ARCHITECTURAL SPECIFICATION

Horniman Museum + Gardens

Security Suite Refurbishment

Document Number: LAB-649-SPE001

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Document History

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Specification Contents:

A GENERAL REQUIREMENTS

A - 1. FORMAT DEFINITIONS AND USE OF THE SPECIFICATION

A - 1.1. SPECIFICATION FORMAT

a) The *Specification* comprises Sections A to Z and follows the Uniclass (Common Arrangement) classification system.

b) Sections A and Z provide general requirements applicable to individual trade Works Sections A to Z. Sections E to Z detail particular requirements specific to individual trades or elements of the works and shall be read in conjunction with Section A and other related sections of the *Specification*.

c) The Work Sections listed herein form part of the *Specification* with design responsibility and specification type indicated for each as follows:

i) Prescriptive (P): The Section is a detailed materials and workmanship *Specification* reflecting the Employer's design solution.

ii) Descriptive (D): The Section, when read with the *Design Drawings*, indicates the visual intent with which the *Contractor* must comply when undertaking the *Detailed Design*. The *Contractor* will be expected to submit fabrication / shop drawings and detailed specifications for approval by the architect and Contract Administrator.

d) The Work Sections of the *Specification* shall not impose a lesser standard of material or workmanship than defined in Sections A and Z.

e) The *Specification* shall be read in conjunction with the Conditions of Contract, Preliminaries, *Design Drawings*, Instructions to Tenderers, supplemental information and other relevant documents.

f) Performance criteria where specified shall be considered as minimum standards with which the *Contractor*'s proposals shall comply.

g) Sections A to Z shall constitute a single document.

h) Unless stated otherwise, all requirements of this document (and any related document) refer to work to be provided by, and obligations of, the *Contractor* and therefore all clauses are addressed to, and refer to, the *Contractor*.

A - 1.2. SPECIFICATION CODING EXPLANATION

The Specification clauses are numbered consecutively on the left of the page following introduction heading to each Section.

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A - 1.3. WORK SECTION CATEGORIES

A - General Requirements
K10 - Gypsum Board Dry Linings/ Partitions
K40 - Demountable Suspended Ceilings
L10 – Windows (secondary glazing only)
L20 - Doors
M40 - Ceramic tiling in WC and kitchen
M60 - Painting/ Clear Finishing
N10 - General fixtures and fitted furniture
N13 - Sanitary Appliances/ Fittings
P10 - Sundry Insulation for external walls and roof timbers
P20 – Unframed isolated trims and timber generally
Z20 – Fixings
Z22 – Sealants

Works are considered as Prescriptive and do not require fabrication drawings or further detail design development for the works identified in the clauses above, other than for the following items:

1. New door sets and frames (clause L20) which require fabrication drawings from the timber door supplier for new doors (4 no) based on as-built surveys of new door openings, once constructed.
2. Bespoke fitted furniture for the new security reception desk and open shelving (clause N10). Detailed fabrication drawings prepared by the cabinet maker, showing final materials, assembly methods and fixings will be required for approval by the architect prior to construction. It should be noted that low-level radiators, small power points and data cable containment is integrated within the reception desk, and small power sockets are incorporated in the open shelving unit. These shop drawings will therefore require design coordination with the mechanical and electrical subcontractors.
3. Kitchen worktops and cabinets (clause N10). This is a standard small kitchen installation. The materials and finishes specification for these works have deliberately been left 'open' for the contractor to select their preferred kitchen supplier. Detailed plans and elevations should be provided by the chosen supplier for the architect's approval, based on the design intent drawings provided in the tender documents and the design information included in clause N10.

The requirements noted above only relate to the architectural items of design. The contractor should refer to the mechanical and electrical engineer's works requirements in relation to contractor design requirements for all MEP installations.

A - 1.4. SUPPLEMENTAL INFORMATION

a) Refer to the requirements of the following drawings, reports and supplemental information as relevant:
   i) Pre-construction health and safety file.
   ii) Supplementary Site Information provided by the contract administrator

b) The *Design Drawings* include technical references in the drawing box. This provides a summary materials specification and the clauses within this document that should be read in conjunction with the drawings themselves.

c) Architectural Design are at RIBA Stage 4 Technical Design - Drawings, and the Specifications listed in A 1.3 of this document.

d) Read also in conjunction with the Service Engineer's drawings and specifications issued for tender.

A - 1.5. DEFINITIONS

The following definitions apply to the *Specification*:

a) "Works Information": as defined by the identified and defined terms clause of the Contract.

b) "*Specification*": This document, comprising Sections A - Z inclusive.

c) "*Contractor*'s Proposals": Drawings, detailed technical specifications, method statements, risk assessment, calculations and any other relevant information prepared by the *Contractor*, maintaining the design and visual intent, functional, performance criteria and technical requirements as stated in the Works Information.

d) "*Contractor*'s Statement": Part of the *Contractor*'s Proposals, which explains the *Contractor*'s proposals for the execution of the Performance Specified works including any information which is required to be included.

e) "*Design*":

i) Prescriptive (P): The design solution prepared by the Employer, represented by the Works Information.

ii) Descriptive (D): The design intent prepared by the Employer represented by the Works Information and where fabrication drawings and detailed materials specifications are to be submitted by the Contractor for approval by the architect and contract administrator.

f) "Detailed Design": That prepared by the Contractor.

g) "Design Drawings":

i) Prescriptive (P): Drawings issued by the Employer at the Contract Award and the Project Manager during the course of the Contract.

ii) Descriptive (D): Drawings issued by the Employer at Contract Award and the Project Manager during the course of the Contract, representing the Employer's design intent, showing the visual and design intent, scope, layout, principal dimensions, arrangement of services and structure, function, visual and aesthetic requirements.

h) "Fabrication Drawings":

i) Drawings for the design submissions, for the architect and contract administrator’s acceptance.

i) "*As-built Drawings*": Drawings produced by the *Contractor*, where required, which show the works as finally constructed as represented by the *Working Drawings* unless otherwise agreed.

j) "Contract Drawings": The drawings listed in the Contract

k) "Evaluation": Reviews carried out by the contract administrator.

l) "Inspection": Inspection carried out by the contract administrator of systems, products, materials, components, equipment and installation of the works. Such inspection shall be limited to an inspection of the visual appearance only. The *Detailed Design*; selection of systems, products and materials, and construction of components and equipment shall remain the sole responsibility of the *Contractor* for works specified descriptively.

m) "A(a)ccepted, A(a)cceptance or A(a)cceptable": Systems, products, materials, components, equipment and installations accepted by the contract administrator after evaluation and with due regard to responsibilities as defined in the Contract Documents and stated in the *Specification*.

n) "acceptable equivalent": Systems and products proposed by the *Contractor* as alternatives, equal to or an enhancement of those specified in every respect. Subject to acceptance by the contract administrator following evaluation and with due regard to responsibilities as defined in the Contract Documents and stated in the *Specification*.

o) "*Contractor*'s Supplemental Information": Documentation produced by the *Contractor*, demonstrating that the *Detailed Design* complies with the Contract Documents.

p) "Inspecting Body": Competent independent body or association, which verifies compliance with the Specification.

q) "Testing Body": Competent accredited independent testing body or association, which provides appropriate testing equipment, testing environment and independent testing results which will be used to verify conformance with the Specification. The Testing Authority shall be subject to acceptance by the Project Manager.

r) "works": The scope of work covered by the Specification.

s) "Detailed Design Programme": Submitted by the Contractor, prior to Contract award, showing the Detailed Design drawing submission dates, sample submissions, prototyping and testing activities prior to manufacture.

t) Section 'A' refers to Section 'A' of this specification.

A - 1.6. COPYRIGHT / PATENT RIGHTS

Not applicable.

A - 1.7. DISCLOSURE

Not applicable.

A - 2. DESCRIPTION OF THE PROJECT

A - 2.1. PROJECT DESCRIPTION

This is an Architectural Specification that should also be read in conjunction with the MEP Works Information and for Project-wide Common Design Items.

A - 2.2. SCOPE OF WORK

a) Refurbishment of the existing security desk and staff reception area, security office and staff break-out, kitchen and WC facilities located behind the staff reception area.

b) Modification of internal partitions to suit adjusted room layouts, upgrade of internal finishes and decorations, new wc's and a staff kitchen including new sanitary ware and kitchen fittings, provision of new suspended ceilings, new and refurbished doors and ironmongery, installation of new bespoke fitted furniture including a new staff reception desk and worktop, shelving units, installation of secondary glazing. Upgrade of lighting, power, IT containment and heating is also included and documented in the mechanical and electrical engineer's tender documents.

c) A period of IT installation by the Museum's independently appointed IT consultants will required between the two phases of the project. These works will fall outside the contract but the contractor will be expected to liaise with the IT provider with regard to programme dates and afford access to a 'clean' works area for these works to be carried out. Condition surveys before and after this IT installation will be carried out with all parties present to confirm the condition of the works before and after these third party works are undertaken .

d) There are requirements to provide unobstructed access to the Museum's main fire control panel in the main staff reception area (within the works area) for emergency access by Museum staff and emergency services.

e) An unobstructed fire egress route between the Museum galleries exit door and the staff entrance door needs to be maintained at all times. The second stage of works identified in this tender will occupy this general area and the contractor is to provide clear delineation for this escape route at all times. Were works are planned in the escape route area itself, the contractor should put in place management procedures that ensure this route remains unobstructed in the event of evacuation.

DETAILS OF CONTRACTORS RESPONSIBILITIES

A - 2.3. DESCRIPTIVE ELEMENTS OF THE WORKS (D)

A - 2.3.1. GENERAL REQUIREMENTS

a) Take responsibility for the production of fabrication drawings and final materials specification as set out in the design documents.

b) Design and general performance requirements shall be as stated herein. Specific performance requirements are provided in each Work Section (A to Z) of the Specification.

c) Where no material, product or supplier is indicated in the *Specification*, propose suitable materials and systems which comply with the design intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

d) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the contract administrator.

e) Interfaces:

i) Co-ordinate with the work of others including all interfacing as required.

ii) Performance shall be maintained at all interface conditions.

A - 2.3.2. CONTRACTOR's RESPONSIBILITIES

a) The *Contractor*'s fabrication drawings and associated materials specifications shall include drawings, calculations, methods, technical and specifications detailing the proposed materials and systems in order that a technical appraisal can be made by the contract administrator prior to acceptance.

b) The design and visual character of the project is important and shall be maintained. Hence, there shall be no variation in the final surface finish of similar materials, which shall remain visually consistent, including colour and texture, regardless of orientation or natural grain within agreed tolerances and agreed samples.

c) Where proprietary products are to be installed, be responsible for providing any modification, additional bracing, reinforcing and suitable fixings, to ensure that the products meet the requirements of the Works Information for the circumstances and situation in which they shall be expected to perform. Be responsible for conveying any concerns that the manufacturers may have expressed regarding the suitability of products for the purpose intended.

d) Be responsible for ensuring that items specified are installed correctly such that the performance requirements specified are fully satisfied for the service life required. All fixings and other aspects not fully detailed or specified shall be regarded as the *Contractor*'s responsibility.

e) Be responsible for the final selection of products and associated components, which shall be used solely for the purpose intended by the manufacturer; which shall satisfy the requirements of the Works Information.

f) Be responsible for the carrying out of all testing as specified and as necessary to demonstrate compliance.

g) Provide warranties as required.

h) Set out the works and accurately co-ordinate all related works.

A - 2.3.3. CONTRACTORS PROPOSALS

a) Not Applicable

A - 2.3.4. THE DETAILED DESIGN

a) Comply with all relevant Codes of Practice, Standards, Fire Regulations, Building Regulations (refer to clause series A.6.2) and local Building Codes, Safety Regulations and any other regulations applicable to the installation, together with all relevant Statutory Rules, Regulations, Bye-laws and other enforceable instruments applicable to both the design and execution of the works.

b) Submit to the Contract Administrator one distributed transmitted electronic copy of all design/ production information associated with fabrication drawings. Detailed Design work shall be clearly legible when reduced to A3 paper size.

c) The fabrication drawings shall finalise all manufacturing, interface and installation details.

d) Ensure that any necessary amendments are made in a timely manner, unless and until the contract administrator confirms that resubmission is not required, submit copies of amended drawings, etc., and ensure incorporation of necessary amendments.

e) Select suitable materials, sizes, thicknesses, types and locations of fixings and sealants, all in accordance with specified standards and ensure that they are used for the purpose intended by the manufacturer.

f) Any necessary support structure shall incorporate all movements and tolerances to which it is subjected.

g) Show details of all fixing requirements to interfacing elements of the works, which shall be accepted with the contract administrator prior to commencement of the installation.

h) Co-ordinate all interfaces.

i) The contract administrator's review of fabrication drawings shall relate to visual performance and functional matters only.

j) Be responsible for providing method statements and safety risk assessments for review.

A - 2.3.5. SUPPLY OF SUPPLEMENTAL INFORMATION

a) Provide supplemental information in respect of design, materials, systems, methods, installation and procedures to the contract administrator.

b) Supplemental information shall comply fully with the design intent, functional and performance requirements of the Works Information.

c) Provide such supplemental information as necessary to demonstrate compliance with the requirements of A.7 of the Specification.

A - 2.3.6. SYSTEMS, PRODUCTS AND MATERIALS PREFERENCES

a) Not Applicable.

A - 2.3.7. DETAILED_DESIGN, MANUFACTURING AND INSTALLATION TOLERANCES

a) The *Specification* together with the corresponding *Design Drawings* indicate the dimensional tolerances (hereafter referred to as "tolerances") to which the *Contractor* shall work (where relevant) for the *Detailed Design*, manufacture, sub-assembly, setting out and installation of the works.

b) The fabrication drawings shall clearly demonstrate how manufacturing and construction tolerances are to be accommodated.

c) Take account of various specified tolerances and their effect on the works. Allow for integration of following work. Inform the contract administrator of any apparent tolerance omissions, inconsistencies or incompatibilities, and their resolution.

d) Maintain the tolerances as defined and demonstrate, upon request by the contract administrator, the means by which specified tolerances shall be assured and, where appropriate, which specialist equipment and/ or methods shall be used.

e) All dimensions shall be checked on Site, confirming all dimensions critical to the works. Site measurements shall be undertaken in sufficient time to enable corrective action to be taken to the works, or if agreed by the Project Manager the work of others, to ensure an accurate fit within agreed or implied tolerances.

f) Confirm common reference points and agree with the contract administrator. Carry out dimensional checks prior to the commencement of manufacture as necessary.

g) Ensure that any dimensions are compatible and consistent with other relevant design dimensions and accumulated tolerances and movements. State and/ or show, on the fabrication drawings, the provisions made which are intended to accommodate the accumulated tolerances of adjoining or adjacent trades.

h) Inform the contract administrator of any work that does not meet the specified tolerances.

i) The works shall be free from deformation outside of specified tolerances and shall not be subject to warping, twisting and/ or perishing but remain stable, firm, free from vibrations, knocking, rattles and/ or whistles, squeaks or other such noises, taking into account known or specified conditions.

j) In the event of there being any discrepancy in the values of existing datum reference points, datum levels, buildings, foundations or other features to which the works are related, determine and report such a discrepancy to the contract administrator and obtain written instructions before proceeding.

k) The permissible tolerances stated in the *Specification* shall be progressively checked up to handover. Where two or more different tolerances can be derived by calculation and/ or from the fabrication drawings for the same dimension, the least tolerance shall apply which shall be confirmed by the *Contractor* to the contract administrator. Tolerances shall not be cumulative.

l) Method statements and safety risk assessments.

A - 2.3.8. A.3108 SUBSTITUTION AT THE TIME OF TENDER

a) Not Applicable.

A - 2.4. PRESCRIPTIVE ELEMENTS OF THE WORKS (P)

A - 2.4.1. General Requirements

a) Supply, deliver, install and warrant the works in strict compliance with the materials and workmanship requirements of the Works Information.

A - 3. SUBMITTALS

A - 3.1. PROCEDURE

a) A schedule of submittals for fabrication drawings shall be provided for agreement with the contract administrator. The schedule shall indicate the dates on which the contract administrator shall receive the required submittals. The schedule shall be correlated with the master programme and include the period for the review and reply time. Critical decision dates shall be indicated for selection of finishes and colours. The schedule of submittals shall be revised and resubmitted as necessary.

b) Provide submittals in accordance with the following:

i) Addressing of Submittals: Submittals shall be delivered to the premises identified by the contract administrator.

ii) Identification of Submittals: Each submittal shall be individually identified on a self-adhered printed label with the project name, respective Specification reference, supplier's/ manufacturer's name and product reference as appropriate. Each submittal shall be accompanied by a transmittal form containing similar information; together with the purpose for which the submittal is being made. Space shall be provided on the label on each item submitted for acceptance by the contract administrator..

iii) Numbering of Submittals: Submittals shall be numbered consecutively, and that numbering system shall be retained throughout all revisions and resubmittals.

iv) Completeness of Submittals: All relevant information shall be included within each submittal to define completely and explain each separate system of work. Submittals may be combined from various sections as necessary and furnished at one time as a single submission.

v) Variations and Substitutions: Submittals that differ from the requirements of the *Design Drawings* and the *Specification* shall be so identified.

c) Submission and Return of f*abrication drawings*/ Documents:

i) Provide a list of *fabrication drawings* proposed.

ii) Information specifically requested for each element of the works shall be provided. Additional information may be required by the contract administrator.on inspection of the *Contractor*'s submittals to allow for accurate comments to be made.

A - 3.2. TENDER SUBMITTALS

a) Provide submittals as required by the Works Information.

A - 3.3. TENDER RESPONSE

a) The Contractor to make response in accordance with the requirements of the Works Information.

A - 3.4. POST CONTRACT SUBMITTALS

a) The Contractor to make submittals as required by the Works Information.

A - 3.5. POST CONTRACT RESPONSE

a) The Contractor to make a response in accordance with the requirements of the Works Information.

A - 3.6. SAMPLES GENERALLY

a) Samples shall include various products, natural materials, fabricated items, equipment, devices, appliances or components thereof, as may be required to satisfy the visual appearance and technical requirements of the *Design*.

b) Samples shall be reviewed for their visual characteristics only and where moving or operating elements are involved, the contract administrator.shall be given the opportunity to review working samples.

c) Ranges of samples shall be provided where a considerable range of colour, graining, texture, smoothness and other characteristics may be anticipated in the works.

d) Where custom colours are specified, samples shall be submitted illustrating precise colours, textures, patterns and finishes for review by the contract administrator.

e) Where the sample sizes stated in the Works Sections are not representative to allow the contract administrator to appraise the visual characteristic of the material/ component provide samples of a suitable size.

A - 3.7. PRE-CONTRACT SAMPLES

a) Not required.

A - 3.8. POST CONTRACT SAMPLES

a) At the appropriate time provide the contract administrator.with samples indicated in Work Sections, which shall be kept as a record of materials to be incorporated in the works and used as references for controlling consistency throughout the works.

b) Post contract award samples shall comprise materials in their final form.

c) Samples shall include relevant trade literature and technical specifications.

A - 3.9. BENCHMARKS

a) Upon commencement of installation, erect complete sections of elements of the works for the acceptance of the contract administrator. These shall be used as a quality benchmark for the remainder of the works until Practical Completion.

b) Installations shall not commence in other areas of that particular trade until the contract administrator. has examined and accepted the quality benchmark. Carry out immediately any alterations or adjustments required to achieve the quality of installation required by the Works Information.

c) Upon receipt of the acceptance, fully protect the quality benchmark. It shall be used, from time to time, by the Supervisor to check and monitor quality of materials and workmanship incorporated in the remaining areas of the works, or where specifically stated for the purpose of further testing. Remove and replace all protection when requested by the contract administrator for such purposes.

A - 3.10. FABRICATION_DRAWINGS

a) Following Contract award, the required fabrication drawings, shall be submitted to the contract administrator for review.

b) The fabrication drawings shall be fully dimensioned in metric, to an agreed scale appropriate to the detail, and include:

i) Full size details and graphic representation describing materials, components and equipment, construction, finishes, provision for movements, fabrication and erection tolerances.

ii) Layouts, locations and assemblies of all types of construction detail and junctions, details of materials, method of jointing, details of all Site connections and fixing and sealing methods, finishes and all pertinent information related to:

- Method of fabrication and construction.
- Proper relation to adjoining work.
- Finishes.
- Amplification of details.
- Minor changes to the *Design* to suit actual conditions.

c) Submit fabrication drawings and do not commence fabrication of components until formally returned by the contract administrator with either 'A' or 'B' endorsed on each of the fabrication drawings. Ensure that space is left clear on each of the fabrication drawings for endorsing by the contract administrator. The following drawing codes shall be used when returning the fabrication Drawings to the Contractor:

   i) Drawing endorsed 'A' - Fabrication, manufacture or construction may proceed in accordance with the drawings submitted.

   ii) Drawing endorsed 'B' - Fabrication, manufacture or construction may proceed in accordance with the drawings submitted subject to the *Contractor* taking necessary action based on the contract administrator's comments and all annotations added to the returned drawings. Unless indicated to the contrary on such drawings, the work shall comply with the Contract Documents. To achieve 'A' status, the required number of copies of amended drawings shall be sent to the contract administrator.

   iii) Drawings endorsed 'C' - No work shall be fabricated, manufactured or constructed. Submit new drawings to the contract administrator for review until re-submission is not required.

d) The contract administrators final comment on the fabrication drawings ('A') shall be conditional upon receipt of all documentation, certification, acceptances in respect of anchorages, fire stop assemblies, samples, mock-ups and test reports as defined in the Specification.

e) When preparing the fabrication drawings consult the current Architectural, Structural and Services Design Drawings, adjusting the fabrication Drawings to allow for any changes to Site tolerances and/ or discrepancies where applicable.

f) If, before commencing or during the preparation of the fabrication drawings the design intent of the Design Drawings and/ or Specification may be affected, or where other elements of the works may be affected, notify the contract administrator immediately.

g) Where applicable, the fabrication drawings may utilise the manufacturer's standard details provided that they comply with the design intent.

h) The contract administrator shall have the right at all reasonable times to visit the *Contractor*'s (or his specialist sub-contractors) design office to check on progress.

i) The fabrication drawings shall be annotated in English and titled in the manner determined for the Contract, with the title block fully indicating the part of the works to which they apply.

j) Maintain on Site a full set of fabrication drawings, Working Drawings and technical specifications.

k) Upon completion of the design, manufacture and installation phases, provide the contract administrator of As-built Drawings.

l) No fabrication drawings shall be accepted if produced to a reduced size.

m) The fabrication drawings shall be fully co-ordinated with interfacing trades.

A - 3.11. AS-BUILT_DRAWINGS AND MANUALS

a) The Contractor provides as-built information as required in the Project Works Information.

A - 3.12. OTHER SUBMITTALS

Where required by the Works Information.

i) Prescriptive (P): Drawings issued by the Employer at the Contract Award and the Project Manager during the course of the Contract.

b) Product Data: Provide technical information detailing the characteristics of each system, system component or material incorporated in the works. This shall include material schedules and manufacturer's literature.

c) Certifications: Provide independently certified reports verifying compliance of each element or component with the requirements of the Works Information.

d) QA/ QC Programme: Provide a programme to satisfy the requirements of A.6 of the Specification, the Contract conditions or any other documents referred to in the Contract Documentation.

e) Pre-construction Testing Reports:

i) Provide technical reports recording test results systems, components and materials as required by the Works Information, the contract administrator prior to commencement of installation.

ii) These reports shall state compliance with the technical requirements of the Works Information and include, where appropriate, test certificates.

f) Maintenance/ Operation Manuals: Manuals prepared by the *Contractor* for the Client/ building user's maintenance and operation of the various building systems and/ or components thereof.

g) Supplementary Product Literature: manufacturer's catalogue information, product specifications, standard illustrations, diagrams and standard details. The supplementary product literature shall describe physical characteristics such as size, weight, finish, material analysis, electrical requirements and other information such as load tables, test results, assessments and industry quality standards.

h) Manufacturer's/Supplier'sRecommendations: Manufacturer's/ supplier's recommendations shall be contained within a formal printed document in accordance with the QA/ QC procedures.

i) Technical Calculations: These shall consist of technical engineering calculations which document technical performance of various systems, system components and/ or materials, as required by the Works Information.

j) Guarantees and warranties: Provide certified copies of all relevant guarantees and warranties available for installed materials and products.

k) Prepare and submit method statements and risk assessments for review.

l) The Contractor shall provide a post construction sustainability evaluation report to demonstrate performance against the sustainability requirements defined within the Sustainability Report, format to be agreed.

m) All submittals provided shall be written in the English language.

A - 4. PERFORMANCE REQUIREMENTS AND DATA

A - 4.1. GENERAL

A - 4.1.1. PERFORMANCE REQUIREMENTS

a) Minimum Requirements: Where there is in existence a relevant British Standard, BS code of practice, draft BS, German DIN Standard, ISO Standard, European Standard or British Board of Agrément Certificate applicable to the design, execution or performance of the works or any part thereof, then the recommendations and requirements of such documents shall be considered a minimum standard for the work described and must be complied with. Should two standards conflict notify the Project Manager of the option preferred for use.

b) The works shall comply with the latest edition of the Building Regulations unless this conflicts with the Employers Standards Baseline.

A - 4.2. DESIGN AND SERVICE LIFE

A - 4.2.1. DESIGN LIFE OF BUILDING

The design life of the works shall be in accordance with BS ISO 15686: Part 1 or as otherwise defined within the Contract or Employers Requirements.

A - 4.2.2. SERVICE LIFE OF COMPONENTS

a) Primary components are all components with a predicted service life not less than the design life of the element being specified without the need for maintenance, other than regular cleaning.

b) Secondary components:

i) Secondary components are all components that may require replacement during the design life of the building, assuming regular cleaning and maintenance has been carried out in accordance with information to be provided by the *Contractor* and his relevant suppliers.

ii) Secondary components shall be capable of easy replacement without compromising the structural or weatherproof integrity of the element being specified.

iii) Secondary components shall be capable of replacement without progressive dismantling of adjacent elements.

c) Confirm the predicted service life (i.e. the service life predicted from recorded performance or accelerated tests) and maintenance requirements of the components of the building as defined in BS 7543 and BS ISO 15686 for the review by the contract administrator and provide detailed information at Tender Stage.

d) Materials shall be used solely for the purpose intended by the manufacturer and which satisfy the requirements of the *Specification*.

e) Premature deterioration shall not be acceptable.

f) The performance criteria shall be satisfied for the full service life of the works, as stated in the Specification, provided always that the maintenance has been carried out as specified.

g) The works shall be suitable for their intended purpose and perform satisfactorily for their full design life. Elements shall be designed, manufactured, cured and tested in compliance with all relevant glazing, metal, steel and London Underground standards.

h) Selected materials shall be durable and satisfy the requirements of the Specification for the service life of the works.

i) Exposure to sunlight during the lifetime of the works shall not reduce the performance or visual appearance of any element/ component. Expected solar performance under varying conditions of solar radiation and external/ internal air velocity shall be taken into consideration.

j) The works shall perform throughout the service life without failure resulting from defects in design, materials or workmanship. Failure shall be defined as breakage, disengagement of components, deflection beyond stated values, reduction in performance or unacceptable change in appearance including breakage.

k) The works shall comply with Section 5 of Approved Document A of the Building Regulations, with regard to accidental damage/ robustness.

l) Metal sheets shall not suffer bowing, dimpling, oil canning, sagging, pillowing, rippling, warp, abrupt transitions and other visual deformation or irregularity.

m) Electro-chemical corrosion or staining resulting from water running from one material to another shall be prevented.

n) Non structural elements are to have a minimum design life of 30 years with a first maintenance life of 15 years.

o) Adequate measures shall be taken to prevent bimetallic corrosion between dissimilar metals, attention is drawn to publication British Standards Institute Practice Document PD6484 "Commentary on corrosion at bimetallic contacts and its alleviation.

A - 4.3. ENVIRONMENTAL CONDITIONS

A - 4.3.1. GENERAL

This is an Architectural Specification refer to Mechanical Engineering Works Information for particular services requirements.

A - 4.3.2. CLIMATIC DATA

Refer to the Mechanical Engineering Works Information.

A - 4.4. ENVIRONMENTAL REQUIREMENTS

A - 4.4.1. GENERAL

Refer to series clause A7 for sustainability/ environmental requirements.

A - 4.5. ACUSTIC PERFORMANCE

A - 4.5.1. GENERAL

a) The Works shall achieve sound reduction values stated in the works sections as applicable.

b) Evidence shall be provided to confirm that the acoustic requirements have been achieved.

A - 4.5.2. VENTILATION – Noise Attenuation Requirements – not applicable.

A - 4.6. SECURITY

A - 4.6.1. GENERAL

Refer to the Works Information and Employer's Security Advisors for specific requirements to be implemented in the Works.

A - 4.7. FIRE AND SMOKE

A - 4.7.1. GENERAL

a) Refer to the Works Information and Building Control Reports.

b) Unless otherwise stated in the Works Information, the Works shall be in accordance with the Building Regulations in conjunction with BS7974 where applicable.

c) Where the Statutory Authorities and/ or Local/ National Fire Regulations require specific fire resistance to elements of structure which form a junction with adjacent components, ensure that the junction is fire stopped to the same degree as the elements.

d) Supply test certificates to demonstrate that all materials met the above requirements.

A - 4.8. CORROSION PROTECTION

A - 4.8.1. GENERAL

a) Ensure that protective measures are taken to avoid any corrosion, or any deleterious effects caused by manufacturing, finishing, transportation, storage and installation of materials.

b) Ensure full resistance to any corrosion for components that are secured or bolted to each other, paying particular attention to the surface damage caused by such bolting or securing.

c) Ensure full resistance in repair of corrosion protection to cope with the Site cutting of components, especially at boundary and external conditions.

d) The minimum requirements for the corrosion protection system for secondary structural steelwork shall conform to BS 5493, BS EN ISO 12944: Parts 1-8 and BS EN ISO 14713: Parts 1,2 & 3 as appropriate. For primary structural steelwork refer to the Structural Engineer's documentation.

e) The environmental category under BS EN ISO 12944: Part 2 shall be:

i) External corrosion: refer to Structural Engineers specification.

ii) Internal corrosion: refer to Structural Engineers specification.

f) Allow for protection against all corrosion arising from exposure to seawater, non-saline water, soil, high humidity, low or high temperatures, chemical acids and alkalis, abrasion and impact, fungi and bacteria.

g) Particular care shall be taken with delivery and storage on Site, particularly if storage is prolonged. On no account shall materials or components be stored or used beyond the manufacturer's expiry date.

A - 4.8.2. GALVANISING CORROSION PROTECTION

The interval to first maintenance shall be no less than 'Very long (equal to or greater than 20 years)' as defined in BS EN ISO 14713: Parts 1,2 & 3. Refer also to the requirements for design and service life.

A - 4.8.3. ELECTROLYTIC PROTECTION

At all locations where different metals are assembled together, ensure that electrolytic corrosion does not occur and that the necessary protection is provided where needed, in both temporary and permanent conditions.

A - 4.9. EARTH BONDING LIGHTNING PROTECTION

A - 4.9.1. GENERAL

a) Refer to the Services Engineer's documentation

A - 5. QUALITY CONTROL

A - 5.1. GENERAL QUALITY ASSURANCE QUALITY CONTROL TESTING

Refer to applicable the Project Works Information requirements.

A - 5.1.1. MEANS OF AUDITING

a) Refer to applicable the Project Works Information requirements

A - 5.1.2. QUALITY CONTROL METHODS

a) Refer to applicable the Project Works Information requirements

Testing

A - 5.1.3. TESTING AND INSPECTION

a) Where required, engage an accredited UKAS or similar independent testing specialist, as agreed with the *Project Manager*, to verify that the requirements of the Contract have been satisfied.

b) Allow for testing on samples and materials incorporated in the works as necessary.

c) Acceptance shall only be given to materials that comply with the standards set out in the *Specification*. Inform the *Project Manager* of test results for materials not complying. The official certification of test results shall be given after acceptance and before manufacture of the materials.

d) Approach to testing:

i) Off-Site testing:

- The *Contractor* may provide data from previous independently certified tests and Agrément certificates to demonstrate that the proposed systems meet the performance requirements of the *Specification*. The information shall be to the entire satisfaction of the *Project Manager*. Where applicable, tests shall include static and dynamic results.
- All tests shall comply with the rules and standards laid down by the appropriate testing authorities, unless it can be demonstrated that the final design solution has been previously tested and certified to the acceptance of the *Project Manager*. In any event, the performance of the installed works shall remain the *Contractor*'s responsibility.
- If suitable data to demonstrate compliance with the performance requirements is not available, provide prototypes of each type and have them independently tested in accordance with the testing criteria indicated in the *Specification*.

ii) On-Site testing: The *Contractor* shall include for all on-Site testing specified herein.

e) Include and supply detailed proposals of tests that demonstrate compliance with the requirements of the *Specification* and the *Design Drawings*.

f) The following minimum provisions shall be made available to the contract administrator at all times:

i) Suitably qualified personnel using appropriate validated equipment.

ii) All necessary access and facilities for inspection and testing in fabrication shops and on Site.

iii) Regularly calibrated equipment for the purposes of load measuring.

g) Maintain the following:

i) Tests and inspection results during all stages of manufacture, assembly and installation of components.

ii) Certificates relating to the materials used in the work, as confirmation of tests carried out in accordance with the relevant standards and codes.

iii) Records of all inspections and tests performed to substantiate conformity with the *Specification*, including those carried out by sub-contractors and sub-suppliers.

h) Should any test reveal defective material and/ or workmanship, immediately carry out any remedial work and/ or re-testing, including that of a special nature, under instruction from *the contract administrator*.

i) If the contract administrator is of the opinion that the works do not conform to the requirements of this document, or to the details indicated on the fabrication drawings, then the contract administrator shall give instructions for special tests to be carried out to establish the case.

A - 5.1.4. AIRTIGHTNESS FAN TEST

a) Refer to Works Information requirements.

A - 5.1.5. RESULTS AND CERTIFICATES

a) Refer to Works Information requirements.

A - 5.2. STATUTORY REGULATIONS

A - 5.2.1. STANDARDS

a) BSEN Standards shall be the governing standards for the works.

b) Only where expressly stated in the *Specification* shall other standards be applicable to the works.

c) All reference to British and other standards, regulations and requirements of statutory bodies shall mean the latest published editions at the Contract date. Where such standards, regulations and requirements are amended the Contract date and affect the *Contractor*'s responsibilities during the course of the works, immediately inform the *Project Manager*.

A - 5.2.2. BUILDING CODES AND REGULATIONS

a) All materials, components, equipment and workmanship shall comply with all Local Authority Codes and Building Regulations, British Standards, and any other regulations applicable to the works, together with all relevant Statutory Rules, Regulations, Bye-Laws and other enforceable instruments in both the design and execution of the installation.

b) Unless stated otherwise, British Codes and Standards shall apply to the Building Design and Materials as listed herein.

A - 5.2.3. SUBMISSIONS TO AUTHORITIES

a) When required by the Statutory Authorities, submit to them any component part of the works for appraisal, testing, stamping or certifying.

b) After such component part has been satisfactorily approved, tested, stamped or certified, return the marked component or documentary evidence of its approval, as appropriate, to Site for reference purposes.

c) If the Statutory Authority rejects components, replace the component part(s) with those that are acceptable.

d) Obtain any approvals required from the Statutory Authorities.

A - 5.3. SAFETY / PROTECTION

Safety

A - 5.3.1. HEALTH AND SAFETY REGULATIONS

a) Comply with the latest Health and Safety Regulations, ensuring that full consideration is given to the health and safety of operatives when completing the *Detailed Design*, manufacturing, installing or operating and maintaining the works.

b) The fabrication drawings shall only incorporate methods of manufacture, installation, maintenance and use that are safe and comply with all Health and Safety regulatory requirements.

c) Provide safety risk assessments.

Protection

A - 5.3.2. DAMAGE ANTICIPATION

Other than damage through terrorist attack or similar activity, anticipate the possible sources of damage to the works and take active and positive protective measures to maintain them in pristine condition until Completion of the whole of the Works.

A - 5.3.3. PROTECTIVE DEVICES

a) Provide necessary protective devices to protect all goods and materials incorporated into the works, at all stages through to Completion of the whole of the Works against damage arising from weather conditions, construction, other contractors, warping, distortion, abrasion and other conditions which could have an adverse effect on any goods and/ or materials used in the works.

A - 5.3.4. PROTECTIVE MEASURES

Provide full details of the protective measures proposed for implementation at each of the following stages:

a) Manufacture and packaging of goods and materials at off-Site locations.

b) Shipment to Site and unloading.

c) Storage on Site and movement to point of installation or construction.

d) Installation/ construction.

e) Completion to handover.

A - 5.3.5. PACKING AND CRATING

a) Where components are delivered to the Site in packages or crates, then each package or crate shall be labelled on the outside giving the reference and quantity of the contents so that deliveries can be accepted at the Site without the necessity of breaking open any package.

b) Carefully remove all protection from the works immediately before Completion and leave the works clean and ready for use.

A - 5.3.6. PROTECTION OF GLAZED ELEMENTS

a) All elements of framework and associated beads and strips shall be stored on Site such that they shall not be damaged, distorted or weathered unevenly.

b) All finished components shall be carefully packed in stillages or crates such that they are suitably separated and protected to prevent scratching, scuffing or other surface damage.

c) All glass panes, sealants and gaskets shall be stored on Site in accordance with their manufacturer's written recommendations.

A - 5.3.7. PEST INFESTATIONS

a) The manufacture and installation of the works shall protect against and not contain or provide harbourage for infestation by pests.

b) Carry out the recommendations and take account of Digest 415 produced by the Building Research Establishment.

A - 5.4. MAINTENANCE TRAINING AND REPLACEMENT MATERIALS

A - 5.4.1. GENERAL

a) Replaceable materials/ components shall be maximised.

b) Materials shall be capable of simple maintenance/ repair and integration with other maintenance systems.

A - 5.4.2. MAINTENANCE MANUAL

a) Content:

i) The Maintenance Manual shall incorporate all maintenance systems and give details of the safe operation and required maintenance of all items, components and systems comprising the works.

ii) This information shall be supplied for the contract administrators review in the following format:

- Specially written information shall be on A4 size pages with typed text using double spacing and in a format agreed prior to submission.
- Drawn information shall generally be on A1 size sheets.

- Standard published information shall be carefully selected and edited to include only those items installed. Where editing is not appropriate, the relevant items shall be typed out and included.

b) Component Information: The following information shall be supplied for every item, component and/ or system:

i) Certified manufacturing certificate.

ii) Full description giving any special features. A full breakdown of the parts and the catalogue number of the constituent parts.

iii) The guarantee period of any element or material where in excess of the warranty required by the Contract Documents.

c) Maintenance Procedures: The Maintenance Manual shall include fully comprehensive details in respect of:

i) Safe cleaning procedures for all elements of the works.

ii) Safe replacement procedures.

iii) Regular cyclical maintenance procedures (avoiding damage).

iv) Safe repair procedures in the event of damage.

v) Washing methods, including the frequency and method of washing required to maintain performance and appearance. Details shall be provided in respect of the maximum time during which performance of components can be maintained, together with the frequency and method of washing required to achieve this.

A - 5.4.3. TRAINING OF USER'S PERSONNEL

a) Not Applicable.

A - 5.4.4. SPARES

a) Where required by the Contract, provide spares upon completion of the works.

b) All spares shall be of identical quality to those installed in the works.

c) In addition, supply a list of recommended spares, together with unit prices for specialist elements of the works.

d) All spares provided as part of the works shall be handed over in crates, boxes or cabinets, each individually marked with the words "Replacement Parts for .. " and the component or equipment name and reference number stencilled on. Such materials shall be identified within the Contract Documents.

A - 5.4.5. PROJECT COMPLETION RECORDS

a) Provide necessary Maintenance Manual information for inclusion in the Health and Safety File.

b) In addition, agree with the Project Manager suitable cross-referencing in the Maintenance Manual so that it is fully co-ordinated with the Health and Safety File and other contractors' O&M manuals.

A - 5.5. GENERAL MATERIALS AND WORKMANSHIP REQUIREMENTS

Materials

A - 5.5.1. STANDARD OF MATERIALS AND QUALITY

a) Materials shall be new, unless otherwise specified, carefully selected and of the best merchantable quality.

b) All materials shall be acceptable to the *Project Manager*.

c) Preference shall be given to materials/ products that comply with the European Union (EU) Construction Products Directive (CPD) and are physically labelled with CE marking.

d) Materials shall comply with all the recommendations of the LPC Design Guide for the Fire Protection of Buildings.

e) Foamed insulation used in the works shall be manufactured using HFC- CFC- and HCFC-free processes, i.e. zero ODP and a global warming potential of less than 5.

f) Insulated foam core sandwich panels shall not be used in the works unless the *Contractor* complies with all the recommendations of:

i) The LPC Design Guide for the Fire Protection of Buildings 2000 from the date of its first publication in December 1999 or any subsequent guidance which supersedes this edition, or

ii) Factory Mutual (FM) Approval standards, or

iii) Independent fire consultants such as Arup Fire or Warrington Fire.

iv) BS 476: Parts 6 and 7.

g) Insulation materials shall be either non-combustible or not easily ignitable (to a minimum of Euroclass A2 and other applicable international standards), and shall not produce measurable quantities of smoke or toxic gases.

A - 5.5.2. HEALTH HAZARDS

All proposed materials shall not in any way be a potential health hazard. Maintain a full, up-to-date knowledge of all current published research and legislation in this respect. The *Contractor* shall also accept the exclusions contained in the Contract documents.

Workmanship

A - 5.5.3. SKILLED PERSONNEL

Execute the work using persons skilled in the processes to be adopted. Where requested, provide such documentation necessary to demonstrate an individual's ability to carry out the work to which he has been assigned.

A - 5.5.4. SUITABILITY OF STRUCTURE

Before commencing any part or element of the works, survey the structure, checking line, level and fixing points and report immediately to the *Project Manager* if the structure is considered to be unsuitable. If the structure is unsuitable, propose remedial action.

A - 5.5.5. SETTING OUT

a) Establish a physical Base Reference Datum on Site from which all primary plan positioned grids and principal levels are subsequently set out. This Base Reference Datum point shall be strategically placed such that it can be referred to as necessary for the duration of the works. It shall be physically robust and located in ground that is not prone to movement or vibration during the works so that it is spatially fixed for the duration of the works. The Base Reference Datum shall be located to within ±2mm accuracy of the design dimension to the designated reference point.

b) Suitably qualified personnel shall carry out all primary setting out. It shall be done using instruments and methods appropriate for achieving the necessary precision and accuracy.

c) Prior to commencing the installation, submit to the contract administrator the proposed method of setting out, how grid lines shall be marked on Site and how their positions shall be checked and maintained for the duration of the works.

d) The plan position of any designated mark (measured to its centre) defining a Primary Positional Grid Line shall be located to within ±2mm of its design dimension from the Base Reference Datum.

A - 5.5.6. PROJECT TOLERANCES DEFINITIONS

a) Tolerance: The defined maximum allowable dimensional deviation from a prescribed or agreed value or position.

b) Base Reference Datum: The physical marker established on Site to define the base reference plan and level position to which all other Site setting out is referenced.

c) Dimension: Any prescribed dimension, or any dimension which can be determined from a set of prescribed dimensions, for any element or part thereof as defined by the designer responsible for that element.

d) Primary Positional Grid Line: Any setting-out grid line used to define the spatial layout of the project and to which the local setting out of elements may be referenced.

e) Location Reference Point: A specified point that is used to define the position of certain other points and/ or elements.

f) Location Reference Plane: A specified plane that is used to define the position of certain other planes and/ or elements. The reference plane shall typically be defined by a specified set of reference points.

g) Location Reference Surface: A specified surface that is used to define the position of another surface and/ or surfaces. The reference surface may be defined mathematically (e.g. as part of a cylinder or as part of a sphere) where it is spatially fixed in relation to specified reference points.

h) Reference Element: A specified element that is used to define the position of other elements. Typically, a specific point on the reference element shall be defined to any other element to which it refers.

A - 5.5.7. COMPATIBILITY

Ensure that all materials and processes employed in the works are compatible with each other and meet the current requirements of the relevant British Standards, Codes of Practice and the Employers Standard Baseline.

A - 5.5.8. MANUFACTURER'S RECOMMENDATIONS

a) The method of building or installing the works shall be in accordance with manufacturer's written instructions/ recommendations, with copies of all such documentation being supplied to the contract administrator prior to commencement of the works.

b) All materials and associated components shall be stored in a clean dry area, in accordance with the manufacturer's recommendations.

A - 5.5.9. SUPPLIERS

Be responsible for all materials, components and equipment supplied or manufactured by sub-contractors or suppliers, until the end of the warranty period defined in the Contract.

A - 5.5.10. COVERING UP

Refer to CRL NEC Contract.

A - 5.5.11. CUTTING

a) All methods, principles, details, etc. for Site cutting of components shall be submitted as part of the *Contractor*'s method statement to the *Project Manager* for review. No manufacture shall commence until it can be demonstrated that all proposed techniques have been reviewed by the contract administrator.

b) Cutting of metal products shall be straight and free from burrs and all joints shall be flush, without gaps or imperfections. If base metal is exposed, the surface shall be protected to the same level of protection as stated in the *Specification*.

c) All edges, unless specifically required otherwise by the *Specification*, shall be lightly arrised and smooth, free from sharp surfaces, snags or points.

A - 5.5.12. DETERIORATION

a) All materials shall be treated/ selected to prevent any damage from all possible combinations of atmospheric deterioration, corrosion, wet rot, dry rot, fungi, mould and all other deleterious effects including atmospheric pollution and pH factor of the adjacent elements.

b) Ensure that no chemical or electrolytic action takes place where dissimilar metals and/ or materials are used together.

c) No materials shall discolour, crack or otherwise be damaged by the worst possible combination of environmental conditions identified herein.

d) With materials subject to surface treatment, special attention shall be given to the substrate to ensure that the preparation is compatible with the surface treatment.

e) Ensure that all superficial dust and friable materials are removed and that adequate protection is provided during the process of the surface treatment and finishes to prevent contamination by dust and other debris.

f) Materials used in the manufacture of the works shall not be liable to infestation attack by micro-organisms, fungi, insects or other vermin, nor provide harbourage for same.

A - 5.5.13. LINE AND LEVEL

All components shall be installed such that they are plumb or horizontal and shall line up with adjacent components, in all directions, taking account of the allowable tolerances as defined in the *Project Common Tolerance and Movement Document*.

A - 5.5.14. METHOD STATEMENTS

Provide detailed method statements describing the sequence and methods to be employed in carrying out the works identifying proposed solutions and processes with regard to workmanship, fabrication, fixing, securing, storing and handling, setting out, site assembly and protection.

A - 6. SUSTAINABILITY/ ENVIRONMENTAL REQUIREMENTS

A - 6.1. CLIENTS ENVIRONMENTAL POLICY

A - 6.1.1. GENERAL

Refer to the Employers Requirements as applicable.

A - 6.2. SCOPE REQUIREMENTS AND RESPONSIVBILITIES -

A - 6.2.1. SCOPE DEFINITIONS

a) 'Environment':

i) Where the term 'Environment' and its derived terms such as 'Environmental', are used within the 7 series clauses of Section A of the *Specification*, it shall be considered within the context of Sustainability. It therefore refers to the impact the works have on the environment.

ii) Where the term 'Environment' and its derived terms such as 'Environmental', are used within the 5 series clauses of Section A and the 1.4 series clauses within Work Sections A to Z, it shall be considered within the context of Performance. It therefore refers to the prevailing environmental conditions and the requirement for the works to withstand the impact of such conditions.

b) 'Sustainability Performance Targets':

i) Where alternative sub-contractors/ suppliers/ products are proposed the Sustainability Performance of the alternative shall be included within the submittal for consideration by the contract administrator.

A - 6.2.2. SUSTAINABILITY AIMS

a) The sustainability aims for the project shall be as follows:

i) Energy: Reduce energy consumption and increase energy efficiency through the building fabric and form.

ii) Water: Minimise water consumption and maximise re-use of water.

iii) Materials: Maximise responsible use of materials.

iv) Waste: Implement waste hierarchy and ensure responsible waste disposal.

v) Noise and Vibration: Consider acoustic insulation of buildings - between individual units, and between interior/ exterior.

vi) Climate Change: Minimise the Site's greenhouse gas emissions and contributions to global warming and ensure facilities will be adaptable to the changing climatic conditions.

vii) Health, Welfare and Comfort: Maximise and promote health, welfare and comfort.

b) The aims as stated within the A.7 series and in relevant Sections of the *Specification*.

c) The works including its materials and components shall be designed, purchased, fabricated, and/ or installed in line with the specified aims.

A - 6.2.3. REFERENCE

The clauses in Section A.7 contain general information and shall be read in conjunction with the following:

i) Works Information.

ii) Work Sections A to Z the *Specification*.

b) Other Contract Documents.

Requirements and Responsibilities

A - 6.2.4. NATURE OF REQUIREMENTS

Whether generic or specific in content, the requirements stated within the *Specification* shall implicitly or explicitly be mandatory, prohibitive, or preliminary in their nature as defined below:

a) Mandatory: These refer to provisions that the contract administrator considers that the *Contractor* shall include in the works to achieve the sustainability requirements.

b) Prohibitive: These refer to provisions that the contract administrator considers the *Contractor* shall exclude from the works to achieve the sustainability requirements.

c) Preliminary: These refer to requirements that the contract administrator requests the *Contractor* to give further consideration to in deciding what/ how provisions shall be included in the works to achieve the sustainability requirements. The contract administrator *r* shall submit documentation that instructs the basis for the *Contractor*'s design.

A - 6.2.5. CONFLICTING REQUIREMENTS

The *Contractor* shall bring to the attention of the contract administrator for consideration, any matters such as performance requirements within this the Works Information, which the *Contractor* considers to be in conflict with the above stated Sustainability aims and requirements of the *Specification*.

A - 6.2.6. ENVIRONMENTAL STANDARDS

The following, which are not listed in any particular order, shall be the standards that form the basis for judging compliances within the industry. The *Contractor* shall bring to the attention of the *Project Manager* areas of conflict between these standards:

a) European Union CO_2 Reduction Targets.

b) BRE Certification Environmental Profiles and The Green Guide to Specification.

c) Approved Document E to the Building Regulations for England and Wales - Resistance to the passage of sound.

d) Approved Document L to the Building Regulations for England and Wales - Conservation of fuel and power.

A - 6.3. PERFORMANCE REQUIREMENTS

A - 6.3.1. DURABILITY

a) Refer to A.5.2 series clauses.

b) Materials, systems and components shall be:

i) Durable and have a high life expectancy preventing the need for frequent replacement.

ii) Robust providing protection against potential malicious or physical abuse. The external wall construction, to areas subject to vehicle movement, shall incorporate additional measures to protect the façade from damage from vehicle movements to the acceptance of the contract administrator.

iii) Reusable at the end of the building's useful life where possible.

A - 6.4. BUILDING ELEMENTS

Assessments

A - 6.4.1. GENERALLY

a) The *Contractor* shall use recognised methods as stated herein, or other internationally recognised methods acceptable to the contract administrator and shall comply with the requirements.

b) Any modification and implications to the methods stated herein shall be submitted to the *Project Manager* for acceptance.

A - 6.4.2. BREEAM Rating Distribution

The distribution of building elements within the project that shall meet the following ratings:

a) Not applicable.

A - 6.4.3. ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

Responsible Sourcing of Materials, suppliers of materials must have a certified Environmental Management System (e.g. ISO14001, EMAS, BS8555) in place covering the manufacturing process for each material.

Where available, a certified Environmental Management System should be provided from suppliers covering the extraction process for the raw materials used as part of the manufacturing process.

A - 6.4.4. ALTERNATIVE METHODOLOGIES

The *Contractor* may propose an alternative construction component assessment methodology, for which he must provide documentary justification, for acceptance by the contract administrator.

A - 6.4.5. GREENSPEC

Not required.

A - 6.5. PRODUCTS AND MATERIALS

General

A - 6.5.1. SOURCING MATERIALS

Maximise the proportion of materials that shall be responsibly sourced and demonstrate that consideration has been given to the use of materials meeting the following criteria:

a) Energy, greenhouse gases and global warming:
   i) Low embodied energy.
   ii) Lean material and construction.
   iii) Less Greenhouse Gas (GHG) / Ozone Depletion Potential (ODP) in manufacture, use and/ or demolition and disposal.
   iv) Low operational energy.

b) Environmental certification.
   i) Environmental management system (EMS) certification, refer to A.7.4 series clauses.
   ii) Sustainable sources of timber, refer to A.7.5 series clauses.

c) Natural resources:
   i) Renewable and abundant.
   ii) Rapid renewal.
   iii) Salvaged, refurbished and reused materials.
   iv) High recycled and recyclable content.
   v) Commonly recycled.
   vi) Agricultural and industrial byproducts.
   vii) High reclaim / reuse/ recyclable potential.
   viii) Adaptable and flexible.
   ix) Appropriately durable with low maintenance demand.

x) Alternative replacement materials (for example, cement replacement such as pulverised fuel ash (PFA) or ground granulated blast furnace slag (GGBFS)).

d) Toxicity to the environment:

i) Minimal life cycle toxicity.

ii) Eliminated life cycle carcinogen.

iii) Low or zero Global Warming Potential (GWP).

iv) Zero ODP (zero ozone depletion potential).

v) All foamed insulation used in the works shall be manufactured using HFC- CFC- and HCFC-free processes, i.e. zero ODP and a global warming potential of less than 5 with a target of zero GWP.

vi) Low or zero VOC content.

e) Locally sourced:

i) Maximise the use of building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 200km of the project Site.

Maximise the use of recycled aggregates obtained on Site/ from Site within a 30km radius or from a recycled, non-construction post-consumer (post-industrial) by-product source.

A - 6.5.2. EMBODIED ENERGY

The Contractor must:

a) Inform Project Manager which country(/ies) the materials are proposed to be sourced from and where the product is manufactured. Provide information on the road miles travelled of raw materials to manufacturing facility and of the product to the contract administrator.

b) State the embodied energy in the materials (expressed in kilograms of carbon dioxide equivalent per kilogram of material), calculated in accordance with ISO14064, PAS2050 or the Green House Gas (GHG) Protocol or other equivalent, internationally recognised method for calculating embodied energy:

i) ISO 14064 is the International Organisation for Standardisation's standard for the quantification and reporting of greenhouse gas emissions and removals. For further guidance see: http:/ /www.iso.org/ iso/ catalogue_detail?csnumber=38381.

ii) PAS 2050 is a Publicly Available Specification (PAS) produced by the Carbon Trust and Defra with the British Standards Institute for using life cycle assessment techniques and principles to measure the embodied carbon emissions from goods and services across their lifecycle and examine the carbon emissions of supply chains. For further guidance see http:/ /www.bsigroup.com/ en/

iii) Standards-and-Publications/ Industry-Sectors/ Energy/ PAS-2050/ .

iv) The GHG Protocol is a greenhouse gas accounting and reporting standard for business produced by the World Resources Institute and the World Business Council for Sustainable Development. For further guidance see: http:/ /www.ghgprotocol.org/ standards/corporate-standard.

c) Demonstrate that the supplier has investigated options for reducing the embodied carbon of the materials, by reporting steps taken to reduce the embodied energy of the product (e.g. reducing vehicle movements, use of rail and water for bulk transport, or use of renewable energy technologies).

A - 6.5.3. DELETERIOUS MATERIALS

The following materials shall not be used in the works unless it can be demonstrated, to the satisfaction of the *Project Manager*, that they are safe during manufacture, installation and use and that their suitability is ensured:

a) Asbestos or asbestos-containing products, as defined in the United Kingdom's The Control of Asbestos Regulations 2006, or any statutory modification or re-enactment thereof.

b) Lead where the metal or its corrosive products may be directly ingested, inhaled or absorbed. Applications of lead such as roofing, flashings, rainwater goods and copper alloy fittings containing lead which are specifically required are acceptable, until equal or better alternatives are available.

c) Lead based paints and primers.

d) Urea formaldehyde foam or materials which may release formaldehyde beyond British Standard limits.

e) Pitch polymer DPC.

f) Materials which generally comprise mineral fibres, either man-made or naturally occurring, which have a diameter of 3 microns or less and a length of 200 microns or less, or which contain any fibres not sealed, encapsulated, or otherwise stabilised to ensure that fibre migration is prevented. Products that may contain these fibres include insulation, fire protection and air filters. For all mineral fibre insulation products, test evidence must be available and produced confirming that the materials fulfil the requirements of European Directive 97/ 69/ EC and the Approved Supply List of current HSE CHIP Regulations and consequently are not classified as a possible human carcinogen.

g) Chlorofluorocarbons or hydrochlorofluorocarbons or any goods and/ or materials containing the same (e.g. materials in which CFCs, HCFCs or HFAs have been used as blowing agents)

h) High alumina cement in structural elements.

i) Wood wool slabs in permanent formwork to concrete or in structural elements.

j) Calcium chloride in admixtures for use in reinforced concrete.

k) Aggregates for use in reinforced concrete which do not comply with BS EN 12620 and aggregates for use in concrete which do not comply with the provisions of BS EN 1992.

l) Polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs) or any goods and/ or materials containing the same.

m) Sea dredged aggregates that do not comply with the chloride limits specified in BS EN 206: Part 1, BS EN 12620, BS EN 1744: Part 1 and BS 8500.

n) Lindane - wood treatment/ insecticidal spray.

o) Pentachlorophenol (PCP) or timber treated with Pentachlorophenol - biocide/ wood preservative.

p) Chromated Copper Arsenate (CCA) timber preservative treatment.

q) Tributyltin (TBT).

r) Medium density fibreboard (MDF) which is neither zero formaldehyde nor conforms to class E1 according to BS EN 13986.

s) If wishing to use any of the materials that are listed above, prepare detailed observations for the contract administrator based upon the guidelines contained within the document 'Good Practice in the Selection of Construction Materials' prepared by Ove Arup & Partners.

t) The supplier must demonstrate that the materials will not be hazardous in the event of a fire. In particular, the supplier must confirm that:

i) Any powder coatings contain no materials that might be toxic in the event of a fire (e.g. Epoxy Resin coating), and

ii) Any laminated glass will not produce toxic or irritant fumes in the event of fire.

A - 6.5.4. SUSTAINABLE SOURCES OF TIMBER

a) All timber and wood based products for both temporary and permanent uses within the works shall be procured only from Legally Sourced Timber and from Certified Sustainable Sources.

b) Legally Sourced Timber means timber sourced in accordance with the definition of Legally Sourced Timber in BREEAM Credit Mat 5 - Responsible Sourcing of Materials, AND which is not listed on Appendix I of the Convention on the International Trade in Endangered Species (CITES); or if a timber species is listed in Appendix II or III of CITES, that the timber is the subject of a valid, legal import permit or certificate issued in accordance with CITES Article VI. Information about CITES can be found at http://www.cites.org/ . Authentication documentation for any hardwood timber should be carefully checked.

c) Certified Sustainable Sources means timber that carries the Forest Stewardship Council's (FSC) Trademark or has a certified FSC Chain of Custody certificate or that fits the definition of a Tier 1 Legal and Responsibly Sourced product in BREEAM Credit Mat 5 - Responsible Sourcing of Materials (i.e. CSA, SFI with CoC, PEFC, or Reused Timber).

d) Tropical hardwoods in timber or timber-based products (including but not limited to veneers, lippings and manufactured board) shall be avoided. Where use of tropical hardwoods cannot be avoided, all tropical hardwoods must be sustainably sourced (FSC or accepted equivalent as per sub-clause d)) AND must not be listed on any of the CITES appendices for endangered or threatened species (Appendix I, II, or III).

e) Tropical hardwoods or timber-based products from unsustainable or unknown origin are prohibited from use in the works.

f) All timber and timber-based products shall carry the Forest Stewardship Council's (FSC) Trademark or other label from an equivalent internationally recognised, globally applicable, independent certification system for good forest management, acceptable to the BRE.

g) All plywood used in the works shall preferentially be from softwood or temperate hardwoods from sustainable sources. Where use of tropical hardwoods cannot be avoided, all tropical hardwoods must be sustainably sourced (FSC or accepted equivalent as per sub-clause d)) AND must not be listed on any of the CITES appendices for endangered or threatened species (Appendix I, II, or III).

h) Provide information to the *Project Manager* in respect of timber products proposed for use in the works for review and acceptance by the *Project Manager*. No timber products shall be procured prior to acceptance of the proposed timber products by the *Project Manager*. The information shall be presented to the *Project Manager* in tabular form under the following headings:

   i) Country of Origin.
   ii) Trade Name.
   iii) Botanical Name.
   iv) Wood Product Volume Category A (m^3).
   v) Wood Product Volume Category B (m^3).
   vi) Wood Product Volume Category R (m^3).
   vii) Total Volume (m^3), where timber is:
      - Category A: From an FSC certified forest.
      - Category B: From a known certifiable forest.
      - Category R: Recycled material.

i) Proof of the source of supply and all chain of custody certificates, including full shipping documents to confirm the chain of custody from the concession/ plantation to the supplier's premises, shall be supplied for retention by the contract administrator.

End of Section

K10. PLASTERBOARD DRY LININGS / PARTITIONS / CEILINGS

K10 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

K10 - 1.1. SPECIFICATION TYPE

K10 - 1.1.1. DESCRIPTIVE WORKS:

a) Supply, install and warrant the works whilst complying with the visual intent indicated on the *Design Drawings* and criteria stated in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*, propose suitable materials and systems prior to Contract award which comply with the visual intent and performance criteria stated and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the *Project Manager*'s design intent only. The *Contractor* may complete the installation using that product, or such other confirmed as acceptable by the *Project Manager* in writing, but shall remain fully responsible for the *Detailed Design* and performance of the works.

K10 - 1.2. SYSTEM DESCRIPTIONS

Architectural and Functional Requirements

K10 - 1.2.1. SCOPE

General: New plasterboard partitions are to be provided to form new walls between individual rooms in the security office back of house areas including the security room itself, the break out area, WC and kitchen/locker area. On existing external walls to the east side of the works area, mineral wool insulation is to be provided between studs to improve the thermal performance of the external wall surfaces. None of these partitions are to be loadbearing and should interface with the new suspended ceiling above. The following partition types are specified;

a) TYPE IWS-10 Standard metal stud wall plasterboard partition, Gyproc plasterboard taped and filled, painted finish. Applied softwood timber skirtings.

b) TYPE IWS-20 Metal stud wall plasterboard partition, with WBP 12mm ply lining on inside face of wc walls to receive ceramic tiled wall surface. Gypsum plasterboard with higher density core to improve sound insulation to WC to BS EN 520, Type D. Non-tiled surface to be taped and filled, finish. Applied softwood skirtings.

c) Type IWS 30 Metal stud wall plasterboard for security office partitions, security mesh reinforcement behind on face of plasterboard to extend to structural slab level above, taped and filled, painted finish. Applied timber skirtings. Note penetrations for services need to be coordinated with the security mesh, which needs to extend to structural slab level above to avoid intruder access from above the suspended ceiling. Openings in the mesh should not be larger than 100mm in height or width, without agreement of the architect, to maintain the security line above the ceiling.

d) Type IWS 40 – Insulated plasterboard linings to external wall surfaces. Plasterboard linings are to be installed on 100mm thick treated softwood battens, with 70mm thickness mineral wool bats installed between studs and aligned with the front face of the studs to allow for a 25mm cavity between the bats and existing external wall surfaces. Vapour barrier to be provided between insulation and external wall surface. Insulation is to continue to the structural wall head and extend above suspended ceilings to provide insulation for the full height of the external wall. Timber studs are to be used in place of pressed metal studs to reduce cold bridging between the external wall surface and the new internal wall linings.

Note: There is an asbestos lined beam running north-south above the existing suspended ceiling (see architect's drawings for approximate location). This will be encapsulated with any residual debris removed prior to the main contract commencing and will be clearly labelled. Partition framing generally and security mesh for IWS30 must not fix to this beam. The final alignment of partition framing and security mesh fixings to the slab above should be reviewed with the architect prior to installation. It may be necessary to 'splay' the security above suspended ceiling level to avoid fixing to it.

See section P10 for details of insulation details.

K10 - 1.2.2. GENERAL:

a) Systems and products shall be generally from a single manufacturer such as British Gypsum Ltd, or acceptable equivalent.

b) Indicative setting out and service conditions shall be as indicated on the Design Drawings. Indicated fixing zone dimensions do not include plaster skim or other applied finishes.

c) The works shall accommodate all architectural and functional features indicated on the Design Drawings, whilst maintaining the fire and acoustic performance.

d) The Design Drawings do not identify all the framing and supporting accessories:

   i) Lining and partition systems shall include all channels, fixings, fixing straps, timber sections/ noggings, bearers, retaining clips, angles, trims, firestops, sealants, beads, edges, corner reinforcements, control joints, tapes, compounds and other accessories recommended/ supplied by the manufacturer to suit the service conditions. Galvanised mild steel where applicable.

   ii) Where lining and partition systems are to receive wall tiling, stud centres shall be reduced in accordance with the manufacturer's recommendations.

   iii) Ceiling/ bulkhead systems shall include all necessary secondary support, connecting clips, nuts and bolts, fixings, firestops, sealants, beads, edges, corner reinforcements, control joints, tapes, compounds and other accessories/ components recommended/ supplied by the manufacturer to suit the service conditions. Galvanised mild steel where applicable.

   iv) Additional support shall be provided at openings for doors, access hatches and service penetrations.

e) Finishing:

   i) Unless specified, or indicated otherwise, outer lining plasterboards shall be taper edged, taped, filled and finished with plaster skim, suitable to receive applied finishes. Refer to Section M20 of the *Specification*.

   ii) Skim plaster shall not generally be applied to moisture resistant plasterboard, unless the moisture resistant plasterboard has been used for temporary moisture resistance during construction.

   iii) Where skim plaster is applied to moisture resistant plasterboard, use a suitable bonding agent in accordance with the manufacturer's recommendations.

   iv) Flush jointing (tape and fill) shall only be used if samples of the joints have been accepted by the *Project Manager*.

v) Where partitions/ linings are to receive ceramic tiling, there shall be no plaster skim finish to allow for fixing of tiles directly to the plasterboard. Any tapered edge joints included within the tiling area shall be filled with tile adhesive as part of the tiling works.

f) Where fire ratings of systems are indicated, these shall be deemed to be for integrity and insulation.

g) Where acoustic values are stated, these shall be deemed to be based on laboratory derived results, in accordance with BS EN ISO 140: Part 3.

h) All systems shall be sealed at the perimeter and at penetrations to maintain the fire and/ or acoustic performance in accordance with the system manufacturer's recommendations.

i) Systems shall include cut-outs for light fittings, switches, socket outlets, and other services as indicated on the Design Drawings. The setting-out of ceiling supports/ hangers shall be co-ordinated with any services within the ceiling voids.

j) Where indicated on the Design Drawings, systems shall include access panels, which shall maintain the performance of the system into which they are installed.

k) Where the works will be subject to wet conditions such as in shower rooms/ kitchens, the outer facing plasterboard shall be replaced with moisture resistant type with equivalent fire/ acoustic performance to that indicated in the system description.

l) Plasterboard linings and partitions shall provide complete integrated systems spanning from the structural floor slab to structural soffit, unless otherwise indicated on the *Design Drawings*, and shall maintain any required fire and acoustic performance throughout.

m) Deflection details to all heads/ abutments shall be provided to suit the service conditions and predicted deflections.

n) Internal fixing plates, plywood pattresses and timber noggings shall be provided where necessary to support surface-mounted fixtures and fittings.

o) Liaise with the Mechanical and Electrical Engineer and sub-contractors appointed for services related works to ensure that access panels and ceiling mounted services are located to suit the design intent.

p) Socket outlet, switch and data outlet boxes, etc. shall not be located back to back. Detailing of such boxes shall be in accordance with the manufacturer's recommendations.

K10 - 1.3. PERFORMANCE REQUIREMENTS

Comply with the general performance of Section A and the following specific performance requirements.

K10 - 1.3.1. STANDARDS

The Contractor and Subcontractors developing the design is to comply with the current versions of the prevailing Standards .

Structural

K10 - 1.3.2. GENERAL:

Refer to Section A.

K10 - 1.3.3. SPECIFIC MOVEMENTS;

a) Any necessary joints shall accommodate the maximum movements likely to occur at that point.

b) The works shall withstand all static and dynamic design loads imposed, without causing permanent deformation of components or the failure of components, and shall transmit such loads safely to the points of support.

c) The works shall not deflect under loading in any way that is detrimental to any element of the works, adjacent structures or building elements.

d) All components, couplings and fixings shall be installed in such a manner as to be capable of accommodating deflection and tolerances without distortion, deformation or failure.

e) The works shall withstand all vibrations caused by wind effects or any other such shocks, strains, stresses and movements, including the vibrations of smoke extractors and other mechanical ventilation devices that may occur. These shall not cause fracture or deterioration of any element, particularly to any movable or openable element. Suitable devices for absorbing or damping any such vibration shall be included.

K10 - 1.3.4. SPECIFIC DEAD LOADS;

a) The works shall accommodate the following dead loads without any reduction in performance:

   i) The works' own dead load to be accommodated locally, and without causing deflections or movements which adversely affect any component parts.

   ii) The dead loads derived from permanent fixtures or services attached to the surfaces of the works, where indicated on the *Design Drawings*.

b) When calculating loads the worst combination shall be considered, taking account of the fact that the pressure coefficients at various locations may determine more than one design criterion.

K10 - 1.3.5. SPECIFIC LIVE LOADS:

a) Vertical partitions and dry lining shall be capable of accommodating the following live loads without any reduction in performance or distortion:
   i) Horizontally applied loads acting on the surface of any component. The works shall sustain safely, without reduction in performance and without permanent deformation to any component, a static 500N load applied horizontally through a square of 100mm sides on any part of the framing.
   ii) A horizontal line load applied to the works, due to the occupants, in accordance with BS 6180 and BS EN 1991: Part 1-1.
b) The works shall be capable of accommodating, without any reduction in performance or appearance, loads resulting from vibration caused by services installations or any fixture, fitting or component within, or bearing onto, the works.
c) Comply with the duty category for partition/ lining systems generally and severe duty to circulation spaces in accordance with the requirements of BS 5234: Part 2.

K10 - 1.3.6. DEFLECTION:

Head deflection detail to be provided to accommodate the structural movements indicated in the Structural Engineer's Specification and Drawings.

Environmental Performance

K10 - 1.3.7. MOISTURE RESISTANCE:

a) All core materials shall be moisture resistant to satisfy the design life requirements for the environmental conditions specified in Section A of the *Specification*.
b) All adhesives, fixings and associated elements shall have moisture resistant properties to match core materials.
c) Where required, timber shall be subjected to controlled drying to ensure that the moisture content is appropriate for the situation of the finished works. Timber shall remain stable and free from expansion, contraction or other movements that may lead to degradation, loss of appearance or performance.
d) Ensure that the moisture content of all materials is appropriate to the conditions of use and that the components withstand the prevailing levels of relative humidity both in construction and use.
e) Ensure that all materials including supports, bracketry and all fixings are adequately corrosion protected to meet the specified environmental conditions.

Acoustic Performance

K10 - 1.3.8. SOUND INSULATION;

a) The works shall provide the sound insulation levels specified below, which shall be achieved on Site for each type, inclusive of all services penetrations and interfaces with other elements.

b) The Weighted Sound Reduction Index (Rw) and the Weighted Apparent Sound Reduction Index (R'w) shall be defined according to BS EN ISO 717.

c) The partitions shall comply with the requirements of the *Specification* in relation to sound insulation.

d) Provide certificates from a UKAS (or acceptable equivalent) accredited laboratory confirming that the wall constructions meet the laboratory performance requirements where requested.

Fire

K10 - 1.3.9. PARTICULAR FIRE RATINGS;

a) The works shall be classified as 'materials of limited combustibility' as defined in the Building Regulations. Linings shall satisfy approved document B2 and generally achieve a BS EN 15102 C-s3 d2 rating or Class 1 rating or better when tested in accordance with BS 476: Parts 6 and 7.

K10 - 1.4. MATERIALS

Support System

K10 - 1.4.1. PARTITION STUDWORK:

a) The support system shall be as recommended by the manufacturer.

b) Additional supports shall be provided as required to maintain integrity and performance at service locations, penetrations and openings.

c) Metal studwork shall be fabricated from hot-dip zinc coated and iron zinc alloy coated sheet steel to BS EN 10143, being not less than 0.55mm thick fixed by zinc or cadmium plated self-drilling and self-tapping countersunk headed screws.

K10 - 1.4.2. FRAMEWORK TO CEILINGS:

Provide a suitable support system.

Plasterboard

K10 - 1.4.3. STANDARD PLASTERBOARD:

Aerated gypsum core plasterboard to BS EN 520, Type A.

K10 - 1.4.4. MOISTURE RESISTANT PLASTERBOARD:

Gypsum plasterboard with silicone additive water protection and water repellent paper liners to BS EN 520, Types A and H1.

K10 - 1.4.5. ACOUSTIC PLASTERBOARD:

Gypsum plasterboard with higher density core to improve sound insulation to BS EN 520, Type

K10 - 1.4.6. FIXING PRODUCTS;

a) Fixings shall be as recommended by the manufacturer being suitable and adequate to comply with the Specification.

b) Fixings within the framing components shall not be visible.

c) Fixings shall be zinc or cadmium plated, self-drilling and self-tapping countersunk headed screws.

d) Refer also to Section JZ20 of the Specification.

e) Insulation

K10 - 1.4.7. VOID FILLING MATERIAL:

a) The insulation shall be inert, durable, rot-proof and vermin-proof and not be degradable by moisture, temperature or water vapour.

b) The insulation shall not bulge, sag, delaminate or detach during its installation or in situ during the life of the works.

c) Insulation shall have zero Ozone Depleting Potential (ODP), be CFC and HFC free and have a Global Warming Potential (GWP) of less than five.

d) Insulation shall be selected to meet the recommendations of 'The Green Guide to Specification' and shall have a minimal environmental impact when assessed using BREEAM criteria.

e) The selected insulation shall comply with all relevant British Standards and be BBA certified.

f) Mineral fibre mat to comply with BS 3958: Part 5.

Accessories

K10 - 1.4.8. BEADS, JOINTS AND ANGLES:

a) Beads/ angles: Galvanised mild steel edge beads to suit the plasterboard thickness to form a positive perimeter edge.

b) Metal corner reinforcement angles to all exposed arrises, to the board manufacturer's written recommendations.

c) Galvanised mild steel dry lining movement control joints.

d) Primary movement joints: 5mm gasket seals on aluminium extrusions.

e) Sealant to joints in compliance with BS 8212.

f) Style trims: Extruded aluminium or galvanised steel.

g) Edge reveals: Extruded aluminium or galvanised steel edge reveals.

h) Jointing tape: Minimum 53mm wide.

i) Jointing compounds: Comply with BS 8212 with respect to shrinkage and consistency.

j) Acoustic sealant to be applied at all junctions with walls, floors, ceilings and around openings applied as a continuous bead leaving no gaps.

k) Air pressure sealant to be applied as continuous bead to perimeter junctions with walls, floors and ceilings, air gaps around openings and other potential leakage points including framing members and around fire stops.

Finishes

K10 - 1.4.9. FINISHES;

The works shall receive a skim finish.

Cavity Barriers

K10 - 1.4.10. FIRE BARRIERS:

Provide continuous vertical barriers using mineral fibre or acceptable equivalent material using strip cut fibre where indicated on the *Design Drawings* or otherwise required.

K10 - 1.4.11. SECURITY MESH REINFORCEMENT:

Provide expanded metal lath behind finished plasterboard layer for enhanced security of control room. Where partitions do not extend to the underside of the structural slab above, the mesh should extend to prevent intruder access from above the suspended ceiling.

K10 - 2. SUBMITTALS AND TESTING

K10 - 2.1. SUBMITTALS

Tender Submittals

K10 - 2.1.1. TENDER RESPONSE:

a) Provide Tender submittals in accordance with the requirements of Section A of the Specification.

b) Submit a design response with the Tender proposal, to include details of all typical conditions, with dimensions.

c) The Tender design response shall include:

i) Samples where specified.

ii) List of Tests included.

iii) QA/ QC programme.

iv) List of proposed *Working Drawings*.

v) Summary of deviations from the *Specification*.

vi) Outline technical specifications reflecting proposed materials/ systems.

vii) A list of proposed suppliers and sub-contractors intended to be used.

Samples Mock-ups Prototypes and Quality Benchmarks

K10 - 2.1.2. PRE-CONTRACT SAMPLES;

a) Not required

K10 - 2.1.3. POST CONTRACT SAMPLES:

In accordance with Section A, post contract samples of the following shall be provided:.

a) 500mm x 500mm sample of all plasterboard types.

b) 500mm lengths of all metal framing components.

c) Access panels, grilles, etc.

d) All fixing types.

e) All insulation material.

f) Cavity barrier material.

K10 - 2.1.4. BENCHMARK REQUIREMENTS:

The following quality benchmarks shall be provided in locations to be agreed with the *Project Manager*, in accordance with Section A.

a) a) First structural bay of each type of partition, dry lining and ceiling system to be confirmed by Project Manager.

K10 - 2.2. TESTING

K10 - 2.2.1. TEST REQUIREMENTS:

Carry out test or provide published and certified data to demonstrate all fire, structural and acoustic performance requirements.

K10 - 3. FABRICATION AND WORKMANSHIP

K10 - 3.1. FABRICATION

K10 - 3.1.1. GENERAL:

Fabrication of components shall, as a minimum, be in accordance with current regulations and standards.

Fabrication Tolerances

K10 - 3.1.2. GENERAL:E

To comply with all relevant British Standards.

K10 - 3.2. WORKMANSHIP

K10 - 3.2.1. GENERAL:

Workmanship shall generally comply with the requirements of BS 8000: Part 8.

K10 - 3.2.2. STORAGE AND ACCURACY;

a) The works shall be installed using continuous profiles, being free from marks, defects, flaws, steps, waves, or damage of any nature.

b) All elements of framework and associated beads and strips shall be stored on Site such that they shall not be damaged, distorted or weathered unevenly.

c) All finished components shall be carefully packed in stillages or crates such that they are suitably separated and protected to prevent scratching, scuffing, or other surface damage.

d) All materials shall be stored on Site in accordance with the manufacturer's written recommendations.

e) Dimensions and levels of the structure shall be verified before installation commences.

f) Acceptance shall be obtained from the *Project Manager* before drilling or cutting parts of the structure, other than where indicated on the *Design Drawings*.

g) The works shall be installed square, regular to line, level and plane at all junctions fitting to the stated tolerances.

K10 - 3.2.3. PREPARATION OF BACKGROUNDS;

a) All loose material shall be removed by thoroughly brushing the structure to be lined.

b) Noggings, bearers, etc. required to provide fixing points for heads of partitions running parallel with, but offset from main structural supports, or to support fixtures, fittings and services, shall be accurately positioned and securely fixed. After fixing boards, the positions of noggings and bearers shall be marked for following trades.

c) All works shall be carried out in accordance with the board manufacturer's materials and workmanship recommendations.

K10 - 3.2.4. FIXING REQUIREMENTS:

a) The fixing, jointing and finishing of the works, where not specified otherwise, shall be as recommended by the board manufacturer.

b) Boards shall be fixed only in areas that have been made weathertight.

c) Boards shall be cut neatly and accurately without damage to core or tearing of paper facing. Cut edges shall be kept to a minimum and positioned at internal angles wherever possible, with masked bound edges of adjacent boards at external corners.

d) Boards shall be fixed securely and firmly to suitably prepared and levelled backgrounds, with heads of fastenings set in a depression, without breaking the paper or the gypsum core. Finishes shall appear flush, smooth and flat with surfaces free from bowing and abrupt changes of level. Damaged boards shall not be used.

e) Fix to all supports working from the centre of each board.

f) Position fastenings as recommended by the manufacturer.

K10 - 3.2.5. FIXING USING DABS;

a) Plaster dabs shall be applied strictly in accordance with the board manufacturer's written recommendations using an appropriate adhesive recommended by the manufacturer.

b) Apply in a regular pattern in accordance with BS 8212 and BS 8000: Part 8, or in accordance with manufacturer's written recommendations, whichever are the more onerous.

K10 - 3.2.6. INSTALLING METAL STUD PARTITIONS:

a) Comply with the requirements of BS 5234.

b) Metal stud partitions shall be fixed in accordance with the manufacturer's recommendations.

c) Studs shall be positioned at equal centres, maintaining sequence across openings. Additional studs shall be provided as necessary to ensure support to all vertical edges of boards.

d) Vertical joints shall be provided on opposite sides of partitions and be staggered.

e) Where more than one layer of plasterboard is applied, joints between layers shall be staggered.

f) Boards shall be fixed to each stud and along all edges with proprietary screws at appropriate centres, not less than 10mm from the edge of the board. Heads shall be set in a depression, without breaking the paper or the gypsum core.

g) Where indicated on the *Design Drawings*, as required for fire or acoustic purposes, or where required for integrity of the installation, partitions shall be extended up between recesses and services to the underside of the structure over.

h) Where indicated on the *Design Drawings* to provide support for handrails and/ or equipment, fixtures and fittings, provide additional support framing and fixings points within the partition.

K10 - 3.2.7. MOVEMENT JOINTS:

a) Movement joints shall be provided as necessary and/ or as indicated on the *Design Drawings*.

b) Movement joints shall be installed in accordance with the manufacturer's written recommendations.

c) Taping and finishing: All joints shall be taped and veneer skimmed in accordance with the manufacturer's written recommendations.

K10 - 3.2.8. JOINTS IN PLASTERBOARD;

a) Joints between tapered edges of boards shall be lightly butted, leaving a 3mm gap where cut unbound edges occur.

b) Horizontal joints shall not occur in surfaces exposed to view except where the height of the wall exceeds the maximum available length of the board. Precise joint positions not indicated on the *Design Drawings* shall be agreed with the *Project Manager*. Horizontal joints in two layer boarding shall be offset by a minimum of 600mm and noggings shall be positioned to support the outer layer horizontal joints as recommended by the manufacturer.

c) Where plasterboard edges abut dissimilar materials and at points of stress, appropriate edge beads shall be installed as recommended by the manufacturer.

d) Control joints shall be provided as recommended by the system manufacturer.

K10 - 3.2.9. TAPING AND FINISHING:

a) Cut edges of boards shall be lightly sanded to remove paper burrs with a PVAC sealer applied to exposed cut edges and any other plaster surface to which tape is applied.

b) Joints and gaps shall be filled and covered with continuous lengths of tape, and fully bedded. Where joints are to be covered with finish they shall be feathered out to provide a smooth seamless surface.

c) All external angles shall be protected by the use of drywall angle beads with plasterboard edge beads at all visible jointed abutments. Joint finish shall be applied to all external angles. When jointing is complete and dry, apply drywall primer to the complete surface ready to receive decoration.

d) All beads shall be flush with the board.

e) Nail and screw depressions shall be filled with joint filler to provide a flush and smooth surface.

f) All minor indents shall be filled.

g) On completion of joint, angle and spotting treatments a surface finish shall be applied to provide a continuous consistent finish to the surface of boards.

K10 - 3.2.10. FIRE SEALING OF BUILDING SERVICES:

a) Install suitable fire barrier as recommended by the manufacturer. Barrier to provide fire protection to maintain the fire rating of works. All materials/ products shall be manufactured to BS EN ISO 9001 and tested to BS EN 1366 and installed to the manufacturer's instructions.

b) All openings through the dry wall shall be framed out on all sides with metal studding and cross-braced to the metal stud uprights on two opposite sides where possible.

c) Duct/ Dampers shall be restrained on all sides with metal angles or channels anchored to the soffit. Movement of the duct/ dampers shall be through penetrations to accommodate the movement range indicated by the deflection head.

K10 - 3.2.11. FIRE SEALING TO TOP OF NON-LOADBEARING WALLS:

Install suitable fire strip, to maintain the fire rating of the works. All materials/ products shall be manufactured to BS EN ISO 9001 and tested to BS EN 1364: Part 1 and installed to the manufacturer's instructions, unless indicated otherwise on the *Design Drawings*.

K10 - 3.2.12. FIRE SEALING JOINTS AROUND DOOR FRAMES;

Install suitable fire seal, water based acrylic mastic to maintain the fire rating of the works. All materials/ products shall be manufactured to BS EN ISO 9001 and tested to BS EN 1366 and installed to the manufacturer's instructions.

K10 - 3.2.13. SOUND BARRIERS;

a) Align accurately with partition heads and fix tightly at all perimeters and joints in accordance with the manufacturer's recommendations and include steel support sections to ensure permanent stability and continuity with no gaps.

b) Fill all gaps in the plasterboard using joint filler or sealant, to maintain the performance of the specified systems.

K10 - 3.2.14. INSTALLATION TOLERANCES (WALLS);

a) The works shall maintain the planning grid and distribute tolerances equally to achieve the following:
   i) Vertical walls maintaining the offset (ceiling to floor) within ±2mm of its notional setting-out position.
   ii) Straight lines and flat planes in all directions.
   iii) A final finished surface position within 5mm of its notional position when measured in accordance with BS 8212.

b) All dimensions shall be checked on Site prior to commencement of installation.

c) The installation shall accommodate all required tolerances including differences between actual Site dimensions and dimensions shown on the *Design Drawings*.

d) Account shall be taken of the installation tolerance requirements such that repetitive units are accurately located, relative to gridlines.

e) The works shall be erected in alignment and in relation to established lines and grades as indicated on the *Design Drawings*.

f) The maximum variation in height of any part of the works from given datum shall be ±2mm.

g) The maximum offset in plane, level or section between any two adjacent sections shall be ±1mm.

h) The maximum variation in plan over a distance of 1800mm shall not exceed ±2mm.

i) Cut-outs for interfacing works shall comply with the dimensions indicated on the *Design Drawings* ±1mm.

j) A detailed list of tolerances to which the works are to be installed shall be submitted for review by the *Project Manager* prior to commencement of installation. As a minimum this shall include the following:

i) Position on Plan.

ii) Level.

iii) Alignment.

iv) Plumbness.

k) Analysis of the erection sequence and overall method statement shall be produced to satisfy the *Project Manager* that the installation tolerances stated shall be met.

K10 - 3.2.15. INSTALLATION TOLERANCES (CEILINGS);

a) Finished ceiling levels shall be as datum indicated on the Design Drawings ±2mm

b) Check all Site dimensions before commencement of installation.

c) The installation shall accommodate all specified tolerances and differences between actual Site dimensions and dimensions shown on the Working Drawings.

d) The works shall be erected in alignment and in relation to established lines and grades as indicated on the Design Drawings.

e) Install square, regular to line, level and plane within specified tolerances. Do not use cartridge or power activated methods for top fixing or rivets for bottom fixing of hangers

f) The maximum variation in height of any part of the works from given datum shall be ±2mm

g) Cut-outs for interfacing works shall comply with the dimensions indicated on the Design Drawings ±1mm

K10 - 4. SYSTEMS INTEGRATION AND HANDOVER

K10 - 4.1. SYSTEMS INTEGRATION

K10 - 4.1.1. GENERAL:

System will integrate with adjacent surroundings to approval by the contract administrator.

K10 - 4.2. HANDOVER

K10 - 4.2.1. GENERAL:

As the Contract requirements.

End of Section

K40. DEMOUNTABLE SUSPENDED CEILINGS

K40- 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

K40- 1.1. SPECIFICATION TYPE

K40- 1.1.1. DESCRIPTIVE WORKS:

a) Supply, install and warrant the works complying with the visual intent indicated on the *Design Drawings* and criteria stated in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*, the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the Project Manager , but shall remain fully responsible for the *Detailed Design* and performance of the works.

d) Interfaces:

i) Co-ordinate with the work of others including all interfacing as required.

ii) Performance shall be maintained at all interface conditions.

iii) Complete the *Detailed Design* of all interfaces with adjoining trades prior to commencement of manufacture.

K40- 1.2. SYSTEM DESCRIPTIONS

Architectural and Functional Requirements

K40- 1.2.1. SCOPE

a) This work section contains the following suspended ceiling types where indicated on the design drawings and schedule. There are only two ceiling types for the project. In the security control room, break out area, kitchen/locker room and WC suite, new suspended ceilings are to be provided. In the entrance lobby area and the staff area immediately behind the security reception desk, the exiting ceilings are to be retailed and redecorated. Both are described below:

i) TYPE CLG-10 Suspended panel ceiling system. Location: Security office, break out area, kitchen, wc (all works areas other than main reception area with raised plaster ceiling, which is to be retained and redecorated). Note, there is a requirement to install insulation between rafters above this ceiling where the pitched external roof sits above the ceiling system. See section P10 for details.

ii) Type CLG-20 Existing ceiling finish to be retained, prepared for redecoration and redecorated.

K40- 1.2.2. GENERAL:

a) The works shall be installed within the fixing zones indicated on the *Design Drawings*.
b) The works shall accommodate all architectural and functional features indicated on the *Design Drawings*, whilst maintaining the fire and acoustic performance.
c) The works shall include fixings, framing, bracketry, support framing, grids, seals, insulation and all other components/ accessories necessary to complete the works as supplied/ recommended by the manufacturer to suit the service conditions.

Note: There is an asbestos lined beam running north south across the suspended ceiling area and above suspended ceiling level. See architect's drawings for approximate location. This will be encapsulated and any contaminated debris removed prior to the contract commencing. It will be clearly labelled. Fixings and hangers for suspended ceilings and any above-ceiling services should not fix to this beam.

K40- 1.2.3. CAVITY BARRIERS;

Ceiling voids shall incorporate continuous vertical cavity barriers for fire/ smoke and sound, using proprietary encapsulated mesh-reinforced mineral fibre products, installed in accordance with the manufacturer's recommendations and configured as indicated on the *Design Drawings* or otherwise required.

K40- 1.2.4. SUSPENSION SYSTEMS;

a) Unless otherwise specified, suspension systems shall be hot dip galvanised mild steel tee section grid system.

b) The system shall be supported from the structural soffit by galvanised mild steel rigid adjustable hangers, secondary and main runners, with appropriate fixings to the substrate soffit in accordance with the manufacturer's written recommendations.

c) Within bridge and stair superstructures the system shall be supported from the primary steel structures by galvanised mild steel rigid adjustable hangers, secondary and main runners, with an appropriate strapped and clamped fixing arrangement to the primary steel structure, to avoid damage to corrosion protection systems, in accordance with the manufacturers recommendations. Refer to fixing to structure.

d) In areas identified in Design Drawings suspension grid rails will be modified or arranged to avoid steel superstructure where it interrupts installation of continuous secondary grid rails.

K40- 1.2.5. FIXINGS:

a) Fixings shall be concealed unless accepted otherwise by the Project Manager.

b) Visible fixings shall be satin finished stainless steel Alen bolts.

c) The type, size and positioning of all mechanical fixing devices shall be indicated on the Contractor's *Working Drawings* for Project Manager's approval. Full details of their installation techniques and torque settings shall be provided.

d) Where necessary fixing devices shall be capable of three-dimensional adjustment to accommodate building structure and fabrication/ installation tolerances.

K40- 1.2.6. FIXING TO STRUCTURE:

a) Systems shall include all necessary mechanical fixing devices including, but not limited to, anchor bolts, fixings, sockets and other components.

b) Mechanical fixing devices shall be austenitic stainless steel of a suitable grade.

c) Works shall include all necessary preparation such as drilling, plugging, screwing, bolting, cutting, casting-in/ grouting-in and making good.

d) All Fixing shall be co-ordinated with the superstructure design and identified prior to fabrication. Any Fixing to the superstructure will not impair its corrosion protection systems or penetrate sealed sections.

e) Fixing devices shall be concealed, unless otherwise indicated on the Design Drawings or accepted by the Project Manager.

K40- 1.2.7. SERVICES AND FITTINGS;

a) Systems shall accommodate light fittings, grilles, smoke detectors, PA speakers, sprinkler heads or other service penetrations as indicated on the *Design Drawings* or required by the Services Engineer.

b) Additional pattresses and supports as necessary to receive such fittings shall be provided.

c) The setting-out of ceiling supports/ hangers shall be co-ordinated with any services within the ceiling voids.

d) Metal ceiling panels shall incorporate factory formed penetrations with upturned edges to receive fittings.

e) Access panels shall be provided where indicated on the *Design Drawings*.

K40- 1.2.8. JOINTS:

a) Unless specified otherwise, joint widths and configurations shall be as recommended by the manufacturer/ supplier for acceptance by the *Project Manager*.

b) Locations shall be as indicated on the *Design Drawings*, or where recommended by the system/ product manufacturer to the acceptance of the *Project Manager*.

c) Joints shall align with interfacing systems and shall reflect joints in the substrate for movement. Gaps within joints shall be uniform, unless specified or indicated otherwise on the *Design Drawings*.

d) Movement joints shall accommodate all movements whilst maintaining the overall system performance. Movement joints shall appear as similar to the standard joint as possible, to the acceptance of the *Project Manager*.

Metal Ceilings

K40- 1.2.9. TYPE CLG-10 SUSPENDED PANEL CEILING SYSTEM

Location: Dentist

a) Manufacturer: Armstrong or acceptable equivalent

b) Product: Mineral fibre ceiling tiles within lay-in suspended grid

c) Tile Size: Typically 600x600mm refer to Design Drawings

d) Perforations:

i) None:

e) Acoustic treatment: None

f) Colour: RAL 9010 ‘Pure White’

g) Refer to architect’s reflected ceiling drawings

h) Suspension System: Tegular (flush)

i) Exposed metalwork shall be polyester powder coated, from the manufacturer’s standard range

j) Ceiling system to include all necessary secondary, frames, hangers, edge panels, trim, fixings as required to complete the system

k) Coordination with adjacent trades and MEP services is required

K40- 1.3. PERFORMANCE REQUIREMENTS

Generally comply with the general performance requirements of Section A .

K40- 1.3.1. STANDARDS

The works shall be designed, constructed and installed to all relevant current Eurocodes, British Standards, Crossrail and London Underground design standards and guidance.

K40- 1.4. MATERIALS/ COMPONENTS

Metalwork and Finishes

K40- 1.4.1. METALWORK:

Refer to Section Z11.

K40- 1.4.2. FINISHES:

a) Refer to Section Z30 for general finishes to metalwork.

b) Refer to Section Z31 for powder coatings.

c) Refer to Section Z33 for anodising.

Suspension Systems

K40- 1.4.3. SUSPENSION SYSTEMS:

Mild steel suspension systems shall be hot dip galvanised in accordance with BS EN ISO 1461 with cold rolled channels and sections to BS EN 10162 and BS 7364.

Fixings

K40- 1.4.4. General:

a) Refer to Section Z20.

b) Fixings shall be in accordance with the system manufacturer's recommendations, to suit the service conditions.

c) Where necessary, fixing components shall be capable of adequate three-dimensional adjustment to accommodate building structure and system fabrication/ installation tolerances.

d) Fixings shall be inherently corrosion resistant or fully protected to prevent corrosion.

e) Visible fixings shall be a type agreed with the *Project Manager* prior to installation.

Adhesives

K40- 1.4.5. GENERAL:

a) Refer to Section Z20.

b) Adhesives shall be in accordance with BS EN ISO 9665 and to the manufacturer's specification.

c) Adhesives shall be compatible with finished surfaces, preservative/ fire retardant treatments and shall maintain the performance requirements of the elements to be bonded.

K40- 1.4.6. Non Load Bearing Applications

a) Durability class/ strength requirements of adhesives used in non load bearing uses of wood and derived timber products shall be in accordance with BS EN 204.

b) Adhesives used in non load bearing applications shall be tested in accordance with BS EN 205.

Sealants

K40- 1.4.7. SEALANTS:

a) Refer to Section Z22.

b) Sealant products shall be used in accordance with the system manufacturer's written recommendations, to suit the service conditions.

Insulation

K40- 1.4.8. PARTICULAR REQUIREMENTS:

a) Insulation shall be inert, durable, rot-proof and vermin-proof and not be degradable by moisture, extreme temperatures or water vapour, unless the *Design* of the system protects the insulation from the need for such requirements.

b) Insulation shall not bulge, sag, delaminate or detach during its installation or when in situ during the life of the works.

c) All combustible foam products shall be fire resistant modified.

d) Insulation shall be a minimum of Euroclass A2.

e) Insulation shall have zero Ozone Depleting Potential (ODP), be CFC and HFC free and have a Global Warming Potential (GWP) of less than five.

f) Insulation shall be selected to meet the recommendations of 'The Green Guide to Specification' and shall have a minimal environmental impact when assessed using BREEAM criteria.

g) Insulation shall comply with all relevant British Standards and be BBA certified.

h) Expanded polystyrene (EPS) shall not be permitted within the works.

K40- 2. SUBMITTALS AND TESTING

K40- 2.1. SUBMITTALS

Tender Submittals

K40- 2.1.1. TENDER RESPONSE:

Provide Tender submittals in accordance with the requirements of Section A of the Specification.

Samples Mock-ups Prototypes and Quality Benchmarks

K40- 2.1.2. PRE-CONTRACT SAMPLES:

Not required.

K40- 2.1.3. POST CONTRACT AWARD SAMPLES:

In accordance with Section A.4000, post contract award samples of the following shall be provided:

a) 300mm x 200mm tile samples including one finished corner and two adjacent finished edges.

b) Paint finishes as specified.

c) Ceiling grid/ support system.

d) Samples of panels, grilles and trims.
e) All fixing types.
f) All insulation materials.
g) Cavity barrier material.

K40- 2.1.4. MOCK-UP REQUIREMENTS ;

Not required

K40- 2.1.5. PROTOTYPE REQUIREMENTS:

Not required

K40- 2.2. TESTING

K40- 2.2.1. GENERAL;

a) Refer to Section A clause for the general requirements for testing.
b) Independently certified test data and Agrément certificates shall be provided to demonstrate that the proposed systems meet the requirements of the *Specification*.
c) All on-Site testing specified herein, which shall be carried out by an independent testing body accredited by the United Kingdom Accreditation Service (UKAS) shall be included for.

K40- 3. FABRICATION WORKMANSHIP AND TOLERANCES

K40- 3.1. FABRICATION

K40- 3.1.1. GENERAL:

a) Fabrication of materials/ components shall, as a minimum, be in accordance with current regulations and standards.
b) Fabrication shall be based on Site measurements to accommodate construction tolerances. Dimensions given on the *Design Drawings* shall be considered to be indicative only and should not be used for fabrication unless confirmed by the *Project Manager* as suitable.
c) Where applicable and practical, fabrication of materials/ components shall take place in properly equipped workshops with sitework restricted to fixing as far as possible.
d) Materials/ components that are damaged or have any other physical imperfections shall not be used in the works.
e) Adhesive joints shall be adequately protected during the curing process to avoid contamination by dust and other debris.

K40- 3.1.2. GENERAL:

a) Refer to Section Z11.
b) Metal components shall be fabricated using only appropriate grades, strengths and thicknesses.
c) Metal components shall be protected against the effects of corrosion during and after fabrication until application of finishes.
d) All visible cut ends shall be polished smooth with no crude machine cut visible.
e) Preparation of surfaces to receive finishes and coatings shall be in accordance with the finishes and/ or coating manufacturer's printed recommendations.
f) Cut joints/ junctions shall be clean and true without waves or deviations from the vertical and horizontal planes.

g) Protective coatings and finishes on joints shall be to the same standard as the main assemblies.

h) All cutting and drilling of ceiling panels and associated members, including apertures for services, shall take place before the application of painted finishes. Site cutting or drilling shall not be permitted.

K40- 3.2. WORKMANSHIP

K40- 3.2.1. GENERAL;

a) Workmanship shall generally be in accordance with the the relevant and applicable parts of BS 8000: Part 8.

b) Where applicable, the works shall be carried out in accordance with the manufacturer's recommendations.

c) Operatives shall be trained, experienced and appropriately skilled in the installation of the works and, where applicable, be recommended by the system/ product manufacturer.

Storage

K40- 3.2.2. GENERAL;

a) Materials/ components shall not be delivered to Site until required or until there is suitable dry storage space.

b) All materials/ components shall be stored on Site in accordance with the manufacturer's recommendations.

c) Adequate storage shall be provided for all materials/ components to maintain them free from damage and distortion, and in conditions suitable for their intended service conditions.

d) Finished materials/ components shall be carefully packed in stillages or crates such that they are suitably separated and protected to prevent scratching, scuffing, or other surface damage.

e) Protective packaging/ coverings shall not be removed until immediately before materials/ components are required for fixing.

Preparation

K40- 3.2.3. SUITABILITY OF STRUCTURE/ SUBSTRATE:

a) Before commencing installation, the structure shall be surveyed. Dimensions, line, level and fixing points shall be checked. The *Project Manager* shall be informed immediately if the existing structure is unsuitable to receive the works.

b) If the structure/ substrate is unsuitable, remedial action to make the structure suitable shall be proposed.

c) All bases/ backgrounds shall be rigid, dry, sound, smooth, clean, free from dust, dirt and free from grease, dirt and other contaminants before systems/ products are installed.

d) Substrates shall be sound, with no loose material or significant cracks or gaps.

e) All cutting, chasing, plugging, making good and other necessary procedures required to the substrate or to the adjacent works, that cannot/ should not be undertaken after the installation of the works specified herein, shall be completed.

f) Tolerances of the structure/ substrate shall be suitable to permit the required configuration and specified tolerances of the finished systems/ products.

K40- 3.2.4. DAMPNESS:

Where systems/ products are to be installed adjacent to new wet-laid materials, it shall be ensured that:

a) Drying aids shall have been turned off for not less than four days.

b) Tests for moisture content shall be taken, using an accurately calibrated hygrometer or probe in accordance with BS 5325 or BS 8203 or other standard as appropriate and agreed with the *Project Manager*.

c) Readings shall be taken in all corners, along edges and at various points over the area being tested.

Installation

K40- 3.2.5. GENERAL;

a) Works shall not be commenced before the building is weathertight, wet trades have been completed and the building is dried out.

b) Components shall be conditioned by unpacking and spreading out in the spaces where they are to be laid in conditions similar to those that will prevail when the building is occupied.

c) Before, during and after installation, temperature and humidity shall be maintained at levels approximating to those that will prevail during building use.

d) Finishes shall not be installed within 48 hours of any heating having been turned off. After completion of installation, slowly return the heating to its operative temperature not less than 48 hours after completing the installation.

e) Arrangements shall be made for operating the heating/ ventilation/ air conditioning installation up to the date of Practical Completion of the works.

f) Allowance for future moisture and temperature movement shall be made.

g) The works shall be set out and installed accurately, square, true to line, level and plane, free from undulations, with lines and joints aligned, straight and parallel unless specified otherwise, within stated tolerances and in the correct relationship with the building structure.

h) The installation shall accommodate all specified tolerances and differences between actual Site dimensions and dimensions shown on the *Design Drawings*.

i) The setting out of the pattern shall be agreed with the *Project Manager* before ordering materials/ components.

j) Where permitted by the manufacturer, materials/ components shall be cut neatly and accurately without unintended damage. Cut edges shall be kept to a minimum.

k) Setting-out shall be centred between walls so that cut tiles/ planks at perimeter are of equal sizes and not smaller than one third of original size.

l) Materials/ components intended to be installed in 'running lengths' shall be subject to the following:
   i) Straight runs between angles or ends of runs shall be formed in single unjointed lengths wherever possible. Where running joints are unavoidable, obtain acceptance for location and method of jointing from the *Project Manager*
   ii) All joints at angles shall be mitred or as otherwise accepted by the *Project Manager* through sampling.

m) Each material/ component of the works shall be inspected immediately before installation. The works shall be installed using materials/ components being properly sized, free from marks, defects, flaws, steps, waves, or damage of any nature.

n) Materials/ components with prefinished surfaces shall not be altered unless accepted by the *Project Manager*.

o) Damaged units shall not be repaired without acceptance.

p) Materials/ components from the same production batch in the same area to prevent banding, patchiness or other visual variations.

q) Acceptance shall be obtained from the *Project Manager* before drilling or cutting parts of the structure, other than where indicated on the *Design Drawings*.

r) The work of others shall not be cut, drilled or otherwise altered to accommodate the installation of the systems unless accepted by the contract administrator.

s) No materials/ components shall be installed until service outlets, duct covers and other fixtures around which the materials are to be cut have been fixed. The contract administrator shall be informed not less than 48 hours before commencing installation.

t) Provision for movements/ expansion/ contraction shall be made in accordance with the system/ product manufacturer's recommendations.

u) Cut edges of mineral and timber faced boards shall be lightly sanded and treated to match finished faces.

v) Light fittings, grilles, fire and smoke barriers shall be in the correct positions relative to the ceiling grid, prior to commencing installation. Common setting out points shall be used. Provide additional support/ bracing as required.

K40- 3.2.6. FIXING REQUIREMENTS:

a) Refer to Section Z20.

b) Fixings and fastenings shall be installed and positioned as recommended by the manufacturer. Where visible, positions shall be to the acceptance of the contract administrator.

c) The works shall be fixed securely to prevent pulling away, bowing or other movement during use and without causing stress or distortion. Include additional bracing or stiffening as required.

d) Isolating tape, plastic washers or other suitable means shall be provided to prevent bi-metallic corrosion between dissimilar metals or between preservative treated timber and metal.

e) Straighten hangers before use and install vertically without bends or kinks. Do not allow hangers to press against any fittings within the void.

K40- 3.2.7. ADHESIVES;

a) Refer to Section Z20.

b) Primers shall be used where recommended by the adhesive manufacturer before applying adhesives.

c) Materials/ components shall be bonded securely to substrates to give true surfaces free from undulations, air bubbles, scratches, adhesive marks, stains and other visual defects. Joints shall be tightly butted or gaps/ joints left as required.

d) The adhesive shall be spread evenly pressing down materials/ components firmly and rolling (if recommended) to ensure full contact and a good bond overall.

e) All surplus adhesive shall be removed from exposed faces of coverings as the work proceeds.

K40- 3.2.8. MOVEMENT JOINTS;

Movement joints shall be installed in accordance with the manufacturer's written recommendations.

K40- 3.2.9. SEALANTS:

a) Refer to Section Z22.

b) Acoustic sealant: To be applied at all junctions as necessary to maintain acoustic performance requirements.

K40- 3.2.10. ACOUSTIC BLANKET/ CAVITY BARRIER/ INSULATION:

a) Shall be accurately cut to accommodate abutments and configurations.

b) Shall be laid evenly, with no gaps or lipping at joints.

c) Insulation shall fit tightly with closely butted joints fittings and abutments. No gaps shall be left.

d) Insulation shall be kept dry and secure as the work proceeds.

e) Encapsulation material shall be resealed after cutting.

f) Insulation shall be laid out over the ceiling in the widest practical widths to suit spacings of grid members and hangers, with closely butted joints.

g) Electrical cables or light fittings shall not be covered, unless expressly permitted by the Services Engineer.

K40- 3.2.11. FIRE AND SMOKE BARRIERS:

a) Material shall be cut to fit tightly, achieve correct compression and be securely fixed along all edges. All joints shall be wired or stapled together to provide a complete barrier to smoke and flame. Where proprietary systems/products are installed they shall be strictly in accordance with the manufacturer's printed recommendations.

b) A complete barrier shall be formed; there shall be no gaps.

c) Sealants shall not compromise the integrity of the works.

K40- 3.2.12. PACKINGS;

a) Suitable tight packings shall be provided at fixings points to take up tolerances and prevent distortion.

b) Packings shall be of non-compressible, rot-proof and non-corrosive materials/ components that maintain the performance of the systems/ products with which they interface.

c) Packings shall not intrude into zones that are to be filled with sealant or areas required for drainage. The performance requirements of the works and interfacing systems shall be maintained.

Protection

K40- 3.2.13. TEMPORARY PROTECTION:

Finished areas shall be adequately protected from damage by subsequent building operations and other factors until Practical Completion.

K40- 3.2.14. CLEANING;

a) At Practical Completion of the works, or when otherwise agreed with the *Project Manager*, all exposed areas/ surfaces of the works shall be cleaned.

b) Cleaning materials and methods shall be as recommended/ accepted by the system/ product manufacturer, where applicable.

c) Materials or methods that could alter the character of the exposed finishes shall not be used.

d) Adjacent surfaces shall be protected from damage due to cleaning operations.

K40- 3.2.15. COMPLETION:

a) Installed works shall be left clean.

b) Defects shall be repaired without delay, to minimise damage and nuisance.

c) A representative of each system/ product manufacturer shall inspect the works and notify the *Contractor* of any defects. All defects shall be corrected.

d) The works shall not be used for any purpose, except testing, until Practical Completion.

e) On Practical Completion, the works shall be checked for damage and defects. Operable systems shall be tested for satisfactory operation and all damaged or defective materials/ components replaced.

Adverse Conditions

K40- 3.2.16. WORKING IN ADVERSE CONDITIONS:

a) If unavoidable wetting of the works occurs, prompt action shall be taken to minimise and make good any damage.

b) Temporary covers shall be provided as required to keep unfinished areas dry.

c) In severe or continuously wet weather work shall be suspended unless an effective temporary enclosure is provided over the working areas.

Workmanship Tolerances

K40- 3.2.17. GENERAL;

Tolerances shall be measured against the relevant Base Reference Datum; Location Reference Point; Location Reference Plane; Location Reference Surface or Reference Element as defined in Section A.

a) All elements shall be set out to their correct position as indicated on the *Design Drawings* and/ or *Working Drawings*, within ±2mm or 0.1% of the length, whichever is the lesser.

b) Vertical elements shall be plumb, within ±2mm or 0.1% of the height, whichever is the lesser.

c) Horizontal elements shall be level, within ±2mm or 0.1% of the length, whichever is the lesser.

d) The maximum variation in gap from a straightedge applied to a flat vertical plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

e) The maximum variation in gap from a straightedge applied to a flat horizontal plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

f) The maximum variation in gap from a straightedge applied to a flat inclined plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge. Drainage requirements of inclined planes shall be maintained.

g) The maximum offset in plane, level or section between any two adjacent sections shall be ±1mm.

h) The permissible deviation of a floor finish level shall be ±3mm, but shall be flush with any adjacent floor finish.

i) The average width of any panel to panel joint shall be within ±1mm of the nominal joint. Any variation shall be equally distributed with no sudden changes or steps.

j) The maximum deviation between adjacent tile/ panel surfaces either side of an expressed joint shall be 1mm.

k) The bow of any flat surface shall not exceed more than ±2mm from a 2000mm straightedge placed against it in any direction.

l) The straightness of any surface of an edge shall not deviate by more than ±2mm from a 2000mm straightedge placed against it in any direction parallel to the long axis of the element.

m) The centre section of any lineal element shall not bow by more than the lesser of ±2mm or 0.075% of the length of the element measured from a straight line between the ends of the element.

n) The cross-section of any element shall not be twisted by more than 1° from the intended alignment.

o) Dimensional and location tolerances of cut-outs for interfacing works shall be ±1mm the dimensions indicated on the *Design Drawings*. The *Contractor* shall verify, with the appropriate supplier/ trade contractor, that such dimensions and locations are correct. Any deviation shall be agreed with the *Project Manager*.

p) Account shall be taken of the installation tolerance requirements such that repetitive elements are accurately located, relative to gridlines.

q) Tolerances shall not be cumulative. The most onerous tolerance shall apply.

K40- 4. SYSTEMS INTEGRATION AND HANDOVER

K40- 4.1.

K40- 4.2. HANDOVER

K40- 4.2.1. General

a) As the Contract requirement.

End of Section

L10. WINDOWS

L10 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

L10 - 1.1. *SPECIFICATION* TYPE AND FORMAT

L10 - 1.1.1. DESCRIPTIVE WORKS

a) Undertake the *Detailed Design*, supply, install and warrant the works complying with the visual intent indicated on the *Design Drawings* and criteria stated in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*, the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the Project Manager , but shall remain fully responsible for the *Detailed Design* and performance of the works.

L10 - 1.2. SYSTEM DESCRIPTIONS

System Description Functional Requirements and Interfaces

L10 - 1.2.1. SCOPE

a) Type GL-10 Aluminium framed, security-rated secondary glazing to existing windows

Location: Three windows on the external wall to reception area. There are no external window works, beyond internal decoration of existing windows, envisaged within this works package.

b) Frames are to be securely fixed to the inside face of the window reveals. Fixings should minimise damage to the existing surfaces. Windows to be two-panel, vertically sliding units to allow access to the original sash windows behind. Spacings between new and existing windows / opening mechanisms to suit manufacturer’s requirements for ease of cleaning.

c) Windows to be fabricated by Selectaglaze Series 25 VS with type L3 locking catches. Glazing to be laminated to suppliers specification to achieve Pas 24 security rating as a combined system.

d) Pas 24 , **LPS 1175 level SR3 security** certification is to be provided for the combined system. If an alternative product is put forward as a suitable alternative, the Contractor must demonstrate that this certification can be provided for the complete window system including locks and framing.

a) Type GL-20 Aluminium framed, non- security-rated, slimline secondary glazing to existing windows in clock tower lobby.

Location: Two south facing stone framed arched windows in the entrance lobby. Due to the sensitive historic nature of this location, secondary glazing is to be fitted to the timber window framing, not the stone window reveals. Security-rated glazing is not therefore required in this location.

b) Frames are to be securely fixed to the inside face of the existing timber window frames. The type and location of fixings is to be agreed with the architect prior to installation, due to the sensitive historic nature of these windows. Fixings should minimise the impact on the existing window frames.

c) Windows to be fabricated by Selectaglaze Series 20 VS with type L3 locking catches.

Note Existing window heads are arched and framing and glazing panels will need to be formed to meet the profile of the existing window frames.

L10 - 1.2.2. GENERAL

a) The works generally shall be designed, constructed and installed in accordance with BS 6375 and the following:

i) Aluminium windows shall be in accordance with BS 4873.

b) The components of the entire assembly shall be covered by a single source warranty. Therefore, approval shall be obtained from the manufacturer for all materials to be used.

c) Composite and other proprietary systems shall be British Board of Agrément (BBA) certified and tested to satisfy the requirements of the Specification.

d) The works shall accommodate all architectural and functional features indicated on the Design Drawings, whilst maintaining the specified performance.

e) Dimensions indicated on the Design Drawings are nominal and indicative of the design intent. The Contractor shall maintain these dimensions and clearly state them on the Working Drawings. Any deviations from the indicated dimensions shall be stated with the Tender return.

f) Systems shall accommodate services, such as those required by the Services Engineer, in a concealed manner acceptable to the Project Manager.

   i) Locations/ positioning of services shall be agreed with the contract administrator where not indicated on the *Design Drawings*.

   ii) Provide all necessary seals, gaskets and support framing where services penetrate or interface with the works.

g) Determine the type, thickness and density of insulation and any integral or separate overlay to satisfy the requirements of the *Specification*.

h) Finishes:

   i) All metal components shall be corrosion protected.

   ii) Visible aluminium components shall be powder coated or as indicated on the *Design Drawings* or as described.

   iii) Colour(s) shall be to the RAL 9010 pure white

   iv) Fixings shall be concealed unless accepted otherwise by the contract administrator.

   v) Fixing Directly to the Structure:

      - Fixings are to be formed carefully and be 'reversable' so as to have minimum impact on the historic window linings. Methods of fixing and sealing around the secondary glazing is to be agreed with the Contract Administrator prior to installation.

i) The works shall be designed and installed as complete integrated systems, including all necessary support structure, bracketry, fixing rails, angles, fixings and fastenings, clips, pressed metal components, closures, seals and sealants, gaskets, fillers, tapes, spacers, packers, shims, and all other accessories and components necessary to complete the installation.

L10 - 1.2.3. SECONDARY SUPPORT

a) Support shall be configured as indicated on the *Design Drawings*, suitably fixed back to the primary structure by methods acceptable to the contract administrator.

L10 - 1.2.4. Framing and other visible components shall utilise profiles that are consistent and matching in appearance throughout the works.

a) Framing profiles shall be of the minimum cross sections necessary to meet the performance requirements, whilst complying with the design intent indicated on the *Design Drawings*.

b) Joints/ framing shall align with interfacing systems. Gaps within joints shall be uniform.

c) Opening Elements:

i) Opening elements shall be integrated into the systems in lieu of the fixed light glazing, to locations and with functionality as indicated on the *Design Drawings*.

ii) Opening frames shall be mitred at the corners and sufficiently accurately cut to prevent the display of unfinished metal at mitre joints.

iii) Operation shall be by either of the following as described or indicated on the *Design Drawings*:

- Manually operated, horizontal sliding, two-pane secondary windows to allow for access to external window opening mechanism in hot weather for ventilation.

L10 - 1.2.5. PRESSED METAL COMPONENTS/ ACCESSORIES

a) Systems shall incorporate all necessary pressed metal accessories including flashings, copings, cappings, cills, reveals and returns and other formed accessories.

b) Components shall be formed from fully welded and/ or sealed pressed aluminium sheets, which shall be sufficiently thick to provide a visually flat surface and to eliminate excessive distortion and permanent deformation.

c) Provide special prefabricated corner pieces for changes in direction as indicated on the *Design Drawings*. Cut corners at changes in direction shall not be accepted.

d) Components shall be of uniform eggshell finish to RAL 9010 pure white. All handles and accessories are to match this colour.

e) Provide concealed support as required.

f) Include airtightness, breather and vapour control membranes.

i) Joints shall be of profiles accepted by the contract administrator and shall maintain the performance requirements of the *Specification*.

ii) Locations shall be as indicated on the Design Drawings.

L10 - 1.2.6. TYPEGL_01 Window Glazing Panes

a) Glazing details: Toughened glass single-glazed units set within slimline aluminium framing system fastened to internal architrave linings of existing windows.

b) Units to comprise two panes per window, split vertically to allow for horizontal sliding, manual opening.

c) Windows to be located sufficiently far in front of existing windows to allow operation of existing window systems

d) Windows to allow for sufficient space on inside of secondary glazing for re-installation of window blinds. Setting out details for windows and blinds to be confirmed with contract administrator prior to installation.

L10 - 1.3. PERFORMANCE REQUIREMENTS

L10 - 1.3.1. STANDARDS

a) Comply with the general performance requirements of Section A of the Specification and the following specific performance requirements.

b) The works generally shall be designed, constructed and installed to BS 6375.

L10 - 1.3.2. REACTION TO FIRE

Materials shall be either non-combustible or not easily ignitable with low flame spread characteristics and shall not produce excessive quantities of smoke or toxic gases under combustion, confirmed by testing in accordance with the appropriate parts of BS 476, unless otherwise stated.

L10 - 1.3.3. GENERAL

a) The performance criteria shall be satisfied for the full service life of the works, as stated in the *Specification*, provided always that the maintenance has been carried out as specified.

b) Selected materials shall be durable and satisfy the requirements of the *Specification* for the service life of the works.

c) Exposure to sunlight during the lifetime of the works shall not reduce the performance or visual appearance of any element/ component. Take into consideration expected solar performance under varying conditions of solar radiation and external/ internal air velocity.

d) The works shall perform throughout the service life without failure resulting from defects in design, materials or workmanship. Failure shall be defined as breakage, disengagement of components, deflection beyond stated values, reduction in performance or unacceptable change in appearance including breakage.

e) The works shall comply with Section 5 of Approved Document A of the Building Regulations, with regard to accidental damage/ robustness.

f) Electro-chemical corrosion or staining resulting from water running from one material to another shall be prevented.

L10 - 1.3.4. ABRASION RESISTANCE

The works shall resist abrasion from agreed cleaning methods and maintenance systems without any noticeable change in surface appearance.

L10 - 1.3.5. IMPACT RESISTANCE

a) Generally, surfaces shall be sufficiently hard to resist heavy impacts from hand-held objects without any noticeable change to the surface appearance.

b) Hard body impact loads to BS 8200: Classification B.

c) Soft body impact loads to glazed elements to BS 6206 and BS EN 12600: Classification A and 1 respectively.

d) Soft body impact loads to non-glazed elements to BS EN 13049: Classification 5.

e) Manual attack to Loss Prevention Certification Board (LPCB) LPS 1175: Classification Level 3.

f) The extent of any damage determined through testing shall be recorded and, where possible, quantified. Samples shall also be submitted to the *Project Manager*.

L10 - 1.3.6. DEMOUNTABILITY

a) Elements of the works shall be individually and independently removable ensuring access for maintenance and/ or replacement of glazed/ solid infill units and other components in the event of breakage/ damage.

b) The removal of glazed/ solid infill units shall not affect the performance or safety of adjacent or any other part of the works. Provide a method statement for removal and replacement for acceptance.

Services

L10 - 1.3.7. OPENING ELEMENTS

a) Unless specified otherwise, opening lights shall comply with BS 6375: Part 2 and BS EN 12046: Part 1 and with all the performance criteria specified herein.

b) Opening elements shall not disengage from the fixed areas of the works when open or closed under any of the specified loads.

c) When fastened in the closed position the opening elements shall not be capable of removal from the fixed areas of the works except by deliberate action from the interior of the building.

L10 - 1.4. MATERIALS

L10 - 1.4.1. FINISHES

a) Refer to Section Z30 for general finishes to metalwork.

b) Refer to Section Z31 for powder coatings.

c) Refer to Section Z33 for anodising.

L10 - 1.4.2. GENERAL

Fixings

a) Refer to Section Z20.

b) Fixing components shall comply with all statutory requirements (and be to the acceptance of the Building Control Officer and Structural Engineer) both as to strength and type and shall be designed to achieve the requirements of the *Specification*. Select suitable components and fixings in accordance with the requirements of the *Specification*.

c) Where necessary, fixing components shall be capable of adequate three-dimensional adjustment to accommodate building structure and cladding fabrication/ installation tolerances.

d) Only suitable materials shall be used.

e) They shall be inherently corrosion resistant or fully protected to prevent corrosion.

f) The type, size and positioning of all bolts, anchors, brackets, screws, rivets and nuts shall be shown on the *Working Drawings*, together with full details of their installation technique and torque settings, where appropriate.

L10 - 1.4.3. CLEATS, ANGLES, BRACKETS AND OTHER COMPONENTS

a) High grade austenitic stainless steel exterior quality fixing components used in the fixing assemblies shall comply with BS EN 10088, BS EN 10084, BS EN 10250: Part 4, BS EN 10095, BS EN 10048, BS EN 10051, BS EN ISO 9445: Parts 1 & 2 and BS 8298.

b) All non-visible supporting aluminium sub-constructions shall be corrosion protected. Mill finished aluminium shall not be used. Aluminium sub-constructions shall be separated from concrete by bitumen paint or similar acceptable method. Austenitic stainless steel to BS EN 10088 may be used in lieu of aluminium for any supporting sub-constructions.

c) Fixing bolts, nuts, screws and washers shall be manufactured from austenitic stainless steel complying with BS EN ISO 3506: Parts 1 and 2. All screw fixings and attachments shall be secured against vibrating loose.

L10 - 1.4.4. FIXINGS, BOLTS, ANCHORS, SCREWS, RIVETS, SHEAR PINS, NUTS, WASHERS AND OTHER COMPONENTS

a) Mild steel in accordance with BS 4190, BS EN ISO 4016, BS EN ISO 4034 and BS EN ISO 898.

b) Austenitic stainless steel complying with BS EN ISO 3506: Parts 1 and 2.

c) Aluminium alloy of appropriate grade complying with BS EN 754: Parts 3-5, BS EN 755: Parts 1-9, BS EN 573: Part 3 , BS EN 515 and BS EN 12020: Parts 1 and 2.

Adhesives

L10 - 1.4.5. GENERAL

a) Refer to Section Z20.

b) Determine suitable adhesives to achieve the requirements of the *Specification* and satisfy the requirements of BS EN 204.

c) Adhesives shall be compatible with the proposed finishes and any preservative/ fire retardant treatments.

L10 - 1.4.6. SEALANTS

a) Refer to Section Z22.

b) Sealant products shall be used in accordance with the system manufacturer's recommendations, to suit the service conditions.

c) Sealant shall not leak or bleed causing any discolouration or staining.

d) Structural silicone sealants:

i) All glazing requiring structural silicone bonding shall be glazed under controlled factory conditions without any need for Site applied structural bonding sealant.

Insulation

L10 - 1.4.7. PARTICULAR REQUIREMENTS

L10 - 2. SUBMITTALS AND TESTING

L10 - 2.1.1. POST CONTRACT SAMPLES

In accordance with Section A.4000, post contract samples of the following shall be provided:

a) Sample of proposed secondary window frame and opening mechanisms for approval by the contract administrator.

L10 - 2.1.2. BENCHMARK REQUIREMENTS

Not required

a) a) First completed installation of each type of system.

L10 - 2.2. TESTING

L10 - 2.2.1. GENERAL

Not required

L10 - 2.2.2. WIND RESISTANCE TESTS

L10 - 3. FABRICATION AND WORKMANSHIP

L10 - 3.1. FABRICATION

Framing

L10 - 3.1.1. GENERAL

a) Frames shall be manufactured from materials as described. The *Working Drawings* shall show the final extrusion design with dimensions prior to fabrication.

b) All corners shall be jointed and sufficiently flush, flat and true to comply with the specified tolerances.

c) All framing shall utilise the minimum cross section necessary to maintain rigidity and performance.

L10 - 3.1.2. GENERAL

a) The *fabrication drawings* shall provide for sufficient tolerance in manufacture of the works in order to accommodate manufacturing tolerances of interfacing elements.

b) Full details shall be submitted to the contract administrator for review of the proposed methods for achieving and constantly monitoring the tolerances during all stages of the work. Detailed records of the constant control and tolerances achieved shall be submitted to the contract administrator.

L10 - 3.1.3. TOLERANCES FOR MANUFACTURE

a) Assembly: The physical fitting together of any assembly of sub-elements shall be properly allowed for in the *Detailed Design* of the corresponding sub-elements.

b) The following tolerances apply to each individual component:
   i) Length/ Width: Maximum allowed deviation is the lesser of 1.5mm up to 3000mm and 3.0mm above 3000mm of design dimension.
   ii) Thickness/ Depth (extrusion tolerances nominally): Maximum allowed deviation is ±0.5mm.

L10 - 3.1.4. TOLERANCES FOR COMPONENT ASSEMBLY

a) Assembly: The physical fitting together of any assembly of sub-elements shall be properly allowed for in the *Detailed Design* of the corresponding sub-elements.

b) Comply with the following tolerances during assembly of components:
   i) Level of horizontal members: ±1mm from datum in 1500mm non-cumulative.
   ii) Plumb of vertical members: ±1mm to the vertical in any 1500mm, non-cumulative.
   iii) Squareness: Any diagonal length across the panel shall not deviate by more than the lesser of ±3mm or ±0.075% of design dimension.
   iv) Bow: The centre section of the element shall not bow by more than the lesser of 3mm or 0.075% of the length of the element measured from a straight line between the ends of the element.
   v) Straightness: Any surface or edge shall not deviate by more than +1.5mm from a 2m straightedge placed against it in a direction parallel to the long axis of the element.
   vi) Flatness: Any surface shall not deviate by more than +1.5mm from a 2m straightedge placed against it in any direction.
   vii) Twist: No section of the element may be twisted by more than 1° from the section at either end of the element.

c) All finished metal surfaces shall be flat and free from undulations and irregularities.
   i) Twist: ±1.5mm - there shall be no warping of frame.
   ii) Line of panel: ±2mm overall difference between adjacent standards.

d) Tolerances shall not be cumulative.

L10 - 3.2. WORKMANSHIP

Preparation

L10 - 3.2.1. SETTING-OUT

a) In accordance with the sizes of existing window openings. These should be surveyed prior to fabrication and not be assumed to be of one consistent height or width. Tolerances in the existing window reveals need to be accommodated.

Installation

L10 - 3.2.2. GENERAL

a) All works shall be true to detail with continuous profiles, free from marks, defects, flaws, steps, waves, or damage of any nature.
b) Dimensions and levels of the structure shall be verified.
c) The glazing works shall be set out such that all framing members are installed in the correct position, within tolerance and in the correct relationship to the building structure.
d) All fixings should bein accordance with the manufacturer's recommended procedures.
e) Materials shall be kept dry until fixed.
f) Isolating tape, plastic washers or other suitable means shall be used to prevent bi-metallic corrosion between dissimilar metals.
g) The finished work shall be square, regular, true to line, level and plane with a satisfactory fit at all junctions.
h) The works, when installed, shall not be subject to warping or twisting and shall be strictly rigid, firm, free from vibration, knocking, rattles, squeaks and other noises when subject to the worst combination of conditions.

Protection and Completion

L10 - 3.2.3. TEMPORARY PROTECTION

Finished areas shall be adequately protected from damage by subsequent building operations and other factors.

L10 - 3.2.4. COMPLETION

a) Installed works shall be left clean.
b) All work necessary to provide a weathertight finish shall be satisfactorily completed.
c) Defects shall be repaired without delay, to minimise damage and nuisance.
d) A representative of the system manufacturers shall inspect the works and shall notify the *Contractor* of any defects. All defects shall be corrected.

L10 - 3.2.5. GENERAL -To comply with the Contract requirements.

End of Section

L20. DOORS AND HATCHES

L20 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

L20 - 1.1. SPECIFICATION TYPE

L20 - 1.1.1. DESCRIPTIVE WORKS:

a) Undertake the *Detailed Design*, supply, install and warrant the works complying with the visual intent indicated on the *Design Drawings* and criteria stated in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*, the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the Project Manager, but shall remain fully responsible for the *Detailed Design* and performance of the works.

d) Interfaces:

i) Coordinate with the work of others including all interfacing as required.

ii) Performance shall be maintained at all interface conditions.

iii) Complete the Detailed Design of all interfaces with adjoi ning trades prior to commencement of manufacture. Structural openings shall be measured and confirmed prior to door fabrication. Fabrication drawings of doors and frames should be submitted for approval of the architect for approval, based on the as-built opening sizes, prior to fabrication.

L20 - 1.2. SYSTEM DESCRIPTIONS

Architectural and Functional Requirements

L20 - 1.2.1. SCOPE:

General: Supply and fit doors and ironmongery as detailed below;

Internal Timber Doors:

TYPE: D-101 – Internal security door between reception area and security office:

a) New solid core timber door 50mm thickness with solid timber lippings (steel plate reinforcement not required). Plywood faced without mouldings, suitable for priming and painting (see Section M60 for paint specifications).

b) Door framing / jambs in softwood to suit door opening size, decorated (see section M60).

c) Door to include Georgian wired, timber framed vision panel at upper level, above locking mechanism, 200mm wide and set 100mm from top and bottom rail. Window to be coordinated with 3 point locking mechanism to ensure dimensional compatibility.
d) Door leaf to be provided with three heavy duty stainless steel butt hinges.
e) Mortice Lock: Glutz 1836 Treplane Mortice lock with three latches, key operated main bolt, internal lever with single action for escape egress. Wireless, Bluetooth security control system to fabricator's specification.
f) Lever handle: Glutz 5040 Mercury, brushed stainless steel
g) Cylinder lock with Glutz escutcheon plate in brushed stainless steel
h) Brushed Glutz stainless steel kick plates on both door faces.
i) Door closer not required
j) Door to be prepared and decorated (see Section M60 for paint specification)

Ironmongery to be included as a Prime Cost sum in pricing documents.

TYPE: D-102 – Internal security door between break out area and security office:
Specification as D-101 above, but excluding vision panel.

Ironmongery to be included as a Prime Cost sum in pricing documents.

TYPE: D-103 – New solid core door to security manager's office

a) New solid core timber door with softwood, to replace existing door.
b) Acoustic brush seals to be integrated into door leaf / jamb to improve acoustic isolation properties of door.
c) Door to be prepared and door redecorated – see Section M60 for details).
d) Door to be provided with three heavy-duty stainless steel butt hinges and Glutz stainless steel door lever and cylinder lock.
e) Door closers not required.

Ironmongery to be included as a Prime Cost sum in pricing documents.

TYPE: D-104 – Existing door to corridor

a) Existing door and ironmongery to be retained and redecorated. Any defective ironmongery to be identified and replacement products recommended by the Contractor for approval by the Contract Administrator prior to installation.
b) Existing decorations to be prepared and door redecorated – see Section M60 for details).

TYPE: D-105 – WC lobby outer door

a) New solid core timber door 50mm thickness with solid timber lippings. Plywood faced without mouldings, suitable for priming and painting (see Section M60 for paint specifications).
b) Door framing / jambs in softwood to suit door opening size, decorated (see section M60).
c) Door leaf to be provided with three heavy duty stainless steel butt hinges.
d) No locking mechanism
e) Glutz 5375 Stainless steel kickplates on outer face
f) Glutz 5750 brushed stainless steel D pull handle on inner and outer face, 250mm long.
g) Surfaced mounted door closer with brushed stainless steel cover
h) Combined male and female circular brushed stainless steel WC sign on external face.

Ironmongery to be included as a Prime Cost sum in pricing documents.

TYPE: D-106 – WC inner door

a) New solid core timber door 50mm thickness with solid timber lippings. Plywood faced without mouldings, suitable for priming and painting (see Section M60 for paint specifications).
b) Door framing / jambs in softwood to suit door opening size, decorated (see section M60).
c) Door leaf to be provided with three heavy duty stainless steel butt hinges.
d) Glutz brushed stainless steel thumb turn lock with engaged indicator on outside face.
e) Glutz 5375 Stainless steel kickplates on outer face
f) Glutz 5750 brushed stainless steel D pull handle on inner and outer face, 250mm long.
g) Glutz stainless steel coat hook with black rubber bush on inside door face.
h) Door closer not required
i) Combined male and female circular brushed stainless steel WC sign on external face.

Ironmongery to be included as a Prime Cost sum in pricing documents.

L20 - 1.2.2. GENERAL:

a) All door leaves and door frames shall be by the same manufacturer. Alternatively, the frames may be manufactured by a source recommended in writing by the door leaf manufacturer. All doorsets shall be pre-hung and be certified to achieve the performance criteria.

b) The works shall be securely fixed and sealed in accordance with the manufacturer's recommendations, not compromising the performance and certification of the doorset.

c) Ironmongery shall be in accordance with Section P21. The doorset manufacturer shall ensure that the ironmongery does not compromise the certification of the works.

d) All doorsets shall be checked with regards to security and the relevant security symbols.

e) Fixing of signage shall be undertaken by methods that do not compromise the performance and integrity of the doorsets.

f) Doorsets shall be factory pre-machined, and reinforced as necessary, for all specified ironmongery, prior to the application of factory finishes. Ensure that the doorset manufacturer is in receipt of specimen furniture at the earliest opportunity after order placement to enable configurations of machinery.

g) The *Contractor*, in liaison with the manufacturer, shall ensure that the works as specified incorporate all necessary seals, sealants, fixings, accessories and ancillary items are supplied as required in accordance with, and to achieve the requirements of, the *Specification*.

h) Door leaves shall have a suitable solid core to meet the performance requirements of the *Specification*.

i) Door frames shall include integral or planted door stops that are within the frame profile, as accepted by the *Project Manager*.

j) The method of installation of door frames to sub-frames, partitions or blockwork shall provide for seals and components to meet all performance requirements. All fire doors' installation to be carried out by certified specialist in accordance with doors fire certificate requirements.

k) Provide additional support angles, bracketry and framing in order to secure the frames to supporting walls.

l) Pack any gaps between door frame and wall with suitable material to meet performance requirements.

m) Shadow gap detail between wall and frame shall be as indicated on the *Design Drawings*, where required.

n) Ensure that door leaf(ves) and associated panels arrive on Site with adequate surface protection. Material used for surface protection shall be of low flammability and shall be in accordance with the requirements of LPS 1207.

L20 - 1.2.3. PERFORMANCE REQUIREMENTS:

a) The *Contractor* shall use the applicable manufacturer's details of the required visual range to achieve the stated performance.

b) Industry recognised independent third party certification is required indicating compliance of individual doorsets with the specified performance.

c) Duty categories as described shall be in accordance with DD 171.

d) Ensure that all doorsets are clearly marked on the hinge edge, with their door number and performance, enabling them to be reconciled with their intended location.

L20 - 1.3. PERFORMANCE REQUIREMENTS

L20 - 1.3.1. GENERAL:

a) Comply with the general performance requirements of Section A and the following specific performance requirements.

b) Doorsets shall maintain the performance requirements of the walls/ systems that they are set in.

L20 - 1.3.2. STANDARDS

Notwithstanding the list of standards below, the Contractor developing the design is to comply with the current versions of the prevailing BSEN and industry best practice standards:

a) BS/ EN Standards:

i) BS 4787-1: 1980 internal doors

ii) BS 5277: 1976 doors - flatness

iii) BS 5278: 1976 doors - dimensions/ squareness

iv) BS EN ISO 9000: 1987 quality assurance - certification

v) BS EN ISO 9001: 2000 quality assurance - certification.

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L20 - 1.3.3. THERMAL MOVEMENT:

a) Allow for local thermal movements exerted due to climatic conditions.

b) The works, including all necessary support structure, shall be designed to accommodate changes in dimension and shape of its components resulting from changes in service temperatures and from differential surface temperatures between the inside and outside of the building without any reduction in the specified performance. The design shall cater for all temporary and permanent conditions envisaged for the works.

L20 - 1.3.4. STRENGTH OF DOORS AND FRAMES:

a) Ensure that the works, including ironmongery, meet the 'heavy duty' category as defined in DD 171 or an equivalent international standard.

b) Provide evidence to demonstrate that the works, including ironmongery, have been tested to meet the minimum acceptance criteria given in DD 171 for the following:

i) Slamming shut impact.

ii) Slamming open impact.

iii) Heavy body impact.

iv) Hard body impact.

v) Torsion.

vi) Download deformation.

vii) Closure against obstruction.

viii) Resistance to jarring and vibration.

ix) Abusive forces on door handles.

L20 - 1.3.5. MOISTURE MOVEMENT:

a) All parts of the door assembly shall be selected to satisfy the design life requirements for the environmental conditions as specified in Section A and shall withstand moisture movement without permanent deformation or any reduction in the specified performance:

Durability

L20 - 1.3.6. GENERAL:

a) The performance criteria shall be satisfied for the full service life of the works, as stated in the *Specification*, provided always that the maintenance has been carried out as specified.

b) Selected materials shall be durable and satisfy the requirements of the *Specification* for the service life of the works.

c) The works shall perform throughout the service life without failure resulting from defects in design, materials or workmanship. Failure shall be defined as breakage, disengagement of components, deflection beyond stated values, reduction in performance or unacceptable change in appearance including breakage.

d) The works shall comply with Section 5 of Approved Document A of the Building Regulations, with regard to accidental damage/ robustness.

L20 - 1.3.7. ABRASION RESISTANCE:

The works shall resist abrasion from agreed cleaning methods and maintenance systems without any noticeable change in surface appearance.

L20 - 1.3.8. IMPACT RESISTANCE:

a) Generally, surfaces shall be sufficiently hard to resist heavy impacts from hand-held objects without any noticeable change to the surface appearance.

b) Hard body impact loads to BS 8200: Classification B.

c) Soft body impact loads to glazed elements to BS 6206 and BS EN 12600: Classification A and 1 respectively.

L20 - 1.3.9. DEMOUNTABILITY:

a) Elements of the works shall be individually and independently removable, ensuring access for maintenance and/ or replacement of solid infill units and other components in the event of breakage/ damage.

L20 - 1.4. MATERIALS

L20 - 1.4.1. GENERAL:

a) All elements of the doorset shall fulfil the sustainability requirements stipulated within Section A of the Specification.

b) The doors and frames shall be unaffected by micro-organisms, mildew, insects and vermin, nor provide harbourage for same.

L20 - 1.4.2. GENERAL:

a) Refer to Section Z20.

b) Fixings shall be in accordance with the system manufacturer's recommendations, to suit the service conditions.

c) Where necessary, fixing components shall be capable of adequate three-dimensional adjustment to accommodate building structure and system fabrication/ installation tolerances.

d) Fixings shall be inherently corrosion resistant or fully protected to prevent corrosion.

e) Visible fixings shall be a type agreed with the architect prior to installation.

Adhesives

L20 - 1.4.3. GENERAL:

a) Refer to Section Z20.

b) Determine suitable adhesives to achieve the requirements of the *Specification* and satisfy the requirements of BS EN 204.

c) Adhesives shall be compatible with the proposed finishes and any preservative/ fire retardant treatments.

Sealants and Gaskets

L20 - 1.4.4. SEALANTS:

a) Refer to Section Z22.

b) Sealant products shall be used in accordance with the system manufacturer's recommendations, to suit the service conditions.

SUBMITTALS AND TESTING

L20 - 1.5. SUBMITTALS

Tender Submittals

L20 - 1.5.1. TENDER RESPONSE:

a) Provide Tender submittals in accordance with the requirements of Section A.4000 of the Specification.

b) A list of proposed suppliers intended to be used.

Samples Mock-ups Prototypes and Quality Benchmarks

L20 - 1.5.2. PRE-CONTRACT SAMPLES:

a) Not Required

L20 - 1.5.3. POST CONTRACT AWARD SAMPLES:

a) Physical sample of door leaf and frame, fully decorated

b) Samples of any alternative ironmongery products proposed

L20 - 1.5.4. MOCK-UP REQUIREMENTS:

Not required.

L20 - 1.5.5. PROTOTYPE REQUIREMENTS:

Not required

L20 - 1.5.6. QUALITY BENCHMARK REQUIREMENTS::

a) First completed installation of each new door type.

L20 - 1.6. TESTING

L20 - 1.6.1. GENERAL:

a) Refer to Section A clause for the general requirements for testing.

b) Test certificates shall not relieve the *Contractor* of his responsibilities regarding the performance and service life requirements of the doors and frames.

c) Provide independently certified evidence that all specified variants of components comply with specified performance requirements.

L20 - 2. FABRICATION AND WORKMANSHIP

L20 - 2.1. FABRICATION

L20 - 2.1.1. GENERAL:

a) A high degree of accuracy is required in the fabrication and installation of the work so that the works are assembled with tight, close fitting joints to produce components free from distortion.

b) Carry out all work and use all materials in accordance with the manufacturer's recommendations.

c) Accurately cut and form materials to the required shape and with all exposed surfaces and edges true and free from irregularities and defects, using techniques that will not impair the strength of materials used.

d) The works elements shall be square, regular to level and plane with all junctions fitting to the stated tolerances.

e) Doors shall be rebated for lock boxes, door closers, hinges and other items of ironmongery and reinforced as necessary as indicated.

f) Fabrication with timber shall be to BS 1186: Part 2 carefully machining timber to accurate lengths and profiles; free from twisting and bowing. After machining, surfaces shall be smooth and free from tearing, woolliness, chip bruising and other machining defects. The requirements refers to existing/ and replacement doors in 33-37 Charterhouse building only.

g) The tops of doors shall align with the tops of panel sub-frames.

h) Door frames shall be reinforced at hinges, fixings, strikes and door closer locations and shall provide all cut-outs required for the installation of security items.

i) Frames of glazed doors shall be wedged and blocked to prevent racking.

j) Suitable cut-outs shall be provided in the frames for all mortice ironmongery. Metal reinforcements shall be provided for attaching all ironmongery hardware.

Fabrication Tolerances

L20 - 2.1.2. GENERAL:

a) Manufacturing tolerances shall be in accordance with BS 4787, BS 5277, BS 5278 and BS EN 951.

b) The fabrication drawings shall provide for sufficient tolerance in manufacture of the works in order to accommodate manufacturing tolerances of interfacing elements.

L20 - 2.1.3. TOLERANCES FOR MANUFACTURE:

a) Assembly: The physical fitting together of any assembly of sub-elements shall be properly allowed for in the *Detailed Design* of the corresponding sub-elements.

b) The following tolerances apply to each individual component:

i) Length/ Width: Maximum allowed deviation is the lesser of 1.5mm up to 2000mm and 2.0mm above 2000mm of design dimension.

ii) Thickness/ Depth (extrusion tolerances nominally): Maximum allowed deviation is ±0.5mm.

L20 - 2.2. WORKMANSHIP

L20 - 2.2.1. GENERAL:

a) During construction, exposed components shall be protected after fitting and care taken to avoid fitting any components whilst 'wet' trades are still in progress. Protect from abrasives, acids and other corrosive materials.

b) Installation of fire doorsets/ fire door assemblies shall be carried out by sub-contractors who are members of a nationally recognised quality assurance scheme, and ideally the same scheme to which the door manufacturer subscribes.

c) Installation of fire doorsets/ fire door assemblies shall be in accordance with the recommendations of the Architectural and Specialist Door Manufacturer's Association Installation Guide.

L20 - 2.2.2. PROTECTION OF COMPONENTS:

Do not deliver to Site components, which cannot be put immediately into suitable dry, covered storage with a dry floor. Stack on bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

L20 - 2.2.3. PROTECTION OF COMPONENTS AFTER INSTALLATION:

Ensure that all exposed components have protective coverings during storage and after installation to protect factory applied finishes. Door leaves shall also be protected during on-Site operations.

L20 - 2.2.4. MOISTURE CONTENT

a) All timber shall be subjected to controlled drying to ensure that the moisture content, if not otherwise specified, is suitable for the situation of the finished joinery. When fixed, it shall remain stable and free from expansion, contraction or other movements detracting from the required performance or appearance.

b) During delivery, storage, fixing and thereafter to Practical Completion maintain conditions of temperature and humidity to suit the specified moisture content(s) of timber components. When instructed by the Project Manager, test components with an accepted electrical moisture meter used in accordance with the manufacturer's recommendations.

L20 - 2.2.5. IRONMONGERY:

Assemble and fix carefully and accurately using fastenings with a matching finish supplied by the ironmongery manufacturer.

Prevent damage to ironmongery and adjacent surfaces. At completion check, adjust and lubricate as necessary to ensure correct functioning. Refer also to the requirements of Section P21.

L20 - 2.2.6. ON-SITE DIMENSIONS:

a) Take responsibility for all dimensions and for checking dimensions on Site prior to manufacture.

b) Ensure that the Detailed Design accommodates any given tolerances and differences between actual Site dimensions and dimensions shown on the Design Drawings.

Workmanship Tolerances

L20 - 2.2.7. INSTALLATION TOLERANCES:

Tolerances shall be measured against the relevant Base Reference Datum; Location Reference Point; Location Reference Plane; Location Reference Surface or Reference Element as defined in Section A.

a) All elements shall be set out to their correct position as indicated on the *Design Drawings* and/ or *Working Drawings*, within ±2mm or 0.1% of the length, whichever is the lesser.

b) Gaps to head and jambs of doors to frames shall be consistent, of minimal dimensions and shall maintain the performance and functional requirements of the door(s).

c) The gap at the threshold of a door shall provide a nominal 3mm clearance above the finished floor level. Allow sufficient clearance to door leafs at thresholds for leafs to clear floor finishes.

d) Measurement of defects of general flatness of door leaves shall be in accordance with BS 5277.

e) Measurement of dimensions and of defects of squareness of door leaves shall be in accordance with BS 5278 and BS EN 951.

f) The maximum variation from plumb shall be ± 1.5mm.

g) Cut-outs for interfacing works shall be to the dimensions shown on the fabrication drawings ±1mm.

h) Horizontal Plan Position: For any element at any level whose position is defined in relation to a primary reference grid, the maximum allowed deviation from the Design Dimension to that reference grid is ±2mm.

i) Where a series of doors is arranged in an array of two or more, the maximum allowed deviation of the horizontal distance between any two adjacent elements is ±2mm from the corresponding Design Dimension.

j) Planarity: Any door whose position is defined from a reference plane shall not deviate from the Design Dimension of the reference plane by more than ±2mm measuring perpendicular to the defined plane.

k) The width of any joint shall not deviate from the nominal width by more than ±1mm of the joint width. Any variation shall be equally distributed with no sudden changes. The misalignment between joints shall not exceed 1mm.

l) Line and level shall be within ±2mm of the specified level.

m) The works shall be erected such that no point on any part is more than 1mm from its theoretical plane.

n) The dimensional and detailed provisions intended to accommodate the construction tolerances of surrounding elements in order to ensure that all aspects of the works relate satisfactorily to the works as a whole shall be stated and shown on the fabrication drawings.

o) All tolerances stated shall be measured and monitored at a mean temperature.

p) Tolerances shall not be cumulative.

L20 - 3. SYSTEMS INTEGRATION AND HANDOVER

HANDOVER

GENERAL:

As Contract requirements

a) End of section

M40. STONE/ CONCRETE/ QUARRY/ CERAMIC TILING/ MOSAIC

M40 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

M40 - 1.1. SPECIFICATION TYPE

M40 - 1.1.1. PRESCRIPTIVE WORKS

a) Supply, install and warrant the works complying with the visual intent indicated on the *Design Drawings* and criteria stated in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*, the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the Project Manager, but shall remain fully responsible for the *Detailed Design* and performance of the works.

d) Interfaces:

i) Co-ordinate with the work of others including all interfacing as required.

ii) Performance shall be maintained at all interface conditions.

M40 - 1.2. SYSTEM DESCRIPTIONS

Architectural and Functional Requirements

M40 - 1.2.1. SCOPE

Ceramic wall tiling to wall surfaces within the WC area and on the splash back for the staff kitchinette:

Wall tiling

i) TYPE WF-20 Porcelain wall tiles for WC wall tiling and kitchen splash back. Tiles for the WC are to be fixed to WBP ply substrate panels as part of the partition system (see Section K10). Tiles for the kitchen splash back can be applied directly to plasterboard, assuming the plasterboard substrate is moisture resistant. Wall tiling for the WCs should include coved skirting tiles to provide a moisture resistant and easily cleaned interface with the WC floor (rubber floor tiles – see Section M50).

ii) Walls tiles in WC to extend to suspended ceiling level. Wall tiles for kitchen splash-back to extend from worktop to underside of upper cupboards.

M40 - 1.2.2. GENERAL

a) Ceramic tiling, to walls shall be in accordance with BS 5385.

b) The works shall accommodate all architectural and functional features indicated on the *Design Drawings*.

c) Arrangement of tiles shall be as indicated on the *Design Drawings*.

d) Where not specified, all tiled finished shall be supplied and installed as complete integrated systems, including fixings, sealants, adhesives, jointing/ transition strips, trims and all other accessories/ components recommended/ supplied by the tile manufacturer to suit service conditions.

M40 - 1.2.3. ADHESIVE/ BEDDING:

a) Unless specified otherwise, adhesives/ bedding compounds shall be as recommended by the tile manufacturer to suit bases/ backings.

b) Adhesive shall be proprietary and as recommended by the tile manufacturer to suit backings/bases.

M40 - 1.2.4. GROUT:

a) G rout shall be recommended by the tile manufacturer to suit installation conditions.

b) Grout shall be water impervious, mould and chemical resistant.

c) Grout shall be non staining.

M40 - 1.2.5. JOINTS/ EDGINGS:

a) Unless specified otherwise, joint widths and configurations shall be as recommended by the manufacturer/ supplier,

b) Locations shall be as indicated on the *Design Drawings*.

c) Joints shall align with interfacing systems and shall reflect joints in the substrate for movement. Gaps within joints shall be uniform, unless specified or indicated otherwise on the *Design Drawings*.

d) Movement joints shall accommodate all foreseeable movements and expansion/ contraction whilst maintaining the overall system performance. Movement joints shall appear as similar to the standard joint as possible.

M40 - 1.2.6. TYPE WF-10 - WALL TILING TO TOILETS AND KITCHEN SPLASH BACK

.

a) Manufacturer/ Supplier: Dorset Woolliscroft, or acceptable equivalent on WBP ply wall lining.

b) Reference: Spectrum Crystal white gloss wall tiles and coved skirting tiles in WC.

c) Colour: White

d) Tile Size: Nominal 150mm x 150mm (Coordinating dimension)

e) Thickness: 6.5mm thickness

f) Background/ Base: Refer to Design Drawings for locations.

g) Primer: As recommended by the manufacturer. Ardex P51 or similar approved to be applied to IWS-20.

h) Bedding: ARDEX Adhesive bed, to suppliers recommendations

i) Grout:
   i) Manufacturer: Ardex, or acceptable equivalent.
   ii) Reference: Ardex FLEX FS .
   iii) Colour: 24 Cast Iron

j) Joint width: 3mm to suit 150x150mm coordination dimension.

k) Movement Joints: sealant control joints (to match colour of grout) to be provided at corners and regular 6m intervals as required by industry best practice.

l) Accessories: To manufacturer's recommendations

M40 - 1.2.7. TYPE WF-10 – TILED WALLS CORNER/EDGE TRIMS

Edge Trims for Wall Tiles.

a) Location: All exposed corners and edges of wall tiles.
b) Manufacturer/ Supplier: Schluter or acceptable equivalent approved by the Project Manager.
c) Reference: Winkel angle trim.
d) Material: Anodised aluminium.
e) Colour: white
f) Size: Assumed 15x30. Contractor to select to suit application.
g) Thickness: 2mm thickness
h) Background/ Base: As per the wall tile specification.
i) Bedding: ARDEX Adhesive bed, to suppliers recommendations
j) Grout: As per the wall tile specification.

M40 - 1.3. PERFORMANCE REQUIREMENTS

M40 - 1.3.1. STANDARDS

The Contractor shall comply with the Employer's Baseline Standards. The works generally shall be designed, constructed and installed to all relevant, current Eurocodes, British Standards, design standards and guidance with special reference given, but not limited to the following:

BS/ EN Standards:

i) BS 1134-2: 1990 assessment of surface texture.
ii) BS 5385-5: 2009 CoP - wall and floor tiling design/ installation.
iii) BS 8000-11.1: 1998 CoP - workmanship for wall and floor tiling.

Structural

M40 - 1.3.2. GENERAL

Refer to Section A, clause series A of the Specification.

M40 - 1.3.3. SPECIFIC MOVEMENTS

a) The works shall be detailed, manufactured and installed to accommodate all movements of the substrates without damage or any reduction in performance or appearance.
b) Refer to the structural movement joints indicated in the Blenheim Grove Building Works Structural Engineer's documentation and Design Drawings.

Unless otherwise stated the works shall accommodate the following live loads without any reduction in performance or appearance:

a) All loads resulting from movements of the building structure.

b) Loads acting on the surface arising from maintenance and cleaning operations.

c) Impact loads, or transferred impact loads that reasonably occur during their normal service life.

Environmental

M40 - 1.3.4. THERMAL MOVEMENT

a) It shall be ensured that the works are capable of withstanding differential surface temperatures.

M40 - 1.3.5. MOISTURE MOVEMENT

The works shall withstand the following movement without permanent deformation or any reduction in the specified performance:

a) Due to changes in the moisture content of its components, resulting from intended use in WC and kitchen locations, cleaning and maintenance requirements including wall washing and variations in the moisture content of the air.

b) Due to drying shrinkage of building components, both short term and long term to BS 8297 and BS 8298.

M40 - 2. SUBMITTALS AND TESTING

M40 - 2.1. SUBMITTALS

Tender Submittals

M40 - 2.1.1. TENDER RESPONSE:

Provide Tender submittals in accordance with the requirements of Section A of the *Specification*.

M40 - 2.1.2. PRE-CONTRACT SAMPLES:

Not required.

M40 - 2.1.3. POST CONTRACT AWARD SAMPLES:

Post contract award samples of the following shall be provided:

a) Typical wall tile, coved skirting tile, grout colour and edge trim.

M40 - 2.1.4. MOCK-UP REQUIREMENTS:

Not required.

M40 - 2.1.5. REQUIRED PROTOTYPES:

No requirement

M40 - 2.1.6. BENCHMARK REQUIREMENTS:

i) At commencement of work on site complete one control sample area of one full WC wall surface including coved skirtings for architect inspection prior to proceeding with remaining works.

ii) Control samples shall establish the minimum standard of materials and workmanship for the finished installation.

iii) Control samples may form part of the finished installation if deemed acceptable the control sample..

M40 - 2.2. TESTING

M40 - 2.2.1. GENERAL

a) Refer to Section A clause series A for the general requirements for testing.

b) Independently certified test data and Agrément certificates that demonstrate that the proposed systems meet the requirements of the *Specification* shall be provided.

c) All on-Site testing specified herein, which shall be carried out by an independent testing body accredited by the United Kingdom Accreditation Services (UKAS), shall be included for.

M40 - 2.2.2. SEALANT TESTING

Sealant staining and adhesion shall be tested in accordance with BS 3712. Perform test on each type of tile in contact with sealant(s).

M40 - 2.2.3. GROUT STAINING

Evaluate the risk of staining, as recommended by the manufacturer. Seek advice of specialist/ manufacturer if discolouration occurs on trial areas.

M40 - 3. FABRICATION WORKMANSHIP AND TOLERANCES

M40 - 3.1. FABRICATION

M40 - 3.1.1. GENERAL:

a) Fabrication of materials/ components shall, as a minimum, be in accordance with current regulations and standards.

b) Fabrication shall be based on Site measurements to accommodate construction tolerances.

c) Fabricate the works carefully and accurately using proven methods of construction, to ensure compliance with the design requirements.

d) Sections shall be formed true to shape, accurate in size, square, free from distortions, irregularities and defects, to profiles indicated on the *Design Drawings*.

e) Materials/ components that are damaged or have any other physical imperfections shall not be used in the works.

Stone

M40 - 3.1.2. GENERAL:

a) Tiles shall be cleanly cut where required using appropriate cutting tools to form clean edges. Cut edges are to be located at corner or ceiling junctions where possible to conceal the cut edge.

b) Remedial work such as patching and filling during fabrication shall not be undertaken

M40 - 3.2. Fabrication Tolerances WORKMANSHIP

M40 - 3.2.1. GENERAL:

a) Workmanship shall generally be in accordance with the relevant and applicable parts of BS 8000 and BS 5385.

b) Where applicable, the works shall be carried out in accordance with the manufacturer's recommendations.

c) Operatives shall be trained in the installation of the works and, where applicable, be recommended by the system manufacturer.

Storage

M40 - 3.2.2. GENERAL:

a) Materials/ components shall not be delivered to Site until required or until there is suitable dry storage space.

b) All materials/ components shall be stored on Site in accordance with their respective manufacturer's recommendations.

c) Adequate storage shall be provided for all materials/ components to maintain them free from damage and distortion, and in conditions suitable for their intended service conditions.

d) Finished materials/ components shall be carefully packed in stillages or crates such that they are suitably separated and protected to prevent scratching, scuffing, or other surface damage.

e) Protective packaging/ coverings shall not be removed until immediately before components are required for fixing.

Preparation

M40 - 3.2.3. SUITABILITY OF STRUCTURE/ SUBSTRATE:

a) Before commencing installation, the structure shall be surveyed. Dimensions, line and level shall be checked.

b) If the structure/ substrate is unsuitable, remedial action to make the structure suitable shall be proposed.

c) All bases/ backgrounds shall be rigid, dry, sound, clean, free from dust, dirt grease and other contaminates systems/ products are installed.

d) Substrates shall be sound, with no loose material or significant cracks or gaps.

e) Wall surfaces shall be prepared for tiling using a suitable adhesive compound to fill any excessive indentations prior to applying the general adhesive compound.

f) All cutting, chasing, plugging, making good and other necessary procedures required to the adjacent works, that can not/ should not be undertaken after the installation of the works specified herein, shall be completed.

g) Tolerances of the structure/ substrate shall be suitable to permit the required configuration and specified tolerances of the finished systems.

M40 - 3.2.4. DAMPNESS:

Where tiles are to be installed on new wet-laid backgrounds/ bases, ensure that:

a) Drying aids have been turned off for not less than four days.

b) Tests for moisture content, using an accurately calibrated hygrometer, or probe in accordance with BS 5325 or BS 8203 are taken.

c) Readings are taken in all corners, along edges and at various points over the area being tested.

d) Tiles shall not be laid until all readings show suitable humidity in accordance with tile and adhesive manufacturers' recommendations.

M40 - 3.2.5. GENERAL:

a) Components shall be thoroughly conditioned by unpacking and spreading out in the spaces where they are to be laid in conditions similar to those that will prevail when the building is occupied.

b) Before, during and after installation, temperature and humidity shall be maintained at levels approximating to those that will prevail during building use.

c) Finishes shall not be installed within 48 hours of any heating having been turned off. After completion of installation, slowly return the heating to its operative temperature not less than 48 hours after completing the installation.

d) Arrangements shall be made for operating the heating/ ventilation/ air conditioning installation up to the date of Practical Completion of the works.

e) Allowance for future moisture and temperature movement shall be made.

f) The works shall be set out and installed accurately, square, true to line, level and plane free from undulations, with lines and joints aligned, straight and parallel unless specified otherwise and within stated tolerances and in the correct relationship with the building structure.

g) Before adhesive/ bedding material sets, adjustments shall be made to give true, regular appearance to tiles and joints when viewed under final lighting conditions. Sudden irregularities shall not occur.

h) The installation shall accommodate all specified tolerances and differences between actual Site dimensions and dimensions shown on the *Design Drawings*.

i) Setting-out shall be centred between walls so that cut tiles at perimeter are of equal sizes and not smaller than one third of original tile size.

j) Where permitted by the manufacturer, materials/ components shall be cut neatly and accurately without unintended damage. Cut edges shall be kept to a minimum.

k) Materials/ components intended to be installed in 'running lengths' shall be subject to the following:

i) Straight runs between angles or ends of runs shall be formed in single unjointed lengths wherever possible. Where running joints are unavoidable, obtain acceptance for location and method of jointing from the *Project Manager*

l) All joints at angles shall be mitred or as otherwise accepted by the *Project Manager* through sampling.

m) Each component of the works shall be inspected immediately before installation. The works shall be installed using materials/ components being properly sized, free from marks, defects, flaws, steps, waves, or damage of any nature.

n) Damaged units shall not be repaired without acceptance by the contract administrator.

o) Only use materials/ components from the same production batch in the same area to prevent banding, patchiness or other visual variations.

p) Acceptance shall be obtained from the *contract administrator* before drilling or cutting parts of the structure, other than where indicated on the *Design Drawings*.

q) Do not cut, drill or otherwise alter the work of others to accommodate the system/ product installation without first seeking the acceptance of the *Project Manager*.

r) No materials/ components shall be installed until service outlets, duct covers and other fixtures around which the materials are to be cut have been fixed. The *Project Manager* shall be informed not less than 48 hours before commencing laying.

s) Make provision for foreseeable movements/ expansion/ contraction in accordance with the system/ product manufacturer's recommendations.

M40 - 3.2.6. ADHESIVE:

a) Refer to Section Z20.

b) Primers shall be used where recommended by the adhesive manufacturer before applying adhesives.

c) Bond materials/ components securely to substrates to give true surfaces free from undulations, scratches, adhesive marks, stains and other visual defects. Tightly butt or leave gaps/ joints as required.

d) The adhesive shall be spread evenly pressing down materials/ components firmly and rolling (if recommended) to ensure full contact and a good bond overall.

e) All surplus adhesive shall be removed from exposed faces of coverings as the work proceeds.

f) Ridges and high spots shall be eliminated.

M40 - 3.2.7. MORTAR:

Mortar bedding shall be in accordance with manufacturer's recommendations.

M40 - 3.2.8. JOINT WIDTHS;

a) Joints shall be true to line, continuous and without steps.

b) Tile to tile grout joint widths between tiles shall be controlled by using spacer pegs.

M40 - 3.2.9. GROUTING;

a) Grout shall not be applied until the bedding material has hardened sufficiently. The joints shall be a minimum of 5mm deep and free from dust and debris. All joints shall be completely filled, tooled to an accepted profile and wiped down to leave free from blemishes.

b) The works shall be grouted, as soon as bedding material has set firm.

c) All grout joints shall be installed to the full depth of the tile joint. All debris shall be removed from the joints prior to grouting. The grouting joint shall be a nominal 2mm, at no point greater than 3mm or less than 1mm and deviations shall be non-cumulative.

d) The grout joints shall be 'washed' joints, that is the grouting shall be washed out to the bottom line of the arris.

e) Seal grout with a proprietary water-based sealer.

f) Grout shall not stain tiles/ slabs.

g) Surplus material shall be immediately cleaned from surfaces of tiles.

M40 - 3.2.10. TEMPORARY PROTECTION:

Finished areas shall be adequately protected from damage by subsequent building operations and other factors until Practical Completion.

M40 - 3.2.11. CLEANING:

a) At Practical Completion of the works all exposed areas/ surfaces of the works shall be cleaned.

b) Cleaning materials and methods shall be recommended/ accepted by the tile manufacturer, where applicable.

c) Materials or methods that could alter the character of the exposed finishes shall not be used.

d) Adjacent surfaces shall be protected from damage due to cleaning operations.

M40 - 3.2.12. COMPLETION:

a) Installed works shall be left clean.

b) Defects shall be repaired without delay, to minimise damage and nuisance.

c) On Practical Completion, the works shall be checked for damage and defects. All damaged or defective components/ accessories shall be replaced.

M40 - 3.2.13. GENERAL:

Tolerances shall be measured against the relevant Base Reference Datum; Location Reference Point; Location Reference Plane; Location Reference Surface or Reference Element as defined in Section A.

a) All elements shall be set out to their correct position as indicated on the Design Drawings and/ or Working Drawings, within ±2mm or 0.1% of the length, whichever is the lesser.

b) Vertical elements shall be plumb, within ±2mm or 0.1% of the height, whichever is the lesser.

c) Horizontal elements shall be level, within ±2mm or 0.1% of the length, whichever is the lesser.

d) The maximum variation in gap from a straightedge applied to a flat vertical plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

e) The maximum variation in gap from a straightedge applied to a flat horizontal plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

f) The maximum variation in gap from a straightedge applied to a flat inclined plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge. Drainage requirements of inclined planes shall be maintained.

g) The maximum offset in plane, level or section between any two adjacent sections shall be ±1mm.

h) The permissible deviation from vertical datum of a floor finish level shall be ±3mm, but shall be flush with any adjacent floor finish.

i) The average width of any panel to panel joint shall be within ±1mm of the nominal joint. Any variation shall be equally distributed with no sudden changes or steps.

j) The maximum deviation between adjacent tile/ panel surfaces either side of an expressed joint shall be 1mm.

k) The bow of any flat surface shall not exceed more than ±2mm from a 2000mm straightedge placed against it in any direction.

l) The straightness of any surface of an edge shall not deviate by more than ±2mm from a 2000mm straightedge placed against it in any direction parallel to the long axis of the element.

m) The centre section of any lineal element shall not bow by more than the lesser of ±2mm or 0.075% of the length of the element measured from a straight line between the ends of the element.

n) The cross-section of any element shall not be twisted by more than 1° from the intended alignment.

o) Dimensional and location tolerances of cut-outs for interfacing works shall be ±1mm the dimensions indicated on the Design Drawings. The Contractor shall verify, with the appropriate supplier/ trade contractor, that such dimensions and locations are correct. Any deviation shall be agreed with the Project Manager.

p) Account shall be taken of the installation tolerance requirements such that repetitive elements are accurately located, relative to gridlines.

q) Tolerances shall not be cumulative. The most onerous tolerance shall apply.

Sustainability Performance Requirements

M40 - 3.2.14. SUSTAINABILITY PERFORMANCE MAINTAINABILITY

provide detailed information on the maintenance requirements of the product, including:

a) Expected service life before replacement or major refurbishment (which must be at least 50 years);

Recommended maintenance intervals for cyclical maintenance,

b) Recommended inspection programme to detect if any elements are defective, broken or at risk of failure,

c) Reactive condition based maintenance procedures;

Cleaning requirements, including recommended cleaning agent(s) and frequency; cleaners must be non-toxic and preferably biodegradable, and a material safety data sheet must be provided for all recommended cleaning agents.

d) Care of product during major refurbishment

Any special skills required for maintenance in accordance with manufacturer's recommendations

M40 - 3.2.15. VOLATILE ORGANIC COMPOUNDS (VOCS)

In accordance with BREEAM Credit Hea 9 - VOCs, any flooring adhesives must comply with BS EN 13999-1:2007, and the supplier must verify that carcinogenic or sensitising volatile substances are absent.

M40 - 3.2.16. NO TOXIC OR DELETERIOUS MATERIALS:

a) Only non-toxic materials, which are not deleterious to human health, may be used.

b) The supplier must demonstrate that the materials will not be hazardous in the event of a fire.

c) The following banned materials must not form part of any aspect of the work:

i) Asbestos or asbestos-containing products, as defined in the United Kingdom's The Control of Asbestos Regulations 2006, or any statutory modification or re-enactment thereof.

ii) Lead where the metal or its corrosive products may be directly ingested, inhaled or absorbed, including lead based paints and primers.

iii) Materials which may release formaldehyde beyond British Standard limits, including urea-formaldehyde foam.

iv) Materials which generally comprise mineral fibres, either man-made or naturally occurring, which have a diameter of 3 microns or less and a length of 200 microns or less, or which contain any fibres not sealed, encapsulated, or otherwise stabilised to ensure that fibre migration is prevented. Products that may contain these fibres include insulation, fire protection and air filters. For all mineral fibre insulation products, test evidence must be available and produced confirming that the materials fulfil the requirements of European Directive 97/ 69/ EC and the Approved Supply List of current HSE CHIP Regulations and consequently are not classified as a possible human carcinogen.

v) Chlorofluorocarbons (CFCs) or hydro-chlorofluorocarbons (HCFCs) or any goods or materials containing CFCs or HCFCs or other ozone depleting substances (e.g. materials in which CFCs or HCFCs have been used as blowing agents).

vi) Polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs) or any goods or materials containing PCBs or PCTs.

vii) Tributyltin (TBT).

viii) Medium density fibreboard (MDF) which is neither zero formaldehyde nor conforms to class E1 according to BS EN 13986.

M40 - 3.2.17. FAIR TRADE, ETHICAL SOURCING & EQUAL OPPORTUNITIES:

Demonstrate policies and procedures are in place to ensure fair trade and ethical sourcing of your raw materials (e.g. working with suppliers and auditing workplace conditions) and ensuring equal opportunities for all in the workforce (e.g. gender equality and inclusion of minorities).

M40 - 4. SYSTEMS INTEGRATION AND HANDOVER

M40 - 4.1. HANDOVER

M40 - 4.1.1. GENERAL:

a) As the Contract Requirements.

End of Section

M50. RUBBER/ PLASTICS/ CORK/ LINO/ CARPET TILING/ SHEETING

M50 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

M50 - 1.1. SPECIFICATION TYPE

M50 - 1.1.1. PRESCRIPTIVE WORKS:

a) Supply, install and warrant the works as indicated on the *Design Drawings* and criteria in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*,the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the Project Manager , but shall remain fully responsible for the *Detailed Design* and performance of the works.

M50 - 1.2. SYSTEM DESCRIPTIONS

Architectural and Functional Requirements

M50 - 1.2.1. SCOPE

a) New rubber floor tiling in all areas other than on the public side of the new security desk, to include the security office, break out area, WC's, kitchen and locker space and the area behind the main security reception desk. The lobby area in front of the reception desk has historic mosaic tiling which is to be retailed. Any areas of historic mosaic uncovered as part of the removal of existing floor finishes must be retained. All new tiling should be laid on 6mm plywood sheeting to protect underlying historic terrazzo and mosaic finishes. Existing penetrations in the sub-floor should be filled before installation, to ensure the ply sub-floor provides a smooth, even surface. Any major apertures and deformations in the underlying floors which are revealed on removal of existing floor finishes should be inspected with the architect to agree remedial works, prior to installation of the ply sheeting. The ply sheeting should be bonded to the underlying floor finishes, rather than using mechanical fixings.

   i) TYPE FF-10 Rubber Tile Flooring laid on 6mm plywood underlay. Coved rubber skirting sections are not required – applied softwood skirtings are to be installed in all relevant areas other than within the WC cubicle where ceramic coved skirtings will form the interface between floor and wall surfaces.

   ii) Rubber flooring tiles to be Norament 926 Grano Hamerblow finish, colour 5301. Manufacturer Nora by Interface.

M50 - 1.2.2. GENERAL:

a) Setting out and service conditions shall be as indicated on the *Design Drawings*.

b) The works shall accommodate all architectural and functional features indicated on the *Design Drawings*.

c) Unless specified, floor coverings shall include underlays in accordance with manufacturer's recommendations. Underlays shall suit service conditions and finished floor levels.

d) Where not specified, all linings and floor coverings shall be supplied and installed as complete integrated systems, including fixings, sealants, adhesives, jointing/ transition strips, trims and all other accessories/ components recommended/ supplied by the flooring/ lining manufacturer.

e) Flooring finishes shall include manufacturer's data stating the PTV and Rz values to demonstrate compliance with the performance requirements.

M50 - 1.2.3. ADHESIVES/ BONDING AGENTS/ LEVELLING COMPOUNDS:

a) Unless specified otherwise, adhesive/ bonding agents shall be as recommended by the flooring manufacturer to suit performance requirements and bases/ backings.

b) A levelling compound shall be provided where necessary and as recommended for purpose by the system manufacturer.

M50 - 1.2.4. JOINTS:

a) Unless specified otherwise, joint widths and configurations shall be as recommended by the manufacturer/ supplier.

b) Joints shall align with those used in interfacing systems. Gaps within joints shall be uniform, unless specified or indicated otherwise on the *Design Drawings*.

c) Movement joints shall accommodate all movements whilst maintaining the overall system performance. Movement joints shall appear as similar to the standard joint as possible

d) Seams to linings and flooring coverings shall be jointed in accordance with the manufacturer's recommendations

M50 - 1.3. PERFORMANCE REQUIREMENTS

M50 - 1.3.1. STANDARDS

The Contractor shall comply with the Employer's Baseline Standards. The works generally shall be designed, constructed and installed to all relevant Eurocodes, British Standards, Crossrail and London Underground design standards and guidance .

M50 - 2. SUBMITTALS AND TESTING

M50 - 2.1. SUBMITTALS

Tender Submittals

M50 - 2.1.1. TENDER RESPONSE:

Provide Tender submittals in accordance with the requirements of Section A of the *Specification*.

Samples Mock-ups Prototypes and Quality Benchmarks

M50 - 2.1.2. POST CONTRACT AWARD SAMPLES:

A sample tile of the proposed material should be provided for approval by the architect prior to installation

M50 - 2.1.3. MOCK-UPS:

Not required

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M50 - 2.1.4. QUALITY BENCHMARK REQUIREMENTS:

Provide quality benchmarks, in location(s) to be agreed with the *Project Manager*, in accordance with Section A. 40:

a) First full room to be made available for inspection by the architect for benchmarking purposes. This can form part of the permanent works.

M50 - 2.2. TESTING

M50 - 2.2.1. GENERAL:

a) Refer to Section A for the general requirements for testing and the approach to off-Site and on-Site testing. No on site testing is anticipated as part of these works.

M50 - 3. FABRICATION WORKMANSHIP AND TOLERANCES

M50 - 3.1. FABRICATION

M50 - 3.1.1. GENERAL:

a) Fabrication of materials/ components shall, as a minimum, be in accordance with current regulations and standards.

b) Fabrication shall be based on Site measurements to accommodate construction tolerances.

c) Materials/ components that are damaged or have any other physical imperfections shall not be used in the works.

d) Adhesive joints shall be adequately protected during the curing process to avoid contamination by dust and other debris.

M50 - 3.2. Fabrication Tolerances WORKMANSHIP

M50 - 3.2.1. GENERAL:

a) Workmanship shall generally be in accordance with the relevant and applicable parts of BS 8000.

b) Where applicable, the works shall be carried out in accordance with the manufacturer's recommendations.

c) Operatives shall be trained in the installation of the works and, where applicable, be recommended by the system manufacturer.

Storage

M50 - 3.2.2. GENERAL:

a) Materials/ components shall not be delivered to Site until required or until there is suitable dry storage space.

b) All materials/ components shall be stored on Site in accordance with their respective manufacturer's recommendations.

c) Adequate storage shall be provided for all materials/ components to maintain them free from damage and distortion, and in conditions suitable for their intended service conditions.

d) Finished materials/ components shall be carefully packed in stillages or crates such that they are suitably separated and protected to prevent scratching, scuffing, or other surface damage.

e) Protective packaging/ coverings shall not be removed until immediately before components are required for fixing.

Preparation

M50 - 3.2.3. SUITABILITY OF STRUCTURE/ SUBSTRATE:

a) Before commencing installation, the structure shall be surveyed. Dimensions, line and level shall be checked. The architect shall be informed immediately if the existing structure is unsuitable to receive the works.

b) If the structure/ substrate is unsuitable, remedial action to make the structure suitable shall be proposed.

c) All bases/ backgrounds shall be rigid, dry, sound, smooth and free from grease, dirt and other contaminants before systems/ products are installed.

d) Substrates shall be sound, with no loose areas or significant cracks or gaps.

e) The surface of existing floors shall be stripped and suitably prepared prior to the installation of adhesive fixed flooring in accordance with the adhesive manufacturer's recommendations.

f) All cutting, chasing, plugging and other necessary procedures required to the substrate or adjacent works, that cannot/ should not be undertaken after the installation of the works specified herein, shall be completed.

g) Tolerances of the structure/ substrate shall be suitable to permit the required configuration and specified tolerances of the finished systems/ products.

M50 - 3.2.4. DAMPNESS:

Where systems/ products are to be installed on new wet-laid backgrounds/ bases, ensure that:

a) Drying aids shall have been turned off for not less than four days.

b) Tests for moisture content shall be taken, using an accurately calibrated hygrometer or probe in accordance with BS 5325 or BS 8203 or other standard as agreed with the Employer.

c) Readings are taken in all corners, along edges and at various points over the area being tested.

M50 - 3.2.5. GENERAL:

a) Components shall be conditioned by unpacking and spreading out in the spaces where they are to be laid in conditions similar to those that will prevail when the building is occupied.

b) Before, during and after installation, temperature and humidity shall be maintained at levels approximating to those that will prevail during building use.

c) Finishes shall not be installed within 48 hours of any heating having been turned off. After completion of installation, slowly return the heating to its operative temperature not less than 48 hours after completing the installation.

d) Arrangements shall be made for operating the heating/ ventilation/ air conditioning installation up to the date of Practical Completion of the works .

e) Allowance for future moisture and temperature movement shall be made.

f) The works shall be set out and installed accurately, square, true to line, level and plane, free from undulations, with lines and joints aligned, straight and parallel unless specified otherwise, within stated tolerances and in the correct relationship with the building structure.

g) The installation shall accommodate all specified tolerances and differences between actual Site dimensions and dimensions shown on the *Design Drawings*.

h) The setting out of the pattern shall be agreed with the architect before ordering materials/ components.

i) Where permitted by the manufacturer, materials/ components shall be cut neatly and accurately without unintended damage. Cut edges shall be kept to a minimum.

j) Setting-out shall be centred between walls so that cut materials/ components at the perimeter are of equal sizes and (for tiles) not smaller than one third of original size.

k) Materials/ components intended to be installed in 'running lengths' shall be subject to the following:

   i) Straight runs between angles or ends of runs shall be formed in single unjointed lengths wherever possible.

l) Each material/ component of the works shall be inspected immediately before installation. The works shall be installed using materials/ components being properly sized, free from marks, defects, flaws, steps, waves, or damage of any nature.

m) Damaged units shall not be repaired without acceptance.

n) Materials/ components from the same production batch shall be used in the same area to prevent banding, patchiness or other visual variations.

o) Acceptance shall be obtained from the contract administrator before drilling or cutting parts of the structure, other than where indicated on the *Design Drawings*.

p) The work of others shall not be cut, drilled or otherwise altered to accommodate the installation of the system/ product unless accepted by the contract administrator.

q) No materials/ components shall be installed until service outlets, duct covers and other fixtures around which the materials are to be cut have been fixed.

r) Provision for movements/ expansion/ contraction shall be made in accordance with the system/ product manufacturer's recommendations.

M50 - 3.2.6. RESILIENT FLOOR COVERINGS:

Shall be installed in accordance with the Code of Practice for the Installation of Resilient Floor Coverings in accordance with BS 8203.

M50 - 3.2.7. FIXING REQUIREMENTS:

a) Refer to Section Z - 20.

b) Fixings and fastenings shall be installed as recommended by the manufacturer.

c) The works shall be fixed securely to prevent pulling away, bowing or other movement during use and without causing stress or distortion.

M50 - 3.2.8. ADHESIVES:

a) Refer to Section Z - 20.

b) Primers shall be used where recommended by the adhesive manufacturer before applying adhesives.

c) Materials/ components shall be bonded securely to substrates to give true surfaces free from undulations, air bubbles, scratches, adhesive marks, stains and other visual defects.

d) The adhesive shall be spread evenly pressing down materials/ components firmly and rolling (if recommended) to ensure full contact and a good bond overall.

e) All surplus adhesive shall be removed from exposed faces of coverings as the work proceeds.

f) Ridges and high spots shall be eliminated.

M50 - 3.2.9. SEALANTS:

Refer to Section Z - 22.

M50 - 3.2.10. SEAMS:

a) Patterns shall be accurately matched at seams.

b) Seams shall be cut in to ensure a tight joint, without gaps, and be bonded in accordance with the manufacturer's recommendations.

c) Adhesive shall be completely set before commencing welding of seams.

d) Seams shall be hot-welded with matching vinyl rod or solvent-welded.

e) A neat, smooth, strongly bonded seam joint shall be formed flush with finished surface.

M50 - 3.2.11. ENVIRONMENT:

a) Before, during and after installation, temperature and humidity shall be maintained at levels approximating to those that will prevail after the building is occupied.

b) Arrangements shall be made for operating the heating installation up to the date of Practical Completion of the works.

Protection

M50 - 3.2.12. TEMPORARY PROTECTION:

Finished areas shall be adequately protected from damage by subsequent building operations and other factors until Practical Completion.

M50 - 3.2.13. CLEANING:

a) At Practical Completion of the works, all exposed areas/ surfaces of the works shall be cleaned.

b) Cleaning materials and methods shall be as recommended/ accepted by the system/ product manufacturer, where applicable.

c) Suitable number(s) of coats of polish or treatment(s) shall be applied in accordance with the manufacturer's recommendations.

d) Materials or methods that could alter the character of the exposed finishes shall not be used.

e) Adjacent surfaces shall be protected from damage due to cleaning operations.

M50 - 3.2.14. COMPLETION:

a) Installed works shall be left clean.

b) Defects shall be repaired without delay, to minimise damage and nuisance.

c) The works shall not be used for any purpose, except testing, until Practical Completion.

d) On Practical Completion, the works shall be checked for damage and defects, and all damaged or defective materials/ components replaced.

Adverse Conditions

M50 - 3.2.15. WORKING IN ADVERSE CONDITIONS:

a) If unavoidable wetting of the works occurs, prompt action shall be taken to minimise and make good any damage.

b) Temporary covers shall be provided as required to keep unfinished areas dry.

Workmanship Tolerances

M50 - 3.2.16. GENERAL:

Tolerances shall be measured against the relevant Base Reference Datum; Location Reference Point; Location Reference Plane; Location Reference Surface or Reference Element as defined in Section A.

a) All elements shall be set out to their correct position as indicated on the Design Drawings and/ or Working Drawings, within ±2mm or 0.1% of the length, whichever is the lesser.

b) Vertical elements shall be plumb, within ±2mm or 0.1% of the height, whichever is the lesser.

c) Horizontal elements shall be level, within ±2mm or 0.1% of the length, whichever is the lesser.

d) The maximum variation in gap from a straightedge applied to a flat vertical plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

e) The maximum variation in gap from a straightedge applied to a flat horizontal plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

f) The maximum variation in gap from a straightedge applied to a flat inclined plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge. Drainage requirements of inclined planes shall be maintained.

g) The maximum offset in plane, level or section between any two adjacent sections shall be ±1mm.

h) The permissible deviation from vertical datum of a floor finish level shall be ±3mm, but shall be flush with any adjacent floor finish.

i) The average width of any panel to panel joint shall be within ±1mm of the nominal joint. Any variation shall be equally distributed with no sudden changes or steps.

j) The maximum deviation between adjacent tile/ panel surfaces either side of an expressed joint shall be 1mm.

k) The bow of any flat surface shall not exceed more than ±2mm from a 2000mm straightedge placed against it in any direction.

l) The straightness of any surface of an edge shall not deviate by more than ±2mm from a 2000mm straightedge placed against it in any direction parallel to the long axis of the element.

m) The centre section of any lineal element shall not bow by more than the lesser of ±2mm or 0.075% of the length of the element measured from a straight line between the ends of the element.

n) The cross-section of any element shall not be twisted by more than 1° from the intended alignment.

o) Dimensional and location tolerances of cut-outs for interfacing works shall be ±1mm the dimensions indicated on the Design Drawings. The Contractor shall verify, with the appropriate supplier/ trade contractor, that such dimensions and locations are correct. Any deviation shall be agreed with the Project Manager

p) Account shall be taken of the installation tolerance requirements such that repetitive elements are accurately located, relative to gridlines

q) Tolerances shall not be cumulative. The most onerous tolerance shall apply.

M50 - 4. SYSTEMS INTEGRATION AND HANDOVER

M50 - 4.1. SYSTEMS INTEGRATION

M50 - 4.1.1. General:

a) Refer to the design drawings and the Finishes Schedule and integrate with adjacent finishes as required.

M50 - 4.2. HANDOVER

M50 - 4.2.1. GENERAL:

a) As the Contract Requirements.

End of Section

M60. PAINTING/ CLEAR FINISHING

M60 - 1. FORMAT SYSTEMS MATERIALS SUBMITTALS AND WORKMANSHIP

M60 - 1.1. SPECIFICATION TY PE AND FORMAT

M60 - 1.1.1. PRESCRIPTIVE WORKS:

a) Supply, install and warrant the works complying with *Design Drawings* and criteria stated in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*, the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the contract administrator, but shall remain fully responsible for the performance of the works.

M60 - 1.2. SYSTEM DESCRIPTIONS

M60 - 1.2.1. SCOPE

Decoration of new wall finishes, existing wall finishes, non-suspended ceilings, doors and refurbished window frames / architraves, miscellaneous timber trims:

a) TYPE PT-10 Paint finishes to internal wall and ceiling finishes (excluding suspended ceilings)

b) TYPE PT-20 Paint finishes to new doors, new applied softwood skirtings, miscellaneous timber trims and framing

c) TYPE PT-30 Paint finishes to existing doors.

M60 - 1.3. MATERIALS/PRODUCTS

M60 - 1.3.1. TYPE PT-10 WATER BASED EGGSHELL PAINT TO INTERNAL WALLS.

Locations: New partitions, existing retailed wall surfaces.

a) Description: Water based eggshell finish, quick drying and low odour.

b) Product reference: Dulux trade diamond Eggshell or similar approved.

c) Colour: RAL 9010 pure white

d) Preparation: To manufacturers recommendations

e) Initial coats: Primer / Mist Coat. As recommended by manufacturer for new plaster wall surfaces. Existing wall surfaces to be cleaned down with sugar soap. Any areas of lose or flaking paint are to be removed prior to paint application.

f) Number of coats: 2

g) Application; Roller or brush to manufacturers recommendations

M60 - 1.3.2. TYPE PT-20 SOLVENT BASED PAINT TO NEW WOODWORK.

Locations: New doors, softwood skirtings, miscellaneous timber trims and framing.

a) Description: solvent based , quick drying and low odour.
b) Product reference: Dulux trade satinwood or similar approved.
c) Colour: RAL 9010 pure white
d) Preparation: To manufacturers recommendations
e) Initial coats: Primer / Mist Coat. As recommended by manufacturer
f) Number of coats: 2
g) Application; Roller or brush to manufacturers recommendations

M60 - 1.3.3. TYPE PT-30 SOLVENT BASED PAINT FOR EXISTING WOODWORK.

Locations: Existing door and window frames and other retained internal timber trims and framings.

a) Description: Water based eggshell finish, quick drying and low odour.
b) Product reference: Dulux trade satinwood or similar approved.
c) Colour: RAL 9010 pure white
d) Preparation: To manufacturers recommendations. Existing paint finishes to be sanded to form a good key with areas of lose of flaking paint removed. Surfaces to be free of dust prior to paint application.
e) Number of coats: 2
f) Application; Roller or brush to manufacturers recommendations

M60 - 1.4. PERFORMANCE REQUIREMENTS

Comply with the general performance of Section A50 and the following specific performance requirements.

General

M60 - 1.4.1. VISUAL REQUIREMENTS:

a) The definitions contained in BS 2015 and BS EN ISO 4618 shall be used to define adhesion, excess fading, non-uniformity of colour, cracking, peeling, pitting or other visual defects. None of the defects shall be acceptable.

b) Visual requirements shall be based upon samples submitted and agreed.

c) For the purpose of conforming with visual requirements, the work shall be viewed with normal eyesight from a distance of 2m for colour consistency and excessive fading and 1m for cracking, pitting and other defects.

M60 - 1.4.2. DELETERIOUS MATERIALS:

Paint shall be lead free.

M60 - 1.4.3. GLOSS LEVELS:

Specular gloss levels specified shall be measured in accordance with BS EN ISO 2813.

M60 - 1.4.4. SCRATCH RESISTANCE:

Paints used shall comply with the minimum requirements of BS EN ISO 1518 'Scratch test'.

M60 - 1.4.5. LIFE EXPECTANCY:

Life expectancy to first maintenance for paint finishes shall be a minimum of 4-5 years. Provide a written specification for inclusion in the operations and maintenance manual for recoating (by others) at the end of the period.

M60 - 1.5. MATERIALS

M60 - 1.5.1. SOURCE OF MATERIALS:

a) Coating materials shall be obtained from one source and the contract administrator shall be notified of the selected manufacturer before the work commences.

b) All materials used shall be as recommended for the intended application and a warranty shall be provided from the manufacturer for the particular surface and the conditions of exposure. They shall be compatible with each other.

M60 - 2. SUBMITTALS AND TESTING

M60 - 2.1. SUBMITTALS

Tender Submittals

M60 - 2.1.1. TENDER RESPONSE:

a) Provide confirmation of paint manufacturer and products to be used.

M60 - 2.1.2. PRE-CONTRACT SAMPLES:

a) Not required.

M60 - 2.1.3. POST CONTRACT SAMPLES:

a) Not required.

M60 - 2.1.4. MOCK-UPS:

Not required

M60 - 2.1.5. PROTOTYPES:

Not required.

M60 - 2.1.6. BENCHMARK REQUIREMENTS:

The following quality benchmarks shall be provided in locations to be agreed with the architect:

a) First 9m² of eggshell wall finish and 3 linear metres of satinwood timber paint finish

M60 - 2.2. TESTING

M60 - 2.2.1. EVIDENCE OF PERFORMANCE:

a) Provide technical information/ test certificates to demonstrate that materials meet the requirements of the *Specification*.

b) Testing and provision of data do not relieve the *Contractor* of his responsibilities regarding the performance requirements, service life and warranties provided.

M60 - 3. FABRICATION AND WORKMANSHIP

M60 - 3.1. GENERAL

M60 - 3.1.1. COMPATIBILITY:

a) The contract administrator shall be informed of any discrepancy in the specification of coatings. Instructions shall be obtained before proceeding with the application.

M60 - 3.1.2. FIXTURES:

Before commencing work, remove fixtures and fittings (not to be coated), set aside and replace on completion.

M60 - 3.2. PREPARATION

M60 - 3.2.1. GENERAL:

a) Work shall comply with BS 8000: Part 12, BS 6150 and any additional requirements of the *Specification*.

b) When removing or partially removing coatings, the methods used shall not damage the substrate or adjacent surfaces nor adversely affect subsequent coatings. Also, any damaged areas of plasterboard/ dry lining shall be made good.

c) Materials used in preparation shall be of the types recommended by their manufacturers and by the coating manufacturer for the situation and surfaces being prepared.

d) Surfaces shall be fully rubbed down and prepared. The primer and corrosion protection coats of any steelwork shall be touched up after removing, or partially removing, existing coatings. The methods used shall not damage the substrate or adjacent surfaces, nor adversely affect subsequent coatings. The preparatory coatings used shall be of the types recommended by the coating manufacturer for the situation and surfaces being prepared to receive new finishes.

e) Oil based stoppers/ fillers shall be applied after priming; water based stoppers/ fillers shall be used before priming unless otherwise recommended in writing by the manufacturer. Water based stoppers/ fillers shall be patched after priming.

f) Where doors are delivered to Site in a finished condition, any necessary protection shall be provided to the doors when applying coatings to the frames and the like, allowing sufficient drying times to coatings to ensure that the doors are not marked in any way with the coating material.

g) Timing/ Making Good:

i) There shall be an interval of at least the period recommended in writing by the manufacturer between successive coats of paint.

M60 - 3.2.2. SUITABILITY OF SURFACE:

Application of coatings shall not occur until the surfaces and conditions within any given area to receive the specified coatings are acceptable.

M60 - 3.2.3. EXISTING PAINT REMOVAL:

a) If any existing paint finishes require full stripping prior to redecoration, chemical strippers are to be used. Hot methods of paint removal are strictly forbidden due to the historic significance of the building.

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M60 - 3.3. APPLICATION

M60 - 3.3.1. PAINTING GENERALLY:

The works shall comply with BS 8000: Part 12, BS 6150 and any additional requirements of the *Specification*.

M60 - 3.4. FINISHES

M60 - 3.4.1. GENERAL:

a) Once applied the finish shall not in any way slump, flow, crack, flake, split, sag, pit, bubble, blister, float, effloresce, craze, shrink, break, wrinkle, crinkle, yellow, chalk, fade, discolour, powder, stain, bleed or lose its finish or gloss in any way. Full account of the extremes of all atmospheric and environmental conditions shall be taken.

b) All surface finishes shall be dry to handle.

c) Unless otherwise specified, thinning shall only be carried out in accordance with the manufacturer's recommendations.

d) There shall be no variation of final surface finish.

e) All paints shall be anti-mould and stable in humid conditions and suitable to hot climate exposure.

M60 - 3.5. PROTECTION OF ADJACENT SURFACE

M60 - 3.5.1. GENERAL REQUIREMENTS:

a) Adequate protection shall be provided to adjacent surfaces which are completely pre-finished or have a fair-faced natural finish as specified

b) Splashes resulting from work carried out on Site shall be cleared from all surfaces. Ironmongery, where decorated, should be eased. All splashes and drips on non-decorated existing or new ironmongery should be fully cleaned off, avoiding scratching of the exposed metallic surfaces. All splashes and drips on glazing should be removed.

c) Upon completion of the work, defects to finished surfaces shall be made good or replaced if they cannot be adequately cleaned.

d) Adjacent elements shall be removed and refixed where appropriate, prior to and after applying coatings

M60 - 4. SYSTEMS INTEGRATION AND HANDOVER

M60 - 4.1. SYSTEMS INTEGRATION

M60 - 4.1.1. GENERAL:

Refer to the Design Drawings and the Finishes Schedule and fully integrate with adjacent surfaces.

M60 - 4.2. HANDOVER

M60 - 4.2.1. GENERAL:

As the Contract Requirements.

End of Section

N10. GENERAL FIXTURES/ FURNISHINGS/ EQUIPMENT

N10 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

N10 - 1.1. *SPECIFICATION* TYPE AND FORMAT

N10 - 1.1.1. DESCRIPTIVE WORKS:

a) Undertake the *Detailed Design to* ***produce fabrication drawings***, supply, install and warrant the works complying with the visual intent indicated on the *Design Drawings* and criteria stated in the *Specification*.

b) Material sample for beech veneer to be used, including a 1000x650mm fully laminated panel of book-matched veneer with solid beech lippings to be provided for architect's approval and benchmarking.

c) Where no material, product or supplier is indicated in the *Specification*, the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

d) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the Project Manager, but shall remain fully responsible for the *Detailed Design* and performance of the works.

N10 - 1.2. SYSTEM DESCRIPTIONS

System Description Functional Requirements and Interfaces

N10 - 1.2.1. SCOPE:

General: This work section contains the following system types:

a) Security reception desk, shelving and post storage;

i) TYPE FX-10 – new, bespoke desk and worktop constructed of hardwood veneer timber with hardwood lippings.

ii) TYPE FX-20 – new, bespoke shelving and cupboard unit in security reception area.

iii) TYPE FX-30 – new pigeon hole post storage unit (to be assumed as provisional sum for tendering purposes).

Include pigeon hole unit as prime cost sum for pricing purposes.

iv) TYPE FX-40 kitchen cabinets and Worktop for staff kitchenette.

v) TYPE FX-50 New fitted cupboard around service riser.

N10 - 1.2.2. GENERAL:

a) The works shall meet the requirements of project Documentation, the Design Drawings and any relevant specialist specifications to make the items fit for purpose.

b) Items shall include specific purpose designed fixings, bracketry, support framing and accessories necessary to complete the works in accordance with the *Specification* and the located where indicated on layout drawings.

c) Works shall be designed so that fixings are concealed. Where fixings cannot be concealed, they shall be inconspicuous and accepted by the architect through sampling.

d) Fixing Directly to Structure:

i) Provide and install all fixing devices, including framing, bearing brackets and movement fixings and carry out all necessary preparation work such as drilling, plugging, screwing, bolting, cutting for anchor bolts or sockets to be cast-in, making good, including grouting-in of anchor bolts, and fixing whatsoever necessary.

Submit details of all fixings for review and acceptance by the *architect*.

N10 - 1.2.3. TYPE FX-10 Bespoke timber security desk.

a) New, bespoke security reception desk constructed of natural beech veneer timber with hardwood lippings to all exposed edges, to incorporate plycarbonate visions screens, accessible under-worktop panels for data and power containment, grommit openings for cable routing, removable lower panel to provide access to radiator units mounted below the desk.

b) Front (south facing) vanity and under-desk panels to have book-matched grain. Note curved profile of both vanity panel and under-panel below the worktop knee hole at one end.

c) Polycarbonate screens (4 no) to be installed above the desk to reduce covid infection risk. The panel above the sign-in area (knee hole below) to be framed with brass clamp frame running half-height of the polycarbonate panel and fixed beneath the worktop with a recessed brass plate. Polycarbonate screens fitted above the upper vanity screen section to be recessed into the top edge of the vanity screen as ‘drop-in’ elements that can be removable in future.

d) Open shelving units and cupboard units provided beneath the worktop, as per the design intent drawings, with shelves and cupboard doors faced in been veneer.

e) Curved corner sections of the desk should either be steam-bent and glued, or constructed of turned sections of solid beech hardwood carefully jointed to adjacent veneer panels to form a smooth, even, curved surface and to avoid long-term delamination of veneers. All exposed corners to be pencil rounded.

Note design and installation needs to be fully coordinated with under-worktop cable containment and small power provisions, and integration with low-level radiators. See services engineers drawings for details of small power, data containment and heating components.

a) Standard: To BS EN 14749
b) Timber: To BS EN 942.
c) See also section P20 for general requirements relating to timber products.
    i) Species: Natural European beech veneer from sustainable timber supplier, for all visible surfaces of worktops, fixed panels, access panels. Substrate timber to subcontractor's choice but to be from sustainable timber sources and avoiding PFC's and other prohibited bonding agents. Exposed lips to worktops and screens to be hardwood lipped using sustainably sourced European beech to match the colour and texture of the worktop veneers.
d) The Contractor/ Subcontractor to provide full fabrication drawings to meet design intent as showed on the Design Drawings to be approved by the architect prior to fabrication.
e) All metal support structure, fixings, sealants as required to manufacturer recommendations.
f) Joinery workmanship: as per section Z 10.
g) Other requirements: Samples of the proposed beech veneer and hardwood intended for use for lippings (with proposed finish) to be provided to the architect for approval.
h) See also section P20 for general requirements relating to timber products.

N10 - 1.2.4. TYPE FX-20 Painted timber shelving and cupboard unit in security desk area

a) New, bespoke shelving and cupboard storage unit on west wall of security reception area. Unit to be constructed of timber and painted with off-site spray applied two-pack epoxy paint, brilliant white, to manufacturer's preference. Substrate timber to fabricator's specification but materials must be free of PFC's and other prohibited bonding agents. All shelves and doors are to be painted to a matching finish. All exposed lips and edges are to be pencil rounded and fully decorated. Shelving unit to be fixed back to the adjacent wall surface and spacing blocks are to be provided to create a 100mm cavity behind the unit to allow for small power containment serving power points located in the back of the shelf bays which are to be used for charging radios.

b) Doors forming the low-level cupboard fronts are to sit flush with the outer frame and be fitted with plumb hinges and push-release mechanisms. The inner shelf unit and divider need to be in-set to allow for the doors to sit flush with the outer frame.

c) See services engineer's drawings for electrical installation details. Twin sockets with white face plates are to be provided and inset / integrated into the back panels of the shelving unit with socket back boxes extending into the cavity behind the unit.

General requirements

a) Standard: To BS EN 14749
b) Timber: To BS EN 942.
c) The Contractor/ Subcontractor to provide full fabrication drawings to meet design intent as showed on the Design Drawings to be approved by the architect prior to fabrication.
d) All metal support structure, fixings, sealants as required to manufacturer recommendations.
e) Joinery workmanship: as per section Z 10.
f) Other requirements: Samples of proposed timberwork with two-pack epoxy paint finish to be provided for approval by the architect.
g) See also section P20 for general requirements relating to timber products.

N10 - 1.2.5. TYPE FX-30 Painted timber pigeon hole post storage unit.

To be considered as provisional sum for pricing purposes. Architect to provide design and specification prior to agreement of final cost and installation.

N10 - 1.2.6. TYPE FX-40 KITCHEN SINK WITH TAP IN STAFF KITCHINETTE

Stainless Steel single bowl Sink with drainer and mixed tap, to be mounted as indicated on the design drawings.

a) Manufacturer: FRANKE or equivalent approved
b) Reference: ERICA
c) Tap reference: Zurich Chrome

N10 - 1.2.7. TYPE FX-40 Kitchen Cabinets and Worktops

Formica-faced (or similar approved laminate) Kitchen Cabinets and Worktop to fit Sink type above. Proprietary kitchen cabinet and worktop products are acceptable (Travis Perkins, Wickes or similar) subject to architect's approval.

a) Standard: To BS EN 14749
b) The Contractor/ Subcontractor to provide full shop drawings to meet design intent as showed on the Design Drawings to be approved by the Project Manager.
c) All metal support structure, fixings, sealants as required to manufacturer recommendations.
d) Joinery workmanship: as per section Z 10.
e) Other requirements: Physical amples of proposed worktop in dark gray and cabinet doors in brilliant white to be provided for acceptance of the architect.
f) Door pulls to be brushed stainless steel and samples or product literature should be provided for architect's approval.
g) Kitchen hinges to be standard, kitchen cabinet plumb throw hinges with samples or product literature submitted to the architect for approval.
h) See also section P20 for general requirements relating to timber products.

N10 - 1.2.8. TYPE FX-50 Painted timber cupboard in front of service riser

New, fitted cupboard storage unit with paired doors facing / opening out onto break out area to provide access to IT riser located within cupboard, to suit location of existing penetration through floor within cupboard to basement below. Side and back wall of cupboard formed of studwork partitions with timber doors and budget lock for maintenance access. Unit front to be constructed of timber. Paint finish solvent-based satinwood paint (see clause M60). Timber to fabricator's specification but materials must be free of PFC's and other prohibited bonding agents. All shelves and doors are to be painted to a matching finish. Doors to run full height to ceiling level. All exposed lips and edges are to be pencil rounded and fully decorated.

a) Standard: To BS EN 14749
b) Timber: To BS EN 942.
c) All metal support structure, fixings, sealants as required to manufacturer recommendations.
d) Joinery workmanship: as per section Z 10.
e) See also section P20 for general requirements relating to timber products.

N10 - 1.3. PERFORMANCE REQUIREMENTS

N10 - 1.3.1. DURABILITY:

The works shall be suitable for their intended purpose and perform satisfactorily for their full design life.

Elements shall be designed, manufactured, cured and tested in compliance with all relevant glazing, steel standards.

N10 - 1.4. MATERIALS

N10 - 1.4.1. GENERAL:

a) The works shall meet the requirements of the Design Drawings , British and EU Standards and any relevant specialist specifications to make the items fit for purpose.

N10 - 1.4.2. SUSTAINABILITY PERFORMANCE REQUIREMENTS:

Read in conjunction with Section A where applicable.

N10 - 1.4.3. ROBUSTNESS:

Read in conjunction with Section A where applicable.

N10 - 1.4.4. RESPONSIBLE SOURCING:

Read in conjunction with Section A where applicable.

N10 - 1.4.5. EMBODIED ENERGY:

N10 - 1.4.6. GREEN GUIDE TO SPECIFICATION RATING:

Read in conjunction with Section A where applicable.

N10 - 1.4.7. RECYCLED CONTENT:

Read in conjunction with Section A where applicable.

N10 - 1.4.8. WASTE:

Read in conjunction with Section A where applicable.

N10 - 1.4.9. END OF LIFE DISASSEMBLY FOR REUSE OR RECYCLING:

Read in conjunction with Section A where applicable.

N10 - 1.4.10. VOLATILE ORGANIC COMPOUNDS (VOCS):

Read in conjunction with Section A where applicable.

N10 - 1.4.11. NO TOXIC OR DELETERIOUS MATERIALS:

N10 - 2. SUBMITTALS AND TESTING

N10 - 2.1. SUBMITTALS

Tender Submittals

N10 - 2.1.1. TENDER RESPONSE:

a) Submit example of proposed kitchen unit supplier and general product literature.

N10 - 2.1.2. POST CONTRACT SAMPLES :

In accordance with Section A, post contract award samples of the following shall be provided:

a) Physical sample of proposed worktop, cabinet door, door pulls for architect's approval, alongside fabrication / installation drawings. 1000x650mm fully laminated beech veneer benchmarking sample of facing panel to be provided, to include book-matched grain and solid beech lipping of all edges.

N10 - 2.1.3. MOCK-UP REQUIREMENTS :

Not required

N10 - 2.1.4. QUALITY BENCHMARK REQUIREMENTS:

a) Not required

N10 - 2.2. TESTING

N10 - 2.2.1. TESTING GENERAL:

Each item to be tested of site and comply with the relevant British and EU Standards and as specified by specialist requirements documentation elsewhere to insure it is fit for purpose.

N10 - 3. FABRICATION AND WORKMANSHIP

N10 - 3.1. FABRICATION

N10 - 3.1.1. GENERAL:

Each item to comply with the relevant British and EU Standards and Industry Norms for manufacture and materials. Read in conjunction with Section A where applicable.

Fabrication Tolerances

a) Manufacture shall include appropriate tolerances relevant to the location and integration with supporting systems. recommendations.

b) Operatives shall be trained, experienced and appropriately skilled in the installation of the works and, where applicable, be recommended by the system/ product manufacturer.

N10 - 3.2. WORKMANSHIP

N10 - 3.2.1. GENERAL:

a) Each item to comply with the relevant British and EU Standards and Industry Norms for manufacture and materials. Read in conjunction with Section A where applicable.

Workmanship Tolerances

N10 - 3.2.2. INSTALLATION TOLERANCES:

a) Read in conjunction with Section A where applicable

Tolerances shall be measured against the relevant Base Reference Datum; Location Reference Point; Location Reference Plane; Location Reference Surface or Reference Element as defined in Section A.

b) All elements shall be set out to their correct position as indicated on the Design Drawings and/ or Working Drawings, within ±2mm or 0.1% of the length, whichever is the lesser.

c) The maximum variation from plumb shall be ± 1.5mm.

d) Cut-outs for interfacing works shall be to the dimensions shown on the Working Drawings ±1mm.

e) Horizontal Plan Position: For any element at any level whose position is defined in relation to a primary reference grid, the maximum allowed deviation from the Design Dimension to that reference grid is ±2mm.

f) The width of any joint shall not deviate from the nominal width by more than ±1mm of the joint width. Any variation shall be equally distributed with no sudden changes. The misalignment between joints shall not exceed 1mm.

g) Line and level shall be within ±2mm of the specified level.

h) The works shall be erected such that no point on any part is more than 1mm from its theoretical plane.

i) The dimensional and detailed provisions intended to accommodate the construction tolerances of surrounding elements in order to ensure that all aspects of the works relate satisfactorily to the works as a whole shall be stated and shown on the Working Drawings.

j) All tolerances stated shall be measured and monitored at a mean temperature to be agreed with the Project Manager.

k) Alternative tolerances to those specified may be permitted at the Project Manager's discretion, provided they are agreed in advance of the manufacture of components

l) Tolerances shall not be cumulative

N10 - 4. SYSTEMS INTEGRATION AND HANDOVER

N10 - 4.1. SYSTEMS INTEGRATION

N10 - 4.1.1. GENERAL:

a) Refer to the Design Drawings and fully integrate with adjacent surfaces and services as necessary.

N10 - 4.2. HANDOVER

N10 - 4.2.1. GENERAL:

a) As the Contract Requirements.

End of Section

N13. SANITARY APPLIANCES/ FITTINGS

N13 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

N13 - 1.1. SPECIFICATION TYPE

N13 - 1.1.1. PRESCRIPTIVE WORKS:

a) The works shall be supplied, delivered, installed and warranted in compliance with the materials and workmanship requirements of the *Specification*.

b) Where alternative products are offered by the *Contractor* for acceptance by the *contract administrator*, full supporting documentation for the complete system or installation shall be provided.

N13 - 1.2. SYSTEM DESCRIPTIONS

Architectural and Functional Requirements

N13 - 1.2.1. SCOPE

a) This work section contains the following sanitary appliances:

i) TYPE SAN-16 wc pan and In wall cistern

ii) TYPE SAN-17 wash hand basin with tap

iii) TYPE SAN-04 Mirror

N13 - 1.2.2. GENERAL:

a) Sanitary items shall be arranged and to locations indicated on the *Design Drawings*.

b) Exposed finishes shall be confirmed by the *Project Manager*

c) where not indicated on the Sanitaryware Schedule.

d) Concealed components shall be finished to suit the corrosion protection requirements of the *Specification*.

e) Non-ferrous or stainless steel fastenings shall be used unless otherwise specified.

f) Sanitary appliances shall be supplied and installed as complete integrated systems complete with all fixings, clips, bracketry, seals, sealants, connecting pipework and all other components/ accessories recommended/ supplied by the manufacturer.

g) Sealant:

i) Sealant pointing (at joints between appliance/ fitting/ substrate and adjacent finishes) shall be silicone based sealant with fungicide.

ii) Colour shall be 'White' or to complement the adjacent appliance/ fitting or as agreed with the *Project Manager*.

iii) Refer to Section Z22 for Sealants.

h) Unless otherwise indicated on the *Design Drawings*, sanitaryware shall be mounted on panels as Section K32.

i) All cisterns shall be concealed.

j) All pipework shall be concealed within ducts as far as possible.

N13 - 1.2.3. MANUFACTURERS:

a) Roca Sanitario Ltd..; Samson Road, Hermitage Industrial Estate; LE67 3FP; Tel.: +44 1530 830080; Fax: +44 1530 830010 www.uk.roca.com.

b) Dyson,www.dyson.co.uk/forbusiness; +44 (0)2039555455.

c) Dolphin Solutions Ltd, Compass Park, Southpoint Junction Rd Bodiam, Robertsbridge, TN32 5BS, T 01424 202224, E info@dolphinsolutions.co.uk

Sanitary Fittings

N13 - 1.2.4. TYPE SAN-16 WC PAN AND CISTERN TO W.C. BG.2.05, BG.2.06, BG.2.07:

Floor mounted back to wall WC pan cistern, plastic soft – closing seat and cover with chrome fittings.

a) Pan, cover, seat:

i) Manufacturer: Roca Sanitario Ltd

Reference: Roca Meridian-N Eco Close Coupled Toilet with Dual Outlet Push Button Cistern, Soft Close Seat

i) Pan colour: White.

ii) Pan connector: Refer also to the Mechanical Services specification.

iii) Pan fixing: Subcontractor choice

iv) Soft closing Seat Colour: White.

N13 - 1.2.5. TYPE SAN-17 WASH HAND BASIN WITH TAP TO WC BG.2.05, BG.2.06, BG.2.07:

Compact wall hung vitreous china basin, with one tap hole, shape square.

a) Basin:

i) Manufacturer: Roca Sanitario Ltd

ii) Reference: Hall (325883).
iii) Colour: White.
iv) Size: 500mm wide x 250mm deep x 115mm height.

b) Concealed bracket with fixing clips (S9151).

c) Other requirements:
i) Waste: Aqua; Click – Clack Universal waste, Chrome plug (505400900).
ii) Trap: Aqua; 1¼in outlet connector for basin chrome bottle trap wit (506401614).

d) Tap: Tap, basin mounted.

e) Manufacturer: Dolphin Solutions Ltd.

f) Reference: DOLPHIN MONOBLOC MIXER TAP DB1650
i) Finish: Brushed stainless steel.

N13 - 1.2.6. TYPE SAN-04 MIRROR TO ALL TOILETS:

Wall fixed mirror. Where indicated on the design drawings.

a) Manufacturer: Armitage Shanks Ltd./ Ideal Standard or equivalent approved

b) Reference: Concept mirror

c) Concealed fixing brackets

N13 - 1.3. PERFORMANCE REQUIREMENTS

GENERALLY

a) Comply with the general performance requirements of Section A and the following specific performance requirements.

N13 - 1.3.2. STANDARDS:

The Contractor shall comply with the Employer's Baseline Standards. The works generally shall be designed, constructed and installed to all relevant British Standards.

N13 - 1.4. MATERIALS/ COMPONENTS

N13 - 1.4.1. GENERAL:

a) All ceramic fixtures shall be fired vitreous ceramic ware of the best quality, nonabsorbents and burned so that the whole mass is thoroughly fused and vitrified, producing a material, consistent in colour, which when fractured shall show a homogeneous mass, close grained and free from pores.

b) The glazing of vitreous ceramic fixtures shall be thoroughly fused and unitised to the body, without discolouration, chips or flaws, and shall be free from craze.

c) Warped or otherwise imperfect fixtures shall not be accepted.

Metalwork and Finishes

N13 - 1.4.2. METALWORK:

Refer to Section Z - 11.

N13 - 1.4.3. FINISHES:

Refer to Section Z - 30 for general finishes to metalwork.

Fixings

N13 - 1.4.4. GENERAL:

a) Refer to Section Z20.

b) Fixings shall be in accordance with the system manufacturer's recommendations, to suit the service conditions.

c) Where necessary, fixing components shall be capable of adequate three-dimensional adjustment to accommodate building structure and system fabrication/ installation tolerances.

d) Fixings shall be inherently corrosion resistant or fully protected to prevent corrosion.

e) Visible fixings shall be a type agreed with the *Project Manager* prior to installation.

Sealants and Gaskets

N13 - 1.4.5. SEALANTS:

Refer to Section Z - 22.

N13 - 1.4.6. GASKETS:

a) Refer to Section Z - 23.

b) Gaskets shall be made of either Ethylene Propylene material (EPDM/ EP) or of Silicone.

N13 - 2. SUBMITTALS AND TESTING

N13 - 2.1. SUBMITTALS

Tender Submittals

N13 - 2.1.1. TENDER RESPONSE:

Provide Tender submittals in accordance with the requirements of Section A of the *Specification*.

Samples Mock-ups Prototypes and Quality Benchmarks

N13 - 2.1.2. PRE-CONTRACT SAMPLES:

Not required.

N13 - 2.1.3. Post Contract Award Samples

a) None unless alternative products are proposed.

N13 - 2.1.4. MOCK-UP REQUIREMENTS:

a) Not required

N13 - 2.1.5. PROTOTYPE REQUIREMENTS:

a) Not required

N13 - 2.1.6. Quality Benchmark Requirements

a) Not required

N13 - 2.2. TESTING

N13 - 2.2.1. GENERAL:

a) Refer to Section A clause series A60 for the general requirements for testing.

b) Provide independently certified test data and Agrément certificates that demonstrate that the proposed systems meet the requirements of the *Specification*.

N13 - 3. FABRICATION WORKMANSHIP AND TOLERANCES

N13 - 3.1. FABRICATION

N13 - 3.1.1. GENERAL:

a) Fabrication of materials/ components shall, as a minimum, be in accordance with current regulations and standards.

b) Materials/ components that are damaged or have any other physical imperfections shall not be used in the works.

Fabrication Tolerances

N13 - 3.1.2. GENERAL:

As the relevant British Standards

N13 - 3.2. WORKMANSHIP

N13 - 3.2.1. GENERAL:

a) Workmanship shall generally be in accordance with the relevant and applicable parts of BS 8000.

b) Where applicable, the works shall be carried out in accordance with the manufacturer's recommendations.

c) Operatives shall be trained, experienced and appropriately skilled in the installation of the works and, where applicable, be recommended by the system/ product manufacturer.

Storage

N13 - 3.2.2. GENERAL:

a) Materials/ components shall not be delivered to Site until required or until there is suitable dry storage space.

b) All materials/ components shall be stored on Site in accordance with their respective manufacturer's recommendations.

c) Adequate storage shall be provided for all materials/ components to maintain them free from damage and distortion, and in conditions suitable for their intended service conditions.

d) Finished materials/ components shall be carefully packed in stillages or crates such that they are suitably separated and protected to prevent scratching, scuffing, or other surface damage.

e) Protective packaging/ coverings shall not be removed until immediately before materials/ components are required for fixing.

Preparation

N13 - 3.2.3. SUITABILITY OF STRUCTURE/ SUBSTRATE;

a) Before commencing installation, the structure/ substrate shall be surveyed. Dimensions, line, level and fixing points shall be checked. The *Project Manager* shall be informed immediately if the existing structure/ substrate is unsuitable to receive the works.

b) If the structure/ substrate is unsuitable, remedial action to make the structure/ substrate suitable shall be proposed.

c) All bases/ backgrounds shall be rigid, dry, sound, smooth clean, free dust, dirt, grease and other contaminants before systems/ products are installed.

d) Substrates shall be sound, with no loose material or significant cracks or gaps.

e) All cutting, chasing, plugging, making good and other necessary procedures required to the substrate or to the adjacent works, that cannot/ should not be undertaken after the installation of the works specified herein, shall be completed.

f) Tolerances of the structure/ substrate shall be suitable to permit the required configuration and specified tolerances of the finished systems/ products.

Installation/ Application

N13 - 3.2.4. GENERAL:

a) Works shall not be commenced before the building is weathertight, wet trades have been completed and the building is dried out.

b) Components shall be conditioned by unpacking and spreading out in the spaces where they are to be laid in conditions similar to those that will prevail when the building is occupied.

c) Allowance for future moisture and temperature movement shall be made.

d) The works shall be set out and installed accurately, square, true to line, level and plane, free from undulations, with lines and joints aligned, straight and parallel unless specified otherwise, within stated tolerances and in the correct relationship with the building structure.

e) Support framing members shall be installed in the correct position, within tolerance, and in the correct relationship to the building structure.

f) The installation shall accommodate all specified tolerances and differences between actual Site dimensions and dimensions shown on the *Design Drawings*.

g) Each material/ component of the works shall be inspected immediately before installation. The works shall be installed using materials/ components being properly sized, free from marks, defects, flaws, steps, waves, or damage of any nature.

h) Materials/ components with prefinished surfaces shall not be altered unless accepted by the *Project Manager*.

i) Damaged units shall not be repaired without acceptance.

j) Materials/ components from the same production batch shall be used in the same area to prevent banding, patchiness or other visual variations.

k) Provision for movements/ expansion/ contraction shall be made in accordance with the system/ product manufacturer's recommendations.

l) Noggings and bearers required to support sanitary appliances and fittings shall be accurately positioned, securely fixed and concealed from view.

m) Jointing and bedding compounds shall be used in accordance with the recommendations of the manufacturers of the appliances, accessories and pipes being jointed or bedded.

N13 - 3.2.5. APPLIANCES:

a) WC seats and lids shall be stable when raised and capable of remaining in a vertical position.

b) Cisterns:

i) Cistern operating components shall be as recommended by the cistern manufacturer. The ball valve shall match pressure of water supply.

ii) A cistern shall be fixed at the height recommended by the manufacturer unless otherwise specified or indicated on the *Design Drawings*.

iii) The overflow pipe shall be fixed to falls and located to give visible warning of discharge.

c) Taps shall be fixed securely, making a watertight seal with the appliance.

d) Wastes/ overflows shall be bedded in waterproof jointing compound and fixed with a resilient washer between appliance and backnut.

e) Appliances shall not be used for any purpose until Practical Completion.

N13 - 3.2.6. FIXING REQUIREMENTS:

a) Refer to Section Z - 20.

b) Fixings and fastenings shall be installed as recommended by the manufacturer.

c) The works shall be fixed securely to prevent pulling away or other movement during use and without causing stress or distortion. Include additional bracing and stiffening as required.

d) Isolating tape, plastic washers or other suitable means shall be provided to prevent bi-metallic corrosion between dissimilar metals.

e) Appliances and accessories shall be so assembled and fixed that surfaces designed to falls drain as intended.

N13 - 3.2.7. SEALANTS:

Refer to Section Z - 22.

N13 - 3.2.8. PACKINGS:

a) Suitable tight packings shall be provided at fixing points to take up tolerances and prevent distortion.

b) Packings shall be non-compressible, rot-proof and non-corrosive materials that maintain the performance of the systems with which they interface.

c) Packings shall not intrude into zones that are to be filled with sealant, areas required for drainage. The performance of the works and interfacing systems shall be maintained.

Protection

N13 - 3.2.9. TEMPORARY PROTECTION:

Finished areas shall be adequately protected from damage by subsequent building operations and other factors until Practical Completion.

N13 - 3.2.10. CLEANING:

a) At Practical Completion of the all exposed areas/ surfaces of the works shall be cleaned.

b) Cleaning materials and methods shall be recommended/ accepted by the system/ product manufacturer, where applicable.

c) Materials or methods that could alter the character of the exposed finishes shall not be used.

d) Adjacent surfaces shall be protected from damage due to cleaning operations.

N13 - 3.2.11. COMPLETION:

a) Installed works shall be left clean.

b) Defective components shall be replaced without delay, to minimise damage and nuisance.

c) The works shall not be used for any purpose, except testing, until Practical Completion.

d) On Practical Completion, the works shall be checked for damage and defects. Operable components shall be tested for satisfactory operation and all damaged or defective materials/ components replaced.

Workmanship Tolerances

N13 - 3.2.12. GENERAL:

Tolerances shall be measured against the relevant Base Reference Datum; Location Reference Point; Location Reference Plane; Location Reference Surface or Reference Element as defined in Section A.

a) All elements shall be set out to their correct position as indicated on the *Design Drawings* and/ or *Working Drawings*, within ±2mm or 0.1% of the length, whichever is the lesser.

b) Vertical elements shall be plumb, within ±2mm or 0.1% of the height, whichever is the lesser.

c) Horizontal elements shall be level, within ±2mm or 0.1% of the length, whichever is the lesser.

d) The maximum variation in gap from a straightedge applied to a flat vertical plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

e) The maximum variation in gap from a straightedge applied to a flat horizontal plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

f) The maximum variation in gap from a straightedge applied to a flat inclined plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge. Drainage requirements of inclined planes shall be maintained.

g) The maximum offset in plane, level or section between any two adjacent sections shall be ±1mm.

h) The cross-section of any element shall not be twisted by more than 1° from the intended alignment.

i) Dimensional and location tolerances of cut-outs for interfacing works shall be ±1mm the dimensions indicated on the *Design Drawings*.

j) Account shall be taken of the installation tolerance requirements such that repetitive elements are accurately located, relative to gridlines

k) Tolerances shall not be cumulative. The most onerous tolerance shall apply

N13 - 4. SYSTEMS INTEGRATION AND HANDOVER

N13 - 4.1. SYSTEMS INTEGRATION

N13 - 4.1.1. GENERAL :

a) Refer to the Design Drawings and Specification and integrate with adjacent areas/ surfaces as necessary

N13 - 4.2. HANDOVER

N13 - 4.2.1. GENERAL :

As the Contract Requirements.

a) As the Contract Requirements.

End of Section

P10. SUNDRY INSULATION/ PROOFING WORK/ FIRE STOPS

P10 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

P10 - 1.1. *SPECIFICATION* TYPE AND FORMAT

P10 - 1.1.1. DESCRIPTIVE WORKS:

a) Undertake the supply, install and warrant the works complying with the visual intent indicated on the *Design Drawings* and criteria stated in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*, the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the Project Manager, but shall remain fully responsible for the *Detailed Design* and performance of the works.

P10 - 1.2. SYSTEM DESCRIPTIONS

P10 - 1.2.1. SCOPE

a) Mineral wool insulation is to be installed between rafters in the lean-to roof above the back of house security office area. The full extent of installation cannot be established prior to stripping out of existing ceilings and removal of redundant services.

b) For tender pricing purposes a provisional sum should be assumed.

c) Post strip-out the Contractor is to inspect the works in the presence of the architect to confirm the extent, method of fixing and breather membrane / ventilation requirements to ensure that insulation does not cause interstitial condensation.

d) Mineral wool insulation bats are also to be installed between the existing external walls and new linings – see Section K10.

P10 - 1.3. PERFORMANCE REQUIREMENTS

P10 - 1.3.1. GENERAL:

To comply with relevant British Standards, Building.

P10 - 1.4. PRODUCTS

a) Mineral wool roof insulation bats to be installed between existing roof rafters in single-pitch roof.

b) Product Rockwool Fexi, or similar approved, installed as per manufacturer's recommendations, with vapour barrier to insulation supplier's recommendations.

c) Thickness 70mm (subject to confirmation post ceiling strip out and inspection). With and heigh to suit spacing and length of roof rafters.

a) Mineral wool internal wall lining insulation bats used to line existing external wall surfaces.

b) Product Rockwool Flexi, or similar approved, installed as per manufacturer's recommendations, with vapour barrier to insulation supplier's recommendations.

c) 70mm thickness, width and length to suit timber studwork.

P10 - 1.4.2. PRODUCT CERTIFICATION

a) Certification: For products specified generically, submit evidence of compliance with the specification.

P10 - 2. SUBMITTALS AND TESTING

P10 - 2.1. SUBMITTALS

Tender Submittals

P10 - 2.1.1. TENDER RESPONSE:

Not required.

Samples Mock-ups Prototypes and Quality Benchmarks

P10 - 2.1.2. PRE-CONTRACT SAMPLES:

Not required.

P10 - 2.1.3. POST CONTRACT SAMPLES:

In accordance with Section A4000, post contract samples of the following shall be provided:

a) Insulation materials of each type 300mm x 300mm minimum size.

b) Vapour/ Breather membranes of each type 300mm x 300mm minimum size.

c) Various fixings and fastenings.

P10 - 2.1.4. MOCK-UPS:

Not required

P10 - 2.1.5. PROTOTYPES:

Not required

P10 - 2.1.6. BENCHMARK REQUIREMENTS:

Sample section of two bays of roof insulation (between rafters) and two bays of wall insulation (between timber studs), including breather membranes, to be made available to the architect prior to continuing with the works.

P10 - 3. FABRICATION AND WORKMANSHIP

P10 - 3.1. FABRICATION

P10 - 3.1.1. GENERAL:

To comply with relevant British Standards.

Fabrication Tolerances

As relevant British Standards.

P10 - 3.2. WORKMANSHIP

a) Comply with design requirements pertaining to the separation of cables not in conduit. Maintain required separation of penetrating items from edges of openings and from each other.

P10 - 3.2.2. INSULATION:

a) All components shall be stored on Site such that they are not damaged, distorted or weathered unevenly.

b) Before installation, holes shall be sealed and all debris removed.

c) Material shall fit tightly with closely butted joints fittings and abutments, no gaps shall be left.

P10 - 3.2.3. VAPOUR BARRIER:

a) Before fixing, the moisture content of timber shall be checked and shall be below 20%.

b) Material shall be fixed carefully and neatly to provide a fully sealed barrier free from tears, punctures and sagging.

c) Staples shall be used for fixing at not more than 250mm centres along all supports. Sheets shall only be lapped at supports and not less than 150mm. Material shall lap over and be fixed to reveals of openings.

d) All joints and edges, including around pipes, ducts, etc. shall be sealed with adhesive tape as recommended by the sheet manufacturer.

e) Immediately before covering over, membranes shall be checked for perforations and any found shall be repaired or replaced to the satisfaction of the *Project Manager*.

P10 - 3.2.4. BREATHER MEMBRANES:

a) Before fixing, the moisture content of timber shall be checked and shall be below 20%.

b) Material shall be fixed carefully and neatly to provide a fully sealed membrane free from tears, punctures and sagging.

c) Staples shall be used for fixing at not more than 250mm centres along all supports. Sheets shall only be lapped at supports and not less than 150mm. Material shall lap over and be fixed to reveals of openings.

d) All joints and edges, including around pipes, ducts, etc. shall be sealed with adhesive tape as recommended by the membrane manufacturer..

P10 - 3.2.5. CLEANING:

Upon completion of operations in each containable area of the project, remove fall out of materials

Workmanship Tolerances

P10 - 3.2.6. GENERAL:

As relevant British Standards and Industry Norms as applicable.

P10 - 4. SYSTEMS INTEGRATION AND HANDOVER

P10 - 4.1. SYSTEMS INTEGRATION

P10 - 4.1.1. GENERAL:

Refer to the Design Drawings and Specification for all affected disciplines and integrate with adjacent systems and surfaces as necessary.

P10 - 4.2. HANDOVER

P10 - 4.2.1. GENERAL:

As the Contract Requirements.

End of Section

L11. UNFRAMED ISOLATED TRIMS/ SKIRTINGS/ SUNDRY ITEMS

L11 - 1. FORMAT SYSTEMS PERFORMANCE AND MATERIALS

L11 - 1.1.1. PRESCRIPTIVE WORKS

L11 - 1.2. *SPECIFICATION* TYPE AND FORMAT

a) Supply, install and warrant the works complying with the visual intent indicated on the *Design Drawings* and criteria stated in the *Specification*.

b) Where no material, product or supplier is indicated in the *Specification*, the Contractor shall propose suitable materials and systems which comply with the visual intent and performance criteria stated in the Works Information and remain fully responsible for the *Detailed Design* of the works.

c) Where a particular material, product or supplier is indicated in the *Specification*, such material, product or supplier shall be deemed indicative representing the Employer's design intent only. The *Contractor* may complete the installation using that product, or equivalent confirmed as acceptable by the Project Manager, but shall remain fully responsible for the *Detailed Design* and performance of the works.

d) Interfaces:

i) Co-ordinate with the work of others including all interfacing as required.

ii) Performance shall be maintained at all interface conditions.

iii) Complete the *Detailed Design* of all interfaces with adjoining trades prior to commencement of manufacture.

L11 - 1.3. SCOPE

a) Softwood skirtings at foot of new partition walls – see Design Drawings and Section K10 (partitions)

b) Plywood linings used as backing for ceramic wall tiling – see Design Drawings and Section K10 (paritions)

c) Timber products for doors and door frames – See section L10

d) Timber products used for the manufacture of fitted furniture and other fittings – See Section N10

L11 - 1.4. PERFORMANCE REQUIREMENTS

L11 - 1.4.1. GENERAL

Comply with the general performance requirements of Section A of the *Specification* and the following specific performance requirements.

L11 - 1.4.2. STANDARDS

The Contractor developing the design is to comply with the current versions of the prevailing BSEN and industry best practice standards.

i) BS 1186-3. Class 2-3

ii) BS 476

L11 - 1.5. MATERIALS

L11 - 1.5.1. TIMBER GENERALLY

a) All timber shall be sourced in compliance with the sustainability criteria stipulated in Section A.

b) Timber shall be merchantable, properly seasoned, straight and free from any defects or combination of defects, natural or otherwise, making it unsuitable for its function in the works, and sorted and selected at the time of fabrication for suitability for purpose. No damaged, decayed or rotten materials shall be used.

c) Materials shall be relatively knot free, free from distortion, cracks or other blemishes, insect attack (including pinholes) unless stated otherwise in the specified standards.

d) All timber shall be subjected to controlled drying to ensure that the moisture content, if not otherwise specified, is suitable for the services conditions. When fixed it shall remain stable and free from expansion, contraction or other movements detracting from the required performance or appearance.

e) Timber shall be marked with all information as required within the specified standards. Markings shall be concealed from building user view.

L11 - 1.5.2. TIMBER FOR JOINERY

a) Refer to Section JZ10.

b) In accordance with BS 1186 and BS EN 942.

c) Comply with the requirements for strength grading, where required.

d) Sapwood shall not be used for exposed joinery

e) Splay/ elongated knots shall not be used for exposed joinery

f) No discoloured materials shall be used for exposed joinery.

g) Timber for concealed joinery shall be milled from suitable species and with stock sorted to provide appropriate classes sawn in the most appropriate ways with regard to the service conditions.

h) Softwood for concealed joinery shall have no knots wider than half the width of the section.

Rigid Sheet/ Board

L11 - 1.5.3. PLYWOOD

a) Service class 3 (WBP) in accordance with BS EN 636.

b) Bond quality: Class 3 (WBP) in accordance with BS EN 314, in a suitable mm thickness, if not indicated in the *Design Drawings*.

c) Plywood durability shall meet the minimum hazard class 3 in accordance with BS EN 335 (i.e. moisture content frequently above 20%) unless stated otherwise.

d) Dimensional tolerances shall be in accordance with BS EN 315 and shall satisfy any additional requirements of the *Specification*.

e) Unless stated otherwise, the finish shall be suitable for its location, sanded where finished or unsanded where not visible.

f) Preservative treatment shall be as specified in Section Z12 and to TRADA recommendations.

L11 - 1.5.4. MEDIUM DENSITY FIBREBOARD (MDF)

a) Medium density fibreboard (MDF) shall be in accordance with BS EN 622: Part 5 for dry process boards.

b) Medium density fibreboard shall be suitably balanced.

L11 - 1.5.5. HARDBOARD

Hardboard shall be in accordance with BS EN 622: Part 2.

L11 - 1.5.6. PARTICLEBOARD

Cement bonded particleboard shall be in accordance with BS EN 634 and BRE Digest 477: Part 3.

Preservative/ Fire Retardant Treatments

L11 - 1.5.7. GENERAL

a) Refer to Section Z12.

b) Comply with the recommendations of TRADA.

c) Methods shall be suitable for the service conditions, carried out by a processor licensed by the treatment solution manufacturer for the specific treatment. For each batch of timber a certificate of compliance shall be issued.

d) Where timber materials/ components are visible the preservative/ fire retardant treatment shall not alter the visual characteristics of the timber or finish.

L11 - 1.5.8. MDF

a) Medium density fibreboard (MDF) shall be in accordance with BS EN 622: Part 5.

b) Moisture content at time of fixing: 18%.

c) Moisture content of timber and wood based boards shall be maintained during storage and installation within the range specified for the component.

Metalwork and Finishes

L11 - 1.5.9. METALWORK

a) Refer to Section Z - 11.

L11 - 1.5.10. Finishes

a) Refer to Section Z - 30 for general finishes to metalwork.

b) Refer to Section Z - 31 for powder coatings.

c) Refer to Section Z - 33 for anodising.

L11 - 1.5.11. FIXINGS

a) Refer to Section Z - 20.

b) Fixing components shall comply with all statutory requirements (and be to the acceptance of the Structural Engineer) both as to strength and type and shall be designed to achieve the requirements of the *Specification*. Select suitable components and fixings in accordance with the requirements of the *Specification*.

c) Where necessary, fixing components shall be capable of adequate three-dimensional adjustment to accommodate building structure and system fabrication/ installation tolerances.

d) Only suitable materials shall be used.

e) Fixings shall be inherently corrosion resistant or fully protected to prevent corrosion.

f) The type, size and positioning of all bolts, anchors, brackets, screws, rivets and nuts shall be shown on the *Working Drawings*, together with full details of their installation technique and torque settings, where appropriate.

g) Visible fixings shall be a type agreed with the *Project Manager* prior to installation.

L11 - 1.5.12. ADHESIVES

a) Refer to Section Z - 20.

b) Hot setting phenolic and aminoplastic based adhesives shall be to BS 1203.

c) Thermosetting wood adhesives shall be to BS EN 12765.

d) Polyvinyl acetate thermoplastic adhesive shall be to BS EN 204.

e) Adhesives shall be compatible with finished surfaces, preservative/ fire retardant treatments and shall maintain the performance requirements of the elements to be bonded.

f) Non Load Bearing Applications

i) Durability class/ strength requirements of adhesives used in non load bearing uses of wood and derived timber products shall be in accordance with BS EN 204.

ii) Adhesives used in non load bearing applications shall be tested in accordance with BS EN 205.

L11 - 1.5.13. SEALANTS

Refer to Section Z - 22.

L11 - 2. SUBMITTALS AND TESTING

L11 - 2.1. SUBMITTALS

Tender Submittals

L11 - 2.1.1. TENDER RESPONSE

Provide Tender submittals in accordance with the requirements of Section A of the *Specification*.

Samples Mock-ups Prototypes and Quality Benchmarks

L11 - 2.1.2. PRE-CONTRACT SAMPLES

Not required.

L11 - 2.1.3. POST CONTRACT SAMPLES

Post contract award samples of the following shall be provided, in accordance with Section A:

a) Minimum 300mm length of skirting in specified finish.

b) Minimum 300mm x 300mm square of door leaf timber including lipping, decorated as specified

c) Minimum 300mm length of door frame timber to intended profile.

d) Minimum 300mm x 3000mm square section of beech laminated timber, including solid beech lippings for use in front reception desk worktop (50mm thickness) and screens doors (18mm thickness)

L11 - 2.1.4. MOCK-UP REQUIREMENTS

Not required.

L11 - 2.1.5. PROTOTYPE REQUIREMENTS

Not required.

L11 - 2.1.6. BENCHMARK REQUIREMENTS

Quality benchmarks of the following shall be provided:

The first installation of each type.

L11 - 2.2. TESTING

L11 - 2.2.1. TESTING GENERAL

L11 - 2.2.2. GENERAL

a) Refer to Section A clause for the general requirements for testing and the approach to off-Site and on-Site testing.

b) Provide independently certified test data and Agrément certificates that demonstrate that the proposed systems meet the requirements of the *Specification*.

Off-Site Testing

Not applicable.

On-Site Testing

Not appliable

L11 - 3. FABRICATION AND WORKMANSHIP

L11 - 3.1. WORKMANSHIP

L11 - 3.1.1. General

a) Workmanship shall generally comply with the relevant and applicable parts of BS 8000.

b) Where applicable, the works shall be carried out in accordance with the manufacturer's recommendations.

c) Make due allowance for the sequencing of the whole works and all interfaces.

d) Operatives shall be trained, experienced and appropriately skilled in the installation of the works and, where applicable, be recommended by the system/ product manufacturer.

L11 - 3.1.2. STORAGE

a) Do not deliver materials/ components to Site until required or until there is suitable dry storage space ensuring that the required moisture content can be maintained.

b) All materials/ components shall be stored on Site in accordance with the manufacturer's recommendations.

c) Adequate storage shall be provided for all materials/ components to maintain them free from damage and distortion, and in conditions suitable for their intended service conditions.

d) Finished materials/ components shall be carefully packed in stillages or crates such that they are suitably separated and protected to prevent scratching, scuffing, or other surface damage.

e) Do not remove protective package/ coverings until immediately before materials/ components are required for fixing.

Preparation

L11 - 3.1.3. SUITABILITY OF STRUCTURE/ SUBSTRATE

a) Before commencing installation, survey the structure, checking dimensions, line, level and fixing points and report immediately to the *Project Manager* if the existing structure is unsuitable to receive the works.

b) If the structure/ substrate is unsuitable, propose remedial action to make the structure suitable.

c) All bases/ backgrounds shall be rigid, dry, sound, smooth, clean, free from dust, dirt, grease and other contaminants before systems/ products are installed.

d) Substrates shall be sound, with no loose material or significant cracks or gaps.

e) All cutting, chasing, plugging, making good and other necessary procedures required to the substrate or to the adjacent works, that cannot/ should not be undertaken after the installation of the works specified herein, shall be completed.

f) Tolerances of the structure/ substrate shall be suitable to permit the required configuration and specified tolerances of the finished systems/ products.

L11 - 3.1.4. DAMPNESS

Where systems/ products are to be installed on new wet-laid backgrounds/ bases:

a) Drying aids shall have been turned off for not less than four days.

b) Tests for moisture content shall be taken, using an accurately calibrated hygrometer or probe in accordance with BS 5325, BS 8203 or other standard as appropriate and agreed with the *Project Manager*.

c) Readings shall be taken in all corners, along edges and at various points over the area being tested.

d) Readings show suitable relative humidity levels, as recommended by the system/ product manufacturers.

Installation/ Application

L11 - 3.1.5. GENERAL

a) Do not commence the works before the building is weathertight, wet trades have been completed and the building is dried out.

b) Before installation commences, and where applicable, the components shall be thoroughly conditioned by unpacking and spreading out in the spaces where they are to be laid in conditions similar to those that will prevail when the building is occupied. Minimum time and temperature shall be as recommended in writing by the manufacturer.

c) Before, during and after installation, temperature and humidity shall be maintained at levels approximating to those that will prevail during building use.

d) Finishes shall not be installed within 48 hours of any heating having been turned off. After completion of installation, slowly return the heating to its operative temperature not less than 48 hours after completing the installation.

e) Agree arrangements for operating the heating/ ventilation/ air conditioning installation up to the *Completion Date* of the works to ensure that excessive thermal and moisture movement of the works does not take place.

f) Allowance for future moisture and temperature movement shall be made.

g) The works shall be set out and installed accurately, square, true to line, level and plane, free from undulations, with lines and joints aligned, straight and parallel unless specified otherwise, within stated tolerances and in the correct relationship with the building structure.

h) The installation shall accommodate all specified tolerances and differences between actual Site dimensions and dimensions shown on the *Design Drawings*.

i) Where permitted by the manufacturer, materials/ components shall be cut neatly and accurately without unintended damage. Cut edges shall be kept to a minimum.

j) Inspect each material/ component of the works immediately before installation. The works shall be installed using materials/ components being properly sized, free from marks, defects, flaws, steps, waves, or damage of any nature.

k) Do not alter materials/ components with prefinished surfaces except where agreed with the *Project Manager* and except where cut finishes can be prepared and reinstated to their original finish quality.

l) Do not repair damaged units without acceptance. Such acceptance shall not be given where the units are badly damaged or where the proposed repair would impair appearance or performance.

m) Only use materials/ components from the same production batch in the same area to prevent banding, patchiness or other visual variations.

n) Acceptance shall be obtained from the *Project Manager* and Structural Engineer before drilling or cutting parts of the structure, other than where indicated on the *Design Drawings*.

o) Do not cut, drill or otherwise alter the work of others to accommodate the system/ product installation without first seeking the acceptance of the *Project Manager*.

p) No materials/ components shall be installed until service outlets, duct covers and other fixtures around which the materials are to be cut have been fixed. The *Project Manager* shall be informed not less than 48 hours before commencing installation.

q) Make provision for foreseeable movements/ expansion/ contraction in accordance with the system/ product manufacturers recommendations.

Fixing

L11 - 3.1.6. FIXING REQUIREMENTS

a) Refer to Section Z20.

b) Install and position fixings and fastenings as recommended by the manufacturer, and where required by the *Project Manager* to be visible to the *Project Manager*'s acceptance.

c) The works shall be fixed securely to prevent pulling away, bowing or other movement during use and without causing stress or distortion.

d) Isolating tape, plastic washers or other suitable means shall be provided to prevent bi-metallic corrosion between dissimilar metals, or between preservative treated timber and metal.

e) Appliances and accessories shall be so assembled and fixed that surfaces designed to falls will drain as intended.

f) Fixing and jointing methods and types, sizes, quantities and spacings of fastenings shall be suitable having regard to:

i) Nature of and compatibility with product/ material being fixed and fixed to.

ii) Recommendations of manufacturers of fastenings components, products or materials being fixed and fixed to.

iii) Materials and loads to be supported.

iv) Conditions expected in use.

v) The appearance, which shall be subject to acceptance.

L11 - 3.1.7. FIXING THROUGH FINISHES

Fastenings and plugs (if used) shall have ample penetration into the backing.

L11 - 3.1.8. PACKINGS (where required)

a) Suitable tight packings shall be provided at fixing points to take up tolerances and prevent distortion.

b) Non-compressible, rot-proof, non-corrodible materials shall be used and positioned adjacent to fixing points.

c) Packings shall not intrude into zones that are to be filled with sealants.

L11 - 3.1.9. ADHESIVES

a) Refer to Section Z - 20.

b) Primers shall be used where recommended by the adhesive manufacturer before applying adhesives.

c) Bond materials/ components securely to substrates to give true surfaces free from undulations, air bubbles, scratches, adhesive marks, stains and other visual defects. Tightly butt or leave gaps/ joints as required.

d) The adhesive shall be spread evenly pressing down materials/ components firmly and rolling (if recommended) to ensure full contact and a good bond overall.

e) Adhesive dabs shall be applied in accordance with the board manufacturer's recommendations using an appropriate adhesive recommended by the manufacturer.

f) All surplus adhesive shall be removed from exposed faces of coverings as the work proceeds.

g) Ridges and high spots shall be eliminated.

L11 - 3.1.10. NAILING

a) The use of nails as fixings shall only be acceptable in locations agreed with the *Project Manager*, to systems which do not require concealed fixings and where nail fixing is a suitable method for the service conditions.

b) In joints, not less than two nails shall be used and, where appropriate, opposed skew nailing.

c) Masonry nails shall not be used without permission. Nails shall be driven in fully without splitting or crushing the material being fixed.

d) Nail heads shall be punched below surfaces that will be visible in the completed work.

L11 - 3.1.11. PACKINGS

a) Where required, provide suitable tight packings at fixings points to take up tolerances and prevent distortion.

b) Packings shall be of non-compressible, rot-proof and non-corrosive materials/ components that maintain the performance of the systems/ products with which they interface.

c) Packings shall not intrude into zones that are to be filled with sealant, areas required for drainage nor otherwise alter the performance requirements of the works nor interfacing systems/ products.

Protection

L11 - 3.1.12. TEMPORARY PROTECTION

Finished areas shall be adequately protected from damage by subsequent building operations and other factors until the *Completion Date*.

L11 - 3.1.13. CLEANING

a) At the *Completion Date* of the works, or when otherwise agreed with the *Project Manager*, clean all exposed areas/ surfaces of the works using agreed cleaning methods and materials.

b) Materials and methods shall be recommended/ accepted by the system/ product manufacturer, where applicable.

c) Apply suitable number of coats of polish or treatment of a type recommended by the covering manufacturer.

d) Do not use materials or methods that could alter the character of the exposed finishes.

e) Protect adjacent surfaces from damage due to cleaning operations.

L11 - 3.1.14. COMPLETION

a) Installed works shall be left clean.

b) Defects shall be repaired without delay, to minimise damage and nuisance.

c) A representative of each system manufacturer shall inspect the works and notify the *Contractor* of any defects. All defects shall be corrected.

d) The works shall not be used for any purpose, except testing, until the *Completion Date*.

e) On the *Completion Date*, the works shall be checked for damage and defects. They shall be tested for satisfactory operation and all damaged or defective components/ accessories replaced.

Workmanship Tolerances

L11 - 3.1.15. GENERAL

a) Vertical elements shall be within ±3mm of their notional plan setting out position.

b) Horizontal elements shall be within ±3mm of any given vertical datum.

c) The maximum variation in gap from a straightedge applied to a flat vertical plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

d) The maximum variation in gap from a straightedge applied to a flat horizontal plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge.

e) The maximum variation in gap from a straightedge applied to a flat inclined plane shall be 2mm for a 3000mm straightedge and 1mm for a 1000mm straightedge. ***Drainage requirements of inclined planes shall be maintained.***

f) Drainage requirements of inclined planes shall be maintained.

g) The maximum offset in plane, level or section between any two adjacent sections shall be ±1mm.

h) The average width of any panel to panel joint shall be within ±1mm of the nominal joint. Any variation shall be equally distributed with no sudden changes or steps.

i) The straightness of any surface of an edge shall not deviate by more than ±2mm from a 2000mm straightedge placed against it in any direction parallel to the long axis of the element.

j) The centre section of any lineal element shall not bow by more than the lesser of ±2mm or 0.075% of the length of the element measured from a straight line between the ends of the element.

k) The cross-section of any element shall not be twisted by more than 1° from the intended alignment.

l) Cut-outs for interfacing works:

  i) Dimensional and location tolerances of cut-outs for interfacing works shall be ±1mm the dimensions indicated on the *Design Drawings*.

  ii) The *Contractor* shall verify, with the appropriate supplier/ trade contractor, that such dimensions and locations are correct.

  iii) Any deviation shall be agreed with the *Project Manager*.

m) Tolerances shall not be cumulative. The most onerous tolerance shall apply.

L11 - 4. SYSTEMS INTEGRATION AND HANDOVER

L11 - 4.1. SYSTEMS INTEGRATION

L11 - 4.1.1. Not used.

L11 - 4.2. HANDOVER

L11 - 4.2.1. Not used.

End of Section

Z20. FIXINGS/ ADHESIVES

To be read in conjunction with Section A and other related sections of the *Specification*, Preliminaries and Contract Conditions

Z20 - 1. MATERIALS / PRODUCTS AND FABRICATION

Z20 - 1.1. MATERIALS

Z20 - 1.1.1. FIXING GENERALLY:

a) All fixings shall be of sufficient strength, appropriate to their location, and are provided at adequate positions so as to ensure the performance of the elements being attached. The fixings shall be suitable and used solely for the purposes intended by the manufacturer in order to satisfy the requirements of the *Specification*.

b) Unless otherwise specified, the following requirements shall be observed:

i) Durability - fixings shall be selected such that adequate protection against any corrosion likely to occur in their position of use is provided for the service life specified.

ii) Rigidity - fixings shall be used which are suited to the likely stresses, movements and vibrations in use.

iii) Appearance - unless otherwise specified, fixings shall not be visible; where fixings are visible these shall match or suit the items being fixed or comply with the *Design Drawings*.

iv) Removable items that require accessibility or removal shall be fixed with hidden screws and/ or bolts, unless otherwise specified.

c) Fixings that are suitable for their intended purpose and adequate to comply with the requirements stated in the Specification shall be used.

d) All bolts, screws, nuts, anchors and other fixings shall be of adequate strength for their designed purpose and shall, unless specified otherwise, be manufactured from the most appropriate grade of austenitic stainless steel or other materials as specified. Where specified, structural steel fixings shall comply with the grades specified.

e) Fixing components shall be of dimensions not less than those recommended by their manufacturer.

f) All necessary and appropriate fasteners, fixings, bearings, brackets, etc. necessary for the safe and proper installation plus associated flashings and closures shall be used.

g) All fixings shall conform to all statutory requirements in respect of strength and type.

h) Adequate measures shall be taken to prevent bi-metallic corrosion between dissimilar metals and to isolate aluminium components from cementitious surfaces. To this end attention is drawn to publication PD 6484 'Commentary on corrosion at bi-metallic contacts and its alleviation'.

i) Generally, fixings within aluminium framing components shall not be visible, with the exception of capping pieces fixed to vertical mullions.

j) Visible fixings shall be restricted to the assembly of non-visible elements to support steelwork, using round-headed Allen bolts into a proprietary system.

k) Any steel sub-frame assemblies shall be galvanised and effectively weatherproofed to avoid exposure to the external environment.

l) Cast-in channel fixings in concrete and fixings directly made to structural steelwork shall be provided.

m) All fixings shall be tested in accordance with BS 5080: Parts 1 and 2 by an independent Testing Authority acceptable to the *Project Manager*.

Z20 - 1.1.2. BOLTS, NUTS AND WASHERS:

a) Steel:

i) Bolts, screws and nuts shall be in accordance with BS 4190, BS EN ISO 4016 and BS EN ISO 4034.

ii) Mechanical properties of fasteners shall be in accordance with BS EN 20898 and BS EN ISO 898.

b) Mechanical properties of corrosion-resistant stainless steel fasteners (bolts, screws, studs, nuts etc.) shall be in accordance with BS EN ISO 3506.

Z20 - 1.1.3. POWDER ACTUATED FIXING SYSTEMS:

a) Powder actuated fixing systems shall not be used without acceptance.

b) Tools shall be in accordance with BS 4078: Part 2 and Kite mark certified.

c) Fasteners, accessories and consumables shall be types recommended by the tool manufacturer.

Z20 - 1.1.4. SCREW FIXINGS:

a) Wood screws shall be in accordance with BS 1210.

b) Machine screws and machine screw nuts shall be in accordance with BS 4183.

c) Pan head screws shall be in accordance with BS EN ISO 7045 and BS EN ISO 1580.

d) Washers and screw cups, where specified, shall be of the same material as the screw.

Z20 - 1.1.5. PACKINGS GENERALLY:

a) Suitable, tight packings shall be provided at fixing points to take up tolerances and prevent distortion.

b) Non-compressible, rot-proof, non-corrodible materials positioned adjacent to fixing points shall be used.

Z20 - 1.1.6. TYPES OF NAIL;

Nails shall be in accordance with BS 1202.

Z20 - 1.1.7. MASONRY NAILS:

Shall not be used without acceptance by the *Project Manager*.

Z20 - 1.1.8. PLUGS GENERALLY:

Proprietary types selected shall be used to suit the background, loads to be supported and conditions expected in use.

Z20 - 2. SITE INSTALLATION

Z20 - 2.1. APPLICATION

Z20 - 2.1.1. ADHESIVES:

a) Surfaces to receive adhesive shall be sound, unfrozen and free from dust, grease and any other contamination likely to affect bond. Where necessary, clean surfaces using methods and materials recommended by the adhesive manufacturer.

b) Surfaces shall be sufficiently smooth and even to suit the gap-filling and bonding characteristics of the adhesive. Prepare as necessary.

c) Operatives shall observe both the manufacturers' and statutory requirements for storage and safe usage of adhesives.

d) No adhesives shall be used in unsuitable environmental conditions or beyond the manufacturer's recommended maximum shelf life or open-pot time periods.

e) Adhesives shall be applied using recommended spreaders/ applicators to ensure correct coverage. Bring surfaces together within the recommended time period and apply pressure evenly over the full area of contact surfaces to ensure full bonding.

f) Surplus adhesive shall be removed using methods and materials recommended by the adhesive manufacturer and without damage to affected surfaces.

Z20 - 2.1.2. FIXINGS:

a) All necessary preparation work such as drilling, plugging, screwing, bolting, cutting for anchor bolts or sockets to be cast-in and for making good, including grouting-in of anchor bolts and fixings where necessary shall be carried out.

b) The method of fixing shall not damage anything being fixed or anything receiving fixings.

c) Welding shall not be permitted, unless accepted by the *Project Manager*.

d) Fasteners shall be installed with a co-ordinated purpose design tooling system that incorporates a mechanical depth locator to ensure consistent depth setting and facilitates perpendicular installation. The fastener manufacturer shall be capable of providing on-Site instruction in the use of the fastener installation tooling system.

e) All fixings and attachments shall be secured against vibrating loose.

f) All fixings shall be in accordance with Section 2 of Approved Document A of the Building Regulations and any subsequent amendments thereto.

g) Submit QA/ QC procedures for inspection of fixings to the *Project Manager* to include, but not be limited to, checking each fixing for correct torques, depth of mortices, alignment, etc.

h) Ensure that no lock-up stresses are generated.

Z20 - 2.1.3. POWDER ACTUATED FIXING:

a) Tools shall be used in accordance with BS 4078: Part 1. Operatives shall be trained and certified as competent by the *Contractor*.

b) It shall be ensured that operatives take full precautions against injury to themselves and others.

c) All unspent cartridges shall be removed from the Site when no longer required.

d) Zinc rich primer shall be applied to heads of fasteners used externally in external walls or in other locations subject to dampness.

e) Top hat section plastic washers shall be used to isolate cartridge-fired nails from stainless steel components fixed externally, in external walls or in other locations subject to dampness.

Z20 - 2.1.4. SCREW FIXINGS;

a) All screws shall have clearance holes. Screws of 8 gauge or more and all screws into hardwood shall have pilot holes approximately half the diameter of the shank.

b) Before using brass, aluminium or other soft metal wood screws, the thread shall be pre-cut with a matching steel wood screw.

c) Screws shall not be hammered unless specifically designed to be hammered.

d) Screw heads shall be countersunk not less than 2mm below timber surfaces that will be visible in the completed work, unless specified otherwise.

Z20 - 2.1.5. PACKINGS GENERALLY:

It shall be ensured that packings do not intrude into zones that are to be filled with sealants.

Z20 - 2.1.6. NAIL FIXING:

a) In joints, not less than two nails and opposed skew nailing shall be used, unless specified otherwise.

b) Nails shall be driven in fully without splitting or crushing the material being fixed.

c) Nail heads shall be punched below surfaces that will be visible in the completed work.

Z20 - 2.1.7. PLUGS GENERALLY:

Plugs shall be located accurately in correctly sized holes in accordance with the manufacturer's recommendations.

End of Section

Z22. SEALANTS

To be read in conjunction with Section A and other related sections of the *Specification*, Preliminaries and Contract Conditions

Z22 - 1. MATERIALS/ PRODUCTS

Z22 - 1.1. MATERIALS

Z22 - 1.1.1. TYPES AND METHOD:

a) Sealant shall be suitable for the purpose intended, and used strictly in accordance with the manufacturer's instructions.

b) Sealants shall not be in any way a potential health hazard. Maintain full up-to-date records of all current published research and legislation in this respect. Obtain information from the sealant manufacturer regarding storage, handling, use and disposal of sealants.

c) Wet applied sealants shall only be used in the locations shown on the *Design Drawings*

d) Sealants shall be the most appropriate type and grade suitable for the intended application.

e) Written confirmation from the sealant manufacturer shall be obtained and submitted to the *Project Manager* for consideration as to the suitability of the sealant for the application intended.

f) Proposals and reference samples shall be submitted to the *architect* of the type and colour of the sealant prior to ordering.

g) The period during which the sealant shall not change in appearance or colour post application. Any discolouration of sealant during this time shall not be acceptable.

h) The chemical composition of the sealant and primers, where any, shall be compatible with the joint substrate, and with adjacent surface treatments or building components with which they may come into contact.

i) The appropriate hardness, compressibility or consistency of sealants shall be determined in consultation with the manufacturer, considering the joint movement and exposure for the size of joint. Upon request, information shall be furnished concerning theoretical joint movement related to the anticipated temperatures at which sealants shall be installed and cured.

j) It shall be demonstrated that the sealant joints can accommodate and are compatible with any movements to which they may be subjected.

k) Sealants shall have the lowest modulus of elasticity which is consistent with the degree of exposure to wear, abrasion and vandalism. Any sealant exposed to traffic shall have strength and modulus sufficiently high to resist damage by traffic, including indentation.

l) Sealants that are likely to stain, discolour or bleed into adjacent building materials shall not be used. Provide independent testing evidence to this effect.

m) Where the sealant location involves special requirements, the following shall be complied with:

i) Where the sealant is used in trafficked surfaces and/ or requires to be fuel resistant, it shall be in accordance with BS EN 14188: Part 1 and BS 5212.

ii) Where the sealant is required to achieve a period of fire resistance, independent UK performance certification of the proposed sealants shall be provided to show the sealant satisfies the required fire resistance requirement.

iii) Where sealants are in contact with drinking water, evidence of compliance with UK water quality standards shall be provided.

iv) Resistance to permanently wet service environments.

n) Sealant performance shall be verified by provision of current independent test certificates.

o) Manufacturers' product descriptions shall confirm compliance with performance standards including the BS EN ISO 11600 coding and be confirmed on the package labels, in the technical data sheets and on any certificates demonstrating performance capability.

p) Sealants complying with the *Specification* shall be manufactured within an independently assessed BS EN ISO 9000 series quality system. Each pack supplied shall have a batch number and date of manufacture.

q) An on-Site test procedure as recommended by the manufacturer, shall be used as a means of assessing the extent of sealant cure and/ or adhesion to joint surfaces.

Z22 - 2. SITE INSTALLATION

Z22 - 2.1. WORKMANSHIP

Z22 - 2.1.1. APPLICATION:

a) Carefully prepare surfaces to receive sealant, using correct de-greasing solvents, primers and bonding agents as necessary.

b) Where sealants are applied, either on or off Site, they shall be in accordance with BS 6213, BS 6093 or BS 8000: Part 16 and BS EN ISO 11600 as appropriate.

c) The application of sealants shall be in accordance with the supplier's/ manufacturer's written preparatory and application procedures and the British Adhesives and Sealant Association Manual of Good Practice or acceptable equivalent.

d) Excess sealant shall be removed and all joints shall be neat and clean. Only liquids approved by the sealant manufacturer shall be used to tool freshly applied sealants.

e) Sealant shall be evenly applied without bubbles in joints.

f) Sealants shall be adequately protected during the curing process to avoid contamination or damage from other activities or conditions on Site.

g) Joint fillers, when placed in the joint, shall provide a gap consistent with the required depth of sealant. The cross section of sealant in the joint shall be of 2:1 width to depth unless otherwise accepted. Joint fillers shall be as follows:
   i) Compatible with the sealant used and surrounding construction elements.
   ii) Formed from closed cell foam.
   iii) Non-adherent to cured sealant, otherwise bond breaker tape shall be used.

h) Applicators shall operate within an approved BS EN ISO 9001 scheme.

i) Only materials meeting the *Specification* requirements and stored under appropriate conditions shall be used for installation.

End of Section