

# **TOWER OF LONDON EDUCATION FACILITIES**

## **PUR-01-XX-SH-A-0001 REVELLER – CONSERVATION & REPAIRS SPECIFICATION**

**Suitability/Reason for Issue:**

Tender Draft

**Revision Number:**

P02

**Date of Issue:**

29-10-2025

**Project Description:**

**C20**

**DEMOLITION**

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## **C20**

### **Demolition**

#### **General requirements**

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#### **120 EXTENT OF DECONSTRUCTION/ DEMOLITION**

1. General: subject to retention requirements specified elsewhere, deconstruct/ demolish structures down to: : Strip out of arches and Reveller building as shown on drawings

Careful deconstruction of part of the Revetment wall as shown on drawings

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#### **140 BENCHMARKS**

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

#### **Services affected by deconstruction and demolition**

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#### **210 SERVICES REGULATIONS**

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

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#### **220 LOCATION AND MARKING OF SERVICES**

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

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#### **230 SERVICES DISCONNECTION ARRANGED BY CONTRACTOR**

1. General: Arrange with the appropriate authorities and responsible private organizations for disconnection of services, and removal of fittings and equipment owned by those authorities and organizations, where agreed prior to starting deconstruction or demolition
2. Decommissioning action plan: Available in health and safety file

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#### **240 DISCONNECTION OF DRAINS**

1. General: Locate, disconnect and seal disused drain connections. Agree where drains are to be sealed
2. Sealing: Permanent, and within the site

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3. Decommissioning action plan: Available in health and safety file

**250 LIVE DRAINAGE SYSTEMS AND WATERCOURSES**

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1. Unrecorded features: Give notice if unrecorded pipes, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.
2. Drains and associated manholes, inspection chambers, gullies, vent pipes and fittings: Protect and maintain normal flow during deconstruction or demolition

**260 SERVICE BYPASS CONNECTIONS**

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1. General: Provide as necessary to maintain continuity of services to occupied areas of the site on which the deconstruction or demolition is taking place and to adjoining sites and properties
2. Minimum notice to adjoining owners and all affected occupiers: 72 hours, if shutdown is necessary during changeover
3. Timing: Complete bypass of services before demolition works start

**270 SERVICES TO BE RETAINED**

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

**Deconstruction and demolition work**

**310 WORKMANSHIP**

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1. Standard: A particularly high standard of care is needed in the deconstruction in all areas of the building due to its Grade I listed status. All masonry is to be salvaged and retained for reuse.
2. Operatives
  - 2.1. Appropriately skilled and experienced for the type of work.
  - 2.2. Holding, or in training to obtain, relevant [Construction Skills](#) certification of competence.
3. Site staff responsible for supervision and control of work:: Experienced in the assessment of risks involved and methods of deconstruction and demolition to be used. Hold appropriate qualification or training certificates for their role.

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**DEMOLITION**

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**330 DUST CONTROL**

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

**340 HEALTH HAZARDS**

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

**350 ADJOINING PROPERTY**

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1. Temporary support and protection: Provide. Maintain and alter, as necessary as work proceeds. Do not leave unnecessary or unstable projections.
2. Defects: Report immediately (and then follow up in writing) on discovery and provide an assessment of impact.
3. Damage: Minimize disturbance. Repair promptly to ensure safety, stability, weather protection and security.
4. Support to foundations: Do not disturb.

**360 STRUCTURES TO BE RETAINED**

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

**370 PARTLY DEMOLISHED STRUCTURES**

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

**380 DANGEROUS OPENINGS**

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1. General: Provide guarding at all times, including outside of working hours. Illuminate during hours of darkness.

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2. Access: Prevent access by unauthorized persons.

**391 ASBESTOS-CONTAINING MATERIALS – UNKNOWN OCCURRENCES**

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1. Discovery: Stop work and give immediate notice of suspected asbestos-containing materials when they are discovered during deconstruction and demolition work. Avoid disturbing such materials. Follow up with notice in writing.
2. Removal: Submit statutory risk assessments and details of proposed methods for safe removal.

**410 UNFORESEEN HAZARDS**

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

**450 SITE CONDITION AT COMPLETION**

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1. Debris: Clear away and leave the site in a clean, tidy, safe and secure condition.
2. Contaminants: Record details of remaining site contaminants and notify responsible site authorities.

**Materials arising**

**510 CONTRACTOR'S PROPERTY**

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1. Components and materials arising from the deconstruction and demolition work: Property of the contractor, except for designated items which remain the property of the employer – refer to Section C90 Alterations
2. Action: Remove from site as work proceeds, where not to be reused or recycled for site use

**520 RECYCLED MATERIALS BRICKS**

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1. Materials arising from deconstruction and demolition work: Salvage bricks from spine wall demolition works. Remove mortar and dirt and stack neatly on pallets for reuse in brick repairs to arches.  
Storage location to be agreed.

Ω End of Section

**C40**

**CLEANING MASONRY/ CONCRETE**

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## **C40**

### **Cleaning masonry/ concrete**

#### **General/ preparation**

##### **110 SCOPE OF WORK**

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1. Refer to drawings.

##### **120 RELATED REPAIR AND REMEDIAL WORKS**

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1. Work to be carried out before cleaning work: Removal of any redundant fittings. Refer to drawings.
2. Work to be carried out after cleaning work: Repairs to masonry as section C41

##### **142 REMOVAL OF FITTINGS**

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1. Timing: Before commencement of cleaning work.
2. Disturbance to surfaces: Minimize.
3. Items for disposal: Nails, screws and other fixings
4. Items to be kept for reuse: Refer to drawings

##### **160 PROTECTION**

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1. Surfaces not designated for cleaning: Prevent damage, including marking and staining.  
Refer to protection drawings for additional protection,
2. Openings: Prevent ingress of water, cleaning agents and detritus.
  - 2.1. Vents and grilles: Seek instructions before sealing up.
3. Temporary mechanical fastenings
  - 3.1. In masonry: Locate in joints.
  - 3.2. In other surfaces: Seek instructions.

##### **175 CONTROL AND DISPOSAL OF WASH WATER AND DETRITUS**

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

**C40**

**CLEANING MASONRY/ CONCRETE**

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**180 COLD WEATHER**

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

**190 CLEANING GENERALLY**

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

**215 RECORD OF CLEANING WORKS**

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

**230 TRIAL SAMPLES PORTLAND STONE CLEANING**

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1. Trial sample reference: DOFF 01
  - 1.1. Surface: Portland Stone
  - 1.2. Location/ Size: 200x200mm
  - 1.3. Type of soiling: Atmospheric soiling.
  - 1.4. Cleaning methods: Steam as clause 352.



**C40**

**CLEANING MASONRY/ CONCRETE**

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2. Records: Maintain written records for each trial area, including cleaning methods and conditions, to enable replication of results elsewhere.

**231 TRIAL SAMPLES PORTLAND STONE CLEANING**

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1. Trial sample reference: DEF 01
  - 1.1. Surface: Portland Stone
  - 1.2. Location/ Size: 200x200mm
  - 1.3. Type of soiling: Efflorescence / salt deposits
  - 1.4. Cleaning methods: Brush with a soft, dry brush to remove all salt deposits.
2. Records: Maintain written records for each trial area, including cleaning methods and conditions, to enable replication of results elsewhere.

**232 TRIAL SAMPLES PAINT REMOVAL**

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1. Trial sample reference: PAI 01
  - 1.1. Surface: Portland Stone.
  - 1.2. Location/ Size: 200x200mm
  - 1.3. Type of soiling: Paint.
  - 1.4. Cleaning methods: As clause 372.
2. Records: Maintain written records for each trial area, including cleaning methods and conditions, to enable replication of results elsewhere.

**232 TRIAL SAMPLES PORTLAND STONE CLEANING**

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1. Trial sample reference: DEF 02
  - 1.1. Surface: Portland Stone
  - 1.2. Location/ Size: 200x200mm
  - 1.3. Type of soiling: Loose, degraded stone surface
  - 1.4. Cleaning methods: Stiff bristle or nylon brush. Defrass – carefully remove loose and degraded material to reveal sound stone surface. Damage to sound stone is to be avoided.
2. Records: Maintain written records for each trial area, including cleaning methods and conditions, to enable replication of results elsewhere.

**Products/ equipment**

**300 COMPATIBILITY OF CHEMICAL PRODUCTS**

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

**C40**

**CLEANING MASONRY/ CONCRETE**

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**312 SURFACE BIOCIDES**

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

**352 CLEAN STEAM GENERATORS MASONRY**

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1. Manufacturer: [Stonehealth Ltd](#) or equal and approved
  - 1.1. Contact details
    - 1.1.1. Address: G4/5 Draycott Business Park  
Cam  
Dursley  
Gloucestershire  
GL11 5DQ
    - 1.1.2. Telephone: [+44 \(0\)1453 540600](tel:+441453540600)
    - 1.1.3. Web: <https://stonehealth.com/>
    - 1.1.4. Email: [info@stonehealth.com](mailto:info@stonehealth.com)
  - 1.2. Product reference: [DOFF Super Heated Steam Cleaning System](#)
2. Input water temperature: 30°C.
3. Power supply: TBC
4. WaterConsumption: 3–5 L/minute.
5. Operating pressure (maximum): 100 bar (1450 psi).
6. TemperatureRange: 30°C–150°C.
7. Dry weight: 123.5 kg.
8. Pump: 500 x 282 x 310 mm.
9. Box size: 680 x 630 x 1030 mm.

**372 CHEMICAL CLEANING GELS AND LIQUIDS PAINT REMOVAL**

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1. Description: Paint removal from Portland Stone
2. Poulticing medium manufacturer: [Stonehealth Ltd](#)
  - 2.1. Contact details
    - 2.1.1. Address: G4/5 Draycott Business Park  
Cam  
Dursley  
Gloucestershire  
GL11 5DQ
    - 2.1.2. Telephone: [+44 \(0\)1453 540600](tel:+441453540600)

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**CLEANING MASONRY/ CONCRETE**

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2.1.3. Web: <https://stonehealth.com/>

2.1.4. Email: [info@stonehealth.com](mailto:info@stonehealth.com)

2.2. Product reference: [PAINT-RID- Paint remover and paint softener.](#)

3. Form: Liquid.
4. Coverage: 2–5 m<sup>2</sup>/L.
5. Appearance: Viscous liquid.
6. Odour: Slight.
7. Colour: White/ off-white.
8. Solubility in water: Yes.
9. Density: 1.06 g/L.
10. BoilingPoint: 198–230°C.
11. Density: 1.06 g/L.
12. pH value: 3.9–4.5.

**Application**

**412 REMOVAL OF LOOSELY ADHERED DEPOSITS**

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

**432 TOOLING**

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1. Tooling of surfaces: As trial sample DEF 02 as clause 232.

**482 STEAM CLEANING**

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

**495 TESTING PH VALUES FOR CHEMICAL CLEANING**

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

**C40**

**CLEANING MASONRY/ CONCRETE**

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**500 CHEMICAL CLEANING**

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

Ω End of Section

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

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## **C41**

# **Repairing/ renovating/ conserving masonry**

## **Generally/ preparation**

### **110 SCOPE OF WORK**

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

### **120 SITE INSPECTION**

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1. Purpose: To confirm type and extent of repair/ renovation/ conservation work shown on drawings and described in survey reports and schedules of work.
2. Parties involved: Conservation architect, Foreman mason
3. Timing: At least 5 working days before starting each section of work
4. Instructions issued during inspection: Confirm in writing, with drawings and schedules as required, before commencing work

### **125 REMOVAL OF FITTINGS/ FIXTURES**

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1. Items to be removed, and reinstated on completion of repair work: Refer to drawings, nails and screws and other redundant fittings.
  - 1.1. Treatment following removal: Fill holes with lime mortar.
2. Masonry fabric and surfaces: Do not damage during removal and replacement of fittings/ fixtures.

### **130 REMOVAL OF PLANT GROWTHS FROM MASONRY**

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

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

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**140 RECORD OF WORK**

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1. General: Record work carried out to masonry clearly and accurately using written descriptions, sketches, drawings and photographs, as necessary.
2. Specific records: Marked up elevations, materials specifications (mortar, brick/stone used), other site decisions.
3. Documentation: Submit on completion of the work.
  - 3.1. Number of sets: One, in digital format (pdf)

**Workmanship generally**

**150 POWER TOOLS**

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1. Usage for the removal of mortar: Not permitted

**155 PUTLOG SCAFFOLDING**

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1. Usage: Not permitted

**160 PROTECTION OF MASONRY UNITS AND MASONRY**

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

**165 STRUCTURAL STABILITY**

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

**170 DISTURBANCE TO RETAINED MASONRY**

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

**180 WORKMANSHIP**

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1. Skill and experience of site operatives: Appropriate for types of work on which they are employed.

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

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- 1.1. Documentary evidence: Submit on request.

**185 ADVERSE WEATHER**

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

**190 CONTROL SAMPLES**

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1. General: Complete an area of each of the following types of work, and arrange for inspection before proceeding with the remainder: Stone indent repair, mortar repair, repointing.

**Materials/ production/ accessories**

**215 MATERIAL SAMPLES**

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1. Representative samples of designated materials: Submit before placing orders.
  - 1.1. Designated materials: Kentish Ragstone as clause 240, Portland Stone as clause 241, Sands for mortar repairs
2. Retention of samples: Unless instructed otherwise, retain samples on site for reference. Protect from damage and contamination.

**220 RECORDING PROFILES**

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

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**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

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**230 INSPECTION OF DRAWINGS, TEMPLATES, CASTS, ETC.**

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1. Timing: Before starting production of masonry units associated with the following items: Carved stonework
2. Period of notice (minimum): One week

**240 STONE KENTISH RAGSTONE**

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1. Standard: To [BS EN 771-6](#)
2. Supplier: Submit proposals
3. Type: Kentish ragstone
4. Quality: Free from vents, cracks, fissures, discolouration or other defects that may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with workshop drawings prepared by the supplier.
5. Finish: To match existing adjacent stone

**241 STONE PORTLAND STONE**

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1. Standard: To [BS EN 771-6](#)
2. Supplier: Submit proposals
3. Type: Portland stone
4. Quality: Free from vents, cracks, fissures, discolouration or other defects that may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with workshop drawings prepared by the supplier.
5. Finish: To match existing adjacent stone

**250 STONE ORIENTATION**

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

**255 ASHLAR BLOCKS/ DRESSINGS**

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

**265 SALVAGED AND SECOND-HAND BRICKS**

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1. Source: Existing bricks salvaged from areas of demolition of spine wall.
2. Condition



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**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

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- 2.1. Free from matter such as mortar, plaster, paint, bituminous materials and organic growths.
- 2.2. Sound, clean and reasonably free from cracks and chipped arrises.

**Dismantling/ rebuilding**

**310 DISMANTLING MASONRY FOR REUSE REVETMENT WALL**

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1. Masonry units to be reused: Remove carefully and in one piece.
  - 1.1. Treatment: Record archaeologically and photographically prior to any works and submit report to CA. Carefully dismantle. Clean off old mortar, organic growths and dirt, and leave units in a suitable condition for rebuilding.
  - 1.2. Identification: Mark each unit clearly and indelibly on a concealed face, indicating its original position in the construction. Transcribe markings to drawings/ photographs.

**320 REBUILDING PORTLAND STONE**

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1. Description: Repairs to Portland Stone window and door surrounds
2. Replacement materials: Stone, as clause 241
3. Mortar: To match existing
  - 3.1. Standard: Not applicable
  - 3.2. Mix: To be established following mortar analysis of the existing mortar. (Allow for 1:3 ready-mixed non-hydraulic lime putty: sand and stone dust or similar). Refer to section Z21
  - 3.3. Sand source/ type: Well-graded crushed stone, to approval.
4. Fixings: Refer to SE specification for structural repair reinforcement.
5. Rebuilding: To match previous face and joint lines, joint widths and bonding. Adequately bonded to retained work/ backing masonry, as appropriate.
6. Joint surfaces: Dampen, as necessary, to control suction.
7. Laying masonry units: On a full bed of mortar; perpend joints filled.
8. Exposed faces: Remove mortar and grout splashes immediately.
9. Joints: To match existing example in good condition as confirmed by conservation architect.
10. Other requirements: None

**321 REBUILDING KENTISH RAGSTONE**

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1. Description: Repairs to Kentish ragstone walls
2. Replacement materials: Stone, as clause 240
3. Mortar: To match existing

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

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- 3.1. Standard: Not applicable
- 3.2. Mix: To be established following mortar analysis of the existing mortar. (Allow for 1:3 ready-mixed non-hydraulic lime putty: sand and stone dust or similar). Refer to section Z21
- 3.3. Sand source/ type: Well-graded crushed stone, to approval.
4. Fixings: Refer to SE specification for structural repair reinforcement.
5. Rebuilding: To match previous face and joint lines, joint widths and bonding. Adequately bonded to retained work/ backing masonry, as appropriate.
6. Joint surfaces: Dampen, as necessary, to control suction.
7. Laying masonry units: On a full bed of mortar; perpend joints filled.
8. Exposed faces: Remove mortar and grout splashes immediately.
9. Joints: To match existing example in good condition as confirmed by conservation architect.
10. Other requirements: None

**322 REBUILDING BRICKWORK**

---

1. Description: Repairs to brickwork
2. Replacement materials: Bricks, as clause 265
3. Mortar: To match existing
  - 3.1. Standard: Not applicable
  - 3.2. Mix: To be established following mortar analysis of the existing mortar. (Allow for 1:3 ready-mixed non-hydraulic lime putty: sand and stone dust or similar). Refer to section Z21
  - 3.3. Sand source/ type: Well-graded crushed stone, to approval.
4. Fixings: Refer to SE specification for structural repair reinforcement.
5. Rebuilding: To match previous face and joint lines, joint widths and bonding. Adequately bonded to retained work/ backing masonry, as appropriate.
6. Joint surfaces: Dampen, as necessary, to control suction.
7. Laying masonry units: On a full bed of mortar; perpend joints filled.
8. Exposed faces: Remove mortar and grout splashes immediately.
9. Joints: To match existing example in good condition as confirmed by conservation architect.
10. Other requirements: None

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

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**Replacements and insertions**

**330 PREPARATION FOR REPLACEMENT MASONRY**

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

**350 STONE INSERTS TO WINDOW SURROUND**

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1. Description: Stone indent repairs as indicated on drawings
2. Stone: Portland stone, as clause 241
3. Finish: Flush and to match existing.
4. Preparation and insertion: As clause 395.
5. Mortar: To match existing
  - 5.1. Standard: Not applicable
  - 5.2. Mix: To be established following mortar analysis of the existing mortar. (Allow for 1:3 ready-mixed non-hydraulic lime putty: sand and stone dust or similar). Refer to section Z21
  - 5.3. Sand source/ type: Fine sand, to approval
6. Fixings: Bonded dowels, as clause 405
7. Joints: Very fine.
8. Other requirements: None

**395 INSTALLING STONE INSERTS**

---

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

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

---

**405 BONDED DOWELS**

---

1. Description: To Portland stone inserts
2. Standard: Not applicable
3. Dowels: Austenitic stainless steel
4. Adhesive: Epoxy resin
5. Holes for dowels: Suitably sized and accurately aligned in masonry background and in rear of replacement/ insert stone; clean and dry.
6. Other requirements: Do not use adhesive to bond stones at joints unless instructed.

**420 TEMPORARY DISTANCE PIECES FOR JOINTS IN ASHLAR STONework**

---

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

**Tooling/ dressing stone in situ**

**450 WEATHERING LEDGES AT JOINTS**

---

1. Locations: Where stones project or are recessed – confirm with Conservation Architect and Contract Administrator before carrying out work.
2. Requirement: Carefully weather the ledge, to approval.
3. Method: Suitably graded carborundum blocks or tooling, as appropriate.

**455 DESCALING STONE**

---

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

**458 REDRESSING STONE FOLLOWING DEFRASSING**

---

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

**Mortar repairs**

**510 PREPARATION FOR MORTAR REPAIRS**

---

1. Repair area: Area for repair max 50mm in any one direction. Where repair area abuts joints, maintain existing joint widths and do not bridge joints.
2. Decayed masonry: Cut back carefully to a depth equal to the width/height of the repair or to a minimum depth of 20 mm to a sound background. Where the depth of removal exceeds 50 mm, seek instructions.

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

---

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

**520 MORTAR REPAIRS**

---

1. Description: Refer to drawings
2. Undercoats: As section Z21.
  - 2.1. Mix: To match stone in colour and texture as closely as possible.  
To be established following mortar analysis of the existing mortar. (Allow for 1:3 ready-mixed non-hydraulic lime putty: sand and stone dust or similar). Refer to section Z21
  - 2.2. Sand source/ type: Sand:stone dust mix; proportions determined by site trials
  - 2.3. Building up: In layers where necessary, each layer not exceeding 12 mm.
3. Finishing coat: To match approved samples.
  - 3.1. Mix: To match stone in colour and texture as closely as possible.  
To be established following mortar analysis of the existing mortar. (Allow for 1:3 ready-mixed non-hydraulic lime putty: sand and stone dust or similar). Refer to section Z21
  - 3.2. Sand source/ type: Sand:stone dust mix; proportions determined by site trials
  - 3.3. Finished thickness: 7 mm
  - 3.4. Finish: Scraped back, as clause 550
4. Reinforcement: Not required

**540 APPLYING MORTAR**

---

1. Surfaces to receive mortar: Clean, and free from dust and debris. Dampen to control suction.
2. Applying coats: Build up in layers of 12mm thickness. Apply mortar firmly, ensuring good adhesion with no voids. Form a mechanical key to undercoats by combing or scratching to produce evenly spaced lines.
3. Allow each layer to achieve an initial set before applying subsequent coats. Prevent each layer from drying out rapidly by covering immediately with plastics sheeting and/ or dampening intermittently with clean water.
4. Protection: Protect completed repairs from adverse weather until mortar has set.

**550 SCRAPED FINISH TO MORTAR REPAIRS**

---

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

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

---

**Crack repairs/ ties/ reinforcement**

**610 MORTAR REPAIR OF CRACKS**

---

1. Description: Refer to drawings
2. Mortar: To match existing
  - 2.1. Standard: Not applicable
  - 2.2. Mix: To be established following mortar analysis of the existing mortar. (Allow for 1:3 ready-mixed non-hydraulic lime putty: sand and stone dust or similar). Refer to section Z21
  - 2.3. Sand source/ type: As above
3. Preparation: Clean out cracks to remove debris, dust and dirt. Dampen recesses, as necessary, to control suction.
4. Applying mortar: Press well into cracks so that they are fully filled. Ensure that mortar does not encroach upon exposed faces. Finish mortar flush with masonry face.
5. Other requirements: Refer to Structural Engineer's specification for reinforcement.

**Grouting rubble filled cores – Not Used**

**Pointing/ repointing**

**810 PREPARATION FOR REPOINTING**

---

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

**820 POINTING**

---

1. Description: To stonework generally
2. Preparation of joints: Rake out existing mortar, as clause 810
3. Mortar: To match existing
  - 3.1. Standard: Not applicable
  - 3.2. Mix: To be established following mortar analysis of the existing mortar. (Allow for 1:3 ready-mixed non-hydraulic lime putty: sand and stone dust or similar). Refer to section Z21
  - 3.3. Sand source/ type: Crushed stone fine pointing sand, to approval

**C41**

**REPAIRING/ RENOVATING/ CONSERVING MASONRY**

---

4. Joint profile/ finish: Recessed back from weathered arrises to retain original joint widths. Brushed finish, as clause 860

**840 POINTING WITH TOOLS/ IRONS**

---

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

**860 BRUSHED FINISH TO JOINTS**

---

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

Ω End of Section

**C51**

**REPAIRING/ RENOVATING/ CONSERVING TIMBER**

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## **C51**

# **Repairing/ renovating/ conserving timber**

### **General**

#### **110 INSPECTION**

---

1. Purpose: To confirm nature and extent of repair/ renovation/ conservation work shown on drawings, and described in survey reports and schedules of work.
2. Parties involved: Conservation architect, Contractor's representative
3. Timing: At least 5 working days before starting each section of work
4. Instructions issued during inspection: To be confirmed by Contract Administrator

#### **150 TIMBER PROCUREMENT**

---

1. Timber (including timber for wood-based products): Obtained from well-managed forests and/ or plantations in accordance with:
  - 1.1. The laws governing forest management in the producer country or countries.
  - 1.2. International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
2. Documentation: Provide either in accordance with the chain of custody certification scheme requirements:
  - 2.1. documentary evidence (that has been or can be independently verified) regarding the provenance of all timber supplied; or
  - 2.2. evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.
3. Chain of Custody Certification scheme: In accordance with UK Government Timber Procurement Policy (UKTPP) i.e. FSC, GiB or PEFC

#### **160 TIMBER SUPPLIER**

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1. Supplier: Submit proposals

### **Structural repairs/ alterations – Not Used**

### **Products**

#### **360 SOFTWOOD FOR JOINERY REPAIRS**

---

1. Description: External joinery
2. Species: Douglas Fir / To match existing. Confirm timber species by analysis of sample.



**C51**

**REPAIRING/ RENOVATING/ CONSERVING TIMBER**

---

3. Quality: Generally to BS EN 942; free from decay and insect attack (except pinhole borers).
  - 3.1. Appearance class: Class J2 for glazing beads, drip mouldings and the like. J30 or better for all other members. Knots on arrises not permitted where exposed to view..
4. Moisture content on delivery: Match to existing joinery, typically 13–19% for external joinery, 9–13% for internal joinery.

**370 HARDWOOD FOR JOINERY REPAIRS**

---

1. Description: External joinery
2. Species: Oak / to match existing. Confirm timber species by analysis of sample.
3. Quality: Generally to BS EN 942; free from decay and insect attack (except pinhole borers).
  - 3.1. Appearance class: Class J2 for glazing beads, drip mouldings and the like. J30 or better for all other members. Knots on arrises not permitted where exposed to view.
4. Moisture content on delivery: Match to existing joinery, typically 13–19% for external joinery, 9–13% for internal joinery.

**Execution**

**600 WORKMANSHIP**

---

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

**620 PROTECTION OF TIMBER AND WOOD COMPONENTS BEFORE AND DURING INSTALLATION**

---

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

**630 MATERIAL SAMPLES**

---

1. Representative samples of designated materials: Submit before placing orders.
  - 1.1. Designated materials: Timber for joinery repairs

**650 DIMENSIONS GENERALLY**

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1. Site dimensions: Take as necessary before starting fabrication.

**C51**

**REPAIRING/ RENOVATING/ CONSERVING TIMBER**

---

- 1.1. Discrepancies with drawings: Report without delay and obtain instructions before proceeding.

**665 CROSS SECTION DIMENSIONS OF NON-STRUCTURAL SOFTWOOD**

---

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

**670 CROSS SECTION DIMENSIONS OF NON-STRUCTURAL HARDWOOD**

---

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

**700 WOOD COMPONENTS – AS DELIVERED FINISH**

---

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

**710 REUSE OF TIMBER SECTIONS/ WOOD COMPONENTS**

---

1. Sections/ components scheduled to be removed but not reused in existing locations: Agree extent of retention for reuse elsewhere in the works.
  - 1.1. Storage: Protect against damage, and store until required.
    - 1.1.1. Storage location: On site in a clean, dry location
2. Reuse: Adapt sections/ components, as necessary, and install in agreed locations.

**720 TEMPORARY REMOVAL AND REINSTATEMENT OF FITTINGS/ FIXTURES**

---

1. Items to be removed, and reinstated on completion of repair work
  - 1.1. Identification: Attach labels or otherwise mark items using durable, non-permanent means, to identify location and refixing instructions, where applicable. Obtain instruction before removal of any items.
  - 1.2. Storage: Protect against damage, and store until required.
    - 1.2.1. Storage location: On site in a clean, dry location
  - 1.3. Reinstatement: Refit in original locations using original installation methods.
2. Items unsuitable or not required for reuse: Obtain instructions regarding disposal.

**C51**

**REPAIRING/ RENOVATING/ CONSERVING TIMBER**

---

**730 PARTIAL REMOVAL OF EXISTING DECORATIVE/ PROTECTIVE FINISH PAINTED DOORS AND FRAMES**

---

1. Description: Window and door frames, doors.
2. Extent: Remove minimum necessary to expose damaged or decayed wood. Feather the edge of remaining coating around repair site.
3. Method: No hot works. Test for lead paint and take precautions as required.

**740 REMOVAL OF EXISTING DECORATIVE/ PROTECTIVE FINISH CLEAR FINISHED DOORS AND FRAMES**

---

1. Description: Clear finished doors to south Elevation of Tower Bridge Arch 01
2. Extent: Remove completely back to bare wood.
3. Method: Not hot works. Contractor to submit proposals.

**750 CLEANING DIRTY OR STAINED WOOD**

---

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

**780 REPAIR OF DISTORTED TIMBER MEMBERS**

---

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

**850 GLUED JOINTS**

---

1. Adhesive: Submit proposals
  - 1.1. Compatibility: Where relevant, obtain manufacturer's confirmation that adhesive is compatible with preservative/ fire-retardant treatment.
2. Glued structural components: Fabricated to BS 6446 in clean, controlled workshop conditions.

**860 MOISTURE CONTENT CHECKING**

---

1. Procedure: Check moisture content of timber sections with an approved electrical moisture meter.
2. Test results: Keep records of all tests and submit report to Conservation Architect and Contract Administrator. If moisture content falls outside specified range, obtain instructions.

**870 MOISTURE CONTENT TESTING**

---

1. Procedure: Test timber sections with an electrical moisture meter with deep probes. (A meter that has been carefully calibrated against oven drying tests or otherwise guaranteed by an independent testing authority).

**C51**

**REPAIRING/ RENOVATING/ CONSERVING TIMBER**

---

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

**Completion**

**910 MECHANICALLY FASTENED JOINTS**

---

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

Ω End of Section

**C90**

**ALTERATIONS**

---

## C90

### Alterations

**To be read with preliminaries/ general conditions.**

#### **15 RELATED WORK SECTIONS AND INTERFACES**

---

1.

- C20 Demolition
- C40 Cleaning masonry / concrete
- C41 Repairing / renovating / conserving masonry
- C51 Repairing / renovating / conserving timber
- C90 Alterations – repair, refurbish, refit
- L10 Windows / rooflights / screens / louvres
- L20 Doors / shutters / hatches
- L40 General glazing
- M60 Painting / clear finishing
- P21 Door / window ironmongery
- Z10 Purpose-made joinery
- Z11 Purpose-made metalwork
- Z20 Fixings and adhesives
- Z21 Mortars
- Z22 Sealants

### **General**

#### **110 ALTERATION WORKS REVETMENT WALL**

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1. Items: Partial deconstruction of Revetment Wall
2. Locations: Refer to drawings

#### **111 ALTERATION WORKS WINDOWS**

---

1. Items: Removal of window grilles, glazing, window frames, doors
2. Locations: Refer to drawings

#### **112 ALTERATION WORKS STRIP OUT**

---

1. Items: Strip out of fit out finishes and services within arches
2. Locations: Refer to drawings

**C90**

**ALTERATIONS**

---

**125 EMPLOYER'S PROPERTY STONE**

---

1. Components and materials arising from alterations that are to remain the property of the employer: Stone from Revetment wall.
  - 1.1. Protection: Protect from damage. Store in a clean dry location in palette based boxes until handing over to client. Client to instruct where they will be stored (within Tower of London)

**126 EMPLOYER'S PROPERTY RAILINGS**

---

1. Components and materials arising from alterations that are to remain the property of the employer: Railings from Revetment wall.
  - 1.1. Protection: Protect from damage. Store in a clean dry location in bundles until handing over to client. Client to instruct where they will be stored (within Tower of London)

**127 EMPLOYER'S PROPERTY CANON**

---

1. Components and materials arising from alterations that are to remain the property of the employer: Canon adjacent to Revetment wall.
  - 1.1. Protection: Protect from damage. Contractor to submit proposals for its protection in situ or its temporary relocation.

**128 EMPLOYER'S PROPERTY WINDOWS**

---

1. Components and materials arising from alterations that are to remain the property of the employer: Windows from Tower Bridge Arch 03
  - 1.1. Protection: Protect from damage. Store in a clean dry location on palettes until handing over to client. Client to instruct where they will be stored (within Tower of London)

**140 REMOVAL RAILINGS FROM REVETMENT WALL**

---

1. Scope: Railings from Revetment wall
2. Method: Carefully remove railings from Revetment Wall. Contractor is to submit proposals for the removal of the railings to minimise damage to both the stone and the railings. If rough edges remain following removal, retained railing is to be ground to a smooth finish.
3. Special requirements: Railings remain the property of the client for reuse at a later date as clause 126. Cut removed railings at joint with posts, minimising damage.

**141 REMOVAL PART OF REVETMENT WALL**

---

1. Scope: Stone from Revetment wall

**C90**

**ALTERATIONS**

---

2. Method: Carefully deconstruct the top of the stone wall. Remove old mortar, dirt and vegetation from stones, and lights / cabling.
3. Special requirements: Store stone in palette based boxes for transportation by forklift truck. Protect boxes and content from weather. Stone remains the property of the client as clause 125.

**142 REMOVAL GRILLES, GLAZING, WINDOW FRAMES, DOORS**

---

1. Scope: Grilles, Glazing, Window frames, Doors from windows to Tower Bridge Arches and Moat Arches
2. Method: Carefully remove infill as described on drawings. Protect stonework surround from damage.
3. Special requirements: Protect from damage. Store on palettes. Windows remain property of the client as clause 128. Dispose of other items.

**142 REMOVAL STRIP OUT MATERIALS**

---

1. Scope: Materials from strip out to Tower Bridge Arches and Moat Arches
2. Method: Carefully remove infill as described on drawings. Protect stonework and brickwork surround from damage.
3. Special requirements: Dispose of materials.

Ω End of Section

**L10**

**WINDOWS/ ROOFLIGHTS/ SCREENS/ LOUVRES**

---

**L10**

**Windows/ rooflights/ screens/ louvres**

**Clauses – Not Used**

**General**

**120 PRE-CONSTRUCTION SURVEY**

---

1. Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
2. Designated items: Windows generally
3. Primary support structure: Carry out survey sufficient to verify that required accuracy and security of erection can be achieved.
4. Timing: Before fabrication.

**Products**

**315 STEEL WINDOWS**

---

1. Description: New windows to match existing
2. Standard: Non-fire-rated and/ or non-smoke-rated windows to [BS EN 14351-1](#) and [BS 6510](#)
3. Material: Hot-rolled carbon steel / to match existing
4. Window section: To match existing historic examples adjacent
5. Exposure category to BS 6375-1/ design wind load: 1200 Pa
6. Operation and strength characteristics: To [BS 6375-2](#).
7. Finish as delivered: Galvanized
8. Thermal performance (U-value maximum): Ensure performance is as good as possible. Provide U-Value for reference.
9. Acoustic performance rating: Not required
10. Fire performance
  - 10.1. Fire resistance: Not required
  - 10.2. Reaction to fire: Not required
  - 10.3. Fire egress: Not required
11. Glazing details: Pinned and sealed with linseed oil putty. Refer to drawings
12. Beading: Not applicable
13. Ironmongery/ accessories: Refer to ironmongery schedule



**L10**

**WINDOWS/ ROOFLIGHTS/ SCREENS/ LOUVRES**

---

14. Fixing: Resin anchored to rebated stone reveal

**650 METAL LOUVRES**

---

1. Description: To upper section of windows. Refer to drawings.
2. Manufacturer: Bridge Louvres, or equal and approved
  - 2.1. Product reference: BL090-F099K
3. Material: Aluminium
  - 3.1. Finish as delivered: Powder-coated, refer to finishes schedule for colour
4. Fire performance: Manufacturer's standard
5. Number of louvre banks: One
6. Louvre blade pitch and angle: Pitch = 90mm, angle = 45 degrees
7. Blanking panels: Refer to drawings
8. Accessories/ other requirements: Stainless steel insect mesh
9. Fixing: No fixings into stonework. Fix to Unistrut assembly, suspended from soffit.

**Execution**

**710 PROTECTION OF COMPONENTS**

---

1. General: Do not deliver components to site that cannot be installed immediately or placed in clean, dry-floored and covered storage.
2. Stored components: Stack them vertically or near-vertically on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

**730 PRIMING/ SEALING**

---

1. Wood surfaces inaccessible after installation: Prime or seal as specified before fixing components.

**750 BUILDING IN**

---

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

**760 REPLACEMENT WINDOW INSTALLATION**

---

1. Standard: In accordance with [BS 8213-4](#).

**765 WINDOW INSTALLATION GENERALLY**

---

1. Installation: Into prepared openings.

**L10**

**WINDOWS/ ROOFLIGHTS/ SCREENS/ LOUVRES**

---

2. Gap between frame edge and surrounding construction
  - 2.1. Minimum: 1mm
  - 2.2. Maximum: 3mm
3. Distortion: Install windows without twist or diagonal racking.

**770 DAMP-PROOF COURSES IN PREPARED OPENINGS**

---

1. Location: Ensure correct positioning in relation to window frames. Do not displace during fixing operations.

**781 FIXING OF STEEL FRAMES**

---

1. Standard: As [section Z20](#).
2. Fasteners: Resin anchors
  - 2.1. Spacing: When not pre-drilled or specified otherwise, position fasteners not less than 50 mm and not more than 190 mm from ends of each jamb, adjacent to each hanging point of opening lights and at maximum 900 mm centres.

**800 BACKFILLING OF STEEL FRAME SECTIONS**

---

1. Windows fixed direct into openings: After fixing, fill back of steel frame with lime mortar fillet.

**820 IRONMONGERY**

---

1. Fixing: In accordance with any third-party certification conditions applicable. Assemble and fix carefully and accurately using fasteners with matching finish supplied by ironmongery manufacturer. Do not damage ironmongery and adjacent surfaces.
2. Checking/ adjusting/ lubricating: Carry out at completion and ensure correct functioning.

**895 VERIFICATION ON COMPLETION**

---

1. Requirement: Evidence of compliance with architect's specification
2. Method: Inspection of completed areas of glazing
3. Submittals
  - 3.1. Format: Photographic record
  - 3.2. Timing: At completion of installation

Ω End of Section

**L20**

**DOORS/ SHUTTERS/ HATCHES**

---

**L20**

**Doors/ shutters/ hatches**

**General**

**112 TIMBER PROCUREMENT**

---

1. Timber (including timber for wood-based products): Obtain from well-managed forests and/ or plantations in accordance with:
  - 1.1. The laws governing forest management in the producer country or countries.
  - 1.2. International agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
2. Documentation: Provide either in accordance with chain of custody certification scheme requirements:
  - 2.1. Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied, or
  - 2.2. Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.
3. Chain of custody certification scheme: In accordance with [UK Government Timber procurement policy \(UKTPP\)](#), i.e. FSC, GiB or PEFC

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

---

1. Evidence: Provide certified evidence, in the form of a product conformity certificate or engineering assessment, that each pedestrian door/ doorset/ assembly supplied will comply with the specified requirements to [BS EN 14351-1](#). Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.
2. Components and assemblies: Marked to the relevant UKCA/ UKNI/ CEI marking European product standard (hEN), national product standard and/ or third-party certification rating.

**150 SITE DIMENSIONS**

---

1. Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
2. Designated items: Doors in existing openings

**Products**

**215 EXTERNAL MATCHBOARDED DOORS**

---

1. Description: External doors to most arches. Refer to drawings

**L20**

**DOORS/ SHUTTERS/ HATCHES**

---

2. Manufacturer: Submit proposals
  - 2.1. Product reference: Design to match existing adapted as shown on drawings.
3. Standard: To [BS 459](#)
4. Wood: Oak / To match existing timber
  - 4.1. Species: Oak / To match existing timber. Confirm timber species by analysis of sample.
  - 4.2. Board joints: Tongued-and-grooved V joint to match existing
  - 4.3. Moisture content on delivery: 13–19%
5. Finish as delivered: Prepared and primed, as section M60

**330 WOOD DOOR FRAMES**

---

1. Description: To moat arch doors. Refer to drawings
2. Materials: To BS 459
  - 2.1. Species: Oak / To match existing timber. Confirm timber species by analysis of sample.
3. Assembly
  - 3.1. Adhesive: PVAC to [BS EN 204](#), Class D4
  - 3.2. Joinery workmanship: As section Z10.
4. Moisture content on delivery: 13–19%
5. Finish as delivered: Prepared and primed, as section M60
6. Perimeter seals: Not required
7. Fire performance
  - 7.1. Fire resistance: Not required
  - 7.2. Smoke leakage: Not required
  - 7.3. Reaction to fire: Not required
8. Thermal performance (U-value maximum): Not required
9. Fixing: Plugged and screwed as section Z20

**Execution**

**710 PROTECTION OF COMPONENTS**

---

1. General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry, floored and covered storage.
2. Stored components: Stacked on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

**L20**

**DOORS/ SHUTTERS/ HATCHES**

---

**730 PRIMING AND SEALING**

---

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

**760 BUILDING IN**

---

1. General: Not permitted unless indicated on drawings.

**790 FIXING OF WOOD FRAMES**

---

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

**820 SEALANT JOINTS**

---

1. Sealant
  - 1.1. Manufacturer: Submit proposals
    - 1.1.1. Product reference: Submit proposals
  - 1.2. Colour: Black
  - 1.3. Application: As section Z22 to prepared joints. Triangular fillets finished to a flat or slightly convex profile.

**830 FIXING IRONMONGERY GENERALLY**

---

1. Fasteners: Supplied by ironmongery manufacturer.
  - 1.1. Finish/ corrosion resistance: To match ironmongery.
2. Holes for components: No larger than required for satisfactory fit/ operation.
3. Adjacent surfaces: Undamaged.
4. Moving parts: Adjusted, lubricated and functioning correctly at completion.

**850 LOCATION OF HINGES**

---

1. Primary hinges: Where not specified otherwise, positioned with centre lines 250 mm from top and bottom of door leaf.
2. Third hinge: where specified, positioned with centre line 250 mm below centre line of top hinge .

**860 INSTALLATION OF EMERGENCY AND PANIC EXIT DEVICES**

---

1. Standard: Panic exit devices in accordance with [BS EN 1125](#)

Ω End of Section

**L40**

**GENERAL GLAZING**

---

## **L40**

### **General glazing**

#### **General requirements**

##### **111 PRE-GLAZING**

---

1. Pre-glazing of components: Permitted.
2. Prevention of displacement: Submit details of precautions to be taken to protect glazing and compound/ seals during delivery and installation.
3. Defective/ displaced glazing/ compound/ seals: Reglaze components in situ.

##### **140 MATERIAL SAMPLES**

---

1. Representative samples of designated materials: Submit before cutting panes.
  - 1.1. Sample size (minimum): 150 x 150 mm
  - 1.2. Designated materials: Handmade crown glass to match historic examples adjacent

##### **150 WORKMANSHIP AND POSITIONING GENERALLY**

---

1. Glazing generally: In accordance with BS 6262 series.
2. Integrity: Glazing must be wind and watertight under all conditions with full allowance made for deflections and other movements.
3. Dimensional tolerances: Panes/ sheets to be within  $\pm 2$  mm of specified dimensions.
4. Materials
  - 4.1. Compatibility: Glass/ plastics, surround materials, sealers, primers and paints/ clear finishes to be used together to be compatible. Avoid contact between glazing panes/ units and alkaline materials such as cement and lime.
  - 4.2. Protection: Keep materials dry until fixed.

##### **151 PREPARATION**

---

1. Surrounds, rebates, grooves and beads: Cleaned and prepared by others.

##### **155 GLASS GENERALLY**

---

1. Standards: To [BS 952-1](#) and the relevant parts of:
  - 1.1. [BS EN 572-9](#) for basic soda lime silicate glass.
  - 1.2. [BS EN 1748-1-1](#) for borosilicate glass.
  - 1.3. [BS EN 1748-2-1](#) for ceramic glass.
  - 1.4. [BS EN 1863-2](#) for heat-strengthened soda lime silicate glass.

**L40**

**GENERAL GLAZING**

---

- 1.5. [BS EN 12150-2](#) for thermally toughened soda lime silicate safety glass.
- 1.6. [BS EN 12337](#) for chemically strengthened soda lime silicate glass.
- 1.7. [BS EN 13024-2](#) for thermally toughened borosilicate safety glass.
- 1.8. [BS EN 14449](#) for laminated glass and laminated safety glass.
2. Panes/ sheets: Clean and free from obvious scratches, bubbles, cracks and other defects. Rippling and dimples are expected in the handmade glass
  - 2.1. Edges: Generally undamaged. Shells and chips not more than 2 mm deep and extending not more than 5 mm across the surface are acceptable if ground out.

**Types of glazing**

**210 PUTTY-FRONTED SINGLE GLAZING**

---

1. Description: To new and existing windows – refer to drawings
2. Manufacturer: The London Crown Glass Company or equal and approved
  - 2.1. Product reference: LAM-HO
3. Pane material: Mouth blown cylinder glass
4. Surround: Steel
  - 4.1. Sealer: Paint primer
5. Type of putty: Linseed oil
6. Thermal performance (U-value maximum): Unrated
7. Glass installation
  - 7.1. Glass: Located centrally in surround using setting and location blocks, and secured with glazing sprigs/ cleats/ clips.
  - 7.2. Finished thickness of back bedding after inserting glazing (minimum): 1.5 mm.
  - 7.3. Front putty: Finished to a smooth, neat triangular profile stopping 2 mm short of sight line. Surface lightly brushed to seal putty to glass, and left smooth with no brush marks.
8. Sealing putty: Seal as soon as sufficiently hard, but not within seven days of glazing. Within 28 days, apply either:
  - 8.1. The full final finish, suitably protected until completion and cleaned down and made good as necessary, or
  - 8.2. Two coats of primer applied locally to the compound, to be followed nearer completion with the full specified finish.

Ω End of Section

**M60**

**PAINTING/CLEAR FINISHING**

---

## **M60**

### **Painting/clear finishing**

#### **Coating systems**

##### **130 GLOSS PAINT EXISTING METAL WINDOW FRAMES**

---

1. Description: Existing metal window frames
2. Manufacturer: Submit proposals
  - 2.1. Product reference: Submit proposals
3. Surfaces: Previously decorated
  - 3.1. Preparation: Remove all loose and defective coatings
4. Initial coats: As recommended by manufacturer
  - 4.1. Number of coats: Two
5. Undercoats: As recommended by manufacturer
  - 5.1. Number of coats: Two
6. Finishing coats: Full gloss
  - 6.1. Number of coats: One

##### **131 GLOSS PAINT NEW METAL WINDOW FRAMES**

---

1. Description: New metal window frames
2. Manufacturer: Submit proposals
  - 2.1. Product reference: Submit proposals
3. Surfaces: Galvanized
  - 3.1. Preparation: Ensure surfaces are clean and dry
4. Initial coats: Refer to clause 511 / As recommended by manufacturer
  - 4.1. Number of coats: Two
5. Undercoats: As recommended by manufacturer
  - 5.1. Number of coats: Two
6. Finishing coats: Full gloss
  - 6.1. Number of coats: One

##### **150 EGGSHELL/ SATIN PAINT NEW DOORS**

---

1. Description: To new external joinery
2. Manufacturer: Submit proposals
  - 2.1. Product reference: Submit proposals



**M60**

**PAINTING/CLEAR FINISHING**

---

3. Surfaces: Preprimed and sealed
  - 3.1. Preparation: Ensure surfaces are clean and dry
4. Initial coats: Touch up with primer if damaged
  - 4.1. Number of coats: Two
5. Undercoats: As recommended by manufacturer
  - 5.1. Number of coats: Two
6. Finishing coats: Eggshell
  - 6.1. Number of coats: One

**151 EGGSHELL/ SATIN PAINT EXISTING DOORS**

---

1. Description: To existing repaired external joinery
2. Manufacturer: Submit proposals
  - 2.1. Product reference: Submit proposals
3. Surfaces: Previously decorated
  - 3.1. Preparation: Remove all loose and defective coatings. Ensure surfaces are clean and dry
4. Initial coats: As recommended by manufacturer
  - 4.1. Number of coats: Two
5. Undercoats: As recommended by manufacturer
  - 5.1. Number of coats: Two
6. Finishing coats: Eggshell
  - 6.1. Number of coats: One

**160 DECORATIVE WOODSTAIN/ VARNISH/ PRESERVATIVE TOWER BRIDGE ARCH 01 SOUTH ELEVATION DOORS**

---

1. Description: To external doors on the south elevation of Tower Bridge Arch 01
2. Manufacturer: Submit proposals
  - 2.1. Product reference: Matt varnish / Submit proposals
3. Surfaces: Internal and external timber surfaces
  - 3.1. Preparation: Remove all previous coatings. Seek instructions on whether an initial stain coat is required.
4. Initial coats: As recommended by manufacturer
  - 4.1. Number of coats: One
5. Finishing coats: Smooth matt varnish
  - 5.1. Number of coats: Two

**M60**

**PAINTING/CLEAR FINISHING**

---

**Generally**

**215 HANDLING AND STORAGE**

---

1. Coating materials: Deliver in sealed containers, labelled clearly with brand name, type of material and manufacturer's batch number.
2. Materials from more than one batch: Store separately. Allocate to distinct parts or areas of the work.

**220 COMPATIBILITY**

---

1. Coating materials selected by contractor
  - 1.1. Recommended by their manufacturers for the particular surface and conditions of exposure.
  - 1.2. Compatible with each other.
  - 1.3. Compatible with and not inhibiting performance of preservative/fire-retardant pretreatments.

**280 PROTECTION**

---

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

**310 SUPERVISED CONTROL SAMPLES**

---

1. Sample areas of finished work: Carry out, including preparation, as follows:
2. Types of coating Location
3. M60/ 160. Trial area of south elevation door 300x300mm. Exact location to be agreed.
4. Inspection: Give notice when each stage is ready for inspection.
5. Approval of appearance: Obtain before commencement of general coating work.

**320 INSPECTION BY COATING MANUFACTURERS**

---

1. General: Permit manufacturers to inspect work in progress and take samples of their materials from site if requested.

**Preparation**

**400 PREPARATION GENERALLY**

---

1. Standard: In accordance with BS 6150.
2. Refer to any pre-existing CDM Health and Safety File.
3. Refer to CDM Construction Phase Plan where applicable.

**M60**

**PAINTING/CLEAR FINISHING**

---

4. Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
5. Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
6. Substrates: Sufficiently dry in depth to suit coating.
7. Efflorescence salts: Remove.
8. Dirt, grease and oil: Remove. Give notice if contamination of surfaces/ substrates has occurred.
9. Surface irregularities: Remove.
10. Joints, cracks, holes and other depressions: Fill flush with surface, to provide smooth finish.
11. Dust, particles and residues from preparation: Remove and dispose of safely.
12. Water based stoppers and fillers
  - 12.1. Apply before priming unless recommended otherwise by manufacturer.
  - 12.2. If applied after priming: Patch prime.
13. Oil based stoppers and fillers: Apply after priming.
14. Doors, opening windows and other moving parts
  - 14.1. Ease, if necessary, before coating.
  - 14.2. Prime resulting bare areas.

**420 FIXTURES AND FITTINGS**

---

1. Removal: Before commencing work remove: All surface mounted fittings.
2. Replacement: Refurbish as necessary, refit when coating is dry.

**425 IRONMONGERY**

---

1. Removal: Before commencing work: Remove ironmongery from surfaces to be coated.
2. Hinges: Do not remove but protect from paint
3. Replacement: Refurbishment as necessary; refit when coating is dry.

**430 EXISTING IRONMONGERY**

---

1. Refurbishment: Remove old coating marks. Clean and polish.

**440 PREVIOUSLY COATED SURFACES GENERALLY**

---

1. Preparation: In accordance with BS 6150, clause 11.5.
2. Contaminated or hazardous surfaces: Give notice of:
  - 2.1. Coatings suspected of containing lead.

**M60**

**PAINTING/CLEAR FINISHING**

---

- 2.2. Substrates suspected of containing asbestos or other hazardous materials.
- 2.3. Significant rot, corrosion or other degradation of substrates.
- 3. Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
- 4. Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
- 5. Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
- 6. Alkali affected coatings: Completely remove.
- 7. Retained coatings
  - 7.1. Thoroughly clean to remove dirt, grease and contaminants.
  - 7.2. Gloss-coated surfaces: Provide key.
- 8. Partly removed coatings
  - 8.1. Additional preparatory coats: Apply to restore original coating thicknesses.
  - 8.2. Junctions: Provide flush surface.
- 9. Completely stripped surfaces: Prepare as for uncoated surfaces.

**461 PREVIOUSLY COATED WOOD**

---

- 1. Degraded or weathered surface wood: Take back to provide suitable substrate.
- 2. Degraded substrate wood: Repair with sound material of same species.
- 3. Exposed resinous areas and knots: Apply two coats of knotting.

**471 PREPRIMED WOOD**

---

- 1. Areas of defective primer: Take back to bare wood and reprime.

**481 UNCOATED WOOD**

---

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

**490 PREVIOUSLY COATED STEEL**

---

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

**M60**

**PAINTING/CLEAR FINISHING**

---

6. Remaining areas: Degrease.

**511 GALVANIZED, SHERARDIZED AND ELECTROPLATED STEEL**

---

1. White rust: Remove.
2. Pretreatment: Apply one of the following:
  - 2.1. Mordant solution to blacken whole surface.
  - 2.2. Etching primer recommended by coating system manufacturer.

**521 UNCOATED STEEL – MANUAL CLEANING**

---

1. Oil and grease: Remove.
2. Corrosion, loose scale, welding slag and spatter: Remove.
3. Residual rust: Treat with a proprietary removal solution.
4. Primer: Apply as soon as possible.

**531 UNCOATED STEEL – BLAST CLEANING TOWER BRIDGE ANCHOR CABLE**

---

1. Oil and grease: Remove.
2. Blast cleaning
  - 2.1. Atmospheric conditions: Dry.
  - 2.2. Abrasive: Suitable type and size, free from fines, moisture and oil.
  - 2.3. Surface finish: To BS EN ISO 8501-1, preparation grade TBC on consultation with City Bridge Foundation.
3. Primer: Apply as soon as possible and within four hours of blast cleaning.

**622 ORGANIC GROWTHS**

---

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

**631 PREVIOUSLY PAINTED WINDOW FRAMES**

---

1. Paint encroaching beyond glass sight line: Remove.
2. Loose and defective putty: Remove.
3. Putty cavities and junctions between previously painted surfaces and glass: Clean thoroughly.
4. Finishing
  - 4.1. Patch prime, reputty as necessary, and allow to set.

**M60**

**PAINTING/CLEAR FINISHING**

---

- 4.2. Seal and coat as soon as fully set.

**640 EXTERNAL POINTING TO EXISTING FRAMES**

---

1. Defective sealant pointing: Remove.
2. Joint depth: Approximately half joint width; adjust with backing strip if necessary.
3. Sealant
  - 3.1. Manufacturer: Submit proposals
    - 3.1.1. Product reference: Submit proposals
  - 3.2. Preparation and application: As section Z22.

**Application**

**711 COATING GENERALLY**

---

1. Application standard: In accordance with BS 6150, clause 9.
2. Conditions: Maintain suitable temperature, humidity and air quality during application and drying.
3. Surfaces: Clean and dry at time of application.
4. Thinning and intermixing of coatings: Not permitted unless recommended by manufacturer.
5. Overpainting: Do not paint over intumescent strips or silicone mastics.
6. Priming coats
  - 6.1. Thickness: To suit surface porosity.
  - 6.2. Application: As soon as possible on same day as preparation is completed.
7. Finish
  - 7.1. Even, smooth and of uniform colour.
  - 7.2. Free from brush marks, sags, runs and other defects.
  - 7.3. Cut in neatly.
8. Doors, opening windows and other moving parts: Ease before coating and between coats.

**720 PRIMING JOINERY**

---

1. Preservative treated timber: Retreat cut surfaces with two flood coats of a suitable preservative before priming.
2. End grain: Coat liberally allow to soak in, and recoat.

**730 WORKSHOP COATING OF CONCEALED JOINERY SURFACES**

---

1. General: Apply coatings to all surfaces of components.

**M60**

**PAINTING/CLEAR FINISHING**

---

**731 SITE-COATING OF CONCEALED JOINERY SURFACES**

---

1. General: After priming, apply additional coatings to surfaces that will be concealed when fixed in place.
  - 1.1. Components: External door frames

**740 CONCEALED METAL SURFACES**

---

1. General: Apply additional coatings to surfaces that will be concealed when component is fixed in place.
  - 1.1. Components: External window frames

**751 STAINING WOOD**

---

1. Primer: Apply if recommended by stain manufacturer.
2. Application: Apply in flowing coats and brush out excess stain to produce uniform appearance.

**770 EXTERNAL DOORS**

---

1. Bottom edges: Prime and coat before hanging doors.

**790 LINSEED OIL PUTTY GLAZING**

---

1. Setting: Allow putty to set for seven days.
2. Sealing
  - 2.1. Within a further 14 days, seal with a solvent-borne primer.
  - 2.2. Fully protect putty with coating system as soon as it is sufficiently hard.
  - 2.3. Extend finishing coats on to glass up to sight line.

Ω End of Section

**Z10**

**PURPOSE-MADE JOINERY**

---

## **Z10**

### **Purpose-made joinery**

**To be read with preliminaries/ general conditions.**

#### **110 FABRICATION**

---

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

#### **120 CROSS SECTION DIMENSIONS OF TIMBER**

---

1. General: Dimensions on drawings are finished sizes. Check sizes match existing timber sizes
2. Maximum permitted deviations from finished sizes
  - 2.1. Softwood sections: To [BS EN 1313-1](#), clause 6 for sawn sections.
  - 2.2. Hardwood sections:
    - To [BS EN 1313-2](#), clause NA.3 for further processed sections.

#### **130 PRESERVATIVE-TREATED WOOD**

---

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



**Z10**

**PURPOSE-MADE JOINERY**

---

**140 MOISTURE CONTENT**

---

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

**250 FINISHING**

---

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

Ω End of Section

**Z11**

**PURPOSE-MADE METALWORK**

---

**Z11**

**Purpose-made metalwork**

**To be read with preliminaries/ general conditions.**

**310 MATERIALS GENERALLY**

---

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

**320 STEEL LONG AND FLAT PRODUCTS**

---

1. Hot-rolled structural steels (excluding structural hollow sections and tubes): To [BS EN 10025-1](#).
2. Fine grain steels, including special steels: To [BS EN 10025-3](#) and [BS EN 10025-4](#).
3. Steels with improved atmospheric corrosion resistance: To [BS EN 10025-5](#).

**Fabrication**

**515 FABRICATION GENERALLY**

---

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

**527 WELDING**

---

1. Description: Window frames. Off-site welding only
2. Welding procedures
  - 2.1. Method and standard: Metal arc welding to [BS EN 1011-1](#) and [BS EN 1011-2](#).
  - 2.2. Welding Procedure Specification (WPS): Submit pdf copies before commencement of welding. Welds are to be ground smooth
3. Preparation
  - 3.1. Joint preparation: Clean thoroughly.
  - 3.2. Surfaces of materials that will be self-finished and visible in the completed work: Protect from weld splatter.

## **Z11**

### **PURPOSE-MADE METALWORK**

---

#### 4. Jointing

- 4.1. Joints: Fully bond parent and filler metal throughout with no inclusions, holes, porosity or cracks.
- 4.2. Dissimilar metals: Not applicable
- 4.3. Strength requirements: Welds to achieve design loads.
- 4.4. Heat straightening: Not permitted
- 4.5. Complex assemblies: Agree priority for welding members to minimize distortion caused by subsequent welds.
- 4.6. Tack welds: Use only for temporary attachment.
- 4.7. Jigs: Provide to support and restrain members during welding.
- 4.8. Filler plates: Not permitted
- 4.9. Lap joints: Minimum 5 x metal thickness or 25 mm, whichever is greater.
- 4.10. Weld terminations: Clean and sound.

### **Finishing**

#### **745 PREPARATION FOR APPLICATION OF COATINGS**

---

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

#### **780 GALVANIZING**

---

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

### **Completion**

#### **910 DOCUMENTATION**

---

1. Submit
  - 1.1. Manufacturer's maintenance instructions.
  - 1.2. Guarantees, warranties, test certificates, record schedules and log books.

**Z11**

**PURPOSE-MADE METALWORK**

---

**920 COMPLETION**

---

1. Protection: Remove.
2. Cleaning and maintenance: Carry out in accordance with procedures detailed in fabricators' guarantees.

Ω End of Section

**Z21**

**MORTARS**

---

**Z21**

**Mortars**

**Cement gauged mortars – Not Used**

**Lime:sand mortars**

**310 LIME:SAND MORTAR MIXES**

---

1. Specification: Proportions and additional requirements for mortar materials are specified in Section C41.

**320 SAND FOR LIME:SAND MASONRY MORTARS**

---

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

**330 READY PREPARED LIME PUTTY**

---

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

**340 POZZOLANIC ADDITIVES FOR NONHYDRAULIC LIME:SAND MORTARS**

---

1. Manufacturer/ Supplier: Requirements for any pozzolans are to be established during mortar analysis
  - 1.1. Product reference: Submit proposals
2. Mixing: Mix thoroughly into mortar during knocking up.

**350 STORAGE OF LIME:SAND MORTAR MATERIALS**

---

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

**360 MAKING LIME:SAND MORTARS GENERALLY**

---

1. Batching: By volume. Use clean and accurate gauge boxes or buckets.

**Z21**

**MORTARS**

---

2. Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
3. Contamination: Prevent intermixing with other materials, including cement.

**370 SITE PREPARED NONHYDRAULIC LIME:SAND MORTARS**

---

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

**390 KNOCKING UP NONHYDRAULIC LIME:SAND MORTARS**

---

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

**400 MAKING HYDRAULIC LIME:SAND MORTARS**

---

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

Ω End of Section

**Z22**

**SEALANTS**

---

**Z22**

**Sealants**

**Products**

**310 JOINTS**

---

1. Description: External doors
2. Manufacturer: Submit proposals
  - 2.1. Product reference: Submit proposals
3. Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.
4. Fire performance
  - 4.1. Fire resistance: Not required
  - 4.2. Reaction to fire (for rateable products): Not required

**Execution**

**610 SUITABILITY OF JOINTS**

---

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

**620 PREPARING JOINTS**

---

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

**630 APPLYING SEALANTS**

---

1. Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
2. Environmental conditions: Do not dry or raise temperature of joints by heating.

**Z22**

**SEALANTS**

---

3. Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
4. Sealant profiles
  - 4.1. Butt and lap joints: Slightly concave.
  - 4.2. Fillet joints: Flat or slightly convex.
5. Protection: Protect finished joints from contamination or damage until sealant has cured.

Ω End of Section





Specification created using NBS Chorus