

Buttress

Science Museum Group

SIM Combined Projects

9488-BUT-CP-XX-SP-A-00004 - Vehicular
Ramp Specification

Planning Issue

23-02-2024

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BUT01 General

Clauses

100 Precedence

1. General: Where, and to the extent that, documents conflict the following orders of precedence apply:
2. The contractor must read in association with all Landscape Architect, Structural, MEP & Civil Engineering packages.

Separate landscaping, structural, MEP and civil engineers proposals take precedent over indicative architectural information, illustrated across architectural drawings.

Conflict in the documents: Give notice.

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. As directed: as defined for 'approval'.
7. As shown on drawings: This is an implied term deemed included within the specification.
8. 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.
9. BBA: British Board of Agreement.
10. BS: British Standard Specification.
11. CP: British Standard Code of Practice.
12. Fuel: Electricity, gas, oil and any other source of energy.
13. Materials: Materials, components and accessories of every description.
14. Provisional sum: A sum provided for the entire cost of anticipated work that cannot be properly drawn or described.
15. 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.

121 Familiarisation

1. The contractor must fully familiarise themselves with the buildings / assets and their construction, as well as site wide access and logistics, prior to submitting their tender.
2. Site visits provide an opportunity to understand the complexity of the site, interfaces, relationships between buildings, surroundings etc.

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 manner 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.

180 Spares

1. General: Supply designated spares in their original packaging.

185 Conservation specification references

1. Buttress conservation specification clauses are included within the master NBS specification, reference: 9488-BUT-CP-XX-SP-A-00004.

The clause sections are identifiable by the following letter reference BUT, followed by numerical references, from 01 onwards, 02, 03 and so on. Combined are identifiable as follows BUT01, BUT02 and so on.

Note: Similar to standard NBS sections, the Buttress clauses included within a specification may not appear consecutively and it may appear that sections are missing. However, the specification is tailored for the specific project and therefore it may not be appropriate to have certain sections included within this specification.

If in doubt, please advise the Architect of your concerns.

Any anomalies are to be brought to the Architects attention as soon as they become apparent.

190 Schedule of works, drawings, specifications and reports

1. General: The specification must be read in association with all available drawings, schedules, specifications, and reports etc. Copies of which are issued with the tender documents.
2. Architect's drawings numbered: See drawing issue sheet(s) accompanying tender.
3. The Contractor must note that anything mentioned or shown on the aforesaid drawings that is not contained in the specifications and/or schedules or anything which is in the specifications and/or schedules which does not appear in the drawings shall be deemed to be included in the tender figure.
4. The Contractor must fully acquaint themselves with the drawings, specifications, schedules, reports, during the tender period and if there should be anything which is ambiguous or otherwise not clear, the Contractor is to obtain clarification from the Architect before submitting their tender.

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.

250 Contractor designed packages

1. Where appropriate, sub-contractor designed packages related to the architectural elements are highlighted upon drawings and within the preliminaries.

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 the schedule of works documents, 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.

275 References

1. Some standards in this specification 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

BUT02

Specific requirements

Clauses

100 Method Statements

1. The Contractor must provide method statements detailing the sequencing, method of work and protection for the following items:
 - 1.1. Management of security of the site.
 - 1.2. Management of public access to and in and around the museum, including all temporary access provisions.
 - 1.3. Site setup, including deliveries and parking.
 - 1.4. Protection of all historic fabric during the works, including exhibits and collections items.
 - 1.5. Recording of historic fabric prior to the works commencing on site.
 - 1.6. Methodology for movement of materials throughout the site without causing damage to the historic fabric.
 - 1.7. Control of dust, debris, and noise without causing nuisance to adjoining properties.
 - 1.8. Protection against existing masonry falling from high level.
 - 1.9. Management of the removal of waste.
 - 1.10. Safe access for high level works.
 - 1.11. Methodology for removing historic fabric during the works.
 - 1.12. Methodology for all fabric repair works.
 - 1.13. Methodology for scaffold erection and dismantling, fixings, protection, security etc
2. Note: the contractor may be required to provide additional method statements, as stipulated and highlighted across this full specification.

105 Work in Listed Buildings and Heritage Assets

1. It is the responsibility of the Contractor to ensure that no disturbance of any fabric within the listed buildings takes place unless this is specifically detailed on the Architect's drawings and/or specification. The Architect's information is subject to listed building consent and any deviation from this is an offence under the Planning (Listed Buildings and Conservation Areas) Act 1990.
2. Should the Contractor be in doubt about the extent of works or protection required, they must consult with the Architect prior to those works being carried out. Agreement may also be required from the local authority Conservation Officer in some cases, and therefore the Contractor must make any queries to the Architect in a timely manner.
3. The Contractor must 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 must be agreed with the Architect prior to works being carried out.
4. Should it be the case that it is not possible to protect historic features without causing further damage to the building, it is the Contractor's responsibility to exercise maximum care to avoid disturbing any historic fabric during the course of the works. This may entail an approach of temporary protection with the agreement of the Architect.
5. It should be noted that damage to historic fabric cannot be made good in an acceptable manner and that the Contractor is to take all necessary measures to ensure damage does not occur.
6. The Contractor is to satisfy themselves that they are in possession of adequate information prior to commencing any work.
7. Any discrepancies found within this document by the Contractor must be brought to the attention of the Architect at the time of tendering.

8. The contractor is to be responsible for all on site measurement including setting out for new work, details and dimensions for any replacement or repair work.
9. All dimensions included on the drawings are to be checked for accuracy on site prior to commencing work and any discrepancies reported to the Architect immediately.
10. No work shall commence until any such discrepancies have been resolved.
11. See workmanship and supervision clause below.

106 Initial findings and recommendations generally

1. The defect descriptions (work items) and recommendations made across architectural documents, drawings, schedules and specifications are based on inspection(s) made from ground level, floor levels and other accessible vantage points only.

Unless otherwise stated, the inspection(s) have been purely visual and no enclosed spaces or inaccessible parts (such as boarded floors, or hidden timbers etc) have been opened up for inspection.

The contents herein across said documents, indicate the condition of the buildings at the time of the survey(s). If a prolonged and sustained period of time has lapsed, following the survey(s), it is anticipated that the elements in question, may have fallen into further disrepair and may now require further additional works to rectify / remediate.

It is of paramount importance that any repairs undertaken, are carried out based on professional advice and undertaken by experienced and skilled contractors. Insensitive repairs, even correctly carried out, can easily destroy the architectural character of a building and inappropriate solutions to defects may prove unsatisfactory in the long term or in some cases aggravate the problem.

The contractor must note that there were areas of the existing fabric both internally and externally, which were either masked, concealed or hidden from view during the initial assessment by the Architect. This typically ranged from stored items, protective finishes, detritus and vegetation or was simply unsafe to access.

The contractor must undertake a detailed assessment to re-appraise and to corroborate the initial findings as identified on the marked-up drawings and scheduled documents.

Where appropriate, photographs have been embedded within the document(s) to provide additional background and information. They may not refer to the exact asset in question but may serve as a typical example of the work item being described.

110 Opening up and inspection

1. It is the nature of the historic building repair works described on the drawings, that the full scope or nature of these works will not be known until opening-up and exposure of concealed / hidden structure and access to closely inspect the historic fabric has been undertaken by the contractor and Architect. The Contractor is to be fully aware of the requirement for inspection and clarification of the scope and specification of repairs throughout the works, making allowance within the programme for such input by the Architect. It is expected that the Contractor shall make themselves available together with their Head Mason and Conservator to inspect and confirm the scope of works to each elevation with the Architect, Curator and Employer's representatives and that this period of further investigation shall be allowed for in their programme.
2. The Contractor is to allow for a sequencing of work and operations, typically as set out below:
 - 2.1. Preparation and submission of method statements and samples, with adequate time for review by the Design Team and revision or re-sourcing, as necessary. It is recommended that method statements be submitted 2 weeks prior to the undertaking of the relevant works.
 - 2.2. Protection of the adjacent historic fabric and access routes as required.
 - 2.3. Recording and opening-up of the fabric, to expose concealed structure etc.

- 2.4. Inspection of the fabric by the Architect, allowing for recording and survey works, as necessary. The contractor is to include for providing access and allowing time within the programme for such inspections.
- 2.5. Inspection of the fabric by the structural engineer, local authority etc and/or specialist surveyors, timber and damp for example.
- 2.6. Confirmation of instructions for works, which might differ from expectations and allowances, outlined within the contract documents. The contractor is to allow time within the programme and sequence the opening-up and repairs to enable such input.
- 2.7. Undertaking of the specified works, with allowance for inspection by the Design Team as works progress and prior to covering in.
- 2.8. On-going maintenance and adaptation of protection as necessary, removal of the same and cleaning of the site area upon completion of the works.

115 Samples

1. Sample panels will be executed prior to commencement of the works and will be carried out by skilled craftspeople who will be working on the project. The purpose of the sample panels is to ensure that the craftsperson is familiar with the proper execution and care of the works and that the Architect and Property Curator is satisfied with the level of workmanship to be produced.
2. The Contractor shall allow for the participation of the Employer's representatives in the planning, execution, and review of all samples.
3. The Contractor is to provide a secure facility within their compound to store samples of materials and workmanship approved by the Architect. These samples are to remain available for the duration of the works.

120 Recording

1. Photographs
 - 1.1. High quality digital detailed and general photographs will be taken of areas of specific interest at each progress stage, in particular to record evidence of building sequences and materials which may be subsequently lost or covered up.
 - 1.2. At the completion of work general photographs will be taken of the completed work.
2. Drawings
 - 2.1. Final Construction drawings to show all areas of stone repair and renewal, and mortar repairs shall be prepared.
3. Records and reports
 - 3.1. Written records will be kept describing work carried out and observations regarding the condition of the works. Conservation reports of work to fine carving and details shall be prepared.
4. Archive standards
 - 4.1. All record be they photographic, drawn or written, shall be deposited in the assigned work shared folder location in accordance with the Employer's archive policy.

125 Workmanship and supervision

1. Generally: Undertake all work with skill and care in order to produce work fit for its intended purpose and of good quality.
2. The Contractor is to be aware that the the Science and Industry Museum complex is an important heritage site, with a number of listed assets and as such only skilled masons, conservators and craftspeople are to execute the works. Full details / references of those undertaking the works are to be provided to the Architect prior to commencing any works on site.
3. When working with built heritage, the experience and appropriateness of those providing services if of paramount importance.

4. Supervision: Provide competent supervision by experienced personnel familiar with the CPs and other requirements of this specification for all stages of the works and all site activities, including material handling and storage.
5. Safety: The safety of personnel on the site is beyond the scope of this specification, and the contractor should refer to separate health and safety plan.
6. Craftmanship: Undertake work by or under the direct supervision of operatives with suitable training, experience and competence. Craftsmen shall undertake work requiring special skill. Do not permit apprentices to work unsupervised.
7. Standard of workmanship: The standard of workmanship is to be of a very high standard and all work shall be subject to approval by the Architect.

Any work deemed to be of an unsatisfactory standard shall be redone at the contractors own expense.

130 Programme

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 phase of work.

Ω End of Section

BUT03

Access scaffolding

Clauses

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.

102 Proposals: generally (A)

1. The Contractor is to submit their proposals for the scaffold on or before the date for possession and not less than 7 days before commencement of the scaffold.
2. The Contractor's proposals are to include clear drawings and structural calculations in duplicate, sufficient to prove the stability of the proposed temporary structures in accordance with BS EN 12811-1. Drawings will be provided to the Architect and the Structural Engineer.
3. These drawings will clearly indicate positions / locations where any scaffold is to be tied back to the fabric of the building and the proposed method of fixing.
4. No scaffolding shall be commenced on site until the Contractors proposals have been submitted and agreed with the Architect / Structural Engineer. Agreement of the Contractor's proposals does not relieve the Contractor of their responsibilities to ensure full compliance of all requirements.

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. Where tying to the existing structure cannot be avoided the positions and type of any such ties shall be submitted and agreed with the CA prior to the erection of any 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 lead 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. The 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. Lightning protection: The scaffold shall be continuously and effectively bonded to earth against lightning.
- 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 Contractor's expense.

106 Security

1. 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. 'Herras' 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 offset 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.
8. A temporary roof shall be erected over all areas where partial or wholesale re-roofing works or where a controlled environment is required, where not providing this may be detrimental to the structure / interior.
9. Temporary roofs shall be a minimum of 2.5m clear of the existing roof covering / structure to the underside of any scaffold / beam component on the temporary roof.

10. Side sheeting to temporary roofs shall extend to below eaves level on the outside of any scaffolding.
11. All temporary roofs shall be complete, wind and watertight prior to any work being implemented.

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.
5. Access must be maintained across all main thoroughfares and access points at all times.

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. 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 must be maintained and provided at all times.

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, dependant on the item to which is being retained and adequately ventilated for the foreseeable future and/or until reinstatement.
 - 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 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

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. Lime Putty: Lump lime (quick lime) shall be properly slaked in an excess of water and stirred and hoed to ensure coagulation does not occur. All slaking must be carried out under controlled conditions which are to be strictly in accordance with the CDM regulations. The putty shall then be screened through gauze equivalent to a 2.36mm mesh sieve to BS 410:1999 and 2000 and ISO 3310. Non-hydraulic lime shall then be left for at least 48 hours. Prior to batching all excess water shall be siphoned off. It shall then be matured for not less than three months. The putty at time of use to be strictly in accordance with BS 890:1972, BS 6463:1999 and BS EN 459:2010.
4. 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.
5. Where appropriate lead joggles may be used to align indented stones.
6. 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.
7. 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.
8. 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.
9. 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.
 - 9.1. Hydraulic limes, based on St. Astier NHL2:
 - 1 part NHL2; 1 part sieved Baston plastering sand; 1 part Baston sharp sand; 1 part Clipsham stone dust.
 - 1 part NHL2; 2 parts sieved Baston plastering sand; 1 part yellow building sand.
 - 9.2. Hydraulic Lime: Putty limes, based on mature Singleton Birch lime putty:
 - 1 part putty; 1.25 parts sieved Baston plastering sand; 0.5 part Baston sharp sand; 0.5 part Clipsham stone dust; 0.25 part yellow brick dust
 - 1 part putty; 1.5 parts Clipsham stone dust; 0.75 part yellow building sand; 0.25 part yellow brick dust.
 - 9.3. Hot limes, based on Singleton Birch ML90:
 - 1 part quicklime; 2.5 parts sieved Baston plastering sand; 1 part Baston sharp sand; 0.5 part yellow brick dust; 1 part Clipsham stone dust.
 - 1 part quicklime; 3 parts Clipsham stone dust; 1.5 part yellow building sand; 0.5 part yellow brick dust.
10. 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.

11. 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.
12. 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.
13. 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 Lancashire sand from a local quarry.
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. Non-hydraulic Lime: To comply with BS 890: 1972, BS 6463: 1984/1987 and BS EN 459.

N.B. BS 890:1972 is also relevant for traditional feebly hydraulic and grey chalk limes. Although withdrawn by the BSI, BS 890:1972 remains applicable in this specification for the traditional repair and reinstatement of historic building fabric and associated alterations.

2. Lime Putty: Lime Putty: Air/pure lime (i.e. non-hydraulic lime) putty may be obtained from an approved supplier or prepared by the traditional method of slaking lump lime. Lime putty must comply with BS 890:1972 and BS 6463:1987. Hydrated non-hydraulic lime is not to be used unless specified.
3. 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:

3.1. 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.

3.2. a) Moderately Hydraulic lime (NHL 2) (Class C2): This is available from numerous suppliers but colour and strength vary. Mortar samples using the lime as well as the aggregate must be submitted and approved by the Architect before ordering lime for the main work. Lime suppliers are to submit the whiteness index and compressive strength for their lime mixes at 2 years prior to the sample preparations. Available from:

- The Traditional Lime Co.
- Ty-Mawr
- Ecological Building Products
- Ionic Building Supplies

3.3. a) Eminently hydraulic lime (NHL 3.5) (Class C3): Available as above. Also Socli natural hydraulic lime (Castle) NHL 3.5, available from:

- The Traditional Lime Co.
- Ty-Mawr

3.4. a) Very high strength hydraulic lime (NHL 5) (Class D): Socli natural hydraulic lime available from the suppliers noted above.

4. 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.
5. Hydraulic Lime Putty: Hydraulic lime in accordance with above and from an approved manufacturer, run to putty in accordance with the specific gravity and workability given for CL lime putty in BS EN 459. NHL 2 lime is to be used on the same day that it is run to putty. Hydraulic lime putty may be thinned to hydraulic lime grout with an appropriate portion of fine aggregate as given in the Particular Specification, where the grouting of exceptionally fine ashlar joints and gauged brickwork (2mm or less) is required.
6. 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.
7. 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.
8. Ready Mixed Lime:Sand for Mortar: Only to be used from an approved source, agreed with the Architect. Any such ready mixed mortars are to comply with BS 4721:1981 and BS EN 998:2003 and must not include Portland Cement.
9. 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.

10. Lime putty is to be stored in clean containers, protected from contamination and kept in an excess of water to prevent carbonation.
11. 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.
12. 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 shall be carried out by the supervising officer 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 Castle, 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 (stippled, struck, double struck, tuck pointed or galleted) 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 perpends 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 5°C 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 stone 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 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 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 brushed 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 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 his 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 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

BUT16 Hotworks

Clauses

100 General

1. Where the works require operations involving flame, cutting equipment, brazing, and soldering equipment, blow lamps and other equipment producing heat or having naked flames, all work must be carried out strictly in accordance with this Specification and the instructions given on the hotwork Permit issued by the Architect. A copy of the Hotwork Permit is available.
2. 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.
3. Where it is considered that there is no practical alternative to the use of heat-emitting apparatus then a hotwork Permit is to be completed. Each section must be filled out and the permit submitted to the Architect when finished.
4. The person inspecting the work shall consider the following:
 - 4.1. The location of the proposed hotwork in relation to surrounding combustible materials both fixed and movable, with particular reference to substrates, the likelihood of concealed timbers, inaccessible voids, hidden cables or pipes and materials with rapid ignition such as roofing felt, or with a high degree of heat transference such as steel.

Consideration must also be given to the material and space behind the proposed hotwork, e.g. the inner face such as wallpaper, wall hangings, panelling, and furniture placed against or near to the wall which could ignite by heat to determine the risks involved either by direct or conducted heat, such as:

- a) Opening up a void.
 - b) Stripping off the roof covering.
- 4.2. What action to be taken to minimise and, if possible, to eliminate the fire risks, such as:
- a) Removal of combustible materials.
 - b) Clean the area to remove dust and rubbish.
 - c) Ventilation of enclosed spaces.
 - d) Prior saturation with water of combustible materials that cannot be removed.
 - e) Temporary covering of immovable combustible surfaces with a 50-75 mm thickness of damp sand.
 - f) Removal of containers of inflammable gases or compressed gases.
 - g) Protection of surrounding areas with flame-retardant boards or other suitable fire-resistant material.
 - h) The use of butane and not paraffin lamps.
 - i) Confining the hotwork to mornings only.
- 4.3. What fire-fighting facilities are required, such as:
- a) The number and type of portable extinguishers, buckets of water and/or sand to be immediately to hand.
 - b) Fire hoses to hand.
 - c) Adequacy of water supply, and water pressure.
 - d) Nearest fire alarm.
 - e) Builder's tools for opening up roofs, walls, floors, etc.
 - f) Alerting the fire brigade of the time and location of the hotwork and in extremely hazardous situations requesting a fire tender to be in attendance.
- 4.4. What operatives will be permitted to carry out the Hotwork:
- a) Suitably qualified and experienced.

- b) Numbers to be involved never to be less than 3 (i.e. 2 in addition to the experienced operative for standby surveillance as required in (3) and (4)).
- c) NOTE: The accompanying person is to be present during the Hotwork operation and carry out the checks after the work has been completed.

4.5. The "watching" and "follow up" procedure:

- a) During the hotwork process the standby operatives will be in attendance with fire-fighting equipment ready for use.
- b) Following Hotwork the person inspecting the work shall for at least 1 hour after completion of the task (except for any essential minimum break, in which event alternative cover must be provided), make regular inspections of the work with particular reference to the surrounding area to ascertain that there is no ignition.
- c) A further inspection shall be made at the end of the working day by the person inspecting in conjunction with one of the standby operatives.

4.6. A record shall be made of the hotwork on the approved "Hotwork Permit" form and shall be returned to the Architect.

NOTE: It may be prudent to advise Insurers in advance of the hotwork operation so that they can inspect and, if necessary, approve procedures to be adopted.

- 5. Fire extinguishers and appropriate fire-fighting equipment must be to hand during the whole of the attendance time.
- 6. The employer is to be notified when and where hotwork is carried out.

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
- Fire damage
- Graffiti

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.

110 Scope of work

1. As per marked-up 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 and from Historic England/ Historic Environment Scotland or Cadw Historic Monuments Wales, as appropriate
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.

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

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.

317 Cleaning mineralic substrates

1. Equipment: Stonehealth CLEANFILM
2. Cleanfilm refers to the Stonehealth latex cleaning system for internal cleaning, without the use of water.

The areas to be cleaned will be examined by the Supervising Officer and those of historic or delicate nature will be noted for additional precautions. The said officer will be assisted by the Contractor or other participants having an understanding of the principle of the cleaning system. Considerations will include safety, substrate condition and proximity of other works.

Samples to several identified locations are to be undertaken prior to wholesale cleaning works being undertaken and should be agreed with CA. Due merit should be given to the following;

- a) Areas should be representative of the substrate, soiling and detail of the main works.
- b) Test panels should be positioned discreetly.
- c) Location of the test areas must be recorded and protected from further alteration.
- d) The parameters by which the result is obtained must be recorded.
- e) An acceptable test area should be retained as a control panel for the main works.
- f) Measures adopted as a result of tests must be attainable and controllable in the main works.

The cleaning of the building surface should be carried out by a capable operator, who has received instruction from Stonehealth Limited, into the correct use of Cleanfilm.

If the Test Supervisor is not familiar with Cleanfilm they should seek such information from Stonehealth Limited.

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

319 Steam cleaning

1. Areas of biological growth and superficial dirt can be carefully removed using the ThermaTech cleaning system on robust areas of ashlar work, and where appropriate, carving (see Jos cleaning). Water sprayers and small nylon bristle brushes can be used on carved and fragile elements of stonework.
2. Steam cleaning shall not be undertaken when the temperature drops below 4°C or is predicted to drop below 4°C.

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.

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.

412 Removal of loosely adhered deposits

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

422 Biocide application

1. Preparation: Remove loose growths
2. Surfaces: Prevent damage, including abrasion.
3. Biocide treatment: Appropriate solutions to kill growths and inhibit further growths.
 - 3.1. Dead growths: Remove.

462 Water spray cleaning (mounted nozzles)

1. Surfaces: Minimize water run-off. Prevent damage.
2. Adjustment of washing cycle and nozzle positions: Regularly to achieve optimum cleaning performance.

472 Pressurized water cleaning

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

482 Steam cleaning

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

495 Testing pH values for chemical cleaning

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

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



Specification created using NBS Chorus