

Manchester City Art Gallery

9518 RS Architectural Restoration
Specification
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P07	19/04/24	Stage 4	Hannah Bellerby Architect	Stage 4 issue: RS8, RS15 and RS16 added

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DEFINITIONS

CA means Conservation Architect.

REMOVE means disconnect, dismantle as necessary and remove the stated element, work or component and all associated accessories, fastenings, supports, linings, and bedding materials, and dispose of unwanted materials. It does not include removing associated pipework, wiring, ductwork, or other services.

KEEP FOR REUSE means during removal prevent damage to the stated components or materials and clean off bedding and jointing materials. Stack neatly, adequately protect and store until required by the Employer or for use in the Works as instructed.

REPLACE means remove the stated existing components, features, and finishes. Provide and fit in lieu new components, features or finishes which, unless specified otherwise, must match those which have been removed. Make good as necessary.

REPAIR means carry out local remedial work to components, features and finishes as found in the existing building, resecure or refix as necessary and leave in a sound and neat condition. It does not include:

- Replacement of components or parts of components.
- Redecoration.

MAKE GOOD means carry out local remedial work to components, features and finishes which have been disturbed by other, previous work under this Contract and leave in a sound and neat condition. It does not include:

- Replacement of components or parts of components.
- Redecoration.

The meaning of the term shall not be limited by this definition were used in connection with the defect's liability provisions of the Contract.

EASE means make minor adjustments to moving parts of the stated component to achieve good fit in both open and closed positions and ensure free movement in relation to fixed surrounds. Make good as necessary.

TO MATCH EXISTING means use products, materials and methods to match closely all visual characteristics and features of the existing work, with joints between existing and new work as inconspicuous as possible, all to approval of appearance.

TO MATCH ADJACENT means that the component is *to match existing* component in the immediate vicinity, room or area.

SALVAGED refers to materials that have been *removed and kept for re-use* on this job: no second-hand or reclaimed material are to be used on this project.

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.

CONSOLIDATE 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

DRAWINGS Please note that this specification is to be read in conjunction with the drawings and Architectural Specification document NBS 9518. Any discrepancies between the documents or omissions from the specification are to be brought to the attention of the Architect at the time of tendering. Note that all specified products are to be installed to the manufacturer's recommendations and by approved installers.

RS1 PROTECTION OF HISTORIC FABRIC / FEATURES

1.1 WORK IN LISTED BUILDINGS

1.1.1 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.

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.

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.

1.1.2 Should the Contractor be in doubt about the extent of works or protection required, he should 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 should make any queries to the Architect in a timely manner.

No work shall commence until any such discrepancies have been resolved.

1.1.7 To be read in conjunction with [Restoration Specification section RS2 – Protection of Elements and Components](#).

1.1.3 The Contractor is to provide adequate protection to any historic features which are to be retained in order to avoid damage as the works are in progress. The methods for protection should be agreed with the Architect prior to works being carried out.

1.1.4 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.

1.1.5 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.

1.1.6 The Contractor is to satisfy themselves that they are in possession of adequate information prior to commencing any work.

Any discrepancies found within this document by the Contractor should be brought to the attention of the Architect at the time of tendering.

RS2 PROTECTION OF ELEMENTS AND COMPONENTS

2.1 DESIGN

- 2.1.1 Prior to undertaking any construction works, all working areas and access routes are to be thoroughly protected for the duration of the contract.

There are areas within the building which will be affected by destructive investigation surveys / removals and interior / exterior fabric repairs. The careful removal of building fabric will likely produce excessive dust and debris build up within working areas. The proposed fabric repair works are identified within the drawing pack of each respective work package.

2.2 WORK IN LISTED BUILDINGS

- 2.2.1 This section is to be read in conjunction with section [Restoration Specification section RS1 – Protection of Historic Fabric / Features](#).
- 2.2.2 The contractor is to provide adequate protection to any historic features which are to be retained in order to avoid damage as the works are in progress. The methods for protection should be agreed with the Architect prior to works being implemented.
- 2.2.3 Whilst historic floors / surfaces are often worn, discoloured and out of true level, these imperfections can contribute to the interest and historic value of a building and thus should be protected.

2.3 PREPARATION

- 2.3.1 Prior to installation of any protective measures. The areas in question must be thoroughly cleaned to remove all loose debris / dust which could lead to scratching / abrasion of the finished surface once protective boards are overlaid.
- 2.3.2 It is important to try to not over wet floors as the substrate could become loosened or efflorescence could be triggered. Surface dirt should be removed with minimal quantities of warm water.

- 2.3.3 Sweep and vacuum existing floors / components prior to laying / fixing of any protective boards.
- 2.3.4 Contractor is to photograph and record all areas prior to undertaking any works.

2.4 PROTECTION OF HISTORIC FABRIC

- 2.4.1 The structure, fabric, decoration, and contents of the buildings are to be suitably protected by the use of dustsheets, solid protection, sealing of doors, etc.
- 2.4.2 The appropriate method of protection is to be agreed with the Architect and Local Authority Conservation Officer.
- 2.4.3 Equipment and materials must not be propped against decorated surfaces, fittings, or furniture.
- 2.4.4 When dust or vibration is anticipated, the contractor is to give the Client, neighbouring properties/businesses advance warning.
- 2.4.5 Footwear is to be appropriate to the part of the building or structure in which the work is being undertaken to avoid damage to floor finishes and coverings.
- 2.4.6 No contents or fixture and fittings shall be moved by the Contractor without the written permission of the Client.
- 2.4.7 **No** adhesive tapes or fixings should be used to secure in-situ protection. If no alternatives can be proposed, each instance of proposed use should be discussed with the Architect and Project Conservator.
- 2.4.8 No item longer than 1200mm can be carried through the building unsupervised. Materials and objects should be appropriately covered to ensure that damage will not occur to either the fabric or contents of the building. The admission of equipment / materials longer than 1200mm into the building will be considered – however prior consultation must be sought with the Architect / Project Conservator.

- 2.4.9 Cutting of boards on site; dustsheets should be laid, and vacuum cleaners must be available at the point of work and used to collect dust as and when created.
- 2.4.10 All Contractors must adhere to the restricted walkways through the building / site. These routes **MUST** be clearly visible and identified by the Contractor.
- 2.4.11 All contractors must use dustsheets at all times.
- 2.4.12 Illustrative prints relating to particularly fragile elements / components, will be located at the site of work. All contractors are required to familiarise themselves with the pictures provided.
- 2.4.13 **All** areas of the building /asset are **vulnerable** and **important** and should be protected for the duration of the building works.
- 2.4.14 All items protected must be protected by products and materials which are fire retardant.
- 2.4.15 All protective materials will be attached to elements and components by cloth string and/or pressure fixed unless otherwise directed and approved. No direct fix will be acceptable.
- 2.4.16 **Phasing / Sequencing:**
Installation of protection works is likely to be phased pending investigation works. Refer to Scope of Works document and drawing package.

2.5 PROTECTION OF WALLS AND FLOORS

- 2.5.1 Prior to undertaking any fabric repair / investigation works allow for fixing of protective measures to walls and floors within working areas. Refer to marked up drawings.
- 2.5.2 Walls and Floor Generally:
- Lay Antinox protective FR boards to floors and walls within working areas. Tape and seal. Overlay with hardboard in particularly high traffic areas. No direct fix into building fabric is allowed. Loose fix with tape / pressure fix and cloth string.
 - Refer to drawings for locations where protective floor measures are required.

Manufacturer:

Antinox Global,
Castlepoint,
Ellon, AB41 9RG.
Tel: 01358720888.
Email: sales@antinoxglobal.com

Substrate:

wood, stone, concrete

Product reference:

Antinox Protection Board – Black Trade Sheet

Thickness:

6mm (floor) 4mm (walls).

Accessories:

Antinox jointing tape strong and wide / hardboard

2.6 PROTECTION OF EXISTING DOORS AND FRAMES

- 2.6.1 Prior to undertaking fabric repair / construction works, all existing retained doors are to be thoroughly protected for the duration of the project.
- Lightly clean existing door prior to fixing / over-boarding of protective measures.
 - Over-board with Antinox Protection Board and fix in place with cloth string. No direct fix will be acceptable.
 - If existing door is to remain on a main access route for construction traffic, the addition of a hardboard sheet may be required as additional protection.
 - Loosely fix foam (self-gripping) door leaf protector to all leading door edges. No direct fix will be acceptable.
 - Loosely fix foam door jamb (self-gripping) protector within all trafficked openings. No direct fix will be acceptable.
 - Remove and discard of protective measures upon completion of main contract works and undertake any identified door repair / cleaning works identified elsewhere.

2.7 PROTECTION OF STONE STEPS / HANDRAILS / PLINTHS / ENTABLATURE / COLUMNS

2.7.1 Prior to undertaking fabric repair / construction works, all existing retained access routes / steps / landing areas are to be thoroughly protected for the duration of the project.

- Lightly clean area in question prior to fixing / over-boarding of protective measures, to eradicate risk of scratch / abrasion of surfaces.
- Overboard existing steps / walls and landing areas with 12/18mm WBP plywood sheathing with non-slip surfaces including visible nosings.
- Screw fix at joints / treads and risers.
- No direct fix into the existing building fabric is acceptable.
- Columns to be protected up to a height of 2400mm only.

2.8 PROTECTION OF WALL FIXED ITEMS - PLASTER, PAINT, DECORATION

2.8.1 General protection of wall fixed items within the building.

2.8.2 The existing items are to be protected from debris and dust build up including overhead impact damage.

2.8.3 3D plaster and paint above door head height:

- Sheet over with a loose clean cloth, taped and sealed.

2.8.4 3D plaster casts at door head height:

- Construct independent timber frames including timber bracing struts, with 12/18mm WBP plywood sheathing fixed to the front and top faces of the structure. Install foam packers between timber structure and wall to maintain offset from 3D plaster casts.
- No direct fix into the existing building fabric (inc. walls and floors) is acceptable.

- On erection of the scaffold, retain timber bracing struts and install additional foam packers between timber structure and scaffold poles.
- Following scaffold erection, remove timber bracing struts and allow timber structure to be supported by scaffold.
- On removal of the scaffold, reinstall timber bracing struts to allow timber structure to be self-supported.
- Upon completion of the works. Allow for careful removal of all temporary protective measures and tip.

2.9 CONSERVATION WORKING PRACTICES DURING BUILDING WORKS

2.9.1 It is of paramount importance that the working site is maintained and cleaned throughout the construction works.

The following measures are to be observed and looks to reduce the time needed for the conservation clean of the museum post-contract.

- Prior to temporary fixing of protection measures, area to be covered should be vacuumed / cleaned to remove all loose debris and dust prior to over-boarding.
- Vacuum cleaners must be used at source where dust is being created. Bags and filters must be regularly changed, and the vacuum cleaners well maintained.
- Contractors should vacuum up after themselves at the end of each working day.
- In-situ protection must be well maintained.
- Keep to walkways of protection.
- Floor voids should be vacuumed out (check with archaeologist regarding significance of contents).
- Items over 1.2m need to be carried by two people, with ends padded.
- Provide walkways of Antinox covered with hardwood through each room.

- All equipment and materials should be placed on Antinox.
- Loose laid sheets of Antinox should be used by contractors around work areas.
- No access to storage areas or other unauthorised areas outside work site except were accompanied at all times by Project Conservator or designated deputy.

RS3 ACCESS SCAFFOLDING

3.1 DESIGN

- 3.1.1 The design of all scaffolding will be the responsibility of the Contractor and is to be in accordance with the recommendations of BS 5973:1990 "Code of Practice for access and Working Scaffold and special scaffold staircases in Steel" or as updated.
- 3.1.2 Compliance with the various Acts and regulations listed in BS 5973 is the responsibility of the Contractor.
- 3.1.3 Compliance with all aspects of Health and Safety during erection, using and dismantling is the responsibility of the Contractor.
- 3.1.4 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 and the tendered works as a whole.

3.2 PROPOSALS

- 3.2.1 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.
- 3.2.2 The Contractors 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 5973: 1990. Drawings will be provided to the Architect and the Structural Engineer.

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.
- 3.2.3 No scaffolding shall be commenced on site until the Contractors proposals have been submitted and agreed with the Architect/Structural Engineer. Agreement of the Contractors proposals does not relieve the Contractor of his responsibilities to ensure full compliance of all requirements.

3.3 PROGRAMME

- 3.3.1 Prior to commencement of any scaffolding the Contractor shall submit a programme indicating the commencement date, and completion date.
- 3.3.2 Prior to striking the scaffold the contractor will submit a programme indicating the period for dismantling for each area of scaffolding.
- 3.3.3 Scaffold is required for inspection purposes prior to confirmation of scope of the work and the Contractor is to indicate this period on his programme and ensure that his proposals are submitted early enough to ensure that this period is not compromised.
- 3.3.4 The programme is to take account of all the requirements of the sub-contractors who require the use of the scaffold.

3.4 ERECTION REQUIREMENTS

- 3.4.1 All scaffold tubing and fittings are to be galvanised and in good condition and free from corrosion. Rusty components will not be accepted.
- 3.4.2 No steel component (including capped tubes) is to be in contact with the fabric of the building except where specific approval has been given.
- 3.4.3 Where it is necessary to brace the scaffold from the structure then timber packing of a minimum thickness of 20mm is to be placed between the scaffolding and the masonry.
- 3.4.4 No scaffolding shall rest on any roof coverings unless agreed in writing prior to commencement.
- 3.4.5 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. A disc of carpet is to be sandwiched between the plastic scaffold cap and the building fabric at every point of contact.

- 3.4.6 Scaffold tubes are not to encroach within 50mm 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. Where such support is required, the scaffold shall be separated from the building fabric by 20mm timber packers to prevent scarring of the fabric by scaffold tubes.
- 3.4.7 Where it is necessary to brace scaffold through window or door openings 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.
- 3.4.8 A temporary roof shall be erected over the clerestory area where roof repair works are undertaken as further damage to the interior will be detrimental.
- 3.4.9 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.
- 3.4.10 Side sheeting to temporary roofs shall extend to below parapet level on the outside of any scaffolding.
- 3.4.11 All temporary roofs shall be complete, wind and watertight prior to any work being implemented.

3.5 SUPERVISION

- 3.5.1 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.
- 3.5.2 It should be noted that in many instances damage to the historic fabric cannot easily be rectified. Any damage due to the scaffold use, erection or dismantling will be rectified at the Contractors expense.
- 3.5.3 Any area of scaffold not complying with section 2.4 above will not be used for any purpose.

3.6 SECURITY

- 3.6.1 All external scaffolding shall be designed and erected so as to prevent unauthorised access by sheeting (whether ply or steel) to a minimum height of 3 metres at the base. 'Heras' mesh fencing is not considered a suitable alternative.
- 3.6.2 For the purposes of this tender allow for a 2.4m high 'Plas-Hoard' PVC-U hoarding. The contractor must make an allowance for the application of a vinyl graphic along the entire length of the hoarding subject to the client's requirements and design.
- 3.6.3 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.
- 3.6.4 Access to the scaffold is to be via a single point of entry and a lockable door through the barrier described above. Alternative designs should be approved by the Contract Administrator.
- 3.6.5 Ladders to any lower lifts are to be removed at night.
- 3.6.6 Any areas which may be accessible from adjoining structures, roofs, etc. are to be similarly protected by boarding or by other approved means.
- 3.6.7 Scaffolding shall be alarmed at all times.
- 3.6.8 Adequate measures must be taken to prevent unauthorised access from all elevations. Which could include floodlights and motion detectors as well as CCTV cameras.
- 3.6.9 Adequate signage and lighting must be provided in areas where light levels are reduced.

3.7 PROTECTION

- 3.7.1 The covering to pavements is to be double boarded with visqueen between.
- 3.7.2 The contractor is to satisfy all the requirements of the Local Authority and Highways department.
- 3.7.3 All surfaces at ground level are to be suitably protected to prevent the scaffold damaging existing external finishes.
- 3.7.4 Where internal scaffold is to be erected full protection will be required under all scaffolding except with prior written consent.
- 3.7.5 Ensure any architectural features or areas prone to damage are suitably protected.
- 3.7.6 All entrance doors, fire exits etc. are to be kept clear of obstructions and are to be lined at the top and both sides.

3.8 DISMANTLING

- 3.8.1 Ensure all necessary care is taken to ensure that no damage occurs to the fabric of the building.
- 3.8.2 Scaffold tubes should be carefully lowered to ground level and not thrown or dropped.
- 3.8.3 No dismantled components shall be left on site outside working hours unless housed within a secure compound area.

3.9 TEMPORARY PROTECTION AGAINST THE ELEMENTS

- 3.9.1 A temporary roof is required to the clerestory for the duration of all roofing works as per above specification.

Protection to side walls and public walkways under the scaffold are to be allowed for as is the temporary sheeting of opened roofs and lantern.
- 3.9.2 Any damage arising to the building fabric from the failure of temporary sheeting will be made good at the contractor's expense. Sheeting for side walls shall be reinforced translucent sheets which are self-extinguishing and flame retardant (e.g. Monarflex). Details of any alternative proposals shall be submitted for approval with the tender.

- 3.9.3 All sheeting shall be adequately secured against wind uplift etc.
- 3.9.4 All sheeting shall be checked by a competent person once a week and a signed record kept onsite. Any defects are to be rectified immediately.
- 3.9.5 All areas are to be maintained as watertight at all times.

3.10 CERTIFICATES

- 3.10.1 Copies of all handover certificates issued by the scaffolding sub-contractor shall be forwarded to the Contract Administrator upon receipt by the Main Contractor.
- 3.10.2 Copies of all test certificates for hoists shall be forwarded to the Contract Administrator on receipt by the Main Contractor.
- 3.10.3 No scaffolding shall be used unless handover certificates and test certificates have been issued.

3.11 DESCRIPTION OF THE PROPOSED WORKS AND METHODOLOGY

- 3.11.1 It is proposed that a full access scaffold is erected around four sides of the clerestory element to Main entrance foyer (B01-GF-010). This is to encapsulate the building and allow for the replacement of the central lantern and associated roof repair works within a controlled environment, but most importantly that the building interior is protected from the external elements for the duration of the project. Subject to the Structural Engineer's investigations into the loading capacity of the masonry, the scaffold is to be a suspended system, cantilevered and braced through high level window openings at upper level. A temporary roof and internal crash deck are to be provided for the duration of the works.
- 3.11.2 The Main Contractor is to provide the Contract Administrator with a scaffold design well in advance of any erection works.

The scaffold design will highlight all proposed fixing and contact points for discussion with the Architect and Structural Engineer.

Detailed methodologies are to be provided by

the Main Contractor, to accompany the scaffold design.

- 3.11.3 The access scaffold will run around the building to four sides to provide access to the central lantern element to the roof.

Note: the City Art Gallery is in a prominent city centre location. The proposed works and the subsequent site access required is to be coordinated with the neighbouring properties, in accordance with the pre-construction health & safety plan.

- 3.11.4 The scaffold will be built up tight to the facades, with protected scaffold tubes. The scaffold will be braced through existing window and door openings.
- 3.11.5 Where direct fixings will be required into the fabric, these will primarily be taken into mortar joints where the joint size is sufficient.
- 3.11.6 There will be no direct fixings into stonework.
- 3.11.7 The access scaffold may likely be required to house contractor welfare facilities due to space restrictions onsite. The exact arrangement is to be confirmed by the Main Contractor and coordinated with neighbouring properties/businesses.

RS4 ROOF REPAIRS: LEADWORK / COVERINGS / FLASHINGS / GUTTERS

4.1 REQUIREMENTS

- 4.1.1 All leadworks shall be undertaken by trained operatives employed by a contractor who is a member of Lead Contractors Association (LSA).
- 4.1.2 All workmanship shall be in accordance with the Lead Sheet Associations recommendations as contained in the Lead Sheet Manual - a guide to good building practice Volume 1 to 3 and current updates.
- 4.1.3 Working Practices shall comply with the Health and Safety Executive COP2 "Control of lead at work - approved code of practice".
- 4.1.4 All work shall comply with BS 5250 "Code of Practice for control of construction in buildings".

4.2 MATERIALS

- 4.2.1 Lead Sheet
Lead sheet shall be milled lead sheet to BS 1178 unless stated otherwise. The minimum height of lead shall not be less than that recommended in BS 6915 "Specification for design and construction of fully supported lead sheet roofs and wall coverings".
- 4.2.2 Underlay
Building paper to BS 1521, Class A.
- 4.2.3 Plywood
Shall only be used where specified and shall be in accordance with BS 1210. Plywood shall be WBP grade, min. 18mm thick.
- 4.2.4 Copper Nails
Copper nails for fixing lead shall be in accordance with BS 1202-2.
- 4.2.5 Wood Screws
Shall be in accordance with BS 1210.
- 4.2.6 Timber
For gutter linings, roof decks etc shall be 100x25mm straight edged boarding with a 2mm gap between adjoining boards or min 18mm thick WBP plywood.

Timber shall be vacuum pressure impregnated with preservative in accordance with the British Wood Preserving and Damp Proofing Associations Manual and as British Wood Preserving Association Commodity Specification C8.

Timbers shall be planed, free from wane, pitch pockets decay and insect attack.

Moisture content shall not be more than 22% at the time of covering.

4.3 WORKMANSHIP

4.3.1 General

Cut, joint and dress lead neatly and consistently to provide fully waterproof coverings and flashings free from ripples kinks, buckling and cracks.

Comply with BS 6915 and current good practice as described in the latest edition of "The Lead Sheet Manual" published by the Lead Sheet Association unless specifically instructed in writing.

Do not use screws or other sharp instruments to mark out lead. Use solder only where specified and not in any other location.

Ensure that finished leadwork is fully supported.

4.3.2 Lead Welding

In situ lead welding is permitted where specified subject to completion of a "hot work permit" form and compliance with its requirements. Lead chutes / sumps will require onsite welding.

4.3.3 Layout

Agree setting out of joints drips and laps with the Architect prior to commencing work.

4.3.4 Control Samples

Complete an agreed area of finished work and obtain approval of appearance and detail from the Architect before proceeding with the remainder of the works. The sample area(s) shall be selected so as to reflect the problems likely to

be encountered on the majority of the work.

4.3.5 Existing Lead to Be Retained

Thoroughly clean by washing with a detergent solution and using a stiff bristle brush. Rinse off thoroughly. In areas of stubborn soiling a 5% nitric acid 95% water solution may be used provided that it can be established that the runoff does not have an adverse effect on other materials. Thorough rinsing with clean water should be undertaken on completion.

4.3.6 Existing Lead to Be Removed

Lead specified to be stripped and shall become the property of the contractor.

4.3.7 Replacement of Existing Lead

In areas receiving run off from adjoining unprotected roofs (e.g. gutters etc) then the work must be carried out in small sections at a time to reduce the risk of weather damage. The contractor shall check the weather forecast before commencing removal of lead and shall only remove an area small enough to permit its reinstatement within the working day.

4.3.8 Existing Bases

In areas where existing substrate is to be recovered in lead, remove all existing leadwork and brush clean of all debris, dust etc. Inspect all timbers for condition and level. Replace as necessary any rotten boards with timber to match existing. Ensure that where boarding is straight edged the gaps are cleaned of dust to permit ventilation. Where boarding is tongued and grooved seek instruction prior to drilling ventilation holes in an agreed pattern.

Ensure that all boards are securely fixed. Punch in any protruding fastenings and plane or sand as necessary to achieve an even surface.

4.3.9 All Bases

All bases shall be dry, free from dust debris grease and other deleterious material with all nails punched home and free from all protrusions, unevenness etc prior to laying lead.

Laying of underlay and lead will be taken as a joint acceptance of the Main Contractor and sub-contractor of the suitability of the base.

Substrates or decking for lead coverings must provide a near continuous smooth surface that is strong enough to support the lead (and any

superimposed loadings) and hold the fixings firmly and permanently.

4.4 **FIXING AND JOINTING**

4.4.1 Head Fixing of Lead Sheet

Unless specified elsewhere secure top edge of lead sheets with two rows of fixings 25mm and 50mm from the top edge of the sheet at 75mm centres to each row and evenly spaced and staggered.

4.4.2 Fixings

Fix lead sheet to timber substrates using copper clout nails to BS 1202-2 table 2 with annular ring, helical ring or serrated shank, length not less than 20mm, shank diameter not less than 3.35mm and head diameter not less than 8mm, or similar stainless steel (austenitic) clout nails with diameter not less than 2.65mm.

Where lead is to be fixed to concrete or masonry substrates use stainless steel screws to BS 1210 table 3, not less than 19mm in length and not less than 3.35mm diameter, with stainless steel washers and plastic plugs of length and diameter to suit the screws.

4.4.3 Clips

Clips shall generally be 50mm wide unless specified otherwise. Lead clips shall be cut from sheets of the same code thickness as the sheet being secured.

Each clip shall be secured with 2 fastenings not more than 50mm from the edge of the lead sheet. Clips shall be welted around edges of sheets and turned over 25mm.

4.4.4 Copper clips

Copper or tinned copper clips should not be less than 50mm wide and cut from copper sheet not less than 0.6mm thickness conforming to BS EN 1172.

4.4.5 Stainless steel clips

Clips should be fully annealed stainless-steel strip conforming to BSEN 10088 at least 50mm wide and not less than 0.375mm thickness. It may be terre coated if exposed to view.

4.4.6 Wood Cored Roll Joints

Timber core shall be 45x45 rounded timber tapering to a flat base 25mm wide. Ridge rolls may be larger and should be to the dimensions

specified on the drawings. King Wood roll shall be 75x75 rounded timber tapering to a flat base.

Rolls shall be fixed to the base with stainless steel countersunk screws at not more than 300 centres.

Dress under cloak three quarters around the core and fix with nails at 150mm centres for a distance of one third the length of the panel starting from the head of the sheet.

Dress over cloak around core and extent onto main surface to form a 40mm splash lap.

4.4.7 Wetted Joints

Form with a 50mm overlap, 25mm underlap and copper or stainless-steel clips at not more than 450mm centres.

Wet overlap and clips around underlap loosely turn over and lightly dress down.

4.4.8 Drips - Roofs up to 3-degree Pitch

Dress underlap into rebate along top edge of drip and fix with one row of nails at 50mm centres on centre line of rebate. Dress overlaps over drip and form a 40mm splash lap.

4.4.9 Drips - Roofs over 3-degree Pitch

Dress underlap up full height of drip upstand. Fix to lower-level base with two rows of nails 25mm and 50mm from face of drip and at 75mm centres to each row. Seal over nails with a soldered or lead welded dot.

Dress overlaps over drip and form a 75mm splash lap. Secure with lead clips lead welded to underlap with not less than one per bay.

4.4.10 Forming Details

Details may be made by bossing or lead weld except where specified. Lead welded seams must be neatly and consistently formed. Do not undercut or otherwise reduce the thickness of the sheets at the seams. Filler strips are to be of the same composition as the sheets being joined. Butt joints are to be formed to a thickness one third more than the sheets being joined. Lap joints are to be formed with 25mm laps and two loadings to the edge of the overlap.

Bossing must be carried out without thinning cutting or otherwise splitting the lead sheet.

4.4.11 Fixing into Joints

Currently rake out joint or neatly cut chase to depth of 25mm.

Dress lead into joint or chase and up back face. Fix into back face with stainless steel screws, washers, and plastic plugs at minimum 450 centres with a minimum number of 2 fixings per piece of lead.

4.4.12 Finishing

As soon as practical apply a smear coating of patination oil evenly in one direction. Apply only in dry conditions.

Where run off will be onto visible surfaces apply patination oil immediately on completion of the section of work to avoid staining.

4.5 LEAD SHEET COVERINGS / FLASHINGS

4.5.1 COVER FLASHINGS:

Lead:

Code 5 in lengths not exceeding 1500 mm.

End to end joints:

Laps of not less than 100 mm.

Cover:

Overlap to upstand of not less than 75 mm.

Fixing:

Lead wedges into bed joint and clips to bottom edge at laps and 450 mm centres.

Prior to order, manufacture and installation, the contractor should provide fabrication drawings to the CA for comment. No work shall commence until any such discrepancies have been resolved.

RS5 RENEWAL OF RAINWATER GOODS

5.1 OVERHAUL AND REPAIR OF EXISTING RAINWATER GOODS

- 5.1.1 Carefully remove existing gutters and downpipes, as indicated on the drawings.
- 5.1.2 Existing rainwater goods are to be replaced (including fixings) to match original in all respects with particular attention to profiles and details. All materials are to match the original like for like unless otherwise instructed. Allow for stainless steel fixings where concealed within the building fabric.
- 5.1.3 The Contractor is to ensure that discarded cast iron is sent for recycling.

5.2 MATERIALS

- 5.2.1 Cast Iron Rainwater Pipes
Cast iron rainwater pipes to be generally single / double socketed 3" (to be confirmed – to match existing) diameter pipes, conforming to the dimensional requirements of BS 460: 2002 and A2:2007 and to match original. To be manufactured by:

- a) J & J W Longbottom Ltd
Bridge Foundry
Holmfirth
Huddersfield, HD9 7AW
Tel: 01484 681 513
- b) Hargreaves Foundry
Water Lane
Halifax
West Yorkshire, HX3 9HG
Tel: 01422 330 607
Email: info@hargreavesfoundry.co.uk

Fittings

Include for all necessary fittings to each section of pipework, including square and obtuse bends, union sockets with fixing ears, shoes, side and anti-splash shoes, single branch fittings, offsets, holderbats, inspection pieces, and rainwater hoppers to match sizes and profiles of existing.

5.3 Gutters/Gutter Jointing Materials and Fixings

- 5.3.1 Cast Iron Gutters, Fittings and Accessories: To BS 460:2002 and A2: 2007. Profile to match original. Samples of proposed matching profiles to be submitted for approval prior to ordering.
- 5.3.2 Brackets for Cast Iron Gutters: To be fitted as required BS 460:2002 + A2:2007.
 - a) Material: Cast iron.
 - b) Profile: To suit gutter.
- 5.3.3 Nuts and Bolts: Galvanized mild steel or stainless steel to BS 3692:2001.
- 5.3.4 Metal Washers: Galvanized mild steel or stainless steel to BS 4320:1968.

5.4 HANDLING AND STORAGE OF MATERIALS

- 5.4.1 Pipes, Gutters and Fittings: Store under cover and clear of the ground. Stack pipes and gutters on level surface. Do not rest pipes on their sockets. Securely stake end pipes in bottom row to prevent collapse of stack.
- 5.4.2 Pre-Packed Pipe Bundles: Do not open until required for use.

5.5 INSTALLATION AND FIXING

- 5.5.1 Inspection
Inspect all pipes, gutters and fittings before fixing. Reject any which are defective.
- 5.5.2 Damaged Coatings
Make good damage to coatings, recoat or replace as instructed by the Architect.
- 5.5.3 British Standard
Comply with BS EN 12056-2:2000, BS EN 12056-3:2000 and BS 8000-13:1989.
- 5.5.4 Bends and Branches
Do not use lobster back or mitre joint bends and branches. Curve branches in the direction of flow

at connections.

5.5.5 Branch Connections

Make provision in the fixing of branch pipes to main vertical stacks to prevent shearing or deformation due to vertical movement.

5.5.6 Jointing

Joints at the sockets of the components should incorporate a hemp gasket and be sealed with a bedding of red lead and white putty (or approved polysulphide sealant). Where pipes / components are cut on site, the ends shall be cut clean and square with burrs removed. All cut ends shall be made good/recoated in accordance with the manufacturer's recommendations prior to decoration and fixing.

5.5.7 Fixing

Socketed rainwater and soil pipes are to have hardwood bobbins fitted behind ears to give a minimum 38mm projection from wall face to facilitate decoration where agreed. Fixing to the walls is by means of 8mm stainless steel screws through ears and bobbins into plastic plugs in the walls.

5.5.8 Gradients and Heights

Fix pipes and gutters to gradients and heights shown on drawings. See also 'Fall of Gutters'.

5.5.9 Wall Spacer Plates:

Where the pipe is required to be projected from the wall, cast iron wall spacer plates shall be used.

5.5.10 Fixing Ears:

Overhaul and redecorate fixing ears prior to refixing. Report to the Architect those which are found to be defective and cannot be repaired. New ears are to match the original in style and in every other respect. New ears and similar components are not to be ordered until a sample has been approved by the Architect.

5.5.11 Access Points for Cleaning

Fit all access covers and cleaning eyes as the work proceeds. In restricted access situations, locate to allow use of cleansing and testing apparatus. Locate to allow working space for other services in shared ducts.

5.5.12 Fall of Gutters

Gutters to be installed with falls to the outlet unless originally designed to be level. Where gutters are set to a fall, the falls to be no less

than 10mm in 350mm unless instructed otherwise. Under no circumstance is there to be any back fall.

5.5.13 Gutter Joints

Overlap in direction of flow.

5.5.14 Gutter Supports

Fix gutter brackets at not less than 1500mm centres screwed to structure, subject to matching original. Where brackets are not used fix gutter at manufacturer's recommended spacing or using preformed holes but at no more than 1000mm centres.

5.5.15 Install to ensure the complete discharge of rainwater from the building without leaking.

5.5.16 Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.

5.5.17 Provide for thermal and building movement when fixing and jointing and ensure that clearances are not reduced as fixing proceeds.

5.5.18 Where not specified, use plated, sherardized, galvanized, or nonferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed or fixed to.

5.5.19 Obtain all replacement components for each type of pipework from the same manufacturer unless specified otherwise.

5.6 PIPEWORK

5.6.1 Fix securely at specified centres plumb and/or true to line with additional supports as necessary to support pipe collars, particularly at changes in direction.

5.6.2 Bracket fixings: Into stone joints where possible. To be agreed on site.

5.6.3 Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.

5.7 TESTING

5.7.1 Notice to Architect: Inform the Architect to give them adequate opportunity to observe the interim and final tests. Keep records of all tests and supply a copy of each to the Architect.

- 5.7.2 Notice to Statutory Authority: Inform the Architect and give reasonable notice to appropriate Statutory Authority to enable observation of interim and final testing where required.
- 5.7.3 Facilities and Equipment: Provide assistance, clean water and equipment, appliances and materials for interim testing throughout the progress of the work and for final test. Fix tee-pieces and plugs when and where required and seal off and remove as directed by the Architect.
- 5.7.4 Timing
- Commence interim testing as soon as practicable after completion of each pipe stack.
- Test work to be concealed to the satisfaction of the Architect before finally enclosing.
- Carry out final test after completion of all contract work and immediately prior to hand over to the Client.
- 5.7.5 Removal of Obstructions: Ensure that sections of the installation to be tested are completely clear of obstructions, debris and superfluous matter.
- 5.7.6 External Systems: Test with water to ensure rainwater system drains effectively and that pipes and gutters are unobstructed.
- 5.7.7 Prefabricated Units: Ensure tests are carried out at manufacturer's works or place of fabrication.
- 5.7.8 Defects: Locate and remedy all defects and satisfactorily re-test as instructed before proceeding with further installation.

5.8 DECORATION

- 5.8.1 A 4 coat system is the absolute minimum protection for an external pipework and rainwater goods, i.e. 1 primer, 1 undercoat and 2 gloss coats, (or 2 undercoats and 1 gloss coat) giving a minimum coating of 90 microns.
- 5.8.2 Paint System: Dulux Metalshield Gloss System or equal. Colour to match existing.

RS6 PAVING

6.1 SCOPE

- 6.1.1 The following specification relates to replacement natural stone paving to lightwells as indicated on drawing MAG-BUT-18-ZZ-DR-A-52-0001.

6.2 MATERIALS

- 6.2.1 British Standard Quality: All materials used in the contract shall be in accordance with the relevant British Standard. Whenever possible, materials shall be obtained from manufacturers licensed to use the British Standard Certification Mark.

- 6.2.2 Submission of Samples: The Contractor is to provide at least ten days in advance of use, samples of the paving to be used.

- 6.2.3 New Natural Stone Paving
New paving stones are to be Buff York Stone to match the existing in texture and colour.

Supplier (or equal approved)

Johnsons Wellfield
Crosland Hill
Huddersfield
West Yorkshire
HD4 7AB

T: 01484 652311

E: sales@johnsons-wellfield.co.uk

Ensure the supply of stone is commercially available for the duration of the works.

Standard

to BS EN 1341.

Samples

Contractor is to provide appropriate samples of colour variations and finishes available for approval by the architect / conservation officer prior to commencement of works.

Samples should be weathered samples from all areas of the quarry currently being exploited as there may be colour/texture variations between beds within the quarry.

Any change to source of supply to be agreed with the Architect. Samples of materials approved by the Architect are to be labelled and retained at the site office until completion of the contract.

Whilst provisional orders may be placed no confirmation shall be issued until samples have been approved.

Size

Paving thickness: Nominal 50mm

To Princess Street and George Street lightwells around the Athenaeum:

Minimum width 300mm x random lengths (to match existing laying arrangement)

To Princess Street and Nicholas St lightwells:
Sized/ cut to match existing laying arrangement (square slabs)

Quality

All stone shall be free from vents, cracks, fissures, mineral veins, discoloration, and clay pockets. No stone for the project should contain any defect which will adversely affect the strength or appearance of the stone.

- 6.2.4 Lime Mortar

Lime mortar shall be in accordance with the separate specification for lime mortars as RS7.

- 6.2.5 Sand for Mortar

Sand for mortar shall comply with the requirements of BS 1200:1976 and BS EN 13139:2002 and is subject to approval of samples.

- 6.2.6 For laying/bedding materials refer to Civil Engineer's documentation.

6.3 INSTALLATION

- 6.3.1 Break-up existing surfaces where paving is to be replaced or as required for drainage works to a depth required for finished levels and falls.

- 6.3.2 If any parts of the existing surfaces are found to be unstable excavate further to a firm bed, fill in and well compact with approved hardcore.

6.3.3	<u>Falls</u> Paved areas should have a minimum general fall of 1.7% (not less than 1 in 60), new external channels leading to gullies are to have a gradient or not less than 0.8% (1 in 120). Any channels within the paved area should have a gradient not flatter than 1% (1 in 100). For paving with heavily textured surfaces (e.g. riven flagstones, cobbles, etc.) the paved area should have a minimum general fall of 1 in 40.	6.3.7	<u>Sub-base:</u> Limecrete bed 3-1 mix. Expanded lightweight clay aggregate - NHL/5 Thickness: as indicated on Civil Engineer's drawings
6.3.4	<u>Adverse Weather</u> Temperature: Do not lay or joint paving if the temperature is below 3°C on a falling thermometer or below 1°C on a rising thermometer. Frozen materials: Do not use. Do not lay bedding on frozen or frost covered bases. Paving with mortar joints and/ or bedding: Protect from frost damage, rapid drying out and saturation until mortar has hardened. Paving laid and jointed in sand: • Stockpiled bedding sand: Protect from saturation. • Exposed areas of sand bedding and uncompacted areas of sand bedded paving: Protect from heavy rainfall. • Saturated sand bedding: Remove and replace, or allow to dry before proceeding. • Laying dry-sand jointed paving in damp conditions: Brush in as much jointing sand as possible. Minimize site traffic over paving. As soon as paving is dry, top up joints and complete compaction.	6.3.8	<u>Base:</u> as Civil Engineer's drawings
		6.3.9	<u>Accessories:</u> Above to be laid on Terram Geotextile membrane Ref: T1000.
		6.3.10	<u>Lime for Site Mixed Mortar</u> Standard: Nonhydraulic to BS EN 459-1, -2 and -3, type CL 90 or, if ready-mixed lime:sand, to BS EN 998-2.
		6.3.11	<u>Appearance of Paving</u> Smooth and even with regular joints and accurate to line, level and profile.
		6.3.12	<u>Laying Paving</u> Bedding of paving units: Firm so that rocking or subsidence does not occur or develop. Bedding/ Laying course: Consistently and accurately graded, spread and compacted to produce uniform thickness and support for paving units. Slopes: Lay paving units upwards from the bottom of slopes. Paving units: Free of mortar and sand stains. Cutting: Cut units cleanly and accurately, without spalling, to give neat junctions with edgings and adjoining finishes.
6.3.5	<u>Protection of existing works</u> The Contractor must be responsible for making good any damage to existing work recently completed, or existing, adjacent building fabric.	6.3.13	<u>Levels of Paving</u> Permissible deviation from specified levels: Generally: ± 6 mm. Height of finished paving above features: At gullies: +6 to +10 mm. At drainage channels and kerbs: +3 to +6 mm.
6.3.6	<u>Jointing width</u> To match existing, pointed with lime sand mortar (see 6.3.10)		

6.3.14	<u>Regularity</u>	• Drainage fittings, e.g. channels and manholes.
	Standard: To BS 7533	
	Maximum variation in gap under a 3 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface): 3 mm; Difference in level between adjacent paving units (maximum): 2 mm. Sudden irregularities: Not permitted.	Edge detail: Turn sheet up to a height not less than thickness of bedding to form an upstand fitted neatly against features. Width: 300 mm. Jointing: Lap by 300 mm.
6.3.15	<u>Colour Banding</u>	6.3.18 <u>Tooled Joints in Mortar Bedded Units</u>
	Mix in old flags to be re-used with new flags to avoid large areas of discolouration	
6.3.16	<u>Protection</u>	
	Cleanliness: Keep paving clean and free from mortar droppings, oil and other materials likely to cause staining. Materials storage: Do not overload pavings with stacks of materials. Handling: Do not damage paving unit corners, arrises, or previously laid paving. Mortar bedded pavings: Keep free from pedestrian traffic after laying (minimum): 24 hours. Access: Restrict access to paved areas to prevent damage from site traffic and plant.	Joints: Completely filled with bedding mortar as work proceeds. Joint width: 6 mm. Finish: Neat flush profile. 6.3.19 <u>Completion of Paving With Dry Sand Or Fine Aggregate Filled Joints</u> Sand dressing: Leave a thin layer of dry jointing sand over the paving, sweep clean before practical completion. Final compaction of the surface course: In accordance with BS 7533-3. Vacuum cleaning machines: Not allowed.
6.3.17	<u>Laying Geotextile Sheet Edging Strips</u>	
	Location: Immediately below laying course, abutting features which interrupt the laying course, including: • Perimeters/ Edge restraints/ Kerbs. • Other types of paving.	

RS7 LIME MORTAR

PLEASE NOTE THAT THE EXACT MORTAR COMPOSITION TO BE USED ACROSS THE EXISTING FABRIC WILL LIKELY DIFFER TO THE GENERAL MORTAR SPECIFICATION AS IDENTIFIED BELOW.

THE EXACT MORTAR MIX AND STRENGTHS TO BE ADOPTED WILL BE CONFIRMED FOLLOWING ONSITE SAMPLING AND ANALYSIS. IT IS LIKELY THAT THERE WILL BE VARIANTS ACROSS THE FABRIC AND BETWEEN THE ORIGINAL GALLERY AND ATHENAEUM.

PLEASE NOTE THE MORTAR SPECIFICATIONS BELOW RELATE TO INTERNAL BRICKWORK AS PART OF THE PHASE 1 WORKS ONLY.

TO BE READ IN CONJUNCTION WITH SECTION RS12.

7.1 PRODUCT

- 7.1.1 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 for the various materials.
- 7.1.2 Hot lime mix: Quick lime once mixed with the dry aggregates shall be properly slaked in 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. Once the sand has been added, add water gradually in small amounts and continue to mix for a minimum of 20 minutes until a stiff mortar mix is achieved.
- 7.1.3 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.
- Hot limes, based on Singleton Birch ML90:
- 1 part quicklime; 2.5 parts sieved plastering sand; 1 part sharp sand; 0.5 part brick dust; 1 part stone dust.
 - 1 part quicklime; 3 parts stone dust; 1.5 part building sand; 0.5 part brick dust.
- 7.1.4 Refer to RS6 for mortar for paving.

- 7.1.5 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.
- 7.1.6 Measures: Constituents by volume in clean gauge boxes. Gauging by the shovel is strictly forbidden.
- 7.1.7 Suppliers to be consulted for variations in aggregates to achieve required distribution and colour.
- 7.1.8 Mixing and usage to be strictly in accordance with supplier's recommendations.

**** PENDING MORTAR ANALYSIS AND SAMPLING ****

7.2 MATERIALS

- 7.2.1 Non-hydraulic Lime:
To comply with BS 890: 1972, BS 6463: 1984/1987 and BS EN 459.
- 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.
- 7.2.2 Sand
- 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.
- All sand shall be to BS 1199 and BS 1200:1976, well-graded non-staining, sharp and coarse. The sand used for hot lime mortar may contain clays and silt, it may also contain higher fines content but not excessive.
- 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.

Suppliers of lime to be consulted on suitability of sands proposed. Ideally sand to be obtained from the supplier of the lime.

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.

7.2.3 Water

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.

7.3.2 Storage

Lime is to be supplied in bags which must be date stamped with the day of manufacture. Quicklime over 3 months old must not be used. All bags must be delivered to site undamaged and dry without moisture penetration of the covering. Dry hydrate that has been exposed to the air or moisture in transit and in damaged bags is to be rejected.

7.2.4 Pozzolan Material

Where specified, to be:

Ground brick dust, obtainable from:
Bulmer Brick and Tile Co.
Bulmer,
Suffolk
CO10 7EF
tel: 01787 269232

Lime must be stored in a cool, 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, and keep away from direct sunlight.

Metastar 501 obtainable from:
Rose of Jericho,
Horchester Farm,
Holywell,
Dorchester,
Dorset
DT2 0LL,
Tel: 01935 83676.

7.3.3 Cold Weather Working

No work involving the preparation of mortar shall be undertaken when the temperature is 5 degrees centigrade or below and falling or below 4 degrees centigrade when the temperature is rising.

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.

7.3.4 Protection

Following completion the work shall be protected and kept at a temperature above 5oC for a minimum of four weeks until the face has dried and hardened. Protect all new work against frost.

7.2.5 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.

The period of protection must be increased relative to the slower carbonation rate that occurs at lower temperatures.

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. 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.

7.3 WEATHER, STORAGE AND PROTECTION

7.3.1 Transport

Transport, Storage and Handling of Materials:

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.

7.3.5 Damage due to Weather

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

7.4 GOOD WORKING PRACTICE

7.4.1 For all mortar work, best practice requires proper curing and aftercare. Lime mortar may require slightly longer curing times.

7.4.2 To avoid rapid drying and consequent high shrinkage, keep all work damp by repeatedly applying a fine mist of clean potable water, if necessary, several times a day, until the mortar has hardened.

RS8 LIME PLASTER

PLEASE NOTE: THIS SPECIFICATION SECTION REFERS TO LIME PLASTER REPAIRS TO WALLS AND CEILINGS.

8.1 GENERAL

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

This specification relates to internal plaster only.

8.2 PREPARATION – WALLS

- 8.2.1 Remove any loose existing plaster back to sound plaster / substrate.
The extent of re-plastering is restricted to the areas of damp affected / detached plaster as noted on the drawings.
- 8.2.2 Rake out mortar joints to to a depth of 10mm as necessary.
- 8.2.3 Re-point any deep recesses as RS7 and RS12.
- 8.2.4 Thoroughly clean down the substrate to ensure all loose particles and dirt are removed.
- 8.2.5 Thoroughly dampen down the substrate before application using a hose-pipe or sponge. The more porous the background, the more water will be required. Allow the water to soak in a bit then spray again, and repeat until the surface layers of the wall are thoroughly damp. On many occasions this is done the day before, if necessary several times with the last damping just before application starts.
- 8.2.6 Dubbing out: on defaced surfaces it might be necessary to apply a dubbing out coat (using a 3-4mm down well graded aggregate) to provide a relatively level surface. When a dubbing out coat is used let it set sufficiently before keying it. The most efficient way to apply a dubbing coat is by harling. Apply base coat or scratch coat after approx. 3-4 days (more if very deep recesses have been filled)]. Dubbing out should not be seen as remedial repair work to the masonry or brickwork background in lieu of brick repair/ repointing.
- 8.2.7 Do not:
- Use plastering bead on corners

- Use chicken wire or metal lath to form a key

8.3 PREPARATION - CEILINGS

- 8.3.1 Floor covering within area to be repaired is to be protected with visqueen taped to the skirting boards and overlaid with ply or MDF.
- 8.3.2 Following removal of the defective plaster, key and laths are to be inspected and checked throughout the specified area. The contractor is to allow within their programme an appropriate period of time for detailed inspection at high level by the Architect to enable final instructions to be issued for the work.
- 8.3.3 Defective areas of ceiling are to be propped using felt pads on 12mm ply bearers on timber studding.
- 8.3.4 Exceptional care is to be taken supporting areas around details.
- 8.3.5 All timbers including joists and laths are to be inspected for decay by specialist timber Preservation Company and a report issued for consideration of further treatment.
- 8.3.6 LATHS
Following inspection, where existing laths are spaced too close thus preventing adequate key for the plaster, alternate laths are to be cut through and removed.

When existing laths are decayed these are to be cut out with a hacksaw blade and snapped off.

8.4 APPLICATION – WALLS

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

Application is to take place in three coats:

8.4.2 **Undercoat** – apply undercoat/ scratch coat to dampened down and prepared surface. Undercoat is to be reinforced with hair well beaten in, at a rate of 4.5 kg/m³. Thickness can vary according to the overall thickness required but it is normally between 10 and 12 mm. It must not be applied over 15 mm thick. If this is required (e.g. to provide flush surface with adjacent existing plaster) it should be done as an extra coat (two intermediate coats) each not above 12 mm. The thicker the intermediate coats the longer the waiting time before each application. Undercoat is to be cross keyed with a lath scratcher to form a pattern of 25mm – 35mm diamonds with a pointed but blunt wooden lath. Dampen down before application of next coat.

8.4.3 **Float Coat** – apply over the undercoat after it has been allowed to fully set (allow 4-5 days, or more depending on atmospheric conditions). Float coat to be nominally 9-11mm, scoured back and keyed with a devil's float after initial setting. Float coat is also to be reinforced with hair well beaten in, at a rate of 4.5 kg/m³. Check for shrinkage over the first 2 days curing. If any shrinkage cracks appear, dampen down, scour back and re-key to the affected area. Dampen down before application of next coat.

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

8.4.5 Apply all renders firmly to exclude any air and excessive moisture. Suction to be carefully controlled at all times.

8.4.6 Re-work coats as necessary to control shrinkage and to achieve a smooth finish in the Finishing Coat.

8.4.7 PLASTER MIX

Undercoat

1:3 lime putty:grit sand with hair reinforcement.
Mix stood for two weeks, putty to be at least 3 months old.
Hair Reinforcement - 4.5kg/m³ horsehair.

Float Coat

1:3 lime putty:well graded sand with hair reinforcement.
Mix stood for two weeks, putty to be at least 3 months old.
Hair Reinforcement - 4.5kg/m³ horsehair.

Finishing Coat

1:2 lime putty:fine silica sand

8.5 APPLICATION - CEILINGS

INDIVIDUAL BRIDGE REINFORCEMENT

8.5.1 This method is to be used in areas where isolated laths have been removed or where small areas of plaster nibs have been lost, as indicated on the drawings.

8.5.2 Old plaster and laths are to be thoroughly cleaned and treated with a thin coating of PVA solution (1 part PVA to 10 parts / water) in order to control suction and prevent rapid removal of water from the new plaster. From key to adjacent joists with 75mm brass screws left projecting 38mm from the joists.

8.5.3 The area is to be filled with retarded superfine plaster of Paris.

REPLACEMENT SECTIONS

8.5.4 This method is to be used in areas where isolated sections of the ceiling are to be replaced as indicated on the drawings.

8.5.5 If new laths are required (see 8.3.6) these are to be fixed with split or riven oak or hazel laths. These are to be 39mm wide with 10mm gaps between laths and are to be secured with stainless steel or copper wires. Laths are to be cut on joist lines with additional timber battens fixed to the side of the joists to enable ends of new and existing laths to be staggered, with existing laths re-nailed at the junction.

- 8.5.6 Before plastering starts it is essential that all laths are sound and securely fitted, any new laths should be laid so as not to create long continuous joints and they should be left a few mm short of each other to allow for swelling when wetted.
- 8.5.7 Wood lath backgrounds should be well wetted the day before plastering, and again 2 hours before work proceeds. The constant principal is that at no time should the lath be so dry that it will absorb moisture rapidly from the first coat when it is applied. If the area becomes dry in patches, these areas should be damped again to ensure uniform adhesion.
- 8.5.8 Hair must be added to all but the finishing coat. The mortar for the first coat should be stiff enough to hold up when laid, but sufficiently plastic to squeeze easily through gaps between the laths. The first coat should be laid in a diagonal direction across the lath. After the surface has steadied up provide a criss-cross key with a pointed wooden lath. Any subsequent float coat on the ceiling is to be keyed with a devils float and will need to match in with existing levels allowing for a skim finish of approx. 2-3mm.

REPAIRS TO DETAILS

- 8.5.9 Where cornice or other embellishments has become loose, this is to be secured back to the structure with galvanised steel, copper or stainless steel wire drilled through the features and secured to brass screws into the joists and recessed into the detail.
- 8.5.10 Areas of damage are to be made good for completion with fibrous plaster where small sections of cornice are missing wire reinforcement is to be installed and the detail "run in" with fibrous plaster.
- 8.5.11 Larger such replacement / reinstatement of cornice etc are to be by pre-cast fibrous plaster sections manufactured from moulds taken from the existing profiles.
- 8.5.12 Loose details may be secured into the timber structure from below by brass screws and washers recessed into the detail with the surface made good.

PLASTER MIX:

8.5.13 **Render coat (12mm)**

1:3 lime putty:grit sand with hair reinforcement. Mix stood for two weeks, putty to be at least 3 months old. Coarse stuff is to be reinforced with hair well beaten in.
Hair Reinforcement - 7kg/m³ horsehair.

Floating coat (approx. 6mm – to be flush with existing)

1:3 lime putty:well graded sand reinforced with hair reinforcement. Mix stood for two weeks, putty to be at least 3 months old.
Hair Reinforcement - 7kg/m³ horsehair.

Setting coat (2-3mm)

3:2 lime putty:fine silica sand. Setting coat is to be laid on with a laying on trowel, trowelled and floated and made compact by scouring with a cross grained wood float lubricated with water to prevent shrinkage cracking.

8.6 WEATHER & PROTECTION

- 8.6.1 Take precautions to enable internal coating work to proceed without detriment when air temperature is below 3°C.
- 8.6.2 Do not use frozen materials or apply coatings on frozen or frost bound substrates.

8.7 MATERIALS

8.7.1 LIME PUTTY

Type: Slaked directly from CL 90 quicklime to BS EN 459-1, using an excess of water.

Maturation: In pits/ containers that allow excess water to drain away.

Density of matured lime putty: 1.3-1.4 kg/litre. Maturation period before use (minimum): 90 days. Storage: Prevent drying out or wetting: Protect from frost.

8.7.2 SAND

All sand shall be to BS EN 13139, non-staining clean sand. Sand shall be selected so that when the mortar has dried out the colour will match the colour and texture of the original mortar, unless instructed otherwise in writing by the Architect.

Aggregate / Sand to be sourced from a local quarry to the satisfaction of the Conservation Professional. Contractor to submit proposals.

8.7.3

HAIR

Hair to be horsehair from an approved supplier (example: Womersley's Ltd, see 8.5.1) well beaten into an even distribution, free of lumps and clumps. Hair to be clean, free from grease and other impurities. Storage period for haired mortar (maximum): Four weeks.

Note: Hair NOT to be applied to finish coat.

8.7.4

ADDITIVES

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

8.7.5

WATER

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

8.9.2

For plaster to be retained, where indicated on the drawings fill hairline cracks/ around fixing points with suitable fine paste filler

For lime plaster: Lime Putty Fine Surface Filler by Cornish Lime or equal.

For fibrous plaster: Retarded superfine plaster of Paris.

8.8 SAMPLE PANELS

8.8.1

SAMPLE PANELS

Provide a minimum of 2no. 1m x 1m sample panels in locations to be agreed with the Architect, to be fully representative of the likely finished product.

Sample panels to utilise representative materials, to show potential variation in aggregate / sand as agreed with the Architect.

No further work to commence until sample panels are approved by the Architect.

8.9 FINISHING

8.9.1

Once plaster has dried out allow for application of a microporous paint as 9518NBS specification clause M60/ 110.

RS11 BRICK REPAIRS

11.1 MATERIALS

- 11.1.1 Bricks shall match the 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.
- 11.1.2 Bricks shall be free from the presence of fungal attack, visible salts, paint, lime wash or other substances.
- 11.1.3 Ties
Ties to brickwork shall be as follows:
- 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.

All ties are to be manufactured in austenitic stainless steel by: Ancon Clarke, Olive Grove Road, Sheffield S2 3GB.

- 11.1.4 Water
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.

11.1.5 Mortar

Shall be in accordance with specification as instructed, or as referred to in the specification.

11.2 INSPECTION

- 11.2.1 The Contractor should note that the 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 his programme.
- 11.2.2 The Contractor is encouraged to be represented during the inspection in order that he may contribute to any discussion regarding alternative methods of repair.
- 11.2.3 Notice
The Contractor is to give 48 hours' notice to the Architect of the completion of the access scaffold to each area.
- 11.2.4 Confirmation
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.
- 11.2.5 Scaffold
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.
- 11.2.6 Programme
The Contractor shall provide a programme of work based on the Architects 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.

11.3 PROTECT, STORAGE AND CLEANING

11.3.1 Protection of Work Area

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 Monarflex fixed to the outside of the scaffold.

11.3.2 Protection of the Fabric

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.

Where scaffold is erected internally or where scaffolding penetrates through into the building internal fittings shall be adequately protected.

11.3.3 Storage

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.

11.3.4 Storage on Scaffolding

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

11.3.5 Protection of Finished Work

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.

11.3.6 Cleaning of Work

Keep face work clean and free from staining at all times.

Clean off and rub down all brickwork as scaffold is taken down.

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 where lime mortar has been used for pointing.

11.4 CUTTING OUT OF DEFECTIVE BRICKWORK

11.4.1 The areas to be cut out shall be marked on site and approved/confirmed by the Architect prior to commencement of cutting out.

11.4.2 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.

11.4.3 Any damage to adjoining areas will be made good at the contractor's expense.

11.4.4 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.

11.4.5 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.

11.4.6 Under no circumstances will the use of mechanical tools be permitted (disc cutters etc.)

11.4.7 There are power tools that use oscillating blades (Fein saw type) to rake out fine joints; care must be taken with these, especially if the brick is softer than the mortar, as the blade can slide off the mortar and cut into the brick.

11.5 INSERTING NEW BRICKWORK

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

11.5.2 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.

11.5.3 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.

11.5.4 The mortar is to be kept back 25mm from the face to facilitate later pointing.

11.5.5 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.

11.5.6 Where individual bricks 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.

RS12 POINTING OF BRICKWORK

12.1 GENERAL

12.1.1 The Contractor's attention is drawn to the fact that in some cases the joints between bricks may be extremely fine and will demand a great deal of care and attention on site to the preparation, filling and pointing.

12.1.2 Pointing should commence from the top of the building and work down when undertaking fabric repair works.

12.1.3 Before any re-pointing work is undertaken, a survey of the building should be carried out by the supervising officer and the contractor to determine the precise areas to be re-pointed. Following the results of the cleaning samples it is apparent that much of the old lime mortar will be in a sound condition and should be left in place.

12.1.4 Allow for repointing the bottom 450mm of the walls included within the scope, with an additional allowance of 20% for the remaining wall area.

12.2 SAMPLE PANELS

12.2.1 The contractor is to allow for carrying out two test panels each approximately 1 metre square under the direction of the Architect, using the methods described below. Work to the rest of the brickwork should not commence until the test panel has been approved by the Architect. The location of the test panels should be in an area with limited air movement, such as in the top corner of the wall – to be agreed with the architect before commencing.

12.2.2 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.

12.2.3 The contractor is to allow for several sample mixes to determine the most appropriate.

12.2.4 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.

12.3 PREPARATION

12.3.1 It is essential that all pointing is carried out to match previously approved samples.

12.3.2 Where being re-pointed, joints are to be raked out to a depth of 25mm (or not less than twice the joint width) 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.

12.3.3 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.

12.3.4 Under no circumstances will the use of mechanical tools be permitted (disc cutters etc.)

12.3.5 There are power tools that use oscillating blades (Fein saw type) to rake out fine joints; care must be taken with these, especially if the brick is softer than the mortar, as the blade can slide off the mortar and cut into the brick.

12.3.6 Joints are to be flushed out using clean water until the water runs clear. Use brushes, low pressure compressed air or wash out the joints with a hose. Where very fine joints are encountered a large hypodermic syringe shall be used to flush the joints.

12.3.7 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.

- 12.3.8 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.

12.4 FILLING AND POINTING

- 12.4.1 Mortar is to be as specified in accordance with the mortar specification (RS7).
- 12.4.2 Mortar should be plastic and workable but as stiff as possible.
- 12.4.3 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.
- 12.4.4 The mortar is to be introduced into damp joints and compressed with a purpose made pointing iron/key of approximately 30mm diameter giving a shallow "bucket handle" joint. Mortar is to be thoroughly compacted into the joints.
- 12.4.5 Care is to be taken to eliminate lines of mortar occurring on joint intersections, mortar should flow visually from perpend to bed joints.
- 12.4.6 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.

12.5 FINISHING

- 12.5.1 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.

12.6 PROGRESS

- 12.6.1 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.
- 12.6.2 No filling of joints is to proceed until preparation has been inspected and approved by Architect.
- 12.6.3 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.
- 12.6.4 The work is to be kept clean from mortar spillage at all times.
- 12.6.5 When pointing commences only area which can be successfully completed during the normal working day are to be attempted giving due regard to the weather conditions/forecast.

- 12.6.6 Completed areas are to be protected until cured

12.7 CLEANING

- 12.7.1 Clean down all areas on completion using clean water and bristle brushes only.
- 12.7.2 Acid cleaners should not be used when lime mortar is present.

RS13 MASONRY CLEANING: GENERAL REQUIREMENTS

13.1 GENERAL

- 13.1.1 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.

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.

- 13.1.2 The scope of the work is clearly identified on the drawings and the tenderers are to visit the site to confirm for himself the difficulties in executing the work as specified and is to include for such within his tender.

No claim will be entertained for failure to appreciate the difficulties in executing the works.

- 13.1.3 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.

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.

- 13.1.4 **NOTE: Cleaning using the DOFF / TORC POULTICE system(s) should only be undertaken by contractors on the approved list compiled by Stone Health Ltd and will be part of the Rosette Approved Contractors. Contractors MUST provide references and case studies from projects undertaken within the last 3 years.**

13.2 PREPARATION

- 13.2.1 **Scope of Work**
Brickwork to interior elevations as indicated on plans.

- 13.2.2 **Related Repair / Remedial Works**
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.

- 13.2.3 **Removal of Fittings**

Timing:
before commencement of cleaning works.

Disturbance to surfaces:
minimise.

Items for disposal:
as noted on marked up elevations.

Items to be kept for reuse:
as noted on marked up elevations.

- 13.2.4 **Vents and Grilles**
Protect but do not seal up ventilation grilles, air bricks, or other ventilation opening without first seeking instructions.

- 13.2.5 **Control and Disposal of Wash Water and Detritus**
Disposal: Safely. Obtain approvals from relevant authority.

- 13.2.6 **Control of Water**
Collect and divert to prevent ingress and damage to building fabric and adjacent areas.

Provide suitable temporary catchment boards / sheeting, gutters etc. to collect wash water and divert it to suitable discharge points.

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.

Ensure that water does not penetrate interiors and damage finishes, etc. Monitor interior building and seek instructions when any signs of damp appear internally.

Above and below ground drainage systems: Keep free from detritus and maintain normal operation.

13.2.7 **Brushing and scraping**

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.

13.2.8 **Tooling**

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 architect.

13.2.9 **Cold Weather**

Cleaning procedures using water:

Do not use when air temperature is at or below 5°C. Protect damp surfaces from frost.

Chemical cleaning agents:

Do not use when surface temperatures are below those recommended by manufacturer.

13.2.10 **Cleaning Generally**

Operatives:

Appropriately trained and experienced for each type of cleaning works.

- Evidence of training: submit on request.

Control of Cleaning:

Confine cleaning processes and materials to designated areas. Prevent wind drift.

Detritus:

Remove regularly. Dispose of safely.

Monitoring:

Frequently check results of cleaning compared to approved trial samples. If results established by trials are not achieved, seek instructions.

Modifications to cleaning methods and materials:

Seek instructions.

13.2.11 **Record of Cleaning Works**

Written Report:

Record cleaning methods and procedures used for each type of surface and deposit.

Content:

Relevant attributes of cleaning methods used to include:

- Equipment and settings.
- Dwell times.
- Number of applications.
- Ambient temperature.

Additional Documentation:

General photographic survey before cleaning to identify heavy soiling.

Submission:

At completion of cleaning works.

13.2.12 **Trial Samples**

2no. trial samples have been completed for both cleaning methods included in section 13.5 in accordance with scope MAG-BUT-XX-B1-SP-A-00-0001.

13.2.13 **Records:**

Records of the cleaning samples are contained in the sample report produced by W J Structures Ltd (30.01.24).

13.2.14 **Cleaning Generally**

Use operatives who have been trained and experienced with the equipment, materials, and procedures for the type(s) of cleaning and surfaces specified. Provide evidence of their training and experience to the Architect on request.

Confine cleaning to designated area(s) / surfaces. Do not allow cleaning agents or residues to stray onto adjacent or protected surfaces.

Clean, collect and safely dispose of debris from scaffolding, ledges, etc. at the end of each day. Prevent debris falling to lower levels.

Prevent marking of cleaned areas from dirt and debris splashing up from scaffold boards.

Where DOFF/ TORC systems are used,

operatives must be Stonehealth Approved.

are to be boarded up with ply and covered in heavy duty polythene securely taped at all edges.

13.2.15 Monitoring

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.

Do not modify cleaning procedures or materials without approval from the Architect.

13.3 HEALTH AND SAFETY

13.3.1 The Contractor shall be responsible for ensuring that all products used, and all procedures adopted comply in full with current Health and Safety requirements.

13.3.2 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.

13.4 PROTECTION

13.4.1 All surfaces not being cleaned shall be fully protected to ensure that no accidental over spray of cleaning occurs.

13.4.2 Where different cleaning techniques are specified for adjoining surfaces, the surfaces not being cleaned during either operation shall be fully protected.

13.4.3 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) Inbuilt furniture / elements and components

13.4.4 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.

13.4.5 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.

13.4.6 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.

13.4.7 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.

13.4.8 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.

13.4.9 No cleaning operations shall commence until all protection is in place.

13.4.10 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.

13.5 PRODUCTS / EQUIPMENT

13.5.1 Refer to Section 14 for surface biocides.

13.5.2 Cleaning is to be undertaken in accordance with the cleaning sample report using the method described in 13.5.3 – please note this is subject to conservation officer approval.

13.5.3 MICROSTRIP CLEANING

Equipment type:

MICROSTRIP (SAT, Surface Finishing Equipment

Group)

The MICROSTRIP system utilises low volumes of water, fine inert granulate and air. The head is modularised into separate components which results in an effective spread using less water and granulate, without losing a patina if appropriate. The MICROSTRIP has a interchangeable nozzle adjustment of apertures between 5-13mm.

Recommended pressure: 50 PSI in accordance with samples

For each area / surface, establish the optimum settings, nozzle aperture and distance of nozzle from substrate. Keep a written record of these variables but allow an operator to vary.

- 13.5.4 Details of other cleaning methods are listed below should these be requested.

13.5.5 DOFF STEAM CLEANING

Equipment Type:

Stonehealth DOFF with DRS steam / water vacuum recovery unit.

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.



DOFF Method Statement 08.2018



DOFF Risk Assessment



DRS Instructions for Use

13.5.6 TORC ABRASIVE CLEANING

Equipment type:

Stonehealth TORC

Apply abrasive at the lowest pressure that will remove deposits whilst causing the minimum of abrasion to the surface(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.



TORC Method Statement 08.2018



TORC Risk Assessment



Health & Safety Data Sheet Dolomite

13.6 APPLICATION

13.6.1 Removal of Loosely Adhered Deposits

Timing:

Before commencement of other cleaning methods.

Surfaces:

Prevent damage, including abrasion.

13.6.2 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.

13.7 COMPLETION

- 13.7.1 Obtain CA's approval of cleaning to each area / surface and before removal of temporary protection.

After removal of temporary protection, thoroughly clean all glazing, window frames, doors, sills and other affected surfaces.

Check that all gutters, hoppers, downpipes, and gullies are free from obstruction and debris arising from cleaning works.

Refix the following fittings: all items temporally removed and stored.

Complete all necessary documentation, review, and record final results with supportive drawings and photographs.

RS14 MASONRY CLEANING: REMOVAL OF ORGANIC GROWTH

14.1 REMOVAL OF ORGANIC GROWTH

14.1.1 Removal of Plant Growths from Masonry

Plants, root systems and associated soil/debris:

Carefully remove from joints, voids, and face work.

14.1.2 Removal of roots:

Where growths cannot be removed completely without disturbing masonry seek instructions.

14.1.3 Unwanted plants close to masonry:

Where removal of root system is not possible or desirable, cut through stem as close to the ground as possible. Remove bark from stump and apply herbicide paste. Leave stump to wither

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.

14.2 PRODUCTS

14.2.1 Water / air/ fine granulate cleaning system

The use of the MICROSTRIP cleaning system (see 13.5.3) or similar approved is to be used in preference to a biocide unless directed otherwise.

Cleaning system to be used in conjunction with waste / water vacuum recovery unit.

Works to meet requirements of BS 8221-1:2012 "Code of practice for cleaning and surface repair of buildings" for the cleaning of natural stone, brick, terracotta, and concrete.

Sample areas should always be undertaken prior to commencement of wholesale cleaning package(s) as per RS13 13.4 above.

14.2.2 Biocide

Products

Compatible and produced by the same manufacturer

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

14.2.3 Water

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.

14.3 EQUIPMENT

1. Non-ferrous soft wire brushes.
2. Knife blades.
3. Pneumatic garden spray with adjustable nozzle.
4. Rubber gloves.
5. Safety mask.
6. Safety goggles.

14.4 PROTECTION

14.4.1 Protect all planting, landscaped areas etc., with polythene sheeting prior to commencement.

14.4.2 Do not spray near unprotected personnel and animals.

- 14.4.3 Ensure that pollution of waterways, drainage etc. does not occur as a result of treatment.

14.5 HEALTH AND SAFETY

- 14.5.1 Biocide should be approved by the HSE Pesticide Registration Division. and listed on the HSE website under non-agricultural pesticides.
- 14.5.2 The Contractor shall be responsible for ensuring that all products used, and all procedures adopted comply in full with current Health and Safety requirements.
- 14.5.3 Contractor shall ensure all recommended Personal Protection Equipment be worn by his operatives.
- 14.5.4 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.

14.6 STORAGE

- 14.6.1 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.
- 14.6.2 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.
- 14.6.3 Any biocides stored on site shall be kept in securely locked areas with toxic hazard sign.

RS15 DEMOLITION / REMOVAL

15.1 GENERAL REQUIREMENTS

- 15.1.1 Code of Practice: Comply with BS 6187:2011 Demolition subject to any qualifications given hereunder.
- 15.1.2 Scope of Dismantling: The extent of the work is indicated within the work package drawings.
- 15.1.3 The Contractor is to undertake a survey in order to ascertain sufficient information about the structures and its surroundings prior to undertaking any works.
- 15.1.4 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.
- 15.1.5 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.
- 15.1.6 Disconnect Services: Disconnect, divert, seal off or remove existing services.

15.2 MATERIALS

- 15.2.1 New materials:
- 15.2.2 Generally: Any new materials required shall be as specified in this document and the 9518 NBS specification.
- 15.2.3 Old materials:
- 15.2.4 Removal: Remove from the site only those materials not required and identified by the Employer.
- 15.2.5 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.

- 15.2.6 Bricks: Clean, stack and protect on-site any bricks suitable for re-use for general brickwork.
- 15.2.7 Unwanted materials:
- 15.2.8 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.

15.3 METHODS OF TAKING DOWN

- 15.3.1 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.
- 15.3.2 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..

15.4 SAFETY

- 15.4.1 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.
- 15.4.2 Temporary Supports: Design and provide all necessary shores and other temporary supports.
- 15.4.3 Rot Infected Timber: Ensure that infected timber does not contaminate any materials intended for re-use.

15.5 ADJACENT STRUCTURES NOT DISMANTLED

15.5.1 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.

15.5.2 Making Good: Make good only to the extent required to ensure safety of persons, 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.

15.6 PROTECTION

15.6.1 Generally: Provide general protection as clause 5.4 of BS 6187 and Section RS1 / RS2 herein.

15.6.2 Screens: Provide temporary screens or corridors wherever needed for safety, noise or dust control, security or other purposes to facilitate the Works.

15.6.3 Leave the site secure at all times.

15.7 PRELIMINARY WORK

15.7.1 Site Visit: In addition to the general implications of undertaking a survey referred to in above, investigate all locations given with the spot works and ensure that the full extent of the work is understood and priced.

15.7.2 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.

15.7.3 Services: Make safe or divert all services. Liaise with the relevant service authorities as necessary. Test the drains and report on the findings.

15.7.4 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.

15.8 WORKMANSHIP

15.8.1 Code Generally: Make every attempt to undertake the work as follows:

a) Cutting away and alteration work generally: undertake with the minimum amount of disturbance to those parts of the building intended to be left undisturbed.

b) Work involving existing work and components: undertake to the same standard and appearance as that originally achieved.

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

15.9 NUISANCE

15.9.1 Prevent Nuisance: Prevent nuisance as stated in Section 1.585 with particular reference to dust and noise.

15.9.2 Bonfires on or adjacent to the works are strictly prohibited.

15.10 SPOT WORKS

15.10.1 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.

15.10.2 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.

- 15.10.3 Locations: The location of spot work is stated in most instances. Such locations relate to the building as existing.
- 15.10.4 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.
- 15.10.5 Unlocated Spot Works: Work of a type that can be envisaged by reference to description only is not necessarily located.

15.11 TERMS

- 15.11.1 See definitions at the start of this document.

15.12 REFERENCES

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

RS16 JOINERY REPAIRS

16.1 MATERIALS

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

16.1.11 New Timber

Either the treatment to be water borne CCA preservative: applied by pressure treatment to BS 4072 by licensed processor of one of approved specialist firms listed below.

- a. Hicksons Timber Impregnation Co (GB) Ltd - Tanalith b. Rentokil Limited
- b. RD (Chemicals and Wood Processes) Ltd or equivalent

16.1.12 Double vacuum treatment: apply approved organic solvent preservative by double vacuum treatment in accordance with British Wood Preserving and Damp Proofing Association (BWPDA) standards pages 112 - 116 inclusive appropriate to timber species and use. The treatment to be undertaken by a licensed processor of one of the approved firms listed below:

- a. Cuprinol Ltd: BWPDA Standard 115
- b. Hicksons Timber Impregnation Co (GB) Ltd: BWPDA Standard 112.
- c. Protim Ltd: BWPDA Standard 116
- d. Rentokil Ltd: BWPDA Standard 113 or equivalent

16.1.13 Existing Timber

To be Wykamol Microtech Range, Wykamol green range, or similar approved promethium, cypermethium or Boron based organic solvent. Take advice where bats or evidence of bats is found, and inform Architect.

16.1.14 Subsequent Treatment: Liberally brush two coats of specified preservative to all holes and cuts formed after timber has been treated.

16.1.15 Preservative Treatment Certificate: Provide the Architect with the certificate accompanying each consignment to site.

16.1.16 Bolts and Nuts for Carpentry: To Engineer's specification. All fixings to be stainless steel.

16.1.17 Nails and Screws: Nails to BS 1202:1974:Part 1

and screws to BS 1210:1963 each of suitable size and type. All fixings to be stainless steel.

- 16.1.18 Adhesive: Synthetic resin gap-filling adhesive to BS EN 301:2013 and BS EN 302:2013, Type WBP for exterior work and Type MR for interior work.

16.2 TIMBER REPAIRS GENERALLY

- 16.2.1 Mastic sealant for windows:

Standard: To BS 8213-4.

Burnt Sand Mastic: Between Frames And Stone Reveals.

Manufacturer:

Womersleys Ltd. Tel: 01924400651. E: info@womersleys.co.uk

Product:

Traditional Burnt Sand Mastic.

Colour:

Samples to be provided, to achieve natural appearance. The mastic should not be overpainted.

Preparation:

Before pointing, ensure that all wide gaps between the frames and masonry are tightly packed with well haired lime mortar, that has been allowed to cure and harden.

Application:

Working with a Mastic Box or a small hawk and a proprietary mastic trowel press the mastic firmly into the angle of the frame / jamb and filling from the bottom up, forming the mastic joint to a neat 45-degree angle. Keep tools wiped with an oiled cloth during the application. After forming the angle, starting from a corner, press a clean oiled mastic trowel tightly against the face of the timber frame and masonry jamb and carefully press and draw the trowel to create a neat regular fillet. Clean away any excess mastic and wipe the finished timber edges on completion. For mastic to sills, ensure the mastic does not bridge any drips and is left recessed behind the drip check.

Timber Repairs Generally:

- 16.2.2 The purpose of repair is to replace or reinforce those parts of the window/door/element that have decayed so badly that they can no longer function as intended.
- 16.2.3 Wherever possible, repairs to window frames should be carried out in-situ, particularly where the frame is inbuilt and cannot be easily removed without damaging the window or the surrounding

wall. Sashes and casements can usually be removed without damage for repair either onsite or in a joiner's workshop.

- 16.2.4 Prior to undertaking any works. The windows/doors/elements in question should be carefully recorded with photographs and some basic measurements. Sashes, casements and other parts should be appropriately labelled to ensure that they go back in the correct positions. Any historic glass and its characteristics should also be recorded.

- 16.2.5 Following assessment of each window/door/element including identification of areas of decay / missing timber components / damaged glass etc, appropriate repair works can be proposed which suit the situation. In most instances the decayed timber in question can be salvaged in-situ with resin-based repairs undertaken.

Types of repairs include the following:

- 16.2.6 Spliced repairs:

Repairs should be made by carefully cutting away damaged or decayed timber and piecing in timber inserts which are shaped to obtain the maximum strength and match the existing profiles. The new timber should be worked to the line of the existing timber following any existing deformations in the line of the window.

Timber inserts should be designed so that water is directed towards the outer face of the timber and cannot lie on or enter the repair joint.

Timber inserts should ideally match / be similar to the host material to which it is replacing in species, moisture content, grain orientation and growth rate.

Inserts should be fixed to the host material using a thin coat of DRY FLEX (see 16.2.7 below) to the end grains of the timber insert before positioning in the recess, and remove excess product to leave a smooth surface.

- 16.2.7 Resin based repairs:

The use of Resin repairs is to be considered where, small areas of loss can be made good with fillers as opposed to cutting out and splicing in new timber. The decay is to be cut away and

proprietary polyester or epoxy resin repair undertaken. This is an effective way of maximising the amount of original fabric retained.

Manufacturer:

Repair Care International Ltd, 01827 302 517,
supportuk@repair-care.com

Preparation:

- Remove paint for at least 10mm from the area to be treated.
- Remove all decayed and soft timber and create a 'shoulder' of at least 5 mm
- For conservation joint repairs, remove existing linseed putty and open joint along its length - min. 10mm wide x 10mm deep
- Ensure the moisture content is no higher than 18%.
- Sand off any loose fibres and remove dust and dirt
- Prime all bare timber with Repair Care DRY FIX to ensure permanent bond between timber and resin for Dry Flex product

Product References:

- Small splice repairs (5-10mm thickness): Repair Care DRY FLEX 1 (1 hour cure time)
 - Medium splice repairs (5-20mm thickness): Repair Care DRY FLEX 4 (4 hour cure time)
 - Medium splice repairs (5-50mm thickness): Repair Care DRY FLEX 16 (16 hour cure time)
 - Joints: Repair Care Conservation Joint
- Repair products to be used in accordance with manufacturer recommendations.

in polished timber with Brummer filler.

- Fill larger holes 3mm to 15mm with tapered pellets fitted so that the grain runs with the filled timber. Select pellets from identical timber matched for grain and colour. Glue pellets, finish flush with surface.

- Fill larger holes with patches of identical timber let into the surface. Patches must taper in depth and be glued and must be matched for grain and colour. Finish flush with surface.

16.2.9 New timber sections:

- New items must be exactly as drawn or to match original profiles. Full size sections must match exactly.

- New items must be finished by hand. All machine marks must be removed. A surface which is not dead flat is preferred.

16.2.10 General requirements for workmanship:

- It is essential that as much of the original work as possible should be protected and preserved.

- The desired finished result is not that the woodwork should look new. It should look as old as it is but well cared for.

16.2.11 Quality standards:

Reference is made to the following documents which establishes the desired approach and standards in the repair of historic timber windows;

- SPAB Technical Pamphlet No.13 – repair of wood windows.

- Historic England – traditional windows, their care, repair and upgrading.

16.2.12 Renew hardwood timber beads:

Species: Well-seasoned European Oak.

Renew to match existing – all dimensions, mouldings and fixing details.

Record works photographically and log location and date as appropriate.

Sealant:

Manufacturer: Repair Care International Ltd,
01827 302 517, supportuk@repair-care.com

16.2.8 Filling and patching:

- Fill small holes less than 3mm dia and scratches

Type: Silicone based
 Product reference: Repair Care DRY SEAL MP
 Colour: White
 Preparation/ method:

- Remove all loose/defective putty and beads.
- Clean and sand the rebate.
- Ensure the moisture content is no higher than 18%.
- Clean the glass
- Prime the rebate and allow to dry.
- Apply sealant with suitable dispensing gun
- Smooth the surface
- Allow to cure.
- If necessary, remove any excess sealant from the glass.
- Paint may be applied after 2 hours

16.2.13 Hardwood for joinery repairs:
 (NOTE: The below is subject to timber survey report to elements where specified on the drawings).

Species: Well-seasoned European Oak.

Quality: Generally, to BS EN 942' free from decay and insect attack.

Appearance class: Class J2.

Treatment: British Wood Preserving and Damp Proofing Association Commodity Specification C8; Service life: 60 years.

Moisture content on delivery: 12-16%.

16.2.14 Repair of members - cutting out members:

Extent of timber removal: Cut out full cross section of member where wood is defective or decayed, plus 50mm of sound wood.

Distance from face of support to cut end of existing timber: Obtain instructions if dimension exceeds 200mm.

16.3 PRESERVATIVE TREATMENT FOR JOINERY REPAIRS

16.3.1 Generally: No internal joinery is to be preservative treated unless specified or instructed. Timber in contact with damp masonry, e.g. below dpc level, is to be preservative treated. External softwood joinery is to be treated with a boron type preservative such as 'Timbor' rods. Before

application, perform all necessary cutting and machining that is practicable but do not assemble. Doors however may be treated after machining and final assembly. Ensure that moisture content is less than 20% before treatment and after treatment before fixing.

16.3.2 Where bats are found, or the evidence of roosting bats, preservative chemicals are not to be used without the express approval of the Architect.

16.3.3 Preservative Treatment Certificate: provide the Architect with the certificate accompanying each consignment to site.

16.3.4 Treatment to minimise environmental/ecological impact based generally and especially in connection with use where bats are present. The following are products which are deemed acceptable for use as stated. Alternatives may only be used upon proof of their low impact.

16.3.5 New timber:

Vacuum/pressure treatment to be carried out by licensed processors. Type of treatment to suit timber use.

a) 'Tanalith E' pressure treatment, process type to suit timber use.

b) Vacsol - Aqua and Vacsol - Azure, Arch Timber Protection

For other methods of application see existing timber below.

16.3.6 Existing timber:

Brush or spray applied products include:

a) ProBor DB solution or ProBor 10, Safeguard Chemicals Limited. ProBor 20 gel for thicker sections

b) Boracol 10 RH and Boracol 20 Dual Purpose, Biokil Chemicals Ltd.

c) Borax Wood Preservative, Biofa, available from Mike Wye & Associates

d) Or similar boron-based product is the preferred choice.

e) Solvaq FLX F/I, Sovereign Chemicals Limited,

contains fungicides with a safe insecticide, is good but less preferable than the boron products above.

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

a) Boracol 40 Paste, Biokil Chemicals Ltd.

b) ProBor 50, Safeguard Chemicals Limited.

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

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

- 16.3.7 No internal carpentry is to be preservative treated unless specified or instructed. Structural timber in contact with damp masonry, e.g. below DPC level, is to be preservative treated. External softwood carpentry is to be treated only if specified, as the main form of protection is a well-maintained paint or stain coating.

- 16.3.8 Take advice where bats or evidence of bats is found and inform Architect immediately. It is a criminal offence to disturb bats or to damage their roosts. Only use timber treatments approved by English Nature. Their document dated March 2006 or later version, 'Remedial Timber Treatment Products Suitable for Use In Bat Roosts' lists approved proprietary products.

16.4 LIFTING OF FLOORBOARDS

- 16.4.1 The following are guidelines regarding the removal of floorboards without causing damage to boards. The precise method of working is the responsibility of the Contractor.
- 16.4.2 The first board to be lifted is to be carefully selected. Ideally it should have previously been lifted and re-fixed with screws.
- 16.4.3 If this is not possible, select a board which is relatively short, with at least one end in good condition, not against a wall and with a gap at one end.
- 16.4.4 Using a block of wood or a hardened steel plate to protect the adjacent boards, work around the edge of the board to be lifted with a 6" bolster, levering to try to loosen the board, taking great care at all times not to damage the boards. Then

using the same technique work along the sides at one end until the end is free. Place a batten below the free end and gradually move this toward the next set of nails to raise them up. Remove the batten and carefully pull out the nails. Continue to remove the first board completely.

- 16.4.5 Removal of boards after the first should be continued in the same fashion and with the same protective measures. Additional wooden blocks may be required for example when lifting floorboards with a crowbar.

- 16.4.6 All boards are to be identified on their underside with a reference or number, also recorded on a drawing, to ensure that they are re-fixed in their existing locations.

16.5 WORKMANSHIP

- 16.5.1 Code Standard: Unless otherwise specified or noted on the drawings, comply with CP 112: Part 2.
Section 1: General
Section 5: Workmanship
Section 6: Inspection, Testing and Maintenance
Appendix A: sizes and grading of hardwoods and softwoods.
- 16.5.2 Sizes, Stress Grading and Spacing: of carpentry timbers to be as detailed.
- 16.5.3 Drying Out Treated Timber: Before allowing the timber to contact any other materials or components allow the preservative to dry out to the specified moisture content and sufficient to avoid damage to any other materials or components.

16.6 REFERENCES

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

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