

Buttress

Manchester City Council

Heaton Hall Orangery

Heaton Park External Repair Specification
FOR PLANNING AND LBC

14-02-2024

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BUT01

General

Clauses

75 Disclaimer

1. This specification has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of Buttress Architects being obtained.

Buttress Architects accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purposes for which it was commissioned.

Any person using or relying on the document for such other purpose agrees and will by such use or reliance be taken to confirm this agreement to indemnify Buttress Architects for all loss or damage resulting, therefore.

Buttress Architects accepts no responsibility or liability for this document to any party other than the person by whom it was commissioned.

100 Precedence

1. General: Where, and to the extent that, documents conflict the following orders of precedence apply:
 - 1.1. Preliminaries override contract drawings, which override the Reference specification.
Conflict in the documents: Give notice.
 - 1.2. The contractor must read in association with all Architect, Mechanical, Electrical and Structural & Civil Engineers packages.

105 Definitions and interpretations - General

1. Employer's Representative: The person nominated in the Contract as Employer's Representative, Architect, Contract Administrator or Project Manager.
2. Reference specification: Not all clauses in the Reference specification apply to this project. If in doubt about the applicability of a clause, obtain instructions.
3. Communication: When required to communicate – including advise, inform, submit, give notice, instruct, agree, confirm, seek, or obtain information, consent, or instruction, or make arrangements – do so in writing to the Employer's Representative.
4. Responses from the Employer's Representative: Do not proceed until response has been received.
5. Approval: Approval or directions given by the Architect in writing. Unless otherwise specified in the written approval, approval is limited to the visual appearance of the work, materials or components involved and shall not relieve the Contractor from compliance with specification.
6. Conservation Professional: The person(s) responsible for inspecting and providing approval will be registered with conservation accreditation in building conservation from the AABC, RIBA (SCA level) or CIAT-Accredited Conservationist. The Conservation Professional will have specific conservation skills provided by Buttress Architects Ltd.
7. As directed: as defined for 'approval'.
8. As shown on drawings: This is an implied term deemed included within the specification.
9. As Specified: This term means that the work to which it refers is described somewhere in the contract documentation (example, on drawings or in schedules), not necessarily in the specification.
10. BBA: British Board of Agreement.
11. BS: British Standard Specification.

12. CP: British Standard Code of Practice.
13. Fuel: Electricity, gas, oil and any other source of energy.
14. Materials: Materials, components and accessories of every description.
15. Provisional sum: A sum provided for the entire cost of anticipated work that cannot be properly drawn or described.
16. Weather: Specified requirements for weather precautions and protection refer to rain, frost, snow, sleet, gales, excessive sunshine, drying winds, flooding or any other state of the weather which could cause damage or otherwise interfere with the execution of the works.

110 Definitions and interpretations – products and work

1. Remove:
 - a) Disconnect, dismantle as necessary and take out the designated products or work and associated accessories, elements, components, fastenings, supports, linings and bedding materials. Dispose of unwanted materials.
 - b) Excludes taking out and disposing of associated pipework, wiring, ductwork, or other services.
2. Keep for reuse:
 - a) Do not damage designated products or work. Clean off bedding and jointing materials.
3. Make good:
 - a) Execute local remedial work to designated work. Make secure, sound, and neat.
 - b) Excludes redecoration and/ or replacement.
4. Repair:
 - a) Execute remedial work to designated products. Make secure, sound, and neat.
 - b) Excludes redecoration and/ or replacement.
5. Refix: Fix removed products.
6. Replace:
Supply and fix new products matching those removed. Execute work to match original new state of that removed.
7. Ease:
Adjust moving parts of designated products or work to achieve free movement and good fit in open and closed positions.
8. Match existing:
Provide products and work of the same appearance and features as the original, excluding ageing and weathering. Make joints between existing and new work as inconspicuous as possible.
9. Appraise:
Means the contractor is to appraise and carry out own independent assessment of the works detailed here within and update the scope of works as is necessary through consultation with the Architect.
10. Salvaged:
Refers to materials that have been *removed* and *kept for reuse* on this job: no second-hand or reclaimed material are to be used on this project.
11. Consolidation:
Means the contractor is to make something physically stronger and solid. Returning / combing items into a single / coherent whole. Rake out and repoint / build with an NHL mortar. Return to match original profiles. Rebuild in association with structural ties / wall core gravity grouting etc.

115 Documents

1. Currency: References to published documents are to the editions, including amendments, current on the date of the Invitation to tender.
2. Services drawings: Diagrammatic, except to the extent that figured dimensions are given or calculable.
3. Dimensions: Do not rely on scaled dimensions.

4. Ensure that the manufacturers instructions and other information are at the site whilst the related work is being executed. Retain these documents and upon completion of the works, hand them to the Architect in suitable folder(s) together with a contents list.

120 Compliance

1. Submittals, samples, inspections, and tests: Undertake to suit the Works programme. Do not conceal, or proceed with, affected work until compliance with requirements is confirmed.
2. Compliance with proprietary specifications: Retain on site evidence that the proprietary product specified has been supplied.
3. 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, and analysis of results.

125 Design and production documentation

1. Design compliance: Submit certification that design complies with documented requirements.
2. Documentation:
 - 2.1. Draft: Submit complete design and production documentation.
 - 2.2. Final: Submit sufficient copies for distribution to affected parties. Keep at least one copy on site.
 - 2.3. Space requirements: Check space requirements of products or work indicated diagrammatically in the contract documents. Submit a report on consequent variations needed to the design.
 - 2.4. Drawings: Include dimensions.

126 Construction problems, issues

1. If any specified materials, components or drawn details appear to be unfit for purpose, or difficult to apply as intended, or if considered to be likely to be detrimental to the works at any time, the contractor is requested to discuss such problems with the Architect as soon as they arise.

130 Authorities and statutory undertakers

1. Approvals: Submit evidence of approvals of relevant authorities and statutory undertakers.

135 Product samples

1. Complying samples: Retain in good, clean condition on site.

140 Products and Execution

1. General quality
 - 1.1. Products generally: New. Proposals for recycled products will be considered.
 - a) Supply of each product: From the same source or manufacturer.
 - b) Whole quantity of each product required to complete the Works: Consistent kind, size, quality, and overall appearance.
 - c) Product tolerances: Where critical, measure a sufficient quantity to determine compliance.
 - 1.2. Execution generally: Fix, apply, install, or lay products securely, accurately, plumb, neatly and in alignment.
 - a) Colour batching: Do not use different colour batches where they can be seen together.
 - b) Dimensions: Check on-site dimensions.
 - c) Finished work: Not defective, e.g. not damaged, disfigured, dirty, faulty, or out of tolerance.

144 Setting out

1. Accurately set out the works in accordance with Section 6 of BS.5606 Code of Practice for accuracy in buildings. Protect any existing bench marks unless otherwise instructed. Ensure that all critical co-ordinate points are marked in a manner that cannot be removed or in a matter that makes any subsequent movement immediately apparent. Check and seek approval for the setting out before commencing work.

145 Sizes

1. General dimensions: Nominal.
2. Cross section dimensions of timber: Finished dimensions.

146 Descriptions

1. Unless otherwise indicated, any description of work to be undertaken shall be deemed to include:
 - 1.1. Material and components as specified and all labour in fitting and fixing in position, including cutting and wastage.
 - 1.2. Use of plant, tools and temporary works of every description.
 - 1.3. All matters of general application as set forth.

147 Acts, regulations etc

1. Compliance, must comply with:
 - 1.1. Any and all regulations made by any authority having jurisdiction over or in connection with the works.
 - 1.2. Code of practice published by BSI and the other major trade organisations.
 - 1.3. British standards referred to in the specification.
 - 1.4. BRE digests and other autoreactive documents prepared by the major government organisations.
 - 1.5. Printed directions issued by the manufacturers of proprietary materials and components used (whether specified or not).

148 Compliance qualification

1. Excluding statutory documents, compliance is subject to this specification which take precedent. Compliance with codes restricted to the recommendations for workmanship unless otherwise stated (if the contractor has design input).

149 Strict accordance

1. All construction must be undertaken and completed in strict accordance with all drawings, specifications, schedules, statutory building and planning regulations, health and safety regulations, all relevant British Standards, codes of practice requirements and manufacturers recommendations, standards and instructions.
2. Any discrepancies and/or anomalies across construction information must be reported immediately to the contract administrator prior to commencement of any works.

150 Substitution

1. Products: If an alternative product to that specified is proposed, obtain approval before ordering the product.
2. Work: If alternative work to that specified is proposed, obtain approval before execution.
3. Reasons: Submit reasons for the proposed substitution.
4. Documentation: Submit relevant information, including:

- a) manufacturer and product reference;

- b) cost;
 - c) availability;
 - d) relevant standards;
 - e) performance;
 - f) function;
 - g) compatibility of accessories;
 - h) proposed revisions to drawings and specification;
 - i) compatibility with adjacent work;
 - j) appearance; and
 - k) copy of warranty/ guarantee.
5. Alterations to adjacent work: If needed, advise scope, nature, and cost.
6. Manufacturers' guarantees: If substitution is accepted, submit.

155 Incomplete documentation

1. General: Where and to the extent that products or work are not fully documented, they are to be:
- a) Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
 - b) Suitable for the purposes stated or reasonably to be inferred.

160 Manufacturer's recommendation

- 1. General: Comply with manufacturer's current printed recommendations and instructions.
- 2. Changes to recommendations or instructions since close of tender: Submit details.
- 3. Manufacturers' current recommendations and instructions: Keep copies on site.
- 4. Ancillary products and accessories: Use those supplied or recommended by main product manufacturer.
- 5. Agrément certified products: Comply with limitations, recommendations, and requirements of relevant valid certificates
- 6. Strictly observe all manufacturers written instructions, particularly in respect of handling, storage life and conditions, preparing, fixing and protecting.
- 7. Should a manufacturers instructions and this specification be at variation, seek instructions from the Architect.

165 Defects in existing work

- 1. Reporting undocumented defects: When discovered, immediately give notice. Do not proceed with affected related work until response has been received.
- 2. Documented remedial work: Do not execute work which may:
 - a) hinder access to defective products or work; or
 - b) be rendered abortive by remedial work.

166 Before commencing work

- 1. Liaise with all parties concerned and arrange liaison between trades. Do not start or continue any part of the work until:
 - 1.1. Environmental conditions are suitable for the type of work involved.
 - 1.2. Supervisors are satisfied that operatives understand what is required.
 - 1.3. Related preceding work is fully completed and if necessary, tested and approved.

167 Dilapidation inspection of work areas

- 1. In order to record the condition of each internal and external work area:

- 1.1. Immediately prior to the work commencing in an area, undertake an inspection with the Architect in order to record the existing condition of the areas. The inspection is to be limited to the space in and around the work area and the routes to and from the work area.
- 1.2. Prior to the commencement of any work on site including the erection of scaffolding the contractor is to allow to undertake an inspection with the Architect in order to record the existing condition of the existing building (areas not subject to change in particular) including roofs, footpaths, road and other external paved areas.
- 1.3. Provide a report of any significant defects together with a photographic record for each area.
- 1.4. Provide general site wide photographs across all work areas.
- 1.5. Confirm the scope of work within each area with the Architect and agree how any anomalies will be dealt with e.g. occupiers' fixtures and fittings, partition abutments, etc.
- 1.6. Provide an electronic copy of all photographs taken, in jpeg format.

170 Accuracy, appearance and fit

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

175 Service runs

1. General: Provide adequate space and support for services, including unobstructed routes and fixings.
2. Services inaccessible after installation: Submit proposals for future location and identification of runs and fittings.
3. Fixing of services: Submit typical details of locations, types, and methods of fixing of services to fabric.

190 Schedule of works, drawings and reports

1. General: The specification must be read in association with all available drawings and reports etc.

195 Other specifications

1. Other Specifications: This specification is not to be read in isolation and is to be read in conjunction with all other specifications and contract documents. This general specification may be supplemented by particular specifications where individual materials and craft skills are appropriate to a particular region or locality.

200 Sub-consultants, specialists

1. General: The specification must be read in association with all available sub consultant / specialists' information, including drawings, schedules, specifications, and reports. Any discrepancies / anomalies identified are to be brought to the attention of the Architect as soon as they become evident.

252 Limitations

1. The drawings are based upon existing data and no concealed and / or hidden spaces have been exposed and / or opened up for inspection, unless specifically highlighted. Therefore, the arrangement and interfacing illustrated across details are purely indicative / approximate only. The accuracy of the survey data graphically presented cannot be confirmed. These drawings are for tender purposes only.

2. Limited and focused opening up works have been undertaken, to inform build-ups as existing. All detail arrangements and build-ups beyond external visible surfaces are purely indicative / approximations only with suggested construction and interfacing arrangements. The contractor must check all existing build-ups once appropriate safe access has been provided and will advise the Architect of any discrepancies.
3. No hidden or concealed spaces have been assessed or opened up, unless otherwise noted.

255 Drawings

1. All dimensions are in millimetres unless noted otherwise.
2. The existing general arrangement base drawings (plans, sections, and elevations) are based upon 2010 data and in some instances, may not reflect the current arrangement. Dimensions and arrangements must be checked for accuracy onsite by the contractor, prior to any works commencing, ordering or manufacture / fabrication of any elements or components.
3. Any discrepancies / irregularities must be reported to the Architect immediately. No work shall commence until any such discrepancies have been resolved.
4. In any project involving fabric repairs, the tendered drawings may have been prepared well in advance of the contract period and are reflective of the condition / arrangement at the time of survey.
5. The marked-up drawings are based upon surveys from ground level and other accessible vantage points only.
6. The contractor and/or subcontractor must allow a period of two weeks in their programme, to reappraise the drawings and confirm the scope of works to each identified area, once appropriate and safe access has been provided.
7. All areas for repair are to be marked up from the drawings onsite by the contractor and agreed with the Architect, prior to commencing any works.
8. Quantities / areas identified are for tender purposes only.
9. Specific drawing references are provided against each of the work items throughout this schedule, however the contractor must read and appraise all drawings, schedules and specifications provided, against those specifically referenced. If the contractor believes that they are not in possession of the correct and/or relevant information, they must advise and report to the Architect immediately.

260 Familiarisation

1. The contractor shall fully familiarise themselves with the buildings, site and its construction prior to commencement.

265 Design responsibility

1. The contractor will be responsible for developing the design intent drawings / solutions as necessary. Refer to the unique work item references for locations, where this may be applicable.

270 Design intent drawings

1. The contractor is to develop the design intent drawings (where requested) and provide the Architect with drawings for comment. Drawings to be provided, shall include the following as a minimum:
 - 1.1. General arrangement drawings
 - 1.2. Detail fabrication drawings
 - 1.3. Product information sheets
 - 1.4. Structural and fixing calculations

275 Internal ‘dilapidation’ inspection of work areas

1. In order to record the condition of each internal work area:
 - 1.1. Immediately prior to the work commencing within an area, the contractor shall undertake an independent inspection, whilst reviewing the description of work items, schedule of works, specifications and drawings.
 - 1.2. The contractor shall provide a report of any significant defects (which differ from those illustrated) together with a photographic record for each area.
 - 1.3. The contractor shall confirm the scope of work within each area with the Architect and agree how any anomalies will be dealt with e.g. fixtures and fittings, design intent, poor previous installations etc

280 External ‘dilapidation’ inspection of work areas

1. Prior to the commencement of any work on site including fabric repairs etc, the contractor is to undertake an inspection of the exterior envelope (across the entire site). In order to record the existing condition of the existing building (areas not subject to change in particular) including roofs, footpaths, road and other external paved areas.
 - 1.1. The contractor is to provide a report of any significant defects (which differ from those illustrated) together with a photographic record of the external areas.
 - 1.2. The contractor shall confirm the scope of work within each area with the Architect and agree how any anomalies will be dealt with e.g. junctions, repairs, replacement etc.

290 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT03

Access scaffolding

Clauses

100 Overview

1. The scaffolding will be erected in a logical and measured approach to ensure continuity and care is taken during the erection phase. It is assumed that as a phase of repair, a moveable tower scaffold could be utilised during the repair works. This would avoid potential security concerns with a fixed scaffold.
2. A scaffold will not be fixed to any areas of the building. It is assumed that the

101 Health and safety

1. The Contractor shall comply with all legal obligations currently in force and in particular with the following:
 - a) Health and Safety at Work Act 1974
 - b) Lifting Operations and Lifting Equipment Regulations 1998
 - c) Provision and Use of Work Equipment Regulations 1998
 - d) Construction (Health and Welfare) Regulations 1996
 - e) Personal Protective Equipment at Work Regulations 1992
 - f) Manual Handling Operations Regulations 1992
 - g) Management of Health and Safety at Work Regulations 1999
 - h) The Construction (Design & Management) Regulations 2015
 - i) BS EN 12811-1:2003
2. The Contractor shall ensure that a competent person inspects all material to be used for any scaffold prior to erection and inspect the completed scaffolding within 7 days of erection and prior to use.
3. Further inspections shall be carried out by a competent person within 7 days of any alteration to the scaffolding and after weather conditions likely to have affected its strength and stability, prior to use.
4. The Main Contractor is responsible for safety standards during erection, use and dismantling of the scaffold.

103 Design

1. The design of all scaffolding will be the responsibility of the Contractor and is to be in accordance with the recommendations of BS EN 12811-1 or as updated.
2. As the work involved is to a listed building / heritage asset, the scaffold should essentially be regarded as independent of the existing structure and designed accordingly. It is assumed that a large part of the repairs could be undertaken from a appropriately designed tower scaffold. No additional costs will be granted after the acceptance of any tender where this requirement has been overlooked.
3. Compliance with the various Acts and regulations listed in BS EN 12811-1 is the responsibility of the Contractor.
4. Compliance with all aspects of Health and Safety during erection, using and dismantling is the responsibility of the Contractor.
5. The design of the scaffold is to take account of the requirements of all trades which will require access, use as a working platform or storage. No claims will be entertained for additional scaffold or for amending scaffold already erected to suit the requirements of trades contained within the specification.
6. The design of the scaffolding will take into account any specific requirements of any consulting structural engineer appointed to assess the proposals.

7. The Contractor is to ensure that their proposal and any subsequent refinements or additional items comply with the following clauses.
- 7.1. 1.1.1.1 The Contractor shall present to the Employer, the Architect, and the Principal Designer their design for the scaffolding (including canopy / temporary roof), calculations and method statement at least 21 days prior to erection.
 - 7.2. 1.1.1.1 These drawings will clearly indicate positions where any scaffold is to be tied back to the fabric of the building and the proposed method of fixing.
 - 7.3. 1.1.1.1 The Employer reserves the right to employ a suitably qualified Structural or Civil Engineer to check the design and to require amendments where he considers the design inadequate in terms of safety, serviceability, and protection of the existing structure.
 - 7.4. 1.1.1.1 The Contractor shall have regard to all relevant British European standards in particular BS EN12811-1:2003, TG20:08:2011, BS 1139:2001 and BS 2482:2009 including all latest amendments.
 - 7.5. 1.1.1.1 The scaffolding must either be capable of taking the weight of the materials or a loading bay must be provided adjacent to the working lift.
 - 7.6. 1.1.1.1 The Contractor shall obtain the approval of the Architect prior to proposing the use of any scaffold fixings (temporary or permanent) which are attached to the building in any way. Putlog scaffolds are not permitted.
 - 7.7. 1.1.1.1 The Contractor shall, subject to safety requirements, avoid ties through window openings.
 - 7.8. 1.1.1.1 The Contractor must not assume that the existing building structure is in any way suitable or stable enough to provide wind bracing of the scaffolding structure.
 - 7.9. 1.1.1.1 The Contractor is to make an assessment of the ground conditions on which the scaffolding is to bear. Where necessary carry out load bearing tests to ensure the ground is adequate to carry the scaffold.
 - 7.10. 1.1.1.1 The contractor is to ascertain and take into account the requirements of all sub-contractors when designing the scaffold.
 - 7.11. On request the Contractor is to provide the following details:
 - a) Scaffold design
 - b) Full set of drawings
 - c) Calculations
 - d) Number and location of working levels
 - e) Loading bays
 - f) Manufacturer's details for specialist equipment such as ladder beams and duster props, etc.
 - g) Detailed method statements covering erection, fixings, use and dismantling.
 - 7.12. Variations to the design must be clearly documented and be submitted by the Principal Contractor to the Principal Designer to be checked by a competent person.
 - 7.13. The use of 'wedge couplers' for connecting scaffold elements is not permitted.
 - 7.14. Contractors are to be members of the National Association of Scaffolding Contractors or the National Access & Scaffolding Confederation (NASC).
 - 7.15. All sub-contractors must have experience of working in, on and around highly significant heritage assets and surroundings and must be able to provide references if requested, highlighting where similar scaffold solutions, interfaces and arrangements have been erected and dismantled in the past.
 - 7.16. The design of the scaffold(s) must take into account all the requirements of all trades which will require access, use as a working platform or storage. No claims will be entertained for additional scaffold or for amending scaffold already erected to suit the requirements of trades contained within the specification and the tendered works as a whole.
 - 7.17. Allow for all below ground drainage channels, voids below the surface etc to be spanned across with no direct loadings imposed. Review of existing drainage drawings, archaeological reports required by the contractor to ascertain exact locations.

7.18. Snow load: A snow management option is to be adopted by the contractor to minimise any imposed loads that might arise from significant levels for snow fall.

7.19. Lightening protection: The scaffold shall be continuously and effectively bonded to earth against lightening.

7.20. Further Guidance & Standards:

7.20.1. British Standards:

7.20.1.1. BS EN 39 (2001) Loose steel tubes for tube and coupler scaffolds.
Technical delivery conditions

BS EN 741 (2005) Couplers, spigot pins and baseplates for use in falsework and scaffolds - Part 1: Couplers for tubes - Requirements and test procedures

BS 2482 (2009) Specification for timber scaffold boards

BS 1139-1.2 (1990) Metal Scaffolding. Tubes. Specification for Aluminium Tube

BS 1139 2.2 (2009) Metal scaffolding - Couplers and fittings - Couplers and fittings outside the scope of BS EN 74. Requirements and test methods

BS EN 128111 (2003) Temporary Works Equipment, Scaffolds. Performance requirements and general Design

BS 5975 (2019) Code of practice for temporary works procedures and the permissible stress design of falsework

BS EN 199114 (2005) Eurocode 1. Actions on structures - General actions. Wind actions

BS EN 199113 (2003) Eurocode 1. Actions on structures - General actions. Snow Loads

7.21. Industry Technical Guidance:

7.21.1. NASC TG20:21 (2021) Guide to good practice for tube and fitting scaffolding :
Design Guide

7.22. NASC Technical Guidance for erection:

7.22.1. NASC TG20:21 (2021) Guide to good practice for tube and fitting scaffolding :
Operational Guide

7.22.2. NASC TG4:19 (2019) Anchorage Systems for Scaffolding

7.22.3. NASC SG5:18 Overhead Power Sources and Earthing of Scaffold Structures

104 Programme

1. Prior to commencement of any scaffolding the contractor shall submit a programme indicating the commencement date, and completion date. The contractor shall include dates for the Architect and structural engineer visits, alongside other required contractor / sub-contractor attendances.
2. Prior to striking the scaffold, the contractor will submit a programme indicating the period for dismantling for each area of scaffolding.
3. Scaffold is required for inspection purposes prior to confirmation of the scope of the work and the contractor is to indicate this period on their programme and ensure their proposals are submitted early enough to ensure that this period is not compromised.
4. The programme shall take into account all the requirements of the sub-contractors who require the use of the scaffold.

105 Supervision

1. The Contractor is to exercise particular care in supervising the erection and dismantling of the scaffold to ensure that no damage occurs to the fabric of the building.
2. It should be noted that in many instances damage to the historic fabric cannot easily be rectified. Any damage due to the scaffold use, erection or dismantling will be rectified at the Contractors expense.

106 Security

1. **[INSERT PROJECT SPECIFICS, example text provided below, delete and/or modify as appropriate]**

All external scaffolding shall be designed and erected so as to prevent unauthorised access by sheeting (whether painted ply or steel [fully decorated]) to a minimum height of 3 metres at the base. 'Heras' mesh fencing is not considered a suitable alternative. Exact colour of scaffold hoarding is to be confirmed and coordinated with the client.

2. The design and application of any applied graphics across solid hoarding etc is to be confirmed by the client. Contractor must seek further guidance prior to the order and installation of any hoarding.
3. Sheeting which forms part of the perimeter hoarding for the site will also need to comply with constraints for site hoarding specified elsewhere within the preliminaries for the project.
4. Access to the scaffold is to be via a single point of entry and a lockable door through the barrier described above.
5. Any areas which may be accessible from adjoining structures, roofs, etc are to be similarly protected by boarding or by other approved means.
6. Scaffolding shall be alarmed at all times.
7. Adequate measures must be taken to prevent unauthorised access from all elevations. Which could include floodlights and motion detectors as well as CCTV cameras.
8. Adequate signage and lighting must be provided in areas where light levels are reduced due to insertion of crash deck / covered & enclosed public passageways.
9. Allow for temporary removal of any wall fixed items / components during the erection and temporarily remount on the scaffold (CCTV / lights etc). Upon dismantling, refix in original locations and make good any disturbed surfaces.

107 Protection

1. The buildings, structures, assets and their surroundings are of great architectural importance. It is essential; therefore, that the greatest possible care must be taken throughout the repair works to eliminate every possibility of damage to the fabric, and its surroundings from any cause whatsoever.
2. The design and method of construction is to avoid causing damage whatsoever to the fabric of the building. In particular:
 - 2.1. No part of the scaffolding shall be placed in such a way that it abrades the structure or fabric of the building. Adequate timber bearers and soft packing should be used where scaffold is in contact with masonry. Scaffold caps will not be considered as adequate.
 - 2.2. Plastic caps **must** be placed on all tube-ends adjacent to or likely to come into contact with the fabric of the building during erection with a carpet disk offcut between the cap and building fabric, dismantling or as a consequence of lateral movement.
 - 2.3. Scaffolding bearing on the roof must take account of the bearing capacity of the roof construction. Spreader boards should intervene between scaffolding and leadwork, the boards being placed so that rainwater run-off is not impeded.
 - 2.4. Extreme care shall be taken, or temporary protection installed to avoid damage to windows, many of which may contain irreplaceable crown or painted glass of historical importance.

- 2.5. In the event of authority so being given by the Architect, any scaffolding taken through window openings for bracing and tying in is to be adequately buffered to prevent damage to internal stonework, plasterwork, and decorations. On no account is scaffolding to bear onto internal floors, panelling, or other joinery or on to wall paints. All openings through the external wall are to be adequately protected against the ingress of rainwater, snow or blown dust and other debris.
- 2.6. The scaffold is to be adequately earthed against lightning strikes.
3. Landscaping: Where plant and equipment is wheeled across paving or other, the Contractor is to take all reasonable precautions to avoid damage to surfaces. The Contractor is held responsible for making good any such damage.
4. Underground Services: Before erecting the scaffold, the Contractor shall ascertain the location of external services below ground, concealed inspection chamber covers, etc., and shall take such precautions as may be necessary to avoid accidental damage and maintain access (to valves, rodding eyes, inspection chambers, culverts, etc.).
5. The Contractor shall fence off scaffolded area (or areas beneath scaffolding if of the cantilever type) to prevent public access to within 2.0m of any scaffolding.
6. The Contractor shall be responsible for monitoring the security of the scaffold both during and at the end of the working day, taking all precautions to prevent access into the building via this route.
7. The covering to pavements is to be double boarded with visqueen between.
8. All surfaces at ground level are to be suitably protected to prevent the scaffold damaging existing external and internal finishes.
9. Where internal scaffold is to be erected full protection will be required under all scaffolding except with prior written consent.
10. Ensure any architectural features or areas prone to damage are suitably protected.
11. All entrance doors, fire exits etc are to be kept clear of obstructions and are to be lined at the top and both sides.

108 Erection requirements: generally

1. All scaffold tubing and fittings are to be galvanised and in good condition and free from corrosion. Rusty components will not be accepted.
2. No steel component (including capped tubes) will be in contact with the fabric of the building except where specific approval has been given.
3. Where it is necessary to brace the scaffold from the masonry then timber packing of a minimum thickness of 20mm is to be placed between the scaffolding and the masonry.
4. No scaffolding shall rest on any roof coverings unless agreed in writing prior to commencement.
5. The ends of ALL scaffold tubes are to be protected with plastic caps, which are to be fitted prior to delivery to site. Where it is necessary to cut scaffold tubes during erection the end is to be re-capped immediately.
6. Scaffold tubes are not to encroach within 200mm of the surface of the building except where required for support or stabilising. This is to prevent accidental damage to the fabric by minor movement of the scaffold.
7. Unless unavoidable it will not be permitted to brace scaffold through window or door openings. Should this prove necessary the existing finishes are to be protected with 20mm thick timber packers both internally and externally. The opening is to be boarded up with access only for the scaffold tubes.

111 Public access

1. During erection, modification or dismantling, care must be taken to exclude the public and staff from a clearly defined area around the work.
2. Authorised access thoroughfares must have effective protection in the form of fans, netting, sheeting, brick guards, etc. to protect persons from falling objects.
3. Ladders must not be left unattended when accessible to the public.

4. Ladders at ground floor level and other risk areas should be removed and securely locked away at the end of each working day.

113 Dismantling

1. The Contractor is to exercise particular care in supervising the erection and dismantling of the scaffold to ensure that no damage occurs to the fabric of the building.
2. Ensure all necessary care is taken to ensure that no damage occurs to the fabric of the building.
3. Scaffold tubes should be carefully lowered to ground level and not thrown or dropped.
4. No dismantled components shall be left on site outside working hours unless housed within a secure compound area.
5. There will be no alterations to the physical facades, other than the tie hole mortar repairs and these will be sympathetically remediated to match the current mortar composition, texture, and colour.
6. If direct fix into masonry / stonework has resulted in defective elements / components upon striking and removal of the scaffolding, the contractor must allow for full replacement of defective building fabric, on a like-for-like basis. Sample brick / stone are to be provided for review. Bricks and stones must be selected to match the original in size, texture, profile and bond.
7. Upon dismantling of the scaffold, the mortar bed repairs will be mixed to a colour and constituent material matched mortar repair to the tie location, once carefully removed.

114 Certificates

1. Copies of all handover certificates issued by the scaffolding sub-contractor shall be forwarded to the Architect upon receipt by the Main Contractor.
2. Copies of all test certificates for hoists shall be forwarded to the Architect on receipt by the Main Contractor.
3. No scaffolding shall be used unless handover certificates and test certificates have been issued.

115 Fire engine access

1. Access for fire engines and emergency services must be maintained and provided at all times.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT04

Asbestos / hazardous materials

Clauses

100 General

1. Be aware that existing buildings / assets may contain materials which are considered hazardous by current standards. All such materials must be flagged and carefully disposed of in accordance with all relevant legislation and safety standards, and relevant authorities informed wherever applicable.
2. The [Control of Asbestos Regulations 2012](#) came into force on 6 April 2012, updating previous asbestos regulations to take account of the European Commission's view that the UK had not fully implemented the EU Directive on exposure to asbestos (Directive 2009/148/EC).
3. Regulation 4 of the CAW Regulations relates to the identity of the responsible party/ parties who have a duty to manage asbestos. This onus has been changed from the “employer” – as defined under the Health and Safety at Work Act 1974 – to the “duty-holder” who will have a duty to manage asbestos.
4. The CAW Regulations define a “duty-holder” in Regulation 4 as (a) “every person who has, by virtue of a contract or tenancy, an obligation of an extent in relation to the maintenance or repair of non-domestic premises or any means of access thereto or egress therefrom; or (b) in relation to any part of non-domestic premises where there is no such contract or tenancy, every person who has, to any extent, control of that part of those non-domestic premises or any means of access thereto or egress therefrom”.
5. The definition of a “duty-holder” under the CAW Regulations is therefore different from the definition under the 1987 Regulations (where the duty was placed on the Employer).
6. The CAW regulations require the duty-holder to manage the risk from asbestos in non-domestic premises. The “duty-holder” is required to ensure that a “suitable and sufficient assessment is carried out whether asbestos is liable to be present in the premises”. The duty-holder shall take such steps that are reasonable in the circumstances in making the assessment to “those parts of the premises which are reasonably accessible”.
7. The industry standard for asbestos surveys requires contractors to be accredited by the United Kingdom Accreditation Service (UKAS). Surveys are carried out in accordance with the Method of Detecting Hazardous Substances, (the HSE Asbestos Survey Guide HSG264:2012) and three surveys are identified as follows: -

Type 1: Location and Assessment Asbestos Survey (presumptive)

Type 2: Standard Sampling, Identification and Assessment Asbestos Survey (sampling survey)

Type 3: Full Access Sampling and Identification Asbestos Survey (pre-demolition/ major refurbishment surveys)

8. The Architect is not an expert in matters relating to asbestos, nor an accredited surveyor in respect of the UKAS requirements and this report should therefore not be considered as a contribution to the Asbestos Survey Report required by the CAW Regulations. The Architect has no duty to report on asbestos. However, where there is reasonable cause to suspect that asbestos containing materials are encountered during the course of the fabric inspection, these matters will be reported in the usual way.
9. All contractors and specialist sub-contractors dealing with asbestos are to comply with the following Regulations and Directives:
 - Asbestos Surveys and Asbestos Sampling and Removal.
 - The Control of Asbestos Regulations 2012 (2012/632).
 - HSE Asbestos – Health and Safety in the workplace – April 2012.
 - The revised Approved Code of Practice (ACOP) 2nd October 2013.
 - ISO 17020 UKAS P402 accredited laboratory for testing.

Ω End of Section

BUT05 Demolition / removal

Clauses

100 General requirements

1. Code of Practice: Comply with BS 6187:2011 Demolition subject to any qualifications given hereunder.
2. Choice of Demolition Contractor: Ensure that major dismantling is undertaken by specialists who are experienced in working in accordance with BS 6187 and the publications of the National Federation of Demolition Contractors. These documents form the basis of this specification. BS 6187 shall be read in conjunction with this and its principal clauses are referred to hereunder.
3. Scope of Dismantling: The extent of the work is indicated within the drawing package.
4. The Contractor is to undertake a survey in order to ascertain sufficient information about the structures and its surroundings prior to undertaking any works.
5. Before commencing work, complete the survey to obtain the information referred to in BS 6187 clause 4.1. Agree with the Architect and clearly label on-site items, fabric and contents that are not to be demolished but are to be carefully protected and retained or removed for reuse.
6. Investigate Risks: Investigate the features of the structure, ascertain if shock or vibration could damage surrounding property or equipment therein or buried services and check the existence of toxic or flammable substances or asbestos.
7. Disconnect Services: Disconnect, divert, seal off or remove existing services.

105 Materials

1. New materials:
 - 1.1. Generally: Any new materials required shall be as specified hereafter in the appropriate work sections.
2. Old materials:
 - 2.1. Removal and Credit: Remove from the site only those materials not required and identified by the Employer. For any such materials of value, allow credit as stated within separate specification sections. The Employer reserves the right to retain any materials on payment to the Contractor of the credit amount allowed.
 - 2.2. Salvaging: Carefully salvage, protect and label materials and items required by the Employer. Sort, clean off any unwanted dirt and neatly stack or store in locations indicated as advised. Any salvaged materials for reinstatement should be appropriately stored, dependent on the item to which is being retained and adequately ventilated for the foreseeable future and/or until reinstatement. An appropriate specific methodology may be required in certain areas.
 - 2.3. Bricks: Clean, stack and protect on-site any bricks suitable for re-use for general brickwork.
3. Unwanted materials:
 - 3.1. Unwanted Materials: Remove debris and materials not required for retention or re-use on site; do not permit such materials to accumulate or become a health or fire risk.

110 Methods of taking down

1. Select Suitable Methods: Employ methods that cause no shocks or vibration likely to damage surrounding property or equipment housed therein or buried services. The use of explosives is forbidden.
2. Note: The Contractor shall provide the Architect with appropriate method statements and mitigation measures for taking down / temporary supports and retention measures, prior to the dismantling or removal of any asset, component, or element. No works will be permitted to commence until the Architect has advised accordingly.

115 Safety

1. Precautions: Take protective precautions. Ensure there are no risks of uncontrolled collapse. Leave partially removed structures secure. Prevent overloading by debris. Provide props, struts, scaffolding and shores, etc as necessary to ensure the stability of the existing structures. Make preliminary investigations and calculations where necessary and accept responsibility for the overall safety of the Works and existing structures unless expressly made the responsibility of others in the Contract Documents.
2. Temporary Supports: Design and provide all necessary shores and other temporary supports.
3. Rot Infected Timber: Ensure that infected timber does not contaminate any materials intended for re-use.

120 Adjacent structures not demolished

1. Disconnecting: Disconnect by means causing least damage. Leave no unnecessary projections. Obtain instructions from specifier if the Contractor considers it necessary to leave any temporary supports in position.
2. Making Good: Make good only to the extent required to ensure safety of persons, weather protection, stability, and security. Do not leave any dangerous or unnecessary projections. Remove any infected embedded timber, if possible, otherwise cut off flush and soak with creosote – to be agreed with the Architect. Remove any debris constituting a health or fire risk.

125 Protection

1. Generally: Provide general protection as clause 5.4 of BS 6187 and Section 2 herein.
2. Screens: Provide temporary screens or corridors wherever needed for safety, noise or dust control, weather protection, security or other purposes to facilitate the Works.
3. Leave the site secure at all times.
4. Trees: Protect as stated elsewhere in the contract documents.

130 Preliminary work

1. Pre-commencement:
 - 1.1. Site Visit: In addition to the general implications of undertaking a survey referred to in above, visit all locations given with the spot works and ensure that the full extent of the work is understood and priced.
 - 1.2. Removing Debris: Subject to approval and prior to commencing removal of debris, ensure that all items to be salvaged are identified, set aside, protected, labelled, and safely stored for reuse or retention by the Employer. Remove debris, rubbish, loose fittings and the like from the buildings and site and leave tidy. Disinfect if necessary.
 - 1.3. Services: Make safe or divert all services. Liaise with the relevant service authorities as necessary. Test the drains and report on the findings.
 - 1.4. Preliminary Investigations: Undertake investigatory cutting away and opening up in order to become acquainted with the condition of the building. If any investigations of this nature are undertaken by the specifier, provide attendance including labour and suitable hand tools.

140 Workmanship

1. Generally: Make every attempt to undertake the work as follows:
 - a) Work which exposes the building to the weather (e.g. roof repairs): undertake during favourable weather; once such work is commenced, complete it as quickly as possible.
 - b) Cutting away and alteration work generally: undertake with the minimum amount of disturbance to those parts of the building intended to be left undisturbed.
 - c) Work involving existing work and components: undertake to the same standard and appearance as that originally achieved.

2. New Work: Undertake new work associated with the alterations as specified in the appropriate work sections.

145 Nuisance

1. Prevent Nuisance: Prevent nuisance as stated in Section 1.585 with particular reference to dust and noise. Establish and maintain good relations with adjoining occupiers.
2. Bonfires on or adjacent to the works are strictly prohibited.

150 Spot works

1. Description and pricing
 - 1.1. Definition of Spot Work: Alteration or repair work that should be valued on site and which is described in self-contained items that contain work in all trades. The following is deemed to be included with such items:
 - a) All work that can be seen or anticipated on the 'spot' (i.e. the stated location).
 - b) Ancillary work and labours normally associated with the type of work involved.
 - c) The provision of fixing materials of every description
 - d) Properly bonding, jointing and making good to surrounding work.

NOTE: Extending finishing's is not included in a spot item unless so stated in the description.
2. SMM not Applicable: Spot work is not subject to any published method of measurement or other recognised documentation, nor shall any statement given elsewhere in this document in respect of descriptions and/or measurement apply to spot work. Each and every specific rule of measurement set out in any method of measurement referred to in any other contract document is hereby overridden.
3. Locations: The location of spot work is stated in most instances. Such locations relate to the building as existing.
4. Repetitive Work: Repetitive spot work is grouped (i.e. one description covers a number of items of like work) and such work shall be priced to allow for the average circumstances at the various locations.
5. Reference System: Spot work involving a long description is referred to a schedule of typical descriptions ... by means of a brief title and an item reference (e.g. Overhaul 600 x 1450 mm D/H sash as Item xx).
6. Sizes: Sizes are stated in sequence of length/width/height. Any dimensions given with a spot item are approximate. Precise dimensions or other measurements required shall be taken by the Contractor at the Works.
7. Unlocated Spot Works: Work of a type that can be envisaged by reference to description only is not necessarily located.

160 Terms

1. List of terms used: the following terms are used:
 - 1.1. See 'definitions' list identified with section 'General'.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT06

Protection / opening up and investigative works

Clauses

75 Background

1. Prior to undertaking any construction works, all working areas and access routes are to be thoroughly protected for the duration of the contract.
2. There are a number of areas across [INSERT] which will undergo destructive investigation surveys / removals and interior / exterior fabric repairs. The careful removal of building fabric will likely produce excessive dust and debris build up within working areas. The proposed fabric repair works are identified across a series of drawings, specifications and schedules.

100 General

1. The building(s), structure(s), asset(s) and its surroundings are of great historical importance and it is essential, therefore, that the greatest possible care be taken throughout the repair works to eliminate every possibility of damage to the fabric, and its surrounds from any cause whatsoever.
2. The Contractor shall be responsible for arranging with the owners' agents / owner direct for the removal, storage and protection of all rooms, windows or articles which are retained within the finished works and would otherwise be exposed in any way to damage through vibration, damp or humidity attack. The Contractor must ensure that this has been done before the relevant work is commenced. Particular care is to be taken to protect all glazing
3. Work which exposes the historic fabric to the weather (where protection is not specified) undertake during favourable weather; once such work is commenced, complete it as quickly as possible. The Contractor is responsible for preservation of the historic fabric in accordance with the contract documents.
4. Cutting away and alteration work generally:

Undertake with the minimum amount of disturbance to those parts of the building intended to be left undisturbed. The use of power tools should be carefully considered and only used with the Architect's approval. The Contractor is to assume that all opening up will be undertaken by hand.
5. Opening up of joinery should be undertaken at existing access points, or by removal of complete panels, fascia's etc. to joint lines. Retain, reference, and set aside for future refixing any removed panels.
6. Provide all necessary forms of protection, temporary support, and safe access as necessary to allow for inspection of and access to the exposed structure or fabric.

105 Workmanship generally

1. Generally, undertake the works as follows:
 - a) Prior to undertaking any construction works, all working areas and access routes are to be thoroughly protected for the duration of the contract.
 - b) The contractor is to provide adequate protection to any historic features which are to be retained in order to avoid damage as the works are in progress. The methods for protection should be agreed with the Architect prior to works being implemented.
 - c) Whilst historic surfaces are often worn, discoloured and out of true level, these imperfections can contribute to the interest and historic value of a building and thus should be thoroughly protected.
 - d) The Contractor must be aware that works of opening up which are not carried out in accordance with the specification may contravene legislation requiring Listed Building Consent.

- e) Work which exposes the building fabric to the weather (where protection is not specified) undertake during favourable weather; once such work is commenced, complete it as quickly as possible. The Contractor is responsible for the preservation of the building fabric in accordance with the contract documents.
- f) Cutting away and alteration work generally: undertake with the minimum amount of disturbance to those parts of the building intended to be left undisturbed. The use of power tools should be carefully considered and only used with Conservation Professional approval. The Contractor is to assume that all opening up will be undertaken by hand.
- g) Opening up of joinery should be undertaken at existing access points, or by removal of complete panels, fascia's etc. to joint lines. Retain, reference and set aside for future refixing any removed panels.
- h) Provide all necessary forms of protection, temporary support and safe access as necessary to allow for inspection of and access to the exposed structure or fabric.

106 Investigation and assessment

1. The way in which the investigation of the existing fabric is approached will depend on the nature of the project. A building in an advanced state of decay will require a more considered and cautious approach to an asset which may be habitable. It will be necessary to undertake a general survey of the asset as it stands but a more detailed examination will be essential and help inform all future works, including areas of proposed opening up, areas of suspected defects and areas where proposed interventions are likely to affect the historic fabric.
2. Obvious vulnerable areas of building fabric need to be identified to help establish the potential scope of works and to inform mitigation measures for the works and understand how the works will be carried out without endangering personal safety, whilst also reducing risk to the fabric itself.
3. Some of the defects will be obvious, whilst others may be concealed and/or hidden, these areas will have to be further investigated by invasive opening up or through the use of non-destructive investigation techniques such as micro-drilling (to determine timber decay), borescope analysis, thermography (review moisture paths and structural continuity), impulse radar and/or GPR (ground penetrating radar) to locate embedded metal cramps.
4. In addition to actual hands-on site visits, the investigation and assessment may also be backed up by desktop archival research and sources.

110 Onsite recording prior to works

1. In advance of any works commencing onsite (inc. opening up, demolition, removals, temporary, conservation, restoration works etc) the existing building fabric must be thoroughly recorded to provide a snapshot in time and reference archive material for future usage.
2. The contractor shall provide a full dilapidation survey, covering the area of works, to the Conservation Professional for wider distribution and should be provided digitally.
3. The contractor shall agree with the Conservation Professional and clearly label onsite items, fabric and contents that are not to be demolished and/or removed but are to be carefully protected and retained for reuse, conservation and/or restoration works.
4. Subject to approval and prior to commencing removal of detritus, the contractor shall ensure that all items to be salvaged are identified, set aside, protected, labelled (catalogued & tagged), safely stored for reuse and/or retention.
5. The contractor shall adopt the following strategy for recording onsite items, as follows:
 - a) Full dilapidation survey photographs both internally and externally prior to any works taking place.
 - b) Photograph each specific asset, component and/or element which are to undergo works (removal, repair, restoration etc), including but not limited to:

- a. Wall fixed items; wall panelling, dado rails, picture rails, skirtings, inbuilt furniture, lighting etc.
- b. Ceiling fixed items; cornices, roses, lighting etc.
- c. Windows; varying types, surrounds, cills, linings, ironmongery etc.
- d. Door set; varying types, door leaf(s), frame, linings, architraves, ironmongery etc.
- c) Take mouldings and profiles (cross sections/dimensions) of elements and components to allow for reproductions (like-for-like) to be produced.
- d) Where elements of the fabric are loose, carefully remove (retain intact as far as is feasible), tag and store a remnant (of the above) of each instance to assist with future matching within a designated area within the building.
- e) It will also be possible to record areas of the fabric which were previously unseen: offering a unique opportunity to gather invaluable data, previously unavailable.

120 Preparation of fabric

1. Prior to installation of any protective measures. The areas in question must be thoroughly cleaned to remove all loose debris / dust which could lead to scratching / abrasion of the finished surface once protective boards are overlaid.
2. It is important to try to not over wet floors as the substrate could become loosened or efflorescence could be triggered. Surface dirt should be removed with minimal quantities of warm water.
3. Sweep and vacuum existing floors / components prior to laying / fixing of any protective boards.
4. Contractor is to photograph and record all areas prior to undertaking any works.

125 Protection of fabric

1. The Contractor is to prepare a full schedule of all existing defects and damage to the fabric, and the routes to their work areas. Any damage to the fabric found on completion of the works which is not within this schedule will be made good at the contractors expense. Any damage whatsoever caused by the Contractor during the works should be reported to the Architect immediately. The Contractor shall be responsible for the cost of making good any such damage in a manner as directed by the Architect
2. The Contractor shall ensure the proper protection and storage of all materials be they new, secondhand or reused, to eliminate any deterioration or damage. The Contractor shall provide and maintain all necessary adequate temporary dust screens and sheets, etc. for the protection of the public and the fabric, for the purpose of security and to provide complete protection from the weather
3. The Contractors attention is particularly drawn to the need for weather protection when/if the roof coverings are removed.
4. The Contractor shall protect, support and maintain all existing services which are within the area or are affected by the works
5. Generally, provide all necessary and suitable protection to all areas of work and areas adjacent to the works in order to enable the least destructive, safe and efficient means of carrying out of the works.
6. The element of protection is to encompass the non-destructive shielding of the existing building fabric and finishes against wear and tear and destructive working methods; the enclosing of working areas and areas of opening up against environmental and climatic conditions; the security of the working area and the site as a whole and the safety of site operatives, visitors and general public.
7. The structure, fabric, decoration, and contents of the buildings are to be suitably protected by the use of dustsheets, solid protection, sealing of doors, etc.
8. All protection is to be loose laid, or pressure fixed by wedging, bracing, clamping or tying as appropriate in a manner that will not damage the existing fabric of the building, no direct fix will be acceptable. The use of cloth string is acceptable.

9. The Contractor is to make allowance for and carry out all necessary modifications and adaptations of all forms of protection, where so instructed or where so required, to enable the safe and efficient carrying out of the works.
10. All protective installation must be regularly and routinely checked, with replacement of materials etc where well-worn and/or defective.
11. The appropriate method of protection is to be agreed with the Conservation Professional.
12. Equipment and materials must not be propped against decorated surfaces, fittings, or furniture.
13. Footwear is to be appropriate to the part of the building or structure in which the work is being undertaken to avoid damage to floor finishes and coverings.
14. **No** contents or fixture and fittings shall be moved by the Contractor without the written permission of client.
15. **No** adhesive tapes or mechanical fixings shall be used to secure insitu protection. If no alternatives can be proposed, each instance of proposed use should be discussed with the Architect and Project Conservator.
16. **No** item longer than 1200mm can be carried through the building unsupervised. Materials and objects should be appropriately covered to ensure that damage will not occur to either the fabric or contents of the building. The admission of equipment / materials longer than 1200mm into the building will be considered – however prior consultation must be sought with the Architect / Project Conservator.
17. Cutting of boards on site; dustsheets must be laid, and vacuum cleaners must be available at the point of work and used to collect dust as and when created.
18. All Contractors must adhere to the restricted walkways through the building / site. These routes **MUST** be clearly visible and identified by the Contractor.
19. All contractors must use dustsheets at all times.
20. Illustrative prints relating to particularly fragile elements / components, will be located at the site of work. All contractors are required to familiarise themselves with the pictures provided.
21. All areas of the building / asset are vulnerable and important and should be protected for the duration of the building works.
22. All items protected must be protected by products and materials which are fire retardant.
23. Phasing / Sequencing:
 - 23.1. Installation of protection works is likely to be phased pending investigation works. Refer to Scope of Works document and drawing package.

126 General protection of walls and floors

1. Prior to undertaking any construction works. Allow for fixing of protective measures to walls and floors within working areas. Refer to marked up drawings.
 - 1.1. Lay Antinox or equal approved protective FR boards to floors and walls within working areas. Tape and seal. Overlay with hardboard in particularly high traffic areas. No direct fix into building fabric is allowed. Loose fix with tape / pressure fix and cloth string

127 Protection of existing doors and frames retained insitu

1. Prior to undertaking any construction works, all existing retained doors are to be thoroughly protected for the duration of the project.
 - 1.1. · Lightly clean existing door prior to fixing / over-boarding of protective measures.
 - Where retained insitu, over-board with Antinox Protection Board and fix in place with cloth string. No direct fix will be acceptable.
 - If existing door is to remain on a main access route for construction traffic, the addition of a hardboard sheet may be required as additional protection.
 - Loosely fix foam (self-gripping) door leaf protector to all leading door edges. No direct

fix will be acceptable.

- Loosely fix foam door jamb (self-gripping) protector within all trafficked openings. No direct fix will be acceptable.
- Remove and discard of protective measures upon completion of main contract works and undertake any identified door repair / cleaning works identified elsewhere.

140 Conservation working practices during building works

1. It is of paramount importance that the working site is maintained and cleaned throughout the construction works.
2. The following measures are to be observed and implemented throughout the duration of the contract to minimize the disruption to the Client and occupier and reduce the time needed for the final clean prior to Client handover.
 - Prior to temporary fixing of protection measures, area to be covered should be vacuumed / cleaned to remove all loose debris and dust prior to overboarding.
 - Vacuum cleaners must be used at source where dust is being created. Bags and filters must be regularly changed, and the vacuum cleaners well maintained.
 - Contractors should vacuum up after themselves at the end of each working day.
 - Insitu protection must be well maintained.
 - Keep to walkways of protection.
 - Items over 1.2m need to be carried by two people, with ends padded.
 - Provide walkways of Antinox covered with hardwood through each room.
 - All equipment and materials should be placed on Antinox.
 - Loose laid sheets of Antinox should be used by contractors around work areas.
 - No access to storage areas or other unauthorised areas outside work site except where accompanied at all times by Client or Project Architect.

150 Materials for protection generally

1. Dust Sheets: To be linen or cotton type close weave material to prevent the ingress of dust and paints.
2. Polythene Sheet: To be minimum 250micron polythene, laid with all joints lapped and taped to prevent the passage of dust and moisture.
3. Reinforced Polythene: To be heavy duty Sisalite reinforced polythene sheet (860) by British Sisalcraft or similar.
4. Fibreboard: To be minimum 12mm Tentest board, loose laid and cut to suit irregular plan shape.
5. Underlay: To be carpet felt underlay, minimum 1.36 kilos per m2, loose laid and cut to suit.
6. Plywood: To be water and boilproof (wbp) plywood to BS 6566. Generally, the following minimum thicknesses will be used:
7. Floor protection: 4mm, cut to suit with joints taped.
8. Framed protection: 12mm on softwood frame, formed independent of the protected element.
9. Rubberized Foam: To be flexible foamtype pipework insulation, i.e. Armourflex or similar, of a suitable diameter and thickness to provide suitable protection.
10. Antinox is available from Swiftec tel: 0161 945 1500. Correx 2mm black flame retardant, is available from Cordek Ltd. tel: 01403 799 600.
11. Flame retardant bubblewrap FRC120 is available from Euronova Ltd. tel: 0117 944 2061.
12. Megafilm is available from Megafilm, tel: 0121 608 6161.
13. Flame retardant 5mm Impact CoverGuard TIG 5MM150, is available from Bainbridge International tel: 01489 776020. Bainbridge International also supply flame retardant bubblewrap.

155 Opening up and further assessment

1. It may be necessary in some instances to open up areas of the fabric to provide further insight and assessment of building fabric which is concealed and/or hidden from view, this will help to define and inform the full extent and scope of remedial works and detailed repairs required within these locations. For example, there may be embedded timber members within masonry walls which are showing signs of structural failure, this may require microdrilling or the use of a resistograph tool.
2. Locations identified to be opened up shall be kept to an absolute minimum with minimal disturbance to the surrounding fabric.
3. The full extent of the opening up works is to be agreed / marked up with the Architect onsite prior to the commencement of any invasive works to ensure that there is the absolute minimum of disturbance to the historic fabric, and that all other areas are suitably protected.
4. If investigation of spores / fungal decay / mould growth is required, this **MUST** be completed by timber and damp specialist.
5. Works specified as requiring opening up for inspection, shall be undertaken only in accordance with the agreed schedule of opening up, and Method Statements to be submitted by the Contractor. The Contractor should be aware that works to open up structure and finishes which are not carried out in accordance with the specification, may contravene legislation requiring Listed Building Consent.
6. A full photographic record shall be undertaken before commencement and a record maintained throughout the progress of the works.
7. All areas of the fabric opened up for inspection **MUST** be reinstated upon completion of the main works. Reinstatement of the fabric may be required sooner, dependant on the item to which has been opened up. For example, if an area of the external envelope has been opened up, this shall be reinstated and made good following the inspection works to retain a weathertight enclosure.
8. All works **MUST** be undertaken by approved and skilled conservation specialist contractors.
9. If required, trial holes are to be dug in locations agreed with the Architect or Structural Engineer. In locations adjacent to existing buildings or site features, works are to be undertaken by hand.
10. All necessary protection and propping are to be incorporated to ensure the structural integrity of the existing building, the protection of the excavation and building fabric and the safety of the site operatives, occupiers and visitors.
11. Lifting of floorboards is to be undertaken using nonpowered hand tools only, by skilled craftsmen and in such a way as to allow for the reinstatement of all fabric to its existing state.
12. Where there are screw fixed floorboards, these are to be taken up in preference to others. Raised floorboards should be placed carefully on one side such that they do not present a Health and Safety hazard from projecting nail fixings and that these do not damage any existing part of the fabric of the buildings or its contents. Any dust and debris created by lifting of the boards should be vacuumed up as the work proceeds (not only at the end of the working day) to limit the spread of dust, although particular vigilance is required for items of potential archaeological importance.
13. Any items of masonry that are dismantled are to be carefully referenced with their original location. Do not scratch references, mark only on unexposed faces. Any dismantled masonry is to be stored on soft, non-staining, material and is to be placed without stone-to-stone contact.
14. Service ductwork is generally to be opened up for inspection at locations of existing access panels, or other locations as agreed with the Architect. Ductwork and services are to be opened up in such a way as to allow for the reinstatement to their proper functioning state of all fabric and services on completion of the work.
15. Opening up and investigation of existing services are to be carried out strictly as described within the agreed Contractor's Method Statements.
16. Close circuit television (CCTV) investigations where so specified, shall be undertaken by an approved specialist, in accordance with the Architect's instructions.
17. The Contractor is to inform the Architect when areas of opening up are safely secured and available for inspection, allowing a minimum of two working days' notice. Following inspection,

unless otherwise instructed, backfill, relay, refix all disturbed materials and fabric to the area of the works, and make good surface finishes.

160 Health and safety

1. The contractor will provide props, struts, scaffolding and shores, etc as necessary to ensure the stability of the existing structures, including making preliminary investigations and calculations where necessary. The Contractor is responsible for the overall safety of the Works and existing structures unless expressly made the responsibility of others in the Contract Documents. All such methods of temporary support and access are to be clean and isolated from the building fabric by suitable forms of protection.
2. All works are to be carried out strictly in accordance with all relevant legislation and legal obligations currently in force. The Contractor is to have particular consideration of the programming, planning and safe carrying out of operations in respect of other works and site operatives on and about the building.
3. The Contractor is to prepare and submit to the Contract Administrator and Principal Designer, for consideration, Risk Assessments and Method Statements to address the safe carrying out of the works with the minimum of disruption to the existing structure and fabric.
4. All opening up is to be carried out strictly in accordance with the health and safety measures and requirements.

165 Nuisance

1. Prevent all avoidable nuisance on and about the site with particular reference to fumes, dust and noise. Establish and maintain good relations with adjoining occupiers. Smoking is only allowed on site outside of the building, where it has been agreed with the Client and waste is to be collected and disposed of by the Contractor at the end of each working day.
2. Bonfires will not be permitted. All waste materials shall be removed from site and disposed of in a suitable manner and in compliance with all relevant legislation.

170 Risks

1. Fire:
 - 1.1. Fire is one of the greatest risks as the damage can be so far reaching. Where a process creates a high risk of fire and is considered unavoidable, it is important to ensure that there is an adequate policy in place to mitigate the risks.
 - 1.2. Where possible all hot work is to be dealt with offsite or on the ground well away from the building fabric. Hot work is only permitted only when deemed necessary by the Conservation Professional.
 - 1.3. Where possible prefabrication and Hotwork are to be carried out a minimum distance of 6 m outside the building, on the ground and with no combustible materials within 10m of the Hotwork operation.
 - 1.4. The contractor is to advise the Conservation Professional, in writing beforehand, of the dates when hot work is being carried out, and the details (including method statements) of the work. This is to allow the client and Conservation Professional to consider whether any further precautions are deemed necessary. A Hot Work Permit System may be introduced.
2. Burglary, theft and arson:
 - 2.1. The asset must be thoroughly secured and protected at all times throughout the construction contract. All windows, doors and access points into the asset shall be blocked and/or secured at all times, ensure that the fixings do not, in themselves damage the building if it is forced.
 - 2.2. Remove ladders, along with tools and other materials which may pose a risk to the fabric. Consideration should also be given to individual objects of value, this may include fixed assets fireplaces, doors etc which could be easily stripped out or loose portable items. These assets should be security marked with a property ID system (SmartWater or SelectaDNA for example) with assets temporarily over boarded to provide additional

protection and hide from view. Details of the property identification system should be displayed at the perimeter if adopted to deter certain individuals.

3. Access routes:
 - 3.1. It is important to consider access for equipment, materials, and people throughout the asset for the duration of the project. Prior to undertaking actual building works, access routes and elements and/or components of significance should be thoroughly protected.
 - 3.2. Access routes should be carefully chosen to avoid proximity to vulnerable fabric, though this may be difficult for historic fabric. Mitigation measures should be implemented within the interior which may involve the use of foam padding and sheets or plywood or plastic padding for the protection of floors, staircase, and balustrades.
 - 3.3. Protective measures must be carefully cut to fit and fixed to together to minimise the risk of them becoming trip hazards. Sheets are normally taped together at joints.
 - 3.4. Principal trafficked areas need to be checked regularly to ensure that they remain sound and have not moved.
 - 3.5. Vulnerable corners and projections may also need to be protected with foam rubber or expanding foam separated from the material by a sheet of polythene.
4. Incidental damage during repair or conservation work:
 - 4.1. Identify potential risks and look to reduce the likelihood of occurrence and severity, when undertaking any intervention or conservation works.
5. Water damage:
 - 5.1. The exterior envelope of the asset must be maintained and protected at all times to reduce and limit potential water ingress issues.
 - 5.2. As well as rain, other sources of moisture could be introduced during pointing, masonry cleaning and other conservation processes.
 - 5.3. Gutters and downpipes which are disconnected and/or removed during construction works shall be reconnected immediately or temporary drainage system introduced.

172 No Hot Works

1. Hot works will not be allowed. This includes the use of halogen lamps, disc cutters and other spark producing equipment.

A distinct area of the site compound at least 6m from the building can be prepared as a lead working bench for the flame soldering of lead.

No smoking whatever shall be allowed within the buildings, within the immediate vicinity of the buildings or in the working compound other than a site cabin, not used for storage. This rule will be strictly upheld, any operatives found smoking will be asked to leave site immediately by the representative or the architects

The Contractor is to provide a suitable receptacle for the disposal of cigarette stubs and to ensure they are not thrown away on the cobbled areas beyond the compound.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT07

Mortar and pointing

Clauses

100 Materials

1. Hydraulic lime mortar
 - 1.1. Hydraulic Lime Mortar 1:3 using a moderately hydraulic Lime (St. Astier NHL 2 or similar approved) and well graded sand aggregates from 2.5mm down to 75 microns. Sand should be sieved to minimum 1:3rd of joint width. Strength of mortar may be reduced to NHL 2 following analysis of existing mortars.

Suppliers to be consulted for variations in aggregates to achieve required distribution and colour.

Mixing and usage to be strictly in accordance with suppliers' recommendations.
2. Hydraulic lime:
 - 2.1. Hydraulic Lime or pre-mixed hydraulic lime mortar may be obtained from:
 - 2.1.1. Womersley Associate
Walkley Lane
Heckmondwike
WF16 0PG
E: info@womersleys.co.uk Tel: 01924 400651
 - 2.1.2. Telling Lime Products Limited
Primrose Avenue
Fordhouses
Wolverhampton
WV10 8AW Tel : 01902 709777
 - 2.1.3. Joseph Parr Ltd (Alco)
Higginshaw Lane
Royton
Oldham
OL2 6JD Tel: 0161-633-1264
3. Mortar Testing: The lime supplier is to provide chemical analysis and mortar compressive strength test results in accordance with BS EN 459 using the dry hydrate currently produced on request.

101 Mortar mix

1. Mortar Mix: Only after a sample has been approved by the Architect shall the Contractor prepare aggregate blended to the correct grading and/or coarse stuff. The Contractor should therefore be aware of the subsequent preparation and standing times, including initial and final setting times prescribed in this Specification for the various materials.
2. Mix materials sufficiently to obtain a uniform colour and consistency and as specified elsewhere.
3. Dowels Cramps and Joggles: Where it is necessary to secure newly prepared stone or refit existing stone that has become loose with mechanical means, dowels or cramps may be used. Dowels or cramps are to be phosphor bronze or 316 stainless steel grouted in with lime mortar or a lead pour between the stone and the fixing. Dowels shall be threaded or notched to aid purchase on the stone. Where these materials cannot be used a two-part epoxy resin may be used with prior agreement. The position, size and type of cramp or dowel are to be agreed with the architect before preparation is made to receive the fixing.
4. Where appropriate lead joggles may be used to align indented stones.
5. Coarse Stuff; (Non-hydraulic lime): The coarse stuff of one-part air lime putty to three parts sand shall be batched by gauge box. If it is mixed in a mechanical mixer only the minimum amount of water to achieve mixing shall be added.

6. The coarse stuff of air lime and sand shall then be kept covered with damp sacking or polythene sheeting to prevent drying out, and stored for a period of two weeks before use in the main work.
7. Hydraulic Lime:Sand Mixes: Mortar is to be prepared using hydraulic lime and well graded aggregate of the appropriate particle size to suit the joint width.
8. For tendering purposes, assume the following basic mixes: Exact proportions are to be agreed with the Architect on site following the preparation and testing of samples.
 - 8.1. For general ashlar pointing NHL2.
For general pointing to copings NHL5. Note due to joint width, a different mix may be required through appropriate trials.

Hydraulic limes, based on St. Astier NHL2:

- 1 part NHL2; 1.5 part sieved Leighton Buzzard; 1 part sharp yellow sand; 0.5 part stone dust.
 - 1 part NHL2, 2 part sieved Leighton Buzzard; 1 part sharp yellow sand
9. In exposed locations where the stone is hard and durable an eminently hydraulic lime may be used. Where the stone is very soft and the exposure low, a feebly hydraulic lime or fat lime (with or without pozzolanic additive) may be used subject to the work being carried out at an appropriate time of year or under protective covering and controlled ambient conditions. The addition of pozzolanic material, if required, will be specified by the Architect.
 10. All mixing and handling equipment is to be kept clean. Containers, boards, tools, etc. shall be well cleaned before the next batch of mortar is mixed/used.
 11. Measures: Constituents by volume in clean gauge boxes. Cement gauging boxes are to be kept dry at all times. Gauging by the shovel is strictly forbidden.
 12. Mixing: Hydraulic lime is to be added to dry aggregate when knocking up the appropriate mortar mix. The addition of water must be kept to the minimum and should not exceed 75% of the lime by volume. Additional workability if necessary may be achieved by increasing the mixing time not by adding water. A mechanical paddle mixer may be used. If a roller pan mixer is used it must be correctly set to avoid crushing of the aggregate. All mortar is to be used within two hours of mixing.

102 Sand

1. Sand shall be local sand unless stated otherwise within the specification.
2. The sand shall comply with BS 1200:1976 and BS EN 13139:2002, being clean, sharp and coarse. For repair work the sand shall be of the correct colour and texture so that the new mortar, when dried out, will match the original colour and texture of the original or existing mortar (as appropriate). For new work, the sand shall be of the correct colour and texture so that the new mortar, when dried out, will match the approved sample. The aggregate size is to be well graded to match as closely as possible the existing approved mortar sample and to be appropriate to the width of the joint.

N.B. BS 1200:1976 remains applicable in this specification for the traditional repair and reinstatement of historic building fabric and associated alterations.

3. The sand shall be free of clay, silt, organic matter and excessive fines. At least half its content shall be a quartz sand, blending from different sources may be necessary.
4. The maximum particle size and grading will be related to the joint width. All sand and aggregate must be evenly graded with no more than 35% and not less than 10% of any one grading retained on each consecutive sieve size. Sieve sizes that apply depending on mortar joints are 5.0, 2.36, 1.80, 0.6, 0.3, 0.15 and 0.075 mm.
5. Where narrower or wider joints occur the grading will be adjusted to suit after discussion with the Architect. Generally the maximum particle size should be no less than one third of the joint width.

103 Water

1. Water shall be clean and fresh, free from organic and harmful matter in such quantities as would adversely affect the properties of the mortar. Test in accordance with BS EN 1008:2002 any water not obtained from the mains.

104 Lime

1. Hydraulic Lime: Hydraulic lime is to comply with the French standard NFP13-310 and the European standard BS EN-459-1:2010, 2:2010 and 3:2011. The particular traditional classification of hydraulic lime class C1, C2 or C3, will be specified by the Architect appropriate to conditions of existing masonry, exposure and anticipated weathering. The traditional English and French classifications (C1, 2, 3 and D) are used below as recorded by Smeaton and Vicat in the 18th and 19th century. The traditional feebly (grey chalk) lime is not currently available and has been omitted from the present BS and EN 459 Standard. Where required by the Architect, the hydraulic lime is to be obtained from one of the following suppliers:

- 1.1. a) Feebly hydraulic lime (Class C1): Unburnt (grey chalk) limestone is available from:

Totternhoe Lime and Stone Co. Ltd
Totternhoe, Nr. Dunstable
Bedfordshire
LU6 2BU
Tel: 01525 220300

Burning of the stone to produce feebly hydraulic lime has to be by special arrangement. This is to be used for all fine ashlar joints and gauged brickwork with mortar joints of 2mm or less. An alternative method of obtaining a similar lime is to blend a freshly slaked non-hydraulic putty lime with a NHL 2. These vary from one manufacturer to another and therefore mix proportions must be tested before use in the main work.

- 1.2. a) Very high strength hydraulic lime (NHL 5) (Class D): Socli natural hydraulic lime available from the suppliers noted above.
2. Dry Hydrate Fineness: The Contractor is to retain a 0.2mm mesh (200 micron) sieve on site at all times to enable fineness of the dry hydrate to be checked by sampling before use.
3. Aggregate: The word “aggregate” in this context includes one or more of the following:- sand, broken or crushed stone and crushed brick. It also includes other crushed inert materials. If sand particles are not of the correct colour or size, or the aggregate in the existing mortar to be matched is composed of crushed or broken stone or other material, this is to be matched with a similar material.
4. Additives: No additives (pigments, plasticisers and the like) of any sort shall be incorporated in the mortar except in very special circumstances on express written instructions given by the Architect. Raw linseed oil, up to a maximum of 3% of the lime by volume, may be added to aid water-shedding properties of the mortar where appropriate following approval of trial samples by the Architect.
5. Transport, Storage and Handling of Materials: Approved sands shall be stored in clearly marked bags or bunkers and protected from inclement weather, site debris, leaves and the like. Quantities shall be based on the use of dry sand and accurate allowances made for bulking.
6. Hydraulic lime is to be supplied in bags which must be date stamped with the day of manufacture. Hydraulic lime over 3 months old must not be used. All bags must be delivered to site undamaged and dry without moisture penetration of the covering. Dry hydrate that has been exposed to the air or moisture in transit and in damaged bags is to be rejected.
7. Hydraulic lime must be stored in a dry weatherproof building with a raised floor. Record the date of delivery. No materials may be stored on the ground. Do not store bagged lime on site for more than ten weeks.

105 Fine aggregates

1. All sand shall be to BS 1199 and 1200:1976, well-graded non-staining clean sharp coarse sand, uncontaminated by clay/silt. Sand shall be selected so that when the mortar has dried out the colour will match the colour and texture of the original mortar, unless instructed otherwise in writing by the Architect.
2. For work requiring very fine joints in the masonry sand grain size may impede filling the joints. In these instances, fine stone dust or brick dust should replace the sand as the fine aggregate.
3. Suppliers of lime to be consulted on suitability of sands proposed. Ideally sand to be obtained from the supplier of the lime.

110 Pre-works

1. Before any re-pointing work is undertaken, a survey of the building / asset / structure, shall be carried out by the architect and the contractor to determine the precise areas to be re-pointed. Often much of the old lime mortar raked out is sound and could, with advantage (appropriate access), have been left in place. It is essential that all pointing is carried out to match previously approved samples.

115 Preparation

1. In preparation for repointing works, using hand tools only, rake out all loose jointing material to a depth of not less than twice the joint width. All raking/cutting shall leave a clean, square face at the back of the joint, so as to provide optimum contact with the new mortar.
2. The prepared face and joint should be carefully cleaned out with a natural bristle brush and thoroughly flushed out with clean water, avoiding unnecessary saturation. All dust and loose material must be removed, working from top to bottom of the wall.
3. All cutting out and cleaning works should be available for inspection prior to commencement of the repointing.
4. No cleaning agents or fungicides are to be used either before or after repair works, except on the express authority of the Architect or in connection with treating root pockets.
5. Any sound pointing should be left undisturbed, even if it has weathered back behind the general wall face to as much as half the joint width. Generally, only rake out where the existing mortar is capable of being removed by raking out by hand with a blunt instrument, leaving the arrises of the brickwork or stone unharmed. A hammer and chisel should not be used unless permitted by the Architect.

Under no circumstances should an angle grinder or similar tool be used.

The definition of failed means that the pointing has cracked, been partially lost or created a water trap.

6. Any metalwork such as iron wedges found in the mortar joints will be recorded and then removed where possible.
7. Where it is desirable to remove damaging and unsightly cementitious pointing, experiments should be carried out to the approval of the Architect to ascertain the most appropriate method of removal and to limit damage caused to existing work.
8. Vegetation: Remove all growth from the walls and carefully grub out the roots. Treat the root pockets with a solution of sodium chlorate or with tebuthiuron weed-killer. Build up the root pockets reusing the original material in the mortar specified.

120 Application

1. Mortar should be plastic and workable but as stiff as possible. It should be pushed into the back of the joints in layers, avoiding large volumes of deep filling at all times.
2. On rubble elevations, many of which exist at the site / asset, pinning stones should be used to fill wide and deep joints in the same style as the original build. This will reduce the volume of mortar required and will assist the process of setting and final full carbonation. A good yardstick is to

keep the joint thickness to no more than a “finger” thick, if the joints are wider than this, they should be pinned with compatible matching masonry.

3. A “well filled” joint is close to flush with the surrounding masonry / rubblework.

125 Pointing

1. It is essential that the masonry is thoroughly dampened when pointing is commenced. If the joints have dried out before cleaning, they must be re-wetted with a hand-held spray prior to placing of any new mortar. No water should be left lying within the prepared joint.
2. The mortar must be of minimum water content and should be pushed into the joint and firmly ironed in with the maximum possible pressure and minimum of over-working. Pointing irons should be used, not pointing trowels. The pointing irons may be cranked, bronze or steel flat of a width which will fit into the joint and ensure compaction over the full width. Compaction is therefore achieved throughout the depth of the joint each time mortar is placed rather than from the surface alone. The Contractor should be aware that it may be necessary for them to fabricate pointing irons to undertake the works.
3. If the joint is to be filled in one operation, the mortar must be almost crumbly and be ironed in very firmly.
4. Repointing work should begin at the uppermost section of the wall and proceed downwards, ensuring that all the mortar is pressed well into the joints to achieve good compaction. Fill all the joints solidly with the approved mortar mix finishing very slightly back from the masonry and in accordance with the approved sample. The mortar is not to be spread or buttered onto the face of the masonry unless specified.
5. Where directed to produce a weathered, roughened finish to expose the aggregate, the mortar should be left to take its initial set and then stippled with a stiff bristle brush. The bristles should not be dragged across the face but tapped hard against it. Timing is critical. If this technique is applied too early the mortar will be removed too easily and the bond forming between the brick/stone and the mortar will be disrupted. If too late, it will be difficult to make the required impression.
6. The particular finish required (flush) is to be specified by the Architect on site according to the existing and adjacent.
7. Any slight fractures due to shrinkage must be cut out and remade prior to at practical completion of the contract and for final completion at the end of the defect's liability period.
8. When placing the mortar ensure that it is placed in the joint and does not spread over the adjacent stone and cause any lime staining. Likewise, when finishing off ensure no lime is brushed or sponged over the face of the adjacent stones causing lime staining. Such lime staining will not be considered acceptable as a finished result. Surplus lime on the face and arrises of masonry should be cleaned off immediately and all faces kept clean at all times to avoid staining.
9. Rake out all joints to a minimum depth of 35mm using a hooked knife or similar tool. Under no circumstances shall chisels or mechanical tools (disc cutters etc) be used. Extreme care must be taken to ensure no damage is caused to the stonework. Any stones damaged shall be replaced at the contractor's expense.
10. All raking out is to be inspected by the Architect prior to repointing. The works are to be co-ordinated such that preparation is carried out to agreed areas and made available for inspection by the Architect. The Contractor is to be given a minimum of 48 hours' notice for inspection.
11. All joints are to be filled to their full depth and pointed with a purpose made pointing bar with a diameter of 30mm. Where joints widen out due to erosion of the existing stone the pointing is to be kept back to ensure that a consistent visual joint is achieved. Care is to be taken to ensure that a free draining surface is always maintained or created. After the initial set of the mortar, it is to be stippled with a stiff bristled non-ferrous brush to give a texture to the pointing and to remove the smoothness of the pointing bar – giving a ‘weathered’ appearance.
12. It is essential that perpend are allowed to run into horizontal bed joints without any clear definition or “lining” occurring such that the mortar should visually transfer from perpend to bed joint in a smooth manner.

13. Clean off any surplus or spread of mortar with a clean pointing trowel as work proceeds. Great care should be taken to minimise the spread of mortar as lime staining may occur.
14. Filling in pointing is to be carried out in small areas such that all operations can be completed within the working day with due notice being paid to any potential adverse weather conditions.
15. The work is to be kept clean from mortar spillage at all times. Completed areas are to be protected until cured.

130 Masonry mortar repair

1. Pozzolanic Material: Where specified, is to be ground brick or tile dust, obtainable from Bulmer Brick and Tile Co., Bulmer, Nr. Sudbury, Suffolk CO10 7EF, tel: 01787 269232 or Metastar 501 obtainable from Rose of Jericho, Horchester Farm, Holywell, nr. Evershot, Dorchester, Dorset DT2 0LL, Tel: 01935 83676. Particle size of brick dust and colour appropriate to specific site conditions to be given following preparation, curing and laboratory testing of samples by the Contractor.
2. Crushed Stone: Crushed Cumbrian sandstone is to be incorporated in the masonry mortar repair mix to assist achieving a visual match to the stone under repair. The crushed stone granules must be sieved before use to a well graded particle size as specified above for the sand for mortar mixes.
3. Pulverised Fuel Ash: This may be required to darken the colour of the mix to match adjacent stone. The darkest P.F.A. available is therefore to be selected. Particle size of the P.F.A must be well graded and between 0.075 and 0.300mm.
4. The overall proportion of approximately 1 binder to 2 aggregate is to be maintained but mix ratios may be varied for colour matching within this parameter. Allow for 8 additional cured and dry colour samples to be prepared and approved in sequence for each stone colour to be matched to allow for mix variations to achieve matching colours for Architect's approval.
5. Allow for the drilling and resin fixing of stainless-steel armatures to strengthen masonry mortar repairs as necessary. The build-up of deep pockets or large areas of mortar repair must be carried out in stages in depths not exceeding 20mm at a time. These coatings are to be applied to the same specification as for lime plastering. Ensure the larger aggregate sizes (5mm or more) are incorporated in areas of dubbing out.
6. All mixing and handling equipment is to be kept clean. Containers, boards, tools, etc. shall be well cleaned before the next batch of mortar is mixed/used.
7. Preparation: In preparation for masonry mortar repairs use hand tools only, rake out all loose material to a depth of not less than 20mm. All raking/cutting shall leave a clean, square face and well keyed at the back of the stone, so as to provide optimum contact with the new mortar.
8. The prepared faces should be carefully cleaned out with a bristle brush and thoroughly flushed out with clean water, avoiding unnecessary saturation. All dust and loose material must be removed, working from top to bottom of the stone.
9. All cutting out and cleaning works should be approved prior to commencement of applying the stone repair mortar.
10. Finishing: No cleaning agents or fungicides are to be used either before or after repair works, except on the express authority of the Architect.
11. Any sound stone should be left undisturbed, even if it has weathered back behind the general wall face to as much as half a mortar joint width.
12. Generally, the existing pointing and finishing size and pattern is to be maintained round each stone repaired.
13. Where it is desirable to remove damaging and unsightly cementitious pointing, adjacent to the repair experiments should be carried out to the approval of the Architect to ascertain the most appropriate method of removal and to limit damage caused to existing work.
14. Protection, Cleaning and Aftercare:
 - 14.1. General: Following completion of the stone repair joint surface finish the work shall be protected from direct sun and rain and kept at a temperature above 5oC for a minimum of four weeks until the face has dried and hardened.

- 14.2. Protect all new work against frost, any repair damaged due to frost action is to be cut out and remade in frost free conditions.
- 14.3. During dry weather, all new work shall be kept continuously tended and moistened for a minimum of 4 weeks (but not wet) to ensure that the set takes place slowly.
- 14.4. Any mortar or stains caused by the works on the face of the masonry must be completely removed immediately and before the stains dry or mortar hardens.
- 14.5. All general clauses for mortar and pointing in this specification apply equally to masonry mortar repairs (or 'plastic s tone repairs') above.

140 Protection and cleaning

1. General: The work shall be protected from direct sun and rain for a minimum of four weeks (after application). The joint surface finish should be applied and tended at an average minimum temperature of 10°C until the face has dried and hardened. The period of protection must be increased relative to the slower carbonation rate that occurs at lower temperatures.
2. Protect all new work against frost, any joints damaged due to frost action is to be cut out, re-made in frost free conditions, and protected as above.
3. During dry weather, all new pointing shall be kept continuously moist (but not wet) for a minimum of 4 weeks to ensure that the set takes place slowly. Damping down is to be done with a fine mist spray – not a jet of water – in several applications. Water must not be made to flow down the face of the work when damping down. Allow for tending and spraying down for a minimum of three times a day during this period.
4. Turn back scaffold boards adjacent to brick faces at night and during heavy rain to avoid the disfiguration of finished work by abrasion and splashing.
5. Any mortar or stains caused by the works on the face of the masonry must be completely removed before the mortar hardens.
6. Pointing on horizontal surfaces – copings, paving and the like – is to be protected to prevent undue saturation in wet weather.
7. Frost: Work must not be carried out during frost conditions. Frost must not be allowed to affect completed work before it has fully cured. Manufacturers of hydraulic limes are to guarantee the curing periods for the class of lime supplied.
8. Generally pointing and bedding mortar is not to be laid when the temperature is 5°C or below and falling. Work may re-commence when the temperature is 3°C or above and rising. The Contractor is to keep maximum and minimum thermometers on site for the duration of the contract to record night and day time temperatures as directed.
9. Winter working and working when ambient temperatures are below 3°C may only proceed where the Contractor has provided sufficient protection and working conditions to ensure average 24-hour day temperatures for all application, preparation and aftercare of the mortar remain no lower than 8°C at all times.
10. Any work affected by the weather is to be cut out and replaced at the Contractor's expense.

150 Finishing

1. To ensure good compaction and adhesion within the joint, the mortar can be tamped firmly back with a stiff bristle brush as it starts to firm up. The timing of this is critical. If it is carried out too soon after placing, fines in the mix will be drawn to the surface and will form a dense skin, inhibiting the proper curing of the mortar. Once the surface of the mortar is firm (usually the next day) lightly scraping or brushing the surface to expose the aggregate can improve the appearance of the mortar and make the joints less visible.
2. When re-pointing joints should be raked back to approximately 25mm, thoroughly cleaned, including the top and bottom faces of the beds, ready for the new mortar. Pinning stones should not be removed, but if they are loose, they should be removed and put back during the re-pointing. Where a wall has previously been re-pointed and the pinning stones have been lost, suitable replacements should be used. The walls should be well washed to remove any dust and loose friable material making sure that the entire elevation is cleaned down to prevent staining on

the walls. Impervious masonry should be dry when the work commences, however the original backing mortar should be kept damp.

3. Pointing deep joints should be done in layers of 20 - 25mm at a time, allowing the preceding layer to take up before applying the next.

160 Workmanship

1. The mortar shall be a little softer and more porous than the stones/bricks themselves and shall comply with BS4551:2005 parts 1 and 2 for mortars, screeds and plasters and BS4550:1989 part 3 sections 3.6 for methods of testing.
2. Samples: A range of sample mortar mixes are to be prepared for inspection by the Architect. For repair work the mixes are to match the existing mortar in respect of colour, texture and strength. The Architect will identify an area of existing mortar to be matched. For new work the sample mortar mixes are to be prepared as directed by the Architect.
3. The Contractor is to allow for blending and sieving sands from different sources, as necessary, to achieve appropriate grading, colour and texture.
4. If the Architect does not consider the sample mixes to be satisfactory in respect of the requirements of this specification, then further samples are to be provided by the Contractor as necessary.
5. Where applicable and sound existing pointing survives in good condition, the Architect will mark a section which is to be matched in respect of colour, texture and strength.
6. A trial area of pointing is to be executed on specially prepared sample panels (NOT THE EXISTING HISTORIC FABRIC) for approval by the Architect using mortar as specified and approved.
7. The Contractor is to allow for carrying out 4 test panels each approximately 1 square metre under the direction of the Architect, as per methods described hereon in. Work to the rest of the stonework shall not commence until the test panel has been approved by the Architect. The location of test panels is to be agreed prior to commencement. Test panels must have had time to set.
8. Where directed, the Contractor shall prepare a sample panel of masonry, executed in mortar mixes and pointing techniques as specified by the Architect, or to match existing work.

170 Completion

1. The Architect is to be advised at least two weeks in advance of when pointing will be complete in order that an inspection can be made prior to the removal of any scaffold.
2. Remove all tools, plant and equipment and used materials and debris.
3. On completion leave all clean neat and tidy to the satisfaction of the Architect.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT08 Brick repair

Clauses

100 Materials

1. Brick:
 - 1.1. Bricks shall match existing in size, texture, bond, and colour. Samples shall be provided by the Contractor for approval and no final work shall be commenced on the repairs until the sample(s) have been approved in writing.
 - 1.2. Bricks shall be free from the presence of fungal attack, visible salts, paint, lime wash or other substances.
2. Ties:
 - 2.1. Ties to cavity work shall be as follows:
 - 2.1.1.a) where repair involves only the outer skin of cavity brickwork or solid masonry the ties shall be of a resin anchor type (Ancon Clarke ref. AC31) manufactured in austenitic stainless steel.
 - b) where repair involves both skins of cavity brickwork then ties shall be stainless steel fish tail ties to BS 1245: 1978) (Ancon Clarke ref. FVF).
 - c) where repair involves cavity wall tie replacement ties shall be stainless steel anchor resin ties of an approved type.
 - d) where repair involves rebuilding of solid masonry ties shall be stainless steel fish tail ties except where the existing bonding pattern allows header bricks to be used.
 - 2.2. All ties are to be manufactured in austenitic stainless steel by or other approved and agreed:

Ancon Clarke, Olive Grove Road, Sheffield S2 3GB.
3. Water:
 - 3.1. Water for the works shall be clean and fresh without pollutants. Where existing water supply is available within the building this may only be used with the Employers permission. In other cases, a lockable standpipe is to be erected to the approval of the Local Water Authority.
4. Mortar:
 - 4.1. Shall be lime mortar in accordance with specification as instructed.

105 Inspection

1. The Contractor should note that the tender documentation has been prepared based on visual inspection from ground level or from easily accessible parts, without the benefit of access scaffold. Further inspection will be required on completion of the access scaffold and the Contractor is allowed a period of 1 week for inspection and confirmation of the scope of the work in their programme.
2. The Contractor is encouraged to be represented during the inspection in order that they may contribute in any discussion regarding alternative methods of repair.
3. Notice:
 - 3.1. The Contractor is to give 48 hours' notice to the Architect of the completion of the access scaffold to each area.
4. Confirmation:
 - 4.1. Confirmation of the scope of the work will be the issue of revised drawings and confirmed by an Architects Instruction following completion of the inspection from the access scaffold.
5. Scaffold:
 - 5.1. The Contractor shall ensure that all access scaffold is complete and in accordance with the specification and that handover certificates have been issued before inviting

inspection. Inspection will not be carried out if the scaffold is not in accordance with the specification.

6. Programme:

- 6.1. The Contractor shall provide a programme of work based on the tender drawings before commencement of work on site. This programme shall indicate separately the erection sequence for access scaffold, inspection period, order period and works on site for each area of work.

110 Protection, storage and cleaning

1. Protection of work area:

- 1.1. Where large areas of masonry repairs are to be undertaken the scaffold is to be fully protected using a translucent non-combustible sheet such as Monaflex fixed to the outside of the scaffold.

2. Protection of the fabric:

- 2.1. Any existing windows are to be protected with ply or particle board, in the areas adjacent to any area of work. Other features identified on the drawings are to be protected from damage.
- 2.2. Where scaffold is erected internally or where scaffolding penetrates through into the building internal fittings shall be adequately protected.

3. Storage:

- 3.1. Bricks should be stored in stacks on battens protected from moisture and freezing. Adequate care is to be taken to ensure that no damage occurs to the bricks during storage or handling.

4. Storage on scaffolding:

- 4.1. Only bricks for immediate use shall be stored on the scaffold.

5. Protection of finished work:

- 5.1. Protect all work from the weather and to ensure satisfactory curing of the mortar. Protection is to be maintained until completion of all work in that vicinity.

6. Cleaning of work:

- 6.1. Keep face work clean and free from staining at all times.
- 6.2. Clean off and rub down all brickwork as scaffold is taken down.
- 6.3. If acid is used for cleaning down fully protect all windows and other areas liable to damage (e.g. paintwork etc.) Acid shall not be permitted if lime mortar has been used for pointing.

130 Cutting out of defective brickwork

1. The areas to be cut out shall be marked on site and approved/confirmed by the Architect prior to commencement of cutting out.
2. The brickwork shall be carefully cut out with chisels taking extreme care not to damage the arises of adjoining brickwork which may be being retained.
3. Any damage to adjoining areas will be made good at the contractor's expense.
4. The area is to be cleared of any mortar, debris etc and any defect in the backing masonry is to be reported to the Architect.
5. Where large areas of brick or block are to be removed the opening is to be propped with timber props ensuring that no damage is caused to adjoining brickwork.
6. Under no circumstances will the use of mechanical tools be permitted (disc cutters etc.)

150 Inserting new brickwork

1. The recess is to be thoroughly cleaned out and the adjoining brickwork is to be moistened to prevent the mortar "snatching".

2. New bricks or blocks are to be bedded on a bed (and backing where solid walls are involved) of 1:1:6 or 1:2:9 lime: sand: mortar as specified on the drawings. The mortar is to be prepared as described in the specification for lime mortar.
3. New brickwork is to be installed flush with the face of the building and ensuring that the bed joints and perpend joints are maintained consistent with the existing bricks/blocks.
4. The mortar is to be kept back 25mm from the face to facilitate later pointing.
5. Where brickwork is being inserted into worn areas of brickwork the new brick is to be set such that the face is in the line of the original face of the brickwork.
6. Where individual bricks or blocks are being replaced ties are not necessary.
Where larger areas of brickwork or terracotta blocks are to be removed then ties will be required to be located at centres as follows:
 - a) 900 mm centres horizontally and 450mm centres vertically with rows staggered.
 - b) 225 centres vertically within 300mm of any opening.
 - c) At closer centres if specified by the Structural Engineer or indicated on the drawings.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT09

Pointing of brickwork

Clauses

100 General

1. Contractor's attention is drawn to the fact that in some cases the joints between bricks are extremely fine and will demand a great deal of care and attention on site to the preparation, filling and pointing.
2. Pointing should commence from the top of the building and work down.

105 Sample panels

1. The tenderer is to allow for carrying out five test panels each approximately 1 metre square under the direction of the Architect, using the methods described below. One panel should include fine joints. Each must be approved by the Architect before work is to commence. Work to the rest of the brickwork should not commence until the test panel(s) have been approved by the Architect. The location of the test panels is to be agreed with the Architect prior to commencement.
2. Tenderer is to allow for several sample mixes using different coloured fine aggregate to obtain a satisfactory colour for the pointing.
3. The provision of test panels must be included in the programme, provided for inspection no less than 6 weeks in advance of the actual full re-pointing works commencing. The contractor must allow enough time in the programme, for the test panels to cure, before making them available for inspection. The contractor shall note that the process may not be concluded upon the first presentation of sample panels and the Architect / Conservation Officer may request that further sample panels be provided, for further inspection and analysis.

110 Preparation

1. All joints are to be raked out to a depth of 25mm using a fine-toothed saw blade or hooked knife. Extreme care is to be taken to avoid damage to the arris of the brick. Under no circumstances shall chisel and bolsters be used.
2. Under no circumstances will the use of mechanical tools be permitted (disc cutters etc.)
3. Joints are to be flushed out using clean water until the water runs clear. Where very fine joints are encountered a large hypodermic syringe shall be used to flush the joints.

115 Filling and pointing

1. Mortar is to be hydraulic lime mortar in accordance with the Mortar specification.
2. The mortar is to be introduced into damp joints and compressed with a purpose made pointing iron/key of approximately 30mm diameter giving a flush joint. Mortar is to be thoroughly compacted into the joints.
3. Care is to be taken to eliminate lines of mortar occurring on joint intersections, mortar should flow visually from perpend to bed joints.
4. Clean off any surplus or spread of mortar with a clean pointing trowel.
5. The joint is to be lightly stippled as mortar is achieving its first set to remove the mechanical smoothness left by the pointing iron. Protect pointing from over speedy drying during hot weather to the discretion of the architect.

120 Progress

1. The works are to be co-ordinated such that preparation is carried out to agreed areas and made available for inspection by the Architect/Employer's Representative. The Contractor is to give at least 48 hours' notice for inspection.

2. No filling of joints is to proceed until preparation has been inspected and approved by Architect.
3. Filling and pointing is to be carried out in small areas such that all operations in one area can be completed within the working day with due notice being paid to any potential adverse weather conditions.
4. The work is to be kept clean from mortar spillage at all times.
5. When pointing commences only areas which can be successfully completed during the normal working day are to be attempted giving due regard to the weather conditions/forecast.
6. Completed areas are to be protected until cured.

125 Cleaning

1. Clean down all areas on completion using clean water and bristle brushes only. Beat mortar with a bristle brush with oblique bristles after a setting period of couple of hours to dispose of surplus mortar.
2. Acid cleaners should not be used when lime mortar is present.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT10

Removal of organic growth

Clauses

100 General

1. Cleaning of masonry at the building(s) / asset(s) shall only be undertaken by experienced operatives who are approved by the Architect.
2. All areas to be cleaned shall be agreed with the Architect and Property Curator in advance and before any work shall commence.

102 Vegetation removal

1. Where vegetation removal is specified works are to be undertaken by a skilled craftsperson and monitored at all times by the lead mason.
2. Root pockets are to be treated with a solution of sodium chlorate or with tebuthiuron weed-killer and the vegetation allowed to naturally die back prior to attempting removal.
3. The biocide should not contain calcium chloride, which will cause a build up of soluble salts. Where there is any possibility of run off onto limestones then the biocide should not contain zinc or magnesium silicofluoride. Use only biocides with a current Health and Safety Executive number and approved by them for the purpose intended and shall comply with all current pesticide legislation.
4. Treatment with biocides should not be undertaken during wet weather or immediately after prolonged periods of wet weather.
5. The air temperature should be above 5°C during application.
6. Prepare a solution of biocide to the manufacturer's specification.
7. Fill a pneumatic garden-type sprayer two-thirds full with the diluted biocide. Adjust the nozzle to a coarse spray setting. There should be sufficient pressure at the wand nozzle, after pumping the container, to saturate the surface of the masonry without causing excessive 'bounce back' and spray drift.
8. Apply a flood coat. Commence at the top of the vertical surface to be treated and move across horizontally and slowly to allow approximately 100mm run down. The next horizontal pass should be made across the previous run down.
9. Leave the treated area for a minimum of two weeks and a maximum of four weeks to allow the growth to die off. Brush off as much dead growth as possible with dry soft bristle brushes, making sure that any adjacent gutters and hoppers are kept clear.
10. Prepare a second solution of a proven long-lasting biocide to the manufacturer's specification.
11. Fill a second pneumatic sprayer with the diluted biocide and apply in the same manner as above.
12. Allow the surface to absorb and carry out a second application of proprietary biocide as above to prevent recolonisation of the cleaned stone.
13. Remove with great care all vegetation growth from the walls and carefully grub out the roots whilst ensuring stability and completeness of fabric is maintained at all times.
14. Do not attempt to remove vegetation right away but, using secateurs and/ or pruning saw, remove smaller branches so that the main stems can be revealed.
15. Do not under any circumstances pull at the vegetation in the hope that it may become loose.
16. Clear all debris as it accumulates; arrange for disposal to an appropriate location. Leaving debris allows new seeds to take root.
17. Where vegetation removal causes to spalling/delamination the masonry is not to be damaged as it becomes loose. The masonry is to be recorded, set aside and reused in the repair of the damaged stone.

18. Build up the root pockets reusing the original material where possible and providing new when required and as detailed in the mortar specified.

105 Products

1. Hot box water jet:

- 1.1. The use of a 'DOFF' Hot Box water cleaning system or similar approved is considered the most appropriate way to effectively kill off all organic growth other than significant 'woody growth'. This should be used in preference to a biocide unless directed otherwise. DOFF system to be used in conjunction with DRS steam / water vacuum recovery unit. BS 8221-1:2012 Code of practice for cleaning and surface repair of buildings. Cleaning of natural stone, brick, terracotta and concrete. DOFF cleaning system uses steam as the cleaning agent. A normal water supply is taken into the high-pressure pump where the pressure is increased to the required level before it enters the hot-box. The temperature is increased up to 150°C if necessary before it passes to the heat resistant nozzle where special jets direct the steam onto the surface to be cleaned. The DOFF system will effectively remove paint, bitumen, oil and grease, chewing gum, algae etc from virtually all surfaces including brick, stone, concrete, tiles, terracotta, wood, stucco. Consult with Stone Health, Tel: 01453540600, www.stonehealth.com where additional specifications / information can be provided.

Note: Cleaning using the DOFF / TORC system should only be undertaken by contractors on the approved list compiled by Stone Health Ltd and will be part of the Rosette Approved Contractors.

Sample areas must always be undertaken prior to commencement of wholesale cleaning package(s) and agreed with the Architect.

2. Biocide:

- 2.1. The biocide is to be Epicuro Anti-Algae as manufactured by Epicuro Protective Materials, Cardinal House, 39/40 Albemarle Street, London, W1S 4TE.

Where alternative proprietary biocides are proposed they shall be based on a quaternary ammonium compound which is to be subject to the Architects approval.

The biocide should not contain calcium chloride, which will cause a build-up of soluble salts. Where there is any possibility of run off onto limestones then the biocide should not contain zinc or magnesium silicofluoride. Use only biocides with a current Health and Safety Executive number and approved by them for the purpose intended and shall comply with all current pesticide legislation.

Confirmation of this is to be forwarded to the architect prior to commencement of the works.

3. Water:

- 3.1. Water for the works shall be clean and fresh without pollutants. Where existing water supply is available within the building this may only be used with the Employers permission. In other cases, a lockable standpipe shall be erected to the approval of the local water authority.

110 Equipment

1.
 - a) Non-ferrous soft wire brushes.
 - b) Knife blades.
 - c) Pneumatic garden spray with adjustable nozzle.
 - d) Rubber gloves.
 - e) Safety mask.
 - f) Safety goggles.

115 Protection

1. Protect all flowerbeds, landscaped areas etc, with polythene sheeting prior to commencement.
2. Do not spray near unprotected personnel and animals.
3. Ensure that pollution of waterways, drainage etc. does not occur as a result of treatment.

125 Health and safety

1. Biocide should be one approved by the HSE Pesticide Registration Division.
2. The Contractor shall be responsible for ensuring that all products used, and all procedures adopted comply in full with current Health and Safety requirements.
3. Contractor shall ensure all recommended Personal Protection Equipment be worn by their operatives.
4. Ensure that all operations carried out in such a way that they do not represent a risk to health and safety of the general public or other operatives on site. Include for all temporary protection and carrying out work "out of hours" to minimise risks.

130 Storage

1. Ensure all materials are stored in sealed containers clearly marked with their contents. Undiluted biocides should only be stored in the manufacturer's original containers.
2. Biocides should only be diluted in such quantities as can be used during the working day. Diluted biocides should not be stored overnight, but any surplus material at the end of the working day should be disposed of to the satisfaction of the Local Authority.
3. Any biocides stored on site shall be kept in securely locked areas with toxic hazard signs.

135 Preparation

1. Remove as much plant growth, moss, lichens etc. with a knife blade and wire brush as necessary.
2. Ensure that no damage is caused to the stone by the removal of plant growth. If any damage is encountered restrict removal to the removal of moss only.

140 Application

1. Treatment with biocides should not be undertaken during wet weather or immediately after prolonged periods of wet weather.
2. The air temperature should be above 5°C during application.
3. Prepare a solution of quaternary ammonium-based biocide to the manufacturer's specification.
4. Fill a pneumatic garden-type sprayer two-thirds full with the diluted biocide. Adjust the nozzle to a coarse spray setting. There should be sufficient pressure at the wand nozzle, after pumping the container, to saturate the surface of the masonry without causing excessive 'bounce back' and spray drift.
5. Apply a flood coat. Commence at the top of the vertical surface to be treated and move across horizontally and slowly to allow approximately 100mm run down. The next horizontal pass should be made across the previous run down.
6. Leave the treated area for a minimum of two weeks and a maximum of four weeks to allow the growth to die off. Brush off as much dead growth as possible with dry soft bristle brushes, making sure that any adjacent gutters and hoppers are kept clear.
7. Prepare a second solution of a proven long-lasting biocide to the manufacturer's specification.
8. Fill a second pneumatic sprayer with the diluted biocide and apply in the same manner.
9. Allow the surface to absorb and carry out a second application of proprietary biocide as above to prevent re-colonisation of the cleaned stone.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT12

Renewal of rainwater goods

Clauses

100 General

1. The extent of redecoration works to the rainwater systems is to be confined to new sections of installation. Where only sections of a pipe are being replaced then the whole pipe should be redecorated.
2. All components being redecorated are to be carefully removed, descaled, redecorated and re-fixed in accordance with the following specification.

101 Material

1. Cast Iron Rainwater Pipes and Shoes:
 - 1.1. Cast iron rainwater pipes to be generally single / double socketed 4" diameter pipes unless otherwise noted on the drawings, conforming to the dimensional requirements of BS 460: 2002, and manufactured by J & J W Longbottom Ltd or equal approved manufacturer. All dimensions of existing pipes are to be confirmed onsite. All new pipes are to match the existing in terms of size and detail.

New swan necks sized to match offset between gutter and downpipe.
2. Fittings:
 - 2.1. Include for all necessary fittings to each section of pipework, including square and obtuse bends, union sockets with fixing ears, shoes, side and anti-splash shoes, single branch fittings, offsets, holderbats, inspection pieces, rodding points, straps and rainwater hoppers.
3. Jointing:
 - 3.1. Joints at the sockets of the components should incorporate a hemp gasket and be sealed with a bedding of red lead and white putty (or approved mastic). Where pipes / components are cut on site, the ends shall be cut clean and square with burrs removed. All cut ends shall be made good/recoated in accordance with the manufacturer's recommendations prior to decoration and fixing.
4. Fixing:
 - 4.1. Socketed rainwater pipes and all fittings are to be supplied with ears of the projecting type, to give 38mm projection from wall face to facilitate decoration, and each drilled with 2 No. 10mm diameter holes. Fixing to the walls is by means of 8mm chisel pointed galvanised nails driven through these holes into hardwood plugs in the walls.
5. Finish:
 - 5.1. After cutting to finished installed sizes all components are to be dipped in primer, or tar based composition to BS 416: 1973, and given a minimum 4 coat paint system, i.e. primer, 1 undercoat and 2 gloss coats, (or 2 undercoats and 1 gloss coat), giving a minimum coating of 90 microns prior to fixing. 1 final coat of gloss is to be applied when the installation is complete.
 - 5.2. Gutters and RWP's internally are to receive 2 coats of bitumen paint.
6. Gutters and Brackets:
 - 6.1. All gutters are to be 5" cast iron (unless otherwise stated) manufactured by J & J W Longbottom Ltd or equal approved manufacturer. All new brackets to be half round brackets to match existing.
 - 6.2. All new pipework to be primed and painted with two coats of black glass paint.
7. Cast Iron Rainwater Heads:
 - 7.1. All rainwater heads to be replaced are to be ornamental cast iron fittings conforming to the dimensional requirements of BS 460: 2002, and manufactured by J & J W Longbottom Ltd

or equal approved. Jointing fixing and finish of rainwater heads is to be as for Cast Iron Rainwater Pipes and Shoes'.

103 Installation generally

1. Install to ensure the complete discharge of rainwater from the building without leaking.
2. Obtain all replacement components for each type of pipework from the same manufacturer unless specified otherwise.
3. Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
4. Provide for thermal and building movement when fixing and jointing and ensure that clearances are not reduced as fixing proceeds.
5. Where not specified otherwise use plated, sherardized, galvanized or nonferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed or fixed to.
6. Pipework:
 - 6.1. Fix securely at specified centres plumb and/or true to line with additional supports as necessary to support pipe collars, particularly at changes in direction.
 - 6.2. Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.
7. Testing:
 - 7.1. Before striking the scaffold test all gutters by blocking outlets and filling to overflow level. Leave filled gutters for 5 minutes and then inspect for leaks. Inform Architect one week in advance of testing so as they may be present.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT13

Joinery repairs

Clauses

100 Materials

1. Softwood for Carpentry: To comply with CP 112 the structural use of timber Part 2 sections 2 and 3, stress graded to BS 4978:2007 + A1:2011. To be of the same species as existing work to be repaired.
2. Hardwoods for Carpentry Repairs: To be of same species as existing work to be repaired.
3. Oak for carpentry repairs to be not less than 1 year felled with structural characteristics as described for D40 grade in accordance with BS EN 1995-1:2004 + A1:2008.
Knots are not to occupy more than half the cross section.
The slope of the grain is not to be steeper than 1:6.
Oak for structural repairs to be generally suitable for intended use.
Any sections over 250 x 250 in cross section must be in boxed heartwood.
4. Timber Generally: To be clean, straight, sound and matured growth, thoroughly well-seasoned, free from discoloured sap wood, shakes, splits, pithwood, large loose or dead knots, excessive wane and other defects.
5. Plywood: To BS 6566:1985 to be birch faced of thickness and bonding as specified.
6. Preservative Treatment for Timber: To be as defined below. Ensure that moisture content is less than 20% before treatment, and after treatment before fixing. All preservatives to be approved under the Control of Pesticides Regulations 1986 and any latest amendment and used in accordance with other relevant legislation, notably the Health and Safety at Work Act 1974, the Control of Substances Hazardous to Health Regulations 1988, the Wildlife and Countryside Act 1981, the Water Act 1989 and the Environmental Protection Act 1990 and their latest amendments.
 - 6.1. New Timber

Either the treatment to be:
 - a) Water borne CCA preservative: applied by pressure treatment to BS 4072 by licensed processor of one of approved specialist firms listed below.
 - 6.1.1.a. Hicksons Timber Impregnation Co (GB) Ltd - Tanalith b. Rentokil Limited
 - c. RD (Chemicals and Wood Processes) Ltd or equivalent
 - 6.2. Double vacuum treatment: apply approved organic solvent preservative by double vacuum treatment in accordance with British Wood Preserving and Damp Proofing Association (BWPDA) standards pages 112 - 116 inclusive appropriate to timber species and use. The treatment to be undertaken by a licensed processor of one of the approved firms listed below:
 - 6.2.1.a. Cuprinol Ltd: BWPDA Standard 115
 - b. Cuprinol Ltd: BWPDA Standard 115
 - c. Hicksons Timber Impregnation Co (GB) Ltd: BWPDA Standard 112.
 - d. Protim Ltd: BWPDA Standard 116
 - e. Rentokil Ltd: BWPDA Standard 113 or equivalent
 - 6.3. Existing Timber
To be Wykamol Microtech Range, Wykamol green range, or similar approved promethium, cypermethium or Boron based organic solvent.
Take advice where bats or evidence of bats is found, and inform Architect.
7. Subsequent Treatment: Liberally brush two coats of specified preservative to all holes and cuts formed after timber has been treated.
8. Preservative Treatment Certificate: Provide the Architect with the certificate accompanying each consignment to site.

9. Bolts and Nuts for Carpentry: To Engineer's specification. All fixings to be stainless steel.
10. Nails and Screws: Nails to BS 1202:1974:Part 1 and screws to BS 1210:1963 each of suitable size and type. All fixings to be stainless steel.
11. Adhesive: Synthetic resin gap-filling adhesive to BS EN 301:2013 and BS EN 302:2013, Type WBP for exterior work and Type MR for interior work.

150 Window repairs generally

1. Replacement Window Installation:
 - 1.1. Standard: To BS 8213-4.
 - 1.2. Burnt Sand Mastic: Between Frames And Stone Reveals:
 - 1.3. Manufacturer: Womersleys Ltd. Tel: 01924400651. E: info@womersleys.co.uk
 - 1.4. Product: Traditional Burnt Sand Mastic.
 - 1.5. Colour: Samples to be provided, to achieve natural appearance to match existing stonework. The mastic should not be overpainted.
 - 1.6. Preparation: before pointing, ensure that all wide gaps between the frames and masonry are tightly packed with well haired lime mortar, that has been allowed to cure and harden.
 - 1.7. Application: Working with a Mastic Box or a small hawk and a proprietary mastic trowel press the mastic firmly into the angle of the frame / jamb and filling from the bottom up, forming the mastic joint to a neat 45-degree angle. Keep tools wiped with an oiled cloth during the application. After forming the angle, starting from a corner, press a clean oiled mastic trowel tightly against the face of the timber frame and masonry jamb and carefully press and draw the trowel to create a neat regular fillet. Clean away any excess mastic and wipe the finished timber edges on completion. For mastic to sills, ensure the mastic does not bridge any drips and is left recessed behind the drip check.
2. Timber Repairs Generally:
 - 2.1. The purpose of repair is to replace or reinforce those parts of the window or door that have decayed so badly that they can no longer function as intended.
 - 2.2. Wherever possible, repairs to window frames should be carried out in-situ, particularly where the frame is inbuilt and cannot be easily removed without damaging the window or the surrounding wall. Sashes and casements can usually be removed without damage for repair either onsite or in a joiner's workshop.
 - 2.3. Prior to undertaking any works. The windows in question should be carefully recorded with photographs and some basic measurements. Sashes, casements and other parts should be appropriately labelled to ensure that they go back in the correct positions. Any historic glass and its characteristics should also be recorded.
 - 2.4. Following assessment of each window including identification of areas of decay / missing timber components / damaged glass etc, appropriate repair works can be proposed which suit the situation. In most instances the decayed timber in question can be salvaged in-situ with resin-based repairs undertaken.
 - 2.5. Types of repairs include the following;
 - 2.5.1. Spliced repairs:
 - 2.5.1.1. Repairs should be made by carefully cutting away damaged or decayed timber and piecing in timber inserts which are shaped to obtain the maximum strength and match the existing profiles. The new timber should be worked to the line of the existing timber following any existing deformations in the line of the window.
 - 2.5.1.2. Timber inserts should be designed so that water is directed towards the outer face of the timber and cannot lie on or enter the repair joint.
 - 2.5.1.3. Timber inserts should ideally match / be similar to the host material to which it is replacing in species, moisture content, grain orientation and growth rate. Inserts should be glued to the host material, screwed and or pinned with stainless steel fixings. Loose joints in otherwise sound joinery should be reassembled, glued and

wedged or secured with pins as appropriate. See '*Image 100*' for typical splice repair details.

2.5.2. Filling and patching:

- 2.5.2.1. · Fill small holes less than 3mm dia and scratches in polished timber with Brummer filler.
- Fill larger holes 3mm to 15mm with tapered pellets fitted so that the grain runs with the filled timber. Select pellets from identical timber matched for grain and colour. Glue pellets, finish flush with surface.
- Fill larger holes with patches of identical timber let into the surface. Patches must taper in depth and be glued and must be matched for grain and colour. Finish flush with surface.

2.5.3. New timber sections:

- 2.5.3.1. · New items must be exactly as drawn. Full size sections must match exactly.
- New items made to match must be copied exactly in all particulars. Carvings must be identical in all aspects to the original.
- New items must be finished by hand. All machine marks must be removed. A surface which is not dead flat is preferred.

2.5.4. General requirements for workmanship:

- 2.5.4.1. · It is essential that as much of the original work as possible should be protected and preserved.
- The desired finished result is not that the woodwork should look new. It should look as old as it is but well cared for.

2.5.5. Quality standards:

- 2.5.5.1. Reference is made to the following documents which establishes the desired approach and standards in the repair of historic timber windows;
- SPAB Technical Pamphlet No.13 – repair of wood windows.
- Historic England – traditional windows, their care, repair and upgrading.

2.5.6. Renew hardwood timber beads:

- 2.5.6.1. Species: To match existing species. Allow for Well-seasoned European Oak. Renew to match existing – all dimensions, mouldings and fixing details. Record works photographically and log location and date as appropriate.

2.5.7. Hardwood for joinery repairs:

- 2.5.7.1. Species: To match existing timber species. Allow for Well-seasoned European Oak.
Quality: Generally, to BS EN 942' free from decay and insect attack.
Appearance class: Class J2.
Treatment: British Wood Preserving and Damp Proofing Association Commodity Specification C8; Service life: 60 years.
Moisture content on delivery: 12-16%.

2.5.8. Repair of members - cutting out members:

- 2.5.8.1. · Extent of timber removal: Cut out full cross section of member where wood is defective or decayed, plus 50mm of sound wood.
- Distance from face of support to cut end of existing timber: Obtain instructions if dimension exceeds 200mm.

155 Preservative treatment for joinery repairs

1. No internal joinery is to be preservative treated unless specified or instructed. Timber in contact with damp masonry, e.g. below dpc level, is to be preservative treated. External softwood joinery is to be treated with a boron type preservative such as 'Timbor' rods. Before application, perform all necessary cutting and machining that is practicable but do not assemble. Doors however may be treated after machining and final assembly. Ensure that moisture content is less than 20% before treatment and after treatment before fixing.
2. Where bats are found, or the evidence of roosting bats, preservative chemicals are not to be used without the express approval of the Architect.
3. Preservative Treatment Certificate: provide the Architect with the certificate accompanying each consignment to site.
4. Treatment to minimise environmental/ecological impact based generally and especially in connection with use where bats are present. The following are products which are deemed acceptable for use as stated. Alternatives may only be used upon proof of their low impact.
5. New timber:
 - 5.1. Vacuum/pressure treatment to be carried out by licensed processors. Type of treatment to suit timber use.
 - 'Tanalith E' pressure treatment, process type to suit timber use.
 - Vacsol - Aqua and Vacsol - Azure, Arch Timber Protection

For other methods of application see existing timber below.

6. Existing timber:
 - 6.1. Brush or spray applied products include:
 - ProBor DB solution or ProBor 10, Safeguard Chemicals Limited. ProBor 20 gel for thicker sections
 - Boracol 10 RH and Boracol 20 Dual Purpose, Biokil Chemicals Ltd.
 - Borax Wood Preservative, Biofa, available from Mike Wye & Associates
 - Or similar boron-based product is the preferred choice.
 - Solvaq FLX F/I, Sovereign Chemicals Limited, contains fungicides with a safe insecticide, is good but less preferable than the boron products above.

Inaccessible, large/very large dimension timbers and window joinery, applied by injection.

- Boracol 40 Paste, Biokil Chemicals Ltd.
- ProBor 50, Safeguard Chemicals Limited.

Timber frequently subject to damp in excess of 28% moisture content such as window joinery.

- Boron Timber Rods (preservative filled glass rods), Biokil Chemicals Ltd. or equivalent

7. No internal carpentry is to be preservative treated unless specified or instructed. Structural timber in contact with damp masonry, e.g. below DPC level, is to be preservative treated. External softwood carpentry is to be treated only if specified, as the main form of protection is a well-maintained paint or stain coating.
8. Take advice where bats or evidence of bats is found and inform Architect immediately. It is a criminal offence to disturb bats or to damage their roosts. Only use timber treatments approved by English Nature. Their document dated March 2006 or later version, 'Remedial Timber Treatment Products Suitable for Use In Bat Roosts' lists approved proprietary products.

200 Workmanship

1. Standard: Unless otherwise specified or noted on the drawings, comply with CP 112: Part 2.

- 1.1. Section 1: General
 - Section 5: Workmanship
 - Section 6: Inspection, Testing and Maintenance
 - Appendix A: sizes and grading of hardwoods and softwoods.
- 2. Sizes, Stress Grading and Spacing: of carpentry timbers to be as detailed.
- 3. Trimmers and Trimming Joists: 25 mm thicker than ordinary joists.
- 4. Bridging: 50 mm solid sawn softwood to full depth of joints.
- 5. Herringbone Strutting: 38 x 50 mm sawn softwood.
- 6. Drying Out Treated Timber: Before allowing the timber to contact any other materials or components allow the preservative to dry out to the specified moisture content and sufficient to avoid damage to any other materials or components.
- 7. Vertical DPC's: To be built in at junction between internal stud partitions and existing solid external walls.
- 8. Packings and Grounds: To be treated as specified. Do not use hardboard packing.

300 References

- 1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT15

Glazing repairs

Clauses

100 General

1. Glaze: In accordance with the recommendations of BS 6262-4:2005 unless otherwise specified.
2. Rebates: Clean, dry and remove obstructions from rebates and grooves before priming or sealing surfaces prior to glazing.
3. Seal Surfaces of rebates, grooves and beads that will be in contact with putty as follows:
 - a) For painted softwood surrounds, one coat of primer.
 - b) For painted hardwood surrounds, one coat of primer and one undercoat of paint.
 - c) For galvanized steel surrounds, one coat of primer.
 - d) For stained joinery treat rebates and glazing beads with preservative coats.
4. See Painting and Decoration clauses for suitable primers.

105 Materials

1. Clear Float Glass:
Where specified to BS 952-1:1995, selected glazing quality, thickness as specified to match existing and adjacent.
2. Wired Glass: Where specified to BS 952, 6 mm thick, square pattern wired ground and polished.
3. Special Glass:
As specified.

110 Glazing

1. Putty or Mastic
 - a) For timber windows
2. Putty Glazing of Windows: Bed, sprig or clip as appropriate, and back and front putty the glass.
3. Bead Glazing of Windows: Set glass on blocks and distance pieces. Bed and back putty as above or use Sadolin Dri-glaze on stained windows in accordance with manufacturer's instructions.
4. Painting of Putty to BS 544: Prime and paint as soon as sufficiently hard and in any case within two weeks of glazing. Cut out and re-putty any material showing cracks. NB. This standard has been withdrawn by the British Standards Institution but remains applicable for traditional repair and reinstatement of historic building fabric specified. Copies of the Standard may be obtained on-line through the internet.

125 Removal and reinstatement of historic glazing

1. Materials: Historic glass, whether Crown, drawn or cylinder glass, is almost irreplaceable and only at considerable cost. All original glass is historically important and is to be conserved.
2. The greatest care must therefore be taken to avoid damaging historic glass.
3. Replacement glass will be specified by the Architect and is to match existing and adjacent.
4. Removal of Historic Glass: The conventional way to remove a pane from frame is with a glazier's hacking knife, which is inserted between the putty and wood at right angles to the glass and tapped down with a hammer. This method is ineffective with very old, hardened putty and it is probably that, if attempted, the glass will be broken.

5. To soften the old putty a modern chemical paint remover is to be employed such as Ronstrip. This particular type is of putty form and should be applied generously over the glazing putty to thickness of about 10mm ensuring that the Ronstrip is sealed completely from air with a number of overlapping strips of Sellotape or masking tape and left for 24 hours. The tape is then to be removed and the Ronstrip scraped off. It will then be possible to remove about 50% of the old putty behind. The process must be repeated, and the second application should soften sufficiently the remaining putty, including that around the edge of the glass.
6. When all putty has been removed the glazing sprigs (retaining pins) are to be carefully removed with sharp nosed pliers. When all the putty has been cleared from the front and edge of the glass the pane can then be gently pushed out from behind. Extreme care is needed to avoid cracking the sheet; thick ones are, in fact, more likely to break than thin ones, because they are less flexible. The pane is to be cleaned with soap and water.
7. Reglazing with Crown Sheet Glass: When reglazing with salvaged crown sheet the convex side should be outwards both for appearance and for better bedding of the pane into the frame. If flow lines and other marks within the plane of the glass are noticeably curved (a sign of the spinning process of manufacture) it seems to be usual for the pane to be mounted so that these lines are convex upwards (or to either side).
8. Refixing: Workmanship shall comply with the recommendations of BS 6262:2005, and CP 152 (BS 6262:1982). CP 152 has been replaced by the BSI but remains applicable for the traditional repair and replacement of historic building fabric specified. Copies of the Code of Practice may be obtained on-line through the internet.
9. Where specified, new sheet glass shall conform to BS EN 572-1:2012.

300 References

1. Some standards in this specification may have been withdrawn by the British Standards Institution but remain appropriate and applicable for the traditional repair and reinstatement of historic building fabric. Copies of these withdrawn standards may be obtained online.

Ω End of Section

BUT20

Lime plaster to masonry substrates

Clauses

100 General

1. This specification to be read in conjunction with the contract terms, conditions and preliminaries.

105 Preparation

1. Rake out mortar joints to a depth of 10mm as necessary.
2. Re point any deep recesses using a weaker mix of Natural Hydraulic Lime mortar than that specified for the render. (NHL 2 1:3 ratio with 2.5mm down well graded aggregate and sharp sand).
3. Thoroughly clean down the substrate to ensure all loose particles and dirt are removed.
4. Thoroughly dampen down the substrate before application.
5. For particularly indented substrates, provide a dubbing out coat of NHL 3.5 in a 1:1.5 - 2 ratio using a 4mm down well graded aggregate.
6. For masonry, thoroughly wet the wall with clean water using a hose-pipe or sponge. The more porous the background the more water will be required. Allow the water to soak in a bit then spray again, and repeat until the surface layers of the wall are thoroughly damp. When rendering stone and brick any hollow or decayed render should be hacked off and any loose pointing should be raked out and replaced prior to rendering. Brush the wall to remove loose material. Do not rake out pointing to provide a key. Do not use plastering bead on corners as this will give a modern appearance. Do not use chicken wire or metal lath to form a key as it can cause stress in the render due to differential thermal movements and can lead to large-scale failure, especially when it rusts.

110 Application

1. Application is to take place in three coats.

Undercoat – apply render coat to dampened down (masonry substrate only) and prepared surface. Render coat is to be reinforced with hair well beaten in, at a rate of 4.5 kg/m³. Coat to be nominally 10mm thick and no more than 20mm thick. Undercoat is to be cross keyed with a lath scratcher to form a pattern of 25mm – 35mm diamonds. Dampen down before application of next coat.

Float Coat – apply over the Undercoat after it has been allowed to fully set (allow 3-4 days). Float coat to be nominally 6mm thick. Float coat to be keyed with a devils float. Check for shrinkage over the first 2 days curing. If any shrinkage cracks appear, dampen down, scour back and re-key to the affected area. Dampen down before application of next coat.

Finishing Coat – apply over the Float Coat after it has been allowed to set for 3-7 days to achieve a smooth finish and finished using a wooden float, to be nominally 3mm thick. No hair required in Finishing Coat.

2. Apply all renders firmly to exclude any air and excessive moisture. Suction to be carefully controlled at all times.
3. Re-work coats as necessary to control shrinkage and to achieve a smooth finish in the Finishing Coat.

115 Weather and protection

1. Plasters / Renders made from lime as below to be protected from frost, heavy rain, strong wind or direct sun for a minimum of: -

NHL 5	48 hours
NHL 3.5	72 hours
NHL 2	96 hours

Protect using a Hessian sheet, dampened down as necessary.

Apply frost protection if there is any likelihood of frost occurring. Work should not start in frost conditions or with temperatures at 5°C and falling or at 4°C and rising. In working with NHL 2 or in rendering with fine finishing coats, this should be 8°C.

Protection from drying winds or direct sun should be provided by using shading sheets or debris netting on scaffolding.

- Any work affected by the weather is to be cut out and replaced at the Contractor's expense.

120 Plaster / render mixes

- Hair Reinforcement - 4.5kg/m³ horse hair

Render Coat NHL 3.5 1:1.5 ratio, 4mm down well graded aggregate, sharp sand. Hair Reinforcement - 4.5kg/m³ horse hair.

Scratch Coat NHL 3.5 1:2 ratio, 2.5mm down well graded aggregate, sharp sand. Hair Reinforcement - 4.5kg/m³ horse hair

Finishing Coat NHL 3.5 1:2.5 ratio, fine aggregate to be agreed, sharp sand.

125 Materials

- Natural Hydraulic Lime to BS EN 459-1 2001, from an approved UK source and to be from one of the following suppliers.

1.1.

Womersley Associate Heckmondwike WF16 0PG info@womersleys.co.uk Tel: 01924 400651	Walkley Lane E: Whitford Sand Lime & Mortar Co Bedw Whitford Road Holywell Clwyd CH9 9AE Tel. 01352 - 714144
Rose of Jericho Kettering Northamptonshire Tel. 0153 673 439	Masons Mortar 61-67 Trafalgar Lane Leith Edinburgh Tel: 0131 555 0503
Railton Price Ltd The Old Farmhouse 21 Park Street Winterton North Lincolnshire DN15 9UB Tel: 01724 737248	Bleaklow Industries Limited Hassop Avenue, Hassop Bakewell Derbyshire DE45 1NS Tel. 01246 582284
Lincolnshire Lime Co. Northfield Farm Dam Lane Thornton Curtis North Lincolnshire DN39 6XN Tel: 01469 531227	

- All sand shall be to BS 1200, non-staining clean sharp coarse sand. Sand shall be selected so that when the mortar has dried out the colour will match the colour and texture of the original mortar, unless instructed otherwise in writing by the Architect. Aggregate / Sand to be sourced from a local quarry to the satisfaction of the Architect.
- Hair to be horse hair from an approved supplier, well beaten in to an even distribution, free of lumps and clumps. Hair NOT to be applied to finish coat.

130 Sample panels

- Provide a minimum of 2no. 1m x 1m sample panels in locations to be agreed with the Architect, to be fully representative of the likely finished product.
- Sample panels to utilise representative materials, to show potential variation in aggregate / sand as agreed with the Architect.
- No further work to commence until sample panels are approved by the Architect.

135 Additives

1. Under no circumstances will the addition of any additives to the plaster be permitted.

140 Water

1. Water from the works shall be clean and fresh without pollutants. Where existing water supply is available within the building this may only be used with the Employers permission. In other cases a lockable stand pipe shall be erected to the approval of the local water authority.

145 Finishing

1. Once plaster has dried out allow for application of a microporous paint as per specification section [M60].

Ω End of Section

BUT23

Masonry cleaning / sandstone

Clauses

100 General

1. The extent of masonry to be cleaned is identified on the elevational drawings and is to include all cills, ledges, cornices and mouldings within the designated area.
2. The primary purpose is to remove heavy soiling, bird fouling and carbon deposits. The process may also remove some algae staining.
3. No chemicals are to be used as part of the current cleaning process and this specification is to be adhered to rigidly unless instructed in writing by the Architect.
4. Test panels are to be executed in positions agreed with the Architect and under their direction. During these trials final operating pressures, abrasive size and sequence will be confirmed.
5. Unless instructed otherwise the cleaning process is to be executed prior to carrying out any masonry repairs.
6. This document must be read in conjunction with the masonry cleaning general requirements.

105 Materials

1. Water:
 - 1.1. Water for the works shall be clean and fresh without pollutants. Where existing water supply is available within the building this may only be used with the Employers permission. In other cases a lockable standpipe is to be erected to the approval of the Local Water Authority.
2. Abrasive grit:
 - 2.1. Calcium with particle size selected to be smaller than the grain size of the stone surface to be cleaned. On no account should abrasive containing silicone or other known or suspected hazardous materials be used.

110 Equipment

1. Brushes:
 - 1.1. Non ferrous stiff bristled brushes.
2. Hot water wash:
 - 2.1. Proprietary compressor and water meter capable of delivering a variable water pressure of 250-750 p.s.i. at a temperature of 50#C. Lance spread to be adjustable between 5 and 30#
3. Abrasive clean:
 - 3.1. Hodge Clemco Craftsmen system or equal approved to be capable of delivering a variable pressure between 10 and 50 p.s.i., controllable from the lance. Application to be by a small nozzled gun.

115 Cleaning of ashlar stone and dressings

1. Remove by hand tools (brush, hand trowel etc) any heavy build up of bird fouling, moss growth etc. Extreme care is to be taken to ensure that the tools used do not mark or scar the stone in any way.
2. The area is to be cleaned with a low pressure hot water spray. Final pressure and spread is to be determined during the execution of final panels but for tender purposes a pressure of 500 p.s.i. is to be assumed at an operating temperature of 50#C.

The stonework is to be brushed with non-ferrous brushes during application of the spray to remove heavy soiling, bird fouling and organic growth.

3. Following hot water wash a light abrasive clean is to be carried out using the Hodge Clemco Craftsmen system. Pressures for the cleaning will be determined during the execution of the sample panels, but for tender purposes a pressure of 25 p.s.i is to be assumed.

Following completion of the abrasive cleaning rinse down all areas with a low pressure water spray ensuring all surfaces are free from residual dust or accumulation of debris.

125 Pressures

1. Whilst tenders are to be based on the pressures referred to in this specification it should be noted that the works will be carried out at the lowest pressures which achieve the desired level of cleaning.

Once the optimum pressures have been determined during the execution of the trial panels, the pressures should not be increased by the operatives on site without prior written consent. Any operative found to be using pressures in excess of the agreed optimum pressures will be removed from site and any damage caused to the masonry as a result will be rectified at the contractors expense to the full satisfaction of the Architect.

130 Completion

1. Ensure all dust, grit, etc resulting from cleaning operations is thoroughly cleaned up from all areas of the site.

Ensure all run off is safely disposed of.

Ω End of Section

BUT25

Pointing of ashlar stone

Clauses

100 General

1. Contractor's attention is drawn to the fact that the joints between stones are extremely fine and will demand a great deal of care and attention on site to the preparation, filling and pointing.

105 Sample panels

1. The tenderer is to allow for carrying out two test panels each approximately 1 metre square under the direction of the Architect, using the methods described below. Work to the rest of the stonework should not commence until the test panel has been approved by the Architect. The location of the test panels is to be agreed with the Architect prior to commencement.

Tenderer is to allow for several sample mixes using different coloured fine aggregate to obtain a satisfactory colour for the pointing.

110 Preparation

1. All joints are to be raked out to a depth of 25mm using a fine toothed saw blade or hooked knife. Extreme care is to be taken to avoid damage to the arris of the stone. Under no circumstances shall chisel and bolsters be used.
2. Under no circumstances will the use of mechanical tools be permitted (disc cutters etc.)
3. Joints are to be flushed out using a large (30cc) hypodermic syringe and clean water until the water runs clear.
4. The tenderer is to allow for the insertion of a backing 'rod'. This item is to be confirmed during the preparation of the sample area.
5. The backing rod is to be fine waxed string or string coated with petroleum jelly, stretched and twisted several times prior to inserting to the back of the prepared joint with a knife blade.

115 Filling and pointing

1. Filling is to be by the taping and pointing method.
2. The prepared joints are to be covered with 50mm heavy duty carpet tape applied to the stone. The tape is to be slit along the joint line with a sharp knife. It should be noted that the stone will need to be dry for the tape to adhere.
3. The mortar is to be introduced into damp joints and compressed with a purpose made pointing iron/key. Mortar is to be thoroughly compacted into the joints.
4. The mortar is to be pointed firmly into the joints and finished with a very slight recess (not more than 1mm deep).
5. Adhesive tape is to be carefully removed ensuring that no residue of adhesive is left on the stone.
6. Clean off any surplus or spread of mortar with a clean pointing trowel.

120 Progress

1. The works are to be co-ordinated such that preparation is carried out to agreed areas and made available for inspection by the Architect/Employer's Representative. The Contractor is to give at least 48 hours' notice for inspection.
2. No taping or filling of joints is to proceed until preparation has been inspected and approved by Architect.
3. Taping, filling and pointing is to be carried out in small areas such that all operations in one area can be completed within the working day with due notice being paid to any potential adverse weather conditions.

4. The work is to be kept clean from mortar spillage at all times.
5. When pointing commences only area which can be successfully completed during the normal working day are to be attempted giving due regard to the weather conditions/forecast.
6. Completed areas are to be protected until cured.

Ω End of Section

BUT28

Reintroduction of heat

Clauses

75 General

1. - Heating the assets in short bursts is not advisable as this will cause uncontrolled temperature fluctuations, which will not control damp and will likely exacerbate condensation.
- Ongoing analysis of temperature and humidity will need to be undertaken once it is known how the client intends to use the spaces and at what temperatures they are keen to operate. The increase in temperature to suit habitation is to similarly undergo the same process, slow and steady raising of internal temperatures.
- There may be a need to introduce automatic data loggers, to track temp and humidity activity in the future. It is proposed in the first instance to proceed with digital room thermometers during the initial heat reintroduction process.

100 Preparation

1. a) Defective areas (shakes, splits, bowed timber etc) are to be highlighted and routinely photographed for regular review and comparison.
- b) Provide digital room thermometers (temperature & humidity log) within each of the key rooms. To allow for regular recording and monitoring of each space.
- c) Record starting temperature within each identified room.
- d) Take moisture content readings against the visible wall substrates (masonry) and timberwork. The same areas should be tested and reviewed each time.
- e) In advance of the temporary heating devices arriving, take daily readings (am & pm) to record the initial standing.
- f) Install and make any necessary connections for the temporary power supply.

105 Heat reintroduction

1. aa) It is important to note that the reintroduction of 'heat' within the property may yield both negative and positive results with regards to the originally installed timberwork, which has lay dormant, unheated for a considerable period. The results of this can be seen onsite with cupped floorboards and panelling, shakes and splits. Some of the timber may return to its original shape / profile and be salvaged (*though there are no guarantees*), where others may undergo further movement with damage considered irreversible and thus replacement will be necessary.
- bb) 240v supply is not to be used for charging phones, cordless power tools or any other devices as this may overload the system.
- cc) Introduce temporary heating devices, positioned centrally within each of the key spaces. There may be a need to redistribute and reposition temporary heaters throughout the asset, dependant on the reaction of the building fabric to the introduction of heat.
- dd) The heaters should be placed within a sterile zone. No combustibles or materials should be left in close proximity to the heaters at any time.
- ee) Start heating at lowest setting to each device.
- ff) Regularly monitor existing timberwork throughout the process.

gg) The aim is to turn the heating up by 1°C per day, over 5 day working week (5°C total), to reach the average internal temperatures advised.

hh) The heating devices should be turned off at weekends. As a result, we will likely see a drop in overall temp gained through the week.

ii) We may only gain circa 3°C over the week.

jj) Turn heating back on. Continue heating process until desired average temperature is maintained.

kk) Maintain advised average internal temperatures.

ll) The aim is to get the internal average temperature anywhere between 9-12°C (48-53°F). Not 'warm' but a comfortable temperature for the building fabric.

mm) Relative humidity must be maintained within the range of 35-65%.

nn) When (if) the temperature exceeds the desired average temperatures. Open up all windows necessary to allow appropriate cross ventilation. If sash windows, open up and place 10mm thick timber block to maintain air gap. If casement, open on first pin or secure with wire. Again, this will be by trial and error.

oo) If passive ventilation is not sufficient, it may be necessary to introduce loose mechanical ventilation.

pp) All opened windows should be closed and secured of an evening (site closure).

qq) If rooms start to dry out too quickly, and the timber deforms even further. Turn off the heating immediately, either locally or all together and solely rely on natural ventilation for a period of time to bring the room back to the desired temperature. Any issues should be addressed quickly to arrest any further deterioration.

rr) If there are areas where there are pockets of stagnant air (not adequately cross ventilated). It may be necessary to introduce internal fans to disturb the air flow.

ss) In the summer months, when the outdoor temperature is over 25°C, the RH can be in the high 90s. at this point, the rooms may need to be warmer than outside (to reduce condensation). It may be necessary to ramp up the internal temperature up to atleast 5°C higher than outside. Windows should be opened and the ventilation protocol undertaken.

110 New joinery

1. i) Newly installed timber to be subjected to controlled drying to achieve a moisture content at the time of fixing not exceeding 12% for internal work and 17% for external work.

ii) Do not deliver any components or finished joinery to site until the correct conditions can be guaranteed to maintain the specified moisture content.

iii) Do not fix any first fix backing framework, battens etc until conditions prevail to maintain a maximum moisture content of 18%.

iv) Do not fix any joinery if the relative humidity is above 60%.

v) It is the joinery manufacturer's responsibility to ensure that the above conditions are satisfied, and the joinery sub-contractor will be responsible for replacing any component which is subsequently found to be defective due to movement of any description caused by variations in moisture content.

vi) The joinery contractor is responsible for maintaining conditions in their stores and workshops

and ensuring that the main contractor has provided the correct conditions on site prior to commencing any deliveries or installation.

vii) Agree with the Main Contractor arrangements for maintaining the environment up to the date of Practical Completion of the works to ensure excessive movement does not occur.

viii) All internal joinery components shall be dried to achieve an average moisture content of 10-12% at the time of fixing. External joinery components will have a moisture content of between 13-19% on delivery.

Ω End of Section

C40

Cleaning masonry/ concrete

General/ preparation

100 General

1. The cleaning of masonry on any part of this project shall only be undertaken by experienced operatives who have regularly been engaged in or specialise in restorative cleaning of external and internal masonry and shall produce references of such activity with the tender return. The sub-contractor shall be a member of the Stone Federation's surface cleaning contractors.
2. The operatives shall be fully conversant with the method of cleaning specified and have had previous experience and knowledge of the system. The operatives shall have attended training sessions on the use of all items of equipment or chemicals contained in the specification.
3. The scope of the work is clearly identified on the drawings and the tenderers are to visit the site to confirm for themselves, the difficulties in executing the work as specified and is to include for such within their tender.
4. No claim will be entertained for failure to appreciate the difficulties in executing the works.
5. Except where the cleaning is let as a main contract all access scaffolding will be provided by the main contractor. The sub-contractor is to advise the main contractor of their requirements during the tender stage (if known) or immediately on nomination.
6. Any alterations required to the scaffold to suit the sub-contractors needs arising out of their failure to inform the contractor in accordance with this clause will be charged to the sub-contractor.
7. Note: Cleaning using the DOFF / TORC system should only be undertaken by contractors on the approved list compiled by Stone Health Ltd and will be part of the Rosette Approved Contractors.
8. All areas to be cleaned shall be agreed with the Architect and Property Curator in advance and before any work shall commence.
9. Note restriction on air temperature noted below.

101 Preparation

1. Scope of work
 - 1.1. Stonework and masonry to exterior / interior elevations as indicated on marked up elevations.
2. Related repair / remedial works
 - 2.1. Are specified elsewhere. Ensure the following work has been carried out before the cleaning works commences appropriate access and protection of windows / fixtures and fittings etc.
3. Removal of fittings
 - 3.1. Timing: before commencement of cleaning works.
 - 3.2. Disturbance to surfaces: minimise.
 - 3.3. Items for disposal: as noted on marked up elevations.
 - 3.4. Items to be kept for reuse: as noted on marked up elevations.
4. Vents and grilles
 - 4.1. Protect but do not seal up ventilation grilles, air bricks, or other ventilation opening without first seeking instructions.
5. Control and disposal of wash water and detritus
 - 5.1. Disposal: Safely. Obtain approvals from relevant authority.
6. Control of water
 - 6.1. Collect and divert to prevent ingress and damage to building fabric and adjacent areas.
 - 6.2. Provide suitable temporary catchment boards / sheeting, gutters etc. to collect wash water and divert it to suitable discharge points.

- 6.3. Do not let wash water build up at outlets or above levels of flashings or anywhere where there is risk of it penetrating and causing damage to the building fabric.
- 6.4. Ensure that water does not penetrate interiors and damage finishes, etc. Monitor interior building and seek instructions when any signs of damp appear internally.
- 6.5. Above and below ground drainage systems: Keep free from detritus and maintain normal operation.
7. Brushing and scraping
 - 7.1. Before commencing any other methods of cleaning, remove loosely adhered deposits and heavy deposits of biological matter using suitable corrosion resistant brushes and scrapers / spatulas that do not abrade or gouge the surface. Do not use brushes with steel bristles.
8. Tooling
 - 8.1. To remove thick encrustations of dirt carbon and limescale etc. it is recommended, providing that:
 - The work is carried out by skilled and experienced stone masons.
 - None of the original surface / detail is removed unless agreed with the Conservation Professional.
9. Cold weather
 - 9.1. Cleaning procedures using water: Do not use when air temperature is at or below 5°C. Protect damp surfaces from frost.
 - 9.2. Chemical cleaning agents: Do not use when surface temperatures are below those recommended by manufacturer.
10. Cleaning generally
 - 10.1. Operatives: Appropriately trained and experienced for each type of cleaning works.
 - Evidence of training: submit on request.
 - 10.2. Control of Cleaning: Confine cleaning processes and materials to designated areas. Prevent wind drift.
 - 10.3. Detritus: Remove regularly. Dispose of safely.
 - 10.4. Monitoring: Frequently check results of cleaning compared to approved trial samples. If results established by trials are not achieved, seek instructions.
 - 10.5. Modifications to cleaning methods and materials: Seek instructions.
 - 10.6. Clean, collect and safely dispose of debris from scaffolding, ledges, etc. at the end of each day. Prevent debris falling to lower levels.
 - 10.7. Prevent marking of cleaned areas from dirt and debris splashing up from scaffold boards.
11. Record of cleaning works
 - 11.1. Written Report: Record cleaning methods and procedures used for each type of surface and deposit.
 - 11.2. Content: Relevant attributes of cleaning methods used including:
 - Equipment and settings.
 - Dwell times.
 - Number of applications.
 - Ambient temperature.
 - 11.3. Additional Documentation: General photographic survey before cleaning to identify heavy soiling.
 - 11.4. Submission: At completion of cleaning works.
12. Trial samples
 - 12.1. Trial Samples reference is required for all cleaning methods.
 - 12.2. Surface: Masonry and stonework.
 - 12.3. Location / Size: Location to be agreed but no less than 2sq.m per sample.

12.4. Type of soiling:

- Atmospheric soiling.
- Biological growth
- Bird droppings

12.5. Cleaning Methods: As specified above.

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

13. Monitoring

13.1. Regularly monitor effects of each cleaning procedure against the degree of cleaning established by approval trial sample(s). Seek instructions immediately, wherever:

- Disruption to the surface occurs
- Anticipated level of surface cleaning is not being achieved.
- Discolouration or stains are revealed by cleaning.

13.2. Do not modify cleaning procedures or materials without approval from the Conservation Professional.

102 Health and safety

1. The Contractor shall be responsible for ensuring that all products used, and all procedures adopted comply in full with current Health and Safety requirements.
2. Ensure that all operations carried out in such a way that they do not represent a risk to health and safety of the general public or other operatives on site.

120 Related repair and remedial works

1. Work to be carried out before cleaning work: Removal of vegetation, alongside any un-used fixtures and fixings
2. Work to be carried out after cleaning work: Stonework Repairs and Repointing.

142 Removal of fittings

1. Timing: Before commencement of cleaning work
2. Disturbance to surfaces: Minimize.
3. Items for disposal: None unless identified on drawings.
4. Items to be kept for reuse: All unless identified specifically on drawings

162 Protection

1. All surfaces not being cleaned shall be fully protected to ensure that no accidental over spray of cleaning occurs.
2. Where different cleaning techniques are specified for adjoining surfaces, the surfaces not being cleaned during either operation shall be fully protected.
3. Protection of surfaces shall include the following:
 - a) Windows to be boarded up with ply and covered in heavy duty polythene securely taped at all edges.
 - b) Painted surfaces not being redecorated shall be protected with heavy duty polythene and securely taped.
 - c) Areas of delicate carving and statues to be wrapped in polythene sheet tied into place.
4. Where cleaning is internal all fixtures and fittings which cannot be removed are to be fully protected. Statues and any areas of ornate carving are to be protected with ply box covers and heavy-duty polythene.
5. Decorative ironwork is to be fully protected. Where ironwork would puncture polythene a protective layer of expanded polystyrene, foam or similar approved material is to be taped in position prior to installing heavy duty polythene which shall be fully taped.

6. Furniture and fixtures are to be protected against damage with ply or MDF boards and covered with heavy duty polythene fully taped. Where loose furniture is involved, it may be moved to a central point(s) but will still require full protection.
7. The Contractor is to allow for all protection. Where the Architect considers the protection to be inadequate, the protection shall be augmented as directed at the Contractors own cost.
8. Protection shall be inspected at the start of each working day to ensure its integrity. Any defects noted shall be rectified by the Contractor prior to commencement of work.
9. No cleaning operations shall commence until all protection is in place.
10. No protection shall be removed until cleaning operations have been completed and have been inspected and approved by the Architect. Protection is to remain in place until "snagging" items have been completed and approved.
11. Polythene sheeting shall be fixed in such a way that water will run away from the protected items.
12. Protective sheeting shall be checked periodically to ensure that water is not penetrating the protection.
13. Adequate protection must be provided for the general public who may be able to come near to the area to be cleaned. Protective sheeting and temporary barriers shall be erected if necessary. Where laser cleaning is undertaken the protection must ensure that the laser beam cannot escape from the cleaning site and safety notices must be affected and fail-safe locking mechanism put in place to prevent unauthorised access to the cleaning area.
14. Where necessary temporary drainage channels or gutters and hose pipes shall be fitted to carry away waste water. These shall be fed into main drains via a sludge bucket.

175 Control and disposal of wash water and detritus

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

180 Cold weather

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

190 Cleaning generally

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

215 Record of cleaning works

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

232 Trial / sample panels

1. Although the basic cleaning method has been established there is a requirement for sample panels to be carried out to ensure that the Contractor is aware of the standard required. 3 sample panels of each substrate to be cleaned are to be carried out under the direction of the Architect in locations previously agreed with the Architect. Each sample panel will be approximately 2 square metre as item 'trial samples'.
2. Sample panels will be executed prior to commencement of the works and will be carried out by experienced operatives who will be working on the project. The purpose of the sample panels is:
 - a) to confirm the method, working pressures etc to be used.
 - b) to confirm the level of cleaning to be achieved.
 - c) to ensure that the site operatives are familiar from the start with the project requirements. For this reason, it is imperative that the operative executing the trials should be actively involved in the works.
3. Area around sample panels shall be protected as required for the main works.
4. The test clean area shall be inspected and approved by the Architect and Property Curator prior to the method being adopted.
5. Trial cleaning will be carried out on areas where the best method of cleaning needs to be determined. If polychromy or remnants of historic coatings have been identified, extreme care must be used to ensure that the cleaning method does not cause damage or loss.

Products/ equipment

300 Compatibility of chemical products

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

312 Surface biocides

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

315 DOFF cleaning system

1. **Equipment:** Stonehealth DOFF with DRS steam / water vacuum recovery unit.
2. Apply steam at the lowest pressure and allow when removing paint, the appropriate temperature that will remove/soften/loosen deposits without abrading or disrupting the surface(s). If removing biological growth, it may be possible to be removed at a lower temperature but to ensure that the re-growth does not occur, the full temperature of 150°C should be applied over the whole surface in order to kill off the spores. In such instances, there is no need to use a chemical biocide.

For each area / surface, establish the optimum settings (temperature, volume and pressure),

nozzle type and distance of nozzle from substrate. Keep a written record of these variables but allow an operator to vary.

Assist removal of softened deposits with suitable corrosion resistant brushes and scrapers / spatulas that do not abrade or gouge the surface.

Method statements and Risk Assessments are appended to this document for information.

316 TORC abrasive cleaning

1. Equipment: Stonehealth TORC
2. Apply abrasive at the lowest pressure that will remove deposits whilst causing the minimum of abrasion to the surfaces(s). where deposits are ingrained seek instructions.

For each surface, establish the optimum settings (pressure and abrasive volume), nozzle type and distance of nozzle from the surface. Keep a written record of these variables.

Remove and collect dust and debris from each completed surface as work proceeds and finish by rinsing off thoroughly with clean water using a suitable low-pressure spray equipment.

Rinse debris / slurry thoroughly from each completed surface with clean water using suitable low-pressure spray equipment. Do not allow slurry to dry out on the surface.

Method statements and Risk Assessments are appended to this document for information.

320 Mechanical cleaning

1. Where black sulphation crust has accumulated to a depth greater than approx. 2-3mm, reduction using hand tools may be necessary to reduce the thickness of the dirt prior to facilitate further cleaning. Sharp chisels and rifflers may be used to reduce the crust and create a more even surface for progressing cleaning. Extreme care must be taken to ensure that the original carved surface of the carving is not impacted.

326 Piccolo or studio torq

1. Mouldings and robust architectural detail can be cleaned with the Piccolo nozzle or Studio Torq, both of which are smaller versions of the JOS/Vortech system. These should be operated on the lowest possible setting to be effective. Dolomite or dolomite/calcite mix powder will be again be used as the abrasive. Replica carvings which appear to be in sound condition may also be cleaned with this method following appropriate trials.

375 Paint remover poultice

1. Manufacturer: Barretine
Product: Peelaway 07 Paint Remover
Application: Contractor to test areas with specific dwell times ensure adequate removal from substrate. For costing purpose an allowance for two applications should be allowed for to fully remove the paint work. To be completed in line with manufacturer guidelines.

Application

400 Removal of loosely adhered deposits

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

405 General - application

1. Removal of Loosely Adhered Deposits: Timing: Before commencement of other cleaning methods. Surfaces: Prevent damage, including abrasion.

2. Biocide Application: Preparation: Remove loose growths. Surfaces: Prevent damage, including abrasion. Biocide Treatment: Appropriate solutions to kill growths and inhibit further growths. Dead growths: Remove.
3. Abrasive Blocks: Types: Suitable grades of carborundum or gritstone. Application: Lubricate with water. Remove detritus. Abrasive Power Tools: Prohibited.
4. Abrasives Cleaning: Surfaces: Minimise abrasion. Ingrained deposits: Seek instructions. Equipment Settings (including nozzle type and distance from surface): Adjust regularly to achieve optimum cleaning performance for each surface. Detritus: Remove with clean water.

600 Completion

1. Obtain Conservation Professionals approval of cleaning to each area / surface and before of temporary protection.
2. After removal of temporary protection, thoroughly clean all glazing, window frames, doors, sills, and other affected surfaces.
3. Check that all gutters, hoppers, downpipes, and gullies are free from obstruction and debris arising from cleaning works.
4. Give the Conservation Professional two weeks' notice before striking each stage of scaffolding, to allow for final inspections.
5. Refix the following fittings: all items temporally removed and stored.
6. Complete all necessary documentation, review, and record final results with supportive drawings and photographs.

Ω End of Section

C41 Repairing/ renovating/ conserving masonry

Generally/ preparation

100 Inspection and drawings

1. Access:
 - 1.1. In any project involving masonry repairs the tender drawings will have been prepared from visual inspection only, usually without the benefit of access scaffold. **The Contractor is to allow in their programme a period of 2 weeks for confirmation and re-appraisal of the scope of the works to each area.**
 - 1.2. The Contractor is encouraged to be represented during the inspection in order that he may contribute in any discussion regarding alternative methods of repair.
2. Notice:
 - 2.1. The Contractor is to give a minimum of 48 hours' notice to the Architect of the completion of the access scaffold to each area.
3. Confirmation:
 - 3.1. Confirmation of the scope of the work will be the issue of revised drawings and confirmed by an Architects Instruction following completion of the inspection from the access scaffold.
4. Scaffold:
 - 4.1. The Contractor shall ensure that all access scaffold alterations are complete and in accordance with the specification and that handover certificates have been issued before inviting inspection. Inspection will not be carried out if the scaffold is not in accordance with the specification.
5. Drawings:
 - 5.1. In most cases all working drawings will be provided by the Architect. Where fabrication drawings are required to be prepared by the Contractor for specialist areas the Contractor shall submit duplicate copies of the drawings at least two weeks before confirmation of the order for the stonework is required. No cutting of the stonework shall commence until the drawings have been approved in writing by the Architect.
6. Programme:
 - 6.1. The Contractor shall provide a programme of work based on the tender drawings before commencement of work on site. This programme shall indicate separately the erection/alteration(s) sequence for access scaffold inspection period, order period and works on site for each area of work.

105 Protection, storage, transport and cleaning

1. Protection of work area:
 - 1.1. Where large areas of masonry repairs are to be undertaken the scaffold is to be fully protected using a translucent non-combustible sheet such as Monaflex fixed to the outside of the scaffold.
2. Protection of the fabric:
 - 2.1. Any existing windows are to be protected with ply or particle board in the areas adjacent to any area of work. Other features identified on the drawings are to be protected from damage.
 - 2.2. Where scaffold is erected internally or where scaffolding penetrates through into the building internal fittings shall be adequately protected to protect the historic fabric from damage.
 - 2.3. The Contractor is to cover arrises, mouldings, carvings and other finished work with adequate protection, securely fixed without damaging new or existing fabric, to ensure it is not damaged. Any damaged fabric is to be replaced at the Contractor's own cost. Piecing in

or mortar repair will not be considered as acceptable remedial action. Total replacement will be necessary. The Architect is to be advised prior to undertaking such remedial action.

- 2.4. All work should be adequately protected from frost damage. Any frost damaged work is to be cut out and replaced at the Contractor's own expense.
- 2.5. The work is to be protected from direct sun and rain and against rapid or excessive drying until the mortar has properly cured and strictly in accordance with the mortar and pointing specifications. Any work damaged as a result of inadequate protection is to be cut out and replaced at the Contractor's own expense.
- 2.6. Turn back scaffold boards adjacent to finished faces to prevent splashing during heavy rain.
3. Storage:
 - 3.1. Stone should be stored in stacks on battens protected from moisture and freezing. Adequate care is to be taken to ensure that no damage occurs to the stone during storage or handling.
4. Lifting:
 - 4.1. The Contractor shall provide adequate lifting gear to unload and handle stones into position.
5. Storage on scaffolding:
 - 5.1. Only stone for immediate use shall be stored on the scaffold.
6. Protection of finished work:
 - 6.1. Cover arrises, moulds, carving and other finished work to protect from accidental damage. Protection is to be maintained until completion of all work in that vicinity.
7. Cleaning of work:
 - 7.1. Keep facework clean and free from staining at all times.
 - 7.2. Clean off and rub down all stonework to the satisfaction of the Architect as the scaffolding is taken down.
 - 7.3. Any mortar or stains caused by the works on the face of the masonry must be completely removed before the mortar hardens.
8. Transport:
 - 8.1. Transport stone with minimum handling. Stack carefully in vehicle with non-staining packing material to prevent damage.
 - 8.2. Provide adequate lifting plant to unload and handle stones into position.
 - 8.3. Handle stones with tackle, crane or other mechanical aids as necessary.

110 Scope of work

1. **Schedule:** Refer to External Repair 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.

120 Site inspection

1. **Purpose:** To confirm type and extent of repair/ renovation/ conservation work shown on drawings and described in survey reports and schedules of work.
2. **Parties involved:** Contract Administrator and Conservation Architect
3. **Timing:** At least 7 days 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

130 Removal of plant growths from masonry

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

140 Record of work

1. **General:** Record work carried out to masonry clearly and accurately using written descriptions, sketches, drawings and photographs, as necessary.
2. **Specific records:**
3. **Documentation:** Submit electronic copy on completion of the work so this can be recorded with the local authority.
 - 3.1. Number of sets: 1

Workmanship generally

150 Power tools

1. **Usage for removal of mortar:** Not permitted. Hand tools only.

155 Putlog scaffolding

1. **Usage:** Not permitted

160 Protection of masonry units and masonry

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

165 Structural stability

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

170 Disturbance to retained masonry

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

181 Workmanship - Conservation Specific

1. All work shall comply with the general recommendations of B.S. 5390 section 5 Work on Site.
2. **NOTE:** Masonry repairs are to be undertaken only by an approved stone mason who is a member of The Heritage Contractors Section of the Stone Federation. None registered companies or unqualified personnel will not be permitted to work on site.

3. Protection of Masonry Units and Masonry:
 - 3.1. 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.
 - 3.2. Masonry: Prevent damage, particularly to arrises, projecting features and delicate, friable surfaces. Prevent mortar / grout splashes and other staining and marking on face work. Protect using suitable non-staining slats, boards, tarpaulins, etc. Remove protection on completion of the work.
4. Setting Out and Working Drawings:
 - 4.1. For repair work setting out points are to be taken from the existing structure prior to carrying out repair work. Survey reference points should be taken and recorded to enable the correct placement of repairs.
 - 4.2. The Architect is to be advised of any discrepancies in the alignment of existing work prior to carrying out repair work.
 - 4.3. For new work, setting out is to be as specified.
 - 4.4. Working drawings for each elevation are to be prepared and submitted to the Architect at least two weeks before cutting stonework.
 - 4.5. Full size profiles of all mouldings are to be submitted to the Architect prior to carving all of which is to be shown in the pre-contract programme.
 - 4.6. The cutting schedule for all stones is to be submitted to the Architect on request.

185 Adverse weather

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

190 Control samples

1. **General:** Complete an area of each of the following types of work, and arrange for inspection before proceeding with the remainder: A sample should be provided of every repair type in an approved area.

Materials/ production/ accessories

215 Material samples

1. **Representative samples of designated materials:** Submit before placing orders.
 - 1.1. **Designated materials:** Stonework for repairs. A minimum of 4 options are to be provided
2. **Retention of samples:** Unless instructed otherwise, retain samples on-site for reference. Protect from damage and contamination.

220 Recording profiles

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

230 Inspection of drawings, templates, casts, etc.

1. **Timing:** Before starting production of masonry units associated with the following items:
2. **Period of notice (minimum):** Two weeks

240 Stone

1. **Standard:** To BS EN 771-6
2. **Supplier:** Submit proposals
3. **Type:** Buff Sandstone to match historic stonework completed in previous phase of work.
4. **Quality:** Free from vents, cracks, fissures, discolouration, or other defects that may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with shop drawings prepared by the supplier.
5. **Finish:** Tooled to match existing

241 Stone in accordance with

1. Free from any defects on the faces visible in the completed work that could mar the appearance of the stonework.
2. Of proven durability and weather resistance and selected with regard to its suitability to local atmospheric conditions and the nature of the work to be carried out, and its location in the finished work. The Contractor is to confirm to the Architect the suitability of the stone.
3. To match samples of stone, sufficiently large to show natural variations and specified finishes, which are to be submitted for approval prior to ordering.
4. Variations in colour and texture, natural to the source of stone, will only be acceptable within the range of samples supplied to and approved by the Architect. Variations in colour and texture outside the range of approved samples will be rejected.
5. The Contractor is to confirm in writing the quarry and/or bed of origin.
6. Stone from only one quarry bed is to be used throughout.
7. Stone is to be seasoned at the time of delivery to suit the purpose for which it is to be used.
8. Stone for ashlar repair work to be worked to suit the location where it is to be fixed. Finish to match the existing adjacent stonework as approved sample on all faces visible in the finished work.
9. Stone for new ashlar work to be dressed to specified finish and to match approved sample on all faces visible in the finished work.
10. Stones for repairing existing random rubble to match the existing wall to include sufficient bonding stones through the wall.
11. Stones for new random rubble wall to be as specified. To include sufficient bonding stones through the wall; minimum 1 no. bonding stone per 1m² of finished wall.
12. Stones for repairing existing coursed rubble to be roughly dressed to match the existing and to include sufficient bonding stone through the walls.
13. Stones for new coursed rubble to be roughly dressed as specified. To include sufficient bonding stones through the wall; minimum 1 no. bonding stone per 1m² of finished wall.
14. Stone for carving work to be specially selected to be consistent in grain and colour throughout. Supply sufficient quantity of stone for the carver to have ample scope for their work.

15. Samples of the specified stones for repair work are to be submitted for matching purposes. The samples are to match the existing stone in colour, texture, shape, size and surface finish as closely as possible. Where a particular stone has not been specified, the stone samples should be closely related geologically to the stone to be matched.
16. For new work, samples of the specified stone are to be submitted for approval of the full range of colour and texture. Such samples are to meet the specification requirements.

242 Stone and masonry

1. Stone and masonry:
 - 1.1. Stone / masonry is to be selected to match existing in texture and colour.
 - 1.2. Representative samples shall be provided prior to final order. Samples should be weathered samples from all areas of the quarry currently being exploited as there may be colour/texture variations between beds within the quarry. Where dressed stone is to be used then samples of new stone with a dressed face shall also be provided for approval. Whilst provisional orders may be placed no confirmation shall be issued until samples have been approved by the Architect.
 - 1.3. All stone shall be free from vents, cracks, fissures, mineral veins, discoloration, and clay pockets. No stone for the project should contain any defect which will adversely affect the strength or appearance of the stone.

245 Replacement stone units

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

250 Stone orientation

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

251 Laying of stone

1. Natural bed:
 - 1.1. New stonework shall be prepared such that the natural bed is:
 - a) Horizontal for plain walling works.
 - b) Vertical and at right angles to wall face for cornices and other projecting stones.
 - c) Horizontal in quoin stones or end stones. These shall be specially selected to ensure that they are compact non-laminated stones.
 - 1.2. Further bedding details are contained in B.R.E. publications for the relevant type of stone. These are summarised in diagrammatic form in the appendices.

252 Bedding

1. All stones shall be laid on a full and even bed of lime mortar based on "coarse stuff" unless specified elsewhere.

253 Joints

1. Horizontal and vertical joints are to match the existing joint size unless instructed differently by the Architect.

254 Face

1. Stones are to be placed such that their face is flush with the plane of the original stonework. Where new stone is being inserted adjacent to old worn surfaces the new stone shall be set to the face of the nearest unworn surface.

255 Ashlar blocks/ Dressings

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

258 Existing templates

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

265 Salvaged and second hand bricks

1. Source: Existing cracked bricks removed, cleaned. Contractor is to confirm that the brickwork has been salvaged for approved heritage works. Source to confirm that bricks have been kept under covered space.
2. Condition
 - 2.1. Free from matter such as mortar, plaster, paint, bituminous materials and organic growths.
 - 2.2. Bricks to be free from cracks, dirt and efflorescence. :
 - 2.3. Sound, clean and reasonably free from cracks and chipped arrises.

Dismantling/ rebuilding

310 Dismantling masonry for reuse

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

Replacements and insertions

330 Preparation for replacement masonry

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

331 Repairs to stonework

1. General:
 - 1.1. All repairs will be identified during the inspection and will be indicated on the drawings.
 - 1.2. All areas for repair are to be marked up from the drawings on site by the Contractor and agreed with the Architect prior to commencing cutting out.

- 1.3. The Contractor is to notify the Architect once the whole of the area to be repaired is fully accessible. The Architect shall indicate on site any variations to the work found to be necessary.
 - 1.4. Stonework is to be adequately propped during the course of the works.
 - 1.5. All iron cramps and the like encountered during the course of the works are to be removed and replaced with stainless steel fixings. The Architect is to be advised as and when such iron cramps are found.
 - 1.6. Stonework is to be cut out with extreme care to ensure that no damage occurs to existing adjacent stones that are to be left in-situ. In particular, techniques that cause excessive vibration and/or dust are to be avoided. Any damaged or scarred stonework is to be replaced at the Contractor's own cost. Piecing in or mortar repair will not be considered as acceptable remedial action. Total replacement will be necessary. The Architect is to be advised prior to undertaking such remedial action.
 - 1.7. Where the Contractor anticipates that cutting out will not be possible without causing damage, the Architect is to be advised and provided with a method statement describing how potential damage will be controlled before proceeding with the work.
2. Repair techniques:
- 2.1. Repairs to stonework will be one of the following as noted on the drawings:
 - 2.1.1.A) Full block replacement.
 - B) Part block replacement.
 - C) Full face replacement
 - D) Partial face replacement
 - E) Carved work replacement.
 - F) Carved item replacement
 - G) Indent repair
 - H) Redressing
 - I) Crack injection/resin repair
 - J) Stitch repair
 - K) Plastic repair
 - 2.1.2. Note: lettered abbreviations A-K as above will be annotated across drawings where relevant. If letter is followed by a number, that number signifies the quantity of said repair within that location. For example, C2 would mean that 2 stones require a full-face replacement.
 - 2.1.3. Each repair technique is described below.

331 (G) Indent repair (G)

1. General:
 - 1.1. Cut out area of stone identified to a depth of 50mm for indents of 100mm, 65mm for indents up to 150mm and 75mm for indent repairs to a maximum of 300mm.
2. Preparation:
 - 2.1. Carefully form neat arrises to all sides ensuring that no damage occurs to the adjoining stones. Carefully square off the back of the recess and clean out all debris, mortar etc.
3. Installation:
 - 3.1. New stone is to be inserted on a bed of resin with arrises tight to the original stone. Joint thickness to the original arrises of the block is to be consistent with the original mortar joints.
 - 3.2. Ensure that resin is kept back from the mortar joint positions by 25mm to facilitate later pointing.
 - 3.3. Indent repair is to be fully supported until the resin has cured.

331 (H) Redressing (H)

1. General:

- 1.1. Where damage to stone is superficial this can be rectified by redressing the stone. The area to be redressed is to be agreed with the Architect on site.
- 1.2. When surface failure has occurred, the stonework can be redressed to its original profile. This should be undertaken by a skilled stonemasons'. Generally, only 15-25mm of the eroded stone is removed to allow realignment to the original profile. This technique is used for eroded stone deeply embedded within a wall which itself has minimal decay, yet is disfigured.
- 1.3. Where dressing back is required the Contractor shall inform the Architect if, in their opinion, it is necessary to dress back further, i.e. to a greater depth, than specified. Must be agreed.
- 1.4. The redressing of stonework will generally remove all spalling / friable / sheered areas of masonry vulnerable to becoming loose.
2. Preparation:
 - 2.1. The stone is to be taken back the minimum possible to achieve a sound free draining surface using only hand tools.
 - 2.2. On many stones, a more robust descaling will be necessary due to the extent of delamination. This work is to be carried out in accordance with previously agreed samples. A sample will be requested during tender stage so that the contractor understands the extent of descaling necessary to some stones.
3. Finish:
 - 3.1. The redressed stone shall be finished to a smooth texture with minimum tooling marks visible.
 - 3.2. Where it is agreed that only part of the stone is to be redressed the redressed area is to be feathered neatly into the untreated area.

331 (J) Stitch repair (J)

1. Where specified the adjoin joints to both sides of the defect are to be raked out to a depth of 50mm (or as specified by the structural engineer) and to at least 450mm beyond the line of the defect.
2. Raked out joints are to be cleaned out of all debris.
3. Helical stainless-steel tie rods are to be inserted into the joints at the specified centres.
4. Joints are to be fully repointed with all mortar fully compacted and pointed to match the surrounding masonry.

332 Cutting out

1. Cutting out decayed stonework to permit new stones of the specified depth for the appropriate repair to be inserted. Cutting out can be carried out by mechanical means provided that extreme care is taken to ensure that the adjoining stones are not damaged. The stones should be cut to the central section's only by mechanical means ensuring that the perimeter is undamaged. The stone is then to be cut back by hand to the required depth.
2. If any damage occurs to adjoining stones, then the stone is to be replaced at the Contractors expense at the discretion of the Architect.
3. In certain areas previous plastic repairs may have to be removed. In this case the Contractor should note that the plastic repair may be harder than the original stonework and great care is to be exercised to ensure no unnecessary damage occurs to the existing stone.

333 Temporary support

1. Stonework above the course being cut out or dressed back shall be fully supported during the course of the works. Support should be by adequately sized timber props secured and wedged. Care should be taken to ensure that no damage is caused by the props to the adjoining stonework.

334 Existing ferrous cramps

1. Where iron cramps are encountered during the course of the works they are to be brought to the attention of the Architect. Unless instructed otherwise they are to be removed and replaced with non-ferrous cramps.

335 Cleaning out

1. All areas cut out to be cleared of debris mortar etc and washed clean. Care is to be taken not to saturate the stone.
2. Any defects noted in the stone after cutting back or in the masonry backing are to be reported to the Architect.

336 Moistening

1. Wherever new masonry is to be inserted the adjoining stones are to be moistened to ensure that the mortar does not "snatch". Do not saturate the stone.

337 Removal of organic growth

1. See separate specification clause.

338 Descaling

1. Where damage to stone is superficial this can be rectified by descaling the stone. The area to be descaled is to be agreed with the Architect on site.
2. The stone is to be taken back the minimum possible to achieve a sound free draining surface using hand tools only.
3. The descaled stone shall be finished to a smooth texture to avoid water traps.
4. Where it is agreed that only part of the stone is to be descaled the treated area is to be feathered neatly into the untreated area.

345 Preparation of stone

1. Unless specified otherwise, prepare stone so that the natural bed is:
 - 1.1. a) Horizontal in plain walling.
 - b) Vertical and at right angles to the wall face in cornices and other projecting stones.
 - c) Horizontal in quoin stone or end stones which are to be specially selected compact non laminated stones.
 - d) Parallel to the radial centre line of each arch stone and at right angles to the wall face in arches.
2. Mark the natural bed clearly on each stone before it leaves the quarry. Where it is not possible to determine the bed of the stone after extraction, the bed should be marked before quarrying and subsequently marked on each stone as cut.
3. For repair work stones are to be cut to full dimensions to match the original joint layout and width of the masonry. Sufficient stone is to be allowed for to enable working to original bed and perpendicular joints, in particular on quoin stones.
4. For new stonework, work the exposed and joint faces of each stone to a square and plane surface, free from hollow or rough edges to the particular finishes as instructed to match the approved sample.
5. Where the specified stone cannot be obtained in sufficient bed depth to match the existing joint layout the Architect is to be advised before proceeding. Any variation in the orientation of the natural bed from that specified above is to be the subject of future instruction.
6. Mark each stone on an unexposed face, clearly, to indicate its position in the finished work.
7. Only stone for immediate use shall be stored on the scaffold.

346 Working stone

1. Generally, where new stonework is being installed to replace existing stonework, profiles and finishes are to match the original. Samples are to be provided for approval by the Architect. Where existing stones are weathered, profiles are to be agreed with the Architect before proceeding. The Contractor is not to assume that existing stone profiles will be the same around the existing building. Stones are to be cut and profiled as necessary to suit their particular location. Where necessary stones are to be oversized to allow for final dressing in on site to ensure correct alignment and profile.
2. Work the exposed and joint faces of each stone to suit its location. Exposed and joint faces to be free from hollow or rough edges. All saw marks are to be removed from exposed faces to a depth of at least 10mm. Arises to all ashlar are to be chiselled to avoid straight lines when new ashlar are fixed together; where necessary this is to be done prior to construction to ensure accurate alignment in the finished work.

Noting the variance in tooled finishes across the site the Employer has prepared four samples for the Contractor. The Contractor is to retain these samples on site for comparison with finished work by the Architect. The Contractor is to familiarise themselves with the samples and provide their own samples for review and approval by the Architect and Property Curator.

3. Cut and carve stone to accurate clean profiles before building in. In repair work final dressing-in is to be carried out in-situ to ensure accurate alignment with existing adjacent stones. On no account dress off existing stones to suit new stone profiles. Allow for masonry lime mortar repairs to all adjacent existing stones to provide a smooth water shedding junction between new and old stones. In new work, profiles and finishes are to be in accordance with the specification, drawings, schedule of work and approved samples.
4. Chase out mortices for joggles, dowels and cramps before delivery of stone to site.
5. Drill holes for dowels to be fixed to equal depth in adjacent stones.
6. Where particularly specified, cut 'V' shaped sinkings to coincide with those in the ends of adjacent stones for filling with mortar grout or lead, as specified, to form joggles.
7. Where particularly specified, cut dovetail channels in adjacent stones for cramps.
8. Where particularly specified, cut holes for anchor bolts of just sufficient tolerance for easy bolt entry.
9. For repair work, new stones are to be worked to dimensions and profiles of the original. The pattern of joints in the original stonework is to be matched unless specified otherwise.

348 Laying and jointing

1. Lay stones on their natural bed, or as described in clauses for "Preparation of the Stone".
2. Lay stones on a full even bed of mortar, as agreed sample. Ensure that no hard lumps or the like are present in the mortar that could prevent even bedding.
3. In repair work, horizontal and vertical joints are to be of widths to match the original masonry, finished as approved sample, unless specified otherwise. An area of existing masonry will be marked up by the Architect for matching purposes.
4. In new work horizontal and vertical joints are to be of widths to match the approved sample or as specified otherwise. Joints to be finished as approved sample.
5. Ensure stone faces taking mortar are dampened as necessary to prevent premature drying out of the mortar.
6. All joints and joggles are to be filled solid.
7. All dowels, cramps, ties, metal fixings and the like are to be solidly and securely fixed as the work proceeds.
8. Random rubble wall to be laid as specified and to match existing and adjacent.
9. Coursed random rubble to be levelled at heights as specified and to match existing and adjacent.

385 Laying replacement masonry units

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

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.

408 Dowels and cramps

1. All dowels and cramps are to be as manufactured by Ancon Clarke Ltd., Olive Grove Road, Sheffield S2 3GB and are to be manufactured in austenitic stainless steel to B.S. 1449 Part 2 1983. Typical details for cramping are contained in the appendix to the specification.
2. Bronze cramps may also be used subject to prior written approval.

409 Metal fixings

1. Dowels, cramps and the like to be grade 316 Austenitic stainless steel or phosphor bronze grouted in with lime mortar or a lead pour between the stone and fixing. Where these materials cannot be used a two-part epoxy resin may be used with prior agreement; resin to be two part polyester (Exchem Resifix 3 plus or similar approved).
2. Dowels are to be threaded or notched to aid purchase on the stone.
3. The position, size and type of cramp or dowel are to be agreed with the Architect before preparation is made to receive the fixing.
4. Where appropriate lead joggles may be used to align indented stones.

410 Corroded metal fixings

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

Tooling/ dressing stone in situ

450 Weathering ledges at joints

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

455 Descaling stone

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

458 Redressing stone

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

Mortar repairs

540 Applying mortar

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

550 Scraped finish to mortar repairs

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

555 Float finish to mortar repairs

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

Crack repairs/ ties/ reinforcement

640 Pinning

1. **Description:** General pinning repairs to fabric.
2. **Dowels/ Pins**
 - 2.1. **Standard:** To BS EN 1090-1
 - 2.2. **Type:** Austenitic stainless steel threaded rods
 - 2.3. **Diameter:** 6 mm
 - 2.4. **Additional requirements:** Allow provisionally for three dowels per stone
3. **Resin:** Low viscosity resin to approval
4. **Holes:** Drill carefully, sloping downwards into background. Remove drilling dust and debris and keep dry.
5. **Filling holes**
 - 5.1. Check that dowel lengths are correct before filling with resin.
 - 5.2. Use sufficient resin so that when the dowel is inserted the resin is dispersed to achieve an effective repair.
6. **Exposed faces:** Keep clean and free from resin stains. Use temporary plugging material and/ or isolating membranes as necessary.

7. **Clearances:** Keep ends of ties and resin back from face of masonry.
8. **Making good after resin has cured:** Either mortar, as clause 690 or stone plugs, as clause 692

641 Pinning - note

1. Where an area appears to be vulnerable due to non-structural fracturing or finer cracks, and the stone is generally sound, pinning will be used to secure the element in-situ. This will be carried out in threaded Grade 316 stainless steel bar or notched phosphor bronze with the dowel(s) fixed to minimise failure and grouted and packed with lime mortar. Where adhesive is required in addition to dowels, epoxy resin should be used to spot stick the joint and secure the dowel. If necessary, polyester resin may be used in addition to epoxy to spot stick and help secure stone elements where a faster 'set' is required, however, polyester should not be used externally in isolation. Resin should not be used along a crack in such a way to cause a barrier to natural movement of moisture through the stone.

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
 - 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.

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.

870 Water

1. Water for the works shall be clean and fresh without pollutants. Where existing water supply is available within the building this may only be used with the Employers permission. In other cases a lockable stand pipe shall be erected to the approval of the local water authority.

900 Completion

1. The Architect is to be advised at least two weeks in advance of when the works will be complete in order that an inspection can be made prior to the removal of any scaffold.
2. All dust marks, staining, scuff marks and the like are to be carefully cleaned off. Extreme care is to be taken to ensure that no damage occurs to the new or existing fabric of the building. Any damage is to be made good at the Contractor's own expense.
3. Remove all tools, plant and equipment and used materials and debris.
4. On completion leave all neat and tidy to the satisfaction of the Architect.

Ω End of Section

H71

Lead sheet fully supported roof and wall coverings/ flashings

Types of leadwork

100 General:

1. The extent of lead work on the roofs is identified on the following drawings:
2. The work involves:

250 Existing weathering to stone cornice

1. **Description:** The stone cornice running the full perimeter of the orangery has a lead weathering installed. The weathering appears to have been unclipped in areas, and / or worn. Allow for adjustment
2. **Substrate:** Stone Cornice
3. **Sheet underlay:**
4. **Type of lead:** Sandcast
 - 4.1. **Thickness:** Code 7 - 3.15mm
5. **Joints:** Laps (100 mm minimum)
 - 5.1. **Spacing:** 2000mm
6. **Edge details:** Match existing detail. Leadwork to over sail cornice by 15mm with a 45 degree drip.
7. **Fixing:** No fixing into existing stonework. Leadwork to be fixed into mortar joint between parapet and stone cornice as Clause 770.
8. **Accessories:**

498 Combined lead damp-proof course and cover flashing below coping stones to WC block

1. **Lead**
 - 1.1. **Thickness:** Code 6
 - 1.2. **Finish:** Fully coated on both sides with high-build, bitumen based paint on the surfaces which are to be embedded.
2. **Length:** Not more than 1500 mm.
3. **Cover of flashing:** Not less than 150 mm.
4. **Joints:** Lead-weld gusset upstand not less than 100 mm from end of each length, coinciding with vertical mortar joint in wall. Lap adjoining length over gusset upstand.
5. **Laying:** On a thin even bed of wet mortar.
 - 5.1. **Next layer of overlying construction:** Bed on mortar without delay and finish joint neatly.
6. **Fixing cover flashing:** Cover flashing should be formed to ensure 150mm coverage above the bitumen felt roof.

General requirements/ preparatory work

510 Workmanship generally

1. **Standard:** In accordance with BS EN 14783 and BS EN 12588 and to BS 6915 and latest edition of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Training Academy.
2. **Fabrication and fixing:** To provide a secure, free draining and completely weathertight installation.

3. **Operatives:** Trained in the application of lead coverings/ flashings. Submit records of experience on request.
4. **Preforming:** Measure, mark, cut and form lead prior to assembly wherever possible.
5. **Marking out:** With pencil, chalk or crayon. Do not use scribes or other sharp instruments without approval.
6. **Bossing and forming:** Straight and regular bends, leaving sheets free from ripples, kinks, buckling and cracks.
7. **Solder:** Use only where specified.
8. **Sharp metal edges:** Fold under or remove as work proceeds.
9. **Finished work:** Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
10. **Protection:** Prevent staining, discolouration and damage by subsequent works.

515 Lead-welding

1. **In situ lead-welding:** Not permitted.

520 Lead sheet

1. **Production method**
 - 1.1. Rolled, to BS EN 12588, or
 - 1.2. Machine cast and BBA-certified, or
 - 1.3. Sand cast, from lead free from bitumen, solder, other impurities, inclusions, laminations, cracks, air, pinholes and blowholes; to code thicknesses but with a tolerance (by weight) of $\pm 10\%$.
2. **Identification:** Labelled to show compliance with the harmonized standard (hEN) BS EN 14783, where appropriate, and detail of the thickness/ code, weight and type.

610 Suitability of substrates

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

Fixing lead

710 Fixings

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

765 Continuous clips for cross joints in roofing

1. **Lead continuous clips:** 50 mm wide, cut from sheets of same thickness/ code as sheet being secured.
2. **Fixing clips:** Lead-weld top edge of clips to underlap sheet, 50 mm from lower edge of overlap.

3. Fixing lead sheet: Welt edge around continuous clip and dress down.

770 Wedge fixing into joints/ Chases

1. Joint/ chase: Rake out to a depth of not less than 25 mm.
2. Lead: Dress into joint/chase.
 - 2.1. Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
3. Sealant: Mortar as C41
 - 3.1. Application: As section Z22.

780 Wedge fixing into damp-proof course joints

1. Joint: Rake/ cut out under damp-proof course to a depth of not less than 25 mm.
2. Lead: Dress lead into joint.
 - 2.1. Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
3. Sealant: Mortar as C41
 - 3.1. Application: As section Z22.

Jointing lead

810 Forming details

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

970 Patination oil

1. Manufacturer: Submit proposals
 - 1.1. Product reference: Submit proposals
2. Location: Any new leadwork that is required.
3. Application: As soon as practical, apply a smear coating to lead, evenly in one direction and in dry conditions.

Ω End of Section

L40

General glazing

To be read with preliminaries/ general conditions.

10 Workmanship and positioning generally

1. Glazing
 - 1.1. **Generally:** In accordance with BS 6262 series.
 - 1.2. **Integrity:** Wind and watertight under all conditions. Make full allowance for deflections and other movements.
2. Glass
 - 2.1. **Standards:** Generally to BS 952 and to the relevant parts of:
 - 2.1.1. BS EN 572 for basic soda lime silicate glass.
 - 2.1.2. BS EN 1096 for coated glass.
 - 2.1.3. BS EN 12150-2 for thermally toughened soda lime silicate glass.
 - 2.1.4. BS EN ISO 12543 for laminated glass.
 - 2.2. **Quality:** Free from scratches, bubbles and other defects.
 - 2.3. **Dimensional tolerances:** Panes/ sheets to be accurately sized.
 - 2.4. **Material compatibility:** Glass/ plastics, surround materials, sealers primers and paints/ clear finishes to be compatible. Comply with glazing/ sealant manufacturers' recommendations.
 - 2.5. **Protection:** Keep materials dry until fixed. Protect insulating glass units and plastics glazing sheets from the sun and other heat sources.

40 Putty-fronted single-glazing

1. **Description:** Where modern glass.
2. **Pane material:** 4mm clear toughened glass
3. **Surround:** Hardwood
4. **Putty:** Linseed oil
5. **Glass installation**
 - 5.1. **Glass:** Located centrally in surround using setting and location blocks, and secured with glazing sprigs/ cleats/ clips at 300 mm centres.
 - 5.2. **Finished thickness of back bedding after inserting glazing (minimum):** 1.5 mm.
 - 5.3. **Front putty:** Finished to a smooth, neat triangular profile stopping 2 mm short of sight line. Surface lightly brushed to seal putty to glass.
6. **Sealing putty:** Seal as soon as sufficiently hard by applying either the full final finish, or two coats of undercoat applied locally.

95 Window film

1. **Description:** UV film to be installed to the inside face of the modern windows to reduce the G value. Sample tests to be provided by specialist contractor to determine final product.
2. **Type:** UV Safety Film
3. **Manufacturer:** 3M
 - 3.1. **Product reference:** Prestige Ultra PRS70
4. **Colour:**
5. **Application:** Carried out by a firm approved by the film manufacturer in accordance with manufacturer's recommendations.

6. **Installed film:** Fully adhered to the glass with no peeling, and free from bubbles, wrinkles, cracks or tears.
7. **Cleaning and maintenance instructions:** Submit copies.

Ω End of Section

M20

Plastered/ rendered/ roughcast coatings

Types of coating

310 Render repairs coatings to localised areas of elevations on Heaton Hall and Orangery Lime:sand

1. **Description:** Areas identified on drawings. tap test to be completed to guide exact areas for approval with Conservation Architect.
2. **Substrate:** Existing brickwork where existing render has eroded.
 - 2.1. **Preparation:** Remove all dust, surface contaminants and loose and friable existing render and consolidate where necessary. Leave wall damp but not wet. Lightly scratch
3. **Lime manufacturer:** Wormsley's Ltd or Contractors choice to CA approval.
 - 3.1. **Product reference/ Type:** Duro Natural hydraulic lime, Hydraulic NHL3.5. Final coat to be Lime green eco render, natural hydraulic lime top coat.
4. **Undercoats**
 - 4.1. **Mix:** Pre-Mixed
 - 4.1.1. **Sand:** As supplied, if render is site mixed used nosterfield / Leighton Buzzard or equivalent, 2.8mm down in size. to achieve a suitable workable mortar.
 - 4.2. **Thickness (excluding dubbing out and keys):** 9-12mm as necessary to be flush with surrounding render. Scratch surface of each coat to give good key for subsequent coat.
5. **Final coat**
 - 5.1. **Mix:** pre Mixed
 - 5.1.1. **Sand:** to BS EN 13139, grading or approval.
 - 5.2. **Thickness:** 4mm
 - 5.3. **Finish:** Plain wood float to match existing with stike marks.
6. **Accessories:**
7. **Other requirements:** Decorated as M60.

330 Proprietary lime:sand render replacement to interior side of orangery parapet walls

1. **Description:**
2. **Substrate:** Existing brickwork and stonework.
 - 2.1. **Preparation:** Remove all existing render where cracked, loose and unstable. Take back to suitable substrate and ensure clean and ready finish for application render.
3. **Manufacturer:** Keim
4. **Undercoats:** Keim Universal Render
 - 4.1. **Product reference/ Type:** Keim Universal Render
 - 4.1.1. **Fibre reinforcement:** Mineral fibre fillers and glassfibre re-inforcement mesh .
 - 4.2. **Thickness (excluding dubbing out and keys):** 6mm
5. **Final coat:** Keim Universal Render
 - 5.1. **Product reference:** Keim Universal Render
 - 5.2. **Thickness:** 4mm
 - 5.3. **Finish:** Sponge float flat as per manufacturer instruction
6. **Accessories:** Stainless steel beads
7. **Other requirements:** Decorate accordingly as M60 section

350 Roman Cement Repair Render to Mouldings / Casting Mouldings to window surrounds to the Orangery

1. **Description:** Repairs to external mouldings.
2. **Substrate:** Existing eroded render for localised run in situ repairs
 - 2.1. **Preparation:** Remove all dust, surface contaminants and loose and friable existing render and consolidate where necessary. Leave wall damp but not wet. Lightly scratch surfaces for adhesion / prime as necessary.
3. **Manufacturer:** Roman Stucco, Roman cement based binder or contractor to suggest alternative for approval.
4. **Final coat**
 - 4.1. **Mix:** Pre-Mixed
 - 4.1.1. **Lime putty:** As for undercoats.
 - 4.1.2. **Fine sand:** to BS EN 13139
 - 4.1.3. **Gypsum:** As for undercoats.
 - 4.1.4. **Set retarding admixture:** As for undercoats.
 - 4.2. **Thickness:** To suit specific detail on site. Determined on site.
 - 4.3. **Finish:** Make good running mouldings in situ: horse mould formed from tin or zinc sheet, supported by timber profile and brace generally described above. Apply the final coat in one smooth application leaving no marks, ripples, splashes . Junctions are to be completed by hand.
5. **Other requirements:** To be decorated in accordance with M60 for relevant areas. Please note that works are to be completed by an appropriately experienced craftsmen. Confirmation of experience to be provided prior to works commencing.

General

418 Control samples

1. **Complete sample areas, being part of the finished work, in locations as follows:** Provide sample of each repair type appropriate. Repair to Orangery interior face of parapet wall, repair to external wall render,

Materials and marking of mortar

495 Mixing

1. **Render mortars (site prepared)**
 - 1.1. **Batching:** By volume. Use clean and accurate gauge boxes or buckets.
 - 1.2. **Mix proportions:** Based on damp sand. Adjust for dry sand.
 - 1.3. **Lime:sand:** Mix thoroughly. Allow to stand, without drying out, for at least 16 hours before using.
2. **Mixes:** Of uniform consistence and free from lumps. Do not retemper or reconstitute mixes.
3. **Contamination:** Prevent intermixing with other materials.

497 Cold weather

1. **General:** Do not use frozen materials or apply coatings on frozen or frost bound substrates.
2. **External work:** Avoid when air temperature is at or below 5°C and falling or below 3°C and rising. Maintain temperature of work above freezing until coatings have fully hardened.
3. **Internal work:** Take precautions to enable internal coating work to proceed without detriment when air temperature is below 3°C.

Preparing substrates

510 Suitability of substrates

1. Soundness: Free from loose areas and significant cracks and gaps.
2. Cutting, chasing, making good, fixing of conduits and services outlets and the like: Completed.
3. Tolerances: Permitting specified flatness/ regularity of finished coatings.
4. Cleanliness: Free from dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.

527 Raking out for key

1. Joints in existing masonry: Rake out to a depth of 13 mm (minimum).
 - 1.1. Dust and debris: Remove from joints.

531 Roughening for key

1. Substrates: Roughen thoroughly and evenly.
 - 1.1. Depth of surface removal: Minimum necessary to provide an effective key.

556 Removing defective existing render

1. Render for removal: Detached, hollow, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
2. Removing defective render: Cut out to regular rectangular areas with straight edges.
 - 2.1. Horizontal and vertical edges: Square cut or slightly undercut.
 - 2.2. Bottom edges to external render: Do not undercut.
 - 2.3. Render with imitation joints: Cut back to joint lines.
3. Cracks
 - 3.1. Fine hairline cracking/ crazing: Leave.
 - 3.2. Other cracks:
4. Dust and loose material: Remove from exposed substrates and edges.

568 Existing damp affected plaster/ render

1. Plaster affected by rising damp: Remove to a height of 300 mm above highest point reached by damp or 1 m above dpc, whichever is higher.
2. Perished and salt contaminated masonry
 - 2.1. Mortar joints: Rake out.
 - 2.2. Masonry units: Submit proposals.
3. Faults in substrate (structural deficiencies, additional sources of damp, etc.): Submit proposals.
4. Drying out substrates: Establish drying conditions. Leave walls to dry for as long as possible before plastering.
5. Dust and loose material: Remove from exposed substrates and edges.

Backings/ beads/ joints - Not Used

Mouldings/ decorative plasterwork - Not Used

Internal plastering - Not Used

External rendering

810 Application generally

1. **Application of coatings:** Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
2. **Appearance of finished surfaces:** Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
 - 2.1. **Accuracy:** Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
3. **Drying:** Prevent excessively rapid or localized drying out.

820 Dubbing out rendering

1. **General:** Correct substrate inaccuracies.
2. **Thickness of any one coat (maximum):** 16 mm.
 - 2.1. **Total thickness (maximum):** 20 mm, otherwise obtain instructions.
3. **Mix:** As undercoat.
4. **Application:** Achieve firm bond. Allow each coat to set sufficiently before the next is applied. Comb surface of each coat.

840 Undercoats generally

1. **General:** Rule to an even surface. Comb to provide a key for the next coat. Do not penetrate the coat.
2. **Undercoats on metal lathing:** Work well into interstices to obtain maximum key.

856 Final coat – plain floated finish

1. **Finish:** Even, open texture free from laitance.

880 Curing and drying

1. **General:** Prevent premature setting and uneven drying of each coat.
2. **Curing coatings:** Keep each coat damp by covering with polyethylene sheet and/ or spraying with water.
 - 2.1. **Curing period (minimum):** As per render manufacturers guidance
 - 2.2. **Final coat:** Hang sheeting clear of the final coat.
3. **Drying:** Allow each coat to dry thoroughly, with drying shrinkage substantially complete before applying next coat.
4. **Protection:** Protect from frost and rain.

Ω End of Section

M60

Painting/clear finishing

Coating systems

100 General

1. Code of Practice: Comply with BS 6150:2006 "Painting of Buildings" – Code of Practice.
2. Paints: Manufacturer to be agreed with Architect but must be applied in accordance with the makers' instructions and to follow the specification below in principle.
3. Preparation: Allow for sweeping out all areas before applying coatings and protect all floors and fittings with sheets etc. Make good any damage done to adjacent surfaces.
4. All coats of paint to be thoroughly dry before the application of subsequent coats and to be rubbed down with sand paper between each coat.
5. All iron to be thoroughly de-rusted and cleaned of rust before paint is applied.
6. External painting is only to be done in good painting weather when it is free from moisture.
7. All colours to be selected by the Architect subject to sample areas being prepared.
8. Permit manufacturers to inspect work in progress and take samples of their materials from site if requested.

150 External Eggshell Paint

1. **Description:** External metalwork externally e.g handrails
2. **Manufacturer:** Dulux
 - 2.1. **Product reference:**

Dulux Weathershield Exterior Quick Dry Satin

3. **Surfaces:** Previously decorated
 - 3.1. **Preparation:** Remove all loose and defective coatings, degrease and provide key. Ensure surfaces are clean and dry. preparation to be in line with Clause 715. Remove any prior decoration carefully with a wire brush, treat any corrosion with application of 2 coats of Ferton in accordance with manufacturer recommendation.
4. **Undercoats:** Colour - to suit top coat
 - 4.1. **Number of coats:** 1
5. **Finishing coats:** Colour - TBC
 - 5.1. **Number of coats:** 2

150 External Eggshell Paint

1. **Description:** External Timber Windows and Doors where decorated with paint
2. **Manufacturer:** [Dulux Trade, brand of AkzoNobel](#)
 - 2.1. **Contact details**
 - 2.1.1. **Address:** AkzoNobel Decorative Paints
Wexham Road
Slough
Berkshire
SL2 5DS
 - 2.1.2. **Telephone:** [+44 \(0\)333 222 7070](tel:+44203332227070)
 - 2.1.3. **Web:** www.duluxtradepaintexpert.co.uk
 - 2.1.4. **Email:** project.support@akzonobel.com

- 2.2. Product reference: [Weathershield Exterior Quick Drying Satin](#)
3. Composition: Adhesion-promoted acrylic copolymer emulsion and a fungicide.
4. Sheen: Eggshell
5. Colour: Off White - TBC
6. Execution: Applying coating.
7. System code: D4047 - Non-resinous softwood, hardwood etc.
8. Form: Liquid.
9. Capacity:
10. Coverage: Up to 16 m²/L.

165 Internal decoration to Orangery Space

1. Description: Decoration to existing walls and ceilings.
2. Manufacturer: Earthborn
 - 2.1. Product reference: Claypaint - Colour TBC
3. Surfaces: To internal plastered surfaces within main orangery space, including walls, ceiling and covings
 - 3.1. Preparation: AS Clause 400, 423 and 424 as well as the manufacturers requirements.
4. Initial coats: On very absorbent surfaces such as fresh plaster use a priming coat of Claypaint diluted with 20% water and finish with an undiluted final coat. Allow each coat to dry before the next is applied
 - 4.1. Number of coats: 1
5. Finishing coats: Allow each coat to dry before the next is applied
 - 5.1. Application: Roller
 - 5.2. Number of coats: 2

170 External Render Decoration

1. Description: External decoration to previously rendered and repaired areas of both Heaton Hall and Orangery Walls, and Ceiling of the West and East Loggias
2. Manufacturer: BEECK
 - 2.1. Product reference: Renosil Fine - Colour to match existing and TBC following trials.
3. Surfaces: New hydraulic lime based render, and existing rendered finishes .
 - 3.1. Preparation: As Clause 400,420,23. In line with manufacturers recommendations. Newly rendered surfaces are to be left sufficient time to dry out, surfaces are to be washed down with clean cold water to remove all surface dirt. Prime with BEECK fixative and 5 parts water in accordance with manufacturer recommendations. Existing surfaces to have cracked less adherent old coatings removed as poor deep as possible, then thoroughly clean. Treat algae areas with BEEK Fungicide, and prime highly absorbent or crumbling surfaces with BEECK MBA Fixative, thinned with 2 parts water, all accordance wit manufacturers recommendations and data sheets/
4. Initial coats: BEECK Quartz Filler / BEECK Bonding Coat / BEECK Renosil Course as recommended by manufacturer and dependent on substrate.
 - 4.1. Number of coats: 1
5. Undercoats: BEECK Renosil Fine applied with roller in accordance with manufacturer's recommendations and data sheets.
 - 5.1. Number of coats: 1
6. Finishing coats: BEECK Renosil Fine applied with roller in accordance with manufacturer's recommendations and data sheets.
 - 6.1. Number of coats: 2

171 External Render Decoration to Orangery North Wall and Interior of Orangery Parapets

1. **Description:** External decoration to p
2. **Manufacturer:** BEECK
 - 2.1. **Product reference:** Renosil Fine
3. **Surfaces:** New hydraulic lime based render, and existing rendered finishes .
 - 3.1. **Preparation:** As Clause 400,420,23. In line with manufacturers recommendations. Newly rendered surfaces are to be left sufficient time to dry out, surfaces are to be washed down with clean cold water to remove all surface dirt. Prime with BEECK fixative and 5 parts water in accordance with manufacturer recommendations. Existing surfaces to have cracked less adherent old coatings removed as poor deep as possible, then thoroughly clean. Treat algae areas with BEEK Fungicide, and prime highly absorbent or crumbling surfaces with BEECK MBA Fixative, thinned with 2 parts water, all accordance wit manufacturers recommendations and data sheets/
4. **Initial coats:** BEECK Quartz Filler / BEECK Bonding Coat / BEECK Renosil Course as recommended by manufacturer and dependent on substrate.
 - 4.1. **Number of coats:** 1
5. **Undercoats:** BEECK Renosil Fine applied with roller in accordance with manufacturer's recommendations and data sheets.
 - 5.1. **Number of coats:** 1
6. **Finishing coats:** BEECK Renosil Fine applied with roller in accordance with manufacturer's recommendations and data sheets.
 - 6.1. **Number of coats:** 2

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.

250 Surfaces to be cleaned but not coated

1. All existing ironmongery that is to be retained should be cleaned down. .

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.

300 Control samples

1. **Sample areas of finished work:** Carry out samples for all individual paint type. An allowance of minimum of 5 samples for paint type should be allowed to choose final colour.
2. **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.
4. **Suspected existing hazardous materials:** Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
5. **Preparation materials:** Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
6. **Substrates:** Sufficiently dry in depth to suit coating.
7. **Efflorescence salts:** Remove.
8. **Dirt, grease and oil:** Remove. Give notice if contamination of surfaces/ substrates has occurred.
9. **Surface irregularities:** Remove.
10. **Joints, cracks, holes and other depressions:** Fill flush with surface, to provide smooth finish.
11. **Dust, particles and residues from preparation:** Remove and dispose of safely.
12. **Water based stoppers and fillers**
 - 12.1. Apply before priming unless recommended otherwise by manufacturer.
 - 12.2. If applied after priming: Patch prime.
13. **Oil based stoppers and fillers:** Apply after priming.
14. **Doors, opening windows and other moving parts**
 - 14.1. Ease, if necessary, before coating.
 - 14.2. Prime resulting bare areas.

420 Fixtures and fittings

1. **Removal:** Before commencing work remove: Coverplates, grilles, wall clocks, and other surface mounted fixtures.
2. **Replacement:** Refurbish as necessary, refit when coating is dry.

422 Painting new woodwork

1. **Preparation:**
 - 1.1. Prime with the specified wood primer, when primer is hard make good all cracks etc.
2. **Paints:**
 - 2.1. To be as specified as above. Prime all new timber joinery immediately following fabrication. Where specified, apply undercoat to new or repaired joinery, under workshop conditions.

423 Painting new plasterwork

1. **Preparation:**
 - 1.1. Remove any plaster nibs, scum etc and stop in cracks or holes. Wipe off any deposits or efflorescence with a damp sponge and lightly abrade any over-trowelled 'glossy' areas of plaster with worn or fine abrasive paper. Dust off leave to dry and ensure that no efflorescence recurs.

2. Paints:
 - 2.1. Where water-based emulsion is specified, prime with a thinned coat of emulsion. Make good any defects with a plaster filler. Rub down and dust off, patch prime with thinned emulsion. Finish one or two full coats of emulsion specified as directed.

424 Painting existing plasterwork

1. Preparation:
 - 1.1. If the existing emulsion paint is in good condition and firmly adhering clean down the surface. If in poor condition completely remove all the flaking, peeling and powdering coating. Make sure that all the remaining paint is sound and adheres firmly to its backing.
2. Interior Surfaces:
 - 2.1. Apply the finishing material direct. If the surface is very porous, apply a sealing coat of thinned finishing material. Alternatively, if, after thorough preparation a residue of powdery material remains or the adhesion of the previous coating is suspect prime with:
 - 1 coat of primer sealer to reduce the risk of subsequent flaking.
3. Paints:
 - 3.1. To be as specified in the Finishes Schedule or by Architect's Instruction. Prime with thinned coat of water-based emulsion and then apply two coats of emulsion paint.
 - 3.2. Where rollers are used to apply paint finishes they are to provide a smooth and even coating for undercoats. The final top coat shall be brush applied.

425 Ironmongery

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

430 Existing ironmongery

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

440 Previously coated surfaces generally

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

8.2. **Junctions:** Provide flush surface.

9. **Completely stripped surfaces:** Prepare as for uncoated surfaces.

622 Organic growths

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

631 Previously painted window frames

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

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.

715 Paint systems and application

1. **Paint application to metal windows and metalwork:**
 - 1.1. **Priming:**
 - 1.1.1.a) Fabricated and cleaned metalwork to have one coat of primer in the shop.
 - b) Any damaged or unpainted areas are to be primed with works primer before building-in on site.
 - c) Ensure all sharp edges, angles, corners etc are fully covered and protected from damage both in works and on site.
 - d) Allow minimum interval of 16 hours for priming coats to dry.
 - 1.2. **Undercoat and Finish Coat**
 - 1.2.1.a) Clean down painted surfaces to remove mortar, grouting etc.
 - b) Brush apply coats of paint in even thicknesses.
 - c) Ensure all sharp edges, angles, corners etc are fully covered on site.
 - d) Allow a minimum interval of 12 hours between coats.

790 Linseed oil putty glazing

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

800 Glazing

1. **Etched, sand blasted and ground glass:** Treat or mask edges before coating to protect from contamination by oily constituents of coating materials.

Ω End of Section



Specification created using NBS Chorus