

CSM

Architectural Restoration Specification  
Ref:9874RS





**Contents**

RS7    HYDRAULIC LIME MORTAR ..... 4

RS8    MASONRY REPAIRS ..... 7

RS9    POINTING OF ASHLAR ..... 15

RS10   BRICK REPAIRS..... 17

RS11   POINTING OF BRICKWORK..... 20

RS12   MASONRY CLEANING: GENERAL REQUIREMENTS..... 22

RS13   MASONRY CLEANING: REMOVAL OF ORGANIC GROWTH..... 28

## 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 9450 drawings and Architectural Specification**. 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 HYDRAULIC LIME MORTAR

### 1.1 PRODUCT

- 1.1.1 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.

Allow to take core samples of original pointing of existing lime mortars to all areas of coping and brickwork. Prepare sample of matching lime mortars for approval by architect.

- 1.1.2 The exact mortar mix and strengths to be adopted will come following onsite sampling and analysis. It is likely that there will be variants across the fabric.

- 1.1.3 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 3.5 or similar approved). For pointing of ashlar stone the graded grit is to be replaced by equal amounts of grit sand. \*Pending mortar analysis and sampling.

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

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

### 1.2 MATERIALS

- 1.2.1 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](mailto: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](mailto:info@tellinglime.com)

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

#### 1.2.2 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.

For work requiring very fine joints in the masonry sand grain size may impede filling the joints. In these instances, fine stone dust or brick dust should replace the sand as the fine aggregate.

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

### 1.3 WEATHER AND PROTECTION

#### 1.3.1 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.

- 1.3.2 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.
- 1.3.3 Damage due to Weather  
Any work affected by the weather is to be cut out and replaced at the Contractor's expense.
- 1.4 PROTECTION AND GOOD WORKING PRACTICE**
- 1.4.1 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.
- 1.4.2 Scaffolding should always be erected in such a manner as to allow the highest point of the building to be protected – a temporary roof is desirable. 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.
- 1.4.3 Re-pointing
- 1.4.4 Rake out to min. of 30mm deep and repoint rebated sandstone coping cross joints where previous steel caps have been removed. Strip out remainder to metal caps to copings and fully point all open mortar rebated cross joints to view depth of mortar required over 30mm. No later
- claims for additional pointing will be considered post tender.
- 1.4.5 Before any re-pointing work is undertaken, a survey of the building should be carried out by the architect and the contractor to determine the precise areas to be re-pointed. Often much of the old lime mortar raked out is sound and could, with advantage (appropriate access), have been left in place. It is essential that all pointing is carried out to match previously approved samples.
- 1.4.6 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.
- 1.4.7 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.
- 1.4.8 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.

## RS2 MASONRY REPAIRS

### 2.1 GENERAL / PREPARATION

#### 2.1.1 Scope of Work

Schedule:

Generally, as description and drawings.

Records of Masonry to be Repaired:

Before starting work, use measurements and 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.

#### 2.1.2 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:

- Contract Administrator
- 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.

#### 2.1.3 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 schedule.

- 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.

#### 2.1.4 Removal of Plant Growths from Masonry

Cleaning works as clauses:

**RS12 – Masonry Cleaning: General Requirements**

**RS13 – Masonry Cleaning: Removal of Organic Growth.**

Plants, root systems and associated soil/debris:

Carefully remove from joints, voids, and face work.

#### 2.1.5 Removal of roots:

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

#### 2.1.6 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.

### 2.1.7 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.

### 2.1.8 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.

## 2.2 WORKMANSHIP

- 2.2.1 All work shall comply with the general recommendations of BS 5390 part 5 – Work on Site.

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.

### 2.2.2 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.

## 2.3 INSPECTION AND DRAWINGS

### 2.3.1 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 may contribute to any discussion regarding alternative methods of repair.

### 2.3.2 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.

2.3.3 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.

2.3.4 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.

2.3.5 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.

2.3.6 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.

## 2.4 MATERIALS

2.4.1 Stone  
Stone is to be selected to match existing sandstone in texture and colour. Wherever possible stone is to be obtained from the original quarry.

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.

2.4.2 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. Typical details for cramping are contained in the appendix to the specification.

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

2.4.3 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.

2.4.4 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.

2.4.5 Mortar  
Hydraulic lime mortar as specification clause: [RS7 – Hydraulic Lime Mortar](#).

## 2.5 PROTECTION, STORAGE AND CLEANING

2.5.1 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.

- 2.5.2 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.

- 2.5.3 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.

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

- 2.5.5 Storage on Scaffolding  
Only stone for immediate use shall be stored on the scaffold.

- 2.5.6 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.

- 2.5.7 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.

## 2.6 DISMANTLING / REBUILDING

- 2.6.1 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.

- 2.6.2 Rebuilding:  
Replacement materials: as indicated in specification and drawings.

- 2.6.3 Mortar:  
as section [RS7 – Hydraulic Lime Mortar](#)

- 2.6.4 Mix:  
as section [RS7 – Hydraulic Lime Mortar](#)

- 2.6.5 Sand / Source Type:  
as section [RS7 – Hydraulic Lime Mortar](#)

- 2.6.6 Fixings:  
Cramps and dowels as clause as section [RS8 – Masonry Repairs](#)

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

- 2.6.8 Joint Surfaces:  
Dampen, as necessary, to control suction.

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

- 2.6.10 Exposed faces:  
Remove mortar and grout splashes immediately.

- 2.6.11 Joints:  
to match existing.

## 2.7 LAYING OF STONE

- 2.7.1 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.

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

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

- 2.7.4 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.

## 2.8 REPAIRS TO STONWORK

- 2.8.1 General  
All repairs will be identified during the inspection and will be indicated on the drawings. Refer to 9450 drawing series for details, along with any other fabric repair drawing and specification.

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.

- 2.8.2 Repair Techniques  
Repairs to stonework will be one of the following as noted on the 9450 drawing series.

- |     |                              |
|-----|------------------------------|
| (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.

- 2.8.3 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 Contractors 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.

- 2.8.4 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.

- 2.8.5 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.

- 2.8.6 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.

- 2.8.7 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.

## **2.9 (A) FULL BLOCK REPLACEMENT**

### **2.9.1 Preparation**

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

### **2.9.2 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.

## **2.10 (B) REPLACEMENT OF PART OR FULL BLOCK**

### **2.10.1 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.

### **2.10.2 Installation**

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

## **2.11 (C) FULL FACE REPLACEMENT**

### **2.11.1 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.

### **2.11.2 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.

### **2.11.3 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.

## **2.12 (D) PARTIAL FACE REPLACEMENT**

### **2.12.1 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.

### **2.12.2 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.

### **2.12.3 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.

## **2.13 (E) CARVED WORK REPLACEMENT**

### **2.13.1 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.

### **2.13.2 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.

2.13.3 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.

- 2.13.4 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.

## 2.14 (F) CARVED ITEM REPLACEMENT

2.14.1 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.

2.14.2 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 **RS4 – Hydraulic Lime Mortar**; unless specified elsewhere and the mortar is to be kept back 25mm from the face to facilitate later pointing.

## 2.15 (G) INDENT REPAIR

2.15.1 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.

2.15.2 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.

2.15.3 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.

## 2.16 (H) CRACK INJECTION

2.16.1 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.

2.16.2 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.

2.16.3 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.

## 2.16 (I) REDRESSING

2.16.1 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.

#### 2.16.2 Preparation

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

#### 2.16.3 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.

### 2.17 (J) Stitch Repair

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

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

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

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

### 2.18 (K) PLASTIC REPAIR

#### 2.18.1 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.

#### 2.18.2 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.

#### 2.18.3 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.

## RS3 POINTING OF ASHLAR

### 3.1 GENERAL

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

The Contractor is to undertake a hammer test to all sandstone string band features and arch projections and report any defects to architect prior to commencement of works. Allow for repairs following test.

### 3.2 SAMPLE PANELS

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

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

### 3.3 PREPARATION

- 3.3.1 All joints are to be raked out to a depth of 25mm using a fine-toothed saw blade or hooked knife. Extreme care is to be taken to avoid damage to the arris or dislocation of the stone. Under no circumstances shall a chisel and bolsters be used. Under no circumstances will the use of mechanical tools be permitted (disc cutters etc.).
- 3.3.2 There are power tools that use oscillating blades to clean out joints; care must be taken with these, especially if the stone is softer than the mortar, as the blade can slide off the mortar and cut into the stone.
- 3.3.3 Joints are to be flushed out using a large (30cc) hypodermic syringe and clean water until the water runs clear.
- 3.3.4 The tenderer is to allow for the insertion of a backing 'rod'. This item is to be confirmed during

the preparation of the sample area.

- 3.3.5 The backing rod is to be fine waxed string or string coated with petroleum jelly, stretched, and twisted several times prior to inserting to the back of the prepared joint with a knife blade.

### 3.4 FILLING AND POINTING

- 3.4.1 Mortar is to be as described in the lime mortar specification [RS7 – Hydraulic Lime Mortar](#).
- 3.4.2 Filling is to be by the taping and pointing method.
- 3.4.3 The prepared joints are to be covered with 50mm heavy duty carpet tape applied to the stone. The tape is to be slit along the joint line with a sharp knife. It should be noted that the stone will need to be dry for the tape to adhere.
- 3.4.4 The mortar is to be introduced into damp joints and compressed with a purpose made pointing iron/key. Mortar is to be thoroughly compacted into the joints.
- 3.4.5 The mortar is to be pointed firmly into the joints and finished with a very slight recess (not more than 1mm deep).
- 3.4.6 Adhesive tape is to be carefully removed ensuring that no residue of adhesive is left on the stone.
- 3.4.7 Clean off any surplus or spread of mortar with a clean pointing trowel.
- ### 3.5 PROGRESS
- 3.5.1 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.
- 3.5.2 No taping or filling of joints is to proceed until preparation has been inspected and approved by CA.

- 3.5.3 Taping, filling, and pointing is to be carried out in small areas such that all operations in one area can be completed within the working day with due notice being paid to any potential adverse weather conditions.
- 3.5.4 Work is to be kept clean from mortar spillage at all times.
- 3.5.5 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.
- 3.5.6 Completed areas are to be protected until cured.

## RS4 BRICK REPAIRS

### 4.1 MATERIALS

4.1.1 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.

4.1.2 Bricks shall be free from the presence of fungal attack, visible salts, paint, lime wash or other substances.

Replacement bricks to chimney to be frost-resistant.

#### 4.1.3 Ties

Ties to cavity work 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.

#### 4.1.4 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.

#### 4.1.5 Mortar

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

### 4.2 INSPECTION

4.2.1 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.

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

#### 4.2.3 Notice

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

#### 4.2.4 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.

#### 4.2.5 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.

#### 4.2.6 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.

## **4.3 PROTECT, STORAGE AND CLEANING**

### **4.3.1 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.

### **4.3.2 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.

### **4.3.3 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.

### **4.3.4 Storage on Scaffolding**

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

### **4.3.5 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.

### **4.3.6 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 if lime mortar has been used for pointing.

## **4.4 CUTTING OUT OF DEFECTIVE BRICKWORK**

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

- 4.4.2 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.

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

- 4.4.4 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.

- 4.4.5 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.

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

- 4.4.7 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.

## **4.5 INSERTING NEW BRICKWORK**

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

- 4.5.2 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.

- 4.5.3 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.

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

- 4.5.5 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.

- 4.5.6 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.

## **4.6 REPAIRS TO CHIMNEYS**

- 4.6.1 Chimney pots to be replaced with like-for-like replacements, supplied by;

WT Knowles Ltd

Ash Grove Sanitary Pipe Works,  
Elland Rd,  
Halifax  
West Yorkshire, HX5 9JA  
Tel: 01422 370 900  
Email: [sales@wtknowles.co.uk](mailto:sales@wtknowles.co.uk)

Install in accordance with manufacturer's instructions.

- 4.6.2 Remove resin-anchored, 15mm former pull test bolts from chimney and repoint any subsequent holes made by redundant fixings.
- 4.6.3 Remove existing 50x12.5mm strap banding to chimney capping and replace with galvanised mild steel strapping of equivalent size.
- 4.6.4 Wire brush, apply a zinc primer and 1 no. undercoat followed by 1 no. finish coat of gloss to retained chimney strapping.
- 4.6.5 Carefully remove remainder of defective flaunching to chimney and renew with NHL 5 lime mortar as specification [RS7 – Hydraulic Lime Mortar](#).
- 4.6.6 Check both chimneys are free of obstructions and ensure chimneystacks provide through ventilation full height of building. Report any defects to architect.

## RS5 POINTING OF BRICKWORK

### 5.1 GENERAL

- 5.1.1 The Contractor's attention is drawn to the fact that in some cases the joints between bricks are extremely fine and will demand a great deal of care and attention on site to the preparation, filling and pointing.
- 5.1.2 Pointing should commence from the top of the building and work down when undertaking fabric repair works.

### 5.2 SAMPLE PANELS

- 5.2.1 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 is to be agreed with the Architect prior to commencement.
- 5.2.2 The contractor is to allow for several sample mixes using different coloured fine aggregate to obtain a satisfactory colour for the pointing.

### 5.3 PREPARATION

- 5.3.1 All joints are to be raked out to a depth of 25mm using a fine-toothed saw blade or hooked knife. Extreme care is to be taken to avoid damage to the arris of the brick. Under no circumstances shall chisel and bolsters be used.
- 5.3.2 Under no circumstances will the use of mechanical tools be permitted (disc cutters etc.)
- 5.3.3 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.
- 5.3.4 Joints are to be flushed out using clean water until the water runs clear. Where very fine joints are encountered a large hypodermic syringe shall be used to flush the joints.

### 5.4 FILLING AND POINTING

- 5.4.1 Mortar is to be as specified in accordance with the mortar specification.
- 5.4.2 The mortar is to be introduced into damp joints and compressed with a purpose made pointing iron/key of approximately 30mm diameter giving a shallow "bucket handle" joint. Mortar is to be thoroughly compacted into the joints.
- 5.4.3 Care is to be taken to eliminate lines of mortar occurring on joint intersections, mortar should flow visually from perpend to bed joints.
- 5.4.4 Clean off any surplus or spread of mortar with a clean pointing trowel.
- 5.4.5 The joint is to be lightly brushed as mortar is achieving its first set to remove the mechanical smoothness left by the pointing iron.

### 5.5 PROGRESS

- 5.5.1 The works are to be co-ordinated such that preparation is carried out to agreed areas and made available for inspection by the Architect. The Contractor is to give at least 48 hours' notice for inspection.
- 5.5.2 No filling of joints is to proceed until preparation has been inspected and approved by Architect.
- 5.5.3 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.
- 5.5.4 The work is to be kept clean from mortar spillage at all times.
- 5.5.5 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.

5.5.6 Completed areas are to be protected until cured.

## **5.6 CLEANING**

5.6.1 Clean down all areas on completion using clean water and bristle brushes only.

5.6.2 Acid cleaners should not be used when lime mortar is present.

## RS6 MASONRY CLEANING: GENERAL REQUIREMENTS

### 6.1 GENERAL

- 6.1.1 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.
- 6.1.2 The scope of the work is 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.
- Refer to 9450 drawing series for further information.
- No claim will be entertained for failure to appreciate the difficulties in executing the works.
- 6.1.3 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.
- 6.1.4 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.

### 6.2 PREPARATION

- 6.2.1 **Scope of Work**  
Stonework and masonry to as indicated on marked up drawings.
- 6.2.2 **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.
- 6.2.3 **Removal of Fittings**
- Timing:  
before commencement of cleaning works.
- Disturbance to surfaces:  
minimise.
- 6.2.4 **Vents and Grilles**  
Protect but do not seal up ventilation grilles, air bricks, or other ventilation opening without first seeking instructions.
- Cut out 72 no. 225x225mm high level air bricks as specification [RS10 – Brick Repairs](#) in the following locations, to accept new insect mesh;  
20 no. to north elevation  
16 no. to east elevation  
20 no. to south elevation  
16 no. to west elevation
- Install stainless steel 304 expanded insect mesh to the rear of each brick. Mesh to be 0.18mm thickness with apertures of 0.88mm or equal approved. Renew red terracotta as required and lay using 3.5 NHL lime mortar.
- NOTE: There is a protected bees nest within masonry to south-east elevation. Allow to work around bees and nests known to be in the vicinity of the building and avoid disturbance.
- 6.2.5 **Control and Disposal of Wash Water and Detritus**  
Disposal: Safely. Obtain approvals from relevant authority.
- 6.2.6 **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.

#### 6.2.7 **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.

#### 6.2.8 **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 CA.

#### 6.2.9 **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.

#### 6.2.10 **Cleaning Generally**

##### Operatives:

Use operatives who are skilled Stonehealth Approved, having 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 CA on request.

##### Control of Cleaning:

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

##### Detritus:

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.

##### 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 CA.

#### 6.2.11 **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.

#### 6.2.12 Trial Samples

Trial Samples reference is required for all cleaning methods.

##### Surface:

Masonry and stonework.

##### Location / Size:

Location to be agreed but no less than 2sq.m per sample.

##### Type of soiling:

- Atmospheric soiling.
- Biological growth
- Bird droppings
- Fire damage

##### Cleaning Methods:

as specified.

#### 6.2.13 Records:

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

### 6.3 HEALTH AND SAFETY

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

6.3.2 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.

### 6.4 SAMPLE PANELS

6.4.1 Although the basic cleaning method has been established there is a requirement for sample panels to be carried out to ensure that the Contractor is aware of the standard required. 3no. sample panels of each substrate to be cleaned are to be carried out under the direction of the Architect in locations previously agreed with the Architect. Each sample panel will be approximately 1 square metre as item **RS 11.2.1**.

6.4.2 Sample panels will be executed prior to commencement of the works and will be carried out by experienced operatives who will be working on the project. The purpose of the

sample panels is:

a) to confirm the method, working pressures etc. to be used and;

b) to ensure that the site operatives are familiar from the start with the project requirements. For this reason, it is imperative that the operative executing the trials should be actively involved in the works.

6.4.3 Area around sample panels shall be protected as required for the main works.

### 6.5 PROTECTION

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

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

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

6.5.4 Where cleaning is internal all fixtures and fittings which cannot be removed are to be fully protected. Statues and any areas of ornate carving are to be protected with ply box covers and heavy-duty polythene.

6.5.5 Decorative ironwork is to be fully protected. Where ironwork would puncture polythene a protective layer of expanded polystyrene, foam or similar approved material is to be taped in position prior to installing heavy duty polythene

which shall be fully taped.

- 6.5.6 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.
- 6.5.7 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.
- 6.5.8 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.
- 6.5.9 No cleaning operations shall commence until all protection is in place.
- 6.5.10 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.

## 6.6 PRODUCTS / EQUIPMENT

### 6.6.1 Compatibility of Chemical Products

#### Products:

Compatible and produced by the same manufacturer.

### 6.6.2 Surface Biocides

#### Types:

Registered by the Health and Safety Executive (HSE) and listed on the HSE website under non-agricultural pesticides.

### 6.6.3 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 05.2015.p

  
DOFF Risk  
Assesment - 31-05-1

  
DOFF Risk  
Assesment for site -

  
DRS Instructions  
for use.pdf

### 6.6.4 TORC ABRASIVE CLEANING

#### **Equipment type:**

Stonehealth TORC

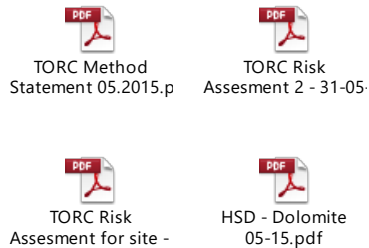
Apply abrasive at the lowest pressure that will remove deposits whilst causing the minimum of abrasion to the surfaces(s). Where deposits are ingrained seek instructions.

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

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

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

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



#### 6.6.5 **CLEANING MINERALIC SUBSTRATES**

##### **Equipment Type:**

Stonehealth CLEANFILM

Cleanfilm refers to the Stonehealth latex cleaning system for internal cleaning, without the use of water.

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

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

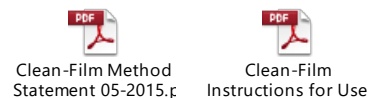
- a) Areas should be representative of the substrate, soiling and detail of the main works.
- b) Test panels should be positioned discreetly.
- c) Location of the test areas must be recorded and protected from further alteration.
- d) The parameters by which the result is obtained must be recorded.
-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

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

into the correct use of Cleanfilm.

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

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



## **6.7 APPLICATION**

### **6.7.1 Removal of Loosely Adhered Deposits**

#### Timing:

Before commencement of other cleaning methods.

#### Surfaces:

Prevent damage, including abrasion.

### **6.7.2 Biocide Application**

#### Preparation:

Remove loose growths.

#### Surfaces:

Prevent damage, including abrasion.

#### Biocide Treatment:

Appropriate solutions to kill growths and inhibit further growths.

#### Dead growths:

Remove.

#### **Abrasive Blocks**

#### Types:

Suitable grades of carborundum OR gritstone.

#### Application:

Lubricate with water. Remove detritus.

#### Abrasive Power Tools:

Prohibited.

### **6.7.3 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.

## **6.8 COMPLETION**

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

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

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

Give the CA two weeks' notice before striking each stage of scaffolding, to allow for final inspections.

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

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

## RS7 MASONRY CLEANING: REMOVAL OF ORGANIC GROWTH

### 7.1 MATERIALS

#### 7.1.1 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.

BS 8221-1:2012 Code of practice for cleaning and surface repair of buildings. Cleaning of natural stone, brick, terracotta, and concrete.

**DOFF cleaning system** uses steam as the cleaning agent. A normal water supply is taken into the high-pressure pump where the pressure is increased to the required level before it enters the hot box. The temperature is increased up to 150°C if necessary before it passes to the heat resistant nozzle where special jets direct the steam onto the surface to be cleaned. The DOFF system will effectively remove paint, bitumen, oil, and grease, chewing gum, algae etc from virtually all surfaces including brick, stone, concrete, tiles, terracotta, wood, stucco. Consult with Stone Health, Tel: 01453540600, [www.stonehealth.com](http://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 [RS12 12.2.14](#) above.

Sample areas should always be undertaken prior to commencement of wholesale cleaning package(s) as per [RS12 12.4](#) above.

#### 7.1.2 Biocide

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.

#### 7.1.3 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.

### 7.2 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.

### **7.3 PROTECTION**

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

### **7.4 HEALTH AND SAFETY**

- 7.4.1 Biocide should be one approved by the HSE Pesticide Registration Division.
- 7.4.2 The Contractor shall be responsible for ensuring that all products used, and all procedures adopted comply in full with current Health and Safety requirements.
- 7.4.3 Contractor shall ensure all recommended Personal Protection Equipment be worn by his operatives.
- 7.4.4 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.

### **7.5 STORAGE**

- 7.5.1 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.
- 7.5.2 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.
- 7.5.3 Any biocides stored on site shall be kept in securely locked areas with toxic hazard sign.

Buttress 