8-025 Specification

05 May 2020

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C11 Site investigation

To be read with Preliminaries/ General conditions.

GENERAL REQUIREMENTS

110 EXTENT OF INVESTIGATION
- Location: Within boundaries shown on drawing 8-025 002.
- Scope:
  - Desk study: Submit proposals.
  - Exploratory holes: Trial pits as clause 250.
- Geophysical tests: Submit proposals.
- Instrumentation: Submit proposals.
- Reports:
  - Type: Factual and interpretive reports.
  - Other requirements: Submit recommendations for further investigation, special studies and remedial work.
- Objectives: Provide data for the design of remedial works and Provide data for the design of the extension substructure.

140 ACCESS TO THE SITE
- Details: The site may be accessed via the garden entrance at Garstang Road.
- Contact: Councillor Pat Hastings, 07803044238.

150 PUBLIC SAFETY
- Protection of the public and occupiers of adjoining property: Erect temporary fences, hoardings, footpaths, warning lights, etc. before starting work.
- Means of escape from adjoining property in the event of fire: Maintain for the duration of the Works.
- Specific hazards which may be encountered: not known.

160 SITE SAFETY
- Excavations and boreholes: Support sides and keep free from ground and surface water.
- Protection: Submit proposals.

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

180 COMPETENCE
- Skill and experience: Appropriate for the type of work.
  - Evidence: Submit prior to commencement.

190 PROTECTION
- Protect the following: trees as shown on drawing 8-025 002.

INVESTIGATION

250 TRIAL PITS, TRENCHES AND SHAFTS
- Purpose: Visual examination and sampling from ground level.
- Standard: In accordance with BS 5930.
- Locations: Submit proposals.
- Full depth: Submit proposals.
- Minimum trench width: Submit proposals.
- Plan dimensions: Submit proposals.
- Protection: Submit proposals.
- Backfill material: Submit proposals.
- Reinstatement: Submit proposals.

265 INSPECTION PITS
- Purpose: To determine the existence of buried services.
- Pit dimensions: The minimum necessary for the described purpose.
- Method of excavation: Hand dig.
- Backfill material: Submit proposals.
- Reinstatement: As existing.

267 SUBSTRUCTURE INSPECTION PITS
- Purpose: To determine the dimensions and formation level of existing substructures and the nature of the soil on which they are bearing.
- Pit dimensions: The minimum necessary for the described purpose.
- Method of excavation: Hand dig.
  - Precautions: Do not excavate lower than the substructure formation level.
- Backfill material: Designated cement-bound concrete grade CB16/20 to a level 150 mm above the substructure formation; compacted, as dug material above.
- Reinstatement: Submit proposals.
- 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

290 PERMEABILITY TESTS
- Standard: Carry out and report in accordance with BS EN ISO 22475-1.
- Test/ method: Submit proposals.
  - Locations: Submit proposals.

C20
Demolition

C20 Demolition

To be read with Preliminaries/ General conditions

GENERAL REQUIREMENTS

110 DESK STUDY/ SURVEY

- Scope: Before starting deconstruction/ demolition work, examine available information, and carry out a survey of:
  - the structure or structures to be deconstructed/ demolished,
  - the site on which the structure or structures stand, and
  - the surrounding area.
- Report and method statements: Submit, describing:
  - Form, condition and details of the structure or structures, the site, and the surrounding area.
    Extent: As drawings 8-025 002, 8-025 003, & 8-025 004 .
  - Type, location and condition of features of historical, archaeological, geological or ecological importance.
  - 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/ 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.
  - Special requirements:
  - Details of services supplied by Statutory Undertakers;
  - Disposal methods for gypsum-based products; and - Results of tests to determine the precise nature of hazardous materials .
- Format of report: PDF .

120 EXTENT OF DECONSTRUCTION/ DEMOLITION

- General: Subject to retention requirements specified elsewhere, deconstruct/ demolish structures down to foundation level: Break up and dig out foundations.

130 GROUNDWORKS

- Old foundations, slabs and the like: Break out in locations and to the extents stated.
- Contaminated material: Remove, and carry out remediation required by the Enforcing Authority.

140 BENCH MARKS

- Unrecorded bench marks and other survey information: Give notice when found. Do not remove marks or destroy the fabric on which they are found.

150 FEATURES TO BE RETAINED

- General: Keep in place and protect the following:
  - Boundary walls;
  - Gates and gate pillars;
  - Railings; or
  - Trees noted on drawings; protect in accordance with BS 5837.

SERVICES AFFECTED BY DECONSTRUCTION/ DEMOLITION

210 SERVICES REGULATIONS

- Work carried out to or affecting new and/ or existing services: Carry out in accordance with the byelaws and/ or regulations of the relevant Statutory Authority.

220 LOCATION 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 National Joint Utilities Group 'Guidelines on the positioning and colour coding of underground utilities' apparatus'.

230 SERVICES DISCONNECTION ARRANGED BY CONTRACTOR

- General: Arrange with the appropriate authorities for disconnection of services and removal of fittings and equipment owned by those authorities prior to starting deconstruction/ demolition.

240 DISCONNECTION OF DRAINS

- General: Locate, disconnect and seal disused foul and surface water drains.
- Sealing: Permanent, and within the site.

250 LIVE FOUL AND SURFACE WATER DRAINS

- Drains and associated manholes, inspection chambers, gullies, vent pipes and fittings:
  - Protect; maintain normal flow during deconstruction/ demolition.
  - Make good any damage arising from deconstruction/ demolition work.
  - Leave clean and in working order at completion of deconstruction/ demolition work.
- Other requirements: Submit proposals.

260 SERVICE BYPASS CONNECTIONS

- General: Provide as necessary to maintain continuity of services to occupied areas of the site on which the deconstruction/ demolition is taking place and to adjoining sites/ properties.
- Minimum notice to adjoining owners and all affected occupiers: 72 hours, if shutdown is necessary during changeover.

270 SERVICES TO BE RETAINED

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

DECONSTRUCTION/ DEMOLITION WORK

310 WORKMANSHIP
- Standard: 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.

320 GAS OR VAPOUR RISKS
- Precautions: Prevent fire and/ or explosion caused by gas and/ or vapour from tanks, pipes, etc.

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

340 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.

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

360 STRUCTURES TO BE RETAINED
- Extent: As drawing 8-025 101.
- Parts which are to be kept in place: Protect.
- Interface between retained structures and deconstruction/ demolition: Cut away and strip out with care to minimize making good.

370 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.

380 DANGEROUS OPENINGS
- General: Provide guarding at all times, including outside of working hours. Illuminate during hours of darkness.
- Access: Prevent access by unauthorized persons.

391 ASBESTOS-CONTAINING MATERIALS – UNKNOWN OCCURRENCES
- Discovery: 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.

410 UNFORESEEN HAZARDS

- Discovery: 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.

450 SITE CONDITION AT COMPLETION

- Debris: Clear away and leave the site in a tidy condition.
- Other requirements: Submit proposals.

MATERIALS ARISING

510 CONTRACTOR'S PROPERTY

- Components and materials arising from the deconstruction/ demolition work: Property of the Contractor except where otherwise provided.
- Action: Remove from site as work proceeds where not to be reused or recycled for site use.

520 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.
- Evidence of compliance: Submit full details and supporting documentation.
  - Verification: Allow adequate time in programme for verification of compliance.

C41
Repairing/ Renovating/ Conserving masonry

C41 Repairing/ Renovating/ Conserving masonry

To be read with Preliminaries/ General conditions

GENERALLY/ PREPARATION

110 SCOPE OF WORK

- Schedule: General masonry repairs, refer to the Building Condition Survey and drawings.
- Records of masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.
- 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

- 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: Employer's representative, Contractor's representative.
- Timing: At least 5 working days before starting each section of work.
- Instructions issued during inspection: Confirm in writing, with drawings and schedules as required, before commencing work.

125 REMOVAL OF FITTINGS/ FIXTURES

- Items to be removed, and reinstated on completion of repair work: Refer to drawings.
  - Identification: Attach labels or otherwise mark items using durable, non-permanent means, to identify location and describe refixing instructions, where applicable.
  - Treatment following removal: Infill & repoint.
  - Storage: Protect against damage, and store until required.
    Storage location: On site.
  - Reinstatement: Refit in original locations using original installation methods.
- Items unsuitable or not required for reuse: Dispose.
  - Disposal: Submit proposals.
- Masonry fabric and surfaces: Do not damage during removal and replacement of fittings/ fixtures.

130 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.

140 RECORD OF WORK

- General: Record work carried out to masonry clearly and accurately using written descriptions, sketches, drawings and photographs, as necessary.
- Specific records: None.
- Documentation: Submit on completion of the work.
  - Number of sets: Two.

WORKMANSHIP GENERALLY

150 POWER TOOLS
- Usage for removal of mortar: Not permitted.

155 PUTLOG SCAFFOLDING
- Usage: Not permitted.

160 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.

165 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.

170 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.

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

185 ADVERSE WEATHER
- General: Do not use frozen materials or lay masonry units on frozen surfaces.
- Air temperature: Do not bed masonry units or repoint:
  - 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.
  - 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.
  - In nonhydraulic lime:sand mortars in cold weather, unless approval is given.
- Temperature of the work: Maintain above freezing until mortar has fully set.
- Rain, snow and dew: Protect masonry by covering during precipitation, and at all times when work is not proceeding.
- Hot conditions and drying winds: Prevent masonry from drying out rapidly.
- New mortar damaged by frost: Rake out and replace.

MATERIAL/ PRODUCTION/ ACCESSORIES

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

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

258 EXISTING TEMPLATES
- General: Templates for replacement stones are available for making copy templates.

260 BRICKS
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.
- Size: 65mm.
- Special shapes: None.
- Recycled content: Submit proposals.

265 SALVAGED AND SECOND HAND BRICKS
- Source: Existing cracked bricks removed, cleaned, bonded with approved epoxy resin adhesive and reused.
- Condition:
  - Free from matter such as mortar, plaster, paint, bituminous materials and organic growths.
  - Sound, clean and reasonably free from cracks and chipped arrises.

DISMANTLING/ REBUILDING

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

REPLACEMENTS AND INSERTIONS

330 PREPARATION FOR REPLACEMENT MASONRY
- Defective material: Carefully remove to the extent agreed. Do not disturb, damage or mark adjacent retained masonry.
- Existing metal fixings, frame members, etc: Report when exposed.
- Redundant metal fixings: Remove.
- 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.

365 REPLACEMENT OF BRICKS GENERALLY

- Bricks: Clay as clause 260.
- Mortar: As section Z21.
  - Mix: 1:2.5 XYZ Ltd NHL3.5 hydraulic lime:sand.
  - Sand source/ type: Well graded crushed stone to approval.
- Fixings: Not required.
- Joints: To match existing.
- Other requirements: None.

385 LAYING REPLACEMENT MASONRY UNITS

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

MORTAR REPAIRS

510 PREPARATION FOR MORTAR REPAIRS

- 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.
- 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.
- Precautions: Do not weaken masonry by removing excessive material. Do not damage adjacent masonry.
- Top and vertical reveals of repair area: Undercut.

520 MORTAR REPAIRS GENERALLY

- Undercoats: As section Z21.
  - Mix: 1:2.5 XYZ Ltd NHL5 hydraulic lime: sand.
  - Sand source/ type: Sharp well graded sand to approval.
  - Building up: In layers where necessary, each layer not exceeding 12 mm.
- Finishing coat: To match approved samples.
  - Mix: 1:3 XYZ Ltd NHL 3.5 hydraulic lime:sand.
  - Sand source/ type: Fine sand to approval.
  - Finished thickness: 7 mm.
  - Finish: To match existing.
- Reinforcement: Not required.

540 APPLYING MORTAR

- Surfaces to receive mortar: Clean, and free from dust and debris. Dampen to control suction.
- 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.
  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.
- Finishing mortar coat: Form accurately to required planes/ profiles, and finish flush with adjacent masonry.
- Protection: Protect completed repairs from adverse weather until mortar has set.

550 SCRAPED FINISH TO MORTAR REPAIRS

- 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

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

POINTING/ REPOINTING

810 PREPARATION FOR REPOINTING

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

820 POINTING BRICKWORK GENERALLY

- Preparation of joints: Carefully brush away loose mortar and Dampen joints, as necessary, to control suction.
- Mortar: As section Z21.
  - Mix: 1:2.5 XYZ Ltd NHL3.5 hydraulic lime:sand.
  - Sand source/ type: Crushed stone fine pointing sand to approval.
- Joints profile/ finish: Recessed back from weathered arrises to retain original joint widths. Brushed finish as clause 860.
- Other requirements: None.

860 BRUSHED FINISH TO JOINTS

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

C45
Damp proof course renewal/ insertion

C45 Damp proof course renewal/ insertion

To read with Preliminaries/ General conditions.

115 SURVEY AND REPORT
- Survey generally:
  - Purpose: To confirm presence and extent of rising damp and suitability of walls for treatment by the proposed dpc system.
  - Timing: Before starting dpc installation work carry out survey and submit survey report.
  - Location of drilled samples: Submit proposals.
- Survey report content:
  - Extent of rising damp: Determine using methods recommended in the Property Care Association 'Code of practice for the installation of remedial damp proof courses in masonry walls', clause 6.
  - Proposals: Submit levels and positions of horizontal and vertical dpcs.
  - Associated work: Nature and extent of repair and/ or replacement work required to ensure an effective dpc.
  - Limitations: Identify areas where a full survey could not be carried out.
  - Other information: Any considered relevant.

135 ASSOCIATED WORK
- Work shown to be necessary by the survey: Carry out as part of main contract works.

140 BEFORE DPC INSTALLATION
- Positions of dpcs not shown on drawings: Submit proposals.
- Internal finishes: Remove only sufficient to expose the proposed line of dpc.
- Fungal or beetle attack to timber sections: Report occurrences.

165 REPOINTING OF WALLS
- Location: On line of proposed dpc.
- Timing: Before installation of chemical injection dpcs.
- Mortar: As section Z21.
  - Mix: As section C41.

210 CHEMICAL INJECTION DPC SYSTEM
- System: Agrément certified.
  - Product type: Contractor's choice.
- Installation: In accordance with BS 6576 by a registered member of the Property Care Association.

250 MAKING GOOD TO EXPOSED INJECTION HOLES
- Mortar mix: A type recommended by the chemical injection dpc system manufacturer to match existing masonry in colour and texture.
  - Installation: Fully fill holes. Finish neatly and flush.
- Approval of appearance: Obtain or first few holes before completing the remainder.

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

C51
Repairing/ Renovating/ Conserving timber

C51 Repairing/ Renovating/ Conserving timber

To be read with Preliminaries/ General conditions

GENERAL

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

130 OPENING UP
- Purpose: To reveal previously concealed areas of structure or fabric not recorded during initial surveys.
- Extent: Submit proposals.
- Timing: Give notice before starting opening up.
  - Period of notice: At least two working days.
- Retained building structure/ fabric: Do not damage or destabilize.

150 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:
  - Documentary evidence (that 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.
- Certification scheme: UK Timber Procurement Policy Category A evidence certification scheme..
  - Other evidence: None.

160 TIMBER SUPPLIER
- Supplier: Submit proposals.

PRODUCTS

310 STRUCTURAL SOFTWOOD (GRADED DIRECT TO STRENGTH CLASS) FOR STRUCTURAL USE GENERALLY

- Strength class to BS EN 338: C24.
- Treatment:
  - Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C8.
    Design service life: 30 years.
  - Fire retardant treatment: Fire retardant impregnation to NBS section Z12 and Wood Protection Association Commodity Specification FR2, Type INT2.
- Moisture content (maximum) at time of installation: 12%.
- Other requirements: Wane not permitted.

EXECUTION

600 WORKMANSHIP

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

610 TEMPORARY SUPPORTS/ PROPPING

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

620 PROTECTION OF TIMBER AND WOOD COMPONENTS BEFORE AND DURING INSTALLATION

- 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.
- Handling: Do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.

650 DIMENSIONS GENERALLY

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

660 CROSS SECTION DIMENSIONS OF STRUCTURAL SOFTWOOD AND HARDWOOD

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

665 CROSS SECTION DIMENSIONS OF NON-STRUCTURAL SOFTWOOD

- Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
- 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

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

680 WARPING OF TIMBER

- 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

- Cutting and machining: Carry out as much as possible before treatment.
- Extensively processed timber: Retreat timber sawn lengthways, thicknessed, planed, ploughed, etc.
- 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

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

740 REMOVAL OF EXISTING DECORATIVE/ PROTECTIVE FINISH TO INTERNAL TIMBER

- Extent: Remove completely back to bare wood.
- Method: Submit proposals.

750 CLEANING DIRTY OR STAINED WOOD

- Generally: Scrub with neutral pH soap and clean, warm water.
- 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

- Extent of timber removal: Cut out full cross section of member where wood is defective or decayed, plus 100 mm of sound wood.
- Distance from face of support to cut end of existing timber: Obtain instructions if dimension exceeds 100 mm.
- Joint profile: Square cut.

780 REPAIR OF DISTORTED TIMBER MEMBERS

- Generally: Repair to shape that member has assumed.

790 PEGS FOR MORTISE AND TENON JOINTS IN STRUCTURAL TIMBER

- Wood species: Oak.
- Condition: Dry, preferably oven 'baked' before use.
- Shape: Round and tapered.
- Second hand pegs: Do not use.
- 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

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

810 BOLTED JOINTS WITH CONNECTORS

- 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.
- Centres of bolt holes: Not more than 2 mm from positions shown on drawings.
- Assembly: Do not crush timber, deform washers or overstress bolts.

860 MOISTURE CONTENT CHECKING

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

870 MOISTURE CONTENT TESTING

- 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.)
- Test sample: Test 5% but not less than 10 lengths of each cross-section in the centre of the length.
- Test results: 90% of values obtained to be within the specified range. Provide records of all tests.

COMPLETION

910 MECHANICALLY FASTENED JOINTS

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

920 DATING TIMBERS USED IN STRUCTURAL REPAIRS

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

C52
Fungus/ beetle eradication

C52 Fungus/ beetle eradication

To be read with Preliminaries/ General conditions.

115 SURVEY AND REPORT
- Survey generally:
  - Purpose: To ascertain nature and extent of fungal/ beetle attack. To ascertain sources and extent of any dampness.
  - Timing: Before starting eradication work carry out survey and submit survey report.
- Survey report content:
  - Description of investigation methods.
  - 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.
  - Laboratory results identifying attacking organisms. Plan and section drawings or annotated photographs, defining extent of attack.
  - Proposals for eradication treatments and procedures, including measures to halt damp penetration and promote drying out.
  - Measurements of wood moisture content, with identification of instances above 20%.
  - Identification of neighbouring buildings that may be involved in attack.
  - Associated work: Nature and extent of repair/ replacement work required to load bearing constructions and to the building fabric in general.
  - Other information: Any considered relevant.

120 ASSOCIATED WORK
- Work shown to be necessary by survey: Carry out as part of main contract works.

140 OPENING UP/ CUTTING OUT/ REMOVAL OF BUILDING FABRIC
- Extent: Submit proposals.
- Retained building fabric: Maintain stability and do not damage.

150 DRYING OUT OF BUILDING FABRIC
- Drying conditions: Establish as soon as possible.
- Drying methods: Hot air treatment to PD CEN TR 15003.

162 PREPARATION GENERALLY FOR PRESERVATIVE/ FUNGICIDE TREATMENTS TO TIMBERS/ MASONRY
- Furnishings/ components/ finishes within treated areas: Prevent staining and other adverse effects.
- Water supplies: Do not contaminate.
- Electrical equipment and supplies: Isolate circuits as required and prevent ingress of treatment fluids.
- Cleanliness: Remove loose material, dust and debris from surfaces to be treated.

210 DRY ROT
- Fruiting bodies: Do not disturb. If heat treatment is not employed, spray with fungicide.
  - Removal: Remove carefully. Clean surfaces.
- 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.
- Infected material to be retained: Treat with penetrative preservative.

220 WET ROT

- Decayed timber to be removed: Cut out until sound timber is reached.
  - Disposal of previously treated timber: At a tip approved by a waste regulation authority.
- Decayed timber to be retained: Treat with penetrative preservative.

230 BEETLE INFESTATION

- 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

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

310 TIMBER PRESERVATIVES/ MASONRY FUNGICIDES GENERALLY

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

318 TIMBER PRESERVATIVE TREATMENT GENERALLY

- Preservative type: Agrément certified retreatment system.
- Tint: Required.
- Treatment method: As manufacturer's recommendations.

338 MASONRY FUNGICIDE TREATMENT

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

355 DRILLING TIMBER FOR INJECTION OF PRESERVATIVES

- Sizes and location of holes: Submit proposals.
- Sealing holes after treatment: Fully fill holes with approved filler; finish neatly and flush.
- Approval of appearance: Obtain approval of first few holes before completing remainder.

390 GUARANTEE

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

D
Groundwork

D20
Excavating and filling

D20 Excavating and filling

To be read with Preliminaries/General conditions

GENERALLY/THE SITE

110 SITE INVESTIGATION
- Report: See Preliminaries section A12.

150 EXISTING SERVICES, FEATURES AND STRUCTURES
- Services: See section A12 for locations.
- Site features to be retained: See section A12 for details.
- Structures: See section A34 for details of protection.

CLEARANCE/EXCAVATING

170 REMOVING SMALL TREES, SHRUBS, HEDGES AND ROOTS
- Identification: Clearly mark trees to be removed.
- Small trees, shrubs and hedges:
  - Cut down.
  - Roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
- Safety: Comply with Forest Industry Safety Accord safety leaflets.

180 CHIPPING AND SHREDDING
- Generally: Permitted, remove arisings from site.

220 STRIPPING TOPSOIL
- 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.
- Depth:
  - Remove to an average depth of 150 mm.
  - Give notice where the depth of topsoil is difficult to determine.
- Handling: Handle topsoil for reuse or sale in accordance with clause 225.
- Around trees: Do not remove topsoil from below the spread of trees to be retained.
- Site storage: Keep separate from excavated sub-soil.

221 TREATING TOPSOIL
- Treatment: Apply a suitable translocated nonresidual herbicide.
- Timing: Not less than two weeks before excavating topsoil.

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

245 EXCAVATIONS ADJACENT TO EXISTING FOUNDATIONS - CONTRACTOR'S DESIGN

- Prior to commencing excavation: Excavate trial pits adjacent to existing foundations to determine extent and formation levels.
- Submit proposals: For ensuring the safety of the existing foundations if the formation level for the new excavation will be below the formation level of the existing foundation.
- Backfill material to new excavation: Submit proposals.

250 PERMISSIBLE DEVIATIONS FROM FORMATION LEVELS

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

260 INSPECTING FORMATIONS

- Give notice: Make advance arrangements for inspection of formations for foundations and filling formations.
  - Notice (minimum): 3 days.
- Preparation: Just before inspection remove the last 150 mm of excavation. Trim to required profiles and levels, and remove.
  - Loose material: Remove.
- Seal: Within 4 hours of inspection, seal formations with concrete.

267 INSPECTION OF FORMATIONS IN SHRINKABLE SOILS

- Inspect formation: For signs of conducting and fine moisture absorbing roots.
- 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

- Give notice if:
  - A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings.
  - The formation contains soft or hard spots or highly variable material.

290 FOUNDATIONS IN MADE UP GROUND

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

310 UNSTABLE GROUND

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

320 RECORDED FEATURES

- Recorded foundations, beds, drains, manholes, etc.: As drawing 8-025-101.
- Contaminated earth: Remove and disinfect as required by Local Authority.

330 UNRECORDED FEATURES

- 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

- Break out: The old foundation/ wall where it crosses the new foundation/ wall:
  - Length of breaking out: Width of the new foundation/ wall plus 300 mm on either side of new foundation.
  - Depth of breaking out: Full depth of existing foundation/ wall.
- Disturbed/ softened soil: When the formation for the old foundation/ wall is deeper than the formation of the new foundation.
  - Excavate: Soil that has been disturbed and/ or softened on either side of the old wall/ foundation, and for 300 mm into undisturbed ground on either side.
- 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.
  - Size of steps: Minimum distance between steps 600 mm and maximum height of step 200 mm.
- Backfilling beneath design formation level: Fill with concrete as foundation is cast.

360 EXCESS EXCAVATION

- Excavation taken wider than required:
  - Backfill: As clause 700.
- Excavation taken deeper than required:
  - Backfill: Under ground bearing slabs: Hardcore as clause 710.

DISPOSAL OF MATERIALS

410 EXCAVATED TOPSOIL STORAGE

- Storage: Stockpile in temporary storage heaps To southern portion of the site.

415 EXCAVATED TOPSOIL REMOVAL

- General: Remove from site.

441 SURPLUS SUBSOIL

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

450 WATER

- Generally: Keep all excavations free from water until:
  - Formations are covered.
  - Below ground constructions are completed.
  - Basement structures and retaining walls are able to resist leakage, water pressure and flotation.
- Drainage: Form surfaces of excavations and fill to provide adequate falls.
- 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

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

457 PUMPING

- General: Do not disturb excavated faces or stability of adjacent ground or structures.
- Pumped water: Discharge without flooding the site or adjoining property.
- Sumps: Construct clear of excavations. Fill on completion.
  - Locations: Submit proposals.

FILLING

500 PROPOSED FILL MATERIALS

- Details: Submit full details of proposed fill materials to demonstrate compliance with specification, including:
  - Type and source of imported fill.
  - Proposals for processing and reuse of material excavated on site.
  - Test reports as required elsewhere.
- Timing: At least 21 days before starting filling.

510 HAZARDOUS, AGGRESSIVE OR UNSTABLE MATERIALS

- 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:
  - Frozen or containing ice.
  - Organic.
  - Contaminated or noxious.
  - Susceptible to spontaneous combustion.
  - Likely to erode or decay and cause voids.
  - With excessive moisture content, slurry, mud or from marshes or bogs.
  - Clay of liquid limit exceeding 80 and/or plasticity index exceeding 55.
  - Unacceptable, class U2 as defined in the 'Specification for highway works', clause 601.

520 FROST SUSCEPTIBILITY

- General: Except as allowed below, fill must be non frost-susceptible as defined in the 'Specification for highway works', clause 801.8.
- Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non frost-susceptible:
  - Fine grained soil with a plasticity index less than 20%.
  - Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
  - Crushed chalk.
  - Crushed limestone fill with average saturation moisture content in excess of 3%.
  - Burnt colliery shale.
- Frost-susceptible fill: May only be used:
  - At depths below the finished ground surface greater than 450 mm.
  - Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.
  - Where frost heave will not affect structural elements.

530 PLACING FILL

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

550 GEOTEXTILE SHEET

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Type: Contractor's choice.
- Polymer type: Contractor's choice.
- Recycled content: Submit proposals.
- Jointing: 300 mm overlap.
- Preparation of subgrade: Before laying sheet, remove humps and sharp projections. Fill hollows.
- Protect from:
  - Exposure to light.
  - Contaminants.
  - Materials listed as potentially deleterious by geotextile manufacturer.
  - Wind uplift.

610 COMPACTED FILLING FOR LANDSCAPE AREAS

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

700 BACKFILLING AROUND FOUNDATIONS

- Under oversite concrete and pavings: Hardcore.
- Under grassed or soil areas: Material excavated from the trench, laid and compacted in 300 mm maximum layers.

710 HARDCORE FILLING

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

D50
Underpinning

D50 Underpinning

To be read with Preliminaries/ General conditions.

TENDERING

10 INFORMATION TO BE PROVIDED WITH TENDER
- Submit: A full description of underpinning proposals including:
  - Drawings: As necessary for understanding the proposals.
  - Method statement.
  - Additional information: Programme showing sequence and resources.

GENERAL

110 UNDERPINNING - CONTRACTOR DESIGN
- Purpose: To found the building below the level of future ground movements.
- Extent: As Structural Engineer's drawing.
- Type: Mass concrete.
- Features: As Structural Engineer's drawing.
- Structural requirements:
  - Generally: As section B50.
  - Modifications: None.
- Design responsibility:
  - Piles: Complete design of piles in accordance with SPERW, clause B1.4, option 2.
  - Other: Underpinning.
- Load factor: To BS EN 1997-1.

165 EXPLORATORY HOLES
- Requirement: Excavate holes to determine: The depth and profile of adjacent existing foundations, the location of drains, and the location of incoming services.
  - Timing: Before commencing excavation for underpinning.
- Findings: Submit details.
- Backfill:
  - Below foundation level: Concrete.
  - Above foundation level but below ground supported slabs: Compacted hard core.
  - Elsewhere: Compacted hard core.

170 DISCONNECTION OF SERVICES IN WORKING AREAS
- Disconnections required:
  - Electric lighting and power;
  - Gas supply at meter; and
  - Water supply.
  - Timing: Before commencing underpinning works within the building.
- Reconnection: Ensure that services cannot be reinstated by site operatives without consent.

TYPES OF UNDERPINNING

210 CONTINUOUS MASS CONCRETE UNDERPINNING

- Underpinning blocks:
  - Depth: As Structural Engineer's drawing.
  - Length (maximum): As Structural Engineer's drawing.
  - Width on either side of wall centre line (minimum): As Structural Engineer's drawing.
  - Depth of hard pack: As Structural Engineer's drawing.
- Materials:
  - Concrete: As Structural Engineer's drawing.
  - Hard packing: As Structural Engineer's drawing.
    Water content: Sufficient only to ensure that packing binds together.
- Sequence: As Structural Engineer's drawing.
- Curing periods (minimum):
  - Between casting underpinning block and pinning up: As Structural Engineer's drawing.
  - Between completion of pinning up and commencement of excavation for the next sequence of underpinning: As Structural Engineer's drawing.
    Extend curing periods to allow for inclement weather.
- Shear connection between underpinning blocks: As Structural Engineer's drawing.
- Features: Backfill remainder of working space with compacted hardcore.

215 INTERMITTENT MASS CONCRETE UNDERPINNING

- Underpinning blocks:
  - Depth: As Structural Engineer's drawing.
  - Length (minimum): As Structural Engineer's drawing.
  - Width on either side of wall centre line (minimum): As Structural Engineer's drawing.
  - Depth of hard pack: As Structural Engineer's drawing.
  - Gap face to face of concrete in adjacent blocks (maximum): As Structural Engineer's drawing.
- Materials:
  - Concrete: As Structural Engineer's drawing.
  - Hard packing: As Structural Engineer's drawing.
    Water content: Sufficient only to ensure that packing binds together.
- Sequence: As Structural Engineer's drawing.
  - Curing periods (minimum):
  - Between casting underpinning block and pinning up: As Structural Engineer's drawing.
  - Between completion of pinning up and commencement of excavation for the next sequence of underpinning: As Structural Engineer's drawing.
    Extend curing periods to allow for inclement weather.
- Drains/ Services: Locate underpinning blocks to avoid.
- Features: Backfill remainder of working space with compacted hardcore.

480 PREFABRICATED REINFORCEMENT

- Usage: Obtain from a manufacturer holding valid certification of approval for welded fabrications issued by the UK Certification Authority for Reinforcing Steels (CARES).

EXECUTION

610 REPAIR OF MASONRY

- Specification: As section C41.
- Timing: After completion of underpinning.

615 CONSTRUCTION OF MASS CONCRETE UNDERPINNING

- Block and working space: Excavate together.
- Formation:
  - Preparation: Remove or compact loose material.
  - Protection: Cover with 50 mm thickness of concrete if there will be a delay of more than four hours between completion of excavation and casting of concrete underpinning.
- Split sleeves: Provide around drain/ service passing through underpinning. Closely fit a rigid sheet to each side of opening to prevent ingress of fill or vermin.
  - Clearance around drain/ service (minimum): 150 mm.
- Dowels/ Shear key/ Front shutter: Provide where required.
- Casting underpinning: In one lift, leaving a gap for packing up beneath existing foundation.
- Packing: On completion of concrete curing period, hard pack gap between underpinning block and existing foundation. Allow packing to cure before commencing excavation for the next sequence of underpinning.

620 CONSTRUCTION OF INTERMITTENT MASS CONCRETE UNDERPINNING/ UNDERPINNING PIERS

- Block and working space: Excavate together. Excavated length not to exceed design length by more than 75 mm.
- Formation:
  - Preparation: Remove or compact loose material.
  - Protection: Cover with 50 mm thickness of concrete if there will be a delay of more than four hours between completion of excavation and casting of concrete underpinning.
- Front shutter: Provide where required.
- Casting underpinning: In one lift, leaving a gap for packing up beneath existing foundation.
- Packing: On completion of concrete curing period, hard pack gap between underpinning block and existing foundation. Allow packing to cure before commencing excavation for the next sequence of underpinning.

TESTING

710 TESTING MORTAR/ CEMENT GROUT

- Standard: To BS EN 445.
  - Exceptions: Strength test using 100 mm cubes.
- Preliminary tests: Required if satisfactory evidence of mix suitability is not available from other sites.
- Frequency of compliance testing: To BS EN 446, clause 8.4.

COMPLETION

910 HEALTH AND SAFETY FILE - MASS CONCRETE UNDERPINNING

- Requirement: Collate and submit a full set of records for inclusion in the health and safety file.
  - Number of copies: Two.
- Content: For each underpinning block record:
  - Date of casting.
  - Depth of base below datum.
  - Length.
  - Width either side of wall.
  - Details of drains and services built into block and diameter of sleeving.
- Latest date for submission: Within 14 days of completion.

E
In situ concrete/Large precast concrete

E05
In situ concrete construction generally

E05 In situ concrete construction generally

To be read with Preliminaries/General conditions.

223 STRUCTURAL DRAWINGS AND SCHEDULES
- Standards:
  - Drawings: To BS EN ISO 3766.
  - Reinforcement schedules: To BS 8666.

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

300 LEVELS OF STRUCTURAL CONCRETE FLOORS
- Tolerances (maximum):
- Level of floor: As Preliminaries section A33.
- Steps in floor level: ±2 mm.

310 SURFACE REGULARITY OF CONCRETE FLOORS TO BS 8204 - GENERAL
- Standard: To BS 8204-1 or -2.
- Measurement: From underside of a 2 m straightedge (between points of contact) placed anywhere on surface and using a slip gauge.

315 SURFACE REGULARITY OF CONCRETE FLOORS TO BS 8204 - TOLERANCE CLASS R1
- Location: When class is not otherwise specified.
- Abrupt changes: Not permitted.

410 IN SITU CONCRETE CONSTRUCTION - SUPERVISION/ CHECKING
- Standard: To BS EN 13670, Execution Class 2.

E60
Precast/ composite concrete floors/ roof decks

E60 Precast/ composite concrete floors/ roof decks

To be read with Preliminaries/ General conditions.

PROPRIETARY FLOORS/ ROOF DECKS

110 PRECAST BEAM AND BLOCK GROUND FLOOR
- Beams: refer to Structural Engineer's detail.
  - Manufacturer: Contractor's choice
    Product reference: Submit proposals.
  - Type: Submit proposals.
- Infill blocks: Proprietary.
- Structural concrete topping: Not required.
- Other requirements: Refer to Structural Engineer's detail.

GENERAL/ PERFORMANCE

240 DETAILING OF PROPRIETARY SYSTEM
- Installation details: Submit location and assembly drawings showing every aspect of the construction, incorporated components and features, trimming for voids, holes for services, and related work by others.
  - Purpose: To allow checking of compatibility with surrounding structure and coordination of services.
- Method statement and risk assessment for installation: Submit.
- Programme: Submit well in advance of construction.

290 STANDARD PRECAST CONCRETE INFILL BLOCKS GROUND FLOOR
- Type: Solid block to BS EN 771-3.
  - Size: 440 x 215 x 100 mm.
- Density: refer to Structural Engineer's detail.
- Compressive strength (minimum): refer to Structural Engineer's detail.
- Transverse load capacity (minimum): 3.5 kN/m² measured on a 420 mm span.
- Other requirements: all block and beam elements to be approved by the Building Control Officer.

INSTALLATION

315 INFILLING AT BEAM BEARINGS
- Type: Submit proposals.
- Installation: Infill gaps in walling below built in standard flooring blocks.

320 CONCRETE INFILL
- Designated concrete: BS 8500-2.
  - Designation: RC25/30.
  - Aggregate size (maximum): 10 mm generally but 6 mm in shear keys between precast units.
- Preparation: Thoroughly clean and wet surfaces of precast units.
- Placing: Avoid segregation and compact thoroughly to eliminate voids.
  - Extent: Fill troughs and other holes.
  - Finish: Flush with top of precast units.
- Protection: Prevent movement of units until concrete has gained sufficient strength.

325 GROUTING

- Mix: Contractor's choice.
- Preparation: Thoroughly clean and wet surfaces.
- Extent: Fill all joints and surface irregularities.

350 LEVELS OF STRUCTURAL CONCRETE FLOORS

- Tolerances: See Preliminaries section A33.

F
Masonry

F10
Brick/ block walling

F10 Brick/ block walling

To be read with Preliminaries/ General conditions.

TYPES OF WALLING

110 CLAY FACING BRICKWORK ABOVE DPC

- Bricks: To BS EN 771-1.
  - Manufacturer: Ibstock Brick Ltd..
    Product reference: A0382A - Tradesman Light.
  - Recycled content: Not applicable.
  - Special shapes: None.
- Mortar: As section Z21.
  - Standard: To BS EN 998-2.
  - Mix: 1:3 masonry cement:sand 6 N/mm² (class M6).
  - Additional requirements: Durability: Freeze/ thaw resistance: Frost resistant.
- Bond: Half lap stretcher.
- Joints: Approved.
- Features: None.

355 CONCRETE COMMON BLOCKWORK TO INNER LEAF

- Blocks: To BS EN 771-3.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Configuration: Group 1.
  - Compressive strength:
    Mean value: Refer to manufacturer.
    Characteristic value: Refer to manufacturer.
    Category: I.
  - Freeze/ thaw resistance: Frost resistant.
  - Thermal properties: Thermal resistance: 0.0885 m²K/W.
  - Recycled content: None permitted
  - Work sizes (length x width x height): 440 x 100 x 215 mm.
    Tolerance category: D2.
  - Special shapes: None.
  - Additional requirements: Reaction to fire: Euroclass A1.
- Mortar: As section Z21.
  - Standard: To BS EN 998-2.
  - Mix: 1:¼:3 cement:lime:sand 12 N/mm² (class M12).
  - Additional requirements: Reaction to fire: Euroclass A1.
- Bond: Contractor's choice.

385 ENGINEERING BRICKWORK BELOW DPC

- Bricks: To BS EN 771-1.
  - Manufacturer: Ibstock Brick Ltd..
    Product reference: A220A Staffordshire Blue Brindle Smooth.
  - Mean compressive strength: Greater than or equal to 75 N/mm².
    Category: Refer to manufacturer.
  - Water absorption: Equal to or less than. 7%.
  - Freeze/ thaw category: F2.
  - Active soluble salts content category: S2.
  - Additional requirements: Reaction to fire: Euroclass A1.
- Mortar: As section Z21.
  - Standard: To BS EN 998-2.
  - Mix: 1:¼:3 cement:lime:sand, 12 N/mm² (class M12).
  - Additional requirements: None.
- Bond: Half lap stretcher.
- Joints: Flush.

400 HARD LANDSCAPING MATERIALS SPECIFICATION

- Minimum BRE 'Green Guide to Specification' online rating: A+.

WORKMANSHIP GENERALLY

430 CONDITIONING OF CLAY BRICKS AND CLAY BLOCKS

- Bricks and blocks delivered warm from manufacturing process: Do not use until cold.
- Absorbent bricks in warm weather: Wet to reduce suction. Do not soak.

440 CONDITIONING OF CONCRETE BRICKS/ BLOCKS

- Autoclaved concrete bricks/ blocks delivered warm from manufacturing process: Do not use.
- Age of nonautoclaved concrete bricks/ blocks: Do not use until at least four weeks old.
- Avoidance of suction in concrete bricks/ blocks: Do not wet.
  - Use of water retaining mortar admixture: Submit details.

500 LAYING GENERALLY

- 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.
- Clay block joints:
  - 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.

535 HEIGHT OF LIFTS IN WALLING USING CEMENT GAUGED OR HYDRAULIC LIME MORTAR

- Quoins and advance work: Rack back.
- Lift height (maximum): 1.2 m above any other part of work at any time.
- Daily lift height (maximum): 1.5 m for any one leaf.

545 LEVELLING OF SEPARATE LEAVES USING CEMENT GAUGED OR HYDRAULIC LIME MORTAR

- 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.

560 COURSING BRICKWORK

- Gauge: Four brick courses including bed joints to 300 mm.

561 COURSING BRICKWORK WITH EXISTING

- Gauge: Line up with existing brick courses.

580 LAYING FROGGED BRICKS

- Single frogged bricks: Frog uppermost.
- Double frogged bricks: Larger frog uppermost.
- Frog cavity: Fill with mortar.

610 SUPPORT OF EXISTING WORK

- Joint above inserted lintel or masonry: Fully consolidated with semidry mortar to support existing structure.

620 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.

635 JOINTING

- Profile: Consistent in appearance.

645 ACCESSIBLE JOINTS NOT EXPOSED TO VIEW

- Jointing: Struck flush as work proceeds.

665 POINTING TO BRICKWORK ABOVE DPC

- Joint preparation: Remove debris. Dampen surface.
- Mortar: As section Z21.
  - Standard: To BS EN 998-2.
  - Mix: 1:2 XYZ Ltd. NHL 3.5 hydraulic lime:sharp well graded sand.
  - Additional requirements: Site made hydraulic lime mortars: submit sample for approval.
- Profile: Recessed back from weathered arrises. Brushed finish as clause C41/860.

671 FIRE STOPPING

- Avoidance of fire and smoke penetration: Fit tightly between cavity barriers and masonry. Leave no gaps.

690 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 mortarswhen at or below 5°C and falling or below 3°C and rising, or as manufacturer's/ supplier's recommendations.
  - In thin layer mortar when outside the limits set by the mortar manufacturer.
- Temperature of walling during curing: Above freezing until hardened.
- Newly erected walling: Protect at all times from:
  - Rain and snow.
  - Drying out too rapidly in hot conditions and in drying winds.

ADDITIONAL REQUIREMENTS FOR FACEWORK

710 THE TERM FACEWORK

- Definition: Applicable in this specification to all brick/ block walling finished fair.
  - Painted facework: The only requirement to be waived is that relating to colour.

740 FINISHED MASONRY WORK REFERENCE PANELS

- General: Before proceeding to construct the following walling types, construct panels as specified. Give notice when panels are dry.
- Selection of masonry units: Reasonably representative of the average quality of the whole order to be delivered .
- Panel types:
  - Walling type: F10/110 .
    Location: To existing hard standing area .
    Size: 1.5 x 1.5 m .
    Other requirements: None .

750 COLOUR CONSISTENCY OF MASONRY UNITS

- Colour range: Submit proposals of methods taken to ensure that units are of consistent and even appearance within deliveries.
- Conformity: Check each delivery for consistency of appearance with previous deliveries and with approved reference panels; do not use if variation is excessive.
- Finished work: Free from patches, horizontal stripes and racking back marks.

760 APPEARANCE

- Brick/ block selection: Do not use units with damaged faces or arrises.
- Cut masonry units: Where cut faces or edges are exposed cut with table masonry saw.
- Quality control: Lay masonry units to match relevant reference panels.
  - Setting out: To produce satisfactory junctions and joints with built-in features and components.
  - Coursing: Evenly spaced using gauge rods.
- Lifts: Complete in one operation.
- Methods of protecting facework: Submit proposals.

780 GROUND LEVEL

- Commencement of facework: Not less than 150 mm below finished level of adjoining ground or external works level.

790 PUTLOG SCAFFOLDING

- Use: Not permitted in facework.

830 CLEANLINESS

- Facework: Keep clean.
- Mortar on facework: Allow to dry before removing with stiff bristled brush.
- Removal of marks and stains: Rubbing not permitted.

F30
Accessories/ sundry items for brick/ block/ stone walling

F30 Accessories/ sundry items for brick/ block/ stone walling

To be read with Preliminaries/ General conditions

CAVITIES

110 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.

120 CLEANLINESS
- Cavity base and faces, ties, insulation and exposed dpcs: Free from mortar and debris.

130 PERPEND JOINT WEEP HOLES
- Form: Open perpend joint.
- 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 each opening.

132 PERPEND JOINT PLASTICS WEEP HOLES
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- 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 each opening.

150 FULL FILL CAVITY INSULATION
- Insulation: Rock wool batts to BS EN 13162.
  - Product certification: British Board of Agrement (BBA).
- Manufacturer: As clause 150A.
  - Product reference: As clause 150A.
- Recycled content: Submit proposals.
- Face size (nominal length x width): To suit wall tie spacing.
- Thickness (nominal): 125 mm.
- Thermal conductivity: 0.037 W/(m·K).
- Reaction to fire class: A1.
- Additional requirements: None.
- Placement: Continuous and free of mortar and debris.

150A FULL FILL CAVITY INSULATION
- Manufacturer: ROCKWOOL Ltd.
  - Web: www.rockwool.co.uk.
  - Email: info@rockwool.com.
  - Product reference: Rockwool Cavity Wall Batts
- Thickness: 120 mm.

180 CAVITY CLOSERS GENERALLY
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Accessories: To include integral dpc and insulation.

REINFORCING/ FIXING ACCESSORIES

214 CAVITY WALL TIES GENERALLY
- Standard: To BS EN 845-1.
  - Type: 2 (Masonry general purpose).
- Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Material/ finish: Austenitic stainless steel - material/ coating reference 3.
- Sizes: 305 mm.
- End types: Symmetrical deformed plate for mortar bedding .
- Embedment length (minimum): 50 mm.
- Movement: Non tolerant.
- Additional requirements: Resistance to water crossing cavity: Resistant.

228 FIXING TIES IN MASONRY CAVITY WALLS WITH FULL FILL CAVITY INSULATION
- Embedment in mortar beds (minimum): 50 mm.
- Placement: Sloping slightly downwards towards outer leaf, without bending. Drip centred in the cavity and pointing downwards.
- Spacing: Staggered in alternate courses.
  - Horizontal centres: 900.
  - Vertical centres: 450.
- Provision of additional ties:
  - One row to support lowest row of insulation batts.
  - Within 225 mm of reveals of unbonded openings and at the vertical reveals of unsupported masonry.
  - Spacing: At not more than 300 mm centres vertically.

241 WALL STARTERS/ CONNECTORS
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Standard: To BS EN 845-1.
- Material/ finish: Austenitic stainless steel - BS EN 845-1 material/ coating reference 3.
- Sizes: As Structural Engineer's drawing.
- End type: Asymmetrical deformed plate and fishtail for mortar bedding.
- Additional requirements: None.

FLEXIBLE DAMP PROOF COURSES/ CAVITY TRAYS

310 DAMP PROOF COURSES - BITUMEN BASED
- Standard: To BS EN 14967, BS 6398 and BS 743.
  - Type: Class B (fibre based bitumen) to BS 6398.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Additional requirements: None.

330 DAMP PROOF COURSES PROPRIETARY PLASTICS
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.

370 PREFORMED CAVITY TRAYS
- Manufacturer: Contractor's choice.
  - Product references and locations: Submit proposals.
- Placement: To provide a free draining and watertight installation.

385 JUNCTION CLOAKS/ STOP ENDS FOR PREFORMED DPCS/ CAVITY TRAYS
- Manufacturer: Contractor's choice.
  - Product references and locations: Submit proposals.
- Placement: Seal laps with dpcs and/ or cavity trays.

390 JUNCTION CLOAKS/ STOP ENDS FOR SITE FORMED DPCS/ CAVITY TRAYS
- Three dimensional changes in shape: Form to provide a free draining and watertight installation. Seal laps.
- Alternative use of preformed junction cloaks/ stop ends: Submit proposals.

INSTALLATION OF DPCS/ CAVITY TRAYS

415 INSTALLATION 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 leaf unless otherwise specified. 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.

425 INSTALLATION OF GROUND LEVEL DPCS
- Joint with damp proof membrane: Continuous and effectively sealed.

445 INSTALLATION OF SILL DPCS
- Form and placement: In one piece and turned up at back when sill is in contact with inner leaf.

465 SEALING OF DPCS GENERALLY
- Overlaps and junctions: Seal with Adhesive recommended by dpc manufacturer.

475 INSTALLATION OF SITE FORMED CAVITY TRAYS
- Requirements to prevent downward ingress of water:
  - Profiles: To match those shown on drawings. Firmly secured.
  - Joint treatment: Use continuous length wherever possible, otherwise lap at least 100 mm and seal to produce a free draining and watertight installation.
  - Horizontal cavity trays: Support using cavity closer.
  - Sloping cavity trays: Prevent sagging.
  - Cleanliness: Free from debris and mortar droppings.

485 INSTALLATION OF CAVITY TRAYS OVER OPENINGS AND OTHER CAVITY BRIDGINGS
- Length: To extend not less than 150 mm beyond ends of lintels/ bridgings.

535 DPC/ CAVITY TRAY LEADING EDGE IN FACEWORK - PROJECTING
- Treatment at face of masonry: Project 5 mm from face of wall at the following locations: Ge nerally .

560 INSTALLATION OF VERTICAL DPCS GENERALLY
- Form: In one piece wherever possible.
  - Joints: Upper part overlapping lower not less than 100 mm.

570 INSTALLATION OF JAMB DPCS AT OPENINGS
- Joint with cavity tray/ lintel at head: Full underlap.
- Joint with sill/ horizontal dpc at base: Full overlap.
- Projection into cavity: Not less than 25 mm.
- Relationship with frame: In full contact.

JOINTS

610 MOVEMENT JOINTS WITH SEALANT TO EXTERNAL FACING BRICKWORK
- Joint preparation and sealant application: As section Z22.
- Filler: Polyurethane foam.
  - Thickness: To match design width of joint.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Placement: Build in as work proceeds with no projections into cavities and to correct depth to receive sealant system.
- Sealant:
  - Designation: ISO 11600-F-20LM.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Colour: To match adjoining brickwork.

650 POINTING IN FLASHINGS
- Joint preparation: Free of debris and lightly wetted.
- Pointing mortar: As for adjacent walling.
- Placement: Fill joint and finish flush.

660 PINNING UP TO SOFFITS
- Top joint of loadbearing walls: Fill and consolidate with mortar.

PROPRIETARY SILLS/ LINTELS/ COPINGS/ DRESSINGS

755 PREFABRICATED STEEL LINTELS
- Standard: To BS EN 845-2.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Types: As schedule.
- Material/ finish: As schedule.
- Sizes: As schedule.
- Additional requirements: As schedule.
- Placement: Bed on mortar used for adjacent work.
  - Bearing length (minimum): As schedule.

MISCELLANEOUS ITEMS

840 OPENINGS FOR FRAMES
- Formation: Use accurate, rigid templates to required size.

850 WALL PLATES
- Placement: On full bed of mortar to correct horizontal level.

G
Structural/Carcassing metal/timber

G12
Isolated structural metal members

G12 Isolated structural metal members

To be read with Preliminaries/ General conditions.

PRODUCTS

320 STEEL MEMBERS

- Steel: To BS EN 10025-2.
  - Grade: S275JR internally, S275J0 externally.
  - Section properties and dimensions: To BS EN 10056 and To BS EN 10365.
  - Surface condition: Free from heavy pitting and rust, burrs, sharp edges and flame cutting dross.

FABRICATION

510 FABRICATION OF STEEL MEMBERS

- Cuts and holes: Accurate and neat.
- Welding: Metal arc method to BS EN 1011-2.
  - Welded joints: Fully fused, with mechanical properties not less than those of the parent metal.
  - Site welding: Obtain approval.
- Joints: Location and layout of fastenings as drawing As Structural Engineer's drawing.

EXECUTION

610 INSTALLATION

- Accuracy: Members positioned true to line and level using, if necessary, steel packs of sufficient area to allow full transfer of loads to bearing surfaces.
- Fixing: Use washers under bolt heads and nuts.
  - Tapered washers: Provide under bolt heads and nuts bearing on sloping surfaces. Match taper to slope angle and align correctly.

650 SHOP PRIMING GENERALLY

- Preparation: To BS EN ISO 12944-4. Remove fins, burrs, sharp edges and weld spatter and clean out crevices.
  - Surface finish: Blast cleaned to BS EN ISO 8501-1, grade Sa 2½.
  - Prepared surfaces: Keep in a dry atmosphere and apply first coating without delay.
- Priming:
  - Primer: Zinc phosphate epoxy.
    Number of coats: Refer to manufacturer.
    Dry film thickness (minimum): First coat 20 micrometres, second coat 60 micrometres.
  - Application: To BS EN ISO 12944-7.
- Other requirements: Overcoat ends of beams built into solid external walls with high build bituminous paint. Extend coating 150 mm from face of wall onto exposed steelwork.

G20
Carpentry/ timber framing/ first fixing

G20 Carpentry/ timber framing/ first fixing

To be read with Preliminaries/ General conditions.

GENERAL

105 TIMBER PROCUREMENT
- Timber (including timber for wood based products): Obtained from well managed forests/ 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:
  - 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.

120 STRUCTURAL DESIGN PROVIDED
- Description: Refer to Strcutural Engineer's drawings.
- Requirements:
  - Generally: As section B50/B51.
  - Additional requirements: None.

150 STRENGTH GRADING OF TIMBER
- Grader: A company currently registered under a third party quality assurance scheme operated by a certification body approved by the UK Timber Grading Committee.

160 GRADING AND MARKING OF SOFTWOOD
- 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 'DRY' or 'KD' (kiln dried).
- Timber graded undried (green) and specified for installation at higher moisture contents: Clearly marked as 'WET' or 'GRN'.
- Structural timber members cut from large graded sections: Regraded to approval and marked accordingly.

PRODUCTS

210 STRUCTURAL SOFTWOOD (GRADED DIRECT TO STRENGTH CLASS) FOR JOISTS, PURLINS & RAFTERS
- Grading standard: To BS 4978, BS EN 14081-1, or other national equivalent and so marked.
- Strength class to BS EN 338: C24.
- Treatment:
  - Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C8.
    Design service life: 30 years.
  - Fire retardant treatment: Fire retardant impregnation to NBS section Z12 and Wood Protection Association Commodity Specification FR2, Type HR.

270 UNGRADED SOFTWOOD FOR INTERNAL NONSTRUCTURAL USE

- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
- Surface finish: Planed all round.
- Treatment:
  - Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C8.
    Design service life: 20 years.
  - Fire retardant treatment: Fire retardant impregnation to NBS section Z12 and Wood Protection Association Commodity Specification FR1, Type DI.

311 NON-STRUCTURAL PLYWOOD FOR EAVES FASCIA AND SOFFIT

- Standard: To an approved national standard.
- Thickness: minimum 18mm.
- Appearance class to BS EN 635: I or II.
- Use class to BS EN 335: Use class 4.
- Bond quality to BS EN 314-2: Class 3.
- Finish: Sanded.
- Edges: Square.
- Treatment:
  - Preservative treatment: Organic solvent impregnation to NBS section Z12 and Wood Protection Association Commodity Specification C11.
    Design service life: 20 years.
  - Fire retardant treatment: None required.

WORKMANSHIP GENERALLY

401 CROSS SECTION DIMENSIONS OF STRUCTURAL SOFTWOOD AND HARDWOOD

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

402 CROSS SECTION DIMENSIONS OF NON-STRUCTURAL SOFTWOOD

- Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
- 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

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

420 WARPING OF TIMBER

- 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.

430 SELECTION AND USE OF TIMBER

- Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.

435 NOTCHES, HOLES AND JOINTS IN TIMBER

- Notches and holes:
  - General: Avoid if possible.
  - Sizes: Minimum needed to accommodate services.
  - Position: Do not locate near knots or other defects.
  - In same joist: Minimum 100 mm apart horizontally.
  - Notches in joists:
    Position: Locate at top. Form by sawing down to a drilled hole.
    Depth (maximum): 0.15 x joist depth.
    Distance from supports: Between 0.1 and 0.2 x span.
  - Holes in joists:
    Position: Locate on neutral axis.
    Diameter (maximum): 0.25 x joist depth.
    Centres (minimum): 3 x diameter of largest hole.
    Distance from supports: Between 0.25 and 0.4 of span.
  - Notches in roof rafters, struts and truss members: Not permitted.
  - Holes in struts and columns: Locate on neutral axis.
    Diameter (maximum): 0.25 x minimum width of member.
    Centres (minimum): 3 x diameter of largest hole.
    Distance from ends: Between 0.25 and 0.4 of span.
- Scarf joints, finger joints and splice plates: Do not use without approval.

440 PROCESSING TREATED TIMBER

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

450 MOISTURE CONTENT

- Moisture content of wood and wood based products at time of installation: Not more than:
  - Covered in generally unheated spaces: 24%.
  - Covered in generally heated spaces: 20%.
  - Internal in continuously heated spaces: 20%.

510 PROTECTION

- Generally: Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- 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.
- Trussed rafters: Keep vertical during handling and storage.

520 EXPOSED END GRAIN PROTECTION

- Components: Seal exposed end grain of the following before delivery to site:
  Joists, rafters, and wall plates.
- Sealer: Aluminium primer.

530 PAINTED FINISHES

- Structural timber to be painted: Primed as specified before delivery to site.

550 EXPOSED TIMBER

- Planed structural timber exposed to view in completed work: Prevent damage to and marking of surfaces and arrises.

JOINTING TIMBER

570 JOINTING/ FIXING GENERALLY
- Generally: Where not specified precisely, select methods of jointing and fixing and types, sizes and spacings of fasteners in compliance with section Z20.

630 BOLTED JOINTS
- Bolt spacings (minimum): To BS EN 1995-1-1, section 8.5.
- 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.
- 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.
- Bolt tightening: So that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut.
  - Checking: At agreed regular intervals up to Completion. Tighten as necessary.

670 ANTI-CORROSION FINISHES FOR FASTENERS
- Galvanizing: To BS 7371-6, with internal threads tapped and lightly oiled following treatment.
- Sherardizing: To BS 7371-8, Class 1.
- Zinc plating: To BS EN ISO 4042 and passivated.

ERECTION AND INSTALLATION

760 TEMPORARY BRACING
- Provision: As necessary to maintain structural timber components in position and to ensure complete stability during construction.

770 ADDITIONAL SUPPORTS
- Provision: Position and fix additional studs, noggings and/ or battens to support edges of sheet materials, and wall/ floor/ ceiling mounted appliances, fixtures, etc. shown on drawings.
- Material properties: Additional studs, noggings and battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

780 WALL PLATES
- Position and alignment: To give the correct span and level for trusses, joists, etc.
- Bedding: Fully in fresh mortar.
- Joints: At corners and elsewhere where joints are unavoidable use nailed half lap joints. Do not use short lengths of timber.

784 JOISTS GENERALLY
- Centres: Equal, and not exceeding designed spacing.
- Bowed joists: Installed with positive camber.
- End joists: Positioned approximately 50 mm from masonry walls.

795 TRIMMING OPENINGS
- Trimmers and trimming joists: When not specified otherwise, not less than 25 mm wider than general joists.

820 VERTICAL RESTRAINT STRAPS

- Type: Twisted.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Material/ finish: Galvanized steel.
- Size:
  - Cross section: Not less than 30 x 2.5 mm.
  - Length: Overall length 1500 mm: end of strap 900 mm below underside of wall plate; twisted immediately beneath joist/ trussed rafter; bent over top of joist/ trussed rafter and extending 100 mm down far side..
- Centres: Not more than 1.2 mm.
- Fixing:
  - To timber members with not less than 30 x 3.5 mm galvanized square twist nails.
  - 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

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Material/ finish: Galvanized steel.
- Size: Not less than 30 x 5 mm cross section, 150 mm cranked end and 1200 mm long.
- Fixing: To top of joists/ rafters/ ties at not more than 1.2 m centres and as shown on drawings.
  - Ensure that cranked end is in tight contact with cavity face of wall inner leaf and is not pointing upwards.
- Straps spanning joists/ rafters/ ties running parallel to wall: Fix noggings and packs tightly beneath straps.
  - Size of noggings and packs: Not less than three quarters of joist/ rafter/ tie depth and not less than 38 mm thick.
  - Notching: Notch joists so that straps fit flush with surface. Do not notch rafters/ ties.
- Fasteners: Not less than four 50 mm x 8 gauge sherardized countersunk screws per strap, evenly spread.

840 STRUTTING TO FLOOR JOINTS

- Type: One of the following:
  - Herringbone strutting: At least 38 x 38 mm softwood.
  - Solid strutting: At least 38 mm thick softwood and at least three quarters of joist depth.
  - Proprietary metal strutting: As Structural Engineer's drawing.
- Fixing: Between joists as follows:
  - Joist spans of 2.5 to 4.5 m: One row at centre span.
  - Joist spans over 4.5 m: Two rows equally spaced.
  - Strutting must not project beyond top and bottom edges of joists.
- Outer joists: Blocked solidly to perimeter walls.

H
Cladding/Covering

H65
Single lap roof tiling

H65 Single lap roof tiling

To be read with Preliminaries/ General conditions.

TYPES OF TILING

120 CONCRETE ROOF TILING WITH COUNTERBATTENS TO EXTENSION

- Substrate: Plywood sarking on rafters at 450 mm centres.
- Pitch: 30° and 20°, refer to drawing 8-025-114.
- Underlay: Vapour permeable underlay to BS EN 13859, Class W1.
  - Recycled content: None permitted.
  - Direction: Parallel to eaves.
  - Head-lap (minimum): 150 mm.
- Counterbattens:
  - Size: 38 x 25 mm.
  - Fixing: 65 x 3.35 mm galvanized annular ring shank nails.
- Battens:
  - Size: 38 x 25 mm .
  - Fixing: 65 x 3.35 mm galvanized annular ring shank nails.
- Tiles: To BS EN 490, interlocking.
  - Manufacturer: As H65/120A.
    Product reference: As H65/120A.
  - Colour: As H65/120A.
  - Size: As H65/120A.
  - Recycled content: As H65/120A.
  - Head-lap: Refer to manufacturer.
  - Fixing:
    Fixing of local areas: Nail every tile.
    Fixing of general areas: Nail every tile.
- Accessories: Dry fix ridge.

120A ROOF TILES

- Manufacturer: Marley Ltd.
  - Web: www.marley.co.uk.
  - Email: info@marley.co.uk.
  - Product reference: Modern
- Finish: Smooth.
- Colour: Anthracite.

TILING GENERALLY

210 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.

235 VAPOUR PERMEABLE UNDERLAY

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Standard: To BS EN 13859-1.
  - Reaction to fire: Class D.
  - Water vapour transmission (minimum): 0.025 m.
  - Resistance to water penetration: Before ageing W1, after ageing W1 .
  - Tensile strength (minimum): Manufacturer's standard.
  - Tear resistance (minimum): Manufacturer's standard.
  - Other BS EN 13859 characteristics: None .
- Weight (mass per unit area): Refer to manufacturer.
- Resistance to wind uplift: Greater than 1600 N/m².

240 UNDERLAY

- Handling: Do not tear or puncture.
- Laying: Maintain consistent tautness.
- Vertical laps (minimum): 100 mm wide, coinciding with supports and securely fixed.
- Fixing: Galvanized steel, copper or aluminium 20 x 3 mm clout head nails.
- Eaves: Where exposed, use an external grade (UV resistant) underlay or a proprietary eaves support product.
- Penetrations: Use proprietary underlay seals or cut underlay to give a watertight fit around pipes and components.
- Ventilation paths: Do not obstruct.

245 BATTENS/ COUNTERBATTENS - TREATED

- Timber: Sawn softwood.
  - Species: In accordance with BS 5534, clause 4.11.1.
  - Permissible characteristics and defects: Not to exceed limits in BS 5534, Annex D.
  - Grading: Fully factory pre-graded in accordance with BS 5534.
  - Moisture content at time of fixing and covering (maximum): 22%.
- Preservative treatment: As section Z12 and Wood Protection Association Commodity Specification C8.
  - Type: Contractor's choice.

255 COUNTERBATTENS ON RIGID SARKING

- Fixing: Through rigid sarking into rafters at not more than 300 mm centres.

265 BATTEN FIXING

- Setting out: Align parallel to ridge in straight horizontal lines to the 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.

275 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.

280 LOCAL AND GENERAL FIXING AREAS
- Definitions:
  - 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.
  - General areas: Remaining areas of roof tiling.

290 MORTAR BEDDING/ POINTING
- Mortar: As section Z21, 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.

EDGES/ JUNCTIONS/ FEATURES

305 GENERALLY
- 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.

365 EAVES
- Underlay support: 12 mm plywood.
  - Continuous to prevent water retaining troughs.
- Gutter: Dress underlay or underlay support tray to form drip into gutter.
- Eaves filler units for profiled tiles: Fix to close underside of first course tiles.
- First course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

405 DRY VERGES
- Underlay: Carry over full width of verge.
- Tiling battens: Carry over underlay and project as recommended by dry verge manufacturer.
- Dry verges:
  - Manufacturer: As H65/405A.
    Product reference: As H65/405A.
  - Fixing: Refer to manufacturer.

405A DRY VERGE CLOSERS
- Manufacturer: Marley Ltd.
  - Web: www.marley.co.uk.
  - Email: info@marley.co.uk.
  - Product reference: Universal Dry Verge System

615 METAL VALLEYS
- Underlay: Cut to rake. Dress over tilting fillets to lap onto metal valley. Do not lay under metal.
- Roof tiles: Cut adjacent tiles to fit neatly.
  - Bedding: On mortar on fibre cement undercloaks laid loose each side of valleys.
  - Valley width between tiles: minimum 150 mm.

660 SIDE ABUTMENTS
- Underlay: Turn up not less than 100 mm at abutments.
- Abutment tiles: Cut as necessary. Fix close to abutments.

670 TOP EDGE ABUTMENTS

- Underlay: Turn up not less than 100 mm at abutments.
- Top course tiles: Fix close to abutments.

700A RIDGE TILES

- Manufacturer: Marley Ltd.
  - Web: www.marley.co.uk.
  - Email: info@marley.co.uk.
  - Product reference: Modern ridge.
- Colour: As tiles.
- Block ends: At exposed end of ridge.

775 DRY MONO-RIDGES

- Underlay: Lay not less than 100 mm over mono-ridge.
- Dry mono-ridge tiles:
  - Manufacturer: As H65/775.
    Product reference: As H65/775.
  - Accessories: As H65/775.

775A MONO-RIDGE TILES

- Manufacturer: Marley Ltd.
  - Web: www.marley.co.uk.
  - Email: info@marley.co.uk.
  - Product reference: Modern mono ridge
- Colour: As tiles.
- Block ends: Both ends of ridge.

H71
Lead sheet coverings/ flashings

H71 Lead sheet coverings/ flashings

To be read with Preliminaries/ General conditions.

TYPES OF LEADWORK

230 VALLEY GUTTER LINING TO SLATE/ TILE ROOFS
- Underlay: Needle punched nonwoven polyester geotextile.
- Type of lead: Rolled to BS EN 12588.
  - Thickness: 2.00 or 2.24 mm (Code 5).
- Pretreatment: Apply thin coating of patination oil to underside of lead and allow to dry before laying.
- Laying: Over and beyond tilting fillets.
- Lengths: Not more than 2000 mm.
  - Cross joints: Lapped not less than 300 mm.
- Fixing: Welt edges. Nail top edge of each sheet. Dress bottom end neatly into eaves gutter.

450 STEP AND COVER FLASHINGS AT LEAN-TO SIDE ABUTMENT
- Lead:
  - Thickness: 2.00 or 2.24 mm (Code 5).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps of not less than 100 mm.
  - Upstand: Not less than 85 mm.
  - Cover to roof: Not less than 150 mm.
- Fixing: Lead wedges at every course and clips at not more than 500 mm centres along free edge.

GENERAL REQUIREMENTS/ PREPARATORY WORK

510 WORKMANSHIP GENERALLY
- Standard: To BS 6915 and latest edition of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Association.
- Fabrication and fixing: To provide a secure, free draining and completely weathertight installation.
- Operatives: Trained in the application of lead coverings/ flashings. Submit records of experience on request.
- Preforming: Measure, mark, cut and form lead prior to assembly wherever possible.
- Marking out: With pencil, chalk or crayon. Do not use scribers or other sharp instruments without approval.
- Bossing and forming: Straight and regular bends, leaving sheets free from ripples, kinks, buckling and cracks.
- Solder: Use only where specified.
- Sharp metal edges: Fold under or remove as work proceeds.
- Finished work: Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
  - Protection: Prevent staining, discolouration and damage by subsequent works.

516 LEADWELDING
- In situ welding: Is permitted, subject to completion of a 'hot work permit' form and compliance with its requirements.

520 LEAD SHEET

- Production method:
  - Rolled, to BS EN 12588, or
  - Machine cast and BBA certified, or
  - 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%.
- Identification: Labelled to show thickness/ code, weight and type.

610 SUITABILITY OF SUBSTRATES

- Condition: Dry and free of dust, debris, grease and other deleterious matter.

620 PREPARATION OF EXISTING TIMBER SUBSTRATES

- Remedial work: Adjust boards to level and securely fix. Punch in protruding fasteners and plane or sand to achieve an even surface.
- Defective boards: Give notice.
- Moisture content: Not more than 22% at time of covering. Give notice if greater than 16%.

640 TIMBER FOR USE WITH LEADWORK

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
- Moisture content: Not more than 22% at time of fixing and covering. Give notice if greater than 16%.
- Preservative treatment: Organic solvent as section Z12 and Wood Protection Association Commodity Specification C8.

FIXING LEAD

710 FIXINGS

- Nails to timber substrates: Copper clout nails to BS 1202-2, or stainless steel (austenitic) clout nails to BS 1202-1.
  - Shank type: Annular ringed, helical threaded or serrated.
  - Shank diameter: Not less than 2.65 mm for light duty or 3.35 mm for heavy duty.
  - Length: Not less than 20 mm or equal to substrate thickness.
- Screws to concrete or masonry substrates: Brass or stainless steel to BS 1210, tables 3 or 4.
  - Diameter: Not less than 3.35 mm.
  - Length: Not less than 19 mm.
  - Washers and plastic plugs: Compatible with screws and lead.
- Screws to composite metal decks: Self tapping as recommended by the deck and lead manufacturer/ supplier for clips.

770 WEDGE FIXING INTO JOINTS/ CHASES

- Joint/ chase: Rake out to a depth of not less than 25 mm.
- Lead: Dress into joint/ chase.
  - 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.
- Sealant: Submit proposals.
  - Application: As section Z22.

790 SCREW FIXING INTO JOINTS/ CHASES

- Joint/ chase: Rake out to a depth of not less than 25 mm.
- Lead: Dress into joint/ chase and up back face.
  - 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.
- Sealant: Submit proposals.
  - Application: As section Z22.

JOINTING LEAD

810 FORMING DETAILS

- Method: Bossing or leadwelding except where bossing is specifically required.
- Leadwelded seams: Neatly and consistently formed.
  - Seams: Do not undercut or reduce sheet thickness.
  - Filler strips: Of the same composition as the sheets being joined.
  - Butt joints: Formed to a thickness one third more than the sheets being joined.
  - Lap joints: Formed with 25 mm laps and two loadings to the edge of the overlap.
- Bossing: Carried out without thinning, cutting or otherwise splitting the lead sheet.
  - Details where bossing must be used: Not applicable .

865 DRIPS WITHOUT SPLASH LAPS

- Underlap: Dress into rebate along top edge of drip.
  - Fixing: One row of nails at 50 mm centres on centre line of rebate.
- Overlap: Dress over drip to just short of lower level.

880 WELTED JOINTS

- Joint allowance: 50 mm overlap and 25 mm underlap.
- Copper or stainless steel clips: Fix to substrate at not more than 450 mm centres.
- Overlap: Welt around underlap and clips and lightly dress down.

970 PATINATION OIL

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Location: To all leadwork.
- Application: As soon as practical, apply a smear coating to lead, evenly in one direction and in dry conditions.

J
Waterproofing

J40
Flexible sheet waterproofing/ damp proofing

J40 Flexible sheet waterproofing/ damp proofing

To be read with Preliminaries/ General conditions.

110 SOFT BLINDING TO HARDCORE BEDS
- Material: Soft sand.
  - Thickness (minimum): 50 mm.
- Finish on completion: Smooth, consolidated bed free of sharp projections.

TYPES OF TANKING/ DAMP PROOFING

120 LOOSE LAID POLYETHYLENE DAMP PROOFING
- Substrate: As drawing 8-025 501revA.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Thickness/ Gauge: 300 micrometres (1200 gauge).
- Recycled content: 1% (minimum) to BS EN ISO 14021.
- Joints:
  - Surface to be joined: Clean and dry beyond full width of joint.
  - Laps (minimum): End and side, 150 mm.
  - Sealing: Continuous mastic strip between overlaps; edge of top sheet sealed with jointing tape.

WORKMANSHIP

310 WORKMANSHIP GENERALLY
- Condition of substrate:
  - Clean and even textured, free from voids and sharp protrusions.
  - Moisture content: Compatible with damp proofing/ tanking.
- Air and surface temperature: Do not apply sheets if below minimum recommended by membrane manufacturer.
- Condition of membrane at completion:
  - Neat, smooth and fully supported, dressed well into abutments and around intrusions.
  - Completely impervious and continuous.
  - Undamaged. Prevent puncturing during following work.
- Permanent overlying construction: Cover membrane as soon as possible.

350 ANGLES IN BONDED DAMP PROOFING/ TANKING
- Preformed rot proof fillet to internal angles:
  - Size (minimum): 50 x 50 mm, splay faced.
  - Bedding: Bitumen mastic or bonding compound.
- Reinforcing strip to all angles:
  - Material: As damp proofing/ tanking.
  - Width (minimum): 300 mm.
  - Timing: Apply before main sheeting.
- Dressing of main sheeting onto adjacent surfaces (minimum): 100 mm.

365 JUNCTIONS WITH FLUSH DPCS/ CAVITY TRAYS

- Adjoining surfaces: Clean and dry.
- Dpcs/ Cavity trays:
  - Expose edge where concealed.
  - Lap and fully bond/ seal sheeting to wall.
  - Dressing of sheeting beyond dpc/ cavity tray (minimum): 50 mm.
  - Bonding/ Sealing: Refer to manufacturer.

370 PREFORMED COLLARS FOR PIPES, DUCTS, CABLES, ETC.

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Sealing: Fully bond to penetrations and sheeting.
- Completed junctions: Impervious.

K
Linings/Sheathing/Dry partitioning

K10
Gypsum board dry linings/ partitions/ ceilings

K10 Gypsum board dry linings/ partitions/ ceilings

To be read with Preliminaries/ General conditions.

TYPES OF DRY LINING

125A METAL STUD PARTITION SYSTEM
- Manufacturer: British Gypsum.
  - Web: www.british-gypsum.com.
  - Email: bgtechnical.enquiries@bpb.com.
  - Product reference: GypWall Classic
- Studs:
  - Type: 70 mm Gypframe 70 AS 50 AcouStuds.
  - Centres: 600 mm
- Head condition:
  - Type: Gypframe 72 C 50 Floor and Ceiling Channels, fixed to existing conditions.
  - Deflection allowance: Not required.
- Insulation:
  - Type: Isover APR 1200.
  - Thickness: 50 mm.
- Linings:
  - Type: 1 x 15 mm Gyproc FireLine MR to each side – tapered edge .
  - Edge: Tapered edge.
- Finishing:
  - Type: Skim coat plaster finish.
  - Primer/ Sealer: Two coats of Gyproc Drywall Sealer.
- Accessories: Rigid beads/ stops as required.
- Other requirements: None.

245 CEILING LINING ON TIMBER TO EXTENSION
- Background: Joists at 450 mm centres.
- Metal resilient (acoustic) bars: Not required.
- Linings: 12.5 mm plasterboard.
  - Fixings: Contractor's choice.
- Finishing: Skim coat plaster.
  - Primer/ Sealer: As recommended by board manufacturer for vapour control.
  - Accessories: Plant-on decorative 'rafters' as per drawing. .
- Other requirements: Fire stopping around service penetrations as section P12.

INSTALLATION

305 GYPSUM BOARDS GENERALLY
- Standard:
  - Gypsum plasterboard to BS EN 520.
  - Fibre reinforced gypsum board to BS EN 15283-2.
  - Evidence of compliance: All sheets to be CE marked. Submit Declaration of Performance (DoP).

335 ADDITIONAL SUPPORTS

- Framing: Accurately position and securely fix to give full support to:
  - Partition heads running parallel with, but offset from main structural supports.
  - Fixtures, fittings and service outlets. Mark framing positions clearly and accurately on linings.
  - Board edges and lining perimeters, as recommended by board manufacturer to suit type and performance of lining.

375 NEW WET LAID BASES

- Dpcs: Install under full width of partitions/ freestanding wall linings.
  - Material: Bituminous sheet or plastics.

435 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.

445 CEILINGS

- 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.

455 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): 600 mm.
- 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.

505 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.

510 SEALING GAPS AND AIR PATHS

- Location of sealant: To perimeter abutments and around openings.
  - Pressurized shafts and ducts: At board-to-board and board-to-metal frame junctions.
- Application: To clean, dry and dust free surfaces as a continuous bead with no gaps.
  - Gaps greater than 6 mm between floor and underside of gypsum board: After sealing, fill with jointing compound.

560 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.

565 VERTICAL JOINTS

- Joints: Centre on studs.
  - Partitions: Stagger joints on opposite sides of studs.
  - Two layer boarding: Stagger joints between layers.

570 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.

620 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.

FINISHING

650 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.

670 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.

680 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.

695 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.

725 REPAIRS TO EXISTING GYPSUM BOARD

- 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.

K11
Rigid sheet flooring/ sheathing/ decking/ sarking/ linings/ casings

K11 Rigid sheet flooring/ sheathing/ decking/ sarking/ linings/ casings

To be read with Preliminaries/ General conditions.

TYPES OF FLOORING/ SHEATHING/ DECKING /SARKING/ LININGS/ CASINGS

110 WOOD-BASED SHEETS GENERALLY

- Standard: To BS EN 13986.
  - Evidence of compliance: All sheets to be CE marked. Submit Declaration of Performance (DoP).

215 PLYWOOD FLOATING FLOOR TO FIRST FLOOR FOLLOWING BEAM WORKS

- Substrate: Joists as per Structural Engineer's drawings.
  - Preparation: Make good to existing substrate to ensure level surface.
- Subfloor: Plywood to an approved national standard.
  - Bonding quality to BS EN 314-2: Class 2.
  - Thickness: Nominally 18 mm.
  - Edges: Tongued and grooved all edges.
  - Setting out: Long edges running across joists. End joints central over joists and staggered.
  - Fixing to joists:
    Fasteners: 50 mm x 8 gauge wood screws into pilot holes.
    Fixing centres (maximum):
    Around floor perimeter and along short edges of each board: 150 mm.
    Along intermediate supports: 300 mm.
- Resilient layer/ Insulation: 100 mm mineral wool quilt between rafters, density 60-100 kg/m³.
  - Recycled content: Contractor's choice.
- Vapour control layer: Not required.
- Floating substrate: 19 mm plasterboard to BS EN 520.
- Flooring: Plywood to an approved national standard.
  - Bonding quality to BS EN 314-2: Class 2.
  - Appearance class to BS EN 635: Class II.
  - Finish: Sanded.
  - Thickness: 18 mm.
  - Edges: Tongued and grooved all edges.
  - Other requirements: None.
- Installation:
  - Floating substrate (where specified): Loose laid on resilient layer with close butted joints.
  - Flooring: Loose laid on resilient layer or spot bonded to floating substrate (where specified) with end joints staggered. All joints glued. Joints in flooring and floating substrate must not coincide.
- Bonding/ Jointing adhesive: Contractor's choice.
- Edges of boards at thresholds and other openings: Supported on loose laid battens.
- Expansion provision:
  - Clear expansion gap around perimeter of floor area and upstands: 1 mm per metre run of floor, with a minimum gap of 10 mm.
  - Intermediate expansion/ movement joints: As recommended by flooring manufacturer.

415 PLYWOOD WALL SHEATHING

- Substrate: MF stud as section K10.
  - Additional supports: None.
- Sheathing: Plywood manufactured to the relevant standards and quality control procedures specified in BS EN 636, and so marked.
  - Type: American construction and industrial plywood or similar approved.
  - Grade: B.
  - Nominal thickness/ number of plies: Refer to manufacturer.
  - Other requirements: None.
- Setting out: Long edges vertical and centred on supports.
  - Expansion gap between adjacent boards (unless otherwise recommended by manufacturer): 2-3 mm.
- Fixing to supports:
  - Fasteners: 50 x 3.35 mm galvanized annular ringed shank nails.
  - Fixing centres (maximum):
    Around board edges: 75 mm.
    Along intermediate supports: 300 mm.
  - Fixing distance from edges (minimum): 25 mm from bottom edge of board and 10 mm from other edges.

WORKMANSHIP

910 INSTALLATION GENERALLY

- Timing: Building to be weathertight before fixing boards internally.
- Moisture content of timber supports (maximum): 18%.
- Joints between boards: Accurately aligned, of constant width and parallel to perimeter edges.
- Methods of fixing, and fasteners: As section Z20 where not specified otherwise.

915 DRYNESS OF CONCRETE/ SCREED SUBSTRATES FOR FLOATING FLOORS

- Relative humidity above substrate when tested with a hygrometer to BS 8201, Appendix A (maximum): 75%.
  - Test points: All corners, around perimeter, and random points over area being tested.
  - Drying aids: Turned off for not less than 4 days before testing.

920 VAPOUR CONTROL LAYER IN FLOATING FLOOR CONSTRUCTION

- Location: Immediately below floating layer.
- Installation:
  - Joints: Overlapped by minimum 150 mm and sealed with vapour resistant tape.
  - Treatment of membrane at perimeter of flooring and upstands: Turned up and sealed to top face of flooring using a method approved by the board manufacturer.
- Excess material: Trimmed off neatly after fixing skirtings/ cover beads.
- Condition of membrane before laying flooring: Clean and dry.

925 BATTENS FOR FLOATING FLOORS

- Timber quality: Free from decay, insect attack (except ambrosia beetle damage) and with no knots wider than half the width of the section.
- Preservative treatment: As section Z12 and Wood Protection Association Commodity Specification C8.
  - Type/ Desired service life: Organic solvent Type FN/ 30 years.
- Moisture content at time of laying (maximum): 16%.

930 ADDITIONAL SUPPORTS

- Additional studs, noggings/ dwangs (Scot) and battens:
  - Provision: In accordance with board manufacturer's recommendations and as follows:
    Tongue and groove jointed rigid board areas: To all unsupported perimeter edges.
    Butt jointed rigid board areas: To all unsupported edges.
  - Size: Not less than 50 mm wide and of adequate thickness.
  - Quality of timber: As for adjacent timber supports.
  - Treatment (where required): As for adjacent timber supports.

940 BOARD MOISTURE CONTENT AND CONDITIONING

- Moisture content of boards at time of fixing: Appropriate to end use.
- Conditioning regime: Submit proposals.

960 FIXING GENERALLY

- Boards/ sheets: Fixed securely to each support without distortion and true to line and level.
- Fasteners: Evenly spaced in straight lines and, unless otherwise recommended by board manufacturer, in pairs across joints.
  - Distance from edge of board/ sheet: Sufficient to prevent damage.
- Surplus adhesive: Removed as the work proceeds.

980 OPEN JOINTS

- Perimeter joints, expansion joints and joints between boards: Free from plaster, mortar droppings and other debris.
- Temporary wedges and packings: Removed on completion of board fixing.

990 ACCESS PANELS

- Size and position: Agree before boards are fixed.
- Additional noggings/ dwangs (Scot), battens, etc: Provide and fix as necessary.

L
Windows/Doors/Stairs

L10
Windows/ Rooflights/ Screens/ Louvres

L10 Windows/ Rooflights/ Screens/ Louvres

To be read with Preliminaries/ General conditions.

GENERAL

110 EVIDENCE OF PERFORMANCE
- Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

115 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:
  - 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.
- Certification scheme: UK Timber Procurement Policy Category A evidence certification scheme or Programme for the Endorsement of Forest Certification (PEFC).
  - Other evidence: None.

120 SITE DIMENSIONS
- Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
- Designated items: All existing openings .

PRODUCTS

205 WINDOW MATERIALS SPECIFICATION
- Minimum BRE 'Green Guide to Specification Online' rating: Submit proposals.

250 WOOD WINDOWS
- Standard: To BS 644.
- Manufacturer: A firm currently registered under a third party quality assurance scheme.
- Exposure category to BS 6375-1/ Design wind load: 1600 Pa.
- Operation and strength characteristics: To BS 6375-2.
- Timber: Generally to BS EN 942.
  - Species: Hardwood as table NA.2.
  - Appearance class: J10 for glazing beads, drip mouldings and the like. J40 or better for all other members.
  - Moisture content on delivery: 12-19%.
- Preservative treatment: Organic solvent as section Z12 and WPA Commodity Specification C5; Desired service life 30 years.
- Finish as delivered: Full paint system as section M60.
- Thermal performance (U-value maximum): 1.2 W/m²K.
- Glazing details: Factory glazed.
  - Beading: External.
- Ironmongery/ Accessories: Submit proposals.
- Fixing: Built in with cramps as clause 780.

335 ALUMINIUM WINDOWS
- Standard: To BS 4873.
- Exposure category to BS 6375-1/ Design wind load: 1600 Pa.
- Finish as delivered: Polyester powder coating to BS 6496 to match sliding/ folding doors.
- Thermal performance (U-value maximum): 1.2 W/m²K.
- Glazing details: Factory glazed.
  - Beading: External.
- Ironmongery/ Accessories: None.
- Fixing: Screwed to masonry reveal as clause 782.

EXECUTION

710 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.

730 PRIMING/ SEALING
- Wood surfaces inaccessible after installation: Prime or seal as specified before fixing components.

750 BUILDING IN
- General: Not permitted unless indicated on drawings.
  - Brace and protect components to prevent distortion and damage during construction of adjacent structure.

760 REPLACEMENT WINDOW INSTALLATION
- Standard: To BS 8213-4.

765 WINDOW INSTALLATION GENERALLY
- Installation: Into prepared openings.
- Gap between frame edge and surrounding construction:
  - Minimum: 3 mm.
  - Maximum: 10 mm.
- Distortion: Install windows without twist or diagonal racking.

766 LOCATION OF OPENABLE WINDOWS IN NATURALLY VENTILATED BUILDINGS
- Location: Over 10 m from sources of external pollution.

780 FIXING OF WOOD FRAMES
- Standard: As section Z20.
- Fasteners: 25 x 3 x 150 mm galvanized carbon steel frame cramps.
  - Spacing: When not predrilled 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.

782 FIXING OF ALUMINIUM FRAMES
- Standard: As section Z20.
- Fasteners: 25 x 3 x 150 mm galvanized carbon steel frame cramps.
  - Spacing: When not predrilled 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.

810 SEALANT JOINTS

- Sealant:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Colour: Grey or white; seek approval.
  - Application: As section Z22 to prepared joints. Finish triangular fillets to a flat or slightly convex profile.

820 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.

L20
Doors/ shutters/ hatches

L20 Doors/ shutters/ hatches

To be read with Preliminaries/ General conditions.

GENERAL

110 EVIDENCE OF PERFORMANCE

- Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

112 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:
  - 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.
- Certification scheme: UK Timber procurement policy Category A evidence certification scheme. or Programme for the Endorsement of Forest Certification (PEFC).
  - Other evidence: None.

115 FIRE RESISTING AND SMOKE CONTROL PEDESTRIAN DOORS/ DOOR ASSEMBLIES/ DOORSETS

- CE marked fire resisting doorsets: To BS EN 16034 and in conjunction with BS EN 13241 and BS EN 14351-1 (and eventually prEN 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 CE marked to BS EN 16034. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.
- Components and assemblies will be marked to the relevant CE marking European product standard (hEN), national product standard and/ or third party certification rating.

120 NON-FIRE RESISTING PEDESTRIAN DOORS/ DOOR ASSEMBLIES/ DOORSETS

- 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.
- Components and assemblies will be marked to the relevant CE marking Euopean product standard, national product standard and/ or third party certification rating.

PRODUCTS

410 WOOD DOORSETS FD30s FIRE RESISTING

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Door leaf:
- Core: Manufacturer's choice.
- Thickness: 44 mm.
  - Facings: Interior grade plywood.
  - Lippings: Exposed lippings to long edges.
  - Finish as delivered: Prepared and primed, as section M60.
- Frame and architraves:
- Type: Refer to manufacturer.
  - Wood species: European redwood or similar approved.
  - Finish as delivered: Prepared and primed, as section M60.
- Preservative treatment: Required.
- Glazing/ Infill details: Clear fire-resisting glazing.
  - Manifestation: Not required.
  - Beading: External.
- Ironmongery: Submit proposals.
- Perimeter seals: Fire and smoke seal.
- Thermal performance (U-value maximum): Manufacturer's standard.
- Other requirements: None.
- Fixing: Plugged and screwed.

530 SLIDING FOLDING EXTERNAL DOORS TO EXTENSION

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Performance: Refer to manufacturer.
- Arrangement: Top hung.
  - Track system: Refer to manufactuter.
- Door leaf: As drawing.
  - Finish as delivered: Polyester powder coated.
  - Glazing/ Infill details: Factory glazed.
    Manifestation: As section L40.
- Operation: Manual.
- Ironmongery: Stainless steel; manufacturer's standard.
- Other requirements: Toughened glass to all glazing below 800 mm over FFL.

EXECUTION

710 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.

730 PRIMING/ SEALING

- Wood surfaces inaccessible after installation: Primed or sealed as specified before fixing components.

760 BUILDING IN

- General: Not permitted unless indicated on drawings.

770 DAMP PROOF COURSES ASSOCIATED WITH BUILT IN WOOD FRAMES

- Method of fixing: To backs of frames using galvanized clout nails.

790 FIXING OF WOOD FRAMES

- Spacing of fixings (frames not predrilled): Maximum 150 mm from ends of each jamb and at 600 mm maximum centres.

809 FIRE RESISTING AND SMOKE CONTROL DOORS/ DOOR ASSEMBLIES/ DOORSETS/ ROLLER SHUTTERS AND CURTAINS - ACCREDITED INSTALLER

- 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

- Gaps between frames and supporting construction: Filled as necessary in accordance with requirements for certification and/ or door/ doorset manufacturer's instructions.

820 SEALANT JOINTS

- Sealant:
  - Manufacturer: Contractor's choice .
    Product reference: Submit proposals .
  - Colour: Grey or white; seek approval .
  - Application: As section Z22 to prepared joints. Triangular fillets finished to a flat or slightly convex profile.

830 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.

840 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 60 doors requiring $\geq$ 60 minutes integrity performance: Coated with intumescent paint or paste before installation.

850 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.

860 INSTALLATION OF EMERGENCY EXIT DEVICES

- Standard: Unless specified otherwise, install panic bolts/ latches in accordance with BS EN 1125.

L30
Stairs/ ladders/ walkways/ handrails/ balustrades

L30 Stairs/ ladders/ walkways/ handrails/ balustrades

To be read with Preliminaries/ General conditions.

PRELIMINARY INFORMATION/ REQUIREMENTS

107 COMPLETION OF DESIGN OF MAIN STAIRCASE

- Requirement: Complete the detailed design to satisfy specified performance criteria and coordinate with the detailed design of related and adjacent work.
  - Standard: Straight stairs and winders to BS 5395-1 and To Building Regulations (Eng) Approved Documents K and M.
- Structural requirements: As section B50.
- Additional requirements: None.
- Design and production information: As Preliminaries section A31.
- Timing of submissions: As Preliminaries section A31.

115 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:
  - 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.
- Certification scheme: Forest Stewardship Council (FSC).
  - Other evidence: None.

130 SITE DIMENSIONS

- Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
  - Designated items: Structural openings, floor to floor heights.

COMPONENTS

210 WOOD STAIRS

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Components:
  - Treads: 21 mm hemlock, bullnose edge.
  - Risers: 9 mm moisture resistant plywood.
  - Strings: 32 mm redwood + string capping.
  - Newels: 82 x 82 mm hemlock - square.
  - Guarding: Hemlock spindles - square.
  - Handrails: 47 x 70 mm European oak, with volute and goose neck.
    Lower handrail: Not required.
- Moisture content at time of installation: 9-13%.
- Finish as delivered: Prepared and sealed as section M60.
  - Slip resistance value of integral tread – water wet (minimum): PTV of 45 to BS 7976.
  - Slip resistance value of integral nosing – water wet (minimum): Rz of 20 µm to BS 1134.
  - Colour of integral nosing: LRV to BS 8493 contrast of 30 (minimum) with tread. Submit proposals.
- Other requirements: Slip resistant coating to treads, as section M60.

550 PURPOSE-MADE BALUSTRADES TO MAIN STAIRCASE

- Component material, grade and finish as delivered:
  - Guarding: Hardwood.
  - Handrails: Hardwood.
    Lower handrail: Not required.
- Workmanship:
  - Joinery: To section Z10.
  - Metalwork: To section Z11.
- Other requirements: None.
- Fixing: Through fixing to timber.
  - Centres: Submit proposals.

INSTALLATION

610 MOISTURE CONTENT

- Temperature and humidity: Monitor and control internal conditions to achieve specified moisture content in wood components at time of installation.

620 PRIMING/SEALING/PAINTING

- Surfaces inaccessible after assembly/installation: Before fixing components, apply full protective/decorative treatment/coating system.

630 CORROSION PROTECTION OF DISSIMILAR MATERIALS

- 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

- Fasteners and methods of fixing: To section Z20.
- Structural members: Do not modify, cut, notch or make holes in structural members, except as indicated on drawings.
- Temporary support: Do not use stairs, walkways or balustrades as temporary support or strutting for other work.
- Applied features (finishes, inserts, nosings and the like): Substrates to be even, dry, sound and free from contaminants. Make good substrate surfaces and prepare/ prime as applied feature manufacturer's recommendations before application.

COMPLETION

910 INSPECTION

- Timing: Two weeks prior to date when Contractor expects work to be practically complete.
- Period of notice (minimum): 3 working days.

L40
General glazing

L40 General glazing

To be read with Preliminaries/ General conditions.

GENERAL REQUIREMENTS

150 WORKMANSHIP AND POSITIONING GENERALLY

- Glazing generally: In accordance with BS 6262 series.
- Integrity: Glazing must be wind and watertight under all conditions with full allowance made for deflections and other movements.
- Dimensional tolerances: Panes/ sheets to be within ± 2 mm of specified dimensions.
- Materials:
  - 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.
  - Protection: Keep materials dry until fixed. Protect insulating glass units and plastics glazing sheets from the sun and other heat sources.

152 PREPARATION

- Surrounds, rebates, grooves and beads: Clean and prepare before installing glazing; ensure compliance with any certified installation requirements.

155 GLASS GENERALLY

- Standards: To BS 952 and relevant parts of:
  - BS EN 572 for basic soda lime silicate glass.
  - BS EN 1096 for coated glass.
  - BS EN 1748-1 for borosilicate glass.
  - BS EN 1748-2 for ceramic glass.
  - BS EN 1863 for heat strengthened soda lime silicate glass.
  - BS EN 12150 for thermally toughened soda lime silicate safety glass
  - BS EN 12337 for chemically strengthened soda lime silicate glass.
  - BS EN 13024 for thermally toughened borosilicate safety glass.
  - BS EN ISO 12543 for laminated glass and laminated safety glass.
- Panes/ sheets: Clean and free from obvious scratches, bubbles, cracks, rippling, dimples and other defects.
  - 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.

165 HEAT SOAKING OF THERMALLY TOUGHENED GLASS

- Standard: To BS EN 14179-1 and -2.
  - Holding period (minimum): 8 hours.
- Certified evidence of treatment: Submit.
- Designated locations: all glazing below 800mm over FFL.

TYPES OF GLAZING

550 GLASS MIRRORS TO WC

- Standard: To BS EN 1036.
  - BS EN 1036-2 characteristics: None relevant.
- Mirror material: Float glass, silvered to give maximum reflection, free from tarnishing, discoloration, scratches and other defects visible in the designed viewing conditions.
  - Thickness: 6 mm.
  - Backing: Contractor's choice.
  - Edge treatment: Polished bevel.
- Background: Plastered masonry.
- Fixing method: Double sided self-adhesive pads at 400 mm centres.
- Installation: Fixed accurately and securely without overtightening fasteners, to provide a flat surface giving a distortion free reflection.

630 MANIFESTATION TO ALL FULL HEIGHT GLAZING OR GLAZING WITH CILL LEVEL BELOW 800 mm OVER FFL

- Design: Plain circle.
  - Art work: To be prepared by contractor and submitted for approval.
  - Media: Scale drawings.
- Technique: Applied film.

M
Surface finishes

M10
Cement based levelling/ wearing screeds

M10 Cement based levelling/ wearing screeds

To be read with Preliminaries/General conditions.

TYPES OF SCREED

195 PROPRIETARY SCREEDS TO BS EN 13813 TO EXTENSION GROUND FLOOR
- Substrate: Block and beam with insulation below screed.
- Screed manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Screed construction: Floating, as clause 290.
  - Reinforcement for crack control: Steel fabric, as clause 392.
- Performance to BS EN 13813:
  - Compressive strength: C30.
  - Flexural strength: F2.
  - Wear resistance: Not required.
- Thickness:
  - Nominal: 90 mm.
  - Minimum: Manufacturer's standard.
- Flatness/ Surface regularity class: SR1.
- Finish: Smooth floated, as clause 530.
  - To receive: Quarry tiles.
- Other requirements: None.

GENERALLY/ PREPARATION

210 SUITABILITY OF SUBSTRATES
- General:
  - 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.

260 FULLY BONDED CONSTRUCTION
- Preparation: Generally in accordance with BS 8204-1.
- Removing mortar matrix: Shortly before laying screed, expose coarse aggregate over entire area of hardened substrate.
- Texture of surface: Suitable to accept screed and achieve a full bond over complete area.
- Bonding coat: Manufacturer's standard.

270 PARTIALLY BONDED CONSTRUCTION
- Preparation: Generally in accordance with BS 8204-1.
- Substrate surface: Brushed finish with no surface laitance.
  - Texture of surface: Suitable to accept screed and achieve a bond over complete area.
- Bonding coat: Manufacturer's standard.

290 FLOATING CONSTRUCTION

- Insulation:
  - Type: 60 mm PIR insulation boards.
  - Installation: Lay with tight butt joints. Continue up at perimeter abutments for full depth of screed.
- Separating layer:
  - Type: Polyethylene sheet, minimum 125 micrometres thick (500 gauge)..
  - Installation: Lay over insulation and turn up at perimeter abutments. Lap 100 mm at joints.

BATCHING/MIXING

302 CEMENTS

- Cement types: In accordance with BS 8204-1, clause 5.1.3.

305 AGGREGATES

- Sand: To BS EN 13139.
  - Grading limits: In accordance with BS 8204-1, Table B1.
- Coarse aggregates for fine concrete levelling screeds:
  - Standard: BS EN 12620.
  - Designation 4/10.
- Lightweight aggregates: In accordance with BS 8204-1, Annex A.

307 ADMIXTURES

- Standard: In accordance with BS 8204-1, Table 1.
- Calcium chloride: Do not use in admixtures.

310 BATCHING WITH DENSE AGGREGATES

- Mix proportions: Specified by weight.
- Batching: Select from:
  - Batch by weight.
  - Batch by volume: Permitted on the basis of previously established weight:volume relationships of the particular materials. Use accurate gauge boxes. Allow for bulking of damp sand.

330 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 consistence. 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.

335 IN SITU CRUSHING RESISTANCE (ISCR)

- Standards and category: In accordance with BS 8204-1, table 4.
  - Testing of bonded and unbonded screeds: To Annex D.
  - Testing of floating levelling screeds: To Annex E.

340 ADVERSE WEATHER

- Screeds surface temperature: Maintain above 5°C for a minimum of four days after laying.
- Hot weather: Prevent premature setting or drying out.

LAYING

345 LEVEL OF SCREED SURFACES
- Permissible deviation: (allowing for thickness of coverings): ±5 mm from datum..

355 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.

375 COMPACTION OF SCREEDS
- General: Compact thoroughly over entire area.
- Screeds over 50 mm thick: Lay in two layers of approximately equal thickness. Roughen surface of compacted lower layer then immediately lay upper layer.

392 GENERAL REINFORCEMENT
- Steel fabric: In accordance with BS 4483.
  - Type: A98.
- Installation: In accordance with BS 8204-1.

405 JOINTS IN LEVELLING SCREEDS GENERALLY
- Laying screeds: Lay continuously using 'wet screeds' between strips or bays. Minimize defined joints.
- Daywork joints: Form with vertical edge.

FINISHING/CURING

510 FINISHING GENERALLY
- Timing: Carry out all finishing operations at optimum times in relation to setting and hardening of screed material.
- Prohibited treatments to screed surfaces:
  - Wetting to assist surface working.
  - Sprinkling cement.

530 SMOOTH FLOATED FINISH
- Finish: Even texture with no ridges or steps.

540 TROWELLED FINISH TO LEVELLING SCREEDS
- Floating: To an even texture with no ridges or steps.
- 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
- Floating: To an even texture with no ridges or steps.
- Trowelling: Successively trowel at intervals, applying sufficient pressure to close surface and give a uniform smooth finish free from trowel marks and other blemishes.

650 CURING
- 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.
- Curing period (minimum): Keep polyethylene sheeting in position for period recommended by screed manufacturer.
- 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.

M20
Plastered/ Rendered/ Roughcast coatings

M20 Plastered/ Rendered/ Roughcast coatings

To be read with Preliminaries/ General conditions.

TYPES OF COATING

280 GYPSUM PLASTER SKIM COAT ON PLASTERBOARD
- Plasterboard: 12.5 or 15 mm.
  - Preparation: Bonding agent recommended by plaster manufacturer.
- Plaster: Board finish/ finish plaster to BS EN 13279-1, class B.
  - Manufacturer: As M20/280A.
    Product reference: As M20/280A.
  - Thickness: 2.5 - 3 mm.
  - Finish: Smooth.
- Accessories: Beads and stops .

280A GYPSUM FINISH PLASTER
- Manufacturer: British Gypsum.
  - Web: www.british-gypsum.com.
  - Email: bgtechnical.enquiries@bpb.com.
  - Product reference: Thistle Durafinish

497 COLD WEATHER
- General: Do not use frozen materials or apply coatings on frozen or frost bound substrates.
- 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.
- Internal work: Take precautions to enable internal coating work to proceed without damage when air temperature is below 3°C.

PREPARING SUBSTRATES

510 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.

541 BONDING AGENT APPLICATION
- General: Apply evenly to substrate to achieve effective bond of plaster/ render coat. Protect adjacent surfaces.

556 REMOVING DEFECTIVE EXISTING RENDER

- Render for removal: Detached, hollow, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
- Removing defective render: Cut out to regular rectangular areas with straight edges.
  - Horizontal and vertical edges: Square cut or slightly undercut.
  - Bottom edges to external render: Do not undercut.
  - Render with imitation joints: Cut back to joint lines.
- Cracks:
  - Fine hairline cracking/ crazing: Leave.
  - Other cracks: Cut out to a width of 75 mm (minimum).
    Dust and loose material: Remove from exposed substrates and edges.

566 REMOVING DEFECTIVE EXISTING PLASTER

- Plaster for removal: Detached, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
  - Hollow, detached areas: Remove where area of detachment is more than 0.5 m².
- Stained plaster: Remove.
- Removing defective plaster. Cut back to a square, sound edge.
- Faults in background (structural deficiencies, damp, etc.): Submit proposals.
- Cracks:
  - Fine hairline cracking/ crazing: Leave.
  - Other cracks; Cut out to a width of 75 mm (minimum).
- Dust and loose material: Remove from exposed substrates and edges.

568 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.
- Perished and salt contaminated masonry:
  - Mortar joints: Rake out.
  - Masonry units: Submit proposals.
- Faults in substrate (structural deficiencies, additional sources of damp, etc.): Submit proposals.
- Drying out substrate: Established drying conditions. Leave walls to dry for as long as possible before plastering.
- Dust and loose material: Remove from exposed substrate and edges.

INTERNAL PLASTERING

710 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 localised drying out.

715 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.

720 DUBBING OUT

- General: Correct substrate inaccuracies.
- New smooth, dense concrete and similar surfaces: Dubbing out prohibited unless total plaster thickness is within range recommended by plaster manufacturer.
- Thickness of any one coat (maximum): 10 mm.
- Mix: As undercoat.
- Application: Achieve firm bond. Allow each coat to set sufficiently before the next is applied. Cross scratch surface of each coat.

725 UNDERCOATS GENERALLY

- General: Rule to an even surface. Cross scratch to provide a key for the next coat.
- Undercoats on metal lathing: Work well into interstices to obtain maximum key.
- Undercoats gauged with Portland cement: Do not apply next coat until drying shrinkage is substantially complete.

777 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.

778 WOOD FLOAT FINISH

- Appearance: An even overall texture. Finish with a dry wood float as soon as wet sheen has disappeared.

M40
Stone/ concrete/ quarry/ ceramic tiling/ mosaic

M40 Stone/ concrete/ quarry/ ceramic tiling/ mosaic

To be read with Preliminaries/ General conditions.

TYPES OF TILING/ MOSAIC

110 TILING TO FLOORS: extension, ground floor all areas

- Tiles: Quarry tiles.
  - Manufacturer/ Supplier: Dennis Ruabon Commercial Ltd..
    Product reference: 150 x 150 mm Quarry Tile (non slip version in wet areas).
  - Colour: Black.
  - Finish: Manufacturer's standard.
  - Size: 150 x 150 mm.
  - Thickness: 12mm.
  - Slip potential:
    Slip resistance value (SRV) (minimum)/ Pendulum test value (PTV) (minimum) to BS 7976-1, -2 and -3: Manufacturer's standard.
    Surface roughness (Rz) (minimum) BS 1134: Manufacturer's standard.
    Ramp test class: Manufacturer's standard.
  - Recycled content: Manufacturer's standard.
- Background/ Base: Calcium sulfate based screed.
  - Preparation: As maunfacturer's recommendation.
- Intermediate substrate: As maunfacturer's recommendation.
- Bedding: As maunfacturer's recommendation.
  - Reinforcement: Not applicable.
  - Adhesive to BS EN 12004: Contractor's choice.
- Joint width: As maunfacturer's recommendation.
- Grout: As maunfacturer's recommendation.
  - Type/ classification: CG2W.
  - Admixture: None.
- Movement joints: As maunfacturer's recommendation.
- Accessories: None.

110A TILING TO WALLS: WC's and kitchen

- Tiles: Ceramic wall tiles, vertical stack bond.
  - Manufacturer/ Supplier: Johnson Tiles.
    Product reference: Prismatics.
  - Colour: White.
  - Finish: Glazed.
  - Size: 200 x 100 mm.
  - Thickness: 6.5 mm.
- Background/ Base: Existing walls.
  - Preparation: As maunfacturer's recommendation.
- Intermediate substrate: As maunfacturer's recommendation.
- Bedding: As maunfacturer's recommendation.
  - Reinforcement: Not applicable.
  - Adhesive to BS EN 12004: Contractor's choice.
- Joint width: As maunfacturer's recommendation.
- Grout: As maunfacturer's recommendation.
  - Type/ classification: CG2W.
  - Admixture: None.
- Movement joints: As maunfacturer's recommendation.
- Accessories: None.

130 FLOOR FINISH MATERIALS SPECIFICATION
- Minimum BRE 'Green Guide to Specification Online' rating: Submit proposals.

GENERAL

210 SUITABILITY OF BACKGROUNDS/ BASES
- Background/ base tolerances: To permit specified flatness/ regularity of finished surfaces given the permissible minimum and maximum thickness of bedding.
- New background drying times (minimum):
  - Concrete walls: 6 weeks.
  - Brick/ block walls: 6 weeks.
  - Rendering: 2 weeks.
  - Gypsum plaster: 4 weeks.
- New base drying times (minimum):
  - Concrete slabs: 6 weeks.
  - Cement:sand screeds: 3 weeks.

215 FALLS IN THE BASES
- General: Give notice if falls are inadequate.

250 SAMPLES
- General: Submit representative samples of the following: Each type of tile.

PREPARATION

310 EXISTING BACKGROUNDS/BASES GENERALLY
- Efflorescence, laitance, dirt and other loose material: Remove.
- Deposits of oil, grease and other materials incompatible with the bedding: Remove.
- Tile, paint and other nonporous surfaces: Clean.
- Wet backgrounds: Dry before tiling.

320 EXISTING CONCRETE/SCREEDS
- Loose or hollow portions: Cut out.
- Making good: Material recommended by tiling adhesive manufacturer.

330 EXISTING PLASTER
- Defective areas: Remove plaster that is loose, soft, friable, badly cracked or affected by efflorescence. Cut back to straight horizontal and vertical edges.
- Making good: Use plaster or nonshrinking filler.

350 EXISTING TILES
- Loose or hollow sounding tiles: Remove.
- Making good: Material recommended by tiling adhesive manufacturer.

360 EXISTING PAINT
- Paint with unsatisfactory adhesion: Remove so as not to impair bedding adhesion.

370 NEW IN SITU CONCRETE
- Backgrounds/ bases to be tiled: Remove mould oil, surface retarders and other materials incompatible with bedding.

380 NEW PLASTER
- Plaster: Dry, solidly bedded, free from dust and friable matter.
- Plaster primer: Apply if recommended by adhesive manufacturer.

390 PLASTERBOARD BACKGROUNDS
- Boards: Dry, securely fixed and rigid with no protruding fixings and face to receive decorative finish exposed.

450 PREPARING CONCRETE BASES FOR UNBONDED BEDDING - WITHOUT SEPARATING LAYER
- Surface finish: Smooth.
- Surface preparation: Before laying mortar bed, dampen lightly.

451 PREPARING CONCRETE BASES FOR UNBONDED BEDDING
- Separating layer: Polyethylene sheet
  - Thickness: 125 micrometres (500 gauge) .
  - Lap at joints: 100 mm.

460 SMOOTHING UNDERLAYMENT
- Type: Recommended by adhesive manufacturer.
- Condition: Allow to dry before tiling.

FIXING

510 FIXING GENERALLY
- Colour/ shade: Unintended variations within tiles for use in each area/ room are not permitted.
  - Variegated tiles: Mix thoroughly.
- Adhesive: Compatible with background/ base. Prime if recommended by adhesive manufacturer.
- Use of admixtures with cementitious adhesives: Only admixtures approved by adhesive manufacturer.
- Cut tiles: Neat and accurate.
- Fixing: Provide adhesion over entire background/ base and tile backs.
- Final appearance: Before bedding material sets, make adjustments necessary to give true, regular appearance to tiles and joints when viewed under final lighting conditions.
- Surplus bedding material: Clean from joints and face of tiles without disturbing tiles.

530 SETTING OUT
- Joints: True to line, continuous and without steps.
  - Joints on walls: Horizontal, vertical and aligned round corners.
  - Joints in floors: Parallel to the main axis of the space or specified features.
- Cut tiles: Minimise number, maximise size and locate unobtrusively.
- Joints in adjoining floors and walls: Align.
- Joints in adjoining floors and skirtings: Align.
- Movement joints: Where locations are not indicated, submit proposals.
- Setting out of floor tiles: Drawing references: seek approval.
- Setting out of wall tiles: Submit proposals.

550 FLATNESS/ REGULARITY OF TILING/ MOSAICS
- Sudden irregularities: Not permitted.
- Deviation of surface: Measure from underside of a 2 m straightedge with 3 mm thick feet placed anywhere on surface. The straightedge should not be obstructed by the tiles and no gap should be greater than 6 mm, i.e. a tolerance of $\pm$ 3 mm.

560 LEVEL OF TILING ACROSS JOINTS
- Deviation (maximum) between tile surfaces either side of any type of joint:
  - 1 mm for joints less than 6 mm wide.
  - 2 mm for joints 6 mm or greater in width.

570 MORTAR BEDDING

- Bedding mix:
  - Cement: Portland to BS EN 197-1, type CEM I/42.5.
  - Sand for walls: Fine aggregate to BS EN 13139. Grading designation: 0/2 (CP or MP) category 2 fines.
  - Sand for floors: Fine aggregate to BS EN 13139. Grading designation: 0/4 (MP) category 1 fines and between 20%-66% passing a 0.5 sieve.
- Batching: Select from:
  - Batch by weight.
  - Batch by volume: Permitted on the basis of previously established weight:volume relationships of the particular materials. Use accurate gauge boxes. Allow for bulking of damp sand.
- Mixing: Mix materials thoroughly to uniform consistence. Use a suitable forced action mechanical mixer. Do not use a free fall type mixer.
- Application: At normal temperatures use within two hours. Do not use after initial set. Do not retemper.

578 CRACK CONTROL REINFORCEMENT

- Type to BS 4483: D49.
- Installation: Place centrally in depth of bed. Lap not less than 100 mm and securely tie together with steel wire.
- Corners: Avoid a four layer build at corners.

650 ADHESIVE BED - NOTCHED TROWEL METHOD (WALLS)

- Application: By 3 mm floated coat of adhesive to dry background in areas of approximately 1 m². Comb surface.
- Tiling: Press tiles firmly onto float coat.

651 ADHESIVE BED - NOTCHED TROWEL AND BUTTERING METHOD (WALLS)

- Application: By floated coat of adhesive to dry background in areas of about 1 m². Comb surface.
- Tiling: Apply thin even coat of adhesive to backs of dry tiles. Fill any ribbed, deep keyed or button profiles. Press tiles firmly onto float coat.
- Finished adhesive thickness: 3 mm or within the range allowed by the adhesive manufacturer.

652 ADHESIVE BED - BUTTERING METHOD (WALLS)

- Tiling: Apply even coat of adhesive to backs of dry tiles. Fill any ribbed, deep keyed or button profiles.
- Finished adhesive thickness: 3 mm or within the range allowed by the adhesive manufacturer.

660 ADHESIVE BED - NOTCHED TROWEL METHOD FOR MESH BACKED MOSAIC (WALLS)

- Application: By 3 mm floated coat of adhesive to dry background. Comb surface.
- Placing mosaic sheets: Hang in horizontal rows, working downwards. Stagger vertical joints. Prevent slippage of sheets. Lightly beat mosaics into adhesive.
- Width, plane and alignment of joints between sheets: To match joints between mosaic tiles.

661 ADHESIVE BED - NOTCHED TROWEL METHOD FOR PAPER FACED MOSAIC (WALLS)

- Application: By 3 mm floated coat of adhesive to dry background. Comb surface.
- Preparing mosaic sheets: Pregrout. Remove surplus before fixing.
- Placing mosaic sheets: Hang in horizontal rows, working downwards. Stagger vertical joints.
- Width, plane and alignment of joints between sheets: To match joints between mosaic tiles.
- Paper face: Before adhesive hardens completely, remove paper face. Complete grouting. Wash off glue from face of mosaic.

710 ADHESIVE BED - NOTCHED TROWEL AND BUTTERING METHOD (FLOORS)

- Application: Floated coat of adhesive to dry base and comb surface.
- Tiling: Apply coat of adhesive to backs of dry tiles. Fill any ribbed, deep keyed or button profiles. Press tiles firmly onto float coat.
- Finished adhesive thickness: Within range allowed by manufacturer.

711 ADHESIVE BED - BUTTERING METHOD (FLOORS)

- Tiling: Apply even coat of adhesive to backs of dry tiles. Fill any ribbed, deep keyed or button profiles.
- Finished adhesive thickness: Within the range allowed by the adhesive manufacturer.

MOVEMENT JOINTS/ GROUTING/ COMPLETION

805 SEALANT MOVEMENT JOINTS WITH METAL EDGINGS IN TILING TO FLOORS

- Edging material: Stainless steel angle.
  - Size: To suit tiles; submit proposals.
  - Bedding: Bed in 1:3 cement:sand.
- Installation: Centre over joints in base. Set to exact finished level of floor.
  - Fixing to base: As manufacturer's recommendations.
- Joint width: To match that of structural movement joint in base.
- Sealant: Generally.
  - Colour: Grey or white.
  - Preparation and application: As section Z22.

875 GROUTING

- Sequence: Grout when bed/adhesive has set sufficient to prevent disturbance of tiles.
- Joints: 6 mm deep (or depth of tile if less). Free from dust and debris.
- Grouting: Fill joints completely, tool to profile, clean off surface. Leave free from blemishes.
  - Profile: Slightly concave.
- Polishing: When grout is hard, polish tiling with a dry cloth.

885 COLOURED GROUT

- Staining of tiles: Not permitted.
- Evaluating risk of staining: Apply grout to a few tiles in a small trial area. If discoloration occurs apply a protective sealer to tiles and repeat trial.

M50
Rubber/ plastics/ cork/ lino/ carpet tiling/ sheeting

M50 Rubber/ plastics/ cork/ lino/ carpet tiling/ sheeting

To be read with Preliminaries/ General conditions.

TYPES OF COVERING

130 CARPET TILING
- Location: Stiarcase, first floor excluding WC.
- Base: Timber.
  - Preparation: As maunfacturer's recommendation.
- Fabricated underlay: Plywood as clause 560.
- Carpet tiles:
  - Manufacturer: Desso.
    Product reference: Arcade.
  - Type: Cut pile.
  - BS EN 1307 classification:
    Levels of use class: 32.
    Luxury rating class: Manufacturer's standard.
    Additional performance properties to BS EN 1307: Suitability for use on stairs (Intensive use).
  - Recycled content: Manufacturer's standard.
  - Size: 500 x 500 mm.
  - Colour/ pattern: Submit proposals.
- Method of laying: Fully adhere all tiles with release adhesive recommended by tile manufacturer..
- Accessories: None.
- Other requirements: None.

155 PVC SHEET FLOORING IN SPECIAL WET AREAS
- Location: Ground floor WC and kitchen, first floor WC.
- Base: Existing to be exposed for assesment of substrate.
  - Preparation: As recommended by manufacturer.
- Fabricated underlay: Plywood as clause 560.
- Flooring roll: PVC to BS EN 13553.
  - Manufacturer: As M50/155A.
    Product reference: As M50/155A.
  - Identity code: W1.
  - BS EN ISO 10874 class: Manufacturer's standard.
  - Slip potential:
    Slip resistance value (SRV) (minimum)/ Pendulum test value (PTV) (minimum) to BS 7976-1, -2 and -3: 36 dry.
    Surface roughness (Rz) (minimum) to BS 1134: 70 micrometres.
  - Recycled content: Manufacturer's standard.
  - Width: As M50/155A.
  - Thickness: As M50/155A.
  - Colour/ pattern: As M50/155A.
- Adhesive (and primer if recommended by manufacturer): As M50/155A.
- Seam welding: As M50/155A.
- Accessories: None.
- Finishing: None.
- Other requirements: None.

155A SHEET FLOORING
- Manufacturer: Altro.
  - Web: www.altro.co.uk.
  - Email: enquiries@altro.com.
  - Product reference: Altro Stronghold 30
- Colour: Abyss K3001.
- Accessories: Skirtings to kitchen area only.

195 FLOOR FINISH MATERIALS SPECIFICATION
- Minimum BRE 'Green Guide to Specification Online' rating: A.

GENERAL REQUIREMENTS

210 WORKMANSHIP GENERALLY
- Base condition after preparation: Rigid, dry, sound, smooth and free from grease, dirt and other contaminants.
- Finished coverings: Accurately fitted, tightly jointed, securely bonded, smooth and free from air bubbles, rippling, adhesive marks and stains.

330 COMMENCEMENT
- Required condition of works prior to laying materials:
  - Building is weathertight and well dried out.
  - Wet trades have finished work.
  - Paintwork is finished and dry.
  - Conflicting overhead work is complete.
  - Floor service outlets, duct covers and other fixtures around which materials are to be cut are fixed.
- Notification: Submit not less than 48 hours before commencing laying.

340 CONDITIONING
- 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.
- 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
- Temperature and humidity: Before, during and after laying, maintain approximately at levels which will prevail after building is occupied.
- Ventilation: Before during and after laying, maintain adequate provision.

PREPARING BASES

410 NEW BASES
- Suitability of bases and conditions within any area: Commencement of laying of coverings will be taken as acceptance of suitability.

420 EXISTING BASES
- Notification: Before commencing work, confirm that existing bases will, after preparation, be suitable to receive coverings.
- 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
- Base drying aids: Not used for at least four days prior to moisture content testing.
- Base moisture content test: Carry out in accordance with BS 5325, Annexe A or BS 8203, Annexe A.
  - Locations for readings: In all corners, along edges, and at various points over area being tested.
- Commencement of laying coverings: Not until all readings show 75% relative humidity or less.

440 SUBSTRATES TO RECEIVE THIN COVERINGS
- 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
- Type: As recommended by covering manufacturer.
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.

470 BASES FROM WHICH EXISTING FLOOR COVERINGS HAVE BEEN REMOVED
- Substrate: Clear of covering and as much adhesive as possible. Skim with smoothing underlayment compound to give smooth, even surface.

560 PLYWOOD UNDERLAY
- Standard: An approved national standard.
- Bonding quality: To BS EN 314-2 class 1.
- Appearance: To BS EN 635 class II.
- Finish: Sanded.
- Thickness: 6 mm.
- Sheet size: 2400 x 1200 mm.
- Substrate: Existing floor boards securely fixed and acceptably level with no gross irregularities or protruding fasteners.
- 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.
- Fasteners: 25 mm ringed shank or twisted shank nails or divergent staples.
  - 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.
  - Placement: Driven with heads set flush with surface, and not projecting through underside of base. Not deformed.

LAYING COVERINGS

610 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.

640 ADHESIVE FIXING GENERALLY
- Adhesive type: As specified, as recommended by covering/ underlay manufacturer or as approved.
- Primer: Type and usage as recommended by adhesive manufacturer.
- Application: As necessary to achieve good bond.
- Finished surface: Free from trowel ridges, high spots caused by particles on the substrate, and other irregularities.

720 DOORWAYS
- Joint location: On centre line of door leaf.

740 EDGINGS AND COVER STRIPS
- Manufacturer: Contractor's choice .
  - Product reference: Submit proposals .
- Material/ finish: Staniless steel .
- Fixing: Secure with edge of covering gripped. Use matching fasteners where exposed to view.

750 STAIR NOSINGS AND TRIMS
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Material/ finish: Stainless steel with non-slip insert.
- 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.
  - Screw fixing with matching plugs: Required.

780 TRAFFICKING AFTER LAYING
- Covering types: All floor coverings.
- Traffic free period: Until adhesive is set.

COMPLETION

820 FINISHING PLASTICS FLOORING
- Cleaning operations:
  - Wash floor with water containing neutral (pH 6-9) detergent. If necessary, lightly scrub heavily soiled areas.
  - Rinse with clean water, removing surplus to prevent damage to adhesive. Allow to dry.
- Emulsion polish: Two coats of a type recommended by covering manufacturer.

880 WASTE
- Spare covering material: Retain suitable material for patching. On completion submit pieces for selection. Hand over selected pieces to Employer.

M60
Painting/ clear finishing

M60 Painting/ clear finishing

To be read with Preliminaries/ General conditions.

COATING SYSTEMS

150 EGGSHELL/ SATIN PAINT TO INTERNAL EXPOSED SOFTWOOD

- Manufacturer: As M60/150A.
  - Product reference: As M60/150A.
- Surfaces: Preprimed and sealed or previously decorated.
  - Preparation:
    - Degrease and abrade to provide key;
    - Ensure surfaces are clean and dry; and
    - Remove all loose and defective coatings.
- Initial coats: As recommended by manufacturer.
  - Number of coats: As recommended by manufacturer.
- Undercoats: As recommended by manufacturer.
  - Number of coats: As recommended by manufacturer.
- Finishing coats: As recommended by manufacturer.
  - Number of coats: As recommended by manufacturer.

150A EGGSHELL/ SATIN PAINT

- Manufacturer: Dulux Trade, brand of AkzoNobel.
  - Web: www.duluxtrade.co.uk.
  - Email: project.support@akzonobel.com.
  - Product reference: Diamond Quick Drying Eggshell
- System code: As follows:
  - D4 Painted walls to be Class O fire rating upgraded
  - D89 New plaster, render, etc.
  - D1076 Non-resinous softwood, hardwood etc .
- Colour: Submit samples for the approval of the Employer .

170 MASONRY COATING TO ALL EXTERNAL EXISTING WALLS .

- Manufacturer: As M60/170A.
  - Product reference: As M60/170A.
- Surfaces: Facing brickwork.
  - Preparation:
    " All loose, flaking and unstable material must be identified and then thoroughly removed using stiff brushes and broad bladed scrapers to get back to a sound edge; these edges should then be feathered in. Ensure that any paint materials left remaining and the underlying substrate is sound and adhering well. Any gloss or shiny surfaces should be thoroughly flatted down using sand or emery paper to create a good key.
    " Any algae growth should be wire brushed to remove all growths and treated with Keim Algicid, brush applied undiluted and allowed to remain undisturbed for three hours before thoroughly washing off.
    " Any cracks or where there is a need to equalise the surface should be filled using Keim Spachtel, a ready to use silicate mineral filler, brush or trowel applied to a pre-wetted surface and dressed back to the required level.
    " Any newly repaired areas must be allowed to dry out for a minimum period of 15 days prior to the application of Keim Mineral Paints.
    " All surfaces must be thoroughly washed down with clean cold water to remove all surface dirt and dust. When all surfaces are clean, sound, wind dry, dust free and free from all surface contaminants, decoration using Keim Mineral Paints may proceed. .
- Initial coats: As recommended by manufacturer .
  - Number of coats: As recommended by manufacturer .
- Undercoats: As recommended by manufacturer .
  - Number of coats: As recommended by manufacturer .
- Finishing coats: As M60/170A .
  - Number of coats: As M60/170A .

170A EXTERIOR PAINT

- Manufacturer: Keim Mineral Paints Ltd.
  - Web: www.keimpaints.co.uk.
  - Email: sales@keimpaints.co.uk.
  - Product reference: Keim Soldalit
- Primer: Keim Soldalit Grob.
- Number of coats: Two.
- Colour: White; submit proposals.

172 FLAME-RETARDANT COATING SYSTEM TO EXPOSED INTERNAL STRUCTURAL TIMBER e.g. RAFTERS.

- Manufacturer: Envirograf or similar approved.
  - Product reference: 145 Timber Frame Fire Coat.
- Reaction to fire rating of system: Class 0 as defined in guidance to Building Regulations (Eng & W).
- Surfaces: Timber.
  - Preparation: As recommended by manufacturer.
- Initial coats: As recommended by manufacturer.
  - Number of coats: As recommended by manufacturer.
  - Application: As recommended by manufacturer.
- Undercoats: As recommended by manufacturer.
  - Number of coats: As recommended by manufacturer.
  - Application: As recommended by manufacturer.
- Finishing coats: As recommended by manufacturer.
  - Number of coats: As recommended by manufacturer.
  - Application: As recommended by manufacturer.

GENERAL

210 COATING MATERIALS
- Manufacturer: Obtain materials from any of the following:
  Keim Mineral Paints (exterior), Dulux Trade Paints (interior).
- Selected manufacturers: Submit names before commencement of any coating work.

215 HANDLING AND STORAGE
- Coating materials: Deliver in sealed containers, labelled clearly with brand name, type of material and manufacturer's batch number.
- Materials from more than one batch: Store separately.

280 PROTECTION
- 'Wet paint' signs and barriers: Provide where necessary to protect other operatives and general public, and to prevent damage to freshly applied coatings.

PREPARATION

400 PREPARATION GENERALLY
- 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, 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.

420 FIXTURES AND FITTINGS
- Removal: Before commencing work remove: Coverplates, grilles, and other surface mounted fixtures .
- Replacement: Refurbishment as necessary, refit when coating is dry.

425 IRONMONGERY
- Removal: Before commencing work remove ironmongery from surfaces to be coated.
- Hinges: Remove.
- Replacement: Refurbish as necessary; refit when coating is dry.

440 PREVIOUSLY COATED SURFACES GENERALLY

- Preparation: In accordance with BS 6150, clause 11.5.
- Contaminated or hazardous surfaces: Give notice of:
  - Coatings suspected of containing lead.
  - Substrates suspected of containing asbestos or other hazardous materials.
- Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
- Significant rot, corrosion or other degradation of substrates.
- Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
- Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
- Alkali affected coatings: Completely remove.
- Retained coatings:
  - Thoroughly clean to remove dirt, grease and contaminants.
  - Gloss coated surfaces: Provide key.
- Partly removed coatings:
  - Additional preparatory coats: Apply to restore original coating thicknesses.
  - Junctions: Provide flush surface.
- Completely stripped surfaces: Prepare as for uncoated surfaces.

456 PREVIOUSLY COATED SURFACES - BURNING OFF

- Risk assessment and method statement: Prepare, and obtain approval before commencing work.
- Adjacent areas: Protect from excessive heat and falling scrapings.
- Exposed resinous areas and knots: Apply two coats of knotting.
- Removed coatings: Dispose of safely.

461 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.

471 PREPRIMED WOOD

- Areas of defective primer: Take back to bare timber.

481 UNCOATED WOOD

- General: Provide smooth, even finish with arrises and moulding edges lightly rounded or eased.
- Heads of fasteners: Countersink sufficient to hold stoppers/fillers.
- Resinous areas and knots: Apply two coats of knotting.

490 PREVIOUSLY COATED STEEL

- Defective paintwork: Remove to leave a firm edge and clean bright metal.
- Sound paintwork: Provide key for subsequent coats.
- Corrosion and loose scale: Take back to bare metal.
- Residual rust: Treat with a proprietary removal solution.
- Bare metal: Apply primer as soon as possible.
- Remaining areas: Degrease.

500 PREPRIMED STEEL

- Areas of defective primer, corrosion and loose scale: Take back to bare metal. Reprime as soon as possible.

511 GALVANIZED, SHERARDIZED AND ELECTROPLATED STEEL
- White rust: Remove.
- Pretreatment: Apply one of the following:
  - Mordant solution to blacken whole surface.
  - Etching primer recommended by coating system manufacturer.

521 UNCOATED STEEL - MANUAL CLEANING
- Oil and grease: Remove.
- Corrosion, loose scale, welding slag and spatter: Remove.
- Residual rust: Treat with a proprietary removal solution.
- Primer: Apply as soon as possible.

541 UNCOATED ALUMINIUM/ COPPER/ LEAD
- Surface corrosion: Remove and lightly key surface.
- Pretreatment: Etching primer if recommended by coating system manufacturer.

570 UNCOATED MASONRY/ RENDERING
- Loose and flaking material: Remove.

580 UNCOATED PLASTER
- Nibs, trowel marks and plaster splashes: Scrape off.
- Overtrowelled 'polished' areas: Key lightly.

590 UNCOATED PLASTERBOARD
- Depressions around fixings: Fill with stoppers/ fillers.

611 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.

622 ORGANIC GROWTHS
- Dead and loose growths and infected coatings: Scrape off and remove from site
- Treatment biocide: Apply appropriate solution to growth areas and surrounding surfaces.
- Residual effect biocide: Apply appropriate solution to inhibit re-establishment of growths.

645 SEALING INTERNAL MOVEMENT JOINTS
- General: To junctions of walls and ceilings with architraves, skirtings and other trims.
- Sealant: Water-borne acrylic.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Preparation and application: As section Z22.

651 EXISTING GUTTERS
- Dirt and debris: Remove from inside of gutters.
- Defective joints: Clean and seal with suitable jointing material.

APPLICATION

711 COATING GENERALLY

- Application standard: In accordance with BS 6150, clause 9.
- 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.

730 WORKSHOP COATING OF CONCEALED JOINERY SURFACES

- General: Apply coatings to all surfaces of components.

731 SITE COATING OF CONCEALED JOINERY SURFACES

- General: After priming, apply additional coatings to surfaces that will be concealed when fixed in place.
  - Components: Built in window frames.
  - Additional coatings: One undercoat.

M61
Intumescent coatings for fire protection of steelwork

M61 Intumescent coatings for fire protection of steelwork

To be read with Preliminaries/General conditions

PROTECTIVE COATING SYSTEMS

110 ON SITE COATING TO PRIMED STEEL INTERNALLY
- Use/ location: Exposed internal faces of columns, beams and purlins, but excluding cladding rails.
- Fire performance: To BS EN 13501-1 and -2, as clause 202.
- Preparation and priming: By steelwork contractor, as section G10.
- Intumescent coating system:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Intumescent coat:
    Type: Contractor's choice.
    Finish: Non-visible areas: Basic and Visible areas: Normal decorative.
  - Top sealer coat:
    Type: Contractor's choice.
    Colour: Manufacturer's standard.
- Bolt head/ Nut protection: As main steelwork.

120 ON SITE COATING TO EXISTING STEEL INTERNALLY
- Use/ Location: Exposed internal faces of columns, beams and purlins, but excluding cladding rails.
- Fire performance: To BS EN 13501-1 and -2, as clause 202.
- Preparation: Blast cleaning.
- Intumescent coating system:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Primer:
    Type: Contractor's choice.
  - Intumescent coat:
    Type: Contractor's choice
    Finish: Non-visible areas: Basic and Visible areas: Normal decorative.
  - Top sealer coat:
    Type: Contractor's choice.
    Colour: Manufacturer's standard.
- Bolt head/ Nut protection: As main steelwork.

PERFORMANCE AND GENERAL REQUIREMENTS

202 FIRE PERFORMANCE TO BS EN 13501-1 AND -2
- Reaction to fire BS EN 13501-1: A1.
- Fire resistance to BS EN 13501-2: REI 60.

203 FIRE PERFORMANCE TO BS 476
- Fire resistance to BS 476-21: 60 minutes.

204 EXPOSURE AND DURABILITY
- Environmental exposure: C3.
- Durability classification: W/Y.

205 VALIDATION OF MATERIALS

- Project-specific evaluation of intumescent coating materials:
  - Standard: In accordance with BS EN 16623, clause 4.
  - Test results: Submit on request.

210 WORKING PROCEDURES

- Standard: In accordance with BS EN 16623.
- Give notice: Before commencing surface preparation and coating application.
- Quality control: Record project specific procedures for surface preparation and coating application.

215 WORKING CONDITIONS

- General: Maintain manufacturer's recommeded temperature, humidity and air quality conditions during application and drying.
- Surface condition: Clean and dry at time of coating application.

270 INSPECTION

- Permit intumescent manufacturer to:
  - Inspect work in progress.
  - Inspect quality control records.
  - Take dry film thickness and other measurements.
  - Take samples of products.
- Intumescent manufacturer's inspection reports: Submit without delay.

PREPARATION OF SURFACES

320 EXISTING STEEL - BLAST CLEANING

- Preparation: Remove oil, grease and contaminants.
- Blast cleaning: Remove existing coatings and rust.
  - Atmospheric condition: Dry.
  - Abrasive: Suitable type and size, free from fines, moisture and oil.
  - Finish: To BS EN ISO 8501-1, preparation grade SA2½, with an average profile of approximately 75 micrometres.
  - Abrasive residues and moisture: Remove.
- Primer: Apply as soon as possible after cleaning and before gingering or blackening appears.

330 EXISTING STEEL - MANUAL CLEANING

- Preparation: Remove oil, grease and contaminants.
- Loose or unsound coatings: Remove to a firm edge.
- Finish: To BS EN ISO 8501-1, preparation grade St2. Leave a clean but unpolished dry surface.
- 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.

APPLICATION OF COATINGS

410 INTUMESCENT COATING DRY FILM THICKNESS (DFT)

- Applicable coatings: Primer, intumescent and top sealer coat.
- Required dft: Determine for every steel member to give specified period of fire resistance. Use intumescent coating manufacturer's current published loading tables.
  - Special sections and partial fire exposure conditions: Obtain required dft in writing from manufacturer.
- Schedule and drawings: Submit at least two weeks before starting work.
  - Schedule content: Member sizes, weights/ thicknesses, loading conditions, etc. showing, for each variant, the exposed perimeter/ sectional area (Hp/A) ratio and required dft.
  - Drawing content: Steelwork drawings marked in colour to show required dft for each member.

420 MEASUREMENT OF INTUMESCENT DFT

- Primer dft: Determine average dft (for deduction from total dft after application of intumescent).
- Intumescent dft: Determine at:
  - 500 mm centres along each coated plane of universal sections (8 planes), and rectangular hollow sections (4 planes).
  - 125 mm centres along coated circular hollow sections, spread evenly around circumference.
- Acceptance standard:
  - Average intumescent dft: Not less than required dft (exclusive of primer and top sealer).
  - 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

- Definition: Reasonably smooth and even. Orange peel, other texture, minor runs and similar minor defects are acceptable.

450 NORMAL DECORATIVE FINISH

- 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

- Definition: High standard of evenness, smoothness and gloss when viewed from a minimum distance of 2 m.

490 TOP SEALER COAT

- Application: To achieve dft recommended by manufacturer and to give an even, solid, opaque appearance, free from runs, sags and other visual defects.

COMPLETION

530 RECORDS OF INTUMESCENT APPLICATION

- On completion of intumescent work, submit:
  - Accurate surface preparation, coating and intumescent application records.
  - Fire resistance certificates.
  - Intumescent manufacturer's recommendations for maintenance and overcoating.

N
Furniture/Equipment

N10
General fixtures/ furnishings/ equipment

N10 General fixtures/ furnishings/ equipment

To be read with Preliminaries/General conditions.

PRODUCTS

110 PURPOSE MADE COUNTER TO CAFE
- Manufacturer: Contractor's choice.
- Standard: BS 8300.
- Timber: To BS EN 942.
  - Species: Douglas fir.
  - Appearance class: J2.
  - Moisture content on delivery: 9 to 13%.
- Wood-based boards: None.
- Metal: None.
  - Grade: Not applicable.
- Other materials: High-pressure laminate countertop.
- Finishes: Hard wax oil to timber.
- Adhesive: Refer to manufacturer.
- Fixings: Refer to manufacturer.
  - Fasteners: Refer to manufacturer.
- Joinery workmanship: As section Z10.
- Metalwork materials and workmanship: As section Z11.
- Other requirements: The contractor shall complete the design.

240 BLINDS TO ALL WINDOWS
- Standard: To BS EN 13120.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Type: Vertical roller.
- Dimensions: Site measure openings.
- Material: Fabric.
  - Finish/ Colour: White.
- Operation: Manual, stainless steel ball chain.
- Operating effort: Class 1.
- Testing: Not required.
- Mechanism endurance: Class 1.
- Accessories/ Other requirements: None.

300A ENTRANCE MATTING
- Manufacturer: Forbo Flooring Systems UK Ltd.
  - Web: www.forbo-flooring.co.uk.
  - Email: info.flooring.uk@forbo.com.
  - Product reference: Tuftiguard Design HD.
- Construction: Closed
- Thickness: 17 mm.
- Size: As drawing 8-025-110.
- Wiper:
  - Configuration: Double wiper
  - Colour: CL – Charcoal.
- Scraper bars: AH, non-reflective heavy duty aluminium
- Mat well frame: AMF 253.

EXECUTION

710 MOISTURE CONTENT OF WOOD AND WOOD-BASED BOARDS
- Standard: To BS EN 942.
- Moisture content on delivery: 9-13%.
- Temperature and humidity: During delivery, storage, fixing and to handover maintain conditions to suit specified moisture contents of timber components.

720 INSTALLATION GENERALLY
- General: As Preliminaries section A33.
- Fixing and fasteners: As section Z20.
- Services: As Engineering Services specification.

770 TRIMS
- Lengths: Wherever possible, unjointed between angles or ends of runs.
- Running joints: Where unavoidable, obtain approval of location and method of jointing.
- Angle joints: Mitred.

COMPLETION

910 GENERAL
- Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
- Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

920 APPLIANCES
- Test: Run for a full cycle, ensure that all functions and features work correctly.
- Documentation: Submit guarantees, instruction manuals, etc.

N11
Domestic kitchen fittings, furnishings and equipment

N11 Domestic kitchen fittings, furnishings and equipment

To be read with Preliminaries/ General conditions.

PRODUCTS

310 FITTED BASE UNITS GENERALLY
- Standard: To BS 6222-2 and -3, and BS EN 14749.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- 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: Plastics laminate.
  - Finish and colour: Brilliant white.
  - Edges: Plastics strip.
  - Other requirements: None.
- Side panels, plinths and shelves:
  - Material: Plastics laminate.
  - Finish and colour: Clear finish.
  - Edges: Plastics strip.
- Accessories: Decor panels and Legs and plinths.

320 FITTED WALL UNITS GENERALLY
- Standard: To BS 6222-2 and -3, and BS EN 14749.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposal.
- 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: Plastics laminate.
  - Finish and colour: Brilliant white.
  - Edges: Plastics strip.
  - Other requirements: None.
- Side panels and shelves:
  - Material: Plastics laminate.
  - Finish and colour: Brilliant white.
  - Edges: Plastics strip.
- Accessories:
  - Add on cornice and pelmet mouldings;
  - Decor panels; and
  - Luminaires.

340 WORKTOPS GENERALLY
- Standard: Heavy duty.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Material: Laminate covered particle board type 1.
- Dimensions: As drawing 8-025-110 and to site measure.
- Exposed edges: Laminate type 1.
- Support: Refer to manufacturer.
- Other requirements: None.

350 SINKS, TAPS, TRAPS AND WASTES TO FOOD PREPARATION AREA

- Sinks:
  - Standard: To BS EN 13310.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposal.
  - Configuration: Double sink with left hand drainer.
  - Overall size: 1000 x 600.
  - Material: Stainless steel .
    Colour and finish: Brushed steel .
- Tap/ chainstay/ overflow holes: One tap hole, centre. and Overflow hole..
- Taps: Pillar.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposal.
  - Operation: Long-arm lever handle.
  - Material: Chromed steel.
- Wastes: Plug and chain.
  - Standard: To BS EN 274-1, -2 and -3.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposal.
  - Size: DN40.
  - Material: Chromed steel.
  - Tail: Slotted.
- Traps: Tubular, P type.
  - Standard: To BS EN 274-1, -2 and -3.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposal.
  - Size: DN40.
  - Material: Plastic.
  - Depth of seal (minimum): 75 mm.
- Accessories: None.

360 APPLIANCES

- Item: Inset hob unit.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposal.
- Colour and finish: Submit proposals.
- Service connections: Mains electricity.

370 SHELVING GENERALLY

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposal.
- Shelves:
  - Material: Plastics laminate.
  - Finish and colour: Brilliant white.
- Accessories: Support brackets.

390 SEALANT

- Standard: To BS EN ISO 11600, class F20 HM.
- Type: One part silicone.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposal.
- Colour: White.

EXECUTION

610 MOISTURE CONTENT OF WOOD AND WOOD BASED BOARDS
- Control and monitoring:
  - Method statement: Submit.

620 INSTALLATION GENERALLY
- Fixings and adhesives: As section Z20.
- Services: As Engineering Services specification.

630 INSTALLING UNITS AND WORKTOPS
- General: Well fitting, stable and secure.

640 INSTALLING APPLIANCES
- Connections: Provide to electric, gas, and hot and cold water services.

650 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.

660 SEALANT BEDDING AND POINTING
- Application: As section Z22.
- Bedding: Inset hob unit and sink to top of worktop.
- Pointing: Between units and splash backs and between units and floor.

670 INSTALLING TRIMS AND MOULDINGS
- Lengths: Un-jointed between angles or ends of runs.
- Angle joints: Mitred.

COMPLETION

910 GENERAL
- Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.
- Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

920 APPLIANCE COMMISSIONING
- Appliance operation, functions and controls: Verify.
- Documentation: Submit guarantees, instruction manuals, etc

N13
Sanitary appliances and fittings

N13 Sanitary appliances and fittings

To be read with Preliminaries/ General conditions.

PRODUCTS

300A WCS AND CISTERNS
- Manufacturer: Ideal Standard (UK) Ltd.
  - Web: www.idealspec.co.uk.
  - Email: ukcustcare@idealstandard.com.
  - Product reference: E1206 - Concept Space Compact Close Coupled/Back To Wall WC Suite - Arc
- Finish: White - (01)
- Cistern: E7860 - Close Coupled Cistern.
- WC Seat: E1293 - WC Seat & Cover.

311A UNISEX ACCESSIBLE CORNER WC EQUIPMENT PACKAGES (DOCUMENT M)
- Manufacturer: Ideal Standard (UK) Ltd.
  - Web: www.idealspec.co.uk.
  - Email: ukcustcare@idealstandard.com.
  - Product reference: S6402 - Concept Freedom Ensuite Bathroom Pack with 60cm Basin & Extended Wall Hung WC

335A WASH BASINS
- Manufacturer: Ideal Standard (UK) Ltd.
  - Web: www.idealspec.co.uk.
  - Email: ukcustcare@idealstandard.com.
  - Product reference: E1345 - Concept Space Arc 55cm Washbasin - Short Projection
- Finish: Chrome - (AA).
- Pedestal: E7837 - Full Pedestal.
- Washbasin Wall Fixings: E0157 - Washbasin Fixing Clips.
- Brassware: B9915 - Concept Blue Basin Mixer.
- Trap: S8910 - Trap 1¼" Plastic Bottle.

438 MIRRORS TO ALL WC AREAS
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Material: Glass.
- Finish/ Colour: Manufacturer's standard.

446A SANITARY TOWEL DISPOSAL BINS SUPPLIED BY THE EMPLOYER

462 TOILET PAPER HOLDERS TO ALL WC AREAS
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.
- Material/ finish: Submit proposals.
- Finish/ Colour: Chrome.

472 HAND DRIERS TO ALL WC AREAS.
- Standard: To BS EN 60335-2-23.
- Type: Warm air.
- Manufacturer: As N13/472A.
  - Product reference: As N13/472A.
- Operation: Manual push button.
- Heater power rating: 2.3 kW.
- Enclosure: As N13/472A.
  - Colour: White.
- Fixing arrangement: As manufacturer's recommendation.
- Ingress protection to BS EN 60529: IPX1.
- Noise level at 1 m (maximum): Manufacturer's standard.
- Features: As N13/472A.
- Electrical supply: As N13/472A.

472A MANUAL HAND DRYER
- Manufacturer: Warner Howard Hand Dryers.
  - Web: www.warnerhoward.co.uk.
  - Email: enquiries@warnerhoward.co.uk.
  - Product reference: DA548

EXECUTION

610 INSTALLATION GENERALLY
- Assembly and fixing: Surfaces designed to falls to drain as intended.
- Fasteners: Nonferrous or stainless steel.
- Supply and discharge pipework: Fix before appliances.
- 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.
- On completion: Components and accessories working correctly with no leaks.
- Labels and stickers: Remove.

620 NOGGINGS AND BEARERS
- Noggings, bearers, etc. to support sanitary appliances and fittings: Position accurately. Fix securely.

630 TILED BACKGROUNDS OTHER THAN SPLASHBACKS
- Timing: Complete before fixing appliances.
- Fixing appliances: Do not overstress tiles.

670 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.

710 INSTALLING TAPS
- Fixing: Secure against twisting.
- Seal with appliance: Watertight.
- Positioning: Hot tap to left of cold tap as viewed by user of appliance.

720 INSTALLING WASTES AND OVERFLOWS

- Bedding: Waterproof jointing compound.
- Fixing: With resilient washer between appliance and backnut.

725 INSTALLING HAND DRIERS

- Fused connection units:
  - Type: Unswitched.
  - Engraving: With 'HAND DRIER'.
  - Location: Immediately below ceiling.
- Final connection: Concealed.
  - Containment: 25 mm PVC-U rigid conduit.

N15
Internal fire and safety signage systems

N15 Internal fire and safety signage systems

To be read with Preliminaries/ General Conditions.

GENERAL

110 FIRE AND SAFETY SIGNAGE SYSTEMS FOR ESCAPE ROUTE
- System manufacturer: Contractor's choice.
  - System reference: Submit proposals.
- Location and layout: As drawing 8-025-110.
  - Language: English.
- Material: Contractor's choice.
  - Other properties: Submit proposals.

SYSTEM PERFORMANCE

205 DESIGN OF INTERNAL SIGNAGE SYSTEMS FOR ESCAPE ROUTE
- Design: Complete detailed design and submit before commencing work.
- Content: Signs including facing information, components, inserts, accessories and fixings necessary to complete the system.
- Proposals: Submit drawings, schedules, technical information, calculations and manufacturer's literature before commencing work.

210 GENERAL REQUIREMENTS
- Signage and way guiding system design: As drawing 8-025-110.
  - For fire escape and evacuation signage: In accordance with: BS 5499-4 or BS ISO 16069.
  - For way guiding systems: In accordance with BS ISO 16069.
  - For safety signs other than escape route signage: In accordance with: BS 5499-10.
- Comply with the requirements of: Drawing 8-025-110.

220 SIGN DESIGN AND FORMAT FOR ESCAPE ROUTE
- Format: In accordance with BS EN ISO 7010.
- Geometric shapes, colours and layout: In accordance with BS ISO 3864-1.
- Design principles for graphical symbols: In accordance with BS ISO 3864-3.
- Colorimetric and photometric properties of safety sign materials: In accordance with BS ISO 3864-4.
- Water safety: In accordance with BS ISO 20712-1.

EXECUTION

610 FIXING SIGNS GENERALLY
- Installation:
- Secure, plumb and level.
- Fasteners and adhesives: As section Z20.
- Strength of fasteners: Sufficient to support live and dead loads.
- Fixings showing on surface of sign: Must not detract from the message being displayed.

COMPLETION

910 DOCUMENTATION

- Submit:
  - Manufacturer's maintenance instructions.
  - Guarantees, warranties, test certificates, record schedules and logbooks.

N17
Portable and mobile firefighting systems

N17 Portable and mobile firefighting systems

To be read with Preliminaries/ General Conditions.

SYSTEM PERFORMANCE

210 DESIGN
- Design: Complete the design of the portable firefighting system.
- Basis: To fire officer's requirements.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

220 COLOUR CODING
- Portable fire extinguishers: Colour code in accordance with BS 7863.

EXECUTION

610 INSTALLING PORTABLE FIRE EXTINGUISHERS
- Mounting height above finished floor level: Bracket fixed at 1 m.

650 INSTALLING FIRE BLANKETS
- Mounting height above finished floor level: Submit proposals.

COMPLETION

910 CLEANING
- Protective wrappings: Remove.
- Cleaning: Clean off and wipe down container finishes.

920 TESTING
- Test standard: To BS 5603-0.
- Test times: At completion.
- Notice for testing (minimum): 3 days.

930 TRAINING
- 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.
- Fire brigade: Submit contact details.

940 MAINTENANCE
- Servicing: Arrange the first annual service of the portable firefighting systems.
- Maintenance standard: To BS 5603-0.

P
Building fabric sundries

P10
Sundry insulation/ proofing work

P10 Sundry insulation/ proofing work

SUNDRY INSULATION/ PROOFING WORK

To be read with Preliminaries/ General conditions

TYPES OF INSULATION

110 EAVES ROOF VENTILATORS FOR EXISTING ROOFS
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Eaves free air space (minimum): As recommended in BRE Report 262.

140A INSULATION FITTED AT RAFTER LEVEL
- Manufacturer: Kingspan Insulation.
  - Web: www.kingspaninsulation.co.uk.
  - Email: info@kingspaninsulation.co.uk.
  - Product reference: Kingspan Kooltherm K7 Pitched Roof Board
- Insulation thickness: 120mm total.

320 BREATHER MEMBRANE
- Manufacturer: As P10/320A.
  - Product reference: As P10/320A.
- Installation requirements:
  - Setting out: Joints minimized. Membrane to form a continuous barrier to prevent water, snow and wind blown dust reaching the substrate.
  - Method of fixing: Refer to manufacturer.
  - Joints: Lapped 100 mm minimum horizontally and 150 mm minimum vertically.
  - Openings: Membrane fixed to reveals.
  - Bottom edges: Membrane lapped over flashings, sills, etc. to allow free drainage to the exterior.
- Penetrations: Sealed.

320A BREATHER MEMBRANE
- Manufacturer: Kingspan Insulation.
  - Web: www.kingspaninsulation.co.uk.
  - Email: info@kingspaninsulation.co.uk.
  - Product reference: Kingspan nilvent

P21
Door/ window ironmongery

P21 Door/ window ironmongery

To be read with Preliminaries/ General conditions.

PRE-TENDER

10 QUANTITIES AND LOCATIONS
- Quantities and locations of ironmongery are scheduled by the contractor .
- Fixing: As sections L10 and L20.

GENERAL

120 IRONMONGERY RANGE SELECTED BY CONTRACTOR
- Source: Single coordinated range.
- Notification: Submit details of selected range, manufacturer and/ or supplier.
- Principal material/ finish: Satin stainless steel, grade 1.4401 (316).
- Items unavailable within selected range: Submit proposals.

140 SAMPLES
- General: Before placing orders with suppliers submit labelled samples of the following: Pull handle, lever handle, and lock .
  - Conformity: Retain samples on site for the duration of the Contract. Ensure conformity of ironmongery as delivered with labelled samples.

170 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 evidence of successful testing by UKAS accredited laboratory .
- Melting point of components (except decorative non functional parts): 800°C minimum.

180 STRENGTH CLASS OR CATEGORY OF DUTY FOR DOOR IRONMONGERY
- Requirement: To BS EN 1192, Class 3.
- 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.

P31
Holes, chases, covers and supports for services

P31 Holes, chases, covers and supports for services

To be read with Preliminaries/General conditions.

EXECUTION

620 HOLES, RECESSES AND CHASES IN IN SITU CONCRETE

- Cast in: Holes larger than 10 mm diameter, recesses and chases.
- Cutting and drilling:
  - Permitted for holes not larger than 10 mm diameter.
  - Not permitted for holes larger than 10 mm diameter except as indicated on drawings.

640 HOLES IN STRUCTURAL STEELWORK

- Cutting and drilling: Not permitted except as indicated on drawings.

650 HOLES, RECESSES AND CHASES IN MASONRY

- Locations: To maintain integrity of strength, stability and sound resistance of construction.
- Sizes: Minimum needed to accommodate services.
  - Holes (maximum): 300 mm².
- Walls of hollow or cellular blocks: Do not chase.
- Walls of other materials:
  - Vertical chases: No deeper than one third of single leaf thickness, excluding finishes.
  - Horizontal or raking chases: No longer than 1 m. No deeper than one sixth of the single leaf thickness, excluding finishes.
- Chases and recesses: Do not set back to back. Offset by a clear distance at least equal to the wall thickness.
- Cutting: Do not cut until mortar is fully set. Cut carefully and neatly. Avoid spalling, cracking and other damage to surrounding structure.

670 NOTCHES AND HOLES IN STRUCTURAL TIMBER

- General: Avoid if possible.
- Sizes: Minimum needed to accommodate services.
- Position: Do not locate near knots or other defects.
- Notches and holes in the same joist: Minimum 100 mm apart horizontally.
- Notches in joists:
  - Position: Locate at top. Form by sawing down to a drilled hole.
  - Depth (maximum): 0.15 x joist depth.
  - Distance from supports: Between 0.1 and 0.2 x span.
- Holes in joists:
  - Position: Locate on neutral axis.
  - Diameter (maximum): 0.25 x joist depth.
  - Centres (minimum): 3 x diameter of largest hole.
  - Distance from supports: Between 0.25 and 0.4 of span.
- Notches in roof rafters, struts and truss members: Not permitted.
- Holes in struts and columns: Locate on neutral axis.
  - Diameter (maximum): 0.25 x minimum width of member.
  - Centres (minimum): 3 x diameter of largest hole.
  - Distance from ends: Between 0.25 and 0.4 of span.

690 INSTALLING PIPE SLEEVES

- Sleeves: Fit to pipes passing through building fabric.
- Material: Match pipeline.
- Size: One or two sizes larger than pipe to allow clearance.
- Finish: Install sleeves flush with building finish. In areas where floors are washed down, install protruding 100 mm above floor finish.
- Masking plates: Fit at visible penetrations, including through false ceilings of occupied rooms.

R
Disposal systems

R10
Rainwater drainage systems

R10 Rainwater drainage systems

To be read with Preliminaries/ General conditions.

SYSTEM PERFORMANCE

210 DESIGN
- Design: Complete the design of the rainwater drainage system.
- Standard:
  - To BS EN 12056-3, clauses 3–7, Annex A and National Annexes.
  - To BS EN 12056-5, clauses 3, 4, 6 and 11.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

221 COLLECTION AND DISTRIBUTION OF RAINWATER
- General: Complete, and without leakage or noise nuisance.

230 DESIGN PARAMETERS - GENERAL
- Roof and gutter construction and finish: pitched roofs with eaves gutters to part single, part two storey building.
- Design rate of rainfall: As BS EN 12056-3, National Annex NB.2.
  - Category: 1.
- Design life of building: 30 years.
- Available capacity of existing below ground drainage (maximum): All below ground drainage shall be replaced to the Structural Engineer's detail.

EXECUTION

600 PREPARATION
- Work to be completed before commencing work specified in this section:
  - Below ground drainage. Alternatively, make temporary arrangements for dispersal of rainwater without damage or disfigurement of the building fabric and surroundings.
  - Painting of surfaces which will be concealed or inaccessible.

605 INSTALLATION GENERALLY
- Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
- Plastics and galvanized steel pipes: Do not bend.
- Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
- Protection:
  - Fit purpose made temporary caps to prevent ingress of debris.
  - Fit access covers, cleaning eyes and blanking plates as the work proceeds.

610 FIXING AND JOINTING GUTTERS
- Joints: Watertight .
- Brackets: Securely fixed.
  - Fixings: Screwed into softwood fascia board .
    Fixing centres: 450 mm .
  - Additional brackets: Where necessary to maintain support and stability, provide at joints in gutters and near angles and outlets.
- Roofing underlay: Dressed into gutter.

615 SETTING OUT EAVES GUTTERS - TO FALLS

- 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.
- Outlets: Align with connections to below ground drainage.

635 FIXING PIPEWORK

- Pipework: Fix securely, plumb and/ or true to line.
- Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
- Externally socketed pipes and fittings: Fix with sockets facing upstream.
- Additional supports: Provide as necessary to support junctions and changes in direction.
- Vertical pipes:
  - Provide a loadbearing support at least at every storey level.
  - Tighten fixings as work proceeds so that every storey is self supporting.
  - Wedge joints in unsealed metal pipes to prevent rattling.
- Wall and floor penetrations: Isolate pipework from structure.
  - Pipe sleeves: As section P31.
  - Masking plates: Fix at penetrations if visible in the finished work.
- Expansion joint pipe sockets: Fix rigidly to buildings. Elsewhere, provide brackets and fixings that allow pipes to slide.

640 FIXING VERTICAL PIPEWORK

- Bracket fixings: Plugged and screwed into masonry.
- Distance between bracket fixing centres (maximum): 1200 mm.

650 JOINTING PIPEWORK AND GUTTERS

- General: Joint with materials and fittings that will make effective and durable connections.
- Jointing differing pipework and gutter systems: Use adaptors intended for the purpose.
- Cut ends of pipes and gutters: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
- Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
- Junctions: Form with fittings intended for the purpose.
- Jointing material: Strike off flush. Do not allow it to project into bore of pipes and fittings.
- Surplus flux, solvent jointing materials and cement: Remove.

690 ELECTRICAL CONTINUITY - PIPEWORK

- Joints in metal pipes with flexible couplings: Clips (or suitable standard pipe couplings) supplied for earth bonding by pipework manufacturer to ensure electrical continuity.

COMPLETION

910 GUTTER TEST

- Preparation: Temporarily block all outlets.
- Testing: Fill gutters to overflow level and after 5 minutes closely inspect for leakage.

R11
Above ground foul drainage systems

R11 Above ground foul drainage systems

To be read with Preliminaries/ General conditions.

GENERAL

115 ABOVE GROUND FOUL DRAINAGE SYSTEM
- Sanitary and floor drainage outlets: As drawing 8025-110.
- Waste pipework: Submit proposals.
- Discharge stack and branch pipework: Cast iron - flexible couplings.
- Separate ventilating pipework: None required.
- Accessories: Grease traps and converters.
- Disposal: To below ground drainage.

SYSTEM PERFORMANCE

210 DESIGN
- 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.

220 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.

EXECUTION

601 INSTALLATION GENERALLY
- Standard: To BS EN 12056-5.
- Components: From the same manufacturer for each type of pipework.
- Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
- Plastics and galvanized steel pipes: Do not bend.
- Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
- Concealed or inaccessible surfaces: Decorate before starting work specified in this section.
- Protection:
  - Purpose made temporary caps: Fit to prevent ingress of debris.
  - Access covers, cleaning eyes and blanking plates: Fit as the work proceeds.

605 PIPE ROUTES
- General: The shortest practical, with as few bends as possible.
  - Bends in wet portion of soil stacks: Not permitted.
  - Routes not shown on drawings: Submit proposals before commencing work.

610 FIXING PIPEWORK

- Pipework: Fix securely plumb and/ or true to line. Fix discharge stack pipes at or close below socket collar or coupling.
- Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
- Externally socketed pipes and fittings: Fix with sockets facing upstream.
- Additional supports: Provide as necessary to support junctions and changes in direction.
- 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.
- Wall and floor penetrations: Isolate pipework from structure, e.g. with pipe sleeves.
  - Masking plates: Fix at penetrations if visible in the finished work.
- Expansion joint sockets: Fix rigidly to the building.
- Fixings: Allow the pipe to slide.

615 FIXING VERTICAL PIPEWORK - CAST IRON, FLEXIBLE COUPLINGS

- Bracket fixings: Bolted into masonry.
- Distance between bracket fixing centres (maximum): 1200 mm.

630 JOINTING PIPEWORK - GENERALLY

- General: Joint with materials, fittings and techniques that will make effective and durable connections.
- Jointing differing pipework systems: With adaptors intended for the purpose.
- Cut ends of pipes: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
- Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
- Junctions: Form with fittings intended for the purpose.
- Jointing material: Do not allow it to project into bore of pipes and fittings.
- Surplus flux, solvent jointing materials and cement: Remove from joints.

680 ELECTRICAL CONTINUITY

- 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

- Markings: To BS 1710.
  - Type: Black, with arrows to indicate direction of flow.
  - Wording: White lettering 'FOUL DRAINAGE' on a black background.
- Type: Integral lettering on pipe wall, self-adhesive bands or identification clips.
- Locations: At 500 mm centres, junctions and both sides of slabs, valves, appliances, bulkheads and wall penetrations.

695 DISCHARGE AND VENTILATING STACKS

- Terminations: Perforated cover or cage that does not restrict airflow.
  - Material: Metal.

700 INSTALLING AIR ADMITTANCE VALVES

- Position: Vertical, above flood level of highest appliance served and clear of insulation materials (other than the manufacturer's insulating cover).
- Connection to discharge stack: Allow removal for rodding, e.g. ring seal.
- Roof spaces and other unheated locations: Fit manufacturer's insulating cover.

COMPLETION

905 PIPEWORK AIRTIGHTNESS TEST

- Preparation:
  - Open ends of pipework: Temporarily seal using plugs.
  - Test apparatus: Connect a 'U' tube water gauge and air pump to pipework via a plug or through trap of an appliance.
- Testing: Pump air into pipework until gauge registers 38 mm.
- Required performance: Pressure of 38 mm is to be maintained without loss for at least three minutes.

915 PREHANDOVER CHECKS

- Temporary caps: Remove.
- Permanent blanking caps, access covers, rodding eyes, floor gratings and the like: Secure complete with fixings.

920 SUBMITTALS

- Manufacturer's instructions for grease traps: Handover at completion.

S
Piped supply systems

S90
Hot and cold water supply systems - domestic

S90 Hot and cold water supply systems - domestic

To be read with Preliminaries/ General conditions.

GENERAL

130 INSTANTANEOUS HOT WATER SUPPLY GENERALLY

- Position of water heater: As drawing 8-025-110.
- Instantaneous water heater: Combination boiler, as section T90.
- Outlets: Submit design and cost proposals.
- Capacity: Submit design and cost proposals.
- Control: Submit design and cost proposals.
- Pipelines: Submit design and cost proposals.
  - Accessories: Submit design and cost proposals.
- Valves: Submit design and cost proposals.
- Insulation: Submit design and cost proposals.
- Sanitary appliances:
  - Sinks, as section N13;
  - Wash basins, as section N13; and
  - Submit design and cost proposals.
- Accessories: Submit design and cost proposals.
- Completion:
  - Flushing and filling;
  - System disinfection;
  - Testing;
  - Commissioning;
  - Testing service pipelines;
  - Documentation;
  - Operating tools;
  - Labels; and
  - Submit design and cost proposals.

SYSTEM PERFORMANCE

210 DESIGN OF DIRECT HOT WATER SUPPLY

- Design: Complete the design of the hot and cold water supply system.
- Standard: To BS EN 806-2, BS 8558 and in accordance with HSE publication 'The control of legionella bacteria in water systems. Approved code of practice and guidance'.
- Proposals: Submit drawings (showing equipment positions and pipeline routes), technical information, calculations and manufacturers' literature.

230 INSTANTANEOUS HOT WATER SUPPLY

- Type: Gas fired.
- Water supply: Mains.

250 PIPELINE SIZES

- Sizing: Calculate sizes to meet simultaneous demand for the building in accordance with BS 8558 or BS EN 806-3. Submit proposals.
- Performance:
  - Water velocity (maximum): 1.3 m/s for hot water and 2.0 m/s for cold water.
  - Filling time (maximum) for cold water storage cistern: one hour.

270 COMBUSTION AIR SUPPLY TO GAS APPLIANCES
- Size: Submit proposals.
- Location: Submit proposals.

PRODUCTS

310 DEZINCIFICATION
- Fittings, pipelines, equipment located below ground or in concealed or inaccessible locations: Resistant to dezincification, e.g. gunmetal.

510 COPPER PIPELINES FOR GENERAL USE
- Standard: To BS EN 1057, Kitemark certified.
- Temper: Half hard R250.
- Finish: Plain.
  - 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.
- Connections to appliances and equipment: Select from:
  - Compression fittings: To BS EN 1254-2, Kitemark certified.
  - Fittings with threaded ends: To BS EN 1254-4.
- Supports: Compatible with pipe material.

620 VALVES GENERALLY
- Types: Approved for the purpose by local water supply undertaker and of appropriate pressure and/ or temperature ratings.
- Control of valves: Fit with handwheels for isolation and lockshields for isolation and regulation of circuits or equipment.

EXECUTION

710 STRIPPING OUT
- Extent of stripping out: Complete installation.

715 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.

718 INSTALLING WATER METERS
- Standard: To BS EN ISO 4064-5.

720 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.

725 INSTALLING WARNING/ OVERFLOW PIPES TO CISTERNS

- Difference (minimum) between normal water level and overflow level:
  - Cold water storage cisterns: The greater of 32 mm or the bore of warning pipe.
  - Feed and expansion cisterns: Sufficient to allow 20% increase in the volume of water in the tank, plus 25 mm.
- Vertical distance (minimum) of water supply inlet above overflow level: Bore of warning pipe.
- Fall (minimum): 1 in 10.
- Installation: Support to prevent sagging. Terminate pipes separately in prominent positions with turned down ends. Turn down within the cistern. Terminate 50 mm below normal water level.
- Insulation: Insulate within the building where the pipe is in an uninsulated space and subject to freezing.

727 INSTALLING VENT PIPES OVER CISTERNS

- Route: Install with no restrictions or valves and rising continuously from system connection to discharge over cistern.
- Internal diameter (minimum): 20 mm.

750 INSTALLING GAS FIRED INSTANTANEOUS WATER HEATERS

- Label: In accordance with BS 5546.

770 INSTALLING FLUE PIPES

- Joints and bends: Minimize number.
- Slope: Not more than 30° from the vertical.
- Joints: Install with sockets uppermost, fully supported and fixed securely with brackets supplied for the purpose. Do not locate joints within the depth of floors.
  - Seals: Seal joints in accordance with manufacturer's installation instructions, to provide a gas-tight installation.
- Expansion and contraction: Accommodate thermal movement.
- Fire safety: Locate a safe distance from combustible materials.
- Roof junction: Weatherproof. Fit terminal and flashings, collars, and the like.

780 BALANCED FLUE TERMINALS

- Opening in external wall: Submit proposals.
- Flue guard: Submit proposals.

790 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.

800 PIPELINES FIXING

- Fixing: Secure and neat.
- Joints, bends and offsets: Minimize.
- Pipeline support: Prevent strain, e.g. from the operation of taps or valves.
- Drains and vents: Fix pipelines to falls. Fit draining taps at low points and vents at high points.
- Thermal expansion and contraction: Allow for thermal movement of pipelines. Isolate from structure. Prevent noise or abrasion of pipelines caused by movement. Sleeve pipelines passing through walls, floors or other building elements.
- Dirt, insects or rodents: Prevent ingress.

810 SUPPORTS FOR COPPER AND STAINLESS STEEL PIPELINES

- Spacing: Fix securely and true to line at the following maximum centres:
  - 15 and 22 mm pipe OD: 1200 mm horizontal, 1800 mm vertical.
  - 28 and 35 mm pipe OD: 1800 mm horizontal, 2400 mm vertical.
  - 42 and 54 mm pipe OD: 2400 mm horizontal, 3000 mm vertical.
- Additional supports: Locate within 150 mm of connections, junctions and changes of direction.

830 PIPELINE SPACING

- Clearance (minimum) to face of wall-fixed pipes or pipe insulation:
  - From floor: 150 mm.
  - From ceiling: 50 mm.
  - From wall: 15 mm.
  - Between pipes: 25 mm.
  - From electrical conduit, cables, etc: 150 mm.

840 JOINTS IN COPPER AND STAINLESS STEEL 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.

850 PIPELINES ENTERING BUILDINGS

- Depth: Lay pipes at least 750 mm and no more than 1350 mm below finished ground level.
- Pipelines rising into building within 750 mm of the external face of the external wall or passing through a ventilated void below floor level: Insulate from finished floor level to 600 mm beyond external face of building.
- Ends of pipeducts: Seal both ends to a depth of at least 150 mm.

855 EXTERNAL SUPPLY PIPELINES

- Requirement: Insulate pipelines exposed to air less than 750 mm below finished ground level or more than 1350 mm below finished ground level.

860 INSTALLING INSULATION TO PIPELINES

- Standard: In accordance with BS 5970.
- Cold water pipelines: Insulate in unheated spaces. Insulate potable cold water pipelines.
- Hot water pipelines: Insulate, except for short lengths in prominent positions next to appliances.
- Appearance: Fix securely and neatly. Make continuous over fittings and at supports. Leave no gaps. Locate split on 'blind' side of pipeline.
- Timing: Fit insulation after testing.

865 INSTALLING INSULATION TO CISTERNS

- Standard: In accordance with BS 5970.
- General: Fix securely to sides and top of cisterns. Leave no gaps.
- Access cover: Allow removal of cover with minimum disturbance to insulation.
- Underside of cistern: Insulate where exposed in unheated spaces.

870 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.

COMPLETION

910 FLUSHING AND FILLING

- Standard: To BS EN 806-4.

920 SYSTEM DISINFECTION

- Disinfection: To BS EN 806-4.

930 TESTING

- Standard: To BS EN 806-4.
  - Notice (minimum): 3 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 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.

940 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.

950 TESTING SERVICE PIPELINES

- Test method: Disconnect from the mains, fill with potable water, exclude air, and apply at least twice the working pressure for 1 h.
- Test criterion: No leakage.

960 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.

970 OPERATING TOOLS

- Tools: Supply tools for operation, maintenance and cleaning purposes.
- Valve keys: Supply keys for valves and vents.

980 LABELS

- Valve labels: Provide labels on isolating and regulating valves on primary circuits, stating their function.

S91
Natural gas supply systems - domestic

S91 Natural gas supply systems - domestic

To be read with Preliminaries/ General conditions.

GENERAL

110 INCOMING GAS SUPPLY
- Supplier: Refer to Employer.
- Volume flow rate: Submit proposals.
- Position of meter: Submit proposals.

SYSTEM PERFORMANCE

210 DESIGN
- Design: Complete the design of the gas supply system.
- Standard: To BS 6891.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

220 PIPELINE SIZES
- Sizing: Calculate sizes of gas pipes for the equipment proposed.
- Equipment gas consumption: In accordance with Chartered Institute of Plumbing and Heating Engineers Design Guide.

PRODUCTS

310 SAFETY AND CONTROL DEVICES
- Standard: To BS EN 13611.

330 DOMESTIC LOW PRESSURE GAS SUPPLY PIPELINES GENERALLY
- Standard: To BS 6891.
- Materials: Copper .
- Fittings: Copper compression and capillary .

340 GAS PLUG COCKS
- Standard: To BS 1552.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.

350 GAS BALL VALVES
- Standard: To BS EN 331.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.

EXECUTION

610 INSTALLATION GENERALLY
- Domestic gas pipelines: To BS 6891.
- Secondary gas meters: To BS 6400.

COMPLETION

910 TESTING, COMMISSIONING AND PURGING GAS PIPELINES

- Standard: To BS 6891.

920 DOCUMENTATION

- Manufacturers' operating and maintenance instructions: Submit for equipment and controls.
- Record drawings: Submit drawings showing the location of circuits and operating controls.

930 OPERATING TOOLS

- Tools: Supply tools for operation, maintenance and cleaning purposes.
- Valve keys: Supply keys for valves, vents and meter housing.
  - Quantity: One for each type of valve, vent and meter housing.

S92
Sprinkler systems - domestic

S92 Sprinkler systems - domestic

To be read with Preliminaries/ General conditions.

GENERAL

SYSTEM PERFORMANCE

210 DESIGN AND DETAILING
- Design and detailing: In accordance with BS 9251.
- Design: Complete the design and detailing of the sprinkler system.
- System designer: Loss Prevention Standard 1301 registered.
- Reliability: Ensure reliability and continuity of water supplies.
- Submittals: Submit drawings showing equipment positions and pipeline routes.

220 EXTENT OF SPRINKLER PROTECTION
- Areas to be protected: Rooms G.003, 1..1 and main staircase.

230 PIPELINES SIZES
- Sizing: Calculate sizes in accordance with BS 9251.
- Method: Hydraulic calculation.
- Proposals: Submit.

240 INTEGRATION WITH FIRE ALARM SYSTEMS
- Link from sprinkler system to fire alarm system:
  - Standard: In accordance with BS 9251.
  - Objectives: To initiate a fire alarm signal.
- Link from fire alarm system to sprinkler system:
  - Standard: In accordance with BS 5839-1.
  - Objectives: Protection of life and property.

260 CABLE SELECTION
- Standard: To BS 8519.
- For sprinkler pumps: Category 3.

PRODUCTS

310 WATER SUPPLY
- System components: In accordance with BS 9251.
- Water quality: Free from suspended fibrous or other matter which may accumulate in the system pipework.
- Isolating valves on ring main: Interlocking key type.
- Connections supplying water for other services: Where the water supply is used by other services, it must be capable of providing recommended flow rates.

EXECUTION

615 INSTALLING RESIDENTIAL AND DOMESTIC SPRINKLER SYSTEMS
- Standard: In accordance with BS 9251.
- Sprinkler installer: Loss Prevention Standard 1301 approved.
- Sprinkler heads: To specialist design.

620 INSTALLING PIPELINES

- Appearance: Install pipes straight, and parallel or perpendicular to walls, floors, ceilings, and other building elements.
- Finish: Smooth, consistent bore, clean, free from defects, e.g. external scratching, toolmarks, distortion, wrinkling and cracks.
- Access: Locate runs to facilitate installation of equipment and accessories and to allow access for maintenance. Do not embed in concrete floors or ceilings.
- Electrical equipment: Install pipelines clear of electrical equipment. Do not run pipelines through electrical enclosures or above switchgear distribution boards or the like.

630 FIXING PIPELINES

- Fixing: Secure and neat.
- Joints, bends and offsets: Minimize.
- Welding: Restrict to pipes of diameter greater than 50 mm.
- Pipeline support: Prevent strain, e.g. from valve operation.
- Drains: Fix pipelines to falls. Fit draining taps at low points.
- Thermal expansion and contraction: Allow for thermal movement of pipelines. Isolate from structure. Prevent noise or abrasion of pipelines caused by movement. Sleeve pipelines passing through walls, floors and other building elements.
- Dirt, insects and rodents: Prevent ingress.
- Changes in direction: Provide standard bends. Do not use elbows.

640 INSTALLING PUMPS

- Power supply for two electrically driven pumps providing a superior supply: Both driven from the same supply with an automatic changeover to a completely independent supply in the event of failure of the first supply.

650 INSTALLING SPRINKLER HEADS

- Orientation: Install upright or pendant, with deflector parallel to slope of roof, ceiling or pitch line of stairs.
- Coverage, location and spacing: In accordance with BS 9251.
- Corrosion protection: Not required.

660 INSTALLING ALARM DEVICES

- Standard: In accordance with BS 9251.

670 INSTALLING ALARM PANELS

- Location: At main control valve sets.
- Gong and water motor: Install water motor with its gong on the outside of an external wall.
  - Position of gong: Centre line not higher than 6 m above the point of connection to the alarm valve.

690 IDENTIFICATION AND LABELS

- Standards: To BS 1710, BS ISO 3864-1 and in accordance with BS 9251.
- Location plate: Locate on external wall as close as practical to the entrance nearest the installation main control valve set.
- Signs for stop valves: Provide to main and subsidiary stop valves.
- Main installation control valves: Label where system comprises more than one installation.
- Water motor alarm gong: Label at each gong.
- Water supply connections to other services: Label at stop valves feeding other services from sprinkler supply system.
- Suction and booster pumps: State output, pressure, speed, flow rate and maximum power absorbed.
- Electric switches and control panels: Identify.
- Sprinklers: Mark orifice size on sprinkler body or deflector.

COMPLETION

810 FLUSHING

- Operation: Fill the system with water and discharge it via the flushing valves. Flush out debris.

820 TESTING

- Standard: In accordance with BS 9251.
- Notice (minimum): 3 days.

830 SETTING TO WORK

- Water supplies and sprinkler system: Test in accordance with BS 9251.

840 DOCUMENTATION

- Standard: In accordance with BS 9251.
- Certificate of conformity: Submit.
- Test records: Submit a record of inspections and tests.
- Operation and maintenance instructions: Submit for the system giving optimum settings for controls. Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
- Record drawings: In accordance with BS 9251, section 6. Submit drawings showing location of pipe runs, sprinklers and valves.

T
Mechanical heating/Cooling/Refrigeration systems

T90
Heating systems - domestic

T90 Heating systems - domestic

To be read with Preliminaries/ General conditions.

GENERAL

SYSTEM PERFORMANCE

210 DESIGN HEATING SYSTEM
- Design: Complete the design and detailing of the heating system.
- Proposals: Submit drawings (showing equipment positions and pipeline routes), technical information, calculations and manufacturer's literature.

220 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:
  - Living rooms: Temperature: 21°C, for 1.5 air changes per hour.
  - Dining rooms: Temperature: 21°C, for 1.5 air changes per hour.
  - Bedsitting rooms: Temperature: 21°C, for 1.5 air changes per hour.
  - Bedrooms: Temperature: 18°C, for 1 air changes per hour.
  - Halls and landings: Temperature: 18°C, for 1.5 air changes per hour.
  - Kitchens: Temperature: 18°C, for 2 air changes per hour.
  - Bathrooms: Temperature: 22°C, for 2 air changes per hour.
  - Toilets: Temperature: 18°C, for 2 air changes per hour.
- Submittals: Submit heat loss calculations for each room using BS EN 12831-1

225 THERMAL INSULATION OF BUILDING FABRIC
- Heat loss calculations: Base on the following maximum U-values:
  - Floors: 0.22W/(m²K).
  - Walls: 0.28W/(m²K).
  - Windows: 2.0W/(m²K).
  - Roofs: 0.18W/(m²K).

226 THERMAL INSULATION OF BUILDING FABRIC
- Heat loss calculations: Base on U-values calculated from the fabric described elsewhere.
- Submittals: Submit U-value calculations.

250 SYSTEM CONTROL
- Temperature and time control: Fully automatic and independent.
- Controls: Compatible with each other and with central heating boiler.

455 FAN CONVECTOR HEATERS AIR CURTAIN OVER DOOR
- Standards: To BS EN 16430-1 and BS EN 16430-2.
- Type: Wall mounted unit.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Output: Submit proposals.
- Volume flow rate: Submit proposals.
- Fan speed: Submit proposals.
- Sizes: Submit proposals.
- Casing finish: Submit proposals.
- Features: Integral thermostat.

465 RADIATORS GENERALLY
- Standard: To BS EN 442-1 and -2.
- Type: Double column convector.
- Manufacturer: Stelrad, Myson, or similar approved.
  - Product reference: Submit proposals.
- Output: Submit proposals.
- Sizes: Submit proposals.
- Connections: 15 mm BOE.
- Material: Steel.
- Finish: White stove enamelled.

480 PROGRAMMERS FOR HEATING & HOT WATER
- Standards: To BS EN 60730-1, -2-7, -2-10, -2-14 and BS EN 61058-1, -2-5. BEAB approved.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Features: Digital display, 7-day, 24-hour, three on/ off switchings each day.

485 THERMOSTATS FOR HEATING
- Standards: To BS EN 60730-1, -2-7, -2-8, -2-9, -2-14 and BS EN 61058-1, -2-5. BEAB approved.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.

490 TIMERS FOR HEATING
- Standards: To BS EN 60730-1, -2-7, -2-10, -2-14 and BS EN 61058-1, -2-5. BEAB approved.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Features: Submit proposals.

EXECUTION

610 INSTALLATION GENERALLY
- Standard: To BS EN 14336.
- 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, use corrosion resistant fittings/ fixings and avoid contact between dissimilar metals by use of suitable washers, gaskets, etc.

620 INSTALLATION OF FEED AND EXPANSION CISTERNS
- Outlet positions: Connect lowest outlets at least 30 mm above bottom of cistern.
- Water level (minimum): 25 mm below the overflow level of the warning pipe.
- 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.
- Mounting height above the highest point of the circulation system (minimum): 1 m.
- Location: Provide sufficient space for cleaning and maintenance, with enough clearance above the cistern to service the valve and accommodate the expansion pipe.
- Plinth: Firm, level and continuous.
- Jointing pipes to thermoplastics cisterns: To BS EN 806-4.
- Insulation: Where the space below the cistern is heated do not insulate the underside.

630 PIPELINE 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.

640 PIPELINE FIXING

- Fixing: Secure and neat.
- Joints, bends and offsets: Minimize.
- Pipeline support: Prevent strain, e.g. from the operation of taps or valves.
- Drains and vents: Fix pipelines to falls. Fit draining taps at low points and vents at high points.
- Thermal expansion and contraction: Allow for thermal movement of pipelines. Isolate from structure. Prevent noise or abrasion of pipelines caused by movement. Sleeve pipelines passing through walls, floors or other building elements.
- Dirt, insects or rodents: Prevent ingress.

650 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.

660 JOINTS IN THERMOPLASTICS PIPELINES

- Fittings and accessories for joints: Purpose designed.
- Preparation: Cut pipes square. Remove burrs.
- Joints: Neat, clean and fully sealed. Install pipe ends into joint fittings to full depth.
- Compression fittings: Do not overtighten.

695 INSTALLATION OF FLUES AND CHIMNEYS GENERALLY

- Standards: To BS EN 15287-1 or BS EN 15287-2.
- Joints and bends: Minimize number.
- Slope (maximum): 30° from the vertical.
- Joints: Install with sockets uppermost, fully supported and fixed securely with brackets supplied for the purpose. Do not locate joints within the depth of floors.
- Sealing of joints: To provide a gas-tight installation.
- Expansion and contraction: Accommodate thermal movement.
- Fire safety: Locate a safe distance from combustible materials.
- Roof junction: Weatherproof. Fit terminal and flashings, collars, and the like.

COMPLETION

810 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.

820 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.

830 TESTING GAS PIPELINES

- Testing and purging: To BS 6891.

840 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.

850 LABELS

- Valve labels: Provide labels on isolating and regulating valves on primary circuits, stating their function.

U
Ventilation/Air conditioning systems

U90
General ventilation - domestic

U90 General ventilation - domestic

To be read with Preliminaries/ General conditions.

SYSTEM PERFORMANCE

210 DESIGN LOCAL EXTRACT FAN VENTILATION
- Design: Complete the design of the ventilation system.
- Ventilation rate: Refer to drawings.
- Proposals: Submit drawings (showing equipment positions and ductwork routes), technical information, calculations and manufacturers' literature.

PRODUCTS

370 RANGE HOODS TO KITCHEN
- Standard: To BS EN 60335-2-31, and BEAB approved.
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals .
- Colour: Submit proposals .
- Finish: Submit proposals .
- Accessories: Submit proposals .

400 CEILING SWEEP FANS TO EXTENSION
- Standard: To BS EN 60335-2-80, and BEAB approved.
- Manufacturer and reference: Submit proposals.
  - Product reference: Submit proposals.
- Diameter: Submit proposals.
- Controls: Submit proposals.
- Colour: Submit proposals.
- Finish: Submit proposals.

413 VENTILATION FAN UNITS GENERALLY
- Standard: To BS EN 60335-2-80, and BEAB approved.
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.
- Performance: Submit proposals.
- Mounting: Wall.
- Controls: Integral humidity sensor and Linked to light switch.
- Accessories: Submit proposals.

525 ROOF SLOPE EXHAUST TERMINALS TO EXTENSION
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Accessories: Submit proposals.

EXECUTION

630 INSTALLING CEILING SWEEP FANS
- Fixing: As manufacturer's recommendations, note profiled ceiling.

650 INSTALLING VENTILATION FANS
- Mounting: Wall mounted with through wall telescopic duct for 127 mm diameter core drill and external grille.

660 FLEXIBLE DUCTWORK

- Installation: Fully extend without overstretching.
- Support: Form smooth flowing curves without kinking, sagging or slumping.

670 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.

690 SITE APPLIED INSULATION

- Location: Fit insulation to ductwork in unheated spaces.
- Installation: Fix securely. Leave no gaps. Make continuous.

COMPLETION

920 OPERATION AND MAINTENANCE

- Operating and maintenance instructions: Submit copies of manufacturers' operating and maintenance instructions for equipment and controls.
- Tools: Supply tools for operation, maintenance and cleaning purposes, including keys for valves and vents.

V
Electrical supply/power/lighting systems

V90
Electrical systems - domestic

V90 Electrical systems - domestic

To be read with Preliminaries/General conditions.

SYSTEM PERFORMANCE

210 DESIGN OF LOW VOLTAGE ELECTRICAL INSTALLATION GENERALLY
- Design and detailing: Complete for the electrical installation.
- Standards: In accordance with BS 7671 and the requirements of the Electricity Distributor.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

230 LV DISTRIBUTION SYSTEM DESIGN
- Design: To cater for the complete working building.
- Spare capacity of distribution equipment: 20% of total DB ways free.
- Equipment: Provide electrical supplies to equipment requiring power.

240 DESIGN OF GENERAL LIGHTING SYSTEM
- Purpose: To illuminate the property for commercial use.
- Design and detailing: Complete for the general lighting system.
- Standard: To SLL 'Code for lighting'.
- Room: Generally.
  - Maintained average illuminance: minimum 300 lux.
  - Glare index: 22.
  - Controls: As drawing 8-025-110, submit proposals for additional energy saving controls.
- Maintenance: Submit proposals for the maintenance/ relamping regime.

250 DESIGN OF EMERGENCY LIGHTING SYSTEM
- Purpose: Illumination of escape routes, signs and points of emphasis to assist occupants to evacuate the premises.
- Design and detailing: Complete for the emergency lighting system.
- Standards:
  - 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.
- System classification: Submit design and cost proposals.
- Method of testing: Submit design and cost proposals.

265 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.

270 CONTROL OF EXTERNAL LUMINAIRES
- Individual control: Not required.
- Group control: Manual.

275 SMALL POWER SYSTEM DESIGN
- Purpose: Socket outlets, fused connection units and cooker control units.
- Small power outlets: Provide to serve the building and its equipment.
- Room: Generally.
  - Outlets: As drawing 8-025-110.
- Fixed equipment: Provide supplies.

280 EARTHING AND BONDING DESIGN
- Design: Complete the design of the earthing and bonding systems.
- Earthing, main bonding, supplementary bonding and protective conductors: In accordance with BS 7430.
- Requirements: Submit proposals.

PRODUCTS

310 PRODUCTS GENERALLY
- Standard: In accordance with BS 7671.
- CE marking: Required.

320 DISTRIBUTION BOARDS
- Standards: To BS EN 61439-1 and BS EN 61439-3.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Third party certification: ASTA certified.
- Rated operational voltage (Ue): Submit proposals.
- Rated operational frequency: Submit proposals.
- Rating: Submit proposals.
- Number of phases: Single.
- Incoming devices: Submit proposals.
- Number of outgoing ways: Submit proposals.
- Outgoing devices: Submit proposals.
- Enclosure:
  - Ingress protection to BS EN 60529: Submit proposals.
  - Material: Submit proposals.
- Accessories: None.

410 CABLES GENERALLY
- Approval: British Approvals Service for Cables (BASEC) certified.
- Cable sizes not stated: Submit proposals and calculations.

420 PROTECTIVE CONDUCTORS
- Type: Cable conductors with yellow/ green sheath.

430 ELECTRICAL ACCESSORIES
- Standards:
  - Generally: To BS 5733.
  - Switches: To BS EN 60669-1.
- Manufacturer: Contractor's choice .
  - Product reference: Submit proposals .
- Finish: Submit proposals .
- Mounting: Submit proposals.

510 LUMINAIRES PENDANT

- Standard: To BS EN 60598-1.
  - Approval: Kitemark certified.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Material: Submit proposals.
- Colour: Submit proposals.
- Mounting: Ceiling surface or ceiling suspended to suit ceiling.
- Lamp: Submit proposals.
  - Wattage: Submit proposals.

510A LUMINAIRES BULKHEAD

- Standard: To BS EN 60598-1.
  - Approval: Kitemark certified.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Material: Submit proposals.
- Colour: Submit proposals.
- Mounting: Ceiling surface.
- Lamp: Submit proposals.
  - Wattage: Submit proposals.

510B LUMINAIRES WALL

- Standard: To BS EN 60598-1.
  - Approval: Kitemark certified.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Material: Submit proposals.
- Colour: Submit proposals.
- Mounting: Wall surface.
- Lamp: Submit proposals.
  - Wattage: Submit proposals.

511 LAMPS GENERALLY

- Standards:
  - Compact fluorescent lamps: To BS EN 60901 and BS EN 61199.
  - High pressure mercury lamps: To BS EN 60188 and BS EN 62035.
  - High pressure sodium lamps: To BS EN 62035.
  - Light emitting diodes (LEDs): To BS EN 62031.
  - Metal halide lamps: To BS EN 62035.
  - Tubular fluorescent lamps:
    Single-capped lamps: To BS EN 60901 and BS EN 61199.
    Double-capped lamps: To BS EN 60081 and BS EN 61195.
  - Tungsten halogen lamps: To BS EN 60432-2 and BS EN 60357.
- Manufacturer: As recommended by luminaire manufacturer.
  - Lamps of the same type and rating: Same manufacturer.

515 LUMINAIRE SUPPORTING COUPLERS

- Standards: To BS 6972 and BS 7001.

530 SELF-CONTAINED EMERGENCY LUMINAIRES

- Standards: To BS EN 60598-1 and BS EN 60598-2-22.
- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Third party product certification: ICEL 1001.
- Luminaire type: Ceiling surface or wall surface.
- Lamp: Submit proposals.
  - Wattage: Submit proposals.
- Type: X.
- Mode of operation: Submit proposals
- Facilities: Submit proposals.
- Duration of emergency mode: 120.
- Indicators:
  - Charging: Green light emitting diodes.
  - Fault: Flashing red light emitting diodes.
- Test in progress: Flashing green light emitting diodes.
  - Position within luminaire: Readily visible. Fix to luminaire body.
- Batteries: Sealed nickel-cadmium, to BS EN 61951-1.
- Material: Submit proposals.
- Colour: Submit proposals.
  - Labelling: Indelibly mark with year of manufacture and installation.
- Legend: To BS EN ISO 7010.

596 MOVEMENT DETECTORS

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
  - Features: Adjustable occupancy sensitivity.

EXECUTION

610 ELECTRICAL INSTALLATION GENERALLY

- Standard: In accordance with BS 7671.

615 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.

645 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.

650 INSTALLING CABLE BASKET

- Support: Submit proposals.
- Access: Provide space encompassing cable basket 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.
- Earth protection: Ensure that, where utilized, basket jointing pieces are properly fixed and provide satisfactory continuity between the separate sections of containment.

655 INSTALLING STEEL CONDUIT AND FITTINGS

- Fixing: Fix securely. Fix boxes independently of conduit.
- Conduit drainage: Provide drainage outlets at lowest points.
- Location: Position vertically and horizontally in line with equipment served and parallel with building lines. Locate where accessible.
- Jointing:
  - Number of joints: Minimize.
  - Lengths of conduit: Maximize.
  - Cut ends: Remove burrs, and plug during construction works.
  - Movement joints in structure: Manufactured expansion coupling.
  - Threaded steel conduits: Tightly screw to ensure electrical continuity, with no thread showing.
  - Conduit connections to boxes and items of equipment, other than those with threaded entries: Earthing coupling/ male brass bush and protective conductor.
  - Changes of direction: Inspection bends.
- Connections to boxes, trunking, equipment and accessories: Screwed couplings, adaptors, connectors and glands: Attach, rubber bushes at open ends.
- Mounting and support: Submit proposals.
- Earth protection: Ensure that satisfactory continuity is maintained between the separate sections of conduit, equipment and accessories.

680 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.

685 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.

690 INSTALLING CABLES IN PLASTER

- Protection: Cover with galvanized steel channel nailed to substrate.

695 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.

700 INSTALLING CABLES IN ACCESSIBLE ROOF SPACES

- Cables running across ceiling joists: Fix to timber battens which are secured to joists.

705 INSTALLING ARMOURED CABLE

- Temperature: Do not start installation if cable or ambient temperature is below 0°C, or has been below 0°C during the previous 24 hours.
- Galvanized steel guards: Fit where cables are vulnerable to mechanical damage.
- Earthing: Bond armour to equipment and main earthing system.
- Connections to apparatus: Moisture proof, sealed glands and shrouds.

710 INSTALLING PVC SHEATHED CABLE

- Temperature: Do not install cables if ambient temperature is below 5°C.

715 INSTALLING MICC CABLE

- Bending: Do not corrugate sheath.
- Sealing cable ends: Fit terminations as soon after cable installation as practicable. Temporarily seal open cable ends to prevent the ingress of moisture where terminations are not fitted immediately.
- Connection to equipment and boxes: Fit shrouded glands.
- Testing: Test each length immediately after fixing. Repeat test 24-48 hours later.

720 INSTALLING ELECTRICAL ACCESSORIES AND EQUIPMENT

- Location: Submit proposals.
- 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 .
- Mounting heights (finished floor level to underside of equipment/ accessory): Submit proposals.
- Accessory face plates: Free from any traces of plaster, grout and paint or similar.

725 FINAL CONNECTIONS

- Size: Determine.
- Cable: Heat resisting white flex.
- Length: Allow for equipment removal and maintenance.

730 INSTALLING MULTIGANG SWITCHES

- General: Connect switches so that there is a logical relationship with luminaire positions. Fit blanks to unused switch spaces.
- Segregation: Internally segregate each phase with phase barriers and warning plates.

735 INSTALLING LUMINAIRES

- Location: As drawing 8-025-110.
- Orientation: Parallel with ceiling.
- Supports: Adequate for weight of luminaire.

740 INSTALLING EMERGENCY LUMINAIRES

- Permanent electrical supplies: Derive from adjacent local lighting circuit.
- Charge indicator: Position in a conspicuous location.

745 INSTALLING EXTERNAL LUMINAIRES

- Locations: Submit proposals.
- Seals: Check for particle ingress and clean.

760 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 and consumer units: 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.

765 ENGRAVING

- Metal and plastic accessories: Engrave, indicating their purpose.
- Emergency lighting test key switches: Describe their function.
- Multigang light switches: Describe the luminaire arrangement.

COMPLETION

810 FINAL FIX

- Accessory faceplates, luminaires and other equipment: Fit after completion of building painting.

820 CLEANING

- Electrical equipment: Clean immediately before handover.
- Equipment not supplied but installed and electrically connected: Clean immediately before handover.

830 INSPECTION AND TESTING GENERALLY

- Standard: In accordance with BS 7671.
- Notice before commencing tests (minimum): 24 hours.
- Labels and signs: Fix securely before system is tested.
- Certificates: Submit.
  - Number of copies: 2 .

860 INSPECTION AND TESTING OF EMERGENCY LIGHTING SYSTEMS

- Standard: In accordance with BS 5266-1.
- Certificate of testing: Submit.
  - Standard: To BS 5266-1, Annex I.
  - Number of copies: 2.
- System log book: To BS 5266-1.

880 DOCUMENTATION

- Timing: Submit at practical completion.
- Contents:
  - 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.

890 MAINTENANCE

- Servicing and maintenance: Undertake.
  - Duration: Until 12 months after Practical Completion.

W
Communications/Security/Control systems

W90
Communications and security systems - domestic

W90 Communications and security systems - domestic

To be read with Preliminaries/ General conditions.

GENERAL

120 FIRE DETECTION AND ALARM SYSTEM
- System manufacturer: Submit proposals.
  - Approval: LPCB LPS 1014.
- Equipment interconnectivity: Low voltage cable.
- Alarms: Submit design and cost proposals.
  - Supplementary devices: Submit proposals.
  - Remote alarm: Not required.

SYSTEM PERFORMANCE

210 DESIGN REQUIREMENTS
- Design: Complete the design of the communications and security systems.
- Proposals: Submit drawings showing equipment positions and routes, technical information, calculations and manufacturer's literature.

220 DESIGN OF FIRE DETECTION AND ALARM SYSTEMS
- Design: In accordance with BS 5839-6.
- Purpose: Protection of life and property.
- Grade: Submit proposals.
- Category: Submit proposals.
- Integration with other alarm systems:
  - Objectives: None.
  - Systems to be integrated: None.

EXECUTION

605 INSTALLING CABLES GENERALLY
- Standard: In accordance with BS 7671.
- General: Install cables neatly and securely. Conceal wherever possible. Protect against accidental damage, adverse environmental conditions, mechanical stress and deleterious substances.
  - Concealed cable runs to outlets: Align vertically 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.
- 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 running across ceiling joists: Fix to timber battens which are nailed to joists.
- Length of final connection: Sufficient for equipment removal and maintenance.

610 INSTALLING OUTLETS AND EQUIPMENT GENERALLY

- Location: Coordinate with other wall or ceiling mounted equipment.
- Positioning: Accurate and square to vertical and horizontal axes.
- Alignment: Align adjacent accessories on the same vertical or horizontal axis.
- Mounting heights (finished floor level to underside of equipment/ accessory): Submit proposals.

640 INSTALLING FIRE DETECTION AND ALARM SYSTEMS

- Installation: In accordance with BS 5839-6.
- Detection devices: Locate to provide safe access for maintenance and testing.
- Environment at installation: Clean and dust free.
- Power supply: Dedicated circuit from main distribution board.

COMPLETION

810 FIRE DETECTION AND ALARM SYSTEM TESTING AND COMMISSIONING

- Standard: In accordance with BS 5839-6.
- Certification: In accordance with BS 5839-6, Annex F.

880 DOCUMENTATION

- Standard: Fire detection and alarm systems in accordance with BS 5839.
- Timing: Submit at completion.
- Contents:
  - Full technical description of each system installed.
  - Manufacturers' operating and maintenance instructions for fittings and apparatus.
  - System log book.
  - Manufacturers' guarantees and warranties.
  - As-installed drawings showing circuits and their ratings, and locations of fittings and apparatus.
  - List of normal consumable items.

Z
Building fabric reference specification

Z10
Purpose made joinery

Z10 Purpose made joinery

To be read with Preliminaries/ General conditions.

110 FABRICATION

- Standard: To BS 1186-2.
- Sections: Accurate in profile and length, and free from twist and bowing. Formed out of solid unless shown otherwise.
  - Machined surfaces: Smooth and free from tearing, wooliness, chip bruising and other machining defects.
- Joints: Tight and close fitting.
- Assembled components: Rigid. Free from distortion.
- Screws: Provide pilot holes.
  - Screws of 8 gauge (4 mm diameter) or more and screws into hardwood: Provide clearance holes.
  - Countersink screws: Heads sunk at least 2 mm below surfaces visible in completed work.
  - Adhesives: Compatible with wood preservatives applied and end uses of timber.

120 CROSS SECTION DIMENSIONS OF TIMBER

- General: Dimensions on drawings are finished sizes.
- Maximum permitted deviations from finished sizes:
  - Softwood sections: To BS EN 1313-1:-
    Clause 6 for sawn sections.
  - Hardwood sections: To BS EN 1313-2:-
    Clause 6 for sawn sections.
    Clause NA.3 for further processed sections.

130 PRESERVATIVE TREATED WOOD

- Cutting and machining: Completed as far as possible before treatment.
- Extensively processed timber: Retreat timber sawn lengthways, thicknessed, planed, ploughed, etc.
- Surfaces exposed by minor cutting and/ or drilling: Treat as recommended by main treatment solution manufacturer.

140 MOISTURE CONTENT

- Wood and wood based products: Maintained within range specified for the component during manufacture and storage.

250 FINISHING

- Surfaces: Smooth, even and suitable to receive finishes.
  - Arrises: Eased unless shown otherwise on drawings.
- End grain in external components: Sealed with primer or sealer as section M60 and allowed to dry before assembly.

Z11
Purpose made metalwork

Z11 Purpose made metalwork

To be read with Preliminaries/ General conditions.

PRODUCTS

310 MATERIALS GENERALLY

- Grades of metals, section dimensions and properties: To appropriate British Standards. When not specified, select grades and sections appropriate for the purpose.
- Prefinished metal: May be used if methods of fabrication do not damage or alter appearance of finish, and finish is adequately protected.
- Fasteners: To appropriate British Standards and, unless specified otherwise, of same metal as component being fastened, with matching coating or finish.

FABRICATION

515 FABRICATION GENERALLY

- Contact between dissimilar metals in components: Avoid.
- Finished components: Rigid and free from distortion, cracks, burrs and sharp arrises.
  - Moving parts: Free moving without binding.
- Corner junctions of identical sections: Mitre.

520 COLD FORMED WORK

- Profiles: Accurate, with straight arrises.

527 WELDING TO STEEL GENERALLY.

- Welding procedures:
  - Method and standard: Metal arc welding to BS EN 1011-1 and -2..
  - Welding Procedure Specification (WPS): Submit 2 copies before commencement of welding.
- Preparation:
  - Joint preparation: Clean thoroughly.
  - Surfaces of materials that will be self-finished and visible in the completed work: protect from weld splatter.
- Jointing:
  - Joints: Fully bond parent and filler metal throughout with no inclusions, holes, porosity or cracks.
  - Dissimilar metals: Welding not permitted.
  - Strength requirements: Welds to achieve design loads.
  - Heat straightening: Not permitted.
  - Complex assemblies: Agree priority for welding members to minimize distortion caused by subsequent welds.
  - Tack welds: Use only for temporary attachment.
  - Jigs: Provide to support and restrain members during welding.
  - Filler plates: Not permitted.
  - Lap joints: Minimum 5 x metal thickness or 25 mm, whichever is greater.
  - Weld terminations: Clean and sound.

FINISHING

710 FINISHING WELDED AND BRAZED JOINTS VISIBLE IN COMPLETE WORK

- Standard: To BS EN ISO 8501-3.
  - Preparation grade: P3.
- Butt joints: Smooth, and flush with adjacent surfaces.
- Fillet joints: Neat.
- Grinding: Grind smooth where indicated on drawings.

745 PREPARATION FOR APPLICATION OF COATINGS

- General: Complete fabrication, and drill fixing holes before applying coatings.
- Paint, grease, flux, rust, burrs and sharp arrises: Remove.

780 GALVANIZING

- Standard: To BS EN ISO 1461.
- Preparation:
  - Vent and drain holes: Provide in accordance with BS EN 14713-1 and -2. Seal after sections have been drained and cooled.
  - Components subjected to cold working stresses: Heat treat to relieve stresses before galvanizing.
  - Welding slag: Remove.
  - Component cleaning: To BS EN ISO 8501-3.
  - Grade: St 2½.

Z12
Preservative/ fire retardant treatment

Z12 Preservative/ fire retardant treatment

To be read with Preliminaries/ General conditions.

110 TREATMENT APPLICATION
- Timing: After cutting and machining timber, and before assembling components.
- Processor: Licensed by manufacturer of specified treatment solution.
- Operatives: Must have completed the PCA training scheme.
- Certification: For each batch of timber provide a certificate of assurance that treatment has been carried out as specified.

120 COMMODITY SPECIFICATIONS
- Standard: In accordance with the Wood Protection Association (WPA) publication 'Industrial wood preservation specification and practice'.

130 PRESERVATIVE TREATMENT SOLUTION STRENGTHS/ TREATMENT CYCLES
- General: Select to achieve specified service life and to suit treatability of specified wood species.

150 WATER-BASED ORGANIC PRESERVATIVE TREATMENT
- Solution:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Application: High pressure impregnation.
- Moisture content of wood:
  - At time of treatment: Not more than 28%.
  - After treatment: Timber to be surface dry before use.

160 ORGANIC SOLVENT PRESERVATIVE TREATMENT
- Solution:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Application: Double vacuum + low pressure impregnation, or immersion.
- Moisture content of wood:
  - At time of treatment: As specified for the timber/ component at time of fixing.
  - After treatment: Timber to be surface dry before use.

165 WATER-BASED MICROEMULSION PRESERVATIVE TREATMENT
- Solution:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Application: Double vacuum + low pressure impregnation.
- Moisture content of wood:
  - At time of treatment: As specified for the timber/ component at time of fixing.
  - After treatment: Timber to be surface dry before use.

180 RECYCLED TIMBER CONTAINING CREOSOTE OR CHROMIUM/ ARSENIC BASED PRESERVATIVE
- Usage: Not permitted.

210A FIRE RETARDANT TREATMENT TO EXPOSED STRUCTURAL TIMBERS

- Standard: In accordance with the Wood Protection Association (WPA) publication 'Industrial flame retardant treatment of wood and wood-based panel products'.
- Solution type: INT 2.
  - Manufacturer: Envirograf.
    Product reference: 145 Timber Frame Fire Coat.
  - Application: Brush, roller, or spray.
- Moisture content of wood:
  - At time of treatment: Not to exceed, 28% for large cross sectional timber, 22% for timber boarding and 15% for board material.
  - After treatment: Timber to be redried slowly at temperatures not exceeding 60°C to minimize distortion and degradation.

610 MAKING GOOD TO PRESERVATIVE TREATMENT ON-SITE

- Preservative solution: Compatible with off-site treatment.
- Application: In accordance with preservative manufacturer's recommendations.

620 MAKING GOOD TO FIRE RETARDANT TREATMENT ON-SITE

- Fire retardant: Compatible with off-site treatment.
- Application: In accordance with fire retardant manufacturer's recommendations.

Z20
Fixings and adhesives

Z20 Fixings and adhesives

To be read with Preliminaries/ General conditions.

PRODUCTS

310 FASTENERS GENERALLY
- Materials: To have:
  - Bimetallic corrosion resistance appropriate to items being fixed.
  - Atmospheric corrosion resistance appropriate to fixing location.
- Appearance: Submit samples on request.

320 PACKINGS
- Materials: Noncompressible, corrosion proof.
- Area of packings: Sufficient to transfer loads.

340 MASONRY FIXINGS
- Light duty: Plugs and screws.
- Heavy duty: Expansion anchors or chemical anchors.

350 PLUGS
- Type: Proprietary types to suit substrate, loads to be supported and conditions expected in use.

390 ADHESIVES GENERALLY
- Standards:
  - Hot-setting phenolic and aminoplastic: To BS 1203.
  - Thermosetting wood adhesives: To BS EN 12765.
  - Thermoplastic adhesives: To BS EN 204.

410 POWDER ACTUATED FIXING SYSTEMS
- Types of fastener, accessories and consumables: As recommended by tool manufacturer.

EXECUTION

610 FIXING GENERALLY
- 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.
- Components, substrates, fixings and fasteners of dissimilar metals: Isolate with washers/ sleeves to avoid bimetallic corrosion.
- Appearance: Fixings to be in straight lines at regular centres.

620 FIXING THROUGH FINISHES
- Penetration of fasteners and plugs into substrate: To achieve a secure fixing.

630 FIXING PACKINGS
- Function: To take up tolerances and prevent distortion of materials and components.
- Limits: Do not use packings beyond thicknesses recommended by fixings and fasteners manufacturer.
- Locations: Not within zones to be filled with sealant.

640 FIXING CRAMPS

- Cramp positions: Maximum 150 mm from each end of frame sections and at 600 mm maximum centres.
- Fasteners: Fix cramps to frames with screws of same material as cramps.
- Fixings in masonry work: Fully bed in mortar.

670 PELLETED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Pellets: Cut from matching timber, match grain and glue in to full depth of hole.
- Finished level of pellets: Flush with surface.

680 PLUGGED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Plugs: Glue in to full depth of hole.
- Finished level of plugs: Projecting above surface.

690 USING POWDER ACTUATED FIXING SYSTEMS

- Powder actuated fixing tools: To BS 4078-2 and Kitemark certified.
- Operatives: Trained and certified as competent by tool manufacturer.

700 APPLYING ADHESIVES

- Surfaces: Clean. Adjust regularity and texture to suit bonding and gap filling characteristics of adhesive.
- Support and clamping during setting: Provide as necessary. Do not mark surfaces of or distort components being fixed.
- Finished adhesive joints: Fully bonded. Free of surplus adhesive.

Z21
Mortars

Z21 Mortars

To be read with Preliminaries/ General conditions.

CEMENT GAUGED MORTARS

110 CEMENT GAUGED MORTAR MIXES
- Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

120 SAND FOR SITE MADE CEMENT GAUGED MASONRY MORTARS
- Standard: To BS EN 13139.
- Grading: 0/2 (FP or MP).
  - Fines content where the proportion of sand in a mortar mix is specified as a range (e.g. 1:1: 5-6):
    Lower proportion of sand: Use category 3 fines.
    Higher proportion of sand: Use category 2 fines.
- Sand for facework mortar: Maintain consistent colour and texture. Obtain from one source.

131 READY-MIXED LIME:SAND FOR CEMENT GAUGED MASONRY MORTARS
- Standard: To BS EN 998-2.
- Lime: Nonhydraulic to BS EN 459-1.
  - Type: CL 90S.
- Pigments for coloured mortars: To BS EN 12878.

135 SITE MADE LIME:SAND FOR CEMENT GAUGED MASONRY MORTARS
- Permitted use: Where a special colour is not required and in lieu of factory made ready-mixed material.
- Lime: Nonhydraulic to BS EN 459-1.
  - Type: CL 90S.
- 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
- Cement: To BS EN 197-1 and CE marked.
  - Types: Portland cement, CEM I.
    Portland limestone cement, CEM ll/A-L or CEM ll/A-LL.
    Portland slag cement, CEM II/B-S.
    Portland fly ash cement, CEM II/B-V.
  - Strength class: 32.5, 42.5 or 52.5.
- White cement: To BS EN 197-1 and CE marked.
  - Type: Portland cement, CEM I.
  - Strength class: 52.5.
- Sulfate resisting Portland cement:
  - Types: To BS EN 197-1 Sulfate resisting Portland cement, CEM I/SR and CE marked.
    To BS EN 197-1 fly ash cement, CEM ll/B-V and CE marked.
  - Strength class: 32.5, 42.5 or 52.5.
- Masonry cement: To BS EN 413-1 and CE marked.
  - Class: MC 12.5.

180 ADMIXTURES FOR SITE MADE CEMENT GAUGED MORTARS

- Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
- Other admixtures: Submit proposals.
- Prohibited admixtures: Calcium chloride, ethylene glygol and any admixture containing calcium chloride.

190 RETARDED READY TO USE CEMENT GAUGED MASONRY MORTARS

- Standard: BS EN 998-2.
- Lime for cement:lime:sand mortars: Nonhydraulic to BS EN 459-1.
  - Type: CL 90S.
- Pigments for coloured mortars: To BS EN 12878.
- Time and temperature limitations: Use within limits prescribed by mortar manufacturer.
  - Retempering: Restore workability with water only within prescribed time limits.

210 MAKING CEMENT GAUGED MORTARS

- Batching: By volume. Use clean and accurate gauge boxes or buckets.
  - Mix proportions: Based on dry sand. Allow for bulking of damp sand.
- Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
  - Mortars containing air entraining admixtures: Mix mechanically. Do not overmix.
- Working time (maximum): Two hours at normal temperatures.
- Contamination: Prevent intermixing with other materials.

LIME:SAND MORTARS

310 LIME:SAND MORTAR MIXES

- Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

320 SAND FOR LIME:SAND MASONRY MORTARS

- Type: Sharp, well graded.
  - Quality, sampling and testing: To BS EN 13139.
  - Grading/ Source: As specified elsewhere in relevant mortar mix items.

345 ADMIXTURES FOR HYDRAULIC LIME:SAND MORTARS

- Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
- Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

360 MAKING LIME:SAND MORTARS GENERALLY

- Batching: By volume. Use clean and accurate gauge boxes or buckets.
- Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
- Contamination: Prevent intermixing with other materials, including cement.

400 MAKING HYDRAULIC LIME:SAND MORTARS

- Mixing hydrated hydraulic lime:sand: Follow the lime manufacturer's recommendations for each stage of the mix.
  - Water quantity: Only sufficient to produce a workable mix.
- Working time: Within limits recommended by the hydraulic lime manufacturer.

Z22
Sealants

Z22 Sealants

To be read with Preliminaries/General conditions.

PRODUCTS

310 JOINTS GENERALLY

- Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.

EXECUTION

610 SUITABILITY OF JOINTS

- Presealing checks:
  - Joint dimensions: Within limits specified for the sealant.
  - Substrate quality: Surfaces regular, undamaged and stable.
- Joints not fit to receive sealant: Submit proposals for rectification.

620 PREPARING JOINTS

- Surfaces to which sealant must adhere:
  - Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
  - Clean using materials and methods recommended by sealant manufacturer.
- Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primer or sealant.
- Backing strip and/ or bond breaker installation: Insert into joint to correct depth, without stretching or twisting, leaving no gaps.
- Protection: Keep joints clean and protect from damage until sealant is applied.

630 APPLYING SEALANTS

- Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
- Environmental conditions: Do not dry or raise temperature of joints by heating.
- Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
- Sealant profiles:
  - Butt and lap joints: Slightly concave.
  - Fillet joints: Flat or slightly convex.
- Protection: Protect finished joints from contamination or damage until sealant has cured.

Z31
Powder coatings

Z31 Powder coatings

To be read with Preliminaries/ General conditions.

120 POWDER COATING MATERIALS

- Manufacturer: Obtain from one only of the following: Interpon.
- Selected manufacturer: Submit details before commencement of powder coating including:
  - Name and contact details.
  - Details of accreditation schemes.
  - Technical data of product including current Agrément certificates.

210 WORKING PROCEDURES

- Comply with the follow following standards.
  - Aluminium components: To BS 6496 or BS EN 12206-1.
  - Steel components: To BS EN 13438.
  - Safety standards: To British Coatings Federation 'Code of safe practice: Powder coating. Application of coating powders by electrostatic spraying'.
  - Health and safety guidance: Health and Safety Executive 'Reducing risk associated with using coating powders - employers' web page.

220 POWDER COATING APPLICATORS

- Applicator requirements:
  - Approved by powder coating manufacturer.
  - Currently certified to BS EN ISO 9001.
  - Comply with quality procedures, guarantee conditions, standards and tests required by powder coating manufacturer.
  - Selected applicator: Submit details before commencement of powder coating including: Name and contact details.
    Details of accreditation schemes.

225 GUARANTEES

- Powder coating manufacturer and applicator guarantees:
  - Submit sample copies before commencement of powder coating.
  - Submit signed project specific copies on completion of work.

310 PRETREATMENT OF ALUMINIUM COMPONENTS

- Condition of components to be pretreated:
  - Free from corrosion and damage.
  - All welding and jointing completed and finish off as specified.
  - Free from impurities including soil, grease and oil.
  - Suitable for and compatible with the pretreatment process.
- Conversion coating requirements:
  - Chromate system: To BS 6496 or BS EN 12206-1.
  - Chromate-free system: To BS EN 12206-1. Submit details before using.
- Rinsing requirements: Use demineralized water. Drain and dry.

320 PRETREATMENT OF STEEL COMPONENTS

- Condition of components to be pretreated:
  - Free from corrosion and damage.
  - All welding and jointing completed and finish off as specified.
  - Free from impurities including soil, grease and oil.
  - Suitable for and compatible with the pretreatment process.
- Conversion coating requirements: To BS EN 13438.
- Rinsing requirements: Use demineralized water. Drain and dry.

330 PRETREATMENT FOR PROTECTION IN AGGRESSIVE ENVIRONMENTS

- Minimum thickness of 60 microns across significant and/ or primary surfaces.
- Minimum thickness of 25 microns on non-significant and/ or secondary faces, ensuring a coherent film layer.
- All cut edges, drilled holes and mitres to be fully sealed.
- Cleaning and maintenance: Carried out once every three to twelve months (dependent on proximity to pollutant).

430 EXTENT OF POWDER COATINGS

- Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces will be deemed 'significant surfaces' for relevant BS 6496/ BS EN 13438 performance requirements.

435 APPLICATION OF POWDER COATINGS

- Surfaces to receive powder coatings: Free from dust or powder deposits.
- Powder colours: Obtain from one batch of one manufacturer.
- Commencement of powder coatings: To be continuous from pretreatment.
- Components to be installed on site in order of application.
- Jig points: Not visible on coated components.
- Curing: Controlled to attain metal temperatures and hold periods recommended by powder coating manufacturer.
- 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.
- Overcoating of components: Not acceptable.

440 PERFORMANCE AND APPEARANCE OF POWDER COATINGS

- For aluminium components:
  - Standard: To BS 6496 or BS EN 12206-1.
- For steel components:
  - Standard: To BS EN 13438.
- Visual inspection after powder coating: Significant surface viewing distances to be as specified in the relevant Standard, unless specified otherwise.
- Colour and gloss levels: To conform with approved samples.

450 ALUMINIUM ALLOY FABRICATIONS

- Units may be assembled:
  - Before powder coating.
  - From components powder coated after cutting to size.
  - Where approved, from components powder coated before cutting to size.
- Exposure of uncoated background metal: Not acceptable.
- Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

460 STEEL FABRICATIONS

- Unit assembly: Wherever practical, before powder coating.
- Exposure of uncoated background metal: Not acceptable.
- Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

470 FIXINGS

- 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

- Before delivery to site: Check all components for damage to powder coatings. Replace damaged components.
- Site damage: Submit proposals for repair or replacement.

510 PROTECTION

- Powder coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.
- Protective coverings must be:
  - Resistant to weather conditions.
  - Partially removable to suit building in and access to fixing points.
- Protective tapes in contact with powder coatings must be:
  - Low tack, self adhesive and light in colour.
  - 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.
- Inspection of protection: Carry out monthly. Promptly repair any deterioration or deficiency.

520 PROTECTION IN HAZARDOUS LOCATIONS

- Minimum thickness of 60 microns across significant and/ or primary surfaces.
- Minimum thickness of 25 microns on non-significant and/ or secondary faces ensuring a coherent film layer.
- All cut edges, drilled holes and mitres to be fully sealed.
- Cleaning: Carried out once every three to twelve months (dependent on proximity to pollutant).

535 DOCUMENTATION

- Submit the following information for each batch of powder coated components:
  - Supplier.
  - Trade name.
  - Colour.
  - Type of powder.
  - Method of application.
  - Batch and reference number.
  - Statutory requirements.
  - Test certificates.
  - Maintenance instructions.

540 COMPLETION

- Protection: Remove any protective coatings.
- Cleaning and maintenance of powder coatings: Carry out in accordance with procedures detailed in powder coating manufacturer and applicator guarantees.