Manchester City Art Gallery

9518 RS Architectural Restoration
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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.

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.

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.

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.

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.

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 i**mportant** 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 advice 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 terne 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 Welted Joints
Form with a 50mm overlap, 25mm underlap and copper or stainless-steel clips at not more than 450mm centres.

Welt 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 is 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 were 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 Falls

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.

6.3.4 Adverse Weather

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.

6.3.5 Protection of existing works

The Contractor must be responsible for making good any damage to existing work recently completed, or existing, adjacent building fabric.

6.3.6 Jointing width

To match existing, pointed with lime sand mortar (see 6.3.10)

6.3.7 Sub-base:

Limecrete bed 3-1 mix. Expanded lightweight clay aggregate - NHL/5

Thickness: as indicated on Civil Engineer's drawings

6.3.8 Base: as Civil Engineer's drawings

6.3.9 Accessories:

Above to be laid on Terram Geotextile membrane Ref: T1000.

6.3.10 Lime for Site Mixed Mortar

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 Appearance of Paving

Smooth and even with regular joints and accurate to line, level and profile.

6.3.12 Laying Paving

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.

6.3.13 Levels of Paving

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.

6.3.14 Regularity

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.

6.3.15 Colour Banding

Mix in old flags to be re-used with new flags to avoid large areas of discolouration

6.3.16 Protection

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.

6.3.17 Laying Geotextile Sheet Edging Strips

Location:
Immediately below laying course, abutting features which interrupt the laying course, including:

- Perimeters/ Edge restraints/ Kerbs.
- Other types of paving.
- Drainage fittings, e.g. channels and manholes.

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.

6.3.18 Tooled Joints in Mortar Bedded Units

Joints:
Completely filled with bedding mortar as work proceeds.

Joint width:
6 mm.

Finish:
Neat flush profile.

6.3.19 Completion of Paving With Dry Sand Or Fine Aggregate Filled Joints

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.

RS7 HYDRAULIC 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 SAMPLYING AND ANALYSIS. IT IS LIKELY THAT THERE WILL BE VARIANTS ACROSS THE FABRIC AND BETWEEN ORIGINAL GALLERY AND ATHENAEUM.

7.1 PRODUCT

7.1.1 Mortar to constitute 1-part Hydraulic Lime: 2½ part graded sand (from 5mm down to 75 microns) using a moderately hydraulic Lime (St. Astier NHL 2 or similar approved). For pointing of ashlar stone the graded grit is to be replaced by equal amounts of grit sand.

7.1.2 Refer to RS6 for mortar for paving.

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

7.1.4 Mixing and usage to be strictly in accordance with supplier's recommendations.

** PENDING MORTAR ANALYSIS AND SAMPLING **

7.2 MATERIALS

7.2.1 Hydraulic Lime

Hydraulic Lime or pre-mixed hydraulic lime mortar may be obtained from:

a) Womersley's Ltd.
Ravensthorpe Industrial Estate
Low Mill Lane
Ravensthorpe
West Yorkshire, WF13 3LN
Tel: 01925 400 651
Email: info@womersleys.co.uk

b) Lime Green Products Ltd.
Coates Kiln
Stretton Road
Much Wenlock
Shropshire, TF13 6DG
Tel: 01925 728 611

c) Telling Lime Limited
Booths Hall
Booths Park, Chelford Road
Knutsford
Cheshire, WA16 8GS
Tel: 01565 756 110
Email: info@tellinglime.com

d) Limetec – LMR Traditional
Office 2, Grove Street
Wantage
Oxfordshire, OX12 7AB
Tel: 01235 434 300
Email: sales@limetec.co.uk

7.2.2 Fine Aggregates

All sand shall be to BS 1199 and BS 1200:1976, well-graded non-staining clean sharp coarse sand, uncontaminated by clay/silt. Sand shall be selected so that when the mortar has dried out the colour will match the colour and texture of the original mortar, unless instructed otherwise in writing by the Architect.

The existing fabric to original Gallery and Athenaeum has very fine joints <5mm. This will require the application of fine aggregates as a larger sand grain size is likely to impede filling the joints. In these instances, fine stone dust or brick dust should replace the sand as the fine aggregate.

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

7.3 WEATHER AND PROTECTION

7.3.1 Cold Weather Working

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

7.3.2 Protection

All work is to be protected from the frost and rain

with hessian sheets for a minimum of 7 days or until the mortar has cured if longer.

In warm weather the work is to be similarly protected with hessian sheets which should be kept moist at all times to avoid quick curing.

7.3.3 Damage due to Weather

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

7.4 PROTECTION AND GOOD WORKING PRACTICE

7.4.1 For all mortar work, best practice requires proper curing and aftercare against the effects of drying winds, strong sunlight, rain, and frost. Lime mortar may require slightly longer curing times. Where scaffolding is in place, fine mesh debris netting securely fixed to the outside of the scaffold gives basic protection to the working area slowing down strong wind whilst allowing good natural light for the works. Securely fixed haps or polythene placed over plywood sheeting on to the top of the scaffold from the wall heads or just below the gutters will ensure that rain does not wash down the face of the walls.

7.4.2 Scaffolding should always be erected in such a manner as to allow the highest point of the building to be protected. In an ideal world, a temporary roof would be desirable, however the costs may be prohibitive. As regards external protection the work should be covered with hessian sheets, polythene, or both. Polythene should never come in contact with the work. Accurate records of the minimum and maximum temperatures below the covers should be taken daily, with provision to record these over weekends and holiday breaks. To avoid rapid drying and consequent high shrinkage, especially in hot or windy weather conditions 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.

7.4.3 Re-pointing

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. Often much of the old lime mortar raked out is sound and could, with advantage (appropriate access), have been left in place. It is essential that all pointing is carried out to match previously approved samples.

7.4.4 Preparation

Joints should be thoroughly cleaned from top to bottom after pre-wetting the wall.

Use brushes, low pressure compressed air or wash out the joints with a hose.

Remove all loose materials and dust. This is important as dust that is left in the joints will deplete the bond.

7.4.5 Application

Mortar should be plastic and workable but as stiff as possible. It should be pushed into the back of the joints in layers, avoiding large volumes of deep filling at all times.

7.4.6 Finishing

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.

When re-pointing joints should be raked back to approximately 25mm, thoroughly cleaned, including the top and bottom faces of the beds, ready for the new mortar. Pinning stones should not be removed, but if they are loose, they should be removed and put back during the re-pointing. Where a wall has previously been re-pointed and the pinning stones have been lost, suitable replacements should be used. The walls should be well washed to remove any dust and loose friable material making sure that the entire elevation is cleaned down to prevent staining on the walls. Impervious masonry should be dry when the work commences, however the original backing mortar should be kept damp.

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.

RS9 MASONRY REPAIRS

9.1 GENERAL / PREPARATION

9.1.1 Scope of Work

Schedule: As drawings

Records of Masonry to be Repaired:
Before starting work, use measurements and high quality digital photographs as appropriate to record bonding patterns, joint widths, specific features, etc.

Identification of masonry units to be removed, replaced, or repaired:
Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced. Transcribe markings to drawings / photographs.

9.1.2 Site Inspection

Purpose:
To confirm type and extent of repair/renovation/ conservation work shown on drawings and described in survey reports and schedules of works. Parties involved:

- Architect
- Foreman mason; and
- Structural engineer

Timing:
To suit contractors programme of work.

Instructions issued during inspection:
Confirm in writing, with drawings and schedules as required, before commencing work.

9.1.3 Removal of Fittings / Fixtures

Items to be removed and reinstated on completion of repair work:
All items fixed to fabric indicated for reuse.

- Identification:
  Attach labels or otherwise mark items using durable, non-permanent means, to identify location and describe re-fixing instructions, where applicable.
- Treatment following removal:
  as drawings
- Storage:
  Protect against damage, and store until required.
- Storage location:
  onsite.
- Reinstatement:
  Refit in original locations using original installation methods.

Items unsuitable or not required for reuse:
To be disposed of appropriately, recycling materials accordingly to reduce landfill. Disposal of materials to be in accordance with the Site Waste Management Plan (SWMP).

Masonry fabric and surfaces:
Do not damage during removal and replacement of fittings / fixtures.

9.1.4 Record of Work

General:
Record work carried out to masonry clearly and accurately using written descriptions, sketches, drawings, and photographs, as necessary.

Specific records:

a. Annotated elevation drawings to identify the location of each individual repair.
b. Photographs of damaged areas prior to removal of any material.
c. Sketches and drawings for each unique item to be replaced, fully dimensioned.
d. Photographs of each repair area following removal of the material.
e. Photographs of the finished repair.

All information is to be cross referenced and fully annotated.

9.1.5 **Structural Stability**

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

Disturbance to Retained Masonry
Retained masonry in the vicinity of repair works: Disturb as little as possible.

Existing retained masonry: Do not cut or adjust to accommodate new or reused units.

Retained loose masonry units and those vulnerable to movement during repair works: Prop or wedge so as to be firmly and correctly positioned.

9.2 WORKMANSHIP

9.2.1 All work shall comply with the general recommendations of BS 5390 part 5 – "Work on Site" or as updated.

NOTE: Masonry repairs are to be undertaken only by an approved stone mason who is a member of The Heritage Contractors Section of the Stone Federation. None registered companies or unqualified personnel will not be permitted to work on site. Contractors MUST provide references and case studies from projects undertaken within the last 3 years.

9.2.2 **Protection of Masonry Units and Masonry**

Masonry Units:
Prevent overstressing during transit, storage, handling and fixing. Store on level bearers clear of the ground, separated with resilient spacers. Protect from adverse weather and keep dry. Prevent soiling, chipping and contamination. Lift units at designed lifting points where provided.

Masonry
Prevent damage, particularly to arrises, projecting features and delicate, friable surfaces. Prevent mortar / grout splashes and other staining and marking on face work. Protect using suitable non-staining slats, boards, tarpaulins, etc. Remove protection on completion of the work.

9.3 INSPECTION AND DRAWINGS

9.3.1 Access
In any project involving masonry repairs the tender drawings will have been prepared from visual inspection only, usually without the benefit of access scaffold. ***The Contractor is to allow in his/her programme a period of 2 weeks for confirmation and appraisal of the scope of the works to each area.***

The Contractor is encouraged to be represented during the inspection in order that he/she may contribute to any discussion regarding alternative methods of repair.

9.3.2 Notice
The Contractor is to give a minimum of 48 hours' notice to the Architect of the completion of the access scaffold to each area.

9.3.3 Confirmation
Confirmation of the scope of the work will be the issue of revised drawings and confirmed following completion of the inspection from the access scaffold.

9.3.4 Scaffold
The Contractor shall ensure that all access scaffold alterations are complete and in accordance with the specification and that handover certificates have been issued before inviting inspection. Inspection will not be carried out if the scaffold is not in accordance with the specification.

9.3.5 Drawings
In most cases all working drawings will be provided by the Architect. Where fabrication drawings are required to be prepared by the Contractor for specialist areas the Contractor shall submit duplicate copies of the drawings at least two weeks before confirmation of the order for the stonework is required. No cutting of the stonework shall commence until the drawings have been approved in writing by the Architect.

9.3.6 Programme
The Contractor shall provide a programme of work based on the tender drawings before commencement of work on site. This programme shall indicate separately the erection/alteration(s) sequence for access scaffold inspection period, order period and works on site for reach area of work.

9.4 MATERIALS

9.4.1 Stone

Stone is to be selected to closely match existing in texture and colour. Wherever possible stone is to be obtained from the original quarry, though the supply of stone must be commercially available for the duration of the works.

Contractor is to liaise with stonemason to provide appropriate samples for approval by the architect / conservation officer prior to commencement of works.

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

Where dressed stone is to be used then samples of new stone with a dressed face shall also be provided for approval.

Where stone has a tooled face then samples of new stone with a tooled face shall also be provided for approval.

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

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.

9.4.2 Dowels and Cramps

All dowels and cramps are to be as manufactured by Ancon Clarke Ltd., Olive Grove Road, Sheffield. S2 3GB (or equal approved) and are to be manufactured in austenitic stainless steel to BS 1449-2:1983 or as updated. Typical details for cramping are contained in the appendix to the specification.

Bronze cramps may also be used subject to prior written approval.

9.4.3 Resin

All resins shall be approved in writing before use. The Contractor is to supply full technical details of proposed resins with his tender or where the work is additional to the contract, not less than 2 weeks before intended use.

9.4.4 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 shall be erected to the approval of the local water authority.

9.4.5 Mortar

Hydraulic lime mortar as specification clause: RS7– Hydraulic Lime Mortar.

9.5 PROTECTION, STORAGE AND CLEANING

9.5.1 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.

9.5.2 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 to protect the historic fabric from damage.

9.5.3 Storage

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

9.5.4 Lifting

The Contractor shall provide adequate lifting gear to unload and handle stones into position.

9.5.5 Storage on Scaffolding

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

9.5.6 Protection of Finished Work

Cover arrises, moulds, carving and other finished work to protect from accidental damage. Protection is to be maintained until completion of all work in that vicinity.

9.5.7 Cleaning of Work

Keep facework clean and free from staining at all

times.

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

9.6 DISMANTLING / REBUILDING

9.6.1 Masonry units to be reused:
Remove carefully and in one piece.

- Treatment:
  Clean off old mortar, organic growths, and dirt, and leave units in a suitable condition for rebuilding.

- Identification:
  Mark each unit clearly and indelibly on a concealed face, indicating its original position in the construction. Transcribe markings to drawings / photographs.

9.6.2 Rebuilding:
Replacement materials: as indicated in specification and drawings.

9.6.3 Mortar:
as section RS7 – Hydraulic Lime Mortar

9.6.4 Mix:
as section RS7 – Hydraulic Lime Mortar

9.6.5 Sand / Source Type:
as section RS7 – Hydraulic Lime Mortar

9.6.6 Fixings:
Cramps and dowels as clause as section
RS9 – Masonry Repairs

9.6.7 Rebuilding:
To match previous face and joint lines, joint widths and bonding. Adequately bonded to retained work / backing masonry, as appropriate.

9.6.8 Joint Surfaces:
Dampen, as necessary, to control suction.

9.6.9 Laying masonry units:
On a full bed of mortar; perpend joints filled.

9.6.10 Exposed faces:
Remove mortar and grout splashes immediately.

9.6.11 Joints: to match existing

9.7 LAYING OF STONE

9.7.1 Natural Bed
New stonework shall be prepared such that the natural bed is:

1. Horizontal for plain walling works.

2. Vertical and at right angles to wall face for cornices and other projecting stones.

3. Horizontal in quoin stones or end stones. These shall be specially selected to ensure that they are compact non-laminated stones.

Further bedding details are contained in the BRE publications for the relevant type of stone. These are summarised in diagrammatic form in the appendices.

9.7.2 Bedding
All stones shall be laid on a full and even bed of hydraulic lime mortar as specification clause:
RS7 – Hydraulic Lime Mortar.

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

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

9.8 REPAIRS TO STONEWORK

9.8.1 General
All repairs will be identified during the inspection and will be indicated on the drawings. And

All areas for repair are to be marked up from the drawings on site by the Contractor and agreed with the Architect prior to commencing cutting out.

9.8.2 Repair Techniques
Repairs to stonework will be one of the following as noted on the drawings

(A) Full block replacement
(B) Part block replacement
(C) Full face replacement
(D) Partial face replacement
(E) Carved work replacement

(F) Carved item replacement
(G) Indent repair
(H) Crack injection/resin repair
(I) Redressing
(J) Stitch repair
(K) Plastic repair

Each repair technique is described below and highlighted on the drawings.

9.8.3 Cutting Out

Cutting out decayed stonework to permit new stones of the specified depth for the appropriate repair to be inserted.

Cutting out can be carried out by mechanical means provided that extreme care is taken to ensure that the adjoining stones are not damaged. This work should be undertaken by skilled stonemasons only.

The stones should be cut to the central section's only by mechanical means ensuring that the perimeter is undamaged. The stone is then to be cut back by hand to the required depth.

If any damage occurs to adjoining stones, then the stone is to be replaced at the Contractor's expense at the discretion of the Architect.

In certain areas previous plastic repairs may have to be removed. In this case the Contractor should note that the plastic repair may be harder than the original stonework and great care is to be exercised to ensure no unnecessary damage occurs to the existing stone.

9.8.4 Temporary Support

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

9.8.5 Existing Ferrous Cramps

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

9.8.6 Cleaning Out

All areas cut out to be cleared of debris mortar etc and washed clean. Care is to be taken not to saturate the stone.

Any defects noted in the stone after cutting back or in the masonry backing are to be reported to the Architect.

9.8.7 Moistening

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

9.9 (A) FULL BLOCK REPLACEMENT

9.9.1 Preparation

The existing stone block is to be cut out to its full depth and the backing masonry inspected.

9.9.2 Installation

New stone is to be inserted on a bed and backing of 1:2:9 cement lime sand mortar. Mortar is to be kept back 25mm from the face of the stone to allow for later pointing.

9.10 (B) REPLACEMENT OF PART OR FULL BLOCK

9.10.1 Preparation

The existing stone block is to be cut out to an agreed line or as shown on the drawing to its full depth. The remaining edge of the block is to be hand dressed to form a new arris ensuring that the adjoining stones are not damaged in any way for ashlar work. The arris is to be formed perfectly plumb and true and at right angles to the face of the block. The backing masonry is to be inspected and any defects reported to the Architect. The backing masonry is to be drilled to receive resin anchors and the adjoining stones drilled to receive dowels.

9.10.2 Installation

New stone is to be bedded in hydraulic lime mortar and cramped and doweled in position.

9.11 (C) FULL FACE REPLACEMENT

9.11.1 General

Where the stone is of sufficient thickness a 100mm indent repair is to be used. This repair may not be used on stone less than 200mm thick and in circumstances where the existing stone thickness varies the Contractor is to inform the Architect when the remaining thickness of the

stone after removal of the face is less than 100mm.

9.11.2 Preparation
Existing block is to be cut back to a depth of 100mm from the front face of the surrounding stonework.

The existing stone is to be drilled to receive resin anchors and the adjoining stones drilled to receive dowels.

9.11.3 Installation
The new stone slab is to be bedded in hydraulic lime mortar and cramped and doweled in position as detailed below. The mortar bed is to be kept back 25mm to allow for pointing.

9.12 (D) PARTIAL FACE REPLACEMENT

9.12.1 General
Where the stone is of sufficient thickness a 100mm indent repair is to be used. This repair may not be used on stone less than 200mm thick and in circumstances where the existing stone thickness varies the Contractor is to inform the Architect when the remaining thickness of the stone after removal of the face is less than 100mm.

9.12.2 Preparation
The existing block is to be cut back to a as agreed with the Architect or as indicated on the drawings to a depth of 100mm from the face of the surrounding stonework. A new arris is to be formed by hand in the position agreed for ashlar work. The arris is to be plumb and true and square to the face of the stone.

9.12.3 Installation
The existing stone is to be drilled to receive resin anchors and the adjoining stones drilled to receive dowels.

New stone slab is to be bedded in hydraulic lime mortar and cramped and doweled in position as detailed below. The mortar bed is to be kept back 25mm to allow for pointing.

9.13 (E) CARVED WORK REPLACEMENT

9.13.1 General
Where carved or projecting stones are identified for replacement the decayed stone shall be cut back to a depth which will ensure that the centre of gravity of the stone to be inserted is contained within the line of the masonry wall. The minimum depth is to be 100mm, but the Contractor is to allow within his rates for any increased depth required to suit individual profiles.

9.13.2 Preparation
The section of decayed stonework is to be cut back to the lines agreed with the Architect and cleaned out of all debris and mortar and rinsed out with clean water.

Any defect in the remaining stone is to be reported to the Architect.

9.13.3 Installation
New stone may be carved prior to placing but must be finished after placing to ensure satisfactory junction with the adjoining stones. Stone is to be bedded in Lime mortar as specification RS7 – Hydraulic Lime Mortar; unless specified elsewhere and mortar is to be kept back 25mm from the face to facilitate later pointing.

9.13.4 Backing stone is to be drilled to receive resin anchors and stainless-steel cramps and adjoining stones are to be drilled to receive dowels as detailed below. If the specified cramps and dowels cannot be achieved the Contractor is to advise the Architect is to instruct on alternatives after the decayed area has been cut out.

9.14 (F) CARVED ITEM REPLACEMENT

9.14.1 General
Where an entire item of carved work is specified for replacement then the original decayed item shall be carefully cut out, any existing dowels, cramps, etc are to be removed.

New stone is to be specially selected for its compactness and is to be worked to the required profiles.

9.14.2 Installation
New stone may be carved prior to placing but must be finished after placing to ensure satisfactory junction with adjoining stones. Stone is to be bedded in lime mortar as specification RS7 – Hydraulic Lime Mortar; unless specified elsewhere and the mortar is to be kept back 25mm from the face to facilitate later pointing.

9.15 (G) INDENT REPAIR

9.15.1 General
Cut out area of stone identified to a depth of 50mm for indents of 100mm, 65mm for indents up to 150mm and 75mm for indent repairs to a maximum of 300mm.

9.15.2 Preparation
Carefully form neat arrises to all sides ensuring that no damage occurs to the adjoining stones. Carefully square off the back of the recess and clean out all debris, mortar etc.

9.15.3 Installation
New stone is to be inserted on a bed of resin with arrises tight to the original stone. Joint thickness to the original arrises of the block is to be consistent with the original mortar joints.

Ensure that resin is kept back from the mortar joint positions by 25mm to facilitate later pointing.

Indent repair is to be fully supported until the resin has cured.

9.16 (H) CRACK INJECTION

9.16.1 General
Crack injection will only be used in limited areas where other forms of repair cannot satisfactorily be executed without significant loss of the historic fabric.

9.16.2 Preparation
Any loose material is to be scraped away using a hacksaw blade and the joint washed out with a syringe and clean water to remove all dust and debris.

9.16.3 Installation
Resin is to be injected into the crack and finished flush to the stonework. It is important to ensure that the resin is injected to the full depth of the crack and that it is completely filled. No resin should be visible on the surface of the stonework.

A cured sample of the resin is to be approved by the Architect prior to commencing repair.

Where the crack is too wide to be repaired with resin then the crack shall be filled with 1:2:9 cement: lime: sand mortar pushed back firmly into the crack ensuring that the crack is completely filled.

The use of mortar repairs rather than resin is to be subject to the Architects approval.

9.16 (I) REDRESSING

9.16.1 General
When surface failure has occurred, the stonework can be redressed to its original profile. This should be undertaken by a skilled stonemason(s). Generally, only 15-25mm of the eroded stone is removed to allow realignment to the original profile. This technique is used for eroded stone deeply embedded within a wall which itself has minimal decay yet is disfigured.

Where damage to stone is superficial this can be rectified by redressing the stone.

The area to be redressed is to be agreed with the Architect on site prior to the contractor carrying out any further works.

The redressing of stonework will generally remove all spalling / friable / sheered areas of masonry vulnerable to becoming loose.

9.16.2 Preparation
The stone is to be taken back the minimum possible to achieve a sound free draining surface using hand tools as appropriate.

9.16.3 Installation
If the existing stone had a tooled face, the new stone will be tooled to match the original detail.

Where it is agreed that only part of the stone is to be redressed, the redressed area is to be feathered neatly into the untreated area.

9.17 (J) Stitch Repair

9.17.1 Where specified the adjoin joints to both sides of the defect are to be raked out to a depth of 50mm (or as specified by the structural engineer) and to at least 450mm beyond the line of the defect.

9.17.2 Raked out joints are to be cleaned out of all debris.

9.17.3 Helical stainless-steel tie rods are to be inserted into the joints at the specified centres.

9.17.4 Joints are to be fully repointed with all mortar fully compacted and pointed to match the surrounding masonry.

9.18 (K) PLASTIC REPAIR

9.18.1 General

Plastic repairs will normally not be used except in exceptional circumstances. It is essential that any plastic repair is correctly carried out to avoid damage to the adjoining stonework.

9.18.2 Preparation

Decayed and damaged stone is to be cut back to a minimum depth of 25mm from the face of the original stonework, or until sound stonework is located whichever is deeper. All loose material debris and mortar is to be removed and the recess thoroughly cleaned. The recess is to be rinsed in clean water.

9.18.3 Installation

Repair is to be carried out using a plastic mortar consisting of hydraulic lime and stone dust.

Samples of repair mortar are to be prepared and approval obtained prior to commencement of repairs. The mix is to be adjusted to ensure that, when dry, the mortar matches the existing stone in colour and texture. The mortar mix should be softer than the stone to avoid future damage.

Stainless steel reinforcement is to be secured with resin into the recess and the resin allowed to cure before commencing the repair.

Moisten the recess and build up in maximum 10mm thick layers of repair mortar, to the required depth allowing each layer to cure before applying the next. The last layer shall be finished to profiles to match the adjoining stone.

RS14 MASONRY CLEANING: REMOVAL OF ORGANIC GROWTH

14.1 REMOVAL OF ORGANIC GROWTH

14.1.1 **Removal of Plant Growths from Masonry**

Cleaning works as clauses:
RS9 – Masonry Cleaning: General Requirements

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

14.2 MATERIALS

14.2.1 **Hot Box Water Jet**

The use of a 'DOFF' Hot Box water cleaning system or similar approved is considered the most appropriate way to effectively kill off all organic growth other than significant 'woody growth'. This should be used in preference to a biocide unless directed otherwise.

DOFF system to be used in conjunction with DRS steam / water vacuum recovery unit.

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.

DOFF cleaning system uses steam as the cleaning agent. A normal water supply is taken into the high-pressure pump where the pressure is increased to the required level before it enters the hot box. The temperature is increased up to 150˚C if necessary before it passes to the heat resistant nozzle where special jets direct the steam onto the surface to be cleaned. The DOFF system will effectively remove paint, bitumen, oil, and grease, chewing gum, algae etc from virtually all surfaces including brick, stone, concrete, tiles, terracotta, wood, stucco. Consult with Stone Health, Tel: 01453540600, www.stonehealth.com where additional specifications / information can be provided.

NOTE: Cleaning using the DOFF / TORC system should only be undertaken by contractors on the approved list compiled by Stone Health Ltd and will be part of the Rosette Approved Contractors as per RS13 13.1.4 above.

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.

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.

14.2.3 **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.


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