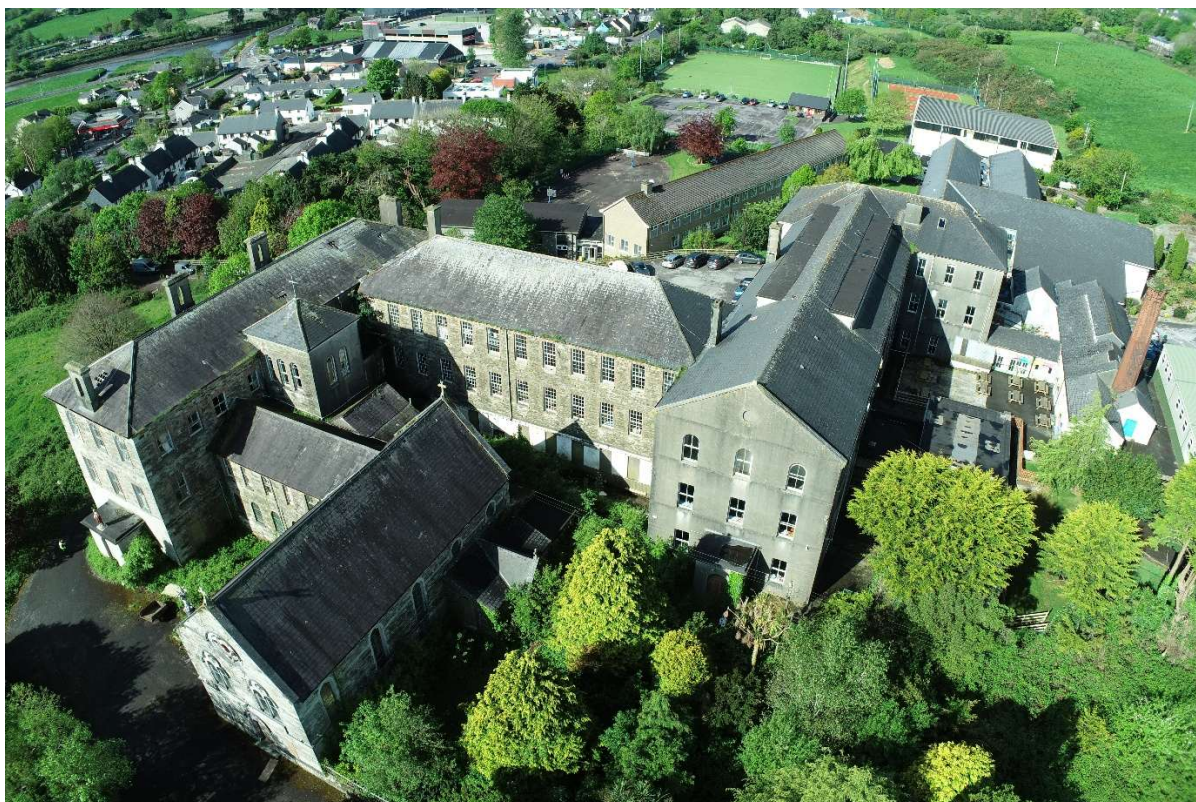


Volume A.2.1 Architectural Specification

**Sacred Heart Secondary School,
Clonakilty, Co.Cork**

Enabling Works II Buildings B1 - B4



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A33/1 MATERIALS & WORKMANSHIP

- a) MATERIALS AND GOODS as specified are to be the best of their respective kinds, “fit for purpose” in accordance with Building Regulations, and those for which there is an Irish/British Standard or Code of Practice are to comply therewith and shall bear the Irish/British Standard mark or alternatively shall be certified to a National Standard of another member of the European Union which provides an equivalent guarantee of safety and suitability - certification and/or a Declaration of Conformity to be by the National Standards Authority of Ireland.
- b) INCOMPLETE DOCUMENTATION.
- General: Where and to the extent that products or work are not fully documented, they are to be:
 - In accordance with the Works Requirements
 - Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
 - Suitable for the purposes stated or reasonably to be inferred from the project documents.
 - Contract documents: omissions or errors in description and/ or quantity shall not vitiate the Contract nor release the Contractor from any obligations or liabilities under the Contract.
 - NB: Relevant documentary evidence (i.e. an EC Declaration of Conformity, which must contain the following information: manufacturer's details (name and address, etc.); essential characteristics for the product; compliance with appropriate European standards and performance data; if relevant the identification number of the Notified Body; and a legally binding signature on behalf of the manufacturer.) shall be submitted to the ER on request and shall be incorporated into the O&M and H&S manuals upon project completion.
- c) CE MARKING
- The CE marking shall be affixed visibly, legibly and indelibly to the construction product or to a label attached to it. Where this is not possible or not warranted on account of the nature of the product, it shall be affixed to the packaging or to the accompanying documents
 - The CE marking shall be followed by the two last digits of the year in which it was first affixed, the name and the registered address of the manufacturer, or the identifying mark allowing identification of the name and address of the manufacturer easily and without any ambiguity, the unique identification code of the product-type, the reference number of the declaration of performance, the level or class of the performance declared, the reference to the harmonised technical specification applied, the identification number of the notified body, if applicable, and the intended use as laid down in the harmonised technical specification applied.
 - Note: An importer or distributor shall be considered a manufacturer for the purposes of EU Regulation No 305/2011 and shall be subject to the obligations of a manufacturer pursuant to Article 11 (obligations of manufacturers) of EU Regulation No 305/2011, where he places a product on the market under his name or trademark or modifies a construction product already placed on the market in such a way that conformity with the declaration of performance may be affected.

- d) **CURRENT STANDARDS:** Generally, references to Irish, British, EN, or other National Standards or Codes of Practice do not give the year of issue or dates of amendments and the latest relevant published version including any relevant amendments published at the date of tender shall apply. Where a Standard Code of Practice has been superseded the edition current at the date of invitation to tender shall apply.
- e) Where a British Standard is used to specify a standard, any product being used to meet that standard must comply with Construction Products Regulations, and must provide a Declaration of Performance (DoP) and 'CE' marking.
- f) **CODES OF PRACTICE** The contractor shall provide a copy of any relevant codes of practice for use by his site supervisory staff.
- g) **SAMPLES OF MATERIALS,** manufacturer's articles and executed work shall be submitted as required to the Architect for approval before incorporation into the works and articles not so approved shall be removed, if directed by the Architect. Approval of any materials or work will not relieve the contractor from responsibility for defects subsequently arising.
- h) **STORAGE OF MATERIALS:** All unfixed materials shall be carefully stored in accordance with the best practice and in a suitable position on site. Manufacturers or agents recommendations regarding storage, transportation, application, material compatibility, workmanship, health & safety, etc. shall be strictly observed.
- i) **WORKMANSHIP**
- All workmanship shall comply with current Irish / British Standard Code of Practice or equivalent standard as noted above and in accordance with B.S. 8000 - "workmanship on building sites" IS / 150 9000 / EN 29000 quality system management and in accordance with Building Regulations Technical Guidance Document Part D.
 - When required working / shop drawings, calculations, documentation, certification, samples, etc. submitted by specialist to the Employer's Representative for consideration and comments before any work is fabricated.
 - On completion the Main Contractor must submit to the Employer's Representative a minimum of four copies of as built drawings, maintenance manuals, material / component guarantees; Certificates of Compliance with Building Regulations and / or relevant standards; and including design, installation and commissioning certificates where applicable collated in a Building Manual.
- j) **WORKMANSHIP SKILLS**
- **Operatives:** Appropriately skilled and experienced for the type and quality of work, compliance with the Building Regulations, compliance with Department of Education and Skills Technical Guidance Documents
 - **Registration:** With Solas Construction Skills Certification Scheme or equivalent programme recognised by Solas.
 - **Evidence:** When requested, operatives must produce a card containing the following details:
 - Name of the registering body.
 - Registration number.
 - Expiry date.
 - Contact details of issuing body.
 - Holder's name and photograph.

k) QUALITY OF PRODUCTS

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

l) QUALITY OF EXECUTION

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

m) COMPLIANCE

- Compliance with proprietary specifications: Retain on site evidence that the proprietary product specified has been supplied.
- Compliance with performance specifications: Submit evidence of compliance, including test reports indicating:
 - Properties tested.
 - Pass/ fail criteria.
 - Test methods and procedures.
 - Test results.
 - Identity of testing agency.
 - Test dates and times.
 - Identities of witnesses.
 - Analysis of results.

n) RELATED WORK

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

o) MANUFACTURER'S RECOMMENDATIONS / INSTRUCTIONS

- General: Comply with manufacturer's printed recommendations and instructions current on the date of the Invitation to tender.
- Changes to recommendations or instructions: Submit details.
- Ancillary products and accessories: Use those supplied or recommended by main product manufacturer.

p) WATER FOR THE WORKS

- Mains supply: Clean and uncontaminated.
- Other: If proposed, provide evidence of suitability.

q) SAMPLES

- Products or executions: Comply with all other specification requirements and Works Requirements in respect of the stated or implied characteristics either:

r) APPEARANCE AND FIT

- Tolerances and dimensions: If likely to be critical to execution or difficult to achieve, as early as possible either:
- Submit proposals; or
- Arrange for inspection of appearance of relevant aspects of partially finished work.

s) CRITICAL DIMENSIONS

- Critical dimensions: Set out and construct the Works to ensure compliance with the tolerances stated.
- Location: Detailed on drawings all curved walls receiving render finishes.

t) SUBSTITUTION OF MATERIALS & PRODUCTS

- Where a substitution is proposed, at the time of proposing the substitution, the Contractor must confirm that they will certify the following:
 - All the works have been constructed with proper materials and in a workmanlike manner.
 - All the works have been constructed in accordance with manufacturers' recommendations.
 - All the materials/products/systems have been installed in accordance with relevant Agrément Certificate, or other appropriate standards listed in TGDs, so that the installation complies with the tested standard for the relevant material/product/system.
 - All materials selected by the Contractor comply with the requirements of Building Regulations.
 - The Contractor has supervised all construction activity on site.

A33/2 TRADE NAMES

- a) OR EQUIVALENT: The phrase "or equivalent" in all tender documentation and drawings shall mean, the material or product named, or a similar product of equal quality and performance. No substitution of materials shall be accepted without the architect's prior written approval.

- b) NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.
- c) WRITTEN AUTHORIZATION: In every case where, on the drawings, in the Specification or in the Bill of Quantities, materials, appliances or fittings of special design, manufacture or description, patented or otherwise, are described or the names of the manufacturers or agents are given, any departure from the specified articles or material will only be permitted on the written authorisation of the Architect. If no such authorisation (which shall not be unreasonably withheld) is obtained, the contractor must supply the articles or materials specified.

Contractor to identify key performance criteria and compare proposed to existing .

A33/3 SITE PREPARATION

a) PROTECTION

- All existing buildings, trees, planting, fences, gates, walls, power lines, services/utilities and other site features, (which are to remain in position during the execution of the works) from damage by site operations and make good any damage to existing features resulting from the works.
- Remove shrubs, trees and planting only as indicated by the Employer's Representative, grub up roots and remove from site. Fill in voids left by removal of roots with hardcore or soil as appropriate to be obtained off site. Protect all planting to be retained.

b) SITE HOARDING:

- Provide site hoarding and safety barriers as indicated to the extent indicated in the pricing document and on-Site Layout Plan / Construction Access and Compound drawings. Ensure integrity of hoarding from unauthorized access, in particular from access by children.
- Include for the removal / relocation of hoarding and safety barriers on completion.
- Provide for secure site entry gates.
- Providing proper signage to indicate flow of traffic.
- Allow for removal and re-sitting of hoarding on completion of various stages of the works as required.
- The entire site (including builders' compound) encompassing the new works is to be hoarded off from the remainder of the site.
- The hoarding to consist of good quality exterior grade timber slatted fencing. Details to be approved before commencement on site.
- Should the contractor wish to incorporate additional signage or such like he shall do so at his own expense and only with the Employer's Representative permission.

c) SETTING OUT

- The line, and levels of formation, side slopes, drainage, carriageways, tracks, footways, and hard shoulders shall be carefully set out, and frequently checked, care being taken to ensure that correct gradients, and cross sections are everywhere obtained.
- The finished surface of the carriageways and footways shall be formed so as to provide adequate fall to, and satisfactory run off at all surface outlets, gullies etc.
- The Contractor shall be entirely responsible for any errors in setting out regardless of whether the Employer's Representative has checked the setting out or not.

d) EXISTING SERVICES

- The Contractor shall, as far as possible ascertain for himself the positions of underground services and shall take all precautions for their protection.
- He shall make good any damage to drains, sewers, mains, cables, or other property caused by his operations.
- All existing gas pipes, water pipes, electric cables, sewers, drains, and other services which do not in the opinion of the Architect require to be changed in location, shall be carefully supported, and protected from damage by the Contractor, and in the case of such damage shall be restored by him to as good condition as that in which they are found.

e) TEMPORARY WORKS: The Contractor shall provide, maintain and remove on completion of the works all temporary works necessary for the proper execution of the Contract and

such temporary works shall be executed, at his own expense, and constructed, and maintained to the satisfaction of the Employer's Representative.

- (f) The PSCS should identify, plan and organise foreseeable temporary works. The appointed Temporary Works Coordinator shall coordinate with a task specific Temporary Works Designer and relevant Permanent Works Designer via a Design Brief to confirm all temporary works design assumptions in addition to ensuring the coordination of permanent works can be completed without risk to those involved. The PSCS will co-operate with all relevant parties thereby enabling the PSDP to co-ordinate the design of Temporary Works.

A33/4 EXCAVATION

- a) **STRUCTURAL SPECIFICATION:** Refer to the Structural Specification for General Excavations Work, General Fill Work, and Excavations and Fill Work for Structures & Pipelines.
- b) **DRAINAGE/SURFACE WATER:** See Structural Engineer's drawings & specifications for external drainage and Mechanical and Electrical Engineers drawings & specifications for internal drainage.
- c) **PIPES AND SERVICES:** When the contractor encounters, in the course of excavation, any water, gas, electricity or other mains, these shall be reported to and dealt with as directed by the Employer's Representative
- d) **TREES AND ROOTS**
 - Trees to be removed within the confines of the site shall be uprooted or cut down as near to ground level as is possible, cut in lengths, the roots grubbed up and all disposed of off the site of the proposed works.
 - All other trees and planting shall be preserved and protected as further described.
- e) **EXISTING TOPSOIL IN SITE:** The Client shall retain the ownership of the soil. It is to be deposited on site in required areas with reference to landscaping and redistributed as directed by the Employer's Representative on completion of construction. Refer to Landscape Architects drawings and specifications.
- f) **PROTECT EXISTING:** Excavations for foundations in positions adjacent to existing buildings, and pathways shall be carried out in such matter that at any time these buildings, and roadways are not endangered by the excavation; all propping, shoring and methods of excavation must be discussed with the Employer's Representative will not relieve the Contractor in any way of his responsibility to ensure the safety of the working, and the adjacent buildings.
- g) **TRENCH SUPPORTS:**
 - i) The Contractor shall design, furnish, put in place, and maintain such sheeting, bracing, etc., as may be required to support the sides, and roof of the excavation, and to prevent any movement which can in any way be a safety hazard, injure the masonry, concrete or pipeline, diminish the necessary width of excavation, or otherwise injure or delay the work or endanger adjacent pavements, buildings or other structures.
 - ii) Great care must be taken in excavating service trenches etc. alongside foundations. Particular attention shall be given to all excavations and filling which extends to depths sufficient to fall within a dispersion angle of 45 degrees from the underside of any foundations or services.
- h) **PIPES AND SERVICES:** Where directed all temporary or disused pipes etc. in or under the permanent work, are to be filled in solid with fine concrete or grout.

PROTECT THE FOLLOWING:

- a) **EXISTING SERVICES**

- Confirmation: Notify all service providers, statutory authorities and/ or adjacent owners of proposed works not less than one week before commencing site operations.
 - Identification: Before starting work, check and mark positions of utilities/ services. Where positions are not shown on drawings obtain relevant details from service providers, statutory authorities or other owners.
 - Work adjacent to services:
 - Comply with service provider's/ statutory authority's recommendations.
 - Adequately protect and prevent damage to services: Do not interfere with their operation without consent of service providers/ statutory authorities or other owners.
 - Identifying services
 - Below ground: Use signboards, giving type and depth.
 - Overhead: Use headroom markers.
 - Damage to services: If any results from execution of the Works:
 - Immediately give notice and notify appropriate service provider/ statutory authority.
 - Make arrangements for the work to be made good without delay to the satisfaction of service provider/ statutory authority or other owner as appropriate.
 - Any measures taken to deal with an emergency will not affect the extent of the Contractor's liability.
 - Marker tapes or protective covers: Replace if disturbed during site operations to service provider's/ statutory authority's recommendations.
- b) **ROADS AND FOOTPATHS**
- Duty: Maintain roads and footpaths within and adjacent to the site and keep clear of mud and debris.
 - Damage caused by site traffic or otherwise consequent upon the Works: Make good to the satisfaction of the Employer, Local Authority or other owner.
- c) **EXISTING TOPSOIL/ SUBSOIL**
- Duty: Prevent over compaction of existing topsoil and subsoil in those areas which may be damaged by construction traffic, parking of vehicles, temporary site accommodation or storage of materials and which will require reinstatement prior to completion of the Works.
 - Protection: Before starting work submit proposals for protective measures.
- d) **RETAINED TREES/ SHRUBS/ GRASSED AREAS**
- Protection: Preserve and prevent damage.
 - Replacement: Mature trees and shrubs if uprooted, destroyed, or damaged beyond reasonable chance of survival in their original shape, as a consequence of the Contractor's negligence, must be replaced with those of a similar type and age at the Contractor's expense.
- e) **EXISTING FEATURES**
- Protection: Prevent damage to existing buildings, fences, gates, walls, statues, roads, paved areas and other site features, which are to remain in position during execution of the Works.
- f) **MATERIALS FOR RECYCLING/ REUSE**
- Duty: Sort and prevent damage to stated products or materials, clean off bedding and jointing materials and other contaminants.
 - Storage: Stack neatly and protect until required by the Employer or for use in the Works as instructed.

C20	DEMOLITION
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To be read with preliminaries/General Specifications and drawings.

C20/1 GENERAL REQUIREMENTS

(a) **EXTENT OF DEMOLITION:** The extent of the demolition is shown on the drawings.

(b) **BUILDING MATERIALS TO BE SALVAGED:**

Existing windows and doors are to be inspected for wood rot and decayed timber. Carefully remove affected areas where feasible and treat to arrest further decay. Where frames are beyond repair, remove the item completely.

Any salvaged windows, ironmongery, doors, fascias, stair elements, balustrades and other fittings are to be carefully set aside and stored for re-use and to enable accurate replication under a subsequent contract. Storage shall be in a dry, secure, internal location unless otherwise agreed.

All stone, sound bricks, slates, quarry tiles, recovered during demolitions or building works are to be carefully salvaged, cleaned and retained for re-use as directed.

The policy of repair is to use matching traditional materials, details and methods. This applies to work to all fabric (roof, walls and windows), as illustrated on the drawings and outlined in the schedule of works. Where conservation work necessitates the replacement of part or whole of any element of the building fabric, this is to be recorded and surveyed and rebuilt to exactly match historic materials and detailing.

(c) **FIXTURES TO BE REMOVED PRIOR TO DEMOLITION:** Existing furniture, equipment to be agreed prior to demolition. All loose debris and accumulated rubbish etc, is to be removed from the site. All defective timber is to be stripped out, removed from site and disposed of, as determined on site by the Architect. All contaminated timber to be either treated or repaired or removed from the site.

(d) **GROUNDWORKS**

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

(e) **BENCH MARKS**

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

(f) **DESK STUDY/ SURVEY**

- Scope: Before starting deconstruction/ demolition work, examine available information, and carry out a survey of:
 - the structure or structures to be deconstructed/ demolished,
 - the site on which the structure or structures stand, and
 - the surrounding area.
- Report and method statements: Submit a survey report and method statement to the ER covering all relevant matters listed below describing:
 - Form, condition and details of the structure or structures, the site, and the surrounding area.

Extent: as per drawings .

- Type, location and condition of features of historical, archaeological, geological or ecological importance.
- Type, location and condition of adjoining or surrounding premises that might be adversely affected by removal of the structure or structures, or by noise, vibration and/ or dust generated during deconstruction/ demolition.
- Identity and location of services above and below ground, including those required for the Contractor's use, and arrangements for their disconnection and removal.
- Form and location of flammable, toxic or hazardous materials, including lead-based

- paint, and proposed methods for their removal and disposal.
- Form and location of materials identified for reuse or recycling, and proposed methods for removal and temporary storage.
- Proposed programme of work, including sequence and methods of deconstruction/ demolition.
- Details of specific pre-weakening required.
- Arrangements for protection of personnel and the general public, including exclusion of unauthorized persons.
- Arrangements for control of site transport and traffic.
- Special requirements:
- Details of services supplied by the Statutory Authority;
- Results of tests to determine the precise nature of hazardous materials;
- Site waste management plan development and proposals; and - Structural calculations in support of method statements .
- Format of report: 2 No. Paper copies and 1 No. PDF digital copy.

- (g) Existing wells – Securely cap / fill any existing wells uncovered to engineers details and building control approval . Inform architect on uncovering any wells.

C20/2 SERVICES AFFECTED BY DEMOLITION

- (a) LOCATION OF SERVICES: Locate and mark the positions of services affected by the work. Arrange with the appropriate authorities for the location and marking of the positions of mains services.
- (b) DISCONNECTION OF SERVICES: Before starting demolition arrange with the appropriate authorities for the disconnection of services and removal of fittings and equipment.
- (c) DISCONNECTION OF DRAINS: Locate and disconnect all disused drain connections. Seal within the site to approval.
- (d) RELOCATION & RECONNECTION OF SERVICES: Specific services are to be disconnected, re-routed and re-connected in accordance with M & E services drawings.

C20/3 DEMOLITION WORK

- (a) WORKMANSHIP GENERALLY:
- Demolish structure(s) in accordance with current Health and Safety Regulations.
 - Operatives must be appropriately skilled and experienced for the type of work.
 - Site staff responsible for supervision and control of the work are to be experienced in the assessment of the risks involved and in the methods of demolition to be used.
- (b) DUST: Reduce dust by periodically spraying demolition works with water.
- (c) HEALTH HAZARDS: Take adequate precautions to protect site operatives and the general public from health hazards associated with vibration, dangerous fumes and dust arising during the course of the Works.
- (d) ASBESTOS BASED MATERIALS: Asbestos in existing buildings to be removed by a specialist asbestos contractor as part of the works. Refer to the asbestos report and register accompanying these works for the locations of asbestos containing materials.
- ASBESTOS-CONTAINING MATERIALS – KNOWN OCCURRENCES
 - General: Materials containing asbestos are known to be present in: refer to Asbestos reports.
 - Removal: By approved licensed contractor, and prior to other works starting in these locations.
 - ASBESTOS-CONTAINING MATERIALS – UNKNOWN OCCURRENCES
 - Discovery: Give notice immediately of suspected asbestos-containing materials when discovered during deconstruction/ demolition work. Avoid disturbing such materials.

- Removal: Submit statutory risk assessments and details of proposed methods for safe removal.
- Report immediately to the Architect any suspected asbestos based materials discovered during the demolition works. Avoid disturbing such materials. Agree with the Architect and PSDP methods for safe removal.

(e) STRUCTURES TO BE RETAINED

- Extent: as per drawings.
- Parts which are to be kept in place: Protect.
- No parts of the building to be left exposed to weather at any time. The interior of the building must be fully protected during all works. The contractor must put in place measures to fully protect the interior of the building during all roofing works, stonework repairs and window refurbishment/replacement.
- Interface between retained structures and deconstruction/demolition: Cut away and strip out with care to minimize making good.

(f) COMPLETION: Clear away all debris and leave the site in a tidy condition on completion.

C20/4 REMOVAL OF EXISTING FINISHES

(a) INTERNAL PLASTER AND RENDER:

Hack off and remove existing plaster and cementitious render from the internal face of external walls, as indicated on drawings.

- PREPARATION:
 - Brush down exposed surfaces to remove loose material, dust and debris.
- METHOD:
 - Carefully strip finishes back to expose underlying masonry.
 - Use hand tools unless otherwise agreed.
 - Avoid damage to the substrate.
 - Allow masonry to dry naturally prior to any subsequent works.

(b) OPENING UP AND INSPECTION

- Following removal of finishes, inspect exposed masonry.
- Notify the ER or Architects of any:
 - Loose or unstable masonry.
 - Open or eroded joints.
 - Signs of damp, decay or deterioration.

(c) MAKING GOOD (PROVISIONAL)

- Carry out minor making good works to exposed masonry only where instructed. Scope of works may include:
 - Localised repointing using appropriate lime-based mortar.
 - Securing loose masonry units.
 - Making safe small defective areas.
- Limitation: No extensive repairs to be undertaken without further instruction.

C20/5 MATERIALS ARISING

- (a) OWNERSHIP: Components and materials arising from the demolition work are to become the property of the Contractor except where otherwise provided. Remove from site as work proceeds.

C30 SHORING/ FAÇADE RETENTION

To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

STRUCTURAL MATERIALS & WORKMANSHIP SPECIFICATION.

Refer also to structural materials & workmanship specification.

50A GENERAL

• **GENERALLY:** Before starting work:

Examine all available information.

Survey the structure, site and surrounding area.

Submit method statements to the ER covering any relevant matters raised in the design brief.

Ensure that all statutory notices have been given and licenses obtained.

• **COMMENCEMENT CONDITION SURVEY:**

Before starting work, survey the existing state of structure to be kept in place to locate and record the magnitude and extent of all cracks, spalling, flaking and other irregularities of the fabric.

Agree the commencement condition survey record with the ER.

• **LOCATION SURVEYS:**

Before starting work, carry out a geometric survey to accurately locate initial positions of structure to be kept in place. Establish a regular grid of survey points on surfaces of structure.

Before loading support systems, carry out a geometric survey to accurately locate initial positions of those systems. Establish a regular grid of survey points on surfaces of support systems.

At regular intervals throughout the Contract period, or until notified otherwise by the ER, carry out further geometric surveys of supported structure and support systems to measure any movement.

Agree with the ER when location surveys are to take place, the number and position of survey points, and the method of recording findings.

• **EXTENT OF SUPPORT WORK:**

Design support systems in accordance with the design brief, BS 5975.

The Contractor shall accept responsibility for the adequacy and stability of support systems and thereby the integrity of supported structure for the period from commencement of erection to completion of dismantling of support systems, in this regard the Contractor shall assess the site to ensure that all necessary supports are put in place in order to comply with the Safety, Health and Welfare at Work (Construction) Regulations. The Contractor should provide for all the requisite shoring, needling and strutting to walls, floors, chimneys and roofs to allow safe and proper execution of the works

• **CORROSION PROTECTION:**

Before starting work, submit corrosion protection proposals for support systems to the ER.

• **WORKMANSHIP:**

Carry out work in accordance with the design brief and BS 5975.

Operatives must be appropriately skilled and experienced for the type of work and hold or be training to obtain relevant CITB Certificates of Competence.

Site staff responsible for supervision and control of the work are to be experienced in the methods of erection and maintenance of support systems to be used.

• **ERECTING SUPPORT SYSTEMS:**

Locate positions of existing and new services which may be affected by support systems. Provide any necessary temporary diversions.

Prevent excessive loadings from foundations of support systems being imposed onto foundations of structure to be kept in place.

Erect support systems and connect to structure to be kept in place taking all necessary precautions to prevent damage, and taking due account of movement of structure which may occur before, during and after demolition.

Promptly repair any damage caused to adjoining property by erection or connection of support systems. Make good to ensure safety, stability, weather protection and security.
Report to the ER any damage caused to retained facades by erection or connection of support systems. Agree methods of repair with the ER.
Check support systems at agreed stages during erection for compliance with design proposals.

- **UNKNOWN HAZARDS:**

Inform the ER of any unrecorded voids, flues, services, etc. discovered during erection of support systems. Agree with the ER methods for infill, making good, relocation of support connections, etc.

- **LOADING SUPPORT SYSTEMS:**

Complete erection and connection of the following support systems before commencement of the demolition of adjoining structure.

The Contractor shall accept responsibility for the adequacy and stability of support systems and thereby the integrity of supported structure for the period from commencement of erection to completion of dismantling of support systems, in this regard the Contractor shall assess the site to ensure that all necessary supports are put in place in order to comply with the Health Safety and Work (Regulations)

- **MAINTAINING SUPPORT SYSTEMS:**

Provide safe access and safe places of work in the support systems for inspection and maintenance.

Regularly inspect and maintain support systems, making good ties, wedges, connections, corrosion protection, etc. as necessary.

Adequately protect support systems from impact damage by vehicles, plant and site operations.

Prevent access of unauthorised persons onto support systems. Leave safe outside working hours.

- **MAINTAINING SUPPORTED STRUCTURE:**

Regularly inspect and monitor supported structure to ensure stability. Report any significant movement or deterioration of the fabric of supported structure to the ER.

Agree any necessary remedial work with the ER.

Adequately protect supported structure from damage by site operations and from staining due to corrosion of support systems.

- **DISMANTLING SUPPORT SYSTEMS:**

When all permanent connections between supported structure and new construction have been made inform the ER and obtain any required permission to disconnect and dismantle support systems.

- **COMPLETION CONDITION SURVEY:**

After disconnection of support systems, survey and record the state of structure kept in place.

Ensure that all defects caused by or due to support systems have been remedied.

Agree the completion condition survey record with the ER.

- **MAKING GOOD:**

Repair any connection holes made in the structure kept in place.

- **COMPLETION:**

Clear away all support systems and leave the site and any working areas beyond the site boundary in a tidy condition on completion.

COMPLETION

910 DISMANTLING RETENTION STRUCTURE

- Permanent connections: When complete between façade and new construction, give notice.

- Disconnection and dismantling: Obtain permission before proceeding.

930 COMPLETION CONDITION SURVEY

- Timing: After disconnection of support systems, survey and record the state of façade.

- Defects: Ensure that defects caused by or due to retention structure have been remedied.

- Record: Submit for agreement.

940 REPAIRS TO FAÇADE

- Scope: Remove fixings and make good connection holes.

C51 REPAIRING/ RENOVATING/ CONSERVING TIMBER

To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

SCOPE OF WORK REPAIR TYPES:

SAMPLE REPAIRS MUST BE PROVIDED OF ALL JOINERY TYPES - FOR APPROVAL BY THE ER BEFORE PROCEEDING WITH THE REPAIRS GENERALLY.

BRITISH & EUROPEAN STANDARDS

- BRITISH & EUROPEAN STANDARDS : comply with the following British and European Standards –
- BS EN 335 (2013) Durability of wood and wood-based products. Use classes: definitions, application to solid wood and wood-based products.
- BS EN 350-2 (1994) Durability of wood and wood-based products. Natural durability of solid wood. Guide to natural durability and treatability of selected wood species of importance in Europe.
- BS 1186-2 (1988) Timber for and workmanship in joinery. Specification for workmanship.
- BS 1186-3 (1990) Timber for and workmanship in joinery. Specification for wood trim and its fixing.
- BS EN 1313-1 (2010) Round and sawn timber. Permitted deviations and preferred sizes. Softwood sawn timber.
- BS EN 1313-2 (1999) Round and sawn timber. Permitted deviations and preferred sizes. Hardwood sawn timber.
- BS 4978 (2007) +A1:2011 - Visual strength grading of softwood. Specification.
- BS 5756 (2007) +A1:2011 Visual strength grading of hardwood. Specification.
- BS 8000-5: (1990) - WORKMANSHIP ON BUILDING SITES - Code of practice for carpentry, joinery and general fixings.
- BS 8213-1: (2004) - Windows, doors and rooflights - Design for safe use.
- BS 8213-4 (2007) - Windows, doors and rooflights. Code of practice for the survey and installation of windows and external doorsets
- BRE DIGESTS Comply with the following BRE Digests –BRE Digest 422 - Painting exterior wood.

C51/1 SCOPE OF WORKS

(a) SCOPE OF WORK

- Inspect all existing timber elements for signs of decay, including fungal decay and insect attack.
- Carefully remove decayed or structurally unsound timber, only where necessary.
- Treat retained timber to arrest further decay.
- No full refurbishment or upgrading is included under this contract unless specifically noted.

(b) EXTENT OF INTERVENTION

- Works to follow a minimum intervention approach.
- Retain maximum amount of sound historic fabric.
- Avoid unnecessary removal or alteration of existing elements.

- COMPONENTS

(a) TIMBER ELEMENTS INCLUDE (NOT LIMITED TO):

- Windows and frames
- External and internal doors
- Floors, stairs, balustrades
- Fascias and joinery items

(b) CONDITION ASSESSMENT/ INSPECTION

- Purpose: To confirm nature and extent of repair/ conservation work shown on drawings and described in survey reports and schedules of work.
- The Contractor is to identify on an elevation-by-elevation basis his proposed strategy for joinery repairs - allowing sufficient time for the ER inspection of final proposed repair types.
- Before the ER inspection - the Contractor is to strip-back paint and mark-up the proposed repairs on the joinery with an indelible- pen in conjunction with annotation of the joinery drawings

- REMOVAL AND REPAIR

(a) LOCALIZED REPAIRS

- Cut out decayed timber back to sound material.
- Extent: Minimum necessary to arrest decay.
- Do not remove sound adjoining material unnecessarily.

(b) TREATMENT

- Apply appropriate fungicidal and/or insecticidal treatment to:
 - Remaining timber
 - Adjacent affected areas
- Application: In accordance with manufacturer's instructions.

(c) BEYOND REPAIR

- Where elements are deemed beyond repair:
 - Carefully remove entire item
 - Avoid damage to adjacent construction
 - Submit to Architect/ER for instruction on whether items are to be salvaged, stored or disposed of.

- SALVAGE AND STORAGE

(a) SALVAGE FOR REUSE / REPLICATION

- Carefully remove and retain:
 - Windows
 - Doors
 - Ironmongery
 - Stair elements
 - Balustrades
 - Fascias and other joinery items

(b) HANDLING

- Label items to identify original location where appropriate.
- Prevent damage during removal and transport.

(c) STORAGE

- Store in:
 - Dry
 - Secure
 - Internal location
- Proposed location: Building 1 (Chapel), following completion of works under this Contract.
- Final storage location to be agreed with the Architect/ER.

(d) PURPOSE

- Retained items to be used for:
 - Future reuse where feasible
 - Accurate replication under subsequent contract

- EXECUTION

(a) SPECIALIST REQUIREMENT

- Timber inspection and treatment works to be carried out by competent specialist contractor.

- Where minor timber repairs are required to arrest further decay, splices shall be made with sound timber of matching species and section. Treated areas shall be coated with an approved wood preservative. Where necessary, compatible adhesive may be used for small inserts. All works shall comply with relevant health & safety requirements, including precautions for lead paint where present.
- For general timber treatment, preservative specifications, and protective coatings, refer to Section C52 – FUNGUS / BEETLE ERADICATION.

(b) MOISTURE CONTROL

- Identify and report sources of moisture contributing to decay.
- Ensure no treatment is undertaken without addressing moisture source where evident.

(c) PROTECTION

- Protect adjacent materials and finishes during works.
- Prevent spread of fungal spores and contamination.

(d) CLEANING

- Remove debris, dust and loose material prior to treatment.

C51/2 PRODUCTS

- | | |
|------|--|
| 361 | <p>SOFTWOOD FOR JOINERY INTERNAL</p> <ul style="list-style-type: none"> • Species: Douglas fir. • Quality: Generally to BS EN 942; free from decay and insect attack (except pinhole borers). - Appearance class: Class J2 = small sections - free of all defects; J5 = intermediate sized sections i.e. c50mm x 25mm sections; J10 on large sections. • Treatment: None required. • Moisture content on delivery: 9-13%. • Moulding Profiles TBC |
| 371 | <p>JOINERY REPAIRS Douglas Fir</p> <ul style="list-style-type: none"> • Species: Douglas Fir. • Quality: Generally to BS EN 942; free from decay and insect attack (except pinhole borers). - Appearance class: Class J2 = small sections i.e. glazing bars, drip mouldings and the like - free of all defects; J5 = intermediate sized sections i.e. c50mm x 25mm sections; J10 on large structural sections. • Treatment: Organic solvent wood preservative - site brushed or spray Boron Wood preservative. • Moisture content on delivery: 12-16% - should be 14%. |
| 375 | <p>REPLACEMENT/REPAIRS JOINERY Hardwood</p> <ul style="list-style-type: none"> • Species: approved. • Quality: Generally to BS EN 942 ; free from decay and insect attack (except pinhole borers). - Appearance class: Class A1. • Fixings/Ironmongery: to be non-ferrous |
| 420 | <p>STAINLESS STEEL SECTIONS AND PLATES Hardwood members</p> <ul style="list-style-type: none"> • Standard: To BS EN 10088 . • Grade: 316. • Source: Obtain steel from a source accredited to a national or internationally accepted quality standard. |
| 480A | <p>SCREWS Timber Repairs</p> <ul style="list-style-type: none"> • Standard: As section Z20. • Material: Brass. • Tensile strength (minimum): TBC. |
| 481 | <p>SCREWS Hardwood Repairs</p> <ul style="list-style-type: none"> • Standard: As section Z20. |

- Material: Stainless steel.
- Tensile strength (minimum): TBC.

541 ADHESIVE TIMBER REPAIRS

- Type: Phenol Resorcinol Formaldehyde / Resorcinol Formaldehyde / Phenol Formaldehyde / Epoxy Resin.
- Manufacturer: Refer to TRADA adhesives suppliers .
- Product reference: Contractor to confirm adhesives selection.

545 ADHESIVE FOR Hardwood

- Type: polyurethane (PU), emulsion polymer isocyanate (EPI), epoxy and phenol resorcinol formaldehyde (PRF) adhesives - seek approval before proceeding.
- Manufacturer: Refer to Accoya for Approved Supplier.
- Insure computability with Resin Repair System and Hardwood Timber Repair Adhesive

C51/3 EXECUTION

600 WORKMANSHIP

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

610A TEMPORARY SUPPORTS/ PROPPING

- General: Provide adequate temporary support at each stage of repair work to prevent damage, overstressing or uncontrolled collapse of any part of the structure.
- Bearings for temporary supports/ propping: Suitable to carry loads throughout repair operations.
- The timber fenestration provides stability and rigidity to the structural frame. A method statement should be submitted for approval to ER and SE before proceeding.

620 PROTECTION OF TIMBER AND WOOD COMPONENTS BEFORE AND DURING INSTALLATION

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

630 MATERIAL SAMPLES

- Representative samples of designated materials: Submit before placing orders.
- Designated materials: All visual timber profiles that are to match existing in Hardwood and Accoya Timber.

640 PROTOTYPES

- General: Prepare one of each of the following items and arrange for inspection before start- ing repetitive fabrication: All typical conditions, were new and repair sections are carried out to allow benchmarking of typical bays or areas requested by ER before proceeding with all areas.

650 DIMENSIONS GENERALLY

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

660 CROSS SECTION DIMENSIONS OF STRUCTURAL SOFTWOOD AND HARDWOOD

- General: Dimensions given on drawings and in schedules of work are finished sizes.
- Maximum permitted deviations from finished sizes:
- Sawn surfaces:
Thickness and widths < 100 mm: -1, +3 mm.
Thickness and widths > 100 mm: -2, +4 mm.
- Further processed surfaces:
Thickness and widths < 100 mm: -1, +1 mm.
Thickness and widths > 100 mm: -1.5, +1.5 mm.

- 670 CROSS SECTION DIMENSIONS OF NONSTRUCTURAL SOFTWOOD AND HARDWOOD
- General: Dimensions given on drawings and in schedules of work are finished sizes.
 - Maximum permitted deviations from finished sizes:
 - Sawn surfaces:
 - Thickness and widths < 100 mm: -1, +3 mm.
 - Thickness and widths > 100 mm: -2, +4 mm.
 - Further processed surfaces: -0, +1.
- 680 WARPING OF TIMBER
- Bow, spring, twist and cup: Not greater than the limits set down in BS 4978 or BS EN 14081- 1 for softwood , or BS 5756 for hardwood.
- 690 PROCESSING TREATED TIMBER
- Cutting and machining: Carry out as much as possible before treatment.
 - Extensively processed timber: Retreat timber sawn lengthways, thickened, planed, ploughed, etc.
 - Surfaces exposed by minor cutting and/ or drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.
- 710 REUSE OF TIMBER SECTIONS/ WOOD COMPONENTS
- Sections/ components scheduled to be removed but not reused in existing locations: Agree extent of retention for reuse elsewhere in the works.
 - Treatment following removal: Required.
 - Storage: Protect against damage, and store until required. Location: On site. Chapel.
- 730 PARTIAL REMOVAL OF EXISTING DECORATIVE/ PROTECTIVE FINISH
- Extent: Remove minimum necessary to expose damaged or decayed wood. Feather the edge of remaining coating around repair site.
 - Method: Careful abrasion using moistened waterproof abrasive paper.
- 740 REMOVAL OF EXISTING DECORATIVE/ PROTECTIVE FINISH
- Extent: Remove completely back to bare wood.
 - Method: Refer to C51.
- 750 CLEANING DIRTY OR STAINED WOOD
- Generally: Scrub with neutral pH soap and clean, warm water.
 - Old varnish: Remove using mixture of turpentine (not turpentine substitute) and acetone in proportions determined by experiment, followed by washing down.
- 760A REPAIR OF MEMBERS - CUTTING OUT MEMBERS
- Refer to SPAB Guidance - Technical Pamphlet 13 - The Repair of wood windows 1998
 - Extent of timber removal: Cut out full cross section of member where wood is defective or decayed, plus 50 mm of sound wood.
 - Distance from face of support to cut end of existing timber: Obtain instructions if dimension exceeds maximum shown on drawing.
 - Joint profile: As drawings.
- 770 REPAIR OF COMPRESSION MEMBERS - PIECING IN
- Defective wood: Remove only decayed or defective wood. Finish cut-outs to clean, regular profiles.
 - Timber inserts: Cut accurately to fit. Glue and pin in place. Lie of grain to match as closely as possible that of parent timber.
 - Joint profile: Refer to SPAB Guidance - Technical Pamphlet 13 - The Repair of wood windows 1998.
- 780 REPAIR OF DISTORTED TIMBER MEMBERS
- Generally: Repair to shape that member has assumed.
- 790 PEGS FOR MORTISE AND TENON JOINTS IN STRUCTURAL TIMBER
- Wood species: Oak.
 - Condition: Dry, preferably oven 'baked' before use.
 - Shape: Round and tapered.
 - Second hand pegs: Do not use.

- Peg holes: Slightly offset such that when pegs are driven home, sections being joined are pulled together.
- 800A **CONDITION OF DOWELS TO BE BONDED INTO TIMBER**
- Condition at time of installation:
 - Dowels generally: Free from corrosive pitting, loose mill scale, loose rust and contaminants that may adversely affect dowels, adhesive, or bond between the two.
- 820 **MAKING CONNECTED JOINTS**
- Connector location: Where not shown otherwise, spacings, end and edge distances to be not less than Standard values to BS 5268-2, Section 6.
 - Bolt hole: As close as practical to nominal diameter of bolt, and not more than 2 mm greater.
 - Centres of bolt holes: Not more than 2 mm from positions shown on drawings.
 - Assembly: Do not crush timber, deform washers or overstress bolts.
- 840 **FIXING FRAMING ANCHORS AND CLEATS**
- Before installation: Submit details if joint geometry prevents installation to manufacturer's recommendations.
 - Installation: Secure using not less than number of fasteners recommended by manufacturer.
- 850 **ADHESIVE JOINTS**
- Moisture content of sections to be joined: Within 5% of equilibrium moisture content for conditions of service, and differing from each other by not more than 3%.
 - Surfaces to be bonded: Close fitting, structurally sound, dry, and free from contamination by dirt, dust, grease or other deleterious substances.
- 870 **MOISTURE CONTENT TESTING**
- Procedure: When instructed, test timber sections with an electrical moisture meter with deep probes, that has been carefully calibrated against oven drying tests or otherwise guaranteed by an independent testing authority.
 - Test sample: Test 5% but not less than 10 lengths of each cross-section in the centre of the length.
 - Test results: 90% of values obtained to be within the specified range. Provide records of all tests.

C51/4 COMPLETION

(a) CERTIFICATION

- Provide certification confirming:
 1. Treatment carried out
 2. Products used
 3. Areas treated

(b) GUARANTEE

- Provide insurance-backed guarantee where treatment systems are used.

C51/5 HEALTH & SAFETY

Contractors working with lead-based paints are required to dispose of wastes in accordance with the required standards

Take precautionary measures to protect employees, the general public, and the environment. The immediate hazards are skin contact and inhaling airborne dust. Workers will require protective equipment to avoid inhalation, ingestion or contact; wet cleaning methods will keep dust to a minimum; (all operatives working on site will have to undergo lead testing, before during and after completion). The slurry and other waste from treatments such as cleaning must be properly handled, and disposed of according to the local requirements.

The Contractor is to ensure that damage to the environment and all health & safety risks are minimized ISO 12944-1 & 8.

C52	FUNGUS / BEETLE ERADICATION
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To be read with preliminaries/General Specifications

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

PRELIMINARY

Dry rot (*Serpula lacrymans*) eradication focus on, three-part approach: removing the moisture source, drying out the affected area, and repairing or replacing damaged timber.

Dry rot is considered a serious, high-moisture-dependent fungal decay that occurs when timber moisture content exceeds 20–22%.

Key elements for specifying dry rot treatment according to NBS and BRE (Building Research Establishment) guidelines include:

1. Assessment and Identification
 - Survey: See PJ Barrett & CO. Preliminary Damp & Timber Decay Report
2. Eradication and Remedial Measures
 - Moisture Control (Crucial): The primary step is to stop the water ingress (leaking pipes, roof leaks, ground moisture) that allows the fungus to grow.
 - Removal: Cut out decayed timber at least 300–500mm beyond the last visible sign of decay to ensure all fungal threads (hyphae) are removed to structural engineer's design.
 - Sterilization: Masonry affected by dry rot should be sterilized to kill dormant spores, often biocidal treatment.
 - Treatments: Use appropriate, approved fungicidal treatments on remaining timber, as specified below and to specialist advice.
3. Repair and Prevention
 - Timber Replacement: Replace removed timber with new, suitably treated, and seasoned timber.
 - Ventilation: Improve ventilation to ensure the timber remains below the 20% moisture content threshold.
 - Design Consideration: Avoid placing timber directly into damp masonry.

Relevant NBS/BRE Documentation

- BRE Digest 299: Dry rot: its recognition and control.
- BRE Digest 345: Wet rots: recognition and control (often used for comparison).
- Good Repair Guide 12: Wood rot: assessing and treating decay.

SCOPE OF WORKS

The purpose of these works is to facilitate the exposure, assessment, control and sterilisation of areas affected by dry rot fungal decay and associated moisture-related deterioration prior to the commencement of the main contract works.

The enabling works are intended to expose concealed defects, remove contaminated timber elements, facilitate drying of the structure, and allow sterilisation of affected masonry and retained structural timbers. The works shall be undertaken under the direction and supervision of the appointed Timber Decay Specialist.

GENERAL REQUIREMENTS

The Contractor shall provide all labour, plant, access equipment, temporary works, containment measures, cleaning operations, and associated works necessary to complete the specification.

All works shall be carried out in a controlled and methodical manner to prevent the spread of contaminated material throughout the building.

The Contractor shall coordinate all works with the Timber Decay Specialist and Structural Engineer where structural timber elements are being removed.

No structural timber shall be removed without prior review and instruction from the Structural Engineer and Timber Decay Specialist.

TIMBER DECAY SPECIALIST ATTENDANCE

The Timber Decay Specialist shall attend the site as required throughout the enabling works programme.

The Timber Decay Specialist shall:

- Advise on the extent of fungal contamination.
- Direct the extent of cutting back and removal of decayed timber.
- Review all concealed timber exposed during the works.
- Specify sterilisation requirements.
- Direct treatment requirements to retained timbers.
- Inspect works before closing up or progressing to subsequent phases.
- Maintain records of treatment locations and works undertaken.

The Contractor shall provide sufficient notice to facilitate inspections at all critical stages.

REMOVAL OF TIMBER ELEMENTS

Provide for the removal of all decayed timber elements identified during the enabling works, including, but not limited to:

- Timber lintels.
- Embedded joist ends.
- Wall plates.
- Timber plugs and fixing grounds.
- Timber packings.
- Decayed floor structures.
- Any additional timber elements identified by the Timber Decay Specialist.

Timbers affected by fungal decay shall be cut back to sound timber under the direction of the Timber Decay Specialist.

Following removal of timber elements, all pockets, recesses and bearing locations shall remain exposed for inspection and treatment.

CLEANING AND PREPARATION

Immediately following the removal of any timber element, the Contractor shall:

- Thoroughly vacuum all exposed surfaces.
- Remove all dust, debris and fungal material.
- Clean all exposed masonry surfaces.
- Clean all pockets and recesses formed by the removal of timber elements.
- Remove all visible fungal growth and contaminated debris.

Cleaning shall extend to all adjacent wall surfaces, floor surfaces, shelves, ledges, voids, recesses and inaccessible corners where fungal contamination may accumulate.

Compressed air may be used where appropriate to dislodge contamination, provided suitable containment and extraction measures are implemented.

All resulting debris shall be removed from the site and disposed of in accordance with applicable waste regulations.

STERILISATION WORKS

Following cleaning operations, all affected areas shall be sterilised under the direction of the Timber Decay Specialist.

Sterilisation works shall include:

- All masonry pockets formed by the removal of timber.
- Bearing locations of joists and lintels.
- Exposed wall surfaces adjacent to fungal outbreaks.
- Floor voids and sub-floor areas.
- Wall heads and wall plate locations.
- Voids revealed during stripping-out works.
- Areas identified by the Timber Decay Specialist during the works.

Sterilisation shall be undertaken using either:

- Lignum Pro M50 Biocide; or
- Microtech Biocide;

or other approved equivalent, subject to written approval by the Contract Administrator and Timber Decay Specialist.

Products shall be applied strictly in accordance with the manufacturer's recommendations.

Drilling timber for injection of preservatives

Sizes and location of holes: Submit proposals.

Approval of appearance: Obtain approval of first few holes before completing remainder.

Guarantee

Type: Insurance backed. Administered by an independent insurance protection company.

Guarantee period (minimum): 12 years from completion of installation.

Documentation: Provide certificates/ guarantees at completion of treatment.

RETAINED TIMBER TREATMENT

All retained structural timbers considered vulnerable to future fungal activity shall be treated as part of the enabling works.

Treatment shall include, but not necessarily be limited to:

- Truss ends.
- Wall plate locations.
- Bearing ends of retained joists.
- Retained lintels.
- Roof timbers adjacent to known fungal outbreaks.
- Other vulnerable locations identified during the works.

Treatment shall be undertaken using approved boron-based preservative systems and associated timber preservatives as directed by the Timber Decay Specialist.

Treatment shall be concentrated on vulnerable timber interfaces with masonry and locations susceptible to moisture accumulation.

FLOOR REMOVAL AND CONTAMINATED FILL

Upon completion of all stripping-out, cleaning, and sterilisation works at the upper levels, the Contractor shall remove contaminated floor build-up materials and aggregate fill identified within the affected areas.

The purpose of this work is to remove residual fungal contamination and organic debris which may remain within the floor construction.

The Contractor shall provide for:

- Removal of contaminated floor aggregate.
- Removal of timber debris remaining within floor voids.
- Removal of organic material and dust deposits.
- Cleaning and preparation of exposed sub-floor surfaces.

FINAL CLEANING BEFORE COMPLETION

The final operation of the enabling works shall comprise a comprehensive cleaning and sterilisation exercise throughout all affected areas.

The Contractor shall allow for:

- Vacuum cleaning of all exposed masonry.
- Vacuum cleaning of wall heads.
- Vacuum cleaning of shelves, ledges and horizontal surfaces.
- Vacuum cleaning of floor voids.
- Cleaning of all pockets and recesses.
- Removal of all dust and fungal debris generated during the works.

Following completion of cleaning, the Timber Decay Specialist shall undertake a final review and direct any additional localised sterilisation works considered necessary.

SEQUENCE OF WORKS

The sequence of the enabling works is critical to successfully controlling fungal contamination and avoiding recontamination of previously cleaned areas.

The Contractor shall undertake the works in a top-down sequence wherever practicable, commencing at roof level and progressing through the upper floors before undertaking works at lower levels.

The general sequence shall be as follows:

- Roof spaces and roof structural timbers.
- Second-floor areas.
- First-floor areas.
- Ground-floor areas.
- Sub-floor voids and floor construction.
- Removal of contaminated aggregate and floor fill.

All stripping-out, timber removal, cleaning, vacuuming, sterilisation and timber treatment works at higher levels shall be completed before commencing equivalent works at lower levels wherever practical.

The removal of contaminated floor aggregate, floor debris and sub-floor contamination shall be one of the

final operations of the enabling works package to prevent the redistribution of fungal spores, dust and contaminated debris into previously cleaned areas.

Following each phase of stripping-out works, thoroughly vacuum and clean all exposed masonry, wall heads, timber pockets, ledges and horizontal surfaces before proceeding to the next stage.

No area shall be considered complete until the Timber Decay Specialist reviews it.

The Contractor shall coordinate the programme of works with the Timber Decay Specialist to ensure that inspections, cleaning operations, sterilisation works and timber treatment are carried out in the correct sequence throughout the contract.

Upon completion of the enabling works, the Timber Decay Specialist shall provide written confirmation outlining:

- Areas inspected.
- Areas sterilised.
- Areas treated.
- Extent of timber removal undertaken.
- Areas requiring further works under the main contract.
- Recommendations for future monitoring, treatment or structural repairs.

The enabling works shall not be considered complete until all identified treatment, cleaning and sterilisation works have been reviewed and accepted by the Timber Decay Specialist.

BUILDING 4 (OCCUPIED BUILDING) – DRY ROT SUMMER WORKS SPECIFICATION

The areas identified as being affected by dry rot fungal decay and associated timber deterioration within Building 4 shall be subject to a programme of opening-up, stripping-out, cleaning and sterilisation works.

Provide to strip all wall plaster within the identified areas of fungal contamination back to the underlying masonry substrate. The extent of stripping shall extend beyond visible evidence of fungal growth, where directed by the Timber Decay Specialist.

Provide for the removal of all timber lintels located within the marked treatment zones. Following removal, all pockets and bearing locations shall be exposed, cleaned, vacuumed and sterilised in accordance with the Dry Rot Enabling Works Specification.

A structural timber beam identified as having fungal decay to one bearing end shall be repaired in accordance with the Structural Engineer's specification and details. The extent of cutting back and repair must be confirmed following exposure of the affected area.

Within the classroom area, strip wall plaster from both sides of the affected masonry walls to facilitate inspection, drying, sterilisation and assessment of embedded timber elements.

Provide to expose all joist bearing ends within the affected classroom and chimney zones. Joist pockets shall remain open for inspection by the Timber Decay Specialist and Structural Engineer.

Provisionally allow for the repair and splicing of twelve (12) joist ends adjacent to the chimney area. This quantity is provisional only and shall be reviewed following exposure of the timber structure. The final extent of repairs shall be determined following inspection of the exposed bearing ends by the Timber Decay Specialist and Structural Engineer.

Following the removal of timber elements and the exposure of the joist pockets, all masonry surfaces shall be thoroughly cleaned, vacuumed, and sterilised. All pockets formed by the removal of lintels, joists and

associated embedded timbers shall be vacuumed and treated using the approved biocidal sterilisation system.

All retained structural timber within the treatment zone shall be treated in accordance with the Timber Decay Specialist's recommendations.

Upon completion of the stripping-out works, the Timber Decay Specialist shall review the exposed structure and provide further recommendations regarding any additional timber repairs, sterilisation works or structural interventions required as part of the main contract works.

*** Specialist Timber Decay Contractor

Due to the complexity of the fungal decay issues identified within the building, all timber decay investigation, sterilisation, timber treatment and associated advisory services shall be undertaken by a suitably qualified specialist timber decay contractor with demonstrable experience in diagnosing, managing, and remediating dry rot (*Serpula lacrymans*) and fungal decay within historic and protected structures.

The appointed specialist shall demonstrate a proven track record in assessing and treating fungal decay within large-scale heritage, conservation and occupied buildings and shall have appropriate professional and technical expertise available throughout the contract period.

The specialist contractor shall be capable of advising on timber treatment, sterilisation methodologies, work sequencing, environmental control measures, timber retention strategies, structural timber repairs and managing concealed fungal contamination exposed during the enabling works.

The specialist contractor shall attend the site at appropriate stages during the contract to review exposed timber elements, advise on the extent of timber removal, direct sterilisation requirements and maintain records of treatment works undertaken.

The Contract Administrator may request evidence of relevant qualifications, previous project experience, professional memberships, references and examples of comparable projects prior to appointment.

The intention of this requirement is not to restrict competition but to ensure that the enabling works are undertaken by a contractor possessing the specialist expertise necessary to manage the fungal decay risks associated with the project and to minimise the risk of unnecessary removal of historic building fabric.

D21	GROUND GAS COLLECTION AND VENTING SYSTEMS
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To be read with preliminaries/General Specifications

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

D21/1 GENERAL SCOPE

(a) SCOPE OF WORK

- This contract includes partial provision only of the ground gas venting strategy.
- Works limited to:
 - Coordination and installation of roof-level vent terminations only, where indicated on Architect's drawings.
- The full ground gas collection and depressurisation system is to be installed as part of a future Construction Contract.

(b) COORDINATION

- Coordinate vent locations with:
 - Architectural drawings
 - Roof construction
 - M&E requirements
- Ensure positions allow for future connection to below-ground system.

D21/2 ROOF VENT PROVISION

(a) VENT LOCATIONS

- Provide vent terminations at roof level as indicated on Architect's drawings.

(b) INSTALLATION

- Install vents to:
 - Maintain roof weathertightness
 - Be compatible with roof build-up and finishes
- Provide appropriate flashings and weathering details.
- Manufacturer: Necoflex Limited or equivalent

(c) ALLOW FOR FUTURE CONNECTION

- Install vent terminations to allow for future connection to radon / ground gas system.
- Ensure routes are clearly identifiable and accessible where required.

D21/3 COMPLETION

(a) LIMITATION OF WORKS

- No subfloor gas collection system, sumps, pipework or mechanical systems are included in this contract.

(b) HANDOVER INFORMATION

- Record and provide:
 - Locations of all installed vent terminations
 - Any provisions made for future connection

F31	PRECAST CONCRETE SILLS/LINTELS/COPINGS/FEATURES
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To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

F31/1 TYPE(S) OF COMPONENT

- (a) CONCRETE U BLOCK LINTELS.
- Drawing reference(s): to SE details
 - Fine Textured sleeved U Block lintels in accordance with structural engineer's specification and to suit wall thickness construction.
 - Concrete grade and reinforcing: Not less than that specified by SE.
 - Finish: Fine textured finish, generally as specified under 'Fair faced components'. To match TYPE BS EN 1992-1-1:2004 + A1:2014 and approved by Architect
 - Work on surface: as per SE specification

F31/2 GENERAL REQUIREMENTS

- (a) MOULDS To Structural specification to be:
- Constructed accurately to give straight, square and true components. Permissible deviations on length +0, -6 mm, other dimensions ± 3 mm.
 - Constructed to prevent loss of grout.
 - Designed to permit demoulding without damage to the components.
 - Coated evenly with a suitable release agent, which must not be allowed to touch the reinforcement.
 - Maintained in clean, sound condition and inspected carefully for defects before each reuse. Damaged moulds must not be repaired and reused if this would impair the surface appearance of the components.
- (b) CONCRETE GENERALLY: Constituent materials, composition of mixes, production of concrete, information to be provided, sampling, testing and compliance to be in accordance with BS 8500-2, BS EN 2006-1 unless otherwise specified.
- Class of concrete: Exch SKPC: C1 0.40
 - Using SRPC: C1 0.20
 - Reinforced and heat cured; C1 0.10
 - Prestressed C1 0.10
 - Aolmixt Containing Calcium Chloride: Not Allowed
- (c) CHLORIDES: The total chloride ion content of the constituents of each mix, expressed as a percentage by weight of cement (including GGBS or PFA if used) in the mix, must not exceed 0.4. Do not use admixtures containing calcium chloride.
- (d) REINFORCEMENT:
- Type of reinforcement, unless otherwise specified: To BS 4449, BS 4482, cut and bent to BS 8666.
 - Galvanized reinforcement: Galvanized to BS EN ISO 1461 after cutting. Chromate treated.
 - Stainless steel reinforcement: To BS 6744.
 - In addition to reinforcement required for structural purposes, precast units must be reinforced as necessary to resist shrinkage and handling stresses.
 - Ensure that the metal of the reinforcement is compatible with the metal of any fixings and accessories that may make contact. At time of placing concrete, reinforcement to be clean and free of corrosive pitting, loose mill scale, loose rust, ice, oil and other substances which may adversely affect the reinforcement, concrete, or bond between the two.

- (e) CASTING AND CURING
 - Placement of concrete: Thoroughly compact.
 - Immature components: Avoid movement, vibration, overloading, physical shock, rapid cooling and thermal shock.
 - Protection from weather: Do not expose panels to direct sunlight and drying winds until at least five days after casting.
 - Delivery to site: Not until at least 14 days after casting.
 - Protection against drying out: methods and duration to BS EN 13369 clause 4.2.13

F31/3 FAIR FACED COMPONENTS

- (a) CONTROL SAMPLES
 - Required samples: Coving.
 - Approval of appearance: Obtain before manufacture of remaining units.
 - Identification and storage location: Clearly label and retain at factory for comparison with production units.
- (b) MIXES FOR VISIBLE FACED COMPONENTS
 - Constituent materials and mix design for each finish type: To remain constant.
 - Colour and appearance of each finish type: To remain constant.
 - Aggregates: To BS EN 12620 and consistent colour, free of deleterious materials that may cause popping and staining.
 - Origin: Single source for each finish type, having sufficient quantity for whole contract.
- (c) CONDITIONS FOR SEPARATE FACING AND BACKING MIXES
 - Difference in cement content: Not greater than 80 kg/m³.
 - Thickness effacing mix (minimum): 10 mm greater than nominal maximum aggregate size, and not less than 25 mm.
 - Location of reinforcement: Not less than 20 mm away from the interface between mixes.
 - Compaction effacing and backing mix: Carry out to create monolithic construction.
- (d) QUALITY OF FINISHES
 - Appearance standard: As established by samples.
 - Must match the approved samples and be consistent throughout the contract. Components having arises or faces which are broken, chipped, cracked, crazed, honeycombed, irregular, inconsistent, stained or otherwise marred such that their appearance or performance is significantly impaired will not be accepted. Note self-finish of exposed white sand and cement without applied paint finish.
- (e) COVER ON VISIBLE FACES
 - Spacers: Not permitted.
 - Proposed method statement: Submit.
- (f) CONSISTENCY OF PRODUCTION METHODS
 - Production methods: To remain consistent for each matching type of finish.
 - Finish appearance: within the range of variation indicated by the samples submitted.
 - Changes to production methods: if variations are proposed for components of the same finish, submit evidence that there will be no difference in appearance.

F31/4 INSTALLATION

- (a) LAYING
 - Bedding components: On full bed of lime based mortar.
 - Packing: If required use slate
 - Removal of marks, stains and extraneous mortar on visible faces: Rubbing not permitted.
 - Protection: protect all areas from damage and cover to prevent render or paint spillages. Note finish of exposed white sand and cement without painting.

G20 CARPENTRY/TIMBER FRAMING/FIRST FIXING
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To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

G20/1 GENERAL INFORMATION/REQUIREMENTS

- (a) **PROTOTYPE TESTS:** Approval will be given to contractor-designed structures that are not amenable to calculation in accordance with BS 5268:Part 2 provided that they comply with design requirements when tested to BS 5268:Part 2, Section 8.
- (b) **STRENGTH GRADING of timber:**
 - To be carried out by companies currently registered under a third party quality assurance scheme operated by any of the certification bodies approved by the UK Timber Grading Committee.
 - Timber of a basic thickness less than 100 mm and not specified for wet exposure to be strength graded at an average moisture content not exceeding 20% with no reading being in excess of 24% and clearly marked as 'DRY' or 'KD' (kiln dried).
 - Timber graded undried (green) and specified for wet exposure conditions to be clearly marked as 'WET' or 'CRN'.
 - Structural timber members cut from large graded sections to be regraded to approval and marked accordingly.

G20/2 TYPE(S) OF TIMBER

- (a) **GRADED SOFTWOOD FOR STRUCTURAL USE GENERALLY**
 - Strength graded to the appropriate standard or rules for the specified grade and so marked.
 - Species and origin: to be agreed Grade: To BS 4978 and BS EN 14081-1 or another national equivalent and SO marked.
 - Preservative treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C 8 Type/desired service life: 40 years
- (b) **UNGRADED SOFTWOOD FOR INTERNAL NON-STRUCTURAL USE - FRAMING TO DUCTS ETC.**
 - Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
 - Surface finish: sawn
 - Preservative treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C8
 - Type/desired service life: 40 years
- (c) **PLYWOOD FOR SUPPORT TO WINDOW HEAD AND SILL DETAILS – WBP**
 - Alternatively Medite Ecologique MDF (Zero Formaldehyde) may be used.
 - Manufactured to an approved national standard.
 - Thickness: 19 mm
 - Appearance class: to BS EN 635: 111
 - Bond quality: to BS EN 314:Part 2: 2
 - Finish: unsanded where concealed, sanded where not concealed
 - Preservative treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C8
 - Type and desired service life: 40 years

- (d) PLYWOOD FOR EXTERNAL / EXPOSED / HUMID CONDITIONS –
- To comply with Class 3 (Exterior Conditions) in accordance with EN 636-3

G20/3 WORKMANSHIP GENERALLY

- (a) CROSS SECTION DIMENSIONS OF STRUCTURAL SOFTWOOD AND POPLAR TIMBER:
- Dimensions on drawings are target sizes as defined in BS EN 336.
 - The tolerance indicators (T1) and (T2) specify the maximum permitted deviations from target sizes as stated in BS EN 336, clause 5.3:
 - Tolerance class 1 (T1) for sawn surfaces
 - Tolerance class 2 (T2) for planed surfaces.
- (b) CROSS SECTION DIMENSIONS OF NONSTRUCTURAL SOFTWOOD TIMBER:
- Dimensions on drawings are finished sizes.
 - Maximum permitted deviations from finished sizes to be as stated in BS EN 1313:Part1:
 - Clause 6 for sawn sections
 - Clause NA. 3 for further processed sections.
- (c) CROSS SECTION DIMENSIONS OF STRUCTURAL & NONSTRUCTURAL HARDWOOD TIMBER
- Dimensions on drawings are finished sizes.
 - Maximum permitted deviations from finished sizes to be as stated in BS 5450:
 - Clause 6.1 for sawn sections.
 - Clause 8.3 for further processed sections.
- (d) WARPING OF TIMBER:
- The amount of bow, spring, twist and cup in a piece of timber of specified grade must not exceed the limits set down in BS 4978 or BS EN 519 for softwood, or BS 5756 for hardwood.
- (e) SELECTION, AND USE OF TIMBER
- Do not use timber members which are damaged, crushed or split beyond the limits permitted by their grading.
 - Ensure that notches and holes are not so positioned in relation to knots or other defects that the strength of members will be reduced.
 - Do not use scarf joints, finger joints or splice plates without approval.
- (f) PROCESSING TREATED TIMBER:
- Carry out as much cutting and machining as possible before treatment.
 - Retreat all treated timber which is sawn along the length, ploughed, thickened, planed or otherwise extensively processed.
 - Treat timber surfaces exposed by minor cutting and drilling with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.
- (g) MOISTURE CONTENT of timber at time of erection to be not more than:
- Covered in generally unheated spaces: 24%
 - Covered in generally heated spaces: 20%
 - Internal in continuously heated spaces: 20%
 - When instructed by Architect, test timber sections with an approved electrical moisture meter used in accordance with manufacturer's recommendations. Test 5% but not less than 10 lengths of each cross-section in the centre of the length. 90% of values obtained to be within the specified range. Provide Architect with records of all tests.
- (h) PROTECTION:
- Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing. Store timber and components under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack.
 - Arrange sequence of construction and cover timber as necessary during and after erection to ensure that specified moisture content is not exceeded.
 - Keep trussed rafters vertical during handling and storage.

- Store and handle on site in accordance with manufacturer's directions and with Truss Plate Association technical bulletin sheets No 2 and No 3.
- (i) SEAL exposed end grain of the following with an extra coat of primer before delivery to site.
- (j) PAINTED FINISHES: Structural timber which is to be painted to be primed as specified before delivery to site.
- (k) CLEAR FINISHES: Structural timber which is to be clear finished to be kept clean and first coat of specified finish applied before delivery to site.
- (l) EXPOSED TIMBER: Prevent damage to and marking of surfaces and arrises of planed structural timber which will be exposed to view in completed work.

G20/4 JOINTING TIMBER

- (a) JOINTING/FIXING GENERALLY: Where not specified otherwise, select fixing and jointing methods and types, sizes and spacings of fasteners in compliance with section Z20. Fasteners to comply with relevant British Standards.

G20/5 ERECTION AND INSTALLATION

- (a) PRE-ERECTION CHECKING:
 - Not less than 10 days before proposed start date, check foundations and other structures to which timber structure will be attached for accuracy of setting out, and holding down bolts for position, protruding length, condition and slackness.
 - Report any inaccuracies and defects to Main Contractor and Architect without delay.
 - Obtain permission of Architect to commence erection.
- (b) MODIFICATIONS/REPAIRS:
 - Inform Architect of any defects due to detailing or fabrication errors. Obtain approval of proposed methods of rectification before starting modification or remedial work.
 - Timber members/components may be rejected if, in the opinion of the Architect, the nature and/or number of defects would result in an excessive amount of site repair.
- (c) TEMPORARY BRACING: Provide as necessary to maintain structural timber components in position and to ensure complete stability during construction.
- (d) ADDITIONAL SUPPORTS:
 - Where not shown on drawings, position and fix additional studs, noggings or battens for appliances, fixtures, edges of sheets, etc., in accordance with manufacturers' recommendations.
 - All additional studs, noggings or battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.
- (e) BEARINGS:
 - Timber surfaces which are to transmit loads to be finished to ensure close contact over the whole of the designed bearing area.
 - Packings, where necessary, to cover the whole of the designed bearing area, to have a crushing strength not less than the timber being supported and, in external locations, to be rot and corrosion proof.
- (f) WALL PLATES: Ensure that wall plates are:
 - Positioned and aligned to give the correct span and level for trusses, joists, etc.
 - Fully bedded in fresh mortar.
 - In lengths of not less than 3 m with half lap joints.
- (g) INSPECTION:
 - Give Architect reasonable opportunity to inspect structural timberwork before covering up.
 - Inspect all accessible bolts at the end of the Defects Liability Period and tighten if necessary.

H62	NATURAL SLATING
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To be read with Preliminaries/General conditions.

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Types of slating

Re use existing slates where possible.

Roof slating

- Description: Natural slate roof covering to pitched roof
- Substrate: rafters at centres and size to match existing (See structural engineers report)
- Pitch: existing to be confirmed. See surveys for approximate reference.
- Underlay: Reinforced windtight breathable roofing membrane for pitched roofs. Pro Clima Solitex Plus, Tyvek Supro or equivalent.
 - Recycled content: None permitted 0% (minimum) to BS EN ISO 14021
 - Direction: Parallel to eaves.
- Battens
 - Size: 50 x 25 mm
 - Fixing: 65 x 3.35 mm galvanized round plain shank nails

Slates

- Supplier: Bangor Blue slates 10mm or equivalent
- Product reference: to match existing natural slate
- Type: to match existing natural slate
- Fixing: Two nails each slate.
- Accessories: None

New Ridge Tiles Type 1: Plain Angle ridge tiles

- Supplier: Bangor Blue Angle Ridge or equivalent
- Product reference: to match existing ridge tiles
- Type: to match existing

New Ridge Tiles Type 2: Roll top angled ridge tiles

- Supplier: Contractor's choice
- Product reference: To match existing roll top angled ridge tiles
- Type: to match existing. See new roof to chapel choir for reference (roof 1b).

Existing Decorative Ridge tiles

- Existing decorative ridge tiles, clean off, and reinstate where possible
- Replacement decorative where required, to match existing

Slating generally:

Basic workmanship

- General: Fix slating and accessories to make the whole sound and weathertight at earliest opportunity.
- Setting out: To true lines and regular appearance, with neat fit at edges, junctions and features.
- Fixings for slating accessories: As recommended by manufacturer.
- Gutters and pipes: Keep free of debris. Clean out at completion.

Removing existing slating

- General: Carefully remove slates, battens, underlay, etc. with minimum disturbance of adjacent retained slating.

- Undamaged slates: Set aside for reuse by Contractor

Counter battens on rigid sarking

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

Batten fixing

- Setting out: Align parallel to ridge in straight horizontal lines to gauge of slates. Align on adjacent areas.
- Batten length (minimum): Sufficient to span over three supports.
- Joints in length: Square cut. Butt centrally on supports. Joints must not occur more than once in any group of four battens on one support.
- Additional battens: Provide where unsupported laps in underlay occur between battens.
- Fixing: Each batten to each support. Splay fix at joints in length.

Slate fixing

- Setting out: Lay slates with an even overall appearance with slightly open (maximum 5 mm) butt joints. Align tails.
- Slate thickness: Consistent in any one course. Lay with thicker end as tail.
- Ends of courses: Use extra wide slates to maintain bond and to ensure that cut slates are as large as possible. Do not use slates less than 150 mm wide.
- Top course: Head-nail short course to maintain gauge.
- Fixing: Centre nail each slate twice through countersunk holes 20-25 mm from side edges.
- Nail dimensions: Determine in accordance with BS 5534 to suit site exposure, withdrawal resistance and slate supplier's recommendations.

Slates – performance specification

- Standards
 - Product specification: To BS EN 12326-1.
 - Methods of test: To BS EN 12326-2.
- Slate type: Normal
 - Dimensional tolerances
 - Deviations from declared length, width, edge straightness, rectangularity, and flatness are not to exceed values specified in BS EN 12326-1, clause 5.12.
- Thickness
 - Nominal thickness and individual thickness variation: To BS EN 12326-1, clause 5.2.

Roof slating edges/ junctions/ features

Generally

- Fittings and accessories: As recommended by slate supplier, do not improvise.
- Exposed fittings and accessories: To match slate colour and finish.
- Cut slates: Cut only where necessary, to give straight, clean edges.
- Flashings: Fix with or immediately after slating. Form neatly.

Accessories:

- Ventilated Flue Caps to be installed to all existing chimney flues, for use where flues are no longer in use to prevent ingress of rainwater, entry of vermin (birds) while allowing adequate ventilation of the flue.
 - Available in Buff and Terracotta colour. Samples to be provided for approval and colour to be confirmed
 - Available in 2 sizes – 300mm (standard flue pot) and 350mm (older flue pot)
 - Available from Damprite Ltd or equivalent.

H62/86 VENTILATOR SLATES

(a) GLIDEVALE PROTECT UNIVERSAL IN-LINE SLATE VENTILATORS

Glidevale In-line Slate ventilators are designed to provide high/low level roof space ventilation and also act as extract terminals for mechanical systems or soil vent pipes.

- Manufactured from polypropylene and ABS for a consistently high quality finish and long lasting construction.
- Available in blue and black: Profile and colour to be matched to the roof covering.
- Select ventilators to be installed with Glidevale Underlay Opening Protectors where provided.
- Glidevale In-line slate and tile ventilators to provide 10,000mm² ventilation area, Install at required centres as per Building Regulations Approved Document C2 and BS 5250 and in accordance with manufacturer's instructions.
- Designed and developed under BS-EN ISO 9001.
- Integral 4mm insect screen.
- Soil vent pipe stacks/mechanical extract ducts to be terminated at the roof slope by means of Glidevale In-Line Slate/Tile Ventilators with all joints and connections to be airtight in accordance with Building Regulations Approved Document H. All ducting/pipes in the roof space to be insulated and all joints made airtight.
- Mechanically fix as per manufacturers fixing instructions.
- Accessories: Soil Universal Pipe Adaptor with 100mm diameter spigot. Flexi Pipe 100mm diameter (for soil vent or extract terminal). Underlay Opening Protector.
- Manufacturer: Glidevale, a division of Building Product Design, 2 Brooklands Road, Sale, Cheshire, M33 3SS, Great Britain. Tel: +44 (0)161 905 5700, Fax: +44 (0)161 905 2085. E-mail: info@glidevale.com

H71 LEAD SHEET COVERINGS/FLASHINGS

To be read with preliminaries/general conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

Note: lead details and locations to match existing to maintain the historic location of the roofs as the buildings are protected structures.

H71/1 TYPES OF LEADWORK

- **GUTTER LINING**
 - Substrate: Plywood on timber framing.
 - Preparation: not required.
 - Underlay: 220 g/m² needle punched geotextile.
 - Type of lead: contractors choice.
 - Thickness: code 5.
 - Pretreatment: patinate.
 - Joints in direction of fall: contractors choice.
 - Spacing: on centre line of gutter.
 - Cross joints: drips with splashlaps.
 - Spacing: contractors choice.
 - Outlets: chute outlet through wall to hopper head.
- **APRON FLASHINGS, all abutment situations**
 - Lead:
 - Thickness: code 5.
 - Dimensions:
 - Lengths: Not more than 1500mm.
 - End to end joints: Laps of not less than 100 mm.
 - Upstand: Not less than 75 mm.
 - Cover to abutment: Not less than 400mm.
 - Fixing: contractors choice.
- **SOAKERS AND STEP FLASHINGS, at lean to and side abutments**
 - Lead soakers:
 - Thickness: code 4.
 - Dimensions:
 - Length: Slate/ tile gauge + lap+ 25 mm.
 - Upstand: Not less than 75 mm.
 - Underlap: Not less than 100 mm.
 - Fixing: By roofer.
 - Lead step flashings:
 - Thickness: code 4.
 - Dimensions:
 - Lengths: Not more than 1500mm.
 - End to end joints: Laps of not less than 100 mm.
 - Cover: Overlap to soaker upstands of not less than 65 mm.
 - Fixing: Lead wedges at every course.
- **FLASHINGS, Generally**
 - Lead:
 - Thickness: code 5.
 - Dimensions:
 - Lengths: Not more than 1500mm.
 - Fixing: contractors choice.

H71/2 GENERAL REQUIREMENTS/ PREPARATORY WORK

- (a) WORKMANSHIP GENERALLY
 - Standard: To BS 6915 and latest edition of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Association.
 - Fabrication and fixing: To provide a secure, free draining and completely weathertight installation.
 - Operatives: Trained in the application of lead coverings/ flashings. Submit records of experience on request.
 - Pre-forming: Measure, mark, cut and form lead prior to assembly wherever possible.
 - Marking out: With pencil, chalk or crayon. Do not use scribes or other sharp instruments without approval.
 - Bossing and forming: Straight and regular bends, leaving sheets free from ripples, kinks, buckling and cracks.
 - Solder: Use only where specified.
 - Sharp metal edges: Fold under or remove as work proceeds.
 - Finished work: Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
 - Protection: Prevent staining, discolouration and damage by subsequent works.
- (b) LEADWELDING
 - In situ lead welding: Not permitted.
- (c) LEAD SHEET
 - Production method:
 - Rolled, to BS EN 12588, or Machine cast, Agrément certified and to code thicknesses with a tolerance (by weight) of $\pm 5\%$, or
 - Sand cast, from lead free from bitumen, solder, other impurities, inclusions, laminations, cracks, air, pinholes and blowholes; to code thicknesses but with a tolerance (by weight) of $\pm 10\%$.
 - Identification: Labelled to show thickness/ code, weight and type.
- (d) SUITABILITY OF SUBSTRATES
 - Condition: Dry and free of dust, debris, grease and other deleterious matter.
- (e) TIMBER FOR USE WITH LEADWORK
 - Quality: Planed, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
 - Moisture content: Not more than 22% at time of fixing and covering. Give notice if greater than 16%.
 - Preservative treatment: Organic solvent as section Z12 and Wood Protection Association Commodity Specification C8.
- (f) UNDERLAY
 - Manufacturer: Pro Clima Solitex Plus or equivalent
 - Product reference: n/a.
 - Handling: Prevent tears and punctures.
 - Laying: Butt or overlap jointed onto a dry substrate.
 - Fixing edges: With copper or stainless steel staples or clout nails.
 - Do not lay over roof edges but do turn up at abutments.
 - Wood core rolls: Fixed over underlay.
 - Protection: Keep dry and cover with lead at the earliest opportunity.

H71/3 FIXING LEAD

- (a) HEAD FIXING LEAD SHEET
 - Top edge: Secured with two rows of fixings, 25 mm and 50 mm from top edge of sheet, at 75 mm centres in each row, evenly spaced and staggered.
 - Sheets less than 500 mm deep: May be secured with one row of fixings, 25 mm from top edge of sheet and evenly spaced at 50 mm centres.

- (b) **FIXINGS**
- Nails to timber substrates: Copper clout nails to BS 1202-2, or stainless steel (austenitic) clout nails to BS 1202-1.
 - Shank type: Annular ringed, helical threaded or serrated.
 - Shank diameter: Not less than 2.65 mm for light duty or 3.35 mm for heavy duty.
 - Length: Not less than 20 mm or equal to substrate thickness.
 - Screws to concrete or masonry substrates: Brass or stainless steel to BS 1210, tables 3 or 4.
 - Diameter: Not less than 3.35 mm.
 - Length: Not less than 19 mm.
 - Washers and plastic plugs: Compatible with screws and lead.
 - Screws to composite metal decks: Self tapping as recommended by the deck and lead manufacturer/ supplier for clips.
- (c) **WEDGE FIXING INTO DAMP PROOF COURSE JOINTS**
- Joint: Rake/ cut out under damp proof course to a depth of not less than 25 mm.
 - Lead: Dress lead into joint.
 - Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
 - Sealant: to approval.
 - Application: As section Z22.

H71/4 JOINTING LEAD

- (a) **FORMING DETAILS**
- Method: Bossing or leadwelding except where bossing is specifically required.
 - Leadwelded seams: Neatly and consistently formed.
 - Seams: Do not undercut or reduce sheet thickness.
 - Filler strips: Of the same composition as the sheets being joined.
 - Butt joints: Formed to a thickness one third more than the sheets being joined.
 - Lap joints: Formed with 25 mm laps and two loadings to the edge of the overlap.
 - Bossing: Carried out without thinning, cutting or otherwise splitting the lead sheet.
 - Details where bossing must be used: as directed.
- (b) **WOOD CORED ROLL JOINTS WITHOUT SPLASH LAP**
- Wood core:
 - Size: 45 x 45 mm round tapering to a flat base 25 mm wide.
 - Fixing to substrate: Brass or stainless steel countersunk screws at not more than 300 mm centres.
 - Undercloak: Dress half way around core.
 - Copper or stainless steel clips: Fix to core at not more than 450 mm centres. Do not restrict thermal movement of the undercloak.
 - Overcloak: Dress around core with edge welted around ends of clips, finishing 5 mm clear of main surface.
- (c) **WOOD CORED ROLL JOINTS WITH SPLASH LAP**
- Wood core:
 - Size: 45 x 45 mm round tapering to a flat base 25 mm wide.
 - Fixing to substrate: Brass or stainless steel countersunk screws at not more than 300 mm centres.
 - Undercloak: Dress three quarters around core.
 - Fixing: Nail to core at 150 mm centres for one third length of the sheet starting from the head.
 - Overcloak: Dress around core and extend on to main surface to form a 40 mm splash lap
- (d) **DRIPS WITH SPLASH LAPS**
- Underlap: Dress into rebate along top edge of drip.
 - Fixing: One row of nails at 50 mm centres on centre line of rebate.
 - Overlap: Dress over drip and form a 40 mm splash lap.

(e) PATINATION OIL

- Manufacturer: contractor's choice.
- Product reference: n/a.
- Location: all exposed areas.
- Application: As soon as practical, apply a smear coating to lead, evenly in one direction and in dry conditions.

J41	REINFORCED BITUMEN MEMBRANE ROOF COVERINGS
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To be read with Preliminaries/ General conditions:

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

LOCATION: FLAT ROOFS – Buildings 1d, 2c & 2d. See drawing WD-EW2-103 Roof Plan

SYSTEM: BauderFLEX

Applicable Structural decks: New Plywood / OSB/3 deck

Roof construction: Warm Roof

DESCRIPTION OF WORKS

Section J41 deals with the installation of the Bauder Waterproofing System, comprising coverings of multiple layers of reinforced bituminous membranes laid and joined using self-adhesive and/or torch application as required. It includes where required, the air and vapour control layer, thermal insulation, underlayer and capping sheet membranes (root resistant for green roof systems) and presumes the deck substrate and roof falls as stated within the specification below. Accessories are included where relevant.

It is intended for use on projects where the detailed design is completed by the specifier (architect or landscape architect) with technical assistance from the manufacturer as required and should be read in conjunction with any project specific drawings provided.

Fire Regulations (Fire Safety: Approved Document B 2019) - Compartmentation

Approved Document B Vol 1: Dwellings Section 5 Internal Fire Spread covers Compartmentation (Compartmentation is covered in Section 8 of Vol 2: Buildings other than dwellings and for Scotland, Wales and NI similar consideration is necessary for both Dwellings and Buildings other than Dwellings) and there is a consideration to be made if the roof goes over a compartment wall. For New Build we will expect the Principal Designer to establish Building Control requirements and notify accordingly before construction. For Refurbishment it is not always easy for the roofing team to establish if there is a compartment wall under the roof and what is its full orientation, we will rely on the specifier or client to tell Bauder Ltd if there is a known compartment wall under the existing roof. As the requirements have proven to be open to various interpretations across Building Control authorities, the Bauder advice is to consult with the Building Control officer for the building.

'Safe2Torch' advice:

The application of torch-on materials to or in the vicinity of combustible deck materials does not conform to the recommendations of BS8217:2005, clause 7.3.2.1, paragraph 3, or the advice given in the 'Safe2Torch' document produced by the National Federation of Roofing Contractors. When encountering an area which contains combustible material a minimum 900mm deep zone of the flat area around the material and any detail flashing to the material itself there is a requirement for 'FLAME-FREE' detailing. In these instances an appropriate alternative Bauder self-adhesive membrane should be used as described in: 'FLAME-FREE' & 'Safe to Torch' DETAILING - ALTERNATIVE MEMBRANES AND APPLICATION. The 'FLAME-FREE' & 'SAFE TO TORCH' detailing and method of application will be described in the Additional Items section and the 'FLAME-FREE' & 'SAFE TO TORCH' DETAILING section of this specification and further detailed in the Bauder 'FLAME-FREE' & 'Safe to Torch' drawings.

Please note, there could be 'FLAME-FREE' areas within the roof area(s), however there are either no roof plans available or the design is not sufficiently complete at this stage in the project to enable Bauder to complete a 'FLAME-FREE' roof plan. Once this plan becomes available and the design is sufficiently complete, please contact the Bauder Area Technical Manager (details at the end of the specification) and this can then be created for this area.

SCOPE OF WORKS

This section includes:

- The Bauder waterproofing system.
- Related Bauder system accessories
- Thermal insulation that meets the required U Value.
- Internal/parapet rainwater outlets (but not the connected drainage/plumbing goods)

This section does not include:

- Construction of the structural deck.
- Proprietary rainwater drainage / plumbing – refer NBS section R10
- Lightning protection – refer NBS Engineering Services, Section W60.
- Latchways Constant Force Post System – refer NBS Section N25.
- Stairs/Ladders/Handrails/Balustrades – See NBS Section L30

Requirements:

1. The guarantee requirements are for a 20 year “Insurance Supported Company Guarantee” beginning on the date of final inspection by manufacturer of the roofing works.
2. The guarantee is to cover the cost of remedial work including materials and labour as a result of water penetration due to faulty workmanship or faulty manufacture of the products specified.
3. In the event of the Approved Installer (sub-contractor) insolvency occurring during the duration of the guarantee the responsibility for the workmanship of the waterproofing installation is to be borne by the waterproofing system manufacturer for the remainder of the guarantee period at no additional cost to the client.
4. That there is no excess on the claims.
5. Guarantee evidence and all associated terms and conditions must be provided for assessment to assure the architect/engineer that the guarantee being offered will be honoured in undiluted form for the duration of the guarantee.
6. The guarantee provided by the single source supplier relates to the entire system as a single entity including the waterproofing membranes, insulation, and the workmanship in installing all of the above. This is required to eliminate split liability on this project. Individual product guarantees combined with a Roofing Contractor guarantee on workmanship will not be accepted.
7. In the event of a change of ownership the guarantee is deemed transferable without cost implication
8. The guarantee must allow for normal cleaning maintenance of the roof.
9. To demonstrate quality, service life and best value, the proposed waterproofing system is required to have a statement of durability stating **life expectancy more than 30 years** from a recognised independent source e.g. BBA certification.
10. Roof Waterproofing System specification, membrane and insulation data sheets, along with a guarantee sample copy including all terms and conditions of proposed system to be submitted with the tender submission.

J41 REINFORCED BITUMEN MEMBRANE ROOF COVERINGS

To be read with Preliminaries/ General Conditions.

TYPES OF COVERING

110A BUILT-UP REINFORCED BITUMEN MEMBRANE WARM DECK ROOF COVERING

- **Roof area:** Roof 1d -16.5m²/ Roof 2c - 21.3m²/ Roof 2d - 15.6m²
- **Substrate:** New Plywood / OSB/3 deck.
 - For the purpose of the tapered insulation scheme design, the roof deck is assumed to be level.
 - Roof falls to be provided by the tapered insulation scheme.

- The design should take account of construction tolerances, permitted deviations and deflections under load, as per Item 4.4 of BS6229:2018.
 - No deflections or back-falls.
 - Preparation: As clause 610A.
- **Primer:** Bauder Activator-Primer (Canister), APR01-Black, applied to the roof substrate and all upstands and skirtings. For application method and guidance information, refer clause 660B.
- Air & vapour control layer:** BauderTEC KSD, 2.5mm thick aluminium lined, elastomeric bitumen self-adhesive air and vapour control layer.
- **Thickness:** Minimum 2.5mm thick
 - **Reinforcement:** Aluminium foil and 200g/m² glass fleece
 - **Bitumen coating:** SBS elastomeric bitumen
 - **Tensile strength:** (EN 12311-1) Length $\geq 1000\text{N}/50\text{mm}$, diagonal $\geq 1000\text{N}/50\text{mm}$.
 - **Cold bend resistance:** (EN 1109) -25°C
 - **Water vapour transmission:** (EN 1931) $\geq 1500\text{m}$
Heat stability: (EN 1110) +70°C
Installation as clauses 670G, 710.
- **Insulation:** Bauder Thermotech MG tapered (Unilin TR/MG supplied by Bauder), mineral glass faced, highly efficient rigid urethane insulation average depth to achieve the required average U value (refer Clause 230). This product has a zero ODP and a Green guide rating of 'A'. BauderPIR T KL 50 angle fillets 50 mm x 50 mm for use with insulated & un-insulated upstands. Installation as clauses 680D and 775
 - **Insulating vertical upstands:** Bauder Thermotech MG Flatboard (Unilin FR/MG supplied by Bauder), mineral glass faced, zero ODP, highly efficient rigid urethane insulation.
The vertical upstand(s) should be insulated, typically an external wall to a conditioned/habited space will be insulated in its own right e.g. a cavity wall, but there is still a requirement for a nominal 50mm thickness of insulation on the external face of the wall to reduce thermal bridging at the roof/wall intersection.
This insulation will be a minimum of 300mm in height from the deck surface to the top of the upstand and will ideally be fitted before the flat insulation so that it is retained at the base. Bauder Insulated Upstand Support Brackets should be installed to secure the top and provide a hard-leading edge.
- **Waterproof covering:** BAUDERFLEX GREEN SYSTEM
- **System manufacturer:** Bauder Limited, 70, Landseer Road, Ipswich, Suffolk, IP3 0DH.
Tel: 01473 257 671. **Fax:** 01473 230 761. **Email:** technical@bauder.co.uk
Web: www.bauder.co.uk **Technical Contact Details - Area Technical Manager:** Alan Scanlan,
M: 087 3933955, **E:** a.scanlan@bauder.ie
- **Primer:** Bauder Activator-Primer (Canister), APR01-Black, applied to the upper surface of the Bauder insulation. For application method and guidance information, refer clause 660B.
 - **Underlayer:** BauderTEC Sprint DUO, 2 mm thick, 200g/m² glass-fibre reinforced, elastomeric self-adhesive bitumen underlayer.
Attachment: As clauses 710, 747A.
 - **Top layer / Cap sheet:** BauderPLANT E 42, 4.2mm thick, 250g/m² polyester reinforced, elastomeric bitumen root resistant, torch applied capping sheet, green slate finish.
Attachment: As clauses 710, 715A, 750B.
 - **Flashings and detail work:** BauderFLEX K4E capping sheet, Charcoal Grey mineral slate.
Install as clauses 773, 775 & 777.
- **Surface protection:** N/A
 - **Surfacing:** Extensive green roof landscaping – N/A
- **Accessories:**
 - Bauder **Bitumen Vertical Refurbishment Outlet DN 70, DN 95 or DN 145 leaf guard** complete with pre-attached bitumen connection flange and dome grating. To be supplied and installed – quantity as required. Installation as clause 784C 784I.

- **Bauder GRP edge trim** (where required) to all perimeter kerbs – Profile: Client to confirm / Type 1 (44mm) / Type 2 (44mm) / Type 3 (70mm) / Type 4 (100mm) / Type 6 (150mm). Colour: Client to confirm / Black / Grey. Installation, as clause 785.
- **Bauder Lightning Conductor Clips** (where required) – Type 4 for PVC coated tapes and uncoated tapes. Installation, as clause 786.

- **Additional Requirements:** 210, 230, 515, 520, 560, 561, 562, 910, 940.
- **Guarantee information:** Refer clause 950C.

PERFORMANCE

210 ROOF PERFORMANCE

- **General:** Secure, free draining and weather tight.

230 INSULATION

- **Thermal transmittance of roof (maximum)** 0.15W/m²K
- U-Values quoted are based on the Bauder waterproofing system build up including insulation and underlying deck material only. This does not include the supporting structure and/or any other materials within the construction below the deck, unless Bauder has been advised otherwise prior to producing the calculations. Refer to the project specific U-Value Calculation for additional information.
- **Finished Surface:** Suitably even, stable and robust to receive roof covering.
- **Insulation compliance:** To relevant British Standard or Agrément certified.

PRODUCTS

330 TIMBER TRIMS, ETC

- **Quality: Planed.** Free from wane, pitch pockets, decay and insect attack (except ambrosia beetle damage).
- **Moisture content at time of covering (maximum):** 22%.
- **Preservative treatment:** Contract Administrator to advise. Please note organic solvent-based timber preservatives are not permitted, as may affect the waterproofing.

331 PREFORMED METAL HARD EDGE INSULATION PROTECTION ANGLES

- **Material:** Once bent (L-shaped) Galvanised mild steel
- **Thickness:** 1.6mm
- **Dimensions:**
 - BauderPIR: 50mm x 50mm
 - BauderROCK / BauderGLAS: 75mm x 75mm
- **Length:** 3 m max.

EXECUTION GENERALLY

515 ADVERSE WEATHER

- **General:** Do not lay coverings in high winds, wet or damp conditions or in extremes of temperature unless effective temporary cover is provided over working area.
- **Unfinished areas of roof:** Keep dry, protect edges of laid membrane from wind action.

520 INCOMPLETE WORK

- **End of working day:** Provide temporary seal to prevent water infiltration.
- **On resumption of work:** Cut away tail of membrane from completed area and remove from roof.

522 PROTECTION AND STORAGE OF MATERIALS

- Store the materials in clean, dry, well-ventilated and cool conditions. Where there are storage containers on site, these may be suitable for storing products.
- The products must not be exposed to a direct naked flame or other ignition sources, or to solvents or other chemicals.
- Store materials designated as temperature sensitive in facilities where temperatures can be maintained at recommended levels.
- Insulation products must be kept dry and protected from wet weather during storage and installation.

- Ensure the product(s) are clear of buildings and any other storage areas.
- Refer to specific Bauder product Technical Datasheet for further information.

560 GENERAL WORKMANSHIP REQUIREMENTS

- Installation of the Bauder waterproofing system may only be carried out by trained and certified operatives approved by Bauder Ltd and who carry current ID badges. These should be available for inspection at all times.
- Workmanship must comply with Codes of Practice BS 8217:2005 (or alternatively Bauder Ltd.'s specification where otherwise stated). Non-compliant workmanship will not be permitted, even if the system is watertight. The client will be told that all such faults must be remedied, before the Guarantee is issued.
- All waterproofing materials and system components must be supplied by Bauder Ltd, unless otherwise stated. Any sub-standard materials or un-authorised alternatives will be rejected. Any building work which is the responsibility of the roofing contractor and has a bearing on the life of the Bauder System must be carried out by properly trained and qualified tradesmen.
- Any structural damage, peculiarities or details discovered that might affect the performance of the Bauder system, should be reported immediately to the client's representative and Bauder Limited in order that they may assist in overcoming the problem.
- At the end of each working day, the new waterproofing should be terminated with a secure and waterproof temporary seal, which will be left in situ, utilising **Bauder** self-adhesive underlayer material (e.g. **BauderTEC Sprint DUO**) to create the seal. The **Bauder** self-adhesive underlayer should be extended onto the flat AVCL by a minimum of 200mm from the exposed edge of the insulation and heat activate to ensure a satisfactory seal.
- To ensure that no moisture contamination of the system can occur between each working period, it is essential that the night seal is properly and securely bonded.
- Where building works are to be carried out by other trades, following completion of the waterproofing, the contractor must make adequate provision for supplying protection to prevent damage to the new membranes. The final inspection will not be carried out by the Bauder Site Technician or the Bauder nominated Independent surveyor until all associated trades are complete and the roof areas are clear from all debris and protection layers.
- It is imperative that the Bauder Approved Contractor conforms to the workmanship criteria as listed above. Any deviation will result in the contract being considered unguaranteeable.
- All mechanical and electrical work to plant and equipment should be carried out by competent mechanical and electrical qualified tradesmen. All plant is to be reinstated and re-commissioned on completion of the roofing works in accordance with the client's detailed specification.
- Where building works are to be carried out by other trades, following completion of the waterproofing, the contractor must make adequate provision for supplying protection to prevent damage to the new waterproofing.
- If any items of plant/equipment are to be situated on the finished roof, a sacrificial layer of Bauder capping sheet is to be loose laid beneath. This is to extend a minimum of 25mm past the point of contact on all sides. In the case of heavy items, it may be necessary to introduce a load-spreading slab, please contact Bauder for further advice.
- All lead work to be carried out by skilled tradesmen and in accordance with current codes of practice and the recommendations of the Lead Contractor Association.

561 SITE INSPECTIONS

- Bauder Site Technicians will carry out regular inspections of the project during the course of the works.
- Bauder must be notified when the roof is ready for final inspection and all related works and snagging complete. See also clause 910.

562 HEALTH & SAFETY INFORMATION – ROOFING WORK

1. Follow the advice shown in the "Responsible Specification Checklist" produced by the National Federation of Roofing Contractors.
2. Suitable precautions must be taken to prevent accidents occurring when roofing systems are being installed.
3. The contractor must ensure that adequate measures are taken to effectively prevent injury to members of the public, contractors and any other persons who may be affected by the works including the public.

4. Where microwave equipment is installed at roof level, care must be taken to prevent persons working on the roof from being exposed to large doses of microwave radiation.
5. Similarly, the contractor should liaise with the client to ensure that there are no extract outlets situated on the roof where noxious or harmful emissions could affect persons working. Suitable precautions will be necessary to prevent exposure where this situation arises.
6. The contractor is responsible for providing adequate firefighting equipment in the form of extinguishers during work on the roof. These should be kept in easily accessible locations and be suitably signed.
7. Whenever possible, access to the roof should be made via internal staircases rather than by temporary means. Where this is not available, it is the responsibility of the contractor to ensure a safe means of access, egress and a safe workplace.
As far as roofs are concerned, edge protection in the form of scaffolding or a fixed structure should be in place to a height of 1.1 metres in accordance with the Workplace (Health, Safety and Welfare) Regulations 1992.
Failing this, the hierarchy of controls should be applied from the Work at Height Regulations 2005. Means of access should be by fixed ladder, passenger hoist or scaffolding.
8. The contractor must ensure that suitable written method statements and risk assessments are available for the work being undertaken. In particular, it is essential that manual handling methods be fully assessed as roofing materials are heavy and can cause serious injury.
9. The contractor must ensure that suitable information about the roof covering is provided to the Client at the end of the work to ensure that work in future can be carried out safely. This information will form part of the Safety File.
10. All persons working on the roof should be provided with, and wear, suitable personal protective equipment and wet weather gear. Training must be provided to all contract staff on the safe use of the equipment.
11. The installer must observe Product Safety Datasheets, relevant to the materials being used as well as completing and complying with COSHH risk assessments.
12. We draw your attention to your duties under the Construction (Design and Management) Regulations 2015. Regulation 4, Client's duties in relation to managing projects states that the client must make suitable arrangements for managing a project, including the allocation of sufficient time and other resources.
13. Regulation 5, Appointment of the Principal Designer and the Principal Contractor states that where more than one contractor will be working on a project at any time, the client must appoint a Principal Designer and a Principal Contractor.

Please note that although Bauder will assist with the roof waterproofing system design, we will not undertake the role of Principal Designer (PD).

Similarly for the Building Safety Act 2022 and the BRAE Regulations the Client has duties which include the appointment of a Principal Designer and/or a Principal Contractor. Bauder recognises its duties as a Designer under the CDM Regulations and the Building Safety Act.

With our skills, knowledge and experience we can help to ensure that the roof design is compliant with the Building Regulations, however we do not have overall responsibility for the planning, management and monitoring of the design work during the design phase. We are not obligated to co-ordinate all matters relating to the design work which are not directly related to the flat roof system specification. Bauder are not in a position where we can take all reasonable steps to ensure compliance with the building regulations for aspects of the building works outside of the flat roofing system design or overall responsibility for co-ordination of such.

14. It is always the responsibility of the contractor to carry out a risk assessment on all aspects of the contract. The 'Safe2Torch' checklist is solely for guidance for the safe installation of torch-on reinforced bitumen membranes and use of gas torches in the workplace.

SUBSTRATES / AIR & VAPOUR CONTROL LAYERS / WARM ROOF INSULATION

610A SUITABILITY OF SUBSTRATE

- **Substrates Generally:**
 - Secure and properly fastened to the sub-structure, clean, dry, smooth, free from frost, corrosion, contaminants, loose material, damage and protrusions.
 - Compatible with waterproofing / coating system.
- **Substrate Design:**
 - Plywood should conform to BS EN 636-3 S (Structural) Condition of Use Service Class 3 (Exterior), minimum 18mm thickness as specified by client.
 - OSB/3 should conform to BS EN 300 & CPD/CE, minimum 18mm thickness as specified by client.
- **Setting out:** The new deck, should be fixed directly to either the joists or firings using non corroding ring shank nails/recommended screw fasteners.
 - All board edges should be fully supported by either the joists, firings or noggins.
 - Board joints to be close butted and staggered in accordance with BS 8217. Expansion gaps between boards on long and short edges to be 3mm.
- **Fasteners:**
 - Type: As recommended by panel manufacturer.
- **Fastener heads:** Flush with, or below the boards surface.
- **Moisture content and stability of substrate:** The deck should be protected from wetting during transportation, storage and installation on site before the Waterproofing System is installed. Before installing the waterproofing system, moisture readings should be taken into the timber deck and not just the surface. The results should be recorded. Readings should be no more than 20%.
- **Deck Falls:** Refer to clauses 110/120/130 above (where appropriate) for roof specific requirements.
 - No deflections or back-falls shall be present if the deck is designed to achieve a zero falls finished surface.
 - Falls to comply with the drainage requirements of BS 6229:2025 and current codes of practice BS 8217:2005.
 - The design should take account of construction tolerances, permitted deviations and deflections under load, as per Item 4.4 of BS6229:2018.
 - An Engineer's deflection analysis and site level survey should be consulted before commencement of waterproofing. Measures to rectify back-falls or deflection shall be undertaken by the deck installer/supplier prior to commencement of the waterproofing system.
- **Preliminary work:** Complete including:
 - Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
 - Fixing of battens, fillets and anchoring plugs/strips.
- **Preparation:** The approved waterproofing contractor is to inspect the installed deck and report any issues, including insufficient falls, that may have a detrimental effect upon the waterproofing system to both the Clients representative and Bauder Limited.
- **Priming:** Before priming and application of the membrane, the substrate shall be clean and dry, free from surface water, ice, snow or frost, dust, dirt, oil, grease, or any foreign matter detrimental to the adhesion of the waterproofing system.

640 FIXING TIMBER TRIMS

- **Fasteners:** type/length appropriate and suitable to particular deck substrate.
- **Fixing centres (maximum):** 500 mm.

641 INSTALLING PREFORMED METAL HARD EDGE INSULATION PROTECTION ANGLES

- **Location:** Use to provide hard edge protection at all internal gutter channels on warm roofs where the insulation from the flat area steps down to meet the insulation in the gutter sole.
- **Preparation:** Surface to be inspected and cleaned if necessary, using white spirit to remove any contaminants, dirt or dust & primed with the specified Bauder primer. Prepared material to be thoroughly dry before use.
- **Installation:** The 50mm x 50mm or 75mm x 75mm (dependant on insulation type) once bent galvanised mild steel angle to be adhered to the exposed leading edge of the insulation using the

specified Bauder primer along the upper surface/edge. The purpose being to retain the metal in position to prevent any post-installation movement.

660B APPLYING PRIMER

- **Primer: Bauder Activator-Primer (Canister), APR01-Black.**
- **Purpose:** Substrate primer to seal and prepare dry surfaces of a variety of common substrate material prior to the application of Bauder self-adhesive bitumen membranes.
- **Before application:** All surfaces must be dry, clean and free from dust, dirt, oil, grease and loose material.
- **Application method:** Spray Applied to provide even and full coverage. Avoid pooling. Never attempt torching within 10 min of primer application, even if the surface appears dry.
- **Application rate:**
 - 300mm wide spray
 - Coverage: Approx. 96 g/m²
 - Two coats may be required for very porous substrates.
- **Application temperature:** +5 - +30°C
- **Drying time:** Approx. 5 - 10 mins, dependent upon ambient temperature and material porosity.
- **Coats:** Fully bond. Allow volatiles to dry off thoroughly between coats.
- **Re-application:** Necessary after 4 hours exposure if waterproofing has not yet been applied, to maintain adhesion performance.
- **Caution:** Use only outdoors in well-ventilated areas or with respiratory apparatus and keep away from all sources of ignition. Take necessary precautions to avoid the solvent vapour from entering the building's ventilation system.

670G LAYING AIR AND VAPOUR CONTROL LAYER

- **Attachment:** Generally, cold applied and fully bonded to substrate in accordance with Bauder requirements.
Timber Boarded / Cross Laminated Timber Decks: First layer random nailed, as clause 355/720. Second layer, **BauderTEC KSD FBS** cold applied and fully bonded to substrate in accordance with Bauder requirements.
- **Side and end laps:** minimum 100 mm, laid with all laps heat sealed to provide a continuous bitumen bead extrusion. Installation methods as recommended by Bauder.
- **Penetrations:** Fully seal using bonding methods recommended by Bauder.
- **Edges of insulation at roof edges, abutments, upstands, kerbs, penetrations and the like:** Enclose, with air and vapour control layer:
The air and vapour control layer must be dressed up all upstands and to the full extent of the detail. This is to ensure that the detail is fully encapsulated to reduce the risk to exposed combustible materials. The contractor is also to form all details in such a way that the underlayer is fully bonded to the air and vapour control layer to the full extent of the detail ensuring in a minimum fully bonded 100mm lap with the air and vapour control layer – please see Bauder Bituminous detail drawings.
- Care should be taken to ensure adhesion when the temperature is below + 5° C.

680G LAYING WARM ROOF INSULATION - BAUDERPIR FA TAPERED - SINGLE/MULTI LAYER

- **Before installing:** No insulation boards should be laid on site without a copy of the current Bauder Tapered Insulation Layout drawing to hand. Contractors should always refer to the Layout Drawing for the recommended start point and layout of boards. If contractors are unsure whether the correct Layout Drawing is on site, they should contact the Bauder Technical Department before commencing installation. For installation guidance, Contractors should refer to the relevant Bauder Tapered Installation Guide.
- **Deck Suitability:** Bauder cannot be held responsible for the drainage performance of tapered insulation schemes applied to an inappropriate deck surface and it is the responsibility of the installing contractor to check the roof deck surface and report any discrepancies.
- **Thermal performance:** Refer to Bauder Tapered Insulation Layout Plan for details of 'U' value achieved by this scheme and clause 230.
- **Wastage:** All off cuts are considered as usable and are included as such within the scheme plan.
- **Setting out:** Installation must be carried out using the appropriate Bauder Installation Guide and laid strictly in accordance with the Bauder Tapered Installation Layout drawing and installation

instructions. The **BauderPIR FA G16 Tapered** boards should be laid with the Bauder number / arrow / grid pattern facing upwards.

- **Long edges:** Fully supported
 - **End edges:** Fully supported.
 - **Joints:** Close butted together.
 - **End joints:** Stagger.
- **Bedding: BauderPIR FA G16 Tapered** boards are to be bonded to the upper surface of the Air and Vapour Control Layer (AVCL) (unless where a base-layer is required – please see Multiple-layer tapered schemes below) using suitable Bauder Polyurethane Insulation Adhesive:
 - **Bauder PU Insulation Adhesive - Tin or Bauder PU Insulation Adhesive – Twin Cartridge** applied in strips following the direction of the board length giving 4No. continuous and equally spaced adhesive beads within each board width (increase to 6No. at the roof perimeter) *
 - **Non-FA Tapered insulation board types:** Where **BauderPIR T G Tapered** Insulation (Unfaced 1:80 / 1:40 boards) or **BauderPIR M Flatboard** Insulation (tissue faced boards) are included within the Bauder Tapered Insulation Layout, these boards are to be bonded to the upper surface of the Air and Vapour Control Layer (AVCL) using either **Bauder PU Insulation Adhesive - Tin or Bauder PU Insulation Adhesive – Twin Cartridge**, applied in strips following the direction of the board length giving continuous and equally spaced adhesive beads within each board width as below:
 - 500mm width **BauderVIP TE** insulation boards - 2 no: (increase to 3 no. at roof perimeter)*
 - 600mm width insulation boards - 2 no: (increase to 3 no. at roof perimeter) *
 - 800mm width insulation boards - 3 no: (increase to 4 no. at roof perimeter) *
 - 1000mm width **BauderVIP TE** insulation boards- 4 no:(increase to 6 no. at roof perimeter)*
 Adhesive bead widths, spray patterns and coverage rates are stated on the appropriate product label and datasheet.
 - **Multiple-layer tapered systems:** Where the total thickness of tapered insulation required is greater than can be achieved by a single layer, base-layer board(s) of **BauderPIR FA-TE Flatboard** can be adhered to the AVCL/previous layer(s) to make up the total thickness required before the uppermost layer of **BauderPIR FA G16/ BauderPIR T G Tapered** boards are installed. **Additional Layer(s):** Each additional layer of insulation board(s) should be laid off-set and staggered with the layer below and should be bonded together using the following adhesives:
 - **Bedding:** As stated above. Surface should be clean and free of debris before application of the additional layer(s)
 - **Foil to Foil (e.g. FA-TE to FA-TE): Bauder Activator Primer (Canister) – APR01-Black** spray applied to the surface of both layers or **Bauder PU Insulation Adhesive – Twin Cartridge** applied in strips following the direction of the board length giving continuous and equally spaced adhesive beads within each board width (as stated above).
 - **Foil to tissue Faced/unfaced boards (e.g. FA-TE to 1:80 tapered boards): Bauder PU Insulation Adhesive - Tin or Bauder PU Insulation Adhesive – Twin Cartridge.** Applied in strips following the direction of the board length giving continuous and equally spaced adhesive beads within each board width (as stated above).
 - **Uppermost layer:** The **BauderPIR FA G16 Tapered** board layer should be bonded using **Bauder Activator Primer (Canister) – APR01-Black** spray applied to the surface of both layers or **Bauder PU Insulation Adhesive – Twin Cartridge** applied in strips following the direction of the board length giving continuous and equally spaced adhesive beads within each board width (as stated above). **BauderPIR FA G16 Tapered** boards should be laid with the Bauder number/arrow/grid pattern facing upwards. Boards should be laid off-set and staggered with the layer below.
 - **Ridge & Valley Infills:** The **BauderPIR GFS G16 (ridge infills) & BauderPIR KFS G16 (valley infills)** should be bonded using **Bauder Activator Primer (Canister) – APR01-Black**, spray applied to the tapered board and bottom of the infill giving continuous full coverage of the infill and the area where the infill is to be placed.
 - **Protection to exposed edges of insulation:** Reduced thickness treated timber batten as clause 640 (or equivalent plywood construction), a minimum width of 150mm and 10mm less in thickness than the insulation to accommodate the build-up of the waterproofing layers – all securely fixed to the deck. Outer edges chamfered at changes in level.

- **Completion:** Boards must be in good condition, well-fitting and stable.
- **IMPORTANT NOTES:**
 - **Bauder Activator-Primer (Canister), APR01-Black**, must be applied to the uppermost surface of insulation prior to installation of the self-adhesive underlayer.
 - Foil to Foil installation (e.g., FA-TE to FA-TE) must not be carried out using the 6.5kg **Bauder PU Insulation Adhesive – Tin**.
 - Foil to AVCL installation (e.g., FA G16 Tapered directly to KSD FBS) must not be carried out using **Bauder Activator Primer (Canister) – APR01-Black**.

**BS EN 1991-1-4 uses the following guidance to calculate perimeter zones. Buildings up to and including 10m in height have a perimeter zone of not more than 2m. Buildings over 10m, uses the calculation of 2 x the building height ÷ 10. These are general guidance rules and do not take into account all of the information used in a full wind uplift calculation, they are therefore superseded by a project specific calculation.*

681B INSTALLING WARM ROOF INSULATION (INSULATED UPSTANDS)

- **Bedding:** Bonded to the upper surface of the air and vapour control layer (AVCL) using suitable Bauder Polyurethane Insulation Adhesive. The adhesive should be applied in strips following the direction of the board length giving 3 no. continuous and equally spaced adhesive beads within each board width. Upstand insulation boards should be installed before the insulation to the flat areas so that the vertical upstand insulation is retained both at the base and at the top. Adhesive bead widths are stated on appropriate product label and datasheet.
Note: Where the surface is uneven or difficult to bond to, it is permissible to use suitable thermally broken fixings.

- **Multiple board layers:** Where the total thickness of insulation required is greater than can be achieved by a single standard board, then additional boards can be adhered to the previous layer(s) to make up the total thickness required. These additional boards should be bonded using suitable Bauder Insulation Adhesive.

Foil to Foil Insulation Boards Only: These additional boards should be bonded using either **Bauder Activator Primer (Canister) – APR01-Black** or **Bauder PU Insulation Adhesive – Twin Cartridge**.

Foil to Tissue Faced Boards: These additional boards should be bonded using suitable Bauder Insulation Adhesive.

Adhesive bead widths or adhesive spray patterns and coverage rates are stated on appropriate product label and datasheet.

The adhesive should be applied in strips following the direction of the board length giving 3 no. continuous and equally spaced adhesive beads within each board width. Upstand insulation boards should be installed before the insulation to the flat areas so that the vertical upstand insulation is retained both at the base and at the top.

The second layer of boards should be laid off-set and staggered.

Note: Where the surface is uneven or difficult to bond to, it is permissible to use suitable thermally broken fixings.

- **Insulated upstand brackets:** Bauder insulated upstand support brackets must be used at all vertical abutment wall upstands (where the wall cavity is insulated) in conjunction with 30mm Bauder insulation. These are to be fixed at 400mm centres using suitable fixings through the air and vapour control layer, so that the top edge is a minimum of 300mm above the surface of the deck. A 3mm gap should be left between adjacent sections. The detail is to be carried out in accordance with the Bauder detail drawing, where provided.
- **Protective hard edges:** treated timber battens or Bauder Insulated upstand brackets (as appropriate to given detail situation) must be used at all right-angled edges e.g. top edges of parapet walls or abutment upstands.
- **Encapsulation seal:** Provision must be allowed for forming a minimum 100mm lap seal between the air and vapour control layer and underlayer where the insulation finishes
- **Important Notes:**
 - **Bauder Activator-Primer (Canister), APR01-Black**, must be applied to the facing of the uppermost surface of insulation prior to installation of the self-adhesive underlayer.

- Foil to foil installation (e.g. FA-TE to FA-TE) must not be carried out using **the 6.5kg Bauder PU Insulation Adhesive – Tin.**
- Foil to AVCL installation (e.g. FA G16 Tapered directly to KSD FBS) must not be carried out using **Bauder Activator Primer (Canister) – APR01-Black.**

WATERPROOF COVERINGS/ ACCESSORIES

710 LAYING REINFORCED BITUMEN MEMBRANES GENERALLY

- **Direction of laying:** Unrolled up the slope.
- Where practicable, install so that water drains over and not into laps.
- **Side and end laps (minimum):** 100 mm, with the exception of mineral surfaced membranes, where side laps are 80 mm, but the head laps to remain 100 mm.
- **Head and side laps:** Offset.
- **Intermediate and top layer/Capping sheet:** Fully bond.
- **Successive layers:** Apply without delay. Do not trap moisture.
- **Strips of bitumen membrane for 'linear' details:** Cut from length of roll e.g. gutter sole pieces.
- **Detail flashings:** to be cut from width of roll.
- **Completed coverings:** Firmly attached, fully sealed, smooth, weatherproof and free draining.

747A SELF-ADHESIVE BONDING OF REINFORCED BITUMEN UNDERLAYER

- **Bond:** Full over whole surface, with no air pockets.
Please note that Bauder Activator-Primer (Canister), APR01-Black, must be applied to the uppermost layer of Bauder Insulation prior to installation of the self-adhesive underlayer.
- **Underlayer:** Cold applied and fully bonded by removing the peel off release film.
Side Laps: to be 80mm and must be laid red over blue, and heat sealed/torched (depending on 'Flame-Free' & 'Safe to Torch' zones) and rolling with the Bauder Long Handled Lap Roller to extrude a continuous bead of bitumen.
Head Laps: to be 100mm and staggered, heat sealed/torched (depending on 'Flame-Free' & 'Safe to Torch' zones) to extrude a continuous bead of bitumen.
The underlayer must be taken up all upstands, edge details, in accordance with current British Codes of Practice and Bauder recommendations. The underlayer must be fully heat sealed/torched (depending on 'Flame-Free' & 'Safe to Torch' zones) with the air and vapour control layer to the full extent of the detail ensuring a minimum 100mm fully bonded lap - please see Bauder Bituminous detail drawings.
- **Alternative underlayer for detail work:** For detailing to un-insulated abutment upstands, where the waterproofing is to be applied to rough or uneven non-combustible surfaces i.e. brickwork or concrete, it is permissible for the installing contractor to use the Bauder underlayer appropriate to the specified system where this product is considered to be better for application to these surfaces. For all other situations, and particularly to vertical insulation, the Bauder Self-Adhesive Underlayer appropriate to the specified system must be used.
- **Provision for prevention of wind uplift (where required):** Mechanically fix as per the corresponding project specific wind load calculation, using appropriate thermally broken fasteners (for un-insulated roofs as clause 355A and for warm roof as clause 355B), fixed through to the deck.
- **Fixing of bitumen membranes to vertical upstands:** Please refer to clause 775.

750A LAYING MINERAL FACED REINFORCED BITUMEN TORCH-ON CAPPING SHEET - 'SAFE TO TORCH' ZONE

- **Bond:** Full over whole surface, with no air pockets.
- **Excess compound at laps of top layer/ capping sheet:** Leave as a continuous bitumen bead extrusion.
- **Laying top layer:** Fully bonded to the underlayer by torching in the approved Bauder manner. Head laps to be 100 mm, side laps to be 80 mm. All laps to upstands, edge details, flashings, etc. to be 100 mm.
- **Fixing of bitumen membranes to vertical upstands:** Please refer to clause 775.
- **Final Inspection:** The finished roof must be thoroughly inspected by the Bauder Site Technician. This is to ensure that any remedial treatment that is necessary can be carried out prior to issuing the guarantee. Failure to ensure the instigation of this inspection will result in the issuing of the Bauder guarantee being put in jeopardy.

- **IMPORTANT NOTE:** The mineral slate finish is a natural product, so the raw material may differ in colour and shade, over which Bauder has no control. There may also be colour variations between each roll of membrane.

FLASHINGS AND DETAIL WORK

773 'FLAME-FREE' & 'SAFE TO TORCH' ZONES - ALTERNATIVE MEMBRANES AND APPLICATION

For detailing application in locations constructed from or within the 'Flame-Free' & 'Safe to Torch' zones to potentially combustible materials or otherwise where it is considered appropriate by the contractor necessary to minimise the potential risk.

- **Primers: Bauder Activator-Primer (Canister), APR01-Black**, must be used when using Bauder self-adhesive membranes and a 'FLAME-FREE' application is required.
- **Underlayers:**
It is permissible to use a Bauder self-adhesive membrane so long as this product is a recognised component of the system specified.
Acceptable alternatives underlayers are listed below: -
 - **BTRS: BauderFLEX G4E** to be replaced with **BauderTEC KSA DUO**
 - **BauderFlex: Bauder EGV 35 TF** to be replaced with **BauderTEC Sprint DUO**
 - **BTRS Plus: N/A**
 - **System Airtech: N/A**

NB: Where surface is uneven or not suitable for a self-adhesive membrane and where the surface is of a non-combustible material and is not required to be a 'Flame-Free' or 'Safe to Torch' zone – it is permissible to use a Torch Applied underlayer, so long as the product is a recognised component of the system specified.

Acceptable alternative underlayers are listed below:

- **BTRS: BauderTEC KSA DUO** to be replaced with **BauderFLEX G4E**
- **BauderFlex: BauderTEC Sprint DUO** to be replaced with **Bauder EGV 35 TF**
- **BTRS Plus: N/A**
- **System Airtech: N/A**
- **Capping sheets:** Where appropriate, the installing contractor can use **Bauder KSO-P SN / KSO ALP SN** self-adhesive capping sheet, applied using the hot air hand tools approved for use with bituminous systems. Please note that **Bauder Activator-Primer (Canister), APR01-Black**, must be applied to the underlayer prior to installation of the self-adhesive capping sheet.
BauderTEC KSO-P SN is only available in one colour – Charcoal Grey
BauderTEC KSO ALP SN is only available in one colour – Brown

Self-adhered membranes - For upstands using only self-adhesive membranes, these will need to be mechanically fixed at the top leading edge of the membrane with Bauder aluminium peel bar regardless of the upstand height. This will be for System Airtech and for areas referred to as 'Flame-Free' zones. Please refer to Bauder Bituminous Standard Detail Drawings.

- **Green Roof Notes:** Please note it is strictly only permissible to use self-adhesive capping sheet for flashings and detailing work when installing **BauderGREEN XF 301 Sedum Blanket** or Hard landscaping finishes.
- **Approved Hot Air Equipment**
The **BauderTEC KSO-P SN / KSO ALP SN** membrane must be applied using the approved hot air hand tools. The list of permissible hot air electrical equipment suppliers for installing Bauder waterproofing membranes are stated below. These are available either for purchase or hire from the below companies:

HOT AIR WELDING EQUIPMENT

LEISTER

Contact: Welwyn Tool Group, Tel 01707 331 111, <http://www.welwyntoolgroup.co.uk>

JAMES LISTER & SONS LIMITED

Contact number: 0121 553 2949, Email: sales@lister.co.uk

ETORCH

Contact: Imperial Thermal Engineering Ltd, Tel 01376 330582, <http://www.imperialthermal.co.uk>

- **Angle Fillets**

- **Warm Roof Systems:** Where there is insulation to the vertical upstands, the angle fillets should be of the same insulation material that has been installed to the upstands.
- **Uninsulated / Inverted Roof Systems:** For all uninsulated or inverted specifications, **BauderPIR M TKL 60 Angle Fillets** must be used.

BauderPIR FA-TE / FA Tapered or Un-insulated (cold) / Inverted Roof

BauderPIR M TKL 60 angle fillets (60 mm x 60 mm) must be used at all right-angled upstands.

- **Warm Roof Construction:** Provisionally bonded in suitable **Bauder Polyurethane Insulation Adhesive** or **Bauder Activator-Primer (Canister), APR01-Black**, and subsequently retained once the underlay detailing is applied.
- **Un-insulated/Inverted Roof Construction:** Coat both the surface area to receive the angle fillet and the angle fillet with **Bauder Activator-Primer (Canister), APR01-Black**. Once both surfaces are tacky, place the angle fillet in the correct location and apply pressure to the angle fillet to ensure adhesion is achieved.
- **Composite decks (e.g. Kingspan Benchmark Topspan / Envirodeck):**
Prefabricated upstands: Insulation and pre-fabricated galvanized steel upstands to be supplied by deck manufacturer and be installed by the decking contractor prior to the waterproofing work being carried out. Refer NBS section H43 specification.
 Coat both the surface area to receive the angle fillet and the angle fillet with **Bauder Activator-Primer (Canister), APR01-Black**.

Once both surfaces are tacky, place the angle fillet in the correct location and apply pressure to the angle fillet to ensure adhesion is achieved.

BauderROCK Insulation

BauderROCK angle fillets, must be used at all right-angled upstands, bonded using either **Bauder PU Insulation Adhesive – Tin** or **Bauder PU Insulation Adhesive – Twin Cartridge**. The adhesive should be applied in a single strip following the direction of the angle fillet. Place the angle fillet in the correct location and ensure adhesion is achieved.

BauderGLAS Insulation

BauderGLAS angle fillets, must be used at all right-angled upstands, bonded using either **Bauder PU Insulation Adhesive – Tin** or **Bauder PU Insulation Adhesive – Twin Cartridge**. The adhesive should be applied in a single strip following the direction of the angle fillet. Place the angle fillet in the correct location and ensure adhesion is achieved.

- **IMPORTANT NOTE** - under no circumstances must fillets of an alternative material be incorporated (i.e. timber, cork, fibre, etc.) as this would invalidate the guarantee.
- **Layers of bitumen membrane:** Carry in staggered formation up the upstand, with each layer fully bonded.
- **Upstands:**
 - **At ends of rolls:** Underlay layer only, form with bitumen membrane carried up without using separate strip.
 - **Elsewhere:** Form with matching strips of bitumen membrane, maintaining laps.
- **Upstand details (150mm minimum height):** This must be taken from the finished roof surface. Please note that for landscaped roofs, this minimum height is measured from the finished landscape surface as opposed to the waterproofing surface. *Special attention should be paid to all structures, such as rooflights, counter-flashings, window and door cills, pipes etc. Bauder cannot take responsibility for water ingress over waterproofing details constructed below the recommended minimum height.
- **Level Thresholds:** Acceptable, providing conforms to BS6229:2018 and current NHBC Standards, chapter, 7.1.
- **Requirements:**
 - Minimum 75mm upstand height. (This must be taken from the waterproofing or top of the insulation if an inverted roof).
 - Falls are directed away from the door cill.

- Waterproofing is dressed up and under the door cill. Prior to installation of the door frame, the membranes must be dressed up the reveal to a minimum 150mm in height.
- Door cill has a minimum 45mm overhang.
- Provision is made for emergency overflow to prevent water getting to the waterproofing and cill interface.

Any level threshold details not meeting this standard cannot be guaranteed by Bauder.

Note: Bauder recommends the installation of a linear drain (**BauderGREEN ER MR 150/60 linear drain and grill plate** is suitable for this purpose) in front of the access door threshold, to help prevent rainwater splash back and snow build-up.

- **Flashings:** Separate flashings must always be formed. Capping sheet taken up the upstand in one piece will not be permitted.
- **Green Roof Notes:** If the client should desire not to see a green mineral finish then it is permissible to install a piece of suitable colour Bauder bituminous capping sheet membrane. The Bauder root resistant capping sheet must be taken a minimum 150mm from the finished landscaping surface*. The suitable coloured Bauder bituminous capping sheet must be lapped onto the Bauder root resistant capping sheet by a minimum 150mm and lapped onto the structure by a minimum of 100mm.
- **Fixing of bitumen membranes to vertical upstands:** Where upstands terminate in excess of 250mm above the finished surface of the main field area capping sheet, screw fix through into the underlying substrate as per the requirements set out below and in accordance with the Bauder Reinforced Bitumen Membrane Installation Guide.

UNDERLAYER - INSULATED UPSTANDS ONLY:

Prior to the installation of the self-adhesive underlayer, ALL insulation board types used to create an insulated upstand require a coating of Bauder Activator-Primer applied to the surface of the insulation board. The Activator-Primer should be applied at a rate of 96g/m².

Insulated upstands exceeding 600mm in height will require additional fixings through the insulation board depending on the board type used, at a rate of:

- **BauderPIR FA-TE**, 5No. fixings, one in each corner and one in the centre
- **BauderROCK**, 1No. fixing, in the centre of the board.
- **BauderGLAS** 1No. fixing, in the centre of the board.

Use thermally broken tube washers with a minimum 45mm round head, and fasteners. Tube size and fastener type for insulation and substrate as recommended by fixing supplier. Screw fix through into the underlying substrate, ensuring that washer is pulled in tight to the insulation.

CAPPING SHEETS - ALL UPSTANDS:

Terminating on the vertical: Where the capping sheet is required to terminate on a vertical face, a **Bauder Aluminium peel bar** is to be used, mechanically fixed at 150mm centres (as per pre-drilled holes) with appropriate fixings suitable to the substrate. Unless protection is being provided to the top leading edge of the membrane and fixing penetrations by an external component, the termination should then be covered with the specified counter flashing material dressed over the top to ensure waterproofing integrity.

Should a traditional lead counter flashing be used, then a separating tape will need to be used between the aluminium bar and lead flashing.

Please note: A Bauder termination bar is not to be used in this scenario unless it has been specified by Bauder. Termination bars are not suitable for brickwork substrates. No additional membrane cover flashing is required.

Terminating on the horizontal: Where the capping sheet is taken onto the horizontal, e.g., on top of the parapet, the membrane must be fixed (using fixings appropriate and suitable to the substrate) with either:

- A **Bauder Aluminium peel bar**, mechanically fixed at 150mm centres (as per pre-drilled holes).
- 5No. screws and washers per capping sheet width, one fixing set in 50mm from the edge of either side of the sheet, with the three remaining fasteners equally spaced in between.
- A **Bauder GRP Trim**, mechanically fixed at 300mm centres (maximum) using screw fasteners of type appropriate to kerb or deck substrate. Nail fixing is not permitted.

Capping sheet cover flashing: - A separate flashing of Bauder capping sheet will be required to cover the fixings (please see Bauder detail drawings).

Please note: Upstands using only self-adhesive membranes (E.g. System Airtech and areas referred to as 'Flame-Free' zones) will need to be mechanically fixed at the top leading edge of the membrane with a

Bauder aluminium peel bar regardless of the upstand height, unless it is retained by a GRP Trim on the horizontal.

Where an exposed edge of Bauder capping sheet terminates on its vertical edge, a separate lead cover flashing must be installed to protect the edge of the exposed membrane. This lead flashing must extend onto the membrane by a minimum 100mm and to the full height of the vertical flashing, then extended underneath the horizontal cover flashing to protect the top leading edge.

Upstands that exceed approximately 1100mm: -

Bauder Ltd do not advocate the use of bitumen waterproofing on upstands exceeding approximately 1100mm due to consideration of the fire regulations. This should be carried out in an appropriate alternative as specified by the client. Please consult with Building Control for confirmation of upstand waterproofing requirements where the height exceeds 1100mm.

MECHANICAL FASTENER SUPPLIER

Refer to the **Bauder Registered Fastener Suppliers** list for options.

Mechanical Fasteners

Type: Deck depth specific screws together with associated galvanised pressed steel washer plates.

777 SECONDARY WEATHERING (PIPES, DUCTING etc.)

- Provision must be made to supply and install a secondary weathering flashing above all waterproof upstand detailing to pipe penetrations, balustrade posts, cable entry pipes, ventilation ducting, sun pipes etc. This can take the form of a welded collar (where appropriate) or a bespoke galvanized cowl or hood sealed with a suitable sealant and fasteners. Solvent welded plastic collars fitted to plastic soil vent pipes.

784A ROOF DRAINAGE OUTLETS

- **Product name:** **Bauder Bitumen Vertical Outlet**
- **Material:** Cast polyurethane body with integral bituminous connection flange.
- **Product size/ reference:**
 - Bauder Compact Vertical Outlet DN 100, 6.1 litres/sec. flow rate, with vertical spigot designed to connect to standard 110mm pipework.
 - Bauder Vertical Outlet DN 70, 7.1 litres/sec. flow rate, with vertical spigot designed to connect to standard 75mm pipework.
 - Bauder Vertical Outlet DN 150, 7.2 litres/sec. flow rate, with vertical spigot designed to connect to standard 160mm pipework.
- **Flow rate:** (Based upon vertical pipework and a 35 mm head of water pressure – according to BS EN 12056:3:2000).
- **Pipe connection:** **Bauder High-Capacity Vertical Outlet** are suitable for connection to:
 - uPVC "O" ring socketed soil grade pipe to BS 4514: 1983
 - Socketed and socket-less cast-iron pipework to BS 416:1973 and EN 887. Socketed pipework will require cold caulking or PVC to cast iron adaptors. Socket-less pipework can be connection using an appropriate SML mechanical coupling.
 - HDPE pipework with appropriate SML mechanical coupling
- **Type of grate/ fittings:** supplied with a tough polyamide Dome Grate leaf guard.
Alternative: **Bauder Locking Leaf Guard Long Leg:** Additional component where higher durability or security is required.
- **Bauder Extension/Compact Extension Unit - Warm roofs only:** When the outlet is used as part of a warm roof build-up and the insulation thickness exceeds 60 mm, an additional extension component must be used. The **Bauder Extension Unit** is suitable for use with Insulation: 60mm - 220 mm.
If the insulation is below 60mm a timber frame must be built to accommodate the outlet.
- **Extension Unit Housing** – Polyurethane housing board 500 x 500 x 60mm with pre-molded opening to receive the **Bauder Extension Unit**. Thermal Conductivity 0.025 W/Mk. Compressive Strength 200 kPa and a Density of 50 kg/m³.
 - **Material:** Cast polyurethane body with integral bituminous connection flange.
 - **Fixing:** The extension unit must be mechanically fixed through the PUR rim to the structural deck.
 - **Type of grate/ fittings:** When required the Dome Grate leaf guard is transferred from the

Bauder Compact Vertical Outlet.

- **Bauder Vertical Outlet - Installation requirements:** These components that form part of the Bauder waterproofing system and for guarantee reasons, should only be installed by Bauder Approved installers. Connectivity to below deck drainage pipework to be the responsibility of the plumbing contractor.
- **Fixing:** The outlet is to be secured through the rim to the structural deck by a minimum of four fasteners appropriate to obtain an adequate attachment to the deck substrate material. Some deck structures require preparatory works before the outlets can be installed:
 - **Concrete decks** – the opening for the outlet to be either pre-cast or core-drilled so that the outlet can be installed at the same time as the air and vapour control layer. Provision for a 250 mm dia. opening is required.
 - **Profiled metal decks** – these also require a 250 mm dia. Opening cut into the decking, but in addition will require a 600 x 600 x 1.25 mm galvanised steel reinforcing plate secured to the deck before the outlet can be installed. This item has a pre-cut 250 mm dia. hole and is available from Bauder.
 - **Isolating outlet/sump/gutter:** All outlets/gutters/sumps should be isolated from the rest of the system utilising a separate piece of AVCL/underlayer flashing. This should be turned down from the main field area and sealed a minimum 100mm onto the AVCL and 100mm with the Underlayer. For detailed information, refer to the Bauder Product Data Sheet and Bauder Detail Drawing.
- **Outlet locations:** Ensure outlets are evenly distributed. Exact location and number to be confirmed by the appropriate Engineer.
- **Overflows/tell-tale overflows:** An appropriate Engineer should consider the requirement for overflows on all roofs. A full capacity overflow should be provided when there is only one outlet on a given roof area.

784G PARAPET EMERGENCY TELL-TALE OVERFLOW

- **Product Name:** Bauder Bitumen Parapet Tell-Tale Overflow DN 50
- **Material and specification:** Stainless Steel. Length of tube 1200mm. Bitumen flange 350 x 350mm.
- **Flow Rate:** In accordance with BS EN 12056-3-2000, overflows or emergency outlets should be provided on flat roofs with parapets and in non-eaves gutters in order to reduce the risk of over spilling of rainwater into a building or structural overloading.
- **Suitability:** Emergency tell-tale overflow outlets are designed to be used as a through chute to warn of a build-up of water on the roof due to a blockage of the drainage system(s). They are not suitable or intended for connection to internal pipework that is within a wall construction or boxed in and is inaccessible after construction.
- **Installation requirements:** The deck or wall structure may require preparatory works before the overflow can be installed.
- **Bauder Bitumen Parapet Tell-Tale Overflow DN 50** to be installed through the system and parapet after creation of a suitable size diameter opening. The overflow should be secured in place and should only be installed by **Bauder Approved installers**.
The overflow opening should be positioned approx. 35mm above the height of the waterproofing finish.
- **Fixing:** Dress the **Bauder Bitumen Underlayer** around the penetration to be detailed.
Mechanically fasten the overflow through the **Bauder Bitumen Underlayer** & through the substrate to enable the pipe to extend past the external edge of the parapet.
The bitumen membrane flange can then be bonded to the **Bauder Bitumen Underlayer** field sheet. Once in place, the **Bauder Capping Sheet** is to be dressed around the pipe and fully bonded to the **Bauder Bitumen Underlayer**, ensuring a bitumen bleed is achieved around the pipe opening.
- **Outlet locations:** Ensure outlets are evenly distributed. Exact location and number to be confirmed by the appropriate Engineer.
- **Overflows/tell-tale overflows:** An appropriate Engineer should consider the requirement for overflows on all roofs. A full capacity overflow should be provided when there is only one outlet on a given roof area.

785 FIXING PERIMETER TRIMS

- **Important note:** To be used on parapets and perimeter kerbs with an inward fall or are less than 200mm in width.
- **Bituminous Membranes:**
 - The first layer of membrane **must** be self-adhesive and dressed to the full extent of the detail using Flame-Free methods. This is to ensure that the detail is fully encapsulated to reduce the risk of fire to exposed combustible materials.
 - Dress the underlayer up and over the perimeter detail to provide a 25mm overhang. Please refer to Bauder standard detail drawings.
- **Trim:**
 - **Trim face depth:** 1=44mm, 2=44mm, 3=70mm, 4=100mm, 6=150mm
 - **Colour:** Type 1 & 2 = Black Type 3, 4 & 6 = Black or Grey
 - **Setting out:** 10mm gap between the back edge of the bottom of the drip to the fascia/wall and 3mm gap between abutting lengths of trim.
 - **Fasteners:** Screw fasteners of type appropriate to kerb or deck substrate. Nail fixing is not permitted.
 - **Fixing:** 30mm from ends and at 300mm (maximum) centres, stagger fixed. ***Can be used to retain the capping sheet where the capping sheet is taken to the full extent of the detail – please see Bauder detail drawing.***
 - 150mm deep trims (type 6) – 3no. additional fixings per length of trim. The fixings are to be face fixed with screws and positioned 75mm down from the top edge, one fixing 100mm in from each end and one in the centre and capped with coloured matched plastic weathering caps. *A fixed timber packer will be required behind the face of the trim to help facilitate ease of fixing.*
 - *For roofs above 10 metres in height – the 100mm deep trim (type 4) will require face fixing, as per 150mm trim above. A fixed timber packer will be required behind the face of the trim to help facilitate ease of fixing.*
 - **Jointing sleeves / bridging piece:** All lengths should be close butt jointed using an internal jointing sleeve. This must be provided to each joint.
 - **Corner pieces:** Purpose made.
- **Completion:**
 - **Contact surfaces:** Prime with **Bauder Primer**.
 - **Joints:** Cover with 200mm long pads of bitumen membrane, bonded to trim.
- **Completion of bitumen membrane:**
 - **Top layer/ Capping sheet:** Butt joint to rear edge of trim.
 - **Cover strip:** Fully bond to trim and top layer/ capping sheet of bitumen membrane. Carry over roof edge upstand and lap 100 mm onto roof. The capping sheet is to be dressed tightly into the top lip of the trim, ensuring a bead of bitumen extrudes at the edge. Please see Bauder detail drawing.
- **Wall / kerb joints:** The new trim must cover any open joint that may exist at the top of the kerb or wall, by a minimum distance of 20mm.

Where the top of the parapet is installed flat or has no inward fall, we would strongly recommend using the GRP Water Check Trim to avoid any standing water being blown over the trim and staining the brickwork/render.

786 LIGHTNING CONDUCTOR CLIPS

- The lightning conductor is to be fixed using the specified conductor clips, incorporating a colour matched Bauder capping sheet pad, fully bonded to the main capping sheet at 1m centres by the approved Bauder roofing contractor. Lightning conductor retention using bituminous membrane strips are not acceptable.
- Where lightning conductors are required to be fixed to brickwork, upstands, parapet walls etc., proprietary clips mechanically fixed should be utilised. Care should be taken to ensure that fixings do not penetrate the new waterproofing system.

SURFACING

863 DESIGNATED MAINTENANCE WALKWAYS

- **Location:** As designated by the client.
- **Application:** Remove the selvedge lap prior to installing. Membrane to be fully bonded to the previous capping sheet layer, making provision for leaving intermittent 100 mm gaps between sheets to form drainage channels, particularly where the walkway layer impedes water run-off.

COMPLETION

910 INSPECTION

- **Interim and final roof inspections:** in accordance with the manufacturer's requirements for guarantee.
- **Notification:**
Final Inspection: It is the responsibility of the approved contractor to advise Bauder Ltd when the roof is ready for Final Inspection. The 'Final Inspection' of the waterproofing must be carried out and approved by Bauder Ltd prior to any landscaping products/materials being installed, otherwise a guarantee cannot be issued. Safe access to carry out this inspection must be provided.
- **Other requirements:** Please also refer to preliminaries / general conditions.
If project needs to follow NHBC Requirements: The waterproofing must be visually inspected and electronically tested for waterproofing integrity, faults rectified, and retested prior to the installation of any landscaping products. The results of the test(s) should be made available to the NHBC.

940 COMPLETION

- **Roof areas:** Clean.
- **Outlets:** Clear.
- **Work necessary to provide a weather tight finish:** Complete.
- **Storage of materials on finished surface:** Not permitted.
- **Completed membrane:** Do not damage. Protect from chemicals, traffic and adjacent or high-level working.

950C GUARANTEE

- A 20 year product and workmanship guarantee is to be provided upon completion following a Final Inspection by Bauder. Details regarding the full terms and conditions are available separately from Bauder Ltd upon request. This system must be installed by a Bauder Approved Contractor, to be eligible for guarantee. The system comprises the waterproofing membranes, insulation, air and vapour control layer, and attachment of these products.
- **IMPORTANT NOTE:** This type of guarantee is not valid for Flat Cold Roofs

K10 PLASTERBOARD DRY LININGS/PARTITIONS/CEILINGS

To be read with Preliminaries/General conditions and drawings

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

K10/1 TYPE(S) OF DRY LINING OR EQUIVALENT

(a) EXISTING PLASTERBOARD CEILINGS TO BE RETAINED, STABILISED AND SECURED.

Works limited to:

- Localised securing
- Temporary propping
- Protection of existing features

No new plasterboard linings or ceiling replacement included in this Contract.

DESCRIPTION

- Existing plasterboard ceiling incorporating historic ceiling roses and copings.
- Location: Building 1b, chapel choir.

INSPECTION

- Inspect for:
 - Movement
 - Cracking
 - Delamination or detachment
- Notify Architect/ER of any areas at risk.

(b) STEEL ENCASEMENT

- Fire Resistance: 60 minutes
- Glasroc F FireCase D120001 (C) (EN) or equivalent
 - One layer of Glasroc F FireCase 15mm providing 60 minutes fire protection to steel columns up to a Section Factor A/V (HP/A) m-1 (max) of 232 at a critical temperature of 550°C
- ACOUSTIC SEALANT: Gyproc sealant
- BACKGROUND: Steel Column
- FRAMEWORK:
 - Perimeter framing: Gypframe FEA1 Steel Angle
 - Four sided column encasement: Fix boards on adjacent faces to each other. Stagger all joints by a minimum of 600mm in adjacent layers and multi-layer linings. Ensure all boards are cut square to maintain tight butt joints with no gaps, and the board-to-board edge fixings are secured into the centre of the abutting Glasroc F FireCase board.
- BOARD AND FIXINGS:
 - Encasement board, Layer 1: Glasroc F FireCase 15mm
 - Encasement board screws (board to metal), Layer 1: Glasroc F FireCase Screws 40mm
 - Encasement board screws (board to board), Layer 1: Glasroc F FireCase Screws 40mm
 - Fix boards on adjacent faces to each other or to metal angles using screws at 150mm centres. Set screw heads flush with board surface.
- FINISHING: Gyproc paper tape jointing system
- All materials unless otherwise indicated shall be supplied by Gypsum Industries, and shall be installed in accordance with their current published instructions and generally in accordance with BS 8212. These standards relate to the above performance data. BS EN 13381-4, Test methods for determining the contribution to the fire resistance of structural members: Applied protection to steel members.
SpecSure® system performance warranty confirms that British Gypsum proprietary systems will perform as specified for the lifetime of the building. The SpecSure® warranty requires that all

components are specified in full and constructed in accordance with British Gypsum's installation guidance. For more details see the British Gypsum website. Always check with the design team before making any changes to the chosen specification, ensuring appropriate substantiation is sought to confirm that the solution still meets all required project performances.

K10/2 STABILISATION

(a) PROPPING

- Provide temporary propping and support as required to prevent collapse during the works.
- Temporary works to be designed and implemented by the Contractor.

(b) SECURING

- Secure existing ceiling to structure above using appropriate mechanical fixings or proprietary systems.
- Fixings to be:
 - Suitable for the existing construction
 - Minimum necessary intervention
 - Installed to avoid damage to finishes and decorative features
- Method of fixing to be submitted to Architect/ER for review prior to installation.

(c) CEILING ROSES

- Protect and retain existing ceiling roses.
- Provide local support where required.
- Do not remove unless instructed by Architect/ER.

K10/3 PROTECTION

(a) DURING WORKS

- Protect ceiling and decorative features from:
 - Vibration
 - Impact
 - Dust

(b) RESTRICTIONS

- Do not cut, remove or alter existing ceiling unless agreed with Architect/ER.

Works to be carried out by a competent contractor experienced in stabilisation of existing ceilings/ historic fabric.



K10/4 FIXING/FINISHING

- (a) DRY LINING GENERALLY:
- Fixing, jointing and finishing materials and accessories, where not specified otherwise, to be as recommended by the board manufacturer.
 - Handle & store materials in accordance with BS 8212, section 5. Do not use damaged boards.
 - Use operatives properly trained for dry lining work and who have attended a recognised training scheme.
 - Fix boards only in areas which have been made weathertight. Prevent frost damage.
 - Cut boards neatly and accurately without damage to core or tearing of paper facing. Keep cut edges to a minimum and position at internal angles wherever possible. Mask with bound edges of adjacent boards at external corners.
 - Fix boards securely and firmly to suitably prepared and accurately levelled backgrounds. Set heads of fastenings in a depression; do not break paper or gypsum core. Finish neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.
- (b) ACOUSTIC SEALANT:
- Sealant: Gyproc Sealant to board manufacturer's recommendation.
 - Location: To perimeter junctions with walls, floors, ceilings and around openings.
 - Before fixing boarding, apply as a continuous bead to clean, dry, dust-free surfaces, leaving no gaps. After application of sealant, fill gaps greater than about 6 mm with jointing compound recommended by plasterboard manufacturer.
- (c) FIRE STOPPING: Seal any gaps at junctions of linings and cavity barriers with perimeter abutments, service penetrations, etc. using tightly packed mineral wool or approved intumescent sealant, to prevent penetration of smoke and flame.
- (d) JOINTS BETWEEN BOARDS:
- Tapered edged plasterboards: Lightly butted. Leave a 3 mm gap where cut/unbound edges occur. Square edged plasterboards to be finished with textured plastic compound: 3 mm gap.
 - Square edged fibre reinforced gypsum boards: 5 mm gap.
- (e) FIXING PLASTERBOARD TO METAL SUPPORTS:
- Fix securely to all supports, working from the centre of each board using proprietary drywall screws at maximum centers to board manufacturer's recommendations.
 - Position screws not less than 10 mm from the edge of the board. Set heads in a depression; do not break paper or gypsum core.
 - Type and length of screws as recommended in BS 8212, section 2.2.3, unless specified otherwise.
- (f) TAPED SEAMLESS FINISH TO PLASTERBOARD:
- Lightly sand cut edges of boards to remove paper burrs.
 - Fill all joints, gaps and internal angles with joint compound and cover with continuous lengths of paper tape, fully bedded. Reinforce external angles, stop ends, etc. with the specified bead/corner tape.
 - When set, cover with joint finish, feathered out to give a flush, smooth, seamless surface.
 - Spot nail/screw depressions with joint filler to give a flush surface.
 - Fill minor indents. After joint, angle and spotting treatments have dried, lightly sand to remove any minor imperfections.
 - Apply specified primer/sealer to give a continuous consistent texture to surface of boards.

K11	RIGID SHEET FLOORING/SHEATHING/LININGS/CASINGS
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To be read with Preliminaries/General conditions.

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K11/1 TYPE(S) OF FLOORING/SHEATHING/SARKING/LINING/CASING OR EQUIVALENT

- (a) PLYWOOD SOFFITS AND DUCT CASINGS & COVERS.
- Softwood Plywood or OSB3 to an approved national standard.
 - Base: Treated softwood battens Additional supports as specified.
 - Softwood Plywood to BS EN 1995-1-1:1004 + A2:2014 equivalent approved national standard.
 - Formaldehyde Emissions Category E1, in accordance with EN13986. Written proof, from NSAI, or equivalent approved testing body, of compliance with E1 Classification is essential.
 - Thickness: 18 mm
 - Durability class: H
 - Face grain direction: Parallel to longitudinal joints
 - Surface finish: Sanded
 - Edges: Square
 - Fix at 150 mm maximum centres along edges of boards and 300 mm maximum centres along intermediate supports with brass wood screws, countersunk and pelleted.
 - Joint treatment: Butt joints.
 - Note: the use of ordinary MDF WILL NOT be permitted. As an alternative to plywood Medite Ecologique MDF (Zero Formaldehyde) may be used.

K11/2 WORKMANSHIP

- (a) INSTALLATION GENERALLY:
- In the absence of manufacturer's recommendations, store, prepare and fix boards in accordance with the recommendations of the relevant trade association.
 - Keep boards dry and do not fix to timber supports having a moisture content greater than 18%.
 - Ensure that building is weathertight before fixing boards internally.
 - Set out boards with joints accurately aligned, of constant width and parallel to perimeter edges.
 - Methods of fixing, and fasteners to be as section Z20 unless specified otherwise.
 - Protect boards/sheets from dirt, stains and damage until Practical Completion.
- (b) ADDITIONAL SUPPORTS:
- Where specified ensure that additional studs, noggings/dwangs or battens are provided as follows:
 - Butt jointed rigid board areas: To all unsupported edges.
 - All additional studs, noggings or battens to be not less than 50 mm wide, of adequate thickness and have the same treatment, if any, as adjacent timber supports.
- (c) FIXING GENERALLY:
- Securely fix boards/sheets to each support without distortion and true to line and level.
 - Fixings to be sufficient distance from edge of board/sheet to prevent damage, evenly spaced in straight lines and, unless otherwise recommended by board manufacturer, in pairs across joints.
 - Remove surplus adhesive as the work proceeds.
- (d) OPEN JOINTS: Keep perimeter joints, expansion joints and joints between boards free from plaster, mortar droppings and other debris. Remove all temporary wedges and packings on completion of fixing.

- (e) **CONDITION:** all boards other than hardboard by storing on site, in conditions similar to those that will prevail after the building is occupied, for at least 48 hours before fixing. Ensure free circulation of air to all surfaces.
- (f) **MOISTURE CONTENT:** When instructed by ARCHITECT, test boards/sheets with an approved electrical moisture meter used in accordance with manufacturer's recommendations. Provide ARCHITECT with records of all tests.
- (g) **ACCESS PANELS:** Agree size and position with ARCHITECT before boards are fixed. Provide additional noggings/dwangs, battens, etc., as necessary and fix in accordance with board manufacturer's recommendations.

L30 STAIRS/LADDERS/WALKWAYS/BALUSTRADES
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To be read with Preliminaries/General conditions.

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L30/1 GENERAL

(a) SCOPE OF WORKS:

Works are limited to inspection, stabilisation and minimal intervention to existing historic stairs, pending future refurbishment works under a subsequent contract.

(b) PROTECTION:

Protect all existing stair elements, balustrades and adjacent fabric during the works. Prevent damage to retained historic features.

(c) SALVAGE AND RETENTION:

Retain all existing elements unless otherwise instructed. Any loose or detached items to be carefully set aside, labelled and stored for potential reuse or replication. Confirm with Architect/ER whether items are to be retained or disposed of.

(d) REFERENCES:

Refer to Section C51 for timber repair and Section C52 for timber treatment.

L30/2 INSPECTION

- Inspect all stair structures to determine extent of decay, instability and required temporary works.
- Notify Architect/ER of any areas of significant structural concern prior to intervention.

L30/3 STAIRS 1 AND 2 (Location: Building 1. Chapel) – MINOR WORKS

(a) CONDITION:

Stairs generally in fair condition.

(b) WORKS:

- Inspect all timber elements for signs of decay, including dry rot.
- Carry out minimal treatment to arrest further decay.
- Carefully strip finishes to underside of stairs to expose timber.
- Isolate timber elements from direct contact with masonry where feasible to reduce moisture transfer.

(c) LIMITATION:

No replacement or major repairs to be undertaken under this contract unless instructed.

L30/4 STAIR 3 (Location: Building 2) – STABILISATION WORKS

(a) CONDITION:

Stair in poor condition, with partial collapse of landings and structural elements.

(b) RETENTION/ TEMPORARY SUPPORT:

- Existing historic stair to be retained.
- Provide adequate propping and temporary supports to stabilise the remaining structure.

- Temporary works to be designed to avoid damage to historic fabric and to be easily removable in future phases.

(c) TIMBER TREATMENT:

Treat all accessible timber to arrest fungal decay in accordance with Section C52.

(d) BALUSTRADE:

Retain existing balustrade where in stable condition.
Protect during works and stabilise locally where required.

(e) LIMITATION:

No reconstruction of stair or landings under this contract.

M20	PLASTERED/RENDERED/ROUGHCAST COATINGS
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To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

M20/1 TYPE(S) OF COATING OR EQUIVALENT

a) INTERNAL LIME RENDER FOR SOLID MASONRY WALLS OF EXISTING BUILDING

- Location: Existing historic building
- Background: Existing solid masonry walls
- Render Coats: 1
 - First Scud coat
- Preparation: Substrates must be strong, sound and free of particles that hinder adhesion. Strip off the plaster. Brush it down. Let it dry. Scud. Dryline with insulated plasterboard
- Application
 - Installed to manufactures instructions
 - Approximately 7 days should be left between coats but this will vary depending on drying conditions such as weather, temperature etc.
 - wet each coat of plaster down with water prior to putting on subsequent coatings. The purpose of this is to kill the suction of the base coats.
 - Belmix Fibres to be used in the base of lime render. These would be added at a quantity of 1.5kg per ton of mortar.
- Manufacturer: Lafarge Tector Natural Base
- Product Reference
 - Tector Natural Base for the scud, second and third coat. Natural hydraulic lime-based rendering mortar
 - Mortar with natural hydraulic lime binder NHL 3.5 and selected aggregates of particle size < 2.5 mm.
 - It has a dual character:
 - Airborne: Because of its calcium hydroxide content, the mortar absorbs CO2 from the air to provide long-term strengths. They show excellent malleability and very little shrinkage. egates of particle size < 2.5 mm.
 - Hydraulic: Due to its dicalcium silicate content, it sets in the presence of water and develops short-term strengths. The low strengths it provides compared to cement make it suitable for use with delicate materials.
 - 100% natural product permeable to water vapour.
 - Colour to be defined by the customer according to range.

b) INTERNAL PLASTER TO RECEIVE PAINT

- Location: Refer to drawings & schedules
- Background: Concrete block. Surfaces should be dry, clean and free from loose dust and dirt. They should be protected from the weather, and suitable for the chosen specification. Some masonry backgrounds of exceptionally high suction may require pre-treatment with GypPrime or equivalent to control their suction.
- Render coat(s): 11mm of Gyproc HardCoat or equivalent under-coat plaster applied directly to block-work and lightly scratched prior to application of Gyproc Skim Coat finish plaster or equivalent applied 2-3mm in thickness. All structural joints between masonry and RC columns should be spanned with suitable building paper and metal rib-lath suitably fixed ensuring that the metal rib-lath spans the joint onto the block-work by a minimum of 150mm.
- Mixing: Gyproc Hard Coat or equivalent is pre-mixed and only clean water needs to be added to prepare it for use. Hand mixing should be carried out in a clean tray or bath. Excessive mechanical mixing should be avoided. Tools and water used in mixing must be clean. Contamination from previous mixes can shorten the setting time and in turn reduce the strength of the plaster when set.

- Application: Gyproc Hard Coat or equivalent should be applied with firm pressure, built out to the required thickness, ruled to an even surface and lightly scratched to form a key for Gyproc or equivalent finish plaster. For machine application, the plaster should be sprayed on to the background in the form of a ribbon. The consistency should allow the ribbons to run together. When a substantial area is covered, Gyproc Hard Coat or equivalent is worked and ruled as in hand plastering.
- Storage: Bags should be stored dry, as absorption of water shortens the setting time, causes set lumps to form in the bags and may reduce the strength of the set plasterwork. If storing on a concrete floor, dry timber platforms should be provided. Gyproc Hard Coat or equivalent stored correctly has a shelf life of 16 weeks and bags are printed with the 'use by' date in order to permit use in strict rotation.
- Finish: Gyproc Skim Coat finish plaster or equivalent applied 2-3mm in thickness Mixing and application of plaster in accordance with manufacturer's instructions. Achieve a smooth, high quality surface finish ready for decoration using a suitable Gyproc or equivalent finish plaster over Gyproc Hard Coat or equivalent.
- Drying Gyproc Hard Coat or equivalent dries from the surface, appearing surface dry before it is fully dry in depth. Environmental conditions and ventilation can also affect the drying time of the plaster.
- Other: SpecSure™ or equivalent lifetime warranty required. Gyproc HardCoat or equivalent undercoat plaster finished with Gyproc SkimCoat or equivalent plaster applied in accordance with our manufacturers recommendations.
- Air tightness performance of 0.03m³/h.m² (50pa).
- Gyproc Hard Coat or equivalent complies with EN 13279-1 types B4/20/2 and C3/20, and is manufactured under a quality system independently audited and certified as conforming with ISO 9001: 2000.

M20/2 GENERAL REQUIREMENTS FOR WORKMANSHIP

- CONTROL SAMPLE(S): Complete sample area(s), being part of the finished work, in approved location and obtain approval of appearance before proceeding: typical external render.
- UNIFORMITY OF COLOUR AND TEXTURE: Once samples of coatings have been approved do not change type or proportion of constituent materials. Ensure that supplies of materials are sufficient to give consistent and uniform colour and texture. Obtain each material from one source and mix different loads if necessary.
- PROPORTIONS FOR CEMENT GAUGED MORTARS: Except where specified otherwise, mix proportions for cement gauged plaster/render undercoat mortars are to be in accordance with the following designations:

Mix type	Mix designation				
	1	2	3	4	5
Cement: lime: sand	1:¼:3	1: ½:4 to 1: ½:4½	1:1:5 to 1:1:6	1:2:8 to 1:2:9	1:3:10 to 1:3:12
Cement: premixed lime & sand (proportion of lime to sand given in brackets)	1:3 (1:12)	1:4 to 1: 4½ (1:9)	1:5 to 1:6 (1:6)	1:8 to 1:9 (1: 4½)	1:10 to 1:12 (1:4)
Cement: Sand (using plasticizer)	-	1:3 to 1:4	1:5 to 1:6	1:7 to 1:8	-
Masonry cement: sand	-	1:3 to 1:3½	1:4 to 1:6	1 :5½ to 1:6½	-

- CEMENT: As specified in the type of coating clause(s).
 - Where Portland cement is specified Portland blastfurnace cement or Portland pulverized-fuel ash cement may be used as an alternative.
 - Where Portland cement, Portland blastfurnace cement, Portland pulverized-fuel ash cement or Sulfate-resisting Portland cement is specified use Class 42.5 or 52.5 material as defined by the appropriate British Standard.

- All cements must comply with the appropriate British Standard and be licensed under the BSI Kitemark scheme for cement.
- e) **READY-MIXED CEMENT GAUGED MORTARS** may be retarded provided they are to BS 4721, used within the working time and site temperatures recommended by the manufacturer and not remixed on site. Obtain from an approved manufacturer.
- f) **ADMIXTURES:**
- Do not use admixtures unless specified or approved.
 - Do not use admixtures of any type with proprietary mixes.
 - Do not use calcium chloride or any admixtures containing calcium chloride.
- g) **MIXING:**
- Measure materials accurately by volume using clean gauge boxes. Proportions of specified mortar mixes are for damp sand. Adjust proportions if dry sand is used.
 - Mix materials thoroughly to a uniform consistency and appearance using suitable mechanical or manual means or, for proprietary mixes, as recommended by the manufacturer.
- h) **CONTAMINATION:** Do not allow contamination of one type of material by another, or by any set material.
- i) **INITIAL SET:** Do not use mixes after initial set has taken place. Do not retemper or reconstitute mixes, unless permitted by the manufacturer of proprietary mixes.
- j) **SCAFFOLDING:** Use independent scaffolding to avoid putlog holes and other breaks in coatings.
- k) **CLEANLINESS:** Protect thoroughly all existing work and approaches using suitable boards, sheets, etc. clean off all droppings on to finished work immediately.
- l) **COLD WEATHER:** Do not carry out external work when air temperature is below 3°C and falling or below 1°C and rising. Take all necessary precautions to enable internal coating work to proceed without damage when air temperature is below 3°C. Do not use frozen materials and do not apply coatings to frozen or frost bound backgrounds.

M20/3 PREPARING BACKGROUNDS

- a) **ACCEPTANCE OF BACKGROUNDS:** Before preparation or application of coatings ensure:
- Backgrounds are secure, adequately true and level to achieve specified tolerances, free from contamination and loose areas, reasonably dry and in a suitable condition to receive specified coatings.
 - All cutting, chasing, fixing of concealed conduits, service outlets and the like, and making good of the background, is completed.
- b) **PREPARATION GENERALLY:**
- Remove efflorescence, dust and other loose material by thoroughly dry brushing.
 - Remove all traces of paint, grease, dirt and other materials incompatible with coating by scrubbing with water containing detergent and washing off with plenty of clean water. Allow to dry before applying coatings unless specified otherwise.
- c) **KEYING/BONDING:** Prepare backgrounds as specified for the type of coating to be applied. Methods other than those specified may be submitted for approval.
- d) **IN SITU CONCRETE SURFACES:** Scrub with water containing detergent to ensure complete removal of mould oil, surface retarders and other materials incompatible with coating. Rinse with clean water and allow to dry unless specified otherwise.
- e) **SMOOTH CONCRETE SURFACES:** Where no keying mix or bonding agent is specified, wet smooth concrete surfaces immediately before plastering.
- f) **SPATTERDASH KEYING MIX:**

- 1 part Portland cement; 1½ -2 parts clean sharp, coarse sand.
 - Mix to a thick slurry and keep well stirred.
 - Throw onto previously dampened surface to a thickness of 3-5 mm and leave rough. Keep damp with fine waterspray or by covering with polyethylene until set. Allow to dry out slowly and harden before applying undercoat.
- g) BONDING AGENT: Type: SBR, Dilute to manufacturer's recommendations. Apply subsequent plaster/render coating whilst bonding agent is still tacky to ensure a good bond.

M20/4 BACKINGS/BEADS/JOINT

- (a) GYPSUM WALLBOARD OR EQUIVALENT BACKINGS:
- Plasterboard: 12.5 mm gypsum wallboard to BS 1230:Part 1, with grey paper face exposed.
 - Fixing and jointing materials and accessories to be as recommended by the board manufacturer. Fixing: in accordance with manufacturer's recommendations.
- (b) STOP BEADS/ CORNER BEADS/ MOVEMENT JOINT BEADS FOR INTERNAL USE: Material: PVCu beads by SAS probead or Renderplas or equivalent. BBA certified.
- (c) BELLCAST BEAD/ STOP BEADS/ CORNER BEADS/ MOVEMENT JOINT BEADS FOR EXTERNAL USE: Material: PVCu beads by SAS probead or Renderplas or equivalent. Exterior grade UV stable. BBA certified. To suit render thickness.
- (d) BEADS/STOPS GENERALLY:
- Provide beads/stops at all external angles and stop ends except where specified otherwise.
 - Cut neatly, form mitres at return angles and remove sharp edges, swarf and other potentially dangerous projections.
 - Fix securely, using the longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with background. Use mechanical fixings for external beads/stops.
 - After coatings have been applied, remove coating material while still wet from surfaces of beads/stops which are to be exposed to view.
- (e) DISSIMILAR SOLID BACKGROUNDS FOR PLASTERING/RENDERING: Where coating is to be continued without break across joints between dissimilar solid backgrounds which are in the same plane and rigidly bonded or tied together, cover joints with a 150 mm wide strip of building paper to BS 1521 and overlay with 300 mm wide expanded stainless-steel lathing. Orientate lathing in accordance with manufacturer's recommendations and fix securely at 300 mm staggered centres along both edges using stainless steel screws with spacers
- (f) MOVEMENT JOINTS:
- Form joints in coatings to coincide with movement joints in background using:
 - stop beads at internal angles and movement joint bead for other joints in external render
 - Ensure that joints extend through coating to background.
- (g) CONDUITS bedded in undercoat to be covered with 100 mm wide joint tape bedded in finishing coat mix, pressed flat and trowelled in. Do not lap ends of tape.
- (h) TAPING JOINTS: Fill and tape (scrim) the following joints between boards (except where coincident with a metal bead): all joints and angles Bed tape centrally over joints using same plaster as following coat. Do not lap ends. Press well in, trowel flat and smooth and allow to set but not dry out before applying coating.
- (i) SERVICE CHASES: Cover with galvanized steel mesh strip fixed securely at 300 mm staggered centres along both edges.

M20/5 PLASTERING

- (a) **APPLICATION GENERALLY:**
- Apply each coating firmly to achieve good adhesion and in one continuous operation between angles and joints. All coatings to be not less than the thickness specified, firmly bonded, of even and consistent appearance, free from rippling, hollows, ridges, cracks and crazing.
 - Finish surfaces to a true plane, to correct line and level, with all angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
 - Prevent excessively rapid or localised drying out.
- (b) **DUBBING OUT:** If necessary to correct background inaccuracies, dub out in thicknesses of not more than 10 mm in same mix as first coat. Allow each coat to set sufficiently before the next is applied. Cross scratch surface of each dubbing out coat.
- (c) **METAL MESH LATHING:** Work undercoat well into interstices to obtain maximum key.
- (d) **UNDERCOATS GENERALLY:** Apply firmly, rule to an even surface and cross scratch each coat to provide a key for the next coat.
- (e) **CEMENT GAUGED UNDERCOATS:** Allow to dry out thoroughly, but not too rapidly, to ensure that drying shrinkage is substantially complete before applying next coat.
- (f) **THIN COAT PLASTER:** Before applying single coat plaster of less than 2 mm thickness, prepare surface by filling holes, scratches and voids with finishing plaster.
- (g) **SMOOTH FINISH:** Trowel or float to produce a tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks. Do not use water brush and avoid excessive trowelling and over polishing.
- (h) **WOOD FLOAT FINISH:** Finish with a dry wood float as soon as wet sheen has disappeared from surface to give an even overall texture.

M20/6 RENDERING

- (a) **APPLICATION GENERALLY:**
- Apply each coating firmly to achieve good adhesion and in one continuous operation between angles and joints. All coatings to be not less than the thickness specified, firmly bonded, of even and consistent appearance, free from rippling, hollows and ridges.
 - Finish surfaces to a true plane, to correct line and level, with all angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
 - Prevent excessively rapid or localised drying out.
- (b) **ACCURACY** of rendering to receive tiles fixed with adhesive. The variation in gap under a 1.8 m straight edge (with feet) placed anywhere on the surface to be not more than 3 mm.
- (c) **DUBBING OUT:**
- If necessary to correct background inaccuracies dub out in thicknesses of not more than 13 mm in same mix as undercoat. Total thickness of dubbing must not exceed 25 mm unless approved otherwise. In areas where thickness of dubbing will exceed 20 mm, first apply an approved keying/ bonding treatment. Comb surface of each dubbing out coat. Allow each coat to set but not dry before the next is applied.
- (d) **ANCHORED MESH REINFORCEMENT:** The first undercoat must be applied through and round the mesh to fully bond with the solid background.
- (e) **UNDERCOATS GENERALLY:**
- Apply first undercoat or dubbing out coat by throwing from a trowel.
 - Allow to stiffen and comb to provide a key for the next coat. Comb to produce evenly spaced wavy horizontal lines, approximately 20 mm apart and 5 mm deep. Do not penetrate through the coat.

- Brush down each undercoat to remove dust and loose particles and dampen to control suction before applying next coat.
- (f) **FINAL COAT - PLAIN FLOATED FINISH:** Finish with wood or other suitably faced float to give an even, open texture. Do not apply water while working up. Do not draw excessive laitance to surface (either by overworking or by use of steel trowel).
- (g) **DRYING:** Work in the shade and out of drying winds whenever possible.
- (h) Keep each undercoat and final coat damp for the first 3-4 days by covering with polyethylene sheet and/or spraying with water. Hang sheeting clear of the final coat where it is the final finish. Thereafter prevent from drying out too rapidly.
- (i) Allow each coat to dry out thoroughly to ensure that drying shrinkage is substantially complete before applying next coat.
- (j) **PROTECTION:** Adequately protect newly applied external coatings against frost and rain for the first 48 hours using polyethylene sheet hung clear of the face, or other approved method.

M60 PAINTING/CLEAR FINISHING

To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

M60/1 NOTIONAL TYPES OF PAINTS / CLEAR FINISHING

- a) **CLEAR FINISHING TO INTERNAL VENEERED TIMBER.**
 - Manufacturer: Dulux Paints Ireland or equivalent.
 - Surface(s): Timber
 - Preparation: As below
 - Initial coat(s): Two coats Dulux Trade Diamond Glaze satin finish or equivalent.
 - Finishing coats: One coat as initial coats.
- b) **PAINTING TO NEW CEILINGS & BULKHEADS.**
 - Manufacturer: Dulux Paints Ireland or equivalent.
 - Surface(s): Concrete, Plaster, or plasterboard.
 - Preparation: One mist coat of Supermatt
 - Initial coat(s): One coat Dulux Trade Supermatt or equivalent
 - Finishing coats: One coat as initial coat.
- c) **COATINGS TO EXTERNAL TIMBER, HARDWOOD**
 - Manufacturer: Dulux Paints Ireland or equivalent.
 - Surface(s): Timber;
 - Preparation: As below
 - Initial coat(s): One coat Dulux Aluminium Wood Primer, and One coat Dulux Exterior Flexible System Undercoat or equivalent.
 - Finishing coats: One Coat Dulux Flexible Gloss..
- d) **PAINTING TO INTERIOR BLOCK WALLS, DRY LINING, DUCT ENCLOSURES & MISCELLANEOUS AREAS.**
 - Manufacturer: Dulux Paints Ireland or equivalent.
 - Surface(s): Plasterboard, Concrete Block
 - Surface Condition: Good (new uncoated)
 - Finish type: Water based.
 - Sheen: Low (flat / matt)
 - Preparation: One mist coat Dulux Trade Supermatt
 - Initial coat(s): One coat Dulux Trade Diamond Matt or equivalent
 - Finishing coats: One coat as initial coat.
- e) **CLEAR SEALER TO INTERIOR BLOCK WALLS NORMAL WEAR, FAIR- FACED BLOCKWORK & IN-SITU F/F CONCRETE.**
 - Manufacturer: Fleetwood F507 Acrylic Sealer or equivalent water based quick drying clear sealer.
 - Surface(s): Concrete Block
 - Preparation: As below
 - Initial coat(s): One coat F507 Acrylic Sealer or equivalent
 - Finishing coats: Two coats F507 Acrylic Sealer or equivalent
 - Application: Strictly in accordance with manufacturer's instructions
- f) **DOOR FRAMES, DOORS & DOOR SCREENS.** To be pre-finished by door manufacturer prior to dispatching to site. Main Contractor will be responsible for any touching up on site that may be required to restore to a pre-finish quality.
 - Manufacturer: Dulux Paints Ireland or equivalent.

- Surface(s): timber doors, frames, screens and linings.
 - Preparation: As below
 - Initial coat(s): 1 coat Dulux Trade Diamond Satinwood or equivalent.
 - Finishing coats: 2 coats as initial coats.
- g) PAINTING TO INTERIOR MDF SKIRTINGS, WINDOWBOARDS ETC
- Manufacturer: Dulux Paints Ireland or equivalent.
 - Surface(s): MDF skirtings and linings.
 - Preparation: One Coat Dulux Trade Quick Drying Undercoat
 - Initial coat(s): 1 coat Dulux Trade Diamond Satinwood or equivalent.
 - Finishing coats: 2 coats as initial coats.
- k) PAINTING TO TIMBER INTERIOR DOORS, SCREENS, FRAMES, WINDOWS, ARCHITRAVES AND SKIRTING – PREVIOUSLY COATED
- Manufacturer: Dulux Paints Ireland or equivalent.
 - Surface(s): Existing Wood coated with paint or varnish
 - Preparation: As below and to manufacturers details
 - Colour: to be confirmed by ER
 - Undercoat: One Coat Dulux Trade Quick Drying Undercoat
 - Initial coat(s): One coat Dulux Trade Diamond Satinwood or equivalent.
 - Finishing coats: One coat as initial coat.
- m) PAINTING TO INTERNAL LIME PLASTER – EXISTING BUILDING
- Manufacturer: Ralston or equivalent breathable paint
 - Surface(s): Lime Plaster
 - Preparation: To manufacturers instructions
 - Colour: Selected colour to be confirmed
 - Initial coat(s): One coat Ralston Siloxan primer to manufacturers instructions
 - Finishing coats: Two coats Ralston Siloxan Matt breathable interior paint

M60/2 GENERALLY

- a) COATING MATERIALS to be obtained from specified manufacturers below unless otherwise approved by Architect in writing. Inform the Architect of selected manufacturer before commencement of any coating work.
- b) HANDLING AND STORAGE:
- Coating materials must be delivered in sealed containers, each clearly labelled with the brand name, type of material and manufacturer's batch number. No non-approved paint brand containers to be permitted on site.
 - Wherever possible materials must be from one manufacturing batch. Inform the Architect if materials from more than one batch are to be used, store separately and allocate to distinct parts or areas of the work.
 - Store materials in accordance with manufacturer's recommendations. Use in order of delivery and before expiry of any shelf life date.
- c) COMPATIBILITY
- Check that all materials to be used are recommended by their manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other.
 - Where surfaces have been treated with preservatives or fire retardants, check with treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance.
 - Inform the Architect of any discrepancy in specification of coatings and obtain instructions before proceeding with application.
- d) ANCILLARY SURFACES: The descriptions of areas to be coated given in schedules, etc. are of necessity simplified. All ancillary exposed surfaces and features are to be coated to match similar or adjacent materials or areas except where a fair faced natural finish is required or items are completely prefinished. In cases of doubt obtain instructions before proceeding.

- e) SURFACES NOT TO BE COATED: radiator valves and stop valves. Existing stonework
- f) OFF SITE WORK:
 - All off site preparation and coating to be carried out under cover in a suitable environment with adequate lighting. Store all items, both before and after coating, in a clean, dry area protected from the weather and mechanical damage, properly stacked with spaces to permit air circulation and prevent sticking of surfaces.
- g) PROTECTION:
 - Adequately protect internal and external surfaces, fixtures and fittings which are not to be coated, by covering with dust sheets, masking or other suitable materials.
 - Exhibit 'Wet paint' signs and provide barriers where necessary to protect other operatives and the general public, and to prevent damage to freshly applied coatings.
- h) CONTROL SAMPLE(S): Prepare sample areas of the finished work, including preparation, in advance of the remainder as set out below. Obtain approval of appearance before proceeding. Type(s) of coating Nature of sample: one 3mx3m area in typical fairfaced blockwork.
- i) INSPECTION OF WORK: Permit coating manufacturers to inspect the work in progress and take samples of their products from site if requested. Specifically include for manufacturer to inspect existing surfaces after preparation and prior to following coats. Include for testing by the paint supplier to confirm that the full number of coats has been installed.

M60/3 PREPARATION

- a) PREPARATION GENERALLY: To BS 6150,
 - Materials used in preparation must be types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
 - Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain comments from the ER before commencing work. Include for all costs required for safe removal of lead based paints.
 - Prevent or control exposure of operatives to dust, vapour and fumes exceeding occupational exposure standards set in the current Health and Safety Executive (HSE) document EH40.
 - Substrates must be sufficiently dry in depth to suit the coating to be applied.
 - Remove efflorescence salts from surfaces. Repeat removal if efflorescence recurs.
 - Clean off dirt, grease and oil from surfaces. If contamination of surfaces/substrates has occurred, obtain instructions before proceeding.
 - Smooth surface irregularities. Fill joints, cracks, holes and other depressions with stoppers/fillers worked well in and finished off flush with surface. Abrade to a smooth finish.
 - Apply oil based stoppers/fillers after priming. Apply water based stoppers/fillers before priming unless recommended otherwise by manufacturer. Patch prime water based stoppers/fillers when applied after priming.
 - Remove dust and particles from dry abrasive preparation of surfaces. Remove residues from wet preparation of surfaces by rinsing with clean water, wiping and allowing to dry.
 - Joints, cracks, holes and other depressions: Fill flush with surface, to provide smooth finish. The contractors attention is specifically called to the nature of the existing Historic Building, significant filling of cracks, depressions, holes, or removal of lumps etc should be expected and should be included for.
 - Ensure that doors, opening windows, etc, are 'eased' as necessary before coating. Prime any resulting bare areas.
 - On existing surfaces it is likely that there is a build up of paints, including a mix of oil and water based paints. So there will be a mix of finishes and surfaces as should be expected by a Contractor working on older buildings of this age. For the avoidance of any doubt the Contractor is entirely responsible for all preparation work required to provide a suitable surface for the number of paint coats described in the attached specification. It is specifically highlighted that additional finishing coats may be required to cover existing stronger colour existing surfaces or a mix of paint types. The Contractor

is deemed to have included for any such additional coats as are required to meet this requirement.

- b) **SUITABILITY OF SURFACES AND CONDITIONS:** Application of coatings will be taken as joint acceptance by the Main Contractor and the Painting Contractor of the suitability of surfaces and conditions within any given area to receive the specified coatings.
- c) **DOORS AND WINDOWS:** Ensure that doors and opening windows, etc., are 'eased' as necessary before coating. Prime any resulting bare areas.
- d) **IRONMONGERY:** Remove from surfaces to be coated and refix on completion. Do not remove hinges unless instructed to do so.
- e) **PREPRIMED TIMBER:** Abrade chalking, powdery and other defective primer back to bare timber, remove dust and reprime resulting bare areas.
- f) **UNCOATED TIMBER:** Abrade to a smooth, even finish with arrises and moulding edges lightly rounded or eased. Ensure that heads of fasteners are countersunk sufficiently to hold stoppers/fillers. Apply two coats of knotting to resinous areas and knots and allow to dry.
- g) **PREPRIMED STEEL:** Abrade defective primer, corrosion and loose scale back to bare metal, remove dust and re-prime resulting bare areas.
- h) **UNCOATED STEEL - BLAST CLEANING:**
 - Remove oil and grease. Blast clean in dry atmospheric conditions using abrasive of suitable type and size, free from fines, moisture and oil. Continue blasting until surface complies with BS 7079: Part A1, preparation grade Sa21/2 Prime surface as soon as possible after blast cleaning and in any case within four hours.
- i) **UNCOATED CONCRETE:** Remove release agents with detergent/emulsion solutions. Ensure that major surface defects are repaired.
- j) **UNCOATED MASONRY/RENDERING:** Remove loose and flaking material with a stiff brush after being aired for a minimum of 30 days @ 24 deg C.
- k) **UNCOATED PLASTER:** Scrape off nibs, trowel marks and plaster splashes. Abrade lightly any overtrowelled 'polished' areas.
- l) **UNCOATED PLASTERBOARD:** Fill depressions around fixings.
- m) **IRONMONGERY:**
 - Removal: Before commencing work: Remove ironmongery from surfaces to be coated.
- n) **PREVIOUSLY COATED SURFACES GENERALLY**
 - Preparation: In accordance with BS 6150, clause 11.5.
 - Contaminated or hazardous surfaces: Give notice of:
 - Coatings suspected of containing lead. Special precautions should be taken during surface preparation of historic paint surfaces over wood and metal as they may contain lead.
 - Substrates suspected of containing asbestos.
 - Significant rot, corrosion or other degradation of substrates.
 - Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain comments from the ER before commencing work.
 - Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
 - Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
 - Alkali affected coatings: Completely remove.
 - Retained coatings:
 - Thoroughly clean to remove dirt, grease and contaminants.
 - Gloss coated surfaces: Provide key.
 - Partly removed coatings:

- Additional preparatory coats: Apply to restore original coating thicknesses.
 - Junctions: Provide flush surface
 - Include for all costs necessary to restoring original coating thicknesses. This is an existing historic building with a mix of finishes, surfaces etc expect and allow for significant preparation work..
 - Completely stripped surfaces: Prepare as for uncoated surfaces.
- o) PREVIOUSLY COATED SURFACES – BLAST CLEANING
- Operatives:
 - i. Trained/ experienced in blast cleaning.
 - ii. Submit evidence of training/ experience on request.
 - Dust and nuisance: Minimize.
- p) PREVIOUSLY COATED SURFACES – BURNING OFF
- Risk assessment and method statement: Prepare, and obtain comments from the ER before commencing work.
 - Adjacent areas: Protect from excessive heat and falling scrapings.
 - Exposed resinous areas and knots: Apply two coats of knotting.
 - Removed coatings: Dispose of safely.
- q) PREVIOUSLY COATED WOOD
- Degraded or weathered surface wood: Take back to provide suitable substrate.
 - Degraded substrate wood: Repair with sound material of same species.
 - Exposed resinous areas and knots: Apply two coats of knotting.
- r) PREVIOUSLY COATED STEEL
- Defective paintwork: Remove to leave a firm edge and clean bright metal.
 - Sound paintwork: Provide key for subsequent coats.
 - Corrosion and loose scale: Take back to bare metal.
 - Residual rust: Treat with a proprietary removal solution.
 - Bare metal: Apply primer as soon as possible.
 - Remaining areas: Degrease
 - This clause does not apply to cast iron work see cast iron spec..
- s) ORGANIC GROWTHS
- Dead and loose growths and infected coatings: Scrape off and remove from site.
 - Treatment biocide: Apply appropriate solution to growth areas and surrounding surfaces.
 - Residual effect biocide: Apply appropriate solution to inhibit re-establishment of growths.
- t) PREVIOUSLY PAINTED WINDOW FRAMES
- Paint encroaching beyond glass sight line: Remove.
 - Loose and defective putty: Remove.
 - Putty cavities and junctions between previously painted surfaces and glass: Clean thoroughly.
 - Finishing:
 - i. Patch prime, reputty as necessary, and allow to harden.
 - ii. Seal and coat as soon as sufficiently hard.

M60/4 APPLICATION

- a) UNSUITABLE CONDITIONS:
- Take all necessary precautions including restrictions on working hours, providing temporary protection and allowing extra drying time, to ensure that coatings are not adversely affected by climatic conditions during and after application Prevent or control exposure of operatives to solvent vapour levels exceeding Occupational Exposure Levels (OEL's) as set in the 2007 Approved Code of Practice (ACOP) for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I 619 of 2001)
 - Unless it is specifically permitted by the coating manufacturer, do not apply coatings:

- To surfaces affected by moisture, frost or airborne dust.
 - When the air or substrate temperature is below 5 °C.
 - When the relative humidity is above 80%.
 - When heat is likely to cause blistering or wrinkling.
- b) COATING GENERALLY: To BS 6150, Sections
- Do not use materials which show any bittiness or other defects when applied. Do not thin or intermix unless specified or recommended otherwise.
 - Apply priming coats as soon as possible on the same day as preparation is completed. They must be of adequate thickness and suit surface porosity.
 - Apply coatings by brush or roller unless otherwise specified or approved.
 - Keep brushes and equipment in a clean condition. Dispose safely of cleaning and waste materials; do not pour into sanitary appliances or drains. Subsequent coats of the same pigmented material must be of a different tint to ensure that each coat provides complete coverage. Apply coatings to clean, dry surfaces in accordance with the manufacturer's recommended intervals between coats.
 - Apply coatings evenly to give a smooth finish of uniform colour, free from brush marks, sags, runs and other defects. Cut in neatly and cleanly. Do not splash or mark adjacent surfaces.
 - Adequately protect drying and completed work from damage.
 - Doors, opening windows and other moving parts: Ease before coating and between coats.
- c) PRIMING JOINERY: Before priming preservative treated timber ensure that any cut surfaces have been retreated and that all preservatives are completely dry. Liberally coat all end grain, allow to soak in and then recoat.
- d) CONCEALED JOINERY SURFACES: Where one or more additional coats are specified to be applied in the factory, they must be applied to all surfaces, including those which will be concealed when components are fixed in place.
- e) STAINING WOOD
- Primer: Apply as recommended by stain manufacturer.
 - Application: Apply in flowing coats and brush out excess stain to produce uniform appearance.
- f) VARNISHING WOOD
- First coat: Preservative primer
 - Brush well in and lay off avoiding aeration.
 - Subsequent coats: Rub down lightly along the grain between coats.
- g) EXTERNAL DOORS: Prime and coat bottom edges before hanging.
- h) BEAD GLAZING: Joinery which is to be painted must have the primer and one undercoat applied to rebates and beads before glazing.
- i) GLAZING: Protect etched, sand blasted and ground glass from contamination by oily constituents of coating materials by treating or marking edges before coating and cleaning surfaces after coating.
- j) COMPLETION: Ensure that opening lights and other moving parts move freely. Remove all masking tape and temporary coverings.
- k) must have the primer and one undercoat applied to rebates and beads before glazing.
- l) GLAZING: Protect etched, sand blasted and ground glass from contamination by oily constituents of coating materials by treating or marking edges before coating and cleaning surfaces after coating.
- m) COMPLETION: Ensure that opening lights and other moving parts move freely. Remove all masking tape and temporary coverings.

M61 INTUMESCENT COATINGS FOR FIRE PROTECTION OF STEEL WORKS

To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

PROTECTIVE COATING SYSTEMS

160A OFF SITE COATING TO PRIMED STEEL :

- Use/ Location: Exposed internal faces of columns, beams and trusses.
- Fire resistance to BS 476-21: 60 minutes.
- Preparation and priming: By steelwork contractor, as section G10. Zinc phosphate, in accordance with Engineers specification
- Intumescent coat:
 - Manufacturer: Nullifire. Product reference: S707-60.
 - Finish: Non-visible areas: Basic, as clause 440. and Visible areas: High decorative, as clause 460.
- Top sealer coat: TS 716 water-based vinyl
 - Coats: 2.
 - Colour: To be confirmed.
- Bolt head/ nut protection: As main steelwork.

GENERAL REQUIREMENTS

205 VALIDATION OF MATERIALS

- Project specific evaluation of intumescent coating materials:
 - Standard: To BS 8202-2, clause 4.
 - Test results: Submit on request.

210 WORKING PROCEDURES

- Standard: To BS 8202-2.
- Give notice: Before commencing surface preparation and coating application.
- Quality control: Record project specific procedures for surface preparation and coating application.

215 WORKING CONDITIONS

- General: Maintain suitable temperature, humidity and air quality during coating application and drying.
- Surfaces to be coated: Clean and dry at time of coating application.

220 APPLICATOR'S PERSONNEL

- Operatives: Trained/ experienced in anticorrosive and intumescent coatings.
- Evidence of training/ experience: Submit on request.

250 SPRAYED COATING APPLICATION

- Spray drift: Minimize.
- Masking: Protect designated adjacent surfaces.
- Designated surfaces: All adjacent surfaces where work is carried out on site.

260 CONTROL SAMPLES

- General: Carry out sample areas of finished work as follows: To be agreed on site.
- Approval of appearance: Obtain before commencement of general coating application.

270 INSPECTION

- Permit intumescent coating manufacturer to:
 - Inspect work in progress.
 - Inspect quality control records.
 - Take dry film thickness and other measurements.
 - Take samples of coating products.

- Intumescent coating manufacturer's inspection reports: Submit without delay.

280 OFF SITE COATED STEEL

- Handling and erection: Use methods and devices designed to minimise damage to intumescent coatings.

PREPARATION OF SURFACES

315 NEW STEEL - BLAST CLEANING

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

APPLICATION OF COATINGS

410 INTUMESCENT DRY FILM THICKNESS (DFT)

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

420 MEASUREMENT OF INTUMESCENT DFT

- Primer dft: Determine average dft (for deduction from total dft after application of intumescent).
- Intumescent dft: Determine at:
 - 500 mm centres along each coated plane of universal sections (8 planes), and rectangular hollow sections (4 planes).
 - 125 mm centres along coated circular hollow sections, spread evenly around circumference.
- Acceptance standard:
 - Average intumescent dft: Not less than required dft (exclusive of primer and top sealer).
 - Local intumescent dft: Not less than 80% of required dft. Areas greater than 100 mm equivalent diameter with a dft of less than 80% of required dft must be brought up to thickness.

440 BASIC FINISH

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

450 NORMAL DECORATIVE FINISH

- Definition: Good standard of cosmetic finish generally, when viewed from a distance of 5 m or more. Minor orange peel or other texture is acceptable.

460 HIGH DECORATIVE FINISH

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

490 TOP SEALER COAT

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

520 COMPLETION OF OFF SITE COATED STEEL

- Exposed unprotected areas, including fixings: Following erection of steelwork, apply intumescent coating locally.
- Unscheduled additional connections to erected steelwork: Remove and reinstate intumescent coating locally.

530 RECORDS OF COATED STEEL

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

N25	PERMANENT ACCESS & SAFETY EQUIPMENT
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To be read with Preliminaries/General conditions.

Roof access to 3 no flat roofs to have latch on safety equipment.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

N25/1 MINIMUM CONTRACTOR STANDARD

This equipment is highly specialised and the Tendering Sub-Contractor must provide the following information with the Tender – failure to provide this information will disqualify the Tenderer;

- Evidence of sub contractor's Professional Indemnity Insurance, €10 million minimum. Professional Indemnity Insurance provided by third parties will not suffice.
- Evidence of ISO9001 & OHSAS 18001 Quality Systems Accreditation.
- The name of the Health & Safety Manager within the organisation and evidence of qualifications.
- Confirmation that the Tenderer's Cable Support Posts are strictly as per Clause below – i.e. posts are one piece with no internal force management system.
- Confirmation that the Tendering company has been in the fall prevention industry for at least 10 years.

On request of the ER the Tenderer must forward confirmation of the following:

- Employers Liability Insurance to €13m.
- Public Liability Insurance to €13m.
- Products Liability Insurance to €13m.
- Three years audited accounts.
- Membership of Irish Health and Safety associations like NISO, ISHA etc.
- Membership of an Irish based Trade Union.
- Membership of the CFOPS pension / CIF sick pay scheme.
- Names of the proposed installation crew and proof that they are trained as banksmen and have training in Work at Height, particularly Rescue from Height.
- Name of company Safety Representative along with copies of their certification / qualifications.
- Names of three projects of equal size completed in Ireland in the last 3 years along with contact names and numbers for reference checks.
- Contact names and telephone numbers for the facilities manager in charge of each of the above three projects, (to check that on-going maintenance contracts are in place and that the installations are fit-for-purpose).

Reference Documents

The schedule of references is not exhaustive and shall also be supplemented by those listed under each related work section. Note that where a standard comprises a number of parts, the latest issues and amendments of each part shall apply.

The Sub-contractor must comply with all relevant standards, etc. at the time of supply.

EN and B.S. Documents Referred to in this Section Include:

EN 795 1997/2012	Personal Protective Equipment against Falls from a Height -Anchor Devices - Requirements and Testing.
BS7883 2005:	Application and Use of Anchor Devices Conforming to BS EN 795.
EN 354 2002:	Personal Protective Equipment against Falls from a Height - Lanyards.
EN 355 2002:	Personal Protective Equipment against Falls from a Height - Energy Absorbers.

EN 358 2000: Personal Protective Equipment against Falls from a Height - Work Positioning Systems.
 EN 361 2002: Personal Protective Equipment against Falls from a Height - Full Body Harnesses.
 EN 363 2008: Personal Protective Equipment against Falls from a Height - Fall Arrest Systems.
 EN 365 2004: Personal Protective Equipment against Falls from a Height - General Requirements for Instructions for Use and for Marking.
 BS8437 2005: Code of Practice for Selection, Use and Maintenance of Personal Fall Protection Systems and Equipment for use in the Workplace.
 EN970 1997: Non-destructive Examination of Fusion Welds. Visual Examination.

HSA documents referred to in work section N25 are:

Health, Safety and Welfare at Work Act 2005 and Regulations as follows;

- Construction Regulations 2006
- General Applications Regulations 2007; Part 4 Working at Height.

N25/2 TYPES OF EQUIPMENT

a) GUIDED TYPE FALL PREVENTION SYSTEM FOR: FLAT ROOF AREAS

- Drawing reference(s) see Architect's Roof Plans
VOL A.3.1 WD-EW2-103
- Manufacturer Skyway Safe Access Equipment or equivalent
- System: must be fully compatible with roofing system and be approved for installation on the roof by the roofing manufacturer
- Anchorage device: 8mm Stainless steel cable.
- Overall system length: as sub-contractors design.
- Anti-Pendulum Anchors as required by the design to prevent swing-fall.
- Intermediate support spacing: as sub-contractors design.
- Accessories/other requirements: as subcontractors design.
- System to be installed in accordance with the BS 7883 and EN 795 by the system manufacturer or a contractor approved by the system manufacturer.
- System must be continuous at all intermediate and corner brackets – users must not have to detach from the system to bypass brackets.
- Cable system to be supported on posts as below. Sub-contractor to prove the roof can take the loads from the posts. Posts may deform in the event of a fall but must not come apart – i.e. must be fully welded with no internal spring or other active force management mechanisms.
- - **Membrane on Insulation on Metal Deck;** Stainless steel posts to sit on top of finished roof membrane and attached to deck with stainless steel toggle bolts after the membrane is complete. Weathering by roofing contractor.
 - **Wall mounted** fixings must be stainless steel and in strict accordance with the details provided.

b) TEMPORARY LADDER RESTRAINTS

- Drawing reference(s): Refer to Architect's Roof Plans
- Manufacturer: Skyway Safe Access Equipment or equivalent
- Standard: to BS EN 795
- Single point anchorage devices for securing portable ladders up to but not exceeding 9m
- Finish: Powder coated to selected RAL colour.
- Fitted to any wall to engineers/ manufacturers details
- Installation in accordance with BS 7883
- Other requirements: Provide with each anchor a backing disc giving the manufacturers name and telephone number and the date of installation and a certificate of compliance with testing and examination requirements of BS EN365
- Comply with BS5395

c) WALKWAYS

- Drawing reference(s): Refer to Architect's Roof Plans.

- Manufacturer: Bauder embossed walkway membrane or equivalent
- Material: Polyester reinforced PVC-P single ply walkway membrane.
- Slip Resistance: Bauder PVC embossed walkway membrane achieves slip resistance class R10 and water drainage class V5
- CE Marking: CE marking in accordance with harmonised European Standard
- Other requirements: To be approved and or deemed suitable for use by the roofing system manufacture and maintain their roofing system warranty / guarantee.

d) **PERSONAL FALL PROTECTION EQUIPMENT (PFPE)**

- Supply the following for storage on site and used by trained personnel only:
 - 2 Skyway Full Body Harness
 - 2 Skyway Standard 2m shock absorbing lanyards
 - 2 Skyway 10m Rope & Grabs
 - 2 Skyway Cable Shuttles.
 - Accessories/Other requirements: as per Bill of Quantities Description.

Note all PFPE must be CE marked – however CE marking does not apply to the elements fixed to the building (posts, cables etc).

N25/3 DESIGN / LAYOUT OF SYSTEMS

- The Tenderer's submission must allow for 100% safe access to all roof areas unless strictly specified otherwise by the Client.
- The Tenderer must, if necessary, advise that equipment is required in areas where the architect or design team may have missed potentially hazardous areas.
- Furthermore, the Tenderer must highlight on a drawing or in writing any areas of the roof that are not covered by the Tenderer's design with a reason why these areas are not included.
- AutoCAD Drawings must be submitted to the design team for approval. However, note that the architect is not an approving authority. The architect may comment on drawings as submitted for approval but it remains the responsibility of the Tenderer to meet the design requirements of all Health & Safety Regulations and Standards as listed above.

N25/4 TESTING OF CABLE SYSTEMS

- Tenderer to provide a copy of their in-house policies and procedures document on proof testing of the swage joints on site using Hydrajaws Cable Test Equipment.
- No less than 8 swages or a minimum of 50% of all swages, whichever is greater, including splices must be proof tested on site to 10kN.
- At least one test must be witnessed by the contractor / client.

N25/5 INFORMATION TO BE PROVIDED WITH TENDER

Submit the following:

- General arrangements drawing(s) at suitable scales showing the proposed layout of access/safety equipment.
- Proposed details of all necessary fixings and abutments with the building fabric.
- Location, direction and magnitude of all significant loads imposed on the building structure/fabric by the equipment.
- Schedule of builder's work, with drawings as necessary, showing extent and details of all work associated with the installation for which the equipment manufacturer/supplier is not contractually responsible.
- Schedule of special provisions and special attendances by others.
- Confirmation that 100% of the roof areas are covered – if this is not the case the reasons why must be highlighted. Refer to Clause N25/3 above. No extra work/variations will be entertained by the client/design team at a later stage.

N25/6 INFORMATION TO BE PROVIDED AFTER ACCEPTANCE OF TENDER:

Detailed AutoCAD drawings to fully describe fabrication and installation as follows:

Drawing content:

- Contractor's name and contact number.
- If third party manufacturers are used provide their name along with model numbers of equipment

proposed.

- General arrangement of the complete installation.
- Detailed description on how initial access to the roof is achieved.
- Restricted areas/ other areas not covered by the design and reasons why.
- Proposed details on how each element (posts etc) are attached to the building.
- Full Design Notes with design loads (as applied to the building), notes on use, installation and certification of the systems.

N25/7 DESIGN/ PERFORMANCE REQUIREMENTS

a) WIND LOADING

- General: Design the access/ safety system to withstand specified wind loads with equipment in position of maximum exposure and in parked position.
- Wind loads: Severe.

b) FINISHING

- General: The equipment as installed must have no irregularities/ projections capable of inflicting personal injury.
- Finished surfaces and edges of all accessible parts: Regular and smooth.

c) DESIGN LIFE/ MAINTENANCE PROGRAMME

- Design life of access/ safety system: Not less than 30 years.
- Schedule for maintenance and for replacement of components: Submit.

d) ASSESSMENT/ TESTING OF FIXING POINTS FOR ANCHOR DEVICES

- Design and installation of fixings in steelwork or timber: Verified by calculation to be capable of sustaining the relevant static and dynamic test forces specified in BS EN 795, clause 4.3.
- Fixings in other materials: Verify suitability by carrying out a test in a sample of the material. The sample must be capable of sustaining the relevant static and dynamic test forces specified in BS EN 795, clause 4.3. Thereafter, each structural anchor installed in that material must be subjected to an axial pull out force of 6 kN to confirm the soundness of the fixing. The structural anchor must sustain the force for a minimum of 15 seconds.

N25/8 FABRICATION, ASSEMBLY AND INSTALLATION

a) FABRICATION AND ASSEMBLY GENERALLY

- Machine cutting, drilling and assembly: Carry out as much as possible in the workshop. Obtain approval for any reassembly on site.
- Dissimilar metal surfaces of assembly components/ supports/ fixings: Isolate to prevent electrolytic or bi-metallic corrosion.

b) PROTECTION

- General: Do not deliver to site any components or assemblies that cannot be installed immediately or unloaded into a suitable well protected storage area.

c) SUITABILITY OF STRUCTURE/ FABRIC

- Visual, geometric and structural survey of supporting structure and fabric: Carry out before commencing installation of access/ safety system. Report immediately if structure/ fabric will not allow required accuracy or structural adequacy or security of fixing.

d) MECHANICAL FIXINGS

- Materials: Unless otherwise recommended by equipment manufacturer:
 - Connecting bolts and other fixings fully accessible for inspection: Mild steel hot dip galvanized to BS 7371-6.
- Nuts: Tapped after galvanizing.
 - Cast-in anchors and other fixings not accessible for routine inspection: Zinc plated or austenitic stainless steel, grade 1.4401 (316) to BS EN 10088-1.

e) FIXINGS FOR SECURING EQUIPMENT

- Adjustment capability: Adequate three-dimensional adjustments to accommodate building structure/ fabric irregularities.

f) FIXING ANCHOR INSTALLATION

- Site drilling or cutting into structure/ fabric: Permitted only in approved locations.
- Distance between all fixing devices and edges of supporting material: Not less than recommended by fixing manufacturer.

g) IDENTIFICATION AND REGISTRATION LABELS FOR FALL PREVENTION SYSTEMS

- Provision: Provide and fix to each piece of equipment a permanent label giving:
 - Manufacturer's name, address and telephone number.
 - Name and/ or reference code of installation/project.
 - Maximum number of users that may be sustained by the equipment.
 - Confirmation if Fall Arrest or Fall Restraint system.
 - Name of certifying engineer and date of certification.
 - Indicate restriction of use by pictogram or other suitable marking.
 - Any other special features or restrictions.
- Location: In positions such that labels can be easily read prior to attachment to the system.

h) SERVICE/ MAINTENANCE OF FALL PREVENTION SYSTEM

- General: Following acceptance of the completed installation, service and maintain the equipment for the period stated below as and at intervals recommended by the manufacturer. Such maintenance to include a 'call-out' service during normal working hours to maintain the equipment in an acceptable and safe condition.
- Service/ Maintenance period: As recommended by manufacturer but not more than 12 months between certification visits.

i) OPERATING INSTRUCTIONS

- Equipment and accessories: Where appropriate, mark in such a way that it is possible to identify the correct mode of operation for their safe use.

j) OPERATING AND MAINTENANCE MANUAL (SAFETY FILE)

- General: Before Completion provide, for inclusion in the Building Manual/Safety File, printed instructions and recommended procedures to be established by the Employer for operating and routinely maintaining the equipment. Provide diagrams where appropriate.
- Content:
 - As-built drawings as per clause (k) below.
 - Instructions for pre-use inspections and attachment to equipment.
 - Comprehensive operating/use instructions, including training required and safety/emergency procedures.
 - Certificates showing that all equipment is certified to governing standards and is fit for use.
 - Servicing and planned maintenance procedures, including assembly instructions where maintenance necessitates dismantling of parts.
 - List of replacement parts, with references if necessary.
 - Recommended procedures for testing / recertifying equipment.

k) AS BUILT DRAWINGS

- General: After commissioning/testing of the equipment and before Completion provide As-Built drawings for inclusion in the Safety File - Number of sets: 2.

Drawing content:

- Contractor's name and contact number.
- Date of Certification/As-Built.
- Equipment Manufacturer's name, model and type numbers.
- General arrangement of the complete installation.
- Detailed description on how initial access to the roof is achieved.
- Restricted areas/ other areas not covered by the design.
- Accurate details on how each element (posts etc) are attached to the building.
- Full Design Notes with design loads (as applied to the building), notes on use, installation and certification of the systems.

l) TRAINING

Allow for one free training session for the client / facility manager / building owner as follows:

- Company to have at least one FETAC Level 6 Trainer on staff to oversee training.

- Training plan to be submitted to the client for approval prior to training session.
- Training to include initial class room session on the correct storage, inspection and use of PFPE (harnesses etc).
- All trainees to demonstrate competency in the use of PFPE before going out on the roof.
- All trainees to be shown how to use the fixed equipment on the roof and demonstrate competency in use of same.
- Training to be assessed by the trainer using standard bank of questions and feedback forms.
- Training certificates to be issued within 24 hours of completion of training.

To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

a) **PITCHED ROOF INSULATION**

- Material: Unilin Thin-R XT/RLOC or equivalent
- Reference: The pitched roof insulation shall be Unilin Insulation Thin-R XT/RLOC manufactured to EN 13165:2012+A2:2016 by Unilin Insulation, comprising of a rigid Polyisocyanurate (PIR) core between composite foil facings. The Thin-R XT/RLOC 150mm with an Agrément declared Lambda value of 0.023 W/mK to achieve a U-Value of 0.15W/m²K for the roof element. To be installed in accordance with instructions issued by Unilin Insulation.
- Thickness: 150mm
- Face Size: 1200mm x 370mm
- Insulation: Polyisocyanurate Rigid Foam
- Standard: BS EN 13165:2012+A2:2016
- Certification: NSAI Certification No. 08/0324, BS EN ISO 9001 Quality Management System & BS EN ISO 14001 Environmental Management System
- Installation: in accordance with manufacturer's instructions

- b) **FIRE STOPPING:** Ensure that any imperfections of fit between building elements that are required to have fire resistance and/or resist the passage of smoke, are completely sealed. Where not specified otherwise, tightly pack gaps with mineral wool.
Fire Protection: Allow for non-combustible insulation 1.5m either side of fire rated walls.

P31 HOLES/CHASES/COVERS/SUPPORTS FOR SERVICES
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To be read with Preliminaries/General conditions.

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SEE ALSO M&E BUILDER'S WORK DRAWINGS AND SCHEDULES.

P31/1 GENERALLY

- a) CO-ORDINATION: Liaise with Lift, Electrical and Mechanical specialists to establish locations and dimensions of all holes and chases required for services. Submit details to Architect for checking before proceeding.
- b) HOLES AND CHASES IN IN-SITU CONCRETE to be cast in. Do not cut hardened concrete or drill holes larger than 10 mm diameter without permission.
- c) HOLES AND CHASES IN PRECAST CONCRETE: Do not cut or drill precast concrete without permission.
- d) HOLES IN STRUCTURAL STEELWORK: Do not cut or drill structural steelwork without permission.
- e) HOLES, RECESSES AND CHASES IN MASONRY
 - Holes, recesses and chases to be in locations which will least affect the strength, stability and sound resistance of the construction, and to be of the smallest practicable size.
 - Holes must not exceed 300 mm square.
 - Do not cut chases in walls of hollow or cellular blocks without approval.
 - In walls of other materials:
 - Vertical chases must be not deeper than one third of the single leaf thickness.
 - Horizontal or raking chases must be not longer than 1 m and not deeper than one sixth of the single leaf thickness.
 - Do not set chases or recesses back to back; offset by a clear distance not less than the wall thickness. Where sockets, etc. are shown on drawings as nominally back to back, obtain instructions.
 - Do not cut until mortar is fully set. Cut carefully and neatly, avoiding spalling, cracking or other damage to surrounding structure. Do not cut chases with mechanical or hand impact tools.
- f) PREFORMED HOLES IN MASONRY: Submit proposals to CA for bridging over holes for ducts, pipes, etc., which exceed one block in width.
- g) PIPE DUCTS FOR services in screeds: Location and size: Refer to Services Engineers drawings; Material: Upvc.
- h) PIPE SLEEVES Material: Upvc
 - Sleeves to extend through full thickness of wall/floor and be accurately positioned to give a minimum clearance around service of 20 mm or diameter of service, whichever is the least. Sleeves, whether built in or installed in preformed holes, to be bedded solid. Seal annular space between service and sleeve with mineral wool and finished with sealant. Where exposed to view, finish bedding and sealing neatly to approval.
- i) PENETRATIONS THROUGH MULTI PURPOSE BUILDING CAVITY FIRE CURTAIN To be sealed in accordance with cavity fire curtain manufacturer's instructions.
- j) SEALING AROUND SERVICES: Seal around services where they pass through non fire rated

partitions with mineral wool and finish with silicone sealant. Completely fill the space, leaving no gaps and finish neatly.

- k) FIRE RESISTING BARRIERS FOR SERVICES PENETRATIONS IN FIRE WALLS.
- Manufacturer and reference: Fire Stop Compound to be installed in accordance with the manufacturer's instructions.

Q10	STONE/CONCRETE/BRICK KERBS/EDGINGS/CHANNELS OR EQUIVALENT
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To be read with Preliminaries/General conditions.

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REFER TO ARCHITECT'S DRAWINGS, LANDSCAPE ARCHITECT'S AND STRUCTURAL ENGINEER'S DRAWINGS AND SPECIFICATION.

Q10/1 TYPE(S) OF KERB/EDGING/CHANNEL

See drawing VOL A.3.1 WD-EW2-402

- (a) PRECAST CONCRETE KERB
- Manufacturer and reference: Roadstone or equivalent
 - Finish/colour: Charcoal Grey
 - Joints: 6mm nominal
 - Other requirements: Set in concrete haunching to engineer's specification.

Q10/2 LAYING

- (a) LAYING GENERALLY:
- Where necessary cut units neatly and accurately with a masonry saw and without spalling to give neat junctions. Bed units in mortar, true to line and level along top and front faces, on accurately cast foundations and secure with a continuous haunching of concrete. Allow bedding to set before placing haunching.
 - Keep exposed faces of units clean and free from concrete and mortar droppings.
- (b) ADVERSE WEATHER: Do not cast foundations, lay units or place haunching if the temperature is below 3 °C on a falling thermometer or 1 °C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.
- (c) CONCRETE FOR FOUNDATIONS AND HAUNCHING: As structural specification.
- (d) MORTAR BEDDING: As structural specification and section Z21.
- (e) CHANNELS: Set out to an even gradient to ensure no ponding or backfall. Lowest points of channels to be 6 mm above drainage outlets.
- (f) RADIUS KERBS/CHANNELS to be used for all radii of 12 m or less.
- (g) ANGLE KERBS to be used for both internal and external 90 degrees changes of direction; cutting of mitres will not be permitted.
- (h) ACCURACY: Max deviations: Level: ± 6 mm; Horizontal & vertical alignment: 3 mm in 3 m.
- (i) TOOLED MORTAR JOINTS: Butter ends of units with bedding mortar as laying proceeds to completely fill joints to a thickness of 6 mm. Tool to a neat flush profile.
- (j) MOVEMENT JOINTS IN PRECAST CONCRETE KERBS adjacent to concrete slabs:
- Lay with expansion joints to coincide with those in slabs.
 - Lay with normal close fitting vertical joints to coincide with slab contraction joints with paint manufacturer's instructions.

Q22 ASPHALT CONCRETE PAVING

To be read with Preliminaries/ General conditions.

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Q22/1 TYPES OF PAVING

DENSE BASE & BINDER COURSE ASPHALT CONCRETE (BITUMEN MACADAM)

Dense asphalt concrete Base and Binder Courses shall comply with IS EN 13108 and Clauses Q22/2 and Q22/3 of the Specification for Roadworks. Asphalt Concrete shall have 32mm nominal size aggregate.

Dense asphalt concrete shall be laid in accordance with Clause Q22/3 of the Specification _____ for _____ Roadworks.

Q22/2 PREPARATORY WORK/ REQUIREMENTS

(a) **BITUMINOUS MATERIALS GENERALLY**
Suppliers' names: Submit for approval

(b) **ACCEPTANCE OF SUB-BASE**
Surface: Sound, clean and suitably close textured.
Levels and falls: To be within the specified tolerances:

- Vehicular areas: +10 to -30mm.
- Pedestrian areas $\square$ 12mm.
- Drainage outlets: 0 to -10mm of the required finished level.

Kerbs and edgings: Complete, adequately bedded and haunched and to the required levels.

(c) **ABUTMENTS**
Vertical edges of manholes, gullies, kerbs and other abutments: Clean and paint with a thin uniform coating of polymer jointing compound.

Q22/3 LAYING

(a) **LAYING GENERALLY**
Preparation: Remove all loose material, rubbish and standing water.
Adjacent work: Form neat junctions. Do not damage.
Channels, kerbs, inspection covers etc.: Keep clean.
New paving:

- Keep traffic free until it has cooled to prevailing atmospheric temperature.
- Do not allow rollers to stand at any time.
- Prevent damage.
- Lines and levels: With regular falls to prevent ponding.
- Overall texture: Smooth, even and free from dragging, tearing or segregation.
- State on completion: Clean.

(b) **MACHINE LAYING**
Unless noted otherwise machine laying is to be used for all work.

(c) **ADVERSE WEATHER**
Frozen materials: Do not use.
Suspend laying:

- During freezing conditions.
- If the air temperature reaches 0°C, or in calm dry conditions -1°C on a falling thermometer.
- Hot rolled asphalt: During periods of continuous or heavy rain or if there is standing water on the base.

(d) LEVELS

Permissible deviation from the required levels, falls and cambers (maximum):

- Finished surface: $\pm 6\text{mm}$.
- Adjacent to gullies and manholes: 0 to + 3mm.

(e) FLATNESS/ SURFACE REGULARITY

Deviation of surface: Where appropriate in relation to the geometry of the surface, the variation in gap under a 3m straightedge placed anywhere on the surface to be not more than:

Base: 25mm

Binder course: 13mm

Surface course: 7mm

- Where a straightedge cannot be used the surface must be of a comparable standard of accuracy when judged by eye.

(f) CONTRACTOR'S USE OF PAVEMENTS

Preparation for final surfacing:

- Vehicular areas: +10 to -30mm.
- Timing: Defer laying until as late as practicable.
- Immediately before laying final surfacing: Clean and make good the base/ binder course. Allow to dry, uniformly apply, without puddles a tack coat of sprayed bitumen emulsion of a suitable grade to BS 434-1 at 1.5 to 2.0 kg/sqm.
- Accuracy: Uniform, without puddles.
- Finishing: Allow emulsion to break completely before applying surface.

R10	RAINWATER DRAINAGE SYSTEMS
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To be read with Preliminaries/General conditions.

NB Trade names and product references are included purely to define the aesthetic and technical performance criteria required by the specifier. It is not the intention to favour one product over another or to exclude other products which meet the performance criteria. In proposing an equivalent product/material/system the contractor will need to provide evidence of compliance with performance criteria and supply all necessary design warranties and ancillary certification required by the Assigned Certifier to comply with the Building Control (Amendment) Regulations.

R10/1 SYSTEM PERFORMANCE

DESIGN

- Design: Complete the design of the rainwater drainage system.
To match existing with additional downpipes where existing rainwater capacity is proven insufficient by manufacturers design. New down pipe locations to be agreed with architect .
- Standard: To BS EN 12056-3, clauses 3-7 and National Annexes.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

COLLECTION AND DISTRIBUTION OF RAINWATER

- General: Complete, and without leakage, condensation or noise nuisance.

ISOLATING TAPE

- A type recommended for the purpose by the cladding manufacturer
- Apply to those surfaces of supports which may otherwise be in contact with cladding or accessories after fixing. This requirement also applies to contact with treated timber.

DESIGN PARAMETERS – GENERAL

- Roof and gutter construction and finish: See Drawings.
- Design rate of rainfall: As BS EN 12056-3, National Annex NB.2. Category: 3.
- Design life of building: 50 years.
- Available capacity of existing below ground drainage (maximum): Refer to structural materials & workmanship specification.
- Allow for leaf guards.

R10/2 TYPE(S) OF PIPEWORK/GUTTER

(a) CAST ALUMINIUM PIPEWORK FOR GRAVITY EXTERNAL DRAINAGE SYSTEM:

- Pipes, fittings and accessories: To BS 8530:2010 & Designed to BS EN 13501:2018, Extruded from 6063 T6 alloy to to BS 1474:1972 Made from aluminium sheet to BS EN515:1993
- Manufacturer and reference: Alumasc Heritage Cast Aluminium Rainwater System or equivalent.
- Type/Grade: Traditional Cast Aluminium Socketed Circular Downpipe. Alumasc Rainwater Aluminium Heritage Circular Pipe Downpipe RW3 100mm or equivalent;
- Fixing: plugged & screwed through lugged collars and pipe brackets at 1.5m max centres into existing masonry.
- Finish/Colour: Polyester Powder Coating to BS EN 12206-1:2004. Internal finish: Powder coating. RAL TBC / Selection of colour samples to be provided for approval by ER to complement the brick and fibre cement cladding colours
- Other requirements: Main structure and support carrier and fixation by others, contractor to site cut/trim as required and level and line through
- Method of jointing: Refer to individual range installation guide
- Method of support/fixing: Refer to individual range installation guide
- See Structural Engineer's drawings & specifications and Mechanical and Electrical Engineers drawings & specifications for details of the rain water recovery system.

- (b) **CAST ALUMINIUM GUTTERS FOR GRAVITY EXTERNAL DRAINAGE SYSTEM:**
- Gutters, fittings and accessories: To BS 8530:2010 & Designed to BS EN 13501:2018, Extruded from 6063 T6 alloy to to BS 1474:1972 Made from aluminium sheet to BS EN515:1993
 - Manufacturer and reference: Alumasc Heritage Cast Aluminium Rainwater System or equivalent.
 - Type 1: Traditional Cast Aluminium Half Round Gutter Profile. Alumasc Rainwater Aluminium Heritage Half Round Gutter HR3 125mm or equivalent. Location: to match existing.
 - Type 2: Traditional Cast Aluminium Victorian Ogee Gutter Profile. Alumasc Rainwater Aluminium Heritage Victorian Ogee Gutter OG3 125mm or equivalent. Location: to match existing.
 - Fixing: plugged & screwed through lugged collars and pipe brackets at 1.5m max centres into existing masonry.
 - Finish/Colour: Polyester Powder Coating to BS EN 12206-1;2004. Internal finish: Powder coating. RAL TBC / Selection of colour samples to be provided for approval by ER to complement the brick and fibre cement cladding colours
 - Other requirements: Main structure and support carrier and fixation by others, contractor to site cut/trim as required and level and line through
 - Method of jointing: Refer to individual range installation guide
 - Method of support/fixing: Refer to individual range installation guide
 - Other: Leaf Protection to be provided to gutters.
 - See Structural Engineer's drawings & specifications and Mechanical and Electrical Engineers drawings & specifications for details of the rain water recovery system.
- (c) **PROPRIETARY RAINWATER OUTLETS: FLAT ROOFS**
- Manufacturer: Alumasc Exterior Building Products or equivalent.
 - Product reference: Harmer Roof AV Vertical spigot aluminium outlet.
 - Roof construction: refer section J41
 - Roof insulation thickness: 230mm.
 - Type of grate/ Fittings: AV grate, secure and tamper proof.
 - Outlet: Type and direction to suit pipework with suitable adaptors and connections.
 - Accessories: Extension ring to suit insulation plus paving depth.
 - Allow for leaf guards protection.

R10/3 INSTALLATION

- (a) **BEFORE COMMENCING WORK** specified in this section, ensure that:
- Below ground drainage is ready to receive rainwater or that the discharge can be dispersed by approved means to prevent damage or disfigurement of the building fabric.
 - Any specified painting of surfaces which will be concealed or inaccessible is completed.
- (b) **INSTALLATION GENERALLY:**
- Install pipework/gutters to ensure the complete discharge of rainwater from the building without leaking.
 - Obtain all components for each type of pipework/guttering from the same manufacturer unless specified otherwise.
 - Provide access fittings and redding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
 - Avoid contact between dissimilar metals and other materials which would result in electrolytic corrosion.
 - Do not bend plastics or galvanized steel pipes.
 - Adequately protect pipework/gutters from damage and distortion during construction. Fit purpose made temporary caps to prevent ingress of debris. Fit all access covers, cleaning eyes and blanking plates as the work proceeds.
 - Where not specified otherwise use plated, sherardized, galvanized or nonferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed.

- (c) **BUILDER'S WORK:** Comply with restrictions on the cutting of holes, chases, notches, etc. and methods of attachment to the building fabric as specified.
- (d) **RAINWATER OUTLETS:** Ensure that:
 - Outlets are securely fixed before connecting pipework and Junctions between outlets and pipework can accommodate all movement in the structure and pipework.
 - Outlets on cold roof constructions are fitted with a luting flange and clamping collar to accept membrane and insulation layers.
 - Outlets on warm roof constructions are fitted with a double luting flange and clamping collar to accept membrane and insulation layers.
 - Outlets with double luting flanges are fitted with under deck clamps.
 - Outlets on inverted roof constructions are fitted with a luting flange and clamping collar to accept membrane.
 - Outlets on inverted roof constructions with granular toppings are installed with gravel guards and domed gratings.
- (e) **FIXING PIPEWORK:**
 - Fix securely at specified centres plumb and/or true to line. Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.
 - Fix branches and low gradient sections with uniform and adequate falls to drain efficiently.
 - Fix externally socketed pipes/fittings with sockets facing upstream.
 - Provide additional supports as necessary to support junctions and changes in direction.
 - Fix every length of pipe at or close below the socket collar or coupling.
 - Provide a load bearing support for vertical pipes at not less than every storey level. Tighten fixings as the work proceeds so that every storey is self-supporting and undue weight is not imposed on fixings at the base of the pipe.
 - Isolate from structure where passing through walls or floors and sleeve pipes as specified.
 - Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
 - Fix expansion joint pipe sockets rigidly to the building and elsewhere use fixings that allow the pipe to slide.
- (f) **JOINTING PIPEWORK/GUTTERS:**
 - Joint using materials, fittings and techniques which will make effective and durable connections.
 - Joint differing pipework/gutter systems with adaptors recommended by manufacturer(s).
 - Cut ends of pipes to be clean and square with burrs and swarf removed. Chamfer pipe ends before inserting into ring seal sockets.
 - Ensure that jointing or mating surfaces are clean, and where necessary lubricated, immediately before assembly.
 - Form junctions using fittings intended for the purpose ensuring that jointing material does not project into bore of pipes, fittings and appliances.
 - Remove surplus flux/solvent/cement/sealant from joints.
- (g) **JOINTING INTERNAL PIPEWORK:** Jointing as per manufacturers recommendations
- (h) **JOINTING EXTERNAL PIPEWORK:** Jointing as per manufacturers recommendations
- (i) **CUTTING COATED PIPEWORK AND GUTTERS:** Recoat bare metal
- (j) **FIXING INSULATION TO INTERNAL PIPELINES AND GUTTERS:**
 - Fixing, secure and neat. Provide continuity at supports and leave no gaps. Fix split pipe insulation with the split on 'blind' side of pipeline.
 - Method as per manufacturers recommendations and specifications. Trimming, Do not fit insulation until completion of pipe airtightness or leakage testing.
- (k) **IDENTIFICATION OF INTERNAL RAINWATER PIPEWORK:**
 - Markings: To BS 1710

- Type: Black bands, with arrows to indicate direction of flow.
 - Wording: White lettering 'RAINWATER DRAINAGE' on a black background.
 - Type: Permanent; integral or painted pipe colour, self-adhesive bands or identification clips.
 - Locations: Junctions, both sides of slabs, bulkheads and wall penetrations.
- (l) COATED PIPEWORK/GUTTERS: Make good to coatings after cutting and any other damage or recoat, as recommended by the manufacturer.
- (m) PIPEWORK WITH UNSEALED JOINTS: Ensure that pipes are firmly secured to prevent rattling at joints and fixings.
- (n) ELECTRICAL CONTINUITY: Use clips or suitable standard couplings supplied for the purpose by pipework manufacturer to ensure electrical continuity at all joints in metal pipes with flexible couplings and which are to be earth bonded.
- (o) ACCESS FOR TESTING AND MAINTENANCE:
- Install pipework and gutters with adequate clearance to permit testing, cleaning and maintenance.
 - Position access fittings and rodding eyes so that they are not obstructed by other pipework, framing, etc.
- (p) TESTING GENERALLY:
- Inform Architect sufficiently in advance to give him a reasonable opportunity to observe tests.
 - Check that all sections of installation are free from obstruction and debris before testing.
 - Provide clean water, assistance and apparatus for testing as required.
 - Carry out tests as specified. After testing, locate and remedy all defects without delay and retest as instructed.
 - Keep a record of all tests and provide a copy of each to the Architect.
- (q) IMMEDIATELY BEFORE HANDOVER:
- Remove construction rubbish and debris from all roofs and gutters. Where possible, sweep and remove fine dust which may enter rainwater systems. Do not sweep or flush dust or debris into the rainwater system. Remove swarf, debris and temporary caps from the entire rainwater installation.
 - Ensure that all access covers, rodding eyes, outlet gratings, etc. are secured complete with all fixings.

Z11	PURPOSE MADE METALWORK
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To be read with Preliminaries/General conditions.

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Building 3 – Replacement roof angles to support soffit .

Sample to be proposed for approval .

(a) **MATERIALS GENERALLY:**

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

(b) **FABRICATION GENERALLY:**

- Fabricate components carefully and accurately to ensure compliance with design and performance requirements. Do not permit contact between dissimilar metals in components which are to be fixed where moisture may be present or occur.
- Finished components to be rigid and free from distortion, cracks, burrs and sharp arrises. Moving parts must move freely and without binding.
- Unless specified otherwise, mitre corner junctions of identical sections.

(c) **COLD FORMED WORK:** Use brake presses or cold rolling to produce accurate profiles with straight arises.

(d) **ADHESIVE BONDING:**

- Prepare surfaces of metals to receive adhesives by degreasing and abrading mechanically or chemically.
- Use adhesives in accordance with manufacturer's recommendations.
- Form bond under pressure.

(e) **THERMAL CUTTING OF STAINLESS STEEL:** After cutting, remove carbonation in the heat affected zone by machining or acid pickling.

(f) **WELDING/BRAZING GENERALLY:**

- Thoroughly clean surfaces to be joined.
- Ensure accurate fit using clamps and jigs where practicable. Use tack welds only for temporary attachment. Make joints with parent and filler metal fully bonded throughout with no inclusions, holes, porosity or cracks.
- Prevent weld spatter falling on surfaces of materials which will be self-finished and visible in completed work. Remove all traces of flux residue, slag and weld spatter.

(g) **WELDING OF STEEL:** Metal arc welding to BS 5135 and BS EN 1011-1, or other methods subject to approval.

(h) **WELDING OF STAINLESS STEEL:** TIG welding to BS 7475, or other methods subject to approval. Use double bevel butt welds, backing bars to remove heat, jiggling, tack welds and any other measures necessary to minimise distortion. Remove slight distortion by light hammering, taking care not to damage surface finish.

(i) **WELDING OF ALUMINIUM ALLOYS:** TIG welding to BS 3019-1, or MIG welding to BS 3571-1, or other methods subject to approval.

- (j) BRAZING: To BS 1723.
- (k) FINISHING WELDED/BRAZED JOINTS:
 - Butt joints which will be visible in completed work to be smooth, flush with adjacent surfaces.
 - Fillet joints which will be visible in completed work to be executed neatly. Grind smooth where specified.
- (l) PREPARATION FOR APPLICATION OF COATINGS:
 - Before applying coating ensure that fabrication is complete and all fixing holes have been drilled, unless otherwise specified.
 - Remove all paint, grease, flux, rust, burrs and sharp arrises.
 - Make good all defects which would show after application of coating and finish surfaces smooth.
- (m) LIQUID ORGANIC COATING FOR ALUMINIUM ALLOY COMPONENTS: To BS 4842.
- (n) CADMIUM/ZINC PLATING OF IRON AND STEEL SURFACES: To BS 1706. 350
CHROMIUM PLATING: To BS 1224.
- (o) GALVANIZING: To BS EN ISO 1461. Provide all necessary vent and drain holes in approved locations and seal to approval after galvanizing.
- (p) ANODIZING: To BS 1615 unless specified otherwise. Provide a certificate of assurance that anodizing has been carried out as specified.
- (q) ANODIZING: To BS 3987.

Z12	PRESERVATIVE/FIRE RETARDANT TREATMENT
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To be read with Preliminaries/General conditions.

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- (a) **GENERALLY:**
 - Application to be carried out after cutting and machining, but before assembly, by a processor licensed by the treatment solution manufacturer for the specified treatment.
 - For each batch of timber, provide a certificate of assurance that treatment has been carried out as specified.
- (b) **BWPDA COMMODITY SPECIFICATIONS**, where specified, are those defined in the latest edition of the British Wood Preserving and Damp-proofing Association Manual. Solution strengths and treatment cycles to be selected to achieve the service life (if specified) and to suit timber treatability.
- (c) **CCA PRESERVATIVE TREATMENT:**
 - Based on oxides of copper, chromium and arsenic.
 - Moisture content of timber at time of treatment to be not more than 28%. Allow timber to dry for at least 14 days before use.
 - Application: High pressure.
 - Preservative solution manufacturer and reference: to be confirmed
- (d) **ORGANIC SOLVENT PRESERVATIVE TREATMENT:**
 - Moisture content of timber at time of treatment to be as specified for the component at time of delivery. After treatment, timber to be surface dry before use.
 - Application: Double vacuum/low pressure.
 - Preservative solution manufacturer and reference: to be confirmed.

Z20	FIXINGS/ADHESIVES
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To be read with Preliminaries/General conditions.

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Z20/1 GENERAL REQUIREMENTS

- (a) **FIXING GENERALLY:**
 - Use fixing and jointing methods and types, sizes, quantities and spacings of fasteners which are suitable having regard to:
 - Nature of and compatibility with product/material being fixed and fixed to,
 - Recommendations of manufacturers of fasteners and manufacturers of components, products or materials being fixed and fixed to,
 - Materials and loads to be supported, and Conditions expected in use,
 - Appearance, this being subject to approval.
- (b) **FASTENERS** for materials and components forming part of external construction to be of corrosion resistant material or have a corrosion resistant finish.
- (c) **FASTENERS** for materials and components:
 - Forming part of external construction but not directly exposed to the weather to be of corrosion resistant material or have a corrosion resistant finish.
 - Directly exposed to the weather to be of corrosion resistant material.
- (d) **FIXING THROUGH FINISHES:** Ensure that fasteners and plugs (if used) have ample penetration into the backing.
- (e) **PACKINGS:**
 - Provide suitable, tight packings at fixing points to take up tolerances and prevent distortion.
 - Use non-compressible, rotproof, noncorrodible materials positioned adjacent to fixing points.
 - Ensure that packings do not intrude into zones that are to be filled with sealant.
- (f) **CRAMP FIXING:**
 - When not specified otherwise position cramps not more than 150 mm from each end of frame sections and at 600 mm maximum centres. Secure cramps to frames with matching screws as masonry work proceeds, and fully bed in mortar.
- (g) **NAILING:** To BS 1202.
 - In joints, use not less than two nails and opposed skew nailing unless specified otherwise.
 - Drive nails fully in without splitting or crushing the material being fixed.
 - Punch nail heads below surfaces that will be visible in the completed work.
- (h) **MASONRY NAILS:** Do not use without approval.
- (i) **PLUGS:** Proprietary types selected to suit the background, loads to be supported and conditions expected in use. Locate plugs accurately in correctly sized holes in accordance with manufacturer's recommendations.
- (j) **SCREW FIXING:**
 - Screws: To BS 1210.
 - All screws to have clearance holes. Screws of 8 gauge or more and all screws into hardwood to have pilot holes about half the diameter of the shank. Before using brass, aluminium or other soft metal wood screws pre-cut the thread with a matching steel

- wood screw.
 - Do not hammer screws unless specifically designed to be hammered. Drive countersunk heads flush with timber surface, or not less than 2 mm below it if they are to be stopped.
 - Washers and screw cups, where specified, to be of the same material as the screw.
- (k) PELLETING: Countersink screw heads 6 mm below timber surface and glue in grain-matched pellets not less than 6 mm thick, cut from matching timber. Pellets to occupy the whole depth of the holes and be finished off flush with surface.
- (l) PLUGGING: Countersunk screw heads 6 mm below timber surface and glue in plugs. Plugs to occupy the whole depth of the holes and project from the surface.
- (m) POWDER ACTUATED FIXING SYSTEMS:
- Do not use without approval.
 - Tools to be to BS 4078:Part 2 and Kitemark certified, and used in accordance with BS 4078:Part 1. Operatives to be trained and certified as competent by tool manufacturer.
 - Fasteners, accessories and consumables to be types recommended by the tool manufacturer.
 - Ensure that operatives take full precautions against injury to themselves and others.
 - Remove all unspent cartridges from the site when no longer required.
 - Apply zinc rich primer to heads of fasteners used externally, in external walls or in other locations subject to dampness.
 - Use top hat section plastics washers to isolate cartridge fired nails from stainless steel components fixed externally, in external walls or in other locations subject to dampness.
- (n) ADHESIVES:
- Adhesive types: As specified in the relevant section.
 - Low Emissivity and formaldehyde free types to be used throughout.
 - Surfaces to receive adhesive to be sound, unfrozen, free from dust, grease and any other contamination likely to affect bond. Where necessary, clean surfaces using methods and materials recommended by adhesive manufacturer.
 - Adjust surface regularity and texture as necessary to suit bonding and gap filling characteristics of adhesive.
 - Ensure that operatives observe manufacturer's and statutory requirements for storage and safe usage of adhesives.
 - Do not use adhesives in unsuitable environmental conditions or beyond the storage period recommended by the manufacturer.
 - Apply adhesives using recommended spreaders/applicators to ensure correct coverage. Bring surfaces together within recommended time period and apply pressure evenly over full area of contact to ensure full bonding. Remove surplus adhesive using methods and materials recommended by adhesive manufacturer and without damaging surfaces.

Z21	MORTARS
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To be read with Preliminaries/General conditions.

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Z21/1 GENERAL REQUIREMENTS

- (a) Refer also to Structural Specification for block-work, mortar, wall-ties and ancillary items.
- (b) **MIX PROPORTIONS FOR CEMENT GAUGED MORTARS**
 - Refer to Structural Specification for mortar groups & mix proportion tables
 - MORTAR shall be to BS 4721, as per Structural Engineer's specification
- (c) **TESTING - CEMENT CONTENT OF MORTAR:** When instructed by Architect, test mortar before use, to determine cement content. Carry out tests using the BREMORTEST method described in Building Research Establishment Information Paper 8/89, or other equivalent.

CEMENT GAUGED MORTARS

110 CEMENT GAUGED MORTAR MIXES

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

120 SAND FOR SITE MADE CEMENT GAUGED MASONRY MORTARS

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

131 READY-MIXED LIME: SAND FOR CEMENT GAUGED MASONRY MORTARS

- Standard: To BS EN 998-2.
- Lime: Nonhydraulic to BS EN 459-1.
 - Type: CL 90S.
- Pigments for coloured mortars: To BS EN 12878.

135 SITE MADE LIME: SAND FOR CEMENT GAUGED MASONRY MORTARS

- Permitted use: Where a special colour is not required and in lieu of factory made ready mixed material.
- Lime: Nonhydraulic to BS EN 459-1.
 - Type: CL 90S.
- Mixing: Thoroughly mix lime with sand, in the dry state. Add water and mix again. Allow to stand, without drying out, for at least 16 hours before using.

160 CEMENTS FOR MORTARS

- Cement: To BS EN 197-1 and CE marked.
 - Types:
 - Portland cement, CEM I.
 - Portland limestone cement, CEM II/A-L or CEM II/A-LL.
 - Portland slag cement, CEM II/B-S.
 - Portland fly ash cement, CEM II/B-V.
 - Strength class: 32.5, 42.5 or 52.5.
- White cement: To BS EN 197-1 and CE marked.

- Type: Portland cement, CEM I.
- Strength class: 52.5.
- Sulfate resisting Portland cement:
 - Types: To BS 4027 and Kitemarked.
 - To BS EN 197-1 fly ash cement, CEM II/B-V and CE marked.
 - Strength class: 32.5, 42.5 or 52.5.
- Masonry cement: To BS EN 413-1 and CE marked.
 - Class: MC 12.5.

180 ADMIXTURES FOR SITE MADE CEMENT GAUGED MORTARS

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

190 RETARDED READY TO USE CEMENT GAUGED MORTAR

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

200 STORAGE OF CEMENT GAUGED MORTAR MATERIALS

- Sands and aggregates: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
- Factory made ready-mixed lime: sand/ ready to use retarded mortars: Keep in covered containers to prevent drying out or wetting.
- Bagged cement/ hydrated lime: Store off the ground in dry conditions.

210 MAKING CEMENT GAUGED MORTARS

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

LIME: SAND MORTARS

Lime based mortar to be provided where an element meet the existing walls to ensure the new harder material do not impact the existing historic wall.

310 LIME: SAND MORTAR MIXES

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

320 SAND FOR LIME: SAND MASONRY MORTARS

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

330 READY PREPARED LIME PUTTY

- Type: Slaked directly from CL 90 quicklime to BS 890, using an excess of water.
 - Maturation: In pits/ containers that allow excess water to drain away.
 - Density of matured lime putty: 1.3 - 1.4 kg/litre.
- Maturation period before use (minimum): 90 days.

335 READY PREPARED LIME PUTTY

- Manufacturer: Contractor's choice.

- Product reference: Submit proposals.
- Maturation period before use (minimum): Seek instructions.

340 POZZOLANIC ADDITIVES FOR NONHYDRAULIC LIME: SAND MORTARS

- Manufacturer/ Supplier: Contractor's choice.
 - Product reference: Submit proposals.
- Mixing: Mix thoroughly into mortar during knocking up.

345 ADMIXTURES FOR HYDRAULIC LIME: SAND MORTARS

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

350 STORAGE OF LIME: SAND MORTAR MATERIALS

- Sands and aggregates: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
- Ready prepared nonhydraulic lime putty: Prevent drying out and protect from frost.
- Nonhydraulic lime: sand mortar: Store on clean bases or in clean containers that allow free drainage. Prevent drying out or wetting and protect from frost.
- Bagged hydrated hydraulic lime: Store off the ground in dry conditions.

360 MAKING LIME: SAND MORTARS GENERALLY

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

370 SITE PREPARED NONHYDRAULIC LIME: SAND MORTARS

- Mixing: Mix materials thoroughly by compressing, beating and chopping. Do not add water.
 - Equipment: Roller pan mixer or submit proposals.
- Maturation period before use (maximum): Seek instructions.

390 KNOCKING UP NONHYDRAULIC LIME: SAND MORTARS

- Knocking up before and during use: Achieve and maintain a workable consistency by compressing, beating and chopping. Do not add water.
 - Equipment: Roller pan mixer or submit proposals.

400 MAKING HYDRAULIC LIME: SAND MORTARS

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

Z22	SEALANTS
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To be read with Preliminaries/General conditions.

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Z22/1 GENERAL REQUIREMENTS

- (a) SEALANT TYPES: As specified in the relevant section.
- (b) SUITABILITY OF JOINTS:
 - Before commencing, check that:
 - Joint dimensions are within limits specified for the sealant.
 - Sealant material and its application method are chemically compatible with adjacent materials, substrate etc.
 - Surfaces are smooth and undamaged.
 - Preparatory work which must be done before assembly of the joint has been carried out.
 - Inform Architect if joints are not suitable to receive sealant and submit proposals for rectification.
- (c) PREPARING JOINTS:
 - Clean surfaces to which sealant must adhere using methods and materials recommended by sealant manufacturer.
 - Remove all temporary coatings, tapes, loosely adhering material, dust, oil, grease and other contaminants which may affect bond.
 - Keep joints clean and protect from damage until sealant is applied.
 - Backing strip, bond breaker, primer: Types recommended for the purpose by sealant manufacturer.
 - Insert backing strips and/or bond breaker tape into joint leaving no gaps.
 - Cover adjacent surfaces with masking tape to prevent staining and protect surfaces which would be difficult to clean if smeared with primer or sealant.
- (d) APPLYING SEALANTS:
 - Ensure that operatives observe manufacturer's and statutory requirements for storage and safe usage of sealants.
 - Use equipment and methods recommended by sealant manufacturer and apply within the recommended application life of primer and sealant, and the recommended air and substrate temperature ranges.
 - Do not apply to damp surfaces (unless recommended otherwise), to surfaces affected by ice or snow or during inclement weather. Do not heat joints to dry them or raise the temperature.
 - Fill joints completely, leaving no gaps, excluding all air and ensuring firm adhesion of sealant to required joint surfaces. Tool the sealant to a neat, slightly concave profile unless specified otherwise. Protect until cured.

Z31	POWDER COATINGS
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To be read with Preliminaries/General conditions.

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Z31/1 GENERAL REQUIREMENTS

(a) **POWDER COATING:**

- This is invoked by reference in other sections. Details of powder coatings to components are given in R10.
- Powder Coating Materials: Obtain from one only of the following manufacturers: Syntha Pulvin, Interpon or equivalent. Submit details of selected manufacturer to the Architect at an early date.

(b) **WORKING PROCEDURES:** Unless specified otherwise, comply with all relevant requirements and recommendations of:

- BS 6496 for aluminium alloy backgrounds; BS 6497 for galvanized steel backgrounds.
- British Coatings Federation: Code of safe practice - Application of powder coatings by electrostatic spraying.
- Powder coating manufacturer's guarantee.

(c) **APPLICATOR REQUIREMENTS:**

- Powder coating applicators must be approved by the powder coating manufacturer and be currently certified to BS EN ISO 9002. Submit details of the selected applicator(s) together with proof of approval and certification to the Architect on request.
- Use only one application plant unless otherwise approved.
- The applicator must comply with all quality procedures, guarantee conditions, standards and tests required by the powder coating manufacturer.
- The applicator must issue a certificate to the Architect before delivery of work to site, confirming that coatings are in accordance with this specification.

(d) **CONTROL SAMPLES:** Prior to ordering materials for the works, obtain approval for:

- Powder coated samples of the various grades and forms of background metal to be used, showing any colour, texture and gloss variation. Agree with the Architect the quantity of samples to be provided.
- Fabrication samples showing joint assembly, how powder coating is affected and how any cut metal edges are protected.

(e) **INDEPENDENT INSPECTION ON SITE:**

- In the event of any unresolved deficiency in coating specification compliance following inspection at plant, the relevant contractor(s)/supplier(s) must commission an Independent Inspection Authority, approved by the Architect, to carry out a site acceptance inspection.
- Acceptance inspection will be carried out in accordance with BS 6001-2 with a limiting quality of 5% where the probability of acceptance is 10%. Each component of a fabricated unit will be assessed as an individual part for sampling procedures.
- Components failing inspection will be assessed by the Architect for removal and reprocessing/replacement.

(f) **COMPONENT DESIGN:**

- Ensure that components to be powder coated comply with relevant recommendations of BS 4479-1, -3 and -4, are of suitable size to fit plant capacity and of suitable thickness to withstand oven curing.
- Ensure that deflection under design load or thermal movement of background metal of components will not be detrimental to powder coatings.

(g) **PRE-TREATMENT:**

- All components to be powder coated are to be free from corrosion and damage,

- and suitable for and compatible with the pre-treatment and powder coating process.
 - Clean, conversion coat, condition, rinse in demineralised water, drain and dry all components in accordance with the powder coating manufacturer's requirements and the pre-treatment supplier's recommendations.
- (h) EXTENT OF POWDER COATINGS:
- Apply powder coatings to all visible surfaces, and all concealed surfaces requiring protection, of all components.
 - All coated surfaces will be deemed 'significant surfaces' for relevant BS 6496/BS 6497 performance requirements.
- (i) APPLICATION OF POWDER COATINGS:
- Surfaces to receive powder coatings must be free from dust or powder deposits.
 - Application of powder coatings to all components must be completed within 48 hours of pre-treatment.
 - Jig points must not be visible on coated components.
 - Curing must be controlled to attain metal temperatures and hold periods recommended by the powder coating manufacturer.
 - Stripping and recoating of components will only be acceptable by prior agreement of the powder coating manufacturer. Stripping, pre-treatment and powder coating are to be in accordance with manufacturer's requirements and must be carried out at the applicator's plant.
 - Overcoating of components will not be acceptable.
- (j) PERFORMANCE AND APPEARANCE OF POWDER COATINGS: To BS 6496/BS 6497.
- (k) ALUMINIUM ALLOY FABRICATIONS:
- Units may be assembled:
 - Before powder coating
 - From components powder coated after cutting to size
 - From components powder coated before cutting to size, subject to approval of the Architect and the powder coating manufacturer.
 - Fabrication resulting in exposure of uncoated background metal will not be acceptable.
 - Assembly sealants must be compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.
- (l) STEEL FABRICATIONS:
- Wherever practical, units must be assembled before powder coating.
 - Fabrication resulting in exposure of uncoated background metal will not be acceptable.
 - Assembly sealants must be compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.
- (m) FIXINGS: All exposed metal fixings must be powder coated together with components, or coated with matching repair paint system applied in accordance with the powder coating manufacturer's recommendations.
- (n) FABRICATION DAMAGE REPAIR/REPLACEMENT:
- Check all components before delivery to site for damage to powder coating. Report findings and proposed method of repair or replacement to the Architect. Obtain approval before commencing remedial work.
 - Repair components with minor damage as soon as possible by cleaning, abrading and coating with matching repair paint system applied in accordance with the powder coating manufacturer's recommendations.
 - Replace components with major damage considered unacceptable for repair.
- (o) PROTECTION:
- All powder coated surfaces of components vulnerable to damage during handling, installation, or by subsequent site operations, are to be fully protected during the course of these works.

- Protective coverings are to be resistant to all weather conditions, removable from areas inaccessible after installation, and partially removable and replaceable for access to fixing points during installation or subsequent site operations.
 - Any protective tapes used in direct contact with powder coatings must be low tack, self-adhesive, light in colour and approved by the tape manufacturer. Apply and remove in accordance with the tape and powder coating manufacturers' recommendations. Do not use solvents to remove adhesive residues unless approved by the powder coating manufacturer.
 - Carry out monthly inspections of protective coverings and promptly repair any deterioration or deficiency.
 - Remove protective coverings only when instructed by the Architect.
- (p) SITE DAMAGE REPAIR/REPLACEMENT:
- Any damage to powder coatings caused during handling and installation, or by
 - subsequent site operations, is to be rectified immediately. Obtain approval before commencing extensive repairs or replacements.
 - Repair components with minor damage by cleaning, abrading and coating with matching repair paint system applied in accordance with the powder coating manufacturer's recommendations.
 - Replace components with major damage considered unacceptable for repair.
- (q) MAINTENANCE: After removal of protective coverings, clean and maintain all powder coated surfaces at regular intervals until Practical Completion. All maintenance is to be in accordance with procedures detailed in the powder coating manufacturer and applicator guarantees.

Z33 ANODIZING

To be read with Preliminaries/ General conditions.

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110 ANODIC COATING

- Anodizer: Select one only of the following: Submit proposals.
- Selected anodizer: Submit details before commencement of anodizing, including:
 - Name and contact details.
 - Details of accreditation schemes.
 - Technical data of product including current Agrément certificates.

210 WORKING PROCEDURES

- Standard: To BS 3987 for anodic coatings on wrought aluminium.

220 ANODIZER REQUIREMENTS

- Processing:
 - Approved: By the Aluminium Finishing Association.
 - Certified: To BS EN ISO 9001.
 - Anodizing plant: Each anodizer to use only one plant.

230 GUARANTEES

- Anodizer guarantees: Submit sample copies before commencement of anodizing.
- Project specific guarantees: Submit signed copies on completion of work.
- Guarantees to cover:
 - Life expectancy.
 - Colour: Opacity and consistency.
 - Texture: Gloss, satin or matt.
 - Quality of coating.

240 CONTROL SAMPLES

- Sequence: Prior to ordering materials for the works, obtain approval of appearance for:
 - Anodic coated samples: Showing colour and texture variation.
 - Fabrication samples: Showing joint assembly, how anodic coating is affected and how cut metal edges are finished and protected.

250 INDEPENDENT INSPECTION AT PLANT

- Requirement: Contractors/ suppliers of the following designated components must commission an approved Independent Inspection Authority to carry out acceptance inspections to confirm that anodic coating application complies with this specification.
 - Designated components: to be agreed with ER.
- Acceptance inspections: Carry out for each variation of colour and finish of each component work package at anodizer's plant prior to any fabrication of units, in accordance with the following:
 - Where three or more production runs are required for application of coatings, not less than three acceptance inspections must be carried out in accordance with BS 6001-1, general inspection level 2, with an acceptance quality limit of 1%.
 - Where less than three production runs are required for application of coatings, one acceptance inspection must be carried out in accordance with BS 6001-2, with a limiting quality of 5% where the probability of acceptance is 10%.

- Components failing inspection: Reprocess or replace and reinspect.
- Inspection reports: Independent Inspection Authority must submit copies

255 QUALITY ASSURANCE SYSTEM

- Requirement: Powder and coating application to the following designated components is to be tested and approved in accordance with the Qualanod system.
- Designated components: to be agreed with ER.

270 COMPONENT DESIGN

- Condition of components to be anodized:
 - To comply with relevant recommendations of BS 4479-1, and -5.
 - Of suitable size to fit plant capacity.

310 PRETREATMENT

- Condition of components to be anodized:
 - Free from corrosion and damage.
 - Suitable for and compatible with the pretreatment and anodizing process.
- Process: In accordance with the specification requirements for the finish.

410 EXTENT OF ANODIC COATINGS

- Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces will be deemed 'significant surfaces' for relevant BS 3987 performance requirements.

420 APPLICATION OF ANODIC COATINGS

- Surfaces to receive anodic coatings: Clean.
- Commencement of anodic coating: To be continuous from pretreatment.
- Jig points: To be agreed. Not on visible areas of anodic coated components.
- Use of touch-up paint: Not acceptable.

430 PERFORMANCE AND APPEARANCE OF ANODIC COATINGS

- Standard: To BS 3987.
- Visual inspection after anodizing: Significant surfaces to be free from visible coating/ defects when viewed from a distance of not less than 5 m for external and 3 m for internal applications.

440 FABRICATION

- Units may be assembled:
 - Before anodizing, providing sufficient drainage holes are included in components to fully drain components.
 - From components anodized after cutting to size.
 - Where approved, from components anodized before cutting to size.
 - Exposure of uncoated background metal: Not acceptable.
 - Assembly sealants: Compatible with anodic coatings. Obtain approval of colour if sealants are visible after fabrication.

450 DAMAGED COMPONENTS - REPAIR/ REPLACEMENT

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

510 PROTECTION

- Anodic coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.
- Protective coverings: Must be:
 - Resistant to weather conditions.
 - Partially removable to suit building in and access to fixing points.
- Protective tapes in contact with anodizing to be:
 - Low tack, self adhesive and light in colour.
 - Applied and removed in accordance with tape and anodizers recommendations.
- Inspection of protection: Carry out weekly. Promptly repair any deterioration or deficiency.

530 DOCUMENTATION

- Submit the following information for each batch of anodic coated components:
 - Supplier.
 - Trade name.
 - Colour (if required).
 - Batch and reference number.
 - Statutory requirements.

540 COMPLETION

- Protection: Remove.
- Cleaning and maintenance of anodic coatings: Carry out in accordance with procedures detailed in anodizer' s guarantees.

KOBW | ARCHITECTS

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