrest systems (particularly where demolition is involved)	Assume all are in good condition. Contractor is to asses the condition of structure prior to demolition works being started.	
	Previous structural modifications including weakening or strengthening of the structure (particularly where demolition is involved)	N/A	
	Any difficulties relating to plant and equipment in the premises, such as overhead gantries whose height restricts access	N/A	
	Health and safety information contained in earlier design, construction or 'as-built' drawings, such as details of pre-stressed and post-tensioned structures	Obtain records on site.	
3.02	Health hazards including:		
	Asbestos, including results of surveys (particularly where demolition is involved)	The building was constructed in the 1940's when the use of Asbestos as a building material and its importation used in the UK. An Asbestos Survey has been carried out and provided at Tender stage.	
	Existing storage of hazardous materials	Current hazardous materials stored on site include but are not limited to: Chemical waste Sharps and needles	
	Contaminated land, including results of surveys	N/A	
	Existing structures containing hazardous materials	Chrysotile identified within the R&D survey carried out.	Basement
	Health risks rising from client's activities	None	

4.0 Significant Design & Construction Hazards

REF	TOPIC	PROJECT SPECIFICATION INFORMATION	OTHER COMMENTS/LOCATION
4.01	Significant design assumptions and suggested work methods, sequences or other control measures	See Appendix 3 & 4	This document
4.02	Arrangements for coordination of ongoing design work and handling design changes	General liaison and distribution of meeting minutes and instructions.	
4.03	Information on significant risks identified during design	See Appendix 3 & 4	This document
4.04	Materials requiring particular precautions	Chrysotile to be removed by a competent and trained operative.	
4.05	Residual hazards upon completion	See Appendix 3 & 4	This document

5.0 The Health & Safety File

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
5.01	Description of its format and any conditions relating to its content	Provide information for Health & Safety File/O+M Manuals users. Content as agreed with Client	Design package

APPENDIX 1
PROJECT DIRECTORY

Project Directory

Building Consultancy

Project	Former Viking Pub, Tills Road, Norwich, NR6 7QZ
Issue number	01
Date of Issue	17/10/2023

	Name and Address	Contact Details
Client	Sprowston Town Council Recreation Ground Road Norwich NR7 8EW	T 01603408063 M E GuyRanaweera@sprowston-tc.gov.uk
Contract Administrator	Jason Menezes 16 Upper King Street Norwich NR3 1HA	T 01603229322 M 07787151492 E Jason.menezes@bidwells.co.uk
Principal Designer	Christopher Driscoll 16 Upper King Street Norwich NR3 1HA	T 01603229328 M 07976581200 E Christopher.drsicoll@bidwells.co.uk
Principal Contractor	TBC	T M E
Building Control	CNC Building Control The Horizon Centre Broadland Business Park Peachman Way Norwich NR7 0WF	T 0808 168 5041 M E
Architect	Steve Lucas 6 Octagon Business Park Hospital Road Little Plumstead Norwich NR13 5FH	T 01603397057 M 07590712263 E sl@prparchitecture.com

Project	Former Viking Pub, Tills Road, Norwich, NR6 7QZ
Issue number	01
Date of Issue	17/10/2023

	Name and Address	Contact Details
Structural Engineer	John Plumber 67 St Laurence Avenue Brundall Norwich NR13 5QN	☎ T 01603717893 ☎ M 07908 419724 ✉ E info@johnplummerpartnership.co.uk
Mechanical & Electrical Consultant	Ben Ling 300 Peachman Way Norwich NR7 0LB	☎ T ☎ M 07795615289 ✉ E ben.ling@bwlconsulting.net

APPENDIX 2
HSE F10 NOTIFICATION INFORMATION

APPENDIX 3
EXISTING BUILDING & SITE INFORMATION

Existing Building & Site Information

BIDWELLS

INFORMATION	SOURCE	COMMENTS
Existing Drawings	Paul Robinson Partnership & Bidwells	
Health & Safety File (Existing buildings)	N/A	
Proposed Layout and Design Drawings	Paul Robinson Partnership	
Structural Engineer Drawings	John Plumber Partnership	
Mechanical and Electrical Drawings	Building services Consulting	
Utilities Location Drawings	Paul Robinson Partnership	
Asbestos Survey Report/Asbestos Register	Sprowston Town Council	Included within PCI pack
Hazardous Substances Reports (see previous section)	N/A	
Condition/Dilapidation Report	N/A	
Planning Consent	Broadland District Council	
Building Regulations Approval	CNC Building Control	
Fire Risk Assessment	N/A	
Design Risk Assessments – Architect:	N/A	
Design Risk Assessments - Structural:	N/A	
Design Risk Assessments - Mechanical & Electrical:	N/A	
Design Risk Assessments - Temporary Works:	N/A	
Clients Health & Safety Procedures	N/A	
Developers Tenants Handbook.	N/A	

APPENDIX 4
POTENTIAL HAZARDS

Existing Building & Site Potential Hazards

BIDWELLS

POTENTIAL HAZARD	YES	NO	LOCATION	COMMENT
Fragile roof lights, asbestos cement sheeting to roofs, etc.		/		
Pitched roofs where access is difficult.		/		
Rotten and defective internal timberwork.	/			Conditions survey being caried out as part of the works.
Refuse and debris from former occupiers		/		
Asbestos – see Section 8	/		Basement	Chrysotile identified within R&D survey. Flash guard to be removed by an appropriately qualified and licensed Asbestos removal contractor as part of the works.
Restricted access and vehicle movements.		/		
Limited area for site set up externally.		/		
Limited area for materials storage.		/		Ensure materials are not excessively stock piled on site and barriers to be erected around stockpiled materials.
Pedestrian access ways to front of building		/		
Residential accommodation adjacent to site/in the vicinity.	/			Residential accommodation in proximity of the property. Ensure disruption and noise levels are kept within the legal limits. Working hours are strictly between 8am-6pm Mon – Fri.
Water courses, etc.		/		
Overhead power lines	/			Telephone mast to the rear of the property. Ensure all site operatives are made aware and extra care is taken when working in proximity.
Contaminated land		/		
Hazardous substances		/		
Pigeons, rodents or other infestations		/		

POTENTIAL HAZARD	YES	NO	LOCATION	COMMENT
Shared access routes		/		Ensure not work materials, tools and works are obstructing entrances and fire exits. Ensure materials are not taken into the property via communal entrances.
Restricted delivery areas/routes		/		There is limited space on site for deliveries. Contractor is to ensure that no vehicles violate any parking restrictions and that no roads are blocked.
Public transport		/		
Train/railway lines/land		/		
Yellow lines/red routes adjacent to premises	/			Parking restrictions sounding the site. The contractor is to ensure that parking restrictions are not violated.
Large areas of glazing		/		
Unguarded roof edges	/			Parts of the works involve replacing roof coverings, facias and soffits and therefore the contractor will need to make provision for safe working at height inclusive of edge protection.
Eyebolts, running lines, etc, without current testing and inspection certificates		/		
Building in constant operation i.e. Not closed for the construction works		/		
Public access		/		
Redundant tanks, petrol or other hazardous substance containers		/		
Overhead trees		/		
Syringes or other evidence of drugs		/		
Horse hair plaster or other potential sources of anthrax spores		/		
Other – please list:		/		

The principal contractor is to specifically investigate the above and is required to submit derails of how health and safety matters will be addressed in the Construction Phase Health and Safety Plan

APPENDIX 5
DESIGNER'S ASSUMPTIONS & IDENTIFICATION OF SIGNIFICANT HAZARDS

The CDM Regulations 2015

BIDWELLS

Designers Guidance & Checklist – Bidwells Guide No 2 (& Appendix 5 to Bidwells Pre-Construction Information)

DESIGNERS ACTIONS & CHECKLIST				
REF	ITEM	COMMENT & RESIDUAL ACTION	COMPLETED	
			YES	NO
1	**Client awareness** - do not commence work in relation to a project unless satisfied that the client is aware of duties.	Formally write to and provide copy of HSE guidance	✓	
2	**Elimination of risk** - take account of the general principals of prevention and PCI when preparing or modifying a design to eliminate foreseeable risks	See guidance below and review during the design process	✓	
3	**Risk reduction and control** - if not possible to eliminate take steps to reduce and control risks through the subsequent design process;	Has the design been reviewed at appropriate stages with the intent to remove/reduce hazards.	✓	
4	**Residual risk** - provide information about those risks to the PD and ensure information is included in the health and safety file; and	Ensure that the PD is aware of remaining risk areas and why they are not eliminated. Provide details on how to manage safely as part of the H&S File	✓	
5	**Provide information** - with the design about aspects of the design of the structure or its construction or maintenance to adequately assist others to comply.	Has the necessary information been provided for the H&S File	✓	

Completed by: Bidwells LLP

Dated: October 2023

Designers Assumptions & Identificaion of Significant Hazards

Designers are required to show/record that they have carried out their duties under the CDM Regulations including compliance with Regulation 9. Designers are required to:

- When preparing of modifying designs:
  - Take account for any pre-construction information provided by the client (and principal designer, if one is involved)
  - Eliminate foreseeable health and safety risks to anyone affected by the project (if possible)
  - Take steps to reduce or control any risks that cannot be eliminated
  - Apply the HSE guidance and the 'Principals of Presentation'
- Provide design information to:
  - The principal designer (if involved), for inclusion in the pre-construction information and the health and safety file
  - The client and principal contractor (or contractor for single contractor projects) to help them comply with their duties, such as ensuring a construction phase plan is prepared
- Communicate, cooperate and coordinate with
  - Any other designers (including the principal designer) so that all designs are compatible and ensure health and safety, both during the project and beyond
  - All contractors (including the principal contractor), to take account of their knowledge and experience of building designs
- Ensure that designs for workplaces meet the requirements of the Workplace Regulations

The following HSE 'CDM red, amber and green lists' should be applied to the design process

Red Lists: Hazardous procedures, products and processes that should be eliminated from the project where possible				
Ref	**Item**	**Comment & Residual Action**	**Eliminated**	
			Yes	**No**
	Lack of adequate pre-construction information, eg asbestos surveys, geology, obstructions, services, ground contamination etc.	Pre-construction information pack available and issued prior to works commencing on site.	✓	
	Hand scabbling of concrete ('stop ends', etc);	Safety Gloves to made available to all on site	✓	
	Demolition by hand-held breakers of the top sections of concrete piles (pile cropping techniques are available);	Use machine breakers where possible. If hand held breakers are used regular breaks should be taken with multiple operatives taking turns at carrying out works. Refer to HSE Guidance.	✓	
	The specification of fragile rooflights and roofing assemblies;	N/A		
	Processes giving rise to large quantities of dust (dry cutting, blasting etc.);	N/A		
	On-site spraying of harmful substances;	Suitable respiratory protective equipment to be made available for all site operatives carrying out the works and those in close proximity. Refer to HSE for guidance.	✓	
	The specification of structural steelwork which is not purposely designed to accommodate safety nets;	Where safety nest cannot be installed suitable fall mats should be used when working at height. Refer to HSE for guidance.	✓	
	Designing roof mounted services requiring access (for maintenance, etc), without provision for safe access (eg. barriers).	N/A		
	Glazing that cannot be accessed Safely, All glazing should be anticipated as requiring cleaning and replacement, so a safe system of access is essential.	N/A		
	Entrances, floors, ramps, stairs and escalators etc not specifically designed to avoid slips and trips during use and maintenance, including effect of rain water and spillages.	N/A		
	Design of environments involving adverse lighting, noise, vibration, temperature, wetness, humidity and draughts or chemical and/or biological conditions during use and maintenance operations.	N/A		
	Designs of structures that do not allow for fire containment during construction	N/A		

Amber Lists: Products, processes and procedures to be eliminated or reduced as far as possible and only specified/allowed if unavoidable. Including amber items would always lead to the provision of information to the Principal Contractor.				
Ref	**Item**	**Comment & Residual Action**	**Eliminated**	
			Yes	**No**
	Internal manholes / inspection chambers in circulation areas;	Ensure suitable reinforcement around opening to accommodate for footfall weight.		✓
	External manholes in heavy used vehicle access zones;	N/A		
	The specification of “lip” details (i.e. trip hazards) at the tops of pre-cast concrete staircases;	N/A		
	The specification of shallow steps (i.e. risers) in external paved areas;	N/A		
	The specification of heavy building blocks i.e. those weighing > 20kgs;	N/A		
	The chasing out of concrete / brick / blockwork walls or floors for the installation of services;	Suitable respiratory protective equipment to be made available for all site operatives carrying out the works and those in close proximity. Refer to HSE for guidance.	✓	
	The specification of heavy lintels (the use of slim metal or hollow concrete lintels being alternatives);	N/A		
	Large and heavy glass panels;	N/A		
	The specification of solvent-based paints and thinners, or isocyanates, particularly for use in confined areas;	Ensure area is well ventilated and additional PPE in the form of respiration masks are made available.	✓	
	Specification of curtain wall or panel systems without provision for the tying (or raking) of scaffolds;	N/A		
	Specification of blockwork walls >3.5 metres high using retarded mortar mixes.	N/A		
	Site traffic routes that do not allow for ‘one way’ systems and/or vehicular traffic segregated from site personnel	N/A		
	Heavy construction components which cannot be handled using mechanical lifting devices (because of access restrictions / floor loadings etc)	N/A		
	Site layout that does not allow for adequate room for delivery and/or storage of materials, including specific components.	Ensure that all materials are stored either in a site compound or in a area away from walkways which does not pose a trip hazard.	✓	

Amber Lists: Products, processes and procedures to be eliminated or reduced as far as possible and only specified/allowed if unavoidable. Including amber items would always lead to the provision of information to the Principal Contractor.				
Ref	**Item**	**Comment & Residual Action**	**Eliminated**	
			Yes	**No**
	Heavy construction components which cannot be handled using mechanical lifting devices (because of access restrictions / floor loadings etc)	N/A		
	On-site welding, in particular for new structures.	N/A		
	Need to use large piling rigs and cranes near 'live' railways and overhead electric power lines or where proximity to obstructions prevents guarding of rigs	Ensure crane operatives are competent prior to carrying out the works. Seek guidance from the owner of the power lines before carrying out the works. Contractor to carry out their own risk assessment and refer to HSE for additional Guidance.		✓

Green Lists: Products, processes and procedures to be positively encouraged.				
Ref	**Item**	**Comment & Residual Action**	**Eliminated**	
			Yes	**No**
	Adequate access for construction vehicles to minimise reversing requirements (one- way systems and turning radii);	Limited access. Where vehicular access is required ensure that adequate signage and a banksman are present when a vehicle is reversing.	✓	
	Provision of adequate access and headroom for maintenance in plant rooms, and adequate provision for replacing heavy components;	N/A		
	Thoughtful location of mechanical / electrical equipment, light fittings, security devices etc. to facilitate access and away from crowded areas;	N/A		
	The specification of concrete products with pre-cast fixings to avoid drilling;	N/A		
	Specify half board sizes for plasterboard sheets to make handling easier;	N/A		
	Early installation of permanent means of access, and prefabricated staircases with hand rails;	N/A		
	The provision of edge protection at permanent works where there is a foreseeable risk of falls after handover;	N/A		
	Practical and safe methods of window cleaning (eg. from the inside);	High level windows can be cleaned from a tower scaffold.	✓	
	Appointment of a Temporary Work Coordinator (BS 5975);	N/A		
	Off-site timber treatment if PPA- and CCA-based preservatives are used (Boron or copper salts can be used for cut ends on site).	N/A		
	Off-site fabrication and prefabricated elements to minimize on site hazards.	All Steel work is being prefabricated off site.		
	Encourage the use of engineering controls to minimize the use of Personal Protective Equipment	N/A		

APPENDIX 6
REFURBISHMENT AND DEMOLITION ASBESTOS SURVEY REPORT

DMD House, 40 Paddock Street, Norwich, NR2 4TW

Refurbishment & Demolition Asbestos Survey Report	
Date	**16th April 2021**
For	**Bidwells**

Site Survey Address
Former Viking Pub **Tills Rd** **Norwich**

CLIENT	INSTRUCTING PARTY
Bidwells **16 Upper King Street** **Norwich** **NR3 1HA**	**Bidwells** **16 Upper King Street** **Norwich** **NR3 1HA**

Report prepared by DMD Environmental Ltd

DMD House

40 Paddock Street

Norwich

NR2 4TW

Contact: Carl Moore or Peter Peruzzi

Telephone: 01603 787499

Email: carl@dmde.uk or peterp@dmdi.co.uk

Report Prepared by: **Carl Moore**

Lead Surveyor:

Eddy Lane Signature: 

Authorised by:

Peter Peruzzi Signature: 

Date of survey: 16th April 2021 **Date of report:** 27th April 2021

SURVEY REPORT CONTENTS

APPENDICES

SECTION 1 – SITE DESCRIPTION

An initial walkthrough was carried out at the beginning of the survey and each room or area were given a unique identifier for the purposes of locating asbestos containing materials within the scope of the survey. This unique identifier is clearly shown on the plans provided in Section 3.

The results of the pre-survey studies are as follows:

INFORMATION REQUESTED	INFORMATION PROVIDED
Building address	The Viking Pub Tills Rd Norwich
Date of construction	1940's
Description	Brick Built with Tiled Roof
Building use	Commercial
Site conditions	Good
Available drawings	No
Information on previous surveys or asbestos removal works	No

DMD Environmental Ltd surveyors attended the site on 17/04/2021 and carried out a Refurbishment Asbestos Survey in accordance with HSG 264 as instructed.

Lead Surveyor	Assistant(s)
Eddie Lane	----------

SCOPE OF WORK

The exact areas to be surveyed and the survey types requested by the client as well as any variations to the scope agreed on site are as follows:

AREA / BUILDING TO BE SURVEYED	SURVEY TYPE	VARIATIONS TO SCOPE OR EXCLUSIONS BY CLIENT
All Areas	Refurbishment & Demolition	N/A

SUMMARY OF FINDINGS

(ID/SP/P – Room – Description – Asbestos type – Estimated quantity – Risk level)

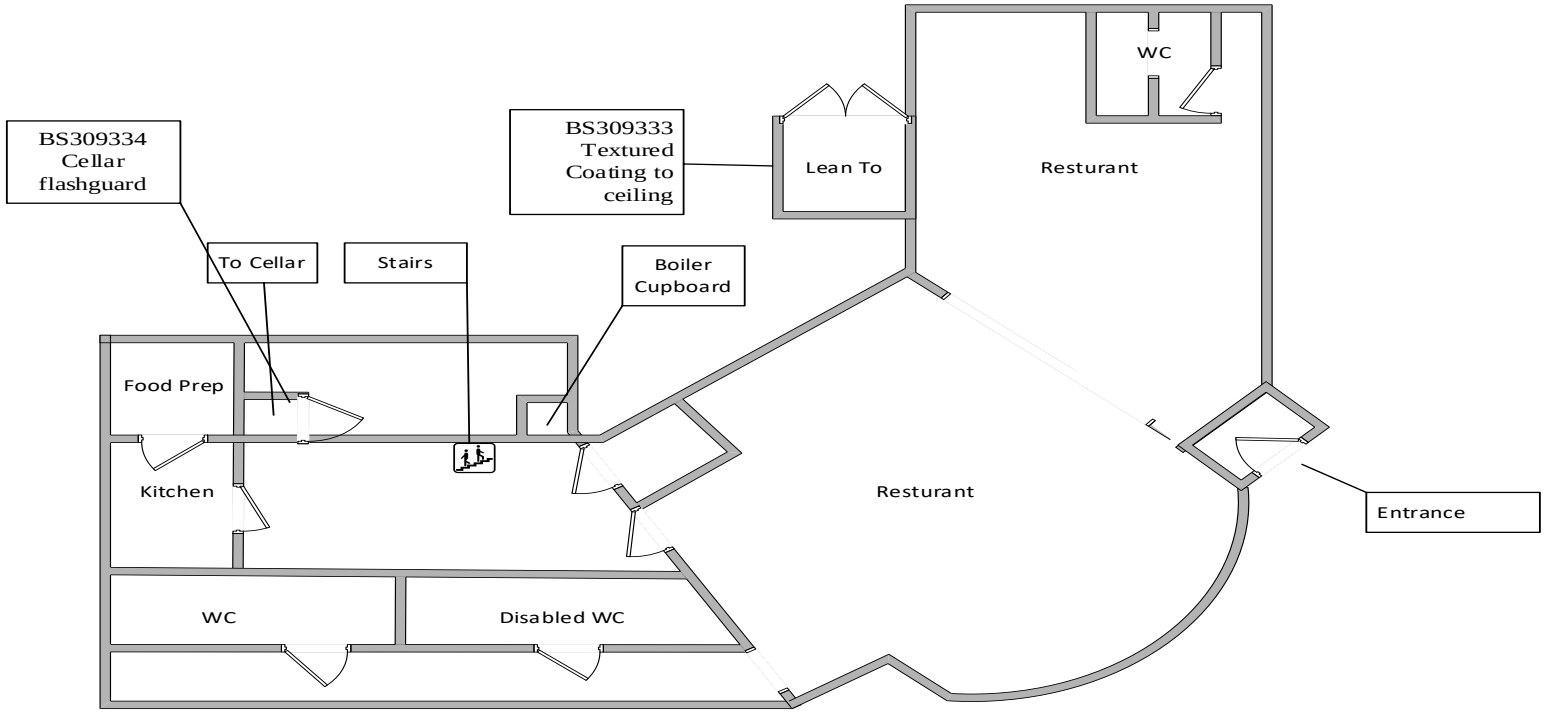
ID04 – Basement – Flash guards – Chrysotile – <1m^2

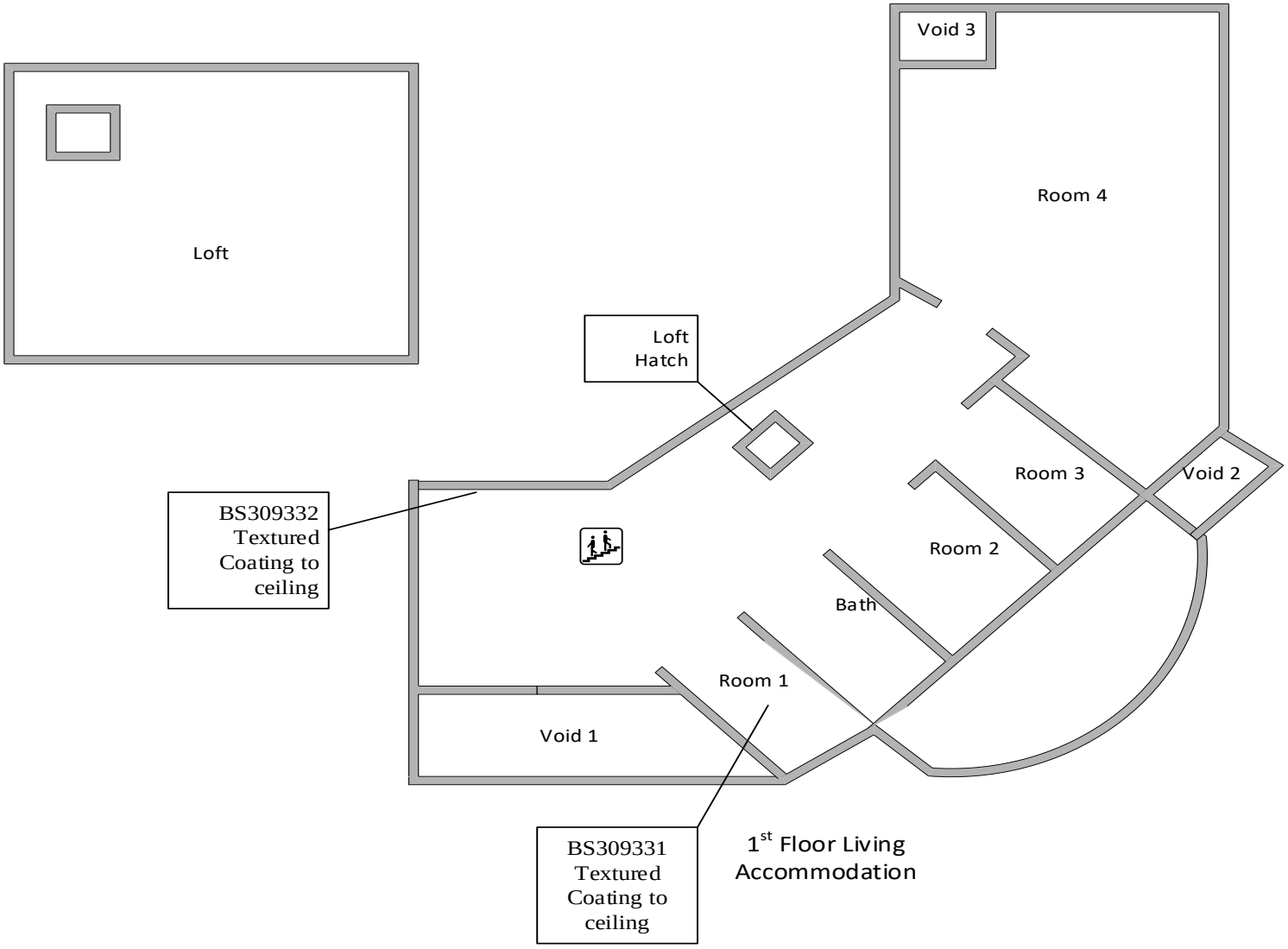
AREAS NOT ACCESSED AND SPECIFIC RESERVATIONS

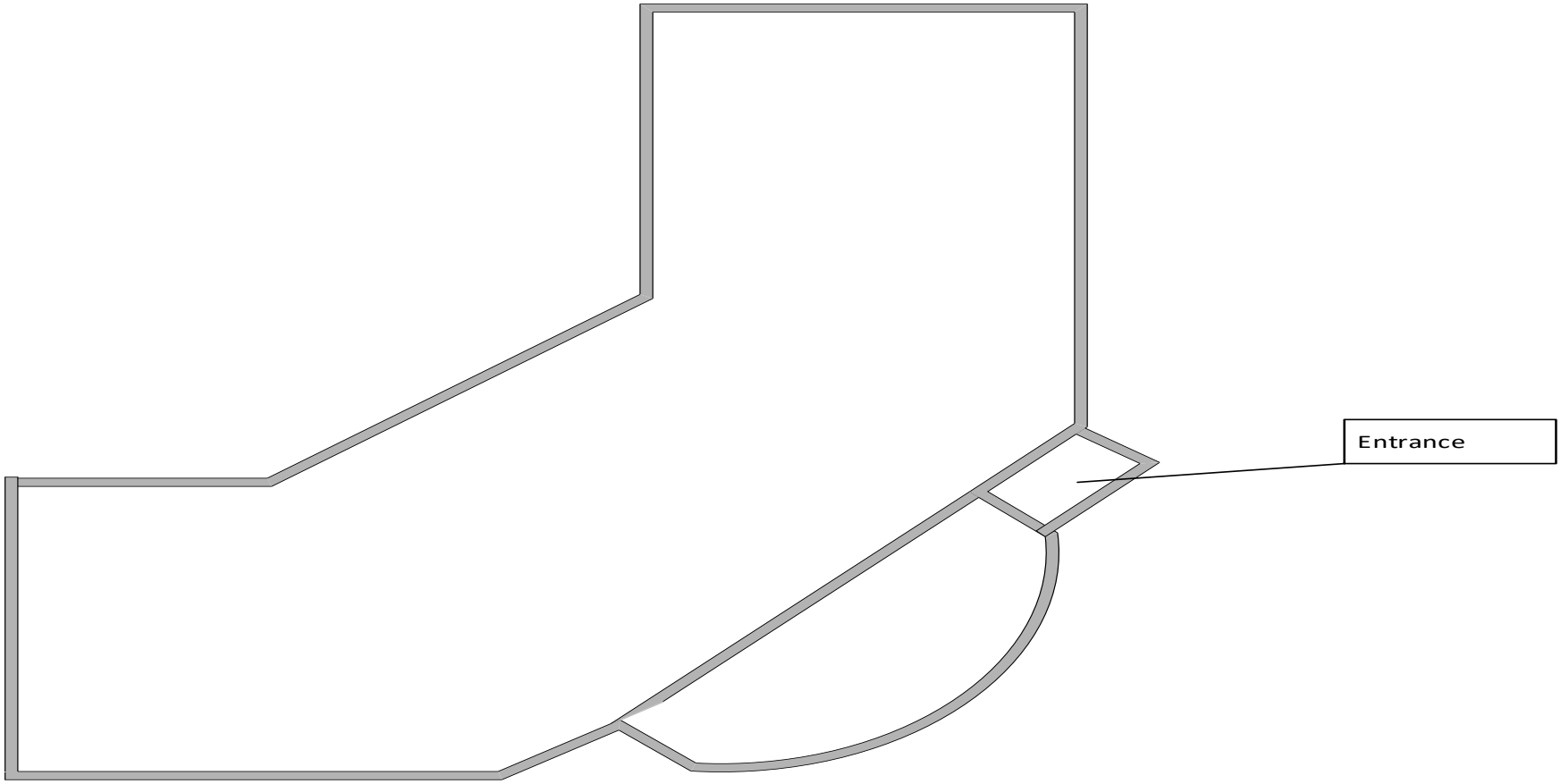
ALL AREA ACCESSED

SECTION 3 – SURVEY DRAWING

No.01




Void 3
Loft
Room 4
Loft Hatch
Room 3
Void 2
BS309332 Textured Coating to ceiling
Room 2
Bath
Room 1
Void 1
BS309331 Textured Coating to ceiling
1st Floor Living Accommodation



Externals

SECTION 4 – SURVEY RESULTS

The following pages contain detailed information about samples taken or presumptions made. All materials suspected of containing asbestos during the inspection are listed along with a picture. Where asbestos was found not to be contained within the product, 'NO' is clearly stated in the 'ASBESTOS' box on the page, in this case all material assessment reverts to '0'.

Where a sample has been taken for analysis, a unique **sample** reference is given, *e.g.* ID01, this can be cross referenced with the analysis certificate provided by the laboratory.

Where a **presumption** or **strong presumption** is made, a unique **presumption** reference is given, *e.g*. P01 or SP01.

Sample and **presumption** reference numbers can be cross referenced with the survey drawings, which display exactly where a sample or presumption was made.

We have adopted a strategy of using representative samples of materials to minimise the number of samples taken and to minimise disturbance of asbestos containing materials.

Inaccessible areas should be presumed to contain amphibole asbestos and appropriate management techniques should be implemented in order to control access to these areas until the presence or absence of asbestos products can be verified. This strategy requires the interpretation that visually similar materials must be assumed to be composed of the same materials.

SAMPLE REFERENCE	PRESUMPTION REFERENCE	RISK LEVEL	ASBESTOS
ID01	N/A	N/A	NO
AREA	**FLOOR**	**ROOM IDENTIFIER**	**DRAWING REFERENCE**
Internal	Ground	Room 1	01

DESCRIPTION OF SAMPLE TAKEN/PRESUMPTION OR OBSERVATION
Textured Coating

QUANTITY	ACCESSIBILITY	LEVEL OF IDENTIFICATION
3m2	Medium	Sampled

MATERIAL ASSESSMENT		
PRODUCT TYPE	0 - NADIS	**RECOMMENDATIONS**
DAMAGE	0 - NADIS	No Action Required
SURFACE TREATMENT	0 - NADIS	
ASBESTOS TYPE	0 - NADIS	**COMMENTS**
MATERIAL ASSESSMENT SCORE	N/A	n/a
POTENTIAL TO RELEASE FIBRES	N/A	

SAMPLE REFERENCE	PRESUMPTION REFERENCE	RISK LEVEL	ASBESTOS
ID02	N/A	N/A	No
AREA	**FLOOR**	**ROOM IDENTIFIER**	**DRAWING REFERENCE**
Internal	Ground	Landing	02

	**DESCRIPTION OF SAMPLE TAKEN/PRESUMPTION OR OBSERVATION**
	Textured Coating

QUANTITY	ACCESSIBILITY	LEVEL OF IDENTIFICATION
$4m^2$	Medium	Sampled

MATERIAL ASSESSMENT		
PRODUCT TYPE	0 - NADIS	**RECOMMENDATIONS**
DAMAGE	0 - NADIS	No Action Required
SURFACE TREATMENT	0 - NADIS	
ASBESTOS TYPE	0 - NADIS	**COMMENTS**
MATERIAL ASSESSMENT SCORE	N/A	n/a
POTENTIAL TO RELEASE FIBRES	N/A	

SAMPLE REFERENCE	PRESUMPTION REFERENCE	RISK LEVEL	ASBESTOS
ID03	N/A	N/A	NO
AREA	**FLOOR**	**ROOM IDENTIFIER**	**DRAWING REFERENCE**
External	Ground	Outside	03

	**DESCRIPTION OF SAMPLE TAKEN/PRESUMPTION OR OBSERVATION**
	Textured Coating

QUANTITY	ACCESSIBILITY	LEVEL OF IDENTIFICATION
$1m^2$	Medium	Sampled

MATERIAL ASSESSMENT		
PRODUCT TYPE	0 - NADIS	**RECOMMENDATIONS**
DAMAGE	0 - NADIS	No Action Required
SURFACE TREATMENT	0 - NADIS	
ASBESTOS TYPE	0 - NADIS	**COMMENTS**
MATERIAL ASSESSMENT SCORE	N/A	n/a
POTENTIAL TO RELEASE FIBRES	N/A	

SAMPLE REFERENCE	PRESUMPTION REFERENCE	RISK LEVEL	ASBESTOS
ID04	N/A	Very Low Risk	Yes
AREA	**FLOOR**	**ROOM IDENTIFIER**	**DRAWING REFERENCE**
Internal	Basement	Cellar	04

DESCRIPTION OF SAMPLE TAKEN/PRESUMPTION OR OBSERVATION
Flash guards

QUANTITY	ACCESSIBILITY	LEVEL OF IDENTIFICATION
1 <m^2	Low	Sampled

MATERIAL ASSESSMENT		
PRODUCT TYPE	2 - Ropes & Woven Textiles	**RECOMMENDATIONS**
DAMAGE	1 - Low Damage	Removal by Trained Operatives
SURFACE TREATMENT	2 - Ropes & Woven Textiles	
ASBESTOS TYPE	1 - Chrysotile	**COMMENTS**
MATERIAL ASSESSMENT SCORE	5	n/a
POTENTIAL TO RELEASE FIBRES	Very Low Risk	

SECTION 5 – ASBESTOS REGISTER

ID/SP/P	Area	Floor	Room	Description	Product type	Asbestos type	Estimated Quantity	Recommended Action	Material score
ID04	Internal	Basement	Cellar	Flash Guards	Asbestos Textiles	Chrysotile	<1m2	Removal by Trained Operatives	5

APPENDIX A – BULK IDENTIFICATION CERTIFICATE

ASBESTOS FIBRE IDENTIFICATION REPORT.

Report/Job No: J109802 Final Issue Date: 20/04/2021

Private & Confidential:
DMD Environmental Ltd
DMD House
40 Paddock Street
Norwich
NR6 7JG

Premises Of Sample Origin:
The Former Viking P/H
Tills Road
Sprowston
Norwich

Cavendish LABORATORIES
Millers Barn
The Warren Estate
Lordship Road
Writtle
Chelmsford
Essex
CM1 3WT
Tel: 01245 422800
Fax: 01245 422501
info@cavendishlaboratories.com

Name of analyst: Paula Turner Sampled by: Client
Date of sample receipt: 19/04/2021 Date of analysis: 20/04/2021

Results:

Laboratory Sample Ref.	Sample Location and Description	Asbestos Fibre Type	Presumptive Product Type
BS309331	1 - Room 1, textured coating to ceiling	No Asbestos Detected	Textured Coating
BS309332	2 - Landing, textured coating to ceiling	No Asbestos Detected	Textured Coating
BS309333	3 - Lean to, textured coating to ceiling	No Asbestos Detected	Textured Coating
BS309334	4 - Cellar, flashguard	Chrysotile	Textile / gasket

Chrysotile= "White asbestos", Amosite= "Brown asbestos", Crocidolite = "Blue asbestos"
Refer to H.S.E. publication HSG 264, for the approximate percentage asbestos content within the presumptive product type.

Method Statement and Disclaimers:
The analysis of the sample(s) detailed on this report is U.K.A.S. accredited. Analysis was performed in accordance with our quality control manual in-house method and Health & Safety Executive publication HSG 248.
Any interpretations or opinions expressed in this report are outside the scope of U.K.A.S accreditation.
Cavendish Laboratories Ltd does not hold U.K.A.S. accreditation for on-site sampling of suspected asbestos materials.
The stated "presumptive product type" is a subjective assessment by our analyst, it is not determined by measurement and it is an opinion. Cavendish Laboratories Ltd. cannot accept responsibility for any discrepancy or inaccuracy arising from collection or labelling of samples by the client. U.K.A.S. stands for United Kingdom Accreditation Service. Where samples are provided by customers, the results apply to the samples as received.

Authorised Signatory:
Paul Jarvis FA004-12 (1/5/20)

Page 1 of 1

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APPENDIX B – MATERIAL RISK ASSESSMENT

Material Assessment	Score	Examples
Product type	1	Asbestos reinforced composites (plastics, resins, mastics, roofing felts, vinyl floor tiles, semi rigid paints or decorative finishes, asbestos cement etc.
	2	Asbestos insulating board, mill boards, other low density insulating boards, asbestos textiles, gaskets, ropes and woven textiles, asbestos paper etc.
	3	Thermal insulation e.g. pipe and boiler lagging or similar, sprayed asbestos, loose asbestos, asbestos mattresses and packing, visible dust, and debris.
Damage / condition	0	Good condition: no visible damage
	1	Low damage: A few scratches or surface marks, broken edges on boards or tiles etc.
	2	Medium damage: Significant breakage of materials or several small areas where material has been damaged revealing loose asbestos fibres
	3	Any material damaged with fibres exposed, any material de-laminating including thermal insulation and sprays, visible asbestos dust, or debris
Surface Treatment	0	Composite materials containing asbestos, reinforced plastics, resins, vinyl tiles
	1	Enclosed sprays and lagging, AIB (with exposed face painted or encapsulated) asbestos cement sheets etc.
	2	Unsealed AIB, textiles or encapsulated lagging and sprays
	3	Unsealed lagging and sprays, visible dust, and debris
Asbestos Type	1	Chrysotile
	2	Amphibole excluding crocidolite
	3	Crocidolite

Score	Potential to release asbestos fibres
10 or more	High
7-9	Medium
5-6	Low
4 or less	Very Low

APPENDIX C – SURVEY NOTES

Notes on Drawings

The drawings supplied with this survey are for orientation and illustrative purposes only. They have not been drawn to scale and should not be used alone for the location and quantifying of asbestos containing materials. They must be viewed in conjunction with the material assessment and photographs, which will give information on quantities and locations.

Survey Objectives

The objectives of this survey were:

To locate and record, as far as reasonably practicable, the presence of asbestos containing materials (ACMs) within the areas of the building specified by the scope. This would have involved destructive investigation, but concentrated on surface inspection of the premises.

To produce a report for the client that is simple to understand, indicating the location and type of all suspect and identified ACMs, including Material Assessments and photographs where necessary, recommendations and an Asbestos Register.

To collect samples of all suspect ACMs for analysis, the results of which are shown in Appendix A of this report. It is normal practice for surveyors to assume ACMs in materials for which samples have already been taken, these suspect areas will be annotated as 'Strongly Presumed as per a Previous Sample'. Where there are areas that cannot be accessed by the surveyor, for any reason, it will be 'Presumed' to contain ACMs.

To assign a risk level for all ACMs identified or presumed by using a simple algorithm as explained in HSG264. This algorithm is calculated based on the type of asbestos found, the extent of any damage to the asbestos and the surface treatment of the product. The algorithm produces a score that will determine the risk level as follows.

Scores more than 10 are regarded as **HIGH RISK** and a significant potential to release asbestos fibres if it is disturbed.
Scores of 7,8 or 9 are considered **MEDIUM RISK**.
Scores of 5 and 6 are rated as **LOW RISK**
Scores of 4 or less are rated as being **VERY LOW RISK**

To provide recommendations on any actions that should be taken by the client, regarding any ACMs found, taking account algorithm score and the type of material. These recommendations can be found within the asbestos register (Section 5).

This report is produced solely for the benefit of Bidwell's and must be made available to all tradesmen and contractors that will have access to the building for any reason, so that they can take appropriate recommendations and/or actions to protect themselves.
This survey report cannot be used as a basis for tendering the removal of any ACMs prior to any refurbishment or demolition work.

Survey Techniques and Methodology

DMD Environmental Ltd surveyors attended the site and carried out a Refurbishment asbestos survey as instructed.

The survey required access and investigation of all areas in the building that are specified in the scope. The method used was a room by room/ area by area visual inspection of those areas. Samples were taken of any suspected asbestos containing materials for laboratory analysis (for results see Appendix A). Sample analysis is conducted in a UKAS accredited laboratory using Polarised Light and Dispersion Staining techniques.

Materials of the same or similar type were only occasionally sampled and it was generally presumed that surfaces identical to where samples were previously taken, was of a similar or the same material.

Survey Limitations, Exclusions, and General Caveats

The locations have been investigated in an intrusive manner, however did not involve demolition or complete removal of fixtures, fittings etc.

During subsequent refurbishment or demolition involving complete or part removal of fixtures and fittings, it must always remain a possibility that asbestos containing materials can be found, which were not identified at the time of the survey.

This could be due to the material being obscured or hidden in such a way that it would not be possible to detect without undertaking demolition work.

DMD Environmental Ltd cannot accept responsibility for any asbestos containing materials in such instances.

Textured Coatings such as "Artex" may contain a trace quantity of asbestos. Due to this low asbestos content, applications of this product may be non-homogenous and may elicit both positive and negative samples. Where both positive and negative samples are obtained, we recommend the client should presume that the textured coating contains asbestos throughout even though a non-detected result has been obtained, particularly where pattern (decorative style) and density are similar.

Abbreviations used in this Survey Report

ID = Identified and is generally used to indicate a sample number e.g. ID01, which is later identified by the laboratory.

P = Presumed, refers to 'Sample Number', i.e. P01, although a sample was not actually taken. It refers to when there is insufficient evidence to suggest that a material does not contain asbestos. For example, a heater flue could have a gasket that is inaccessible to the surveyor, but, based on the experience of the surveyor, it was presumed that the substance contains asbestos material.

SP = Strongly Presumed, refers to where the surveyor has good cause to believe that asbestos is present, but a sample was not taken for laboratory analysis, i.e. SP01. This could occur if the surveyor has decided that a similar or same material has previously been sampled for analysis.

NADIS = No Asbestos Detected in Sample

NAD = No Asbestos Detected

ACM = Asbestos Containing Material

N/A = Not Applicable

APPENDIX D – LEGAL REQUIREMENTS AND DUTYHOLDER RESPONSIBILITIES

The Control of Asbestos Regulations (CAR) 2012 Regulation 4, The Duty to Manage, places an obligation on the duty holder to;

- take reasonable steps to find ACM and check their condition
- make a written record of the location and condition and keep it up to date
- assess the risk of exposure
- prepare a plan to manage that risk

The Material Assessment which has been carried out as part of this survey identifies the materials that will most readily release airborne fibres if disturbed. However, a further Priority Assessment should be carried out by considering factors such as;

- The accessibility of the material
- Its extent
- The use to which the location is put
- Occupancy levels in the area
- Activities carried on in the area
- The frequency of maintenance activities in the area

The Priority Assessment should only be carried out with a detailed knowledge of the above and is the responsibility of the duty holder under the CAR 2012.

To comply fully with Regulation 4 and manage the asbestos risks effectively the duty holder should develop an Asbestos Management Plan which addresses the following points;

- Keep and maintain an up to date record of the location, condition, maintenance, and removal of all asbestos on the premises
- Repair, seal or remove asbestos if there is a risk of exposure
- Maintain asbestos in a good state of repair and regularly monitor the condition
- Inform anyone likely to disturb asbestos of its location and condition
- Have arrangements in place so that work which disturbs asbestos complies with CAR 2012
- Review the plan at regular intervals and update if circumstances change

DMD Environmental Ltd can assist with developing the above documents should this be required.

APPENDIX 7
SITE INVESTIGATION REPORT

BIDWELLS

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