Methodology and Specification for Repairs to Masonry

Rossetti Studios, Flood Street, London, SW3 5TF
Contents

1. Methodology for Repairs to Historic 1
2. Photographs of masonry 2
3. Methodologies for specific types of work 4
4. C41 Stonework Repair Specification 6
5. C42 Brick Repair Specification 15

Contact information
Aimée Felton
aimee.felton@insall-architects.co.uk
Tel: 020 7245 9888
London Office
12 Devonshire Street
London, W1G 7AB
www.insall-architects.co.uk
1.0 Methodology for Repairs to Historic Fabric

Site designations
1. Rossetti Studios is a Grade II listed building located in the Royal Hospital Conservation Area at 72 Flood Street, Chelsea. Constructed in c.1895 by Edward Holland, it now houses eight studios accessible via a central spine corridor, with an additional annex studio (Studio 9) accessible via the southern yard.

2. The front elevation of the building is of high architectural significance with the rubbed-brick door-case, terracotta swags and side turret positively contributing to the appearance of the building. The side and rear elevations are not visible in public views and were not therefore designed with the same architectural aspiration, and are thus of lesser significance, but nevertheless retain importance as part of the original fabric and form of the building.

Description of overall works package
3. The work to repair the brick elevations of Rossetti Studios is described on the accompanying drawings, specification and schedule.

4. The proposed scheme would substantially enhance the listed building and its setting by reinstating lost historic fixtures and fittings and plan forms, such as the mezzanine galleries in Studios 6 and 7 and the original ground-floor plan in Studios 5-7, and removing low-quality additions. The small, poor-quality outbuilding, known as Studio 9, is proposed to be demolished and replaced with a new single-storey studio range that would be linked to Studio 8, creating an improved single unit fit for modern use and with long-term viability. Studio 8, believed to have originally been the caretaker’s house, would be extended by the addition of a new mansard roof to further improve the currently restricted studio accommodation in this area.

5. All of the works described in these documents are considered to be like for like repairs.

Documentation
The extent of the site is shown on drawing 2000 and specific repairs are detailed in the 5000 range of drawings.

Rossetti Studios current condition
6. The main entrance to the building is within the single-storey range and has an elaborate door-case with an 18th-century baroque-style surround. The entire surround is constructed of red rubbed brick which has been very tightly tuck pointed. Sections of bricks project to appear as stylised rustication and the keystone is exaggerated in size. The top of the doorcase is framed by a band of egg and dart decoration, and two carved volute scrolls. Above the door-case there is a projecting pediment framed behind by a small parapet. Either side of the door there are two symmetrical sash windows, which have rubbed brick surrounds and stone cills.

7. Some limited devegetation will be required prior to works commencing.

8. Pinning of fractured stones is intended only where there is risk of the loss of stones or where the existing condition will allow water ingress.

9. Replacement stone is to match existing as determined on site.

10. Replacement brick is to be to in accordance with submitted documentation for Condition 6 of LBC reference LB/16/05442.

11. Areas of re-pointing are limited to joints and void exceeding 20mm min width. Re-pointing will vary between elevations.

Preparation of samples of materials and workmanship
12. Sample panels as part of the discharge of conditions for LB/16/0544 have been produced for the following details, showing full details of the materials in question:

- Cleaning of the brickwork (condition 4 part I)
- Panel of facing brickwork and pointing (condition 6)
General Technical Standards

13. Keep product information on site for reference by all personnel: Obtain or retain copies of manufacturer’s instructions, product information, certificate, delivery notes etc. and hand over on or before completion of the Works.

14. Provide all trades with necessary details of related types of work. Before starting each new type or section of work ensure previous related work is appropriately complete to a suitable standard.

15. Water for the works is to be mains supply, clean and uncontaminated.

16. Obtain Client’s approval of samples well in advance. Retain the approved sample in good, clean condition on site. Remove when no longer required.

17. Before completion make good any damage consequent upon the Works. Clean the Works thoroughly inside and out. Remove all splashes, deposits, efflorescence, rubbish and surplus materials. For any minor faults: Touch up in newly painted work, carefully matching colour and brushing out edges. Repaint badly marked areas back to suitable breaks or junctions.

18. At completion leave the Works secure with, where appropriate, all accesses closed and locked. Account for and adequately label all keys and hand over to Employer.

19. For making good defects arrange access with Employer, give reasonable notice for access to the various parts of the Works and notify when remedial works have been completed.
2.0 Photographs of masonry

Red-rubbed brick facade of entrance

Window dressings  Rusticated door surround  Pointing
3.0 Methodologies for specific types of work

3.1 Methodology 1 – Removal of organic growth

3.1.1 Brushes for use on stonework

- Phosphor bronze brushes: To be made of phosphor bronze bristles in close formation as obtainable from Picreator Enterprises Ltd, 44 Park View Gardens, London, NW4 2PN. (Under no circumstances should ferrous brushes be used).
- Bristle brushes: A variety of bristle brushes may be employed such as toothbrushes, nail brushes and general purpose hardware brushes. Bristles to be of uniform height in close formation.

3.1.2 Areas of vegetation removal

Only areas specified / agreed with the architect should be cleaned / removed of organic growth.

3.1.3 Removal of moss, lichen, loose matter, soil, etc: Dry technique

Remove as much loose matter as possible without damaging the stone beneath using wooden scrapers and stiff bristle or non-ferrous phosphor bronze soft wire brushes.

Observe manufacturers safety instructions; rubber gloves and boots, masks and eye goggles should be worn.

3.2 Methodology 2 – Stonework repair

3.2.1 Where stone repairs are specified, an assessment will be made on site as to the most appropriate method using the joint experience and expertise of the stone mason and architect. This should be undertaken as soon as close inspection (through erection of a scaffold or use of a cherry-picker) is possible.

3.2.2 Stone should only be replaced or repaired where identified by the architect and any further stonework thought to require replacement and not shown on the drawings, should be marked up with chalk to allow for further inspection. The contractor must check with the architect if the drawings / instructions are not clear.

3.2.3 Re-setting stone

- Scrape out mortar joints to stone
- Lever stone loose using timber shims etc to protect the arrises and carved detail
- Clear backing and bedding mortar
- Reset stone using lime mortar to new line in lime mortar as specified using slate shims if necessary

3.2.4 Replacing stone

The type of stone for use in replacements is to be confirmed by the architect following comparison of samples on site. For this purpose the contractor should provide samples of potentially suitable limestone for comparison and selection on site.

Cut out defective stone completely or to a minimum depth of 100mm (or depth to match width / height if less), using hand tools and diamond disc cutters to minimise vibration; and taking care to avoid damage to arrises and surfaces of adjacent stonework.

Provide support as necessary

Fix new stone as specified, worked and finished to conform with existing detail, bedded with lime mortar

Grout and point up with lime mortar finished to slightly reveal arrises keeping the work clean to prevent staining. Replacement stonework shall have a rock-faced surface to match existing stonework. All surface finishing shall be of the same pitch to match existing adjacent stonework. All surface finishing shall be done by hand tools only.
3.2.5 Indented repair

Carefully cut out defective area of stone to minimum depth of 100mm (or depth to match width / height if less), to vertical and horizontal joints, square to the face and with sharp arrises. Use light hand tools or, with prior approval, disc cutters to minimise vibration.

Cut new stone sawn square to provide joint width no greater than 2mm, worked and finished to conform with existing detail.

Replacement stonework shall have a rock-faced surface to match existing stonework. All tooling shall run in the same direction and be of the same pitch to match existing adjacent stonework. All rustication shall be done by hand tools only.

Fix stone into position with minimum 5mm diameter stainless steel threaded pins secured in annulus of polyester or epoxy resin. Avoid getting resin on adjacent stone faces.

Point up with lime mortar finished flush with the face. Mortar colour to match stone as closely as possible.

3.2.6 Lime mortar repairs

Prepare samples of mortar to match the various conditions of weathering and various stone core colours on a piece of stone or tile to be judged on its wet and dry appearance. If using proprietary mix, please follow manufacturer’s instructions.

- Cut out the decayed areas (or previous poor mortar repairs) undercutting the edges to provide key
- Wash out the cavity.
- Saturate the cavity with lime rich water from the top of the coarse stuff curing bin to prevent dewatering of the repair mortar
- Pre-wet the stone using industrial methylated spirits to enhance capillary attraction
- Place the repair mortar compacting in layers not exceeding 10mm in thickness in any one application and having no feather edges
- Allow each layer to dry out before rewetting and placing the next
- For cavities exceeding 12mm in depth and extending over 50mm square surface area, drill holes to take non-ferrous or stainless steel reinforcement and set in epoxy mortar; allowing cover for reinforcement
- Finish repair to the required profile using a wood or felt-covered float, or with a damp sponge or coarse cloth
- Follow joints or surface finishing in the original work, forming joints for later pointing if appropriate
- Protect repairs against frost, rain and direct sunlight for 1 month after completion and keep it moist with dampened hessian for a fortnight to ensure slow drying
4.0 C41 Stonework Repair Specification

C41 REPAIRING/ RENOVATING/ CONSERVING MASONRY

111D REVIEW OF SCOPE OF REPAIR WORK UPON CLOSE INSPECTION
Provide access scaffolding and artificial lighting to all areas where stone repair is to be made to enable the CA to make a close inspection.
Provide attendance and inspect the work with the CA to confirm the nature and extent of the cutting out and preparation of voids as identified on drawings.
Make a record of instructions given during inspections, which may either confirm or vary scope of work, and measure and record relevant details, as clause 121D.
Prepare and submit details of instructions for confirmation.
Prepare schedules and drawings for use as basis of implementation of work.

121D RECORDING TO THE APPROVAL OF THE CA
Clearly mark by appropriate means, the defective stones or parts of stones to be cut out. Record by photograph or other approved method, stones to be cut out and/or missing stones to be reinstated, and the relationship of surrounding work. Note bond, joint size, style and texture of pointing and any special or unusual features for replication. Cross-reference identified and marked stones for cutting out and/or missing stones for reinstatement to drawings or photographs.

145D OPERATIVES
Cutting, dressing, laying and jointing of stone to be carried out by masons skilled in the work required.
Provide evidence of previous experience and details of work previously carried out.

166D TEMPORARY SUPPORT
Provide temporary support to structure. Maintain and modify support as required during repair work.

186D WARM DRY WEATHER
In dry weather keep areas of work damp for a minimum of four hours before pointing and three days after.

211D ORDERING OF STONE
Calculate the quantities required, agree delivery dates and place a firm order for stone from the suppliers specified below promptly upon placement of contract.

221 TAKING PROFILES/PREPARING MOULDS
Take profile of existing stones, as identified by the Architect, by letting zinc/plastic plates into joints.
Prepare moulds, face and zinc/acrylic templates, clearly marked for identification and location.
Hand all templated to Architect on completion.
222 WORKING DRAWINGS
Prepare drawings of plinths, string courses, quoins, arches, cornice elements and moulded stones, to show:
- Fixing details numbered to correspond to numbers on stones.
- Details and locations of accessories.
Provide a Method Statement to show how awkward stones are to be handled and hoisted.
Submit copies of drawings to Architect at least two weeks before required date for cutting stone before proceeding with cutting.
Hand approved set of drawings to Architect on completion.

224D GUARANTEE
Obtain and submit written guarantee by suppliers that all new stone will be from the quarry and bed specified

235D INSPECTION OF MASONRY UNITS
General: Before despatch to site, inspect and check completed units for:
- Match with approved samples.
- Compliance with drawings and specification.
Give notice: At appropriate stages in production to allow inspection of masonry units before delivery to site.

237 APPEARANCE OF STONE
Make arrangements for the Architect to inspect samples of dressed and/or rubble stone which represent the range of variation in appearance.
Obtain approval of appearance before placing orders with suppliers or proceeding with production.

247D RE-USE OF STONE
Agree extent to which existing stone is to be retained for re-use in other than its existing location. Remove all such stone; clean, overhaul, protect and store on site until required.

249D PRODUCTION
Cut and dress stone so that:
- Shaping, finishing and all sinkings and holes for fixing and lifting devices are completed after seasoning but before delivery to site.
- Finished surfaces match those of existing surrounding stones.
- Stone bond and joint lines are maintained.
- Meeting surfaces between adjacent stones are compatible with each other and free from hollow or rough areas.
- V-shaped sinkings and dowel holes correspond with those in new or existing stones that remain or are to be reincorporated, for filling with mortar to form joggles.
- Drill holes for dowels are of equal depth in adjacent stones and in core work.
- Joint size between stones matches that of existing work.
- Joint size within repaired stones is kept to minimum.
- Mitred joints do not occur at corners.
- Natural bed is horizontal in plain walling and quoin stones, vertical and at right angles to wall face in projecting stones and at right angles to line of thrust in arches.

252D IDENTIFICATION
Mark each stone, whether new, secondhand or re-used, clearly on an unexposed face to indicate the natural bed and, where known, its position in the finished work.
253D INSPECTION OF MASONRY UNITS
General: Before despatch to site, inspect and check completed units for:
- Match with approved samples.
- Compliance with drawings and specification. Give notice at appropriate stages in production to allow inspection of masonry units before delivery to site.

322D SPRAYING CLEARED VOIDS
Manufacture and reference: To approval.
Following clearance of voids of vegetation or organic material, spray diluted biocide as recommended by manufacturer.

323D FLUSHING OUT
Flush out cleared joints and voids with clean water by spraying with hand pumps.
Spray not to be one used for weedkillers, biocides, etc.

341D PREPARING BEDS AND BACKINGS
Remove soft mortar by brushing, vacuuming or raking with chisel in preference to cutting with hammer and chisel.
Cut out defective stones or parts of stones until structurally sound material is reached.
Leave cavities cut square and take care not to damage adjacent stones or surfaces to be retained.
Remove or cut out fully all stones, or parts of stones, to be replaced with new, prior to cutting and dressing replacement stone, to ensure that new stone exactly matches the void into which it is to be set.
Remove all unwanted remaining bedding and backing material, fixings and similar items from voids left where defective stones have been cut out and/or where stones are missing.
Rake and clean out cavities to provide sound, hard surfaces for replacement stones/tiles.
Remove dust throughout with a vacuum cleaner.
Treat voids with biocide as clause 322D, if instructed.

343 REPAIRS TO EXISTING STONEWORK
Take great care when reconstructing stonework to save as much as possible of the original fabric and to retain the character of the masonry. In particular, strictly maintain the existing pattern of jointing.
Take extreme care not to disturb, move or damage any masonry however humble, unless instructed otherwise.
Where stones are to be removed keep area of removal to minimum. Remove stones in their entirety, irrespective of size, unless instructed otherwise.
Set stones for re-use aside with care and mark them as necessary on unexposed faces to ensure their replacement on their proper beds and in their proper locations.
Use manual tools only. Power tools will not be permitted.
Notify the Architect of any signs of structural movement found within the walls when stones have been cut out.

345D CUTTING OUT FOR PIECING IN
Where possible ascertain depth of the stone to be repaired. If practical remove stone to a depth of 100mm.
If the stone is less thick than 50 mm or the material that would be left would be unstable, seek instruction.
Cut out defective section to a square or rectangular profile.
361 REMOVAL OF HARD POINTING
Remove a sample section of hard mortar pointing in each area scheduled for removal in agreed location. Carefully cut out hard mortar by picking with chisel to reveal original mortar joint. Drill fine holes along centreline of especially hard mortar joint to loosen mortar, then pick out pointing with chisel. Submit samples to Architect. Obtain approval before proceeding with removal generally.

362 REMOVAL OF STRAP/RIBBON AND PLASTIC SMOOTH POINTING
Remove a sample section of strap and plastic smooth hard pointing in each area scheduled for removal in agreed location. Carefully cut out overlying mortar by picking with chisel to reveal original mortar joint. Submit samples to Architect. Obtain approval before proceeding with removal generally.

363 REMOVAL OF OLD MORTAR STANDING PROUD
Remove a sample section of mortar standing proud of adjacent stones in each area scheduled for removal in agreed location. Carefully dress back the joints with fine chisels to the adjacent stone surfaces. Bevel off the joints at the perimeters of recessed sections to weather and avoid stepped surfaces. Submit samples to Architect. Obtain approval before proceeding with removal generally.

370D BASIC WORKMANSHIP
Comply with the clauses of the following that are relevant to this section, unless otherwise specified or shown on drawings:

371D PROTECTION
Provide all necessary protection to:
- Surrounding work.
- Voids left after defective stones have been cut out and/or where stones are missing.
- Areas of ancient/eroded stonework.

372 SUPPORT
Ensure that structural stability of the building and of all temporary work is maintained throughout. Putlog scaffolding will not be permitted. Scaffolding may be in contact with the building only with the approval of the Architect. All scaffold pole ends within 100mm of the building must be fitted with plastic caps.

376D BONDING
Cut stones to full dimensions so that:
- Bond is maintained with both facework and with backing.
- Bond is maintained with facework and back face of stonework is flush with outer

378D REPLACE DAMAGE STONES
to a minimum depth of 100mm all stones damaged during cutting out, as instructed

380D BITUMEN APPLICATION
Apply two coats bitumen solution to BS 3416:1991, Type 1 of brushing consistency, to rear of stones as indicated on drawings
382D  MASONRY ADHESIVES
For fixing small sections of stone in ‘dentistry’ repairs use ‘Akemi’ resin/epoxy-based adhesive from Ebor Equipment Limited, Trans-Pennine Trading Estate, Gorrells Way, Rochdale, Lancashire OL11 2PX. Tel. 01706 869691, or other approved. For piecing-in larger stones use Certite from SBD Ltd. Dickens House, Enterprise Way, Flitwick, Bedford MK45 5BY, Tel. 01525 722 100, or other approved, in conjunction with metal fixings as clause 392D.

384D  STYRENE-BUTADIENE RUBBER (SBR) BONDING AGENT
Manufacturer and reference: Febond SBR from Feb Limited, Everbuild Building Products Ltd, Site 41, knowsthorpe Way, Cross Green, Leeds LS9 0SW. Tel. 0161 794 7411 or other approved.

392D  METAL DOWELS, FIXINGS AND WALL TIES
Copper or stainless steel as defined in Table 1 of BS 5390.

401D  LAYING AND JOINTING
Start stonework not less than 150mm below finished level of external paving or soil, except where shown otherwise. Keep stonework clean during construction and until Practical Completion. Ensure that no mortar encroaches on face when laying. Turn back scaffolding boards at night and during heavy rain. Rubbing to remove marks or stains will not be permitted. Set mechanical fixings in mortar as clause 442D. Dampen stones and well wet existing stonework and lay stones on a full even bed of mortar with all joints filled. Maintain joint lines as existing, unless otherwise instructed.

403D  FILL DEEP HOLES
in existing masonry with small stones set in bedding mortar as section Z21

411D  JOINTING
Leave face joints slightly proud as the work proceeds. Subsequently clean off flush in a continuous operation to match surrounding work

412D  JOINTING
Finish face joints flush as the work proceeds to match surrounding work.

413D  JOINTING
Leave face joints recessed 30mm as the work proceeds. Subsequently point in a continuous operation with mortar to match surrounding work.

440D  ONE PIECE SILLS/THRESHOLDS
Leave bed joints open except under end bearings. On completion point with mortar to match adjacent work

441D  FORM OPENINGS
using rigid templates accurately fabricated to the required size

442D  MECHANICAL FIXINGS
Bed cramps, dowels and other fixings in 1:3 NHL 3.5 hydraulic lime:sand mortar.

444D  JOGGLE JOINTS
Fill with 1:3 NHL 3.5 hydraulic lime:sand mortar and tamp to expel air.
451D RETAINED ORIGINAL MASONRY
is not to be cut or adjusted in any way to accommodate new or re-used masonry, except
with prior approval of the CA

452 RE-TOOLING
Where a firm surface cannot be achieved by brushing, use chisels to cut back face to a
maximum depth of 20mm and re-tool the surface to match existing adjacent stonework.
Re-tool exposed faces to match existing adjacent stonework if and as instructed by
Architect.

453 REMOVAL OF WATER TRAPS
Report to Architect where water traps and steps result either from dressing back or
erosion. Carefully weather stone to remove traps if and as instructed by Architect.

454D BRUSHING BACK OF ERODED/FLAKING MORTAR POINTING
Brush back stone joints to remove loose and flaking mortar for inspection by CA.
Smooth and compact underlying mortar by gently tamping with smooth rounded dowel.

461D PINNING FRACTURED SPLIT STONES
To dressed stones with sound uneroded surface, carefully drill out stone plug with diamond
coring tool.
Drill across fractures or cracks into sound stone to a minimum depth of 75mm.
Proceed as clause 463D.
Following curing of resin replace stone plug by ‘spot’ epoxy fixing to rear, pointing edges in
mortar.

462D MORTAR FLAUNCHING TO ERODED STONES
Form mortar weathering fillets, avoiding feathered edges, to prevent recesses collecting
water in crevices or whole stones, as instructed

463D PINNING ERODED LOOSENED STONES FOR STABILITY
Carefully drill through face at approximately 300mm to horizontal, to diameter instructed,
ensuring drilling has penetrated background, solid stone or stable core to minimum depth
of 100mm.
Remove debris from hole by blowing out with tubing and flush out hole with clean water
from a syringe.
Attach tubing to syringe and fill with resin prior to filling hole.
Cut to length threaded austenitic stainless steel rod. Allow 6mm cover to face for small
diameter rod, 12mm for large rod.
Fill hole with resin to correct depth to avoid overfilling: e.g. 6mm diameter hole to take 3mm
diameter rod hole to be resin filled to two thirds depth.
Place protective plastic film and modelling clay plug below hole.
Carefully insert dowel into resin filled hole by gently turning and pushing.
Allow resin to cure to Manufacturer’s recommended timings.
Following curing, point hole in matching mortar.

464D CRACKS AND FISSURES TO DRESSED STONWORK
Point in plastic repair mortar, as clause 815D, tamping mortar face back from face of stone.
465D STITCHING ACROSS MAJOR CRACKS
Where instructed and as directed specifically by the CA. All be carried out with utmost care: works to
Remove stones as instructed for a distance of a minimum of 900 mm across the crack.
Clean stones, mark and set aside for possible re-use.
Do not adjust adjacent sound stonework to accommodate new stone unless instructed to do so.
Using removed stone or matching stone salvaged from elsewhere, fill each pocket with pieces of stone at least 200 mm long.
Set stones in mortar as section Z21.
Ensure vertical joints are between 15 mm and 25 mm wide and that the crack line is covered by a stones placed centrally across it.

466D RE-SETTING LOOSENED OR DROPPED STONES TO ARCHES
Cut out and remove as much as possible of the mortar joint at the head of the stone. Gently but firmly push stone upwards and remove as much as possible of the mortar to the two side joints.
Allow stone to drop a little and pack head joint with 1:3 NHL 3.5 hydraulic lime:mortar:sand mix, pushing as much mortar as possible to the back face of the stone.
Lift stone so that its underside is flush with the arch soffit and tamp it to consolidate mortar and push mortar forward. Ensure finished joints are fully filled.
(Simultaneously with the above): while lifting the stone, pack the side joints with 1:3 NHL 3.5 hydraulic lime:sand mortar mix.
Firmly pack the side joints with slate set at least 12mm behind the finished mortar face. Finish all visible joints as clause 865D.

509D SAMPLE PANELS
Allow for providing four different samples of plastic repair, each approximately 300 mm square, to be carried out successively, in agreed locations, for each type of mix/colour required.
Base mortar on preliminary mix of 1:1:2 NHL3.5 hydraulic lime:sand:crushed stone. Allow for altering the mortar mix for each sample and for each panel to dry out completely.
Obtain approval of sample areas before ordering bulk materials.
Retain and protect approved samples until Practical Completion and ensure executed work matches.

511D PREPARATION FOR MORTAR REPAIRS
Cut back damaged stone to firm base and minimum depth of 25mm, in ashlar preferably in regular shape parallel to original coursing.
Undercut head and sides of small areas to provide key.
Reinforce where necessary with 3mm diameter austenitic stainless steel or non-ferrous wire, resin anchored as clause 463D.

540D APPLYING MORTAR
Brush out or vacuum clean cavity to remove all dust and either wet to reduce suction or prime with bonding agent as clause 384D.
Press mortar firmly into cavity and around reinforcement and finish surface slightly rougher than surrounding stone with a wood float.
Apply the mix in two coats scratching the first to receive the second.
Where tile reinforcements are to be used, leave them projecting 5mm to key the final coat.
Roughen surface after initial set with bristle brush or scrim to remove laitance.
Do not form feather edges.
Keep plastic repairs moist for three to four days after completion.
Repair each stone individually.
Do not take plastic repair or reinforcement across joint. Point joint after plastic repairs have set as later separate operation.
700D GROUTING PROCESS
Do not use grouting as a substitute for any necessary making good of the wall core.
Do not carry out any grouting until the making good of masonry to the outer surface of the areas is complete, and until the approval of the CA has been obtained.
All grouting is to take place in the presence of the CA or the Clerk of Works.
Hand grouting may be used for small isolated voids and for fine cracks or fissures using a syringe, in association with tamping and pointing.
Grouting should generally be undertaken by gravity feed, using a watering can and funnels.
Grouting may only be undertaken with a hand pump after receipt of the CA's written approval.
Mechanical pump grouting will not be permitted.
When grouting by gravity using funnels, ensure that each area of wall receives suitable and sufficient quantities of grout and that no cavities are left.
If grouting is undertaken using a hand pump with hose and nozzles, a fully working pressure gauge must be located on the pump at all times. Great care is to be taken to ensure that no masonry is disturbed or caused to bulge during grouting. Grout must never be pumped at a pressure exceeding 20 lbs per square inch (140 kPa).
If masonry is disturbed in any way during grouting, the operation is to cease immediately.
If the CA is not present, he is to be informed of the situation at once and asked for further instructions.

705D AREAS FOR GROUTING
Any area found during the course of the work where instructed.

811D DEPTH OF CUTTING OUT OF POINTING COATINGS
Cut out and remove pointing where indicated on drawings to a minimum depth of 30mm.
Where remaining mortar in the joint is found to be loose or soft, cut back to solid material up to a maximum of 100mm.
Remove all loose or powdered mortar to the beds or perpend joints of the stone.
Report to CA where mortar remains loose or soft or cavities are found at or beyond 100mm depth and seek further instructions.

812D PREPARATION OF FINE JOINTS IN DRESSED STONES
Gently work a fine hacksaw blade along joints and remove loose material to a minimum depth of 13mm.

815D REPOINTING MIXES
(Final mixes subject to appraisal of sample panels. Note that it is likely that mix constituents will vary to suit the varying site conditions.)
Joint depth > 130mm or where stones loose: point 1:3 NHL 3.5 hydraulic lime:sand mortar mix to within 30mm of outer stone face, allow 48 hours to pass then point 30mm deep face joint 1:1:2 NHL 3.5 hydraulic lime:sand:crushed stone.
Joint depth <30mm point 1:1:2 mix NHL 3.5 hydraulic lime:sand:crushed stone mix in one operation.

825D SAMPLE PANELS
Allow for providing four different sample panels of re-pointing, each approximately 900mm square, to be carried out successively, in agreed locations, for each type of joint/colour required.
Allow for altering the mortar mix for each sample and for each panel to dry out completely. Submit panels first raked out and prepared for re-pointing. When this stage is approved then re-point panels and obtain further approval before proceeding generally.
Obtain approval of sample areas before ordering bulk materials.
Retain and protect samples until Practical Completion and ensure executed work match
835D REPOINTING PROCESS
Begin from top of wall. Immediately before re-pointing flush out joints with water to remove all dust and to control suction. Wet surface until it remains wet.
While damp fill joint with specified mortar.
Thoroughly compact mortar to fill all voids and to ensure it adheres firmly to each side of joint. Iron mortar in with appropriate pointing tool (not trowel) of width to suit joint width, keeping finished mortar face back from damaged and weathered arrises and to width of original joint.
Allow sufficient time for the re-pointing to be done without hurry.

851D CLEANLINESS
Keep face of brickwork/stonework clean during pointing. Wash and brush down surface to remove light staining as soon as it occurs. Turn back scaffold boards at night and during heavy rain to prevent splashing.

865D FINISH TO STONEWORK POINTING
Ensure that all new pointing to stonework harmonises in pattern, width, style, colour and texture with the old and surrounding work.
Finish joints slightly recessed from the stone face.
Rub mortar as it 'goes off' with a stiff bristle brush to pull forward grit and give the mortar a roughened but weathering surface. Take care to ensure that no mortar is smudged over the surfaces of the stones and that no mortar is left covering stone arrises.

866D WASH DOWN
completed sections of wall from top to bottom after pointing has hardened
5.0 C42 Brick Repair Specification

C42 Repairing/Conserving Brickwork

10 RECLAIMED BRICKS
-facing bricks reclaimed from demolitions and cutting away on the site will be approved for re-use only if they are free from fungus, have no deep or extensive cracks, or damaged corners or arrisses, and are free from old mortar.

12 SAMPLES
-obtain samples of facing bricks and voussoirs to be used in external brickwork to Architect's approval; keep samples on site.

15 CONTROL SAMPLE
-sample panels of brickwork and pointing made to RBKC approval as part of discharge of condition to match existing. Give notice to Architect of the removal of any sample panels.

25 MORTAR
-to be as specified in Section Z21.
-Ensure that the mortar for the repair is the same strength or weaker than the existing.

27 EXISTING MORTAR SAMPLES
-in cases of fine brickwork, take samples of mortar for analysis by others; record positions of each sample.

30 SURFACE REPAIR
-comply with the general requirements of BS 6270 and use the particular method of repair specified in the Part and Section of BS 6270 stated below for the surface repair of:
- mortar joints (Part 1, Section 3, paragraph 13)
- brickwork (Part 1, Section 3, paragraph 14.3)

35 BRICK TIES
-ensure that the inner and outer skins of brickwork are properly bonded together; carry out remedial work as necessary using a suitable method of non-ferrous ties. Agree method with Architect prior to commencing work.

37 BIOCIDES FOR ALGAE AND LICHEN
-apply a biocide as approved by the Advisory Committee on Pesticides following Health and Safety Executive guidelines and COSHH Regulations.

40 ACCURACY
-keep courses level and perpends vertical and in line with existing courses; plumb all wall faces, angles and features. Adjust joint thicknesses to match the existing.

45 SET OUT
-repairs carefully to achieve satisfactory junctions with existing brickwork / elements.
50 BOND
repairs are to match the existing bond. Additional ties/reinforcement are to be inserted to ensure patched brickwork is securely integrated.
unless stated otherwise 112 mm walls are to be in stretcher bond, and other brickwork in Flemish bond.

52 BACKING BRICKWORK
to faced walls is to be in the same bond as the facework.

53 LAY FACING BRICKWORK
to be pointed later on a full bed of mortar and fill all frogs and joints; rake out to C40 as the work proceeds

54 LAY FACING BRICKWORK
on a full bed of mortar and fill all frogs and joints; strike off joints as the work proceeds; tamp lightly with a stiff bristle brush when nearly dry to match weathered pointing.

55 LAY GENERAL WALLING
brickwork on a full bed of mortar and fill all frogs and joints; strike off joints with a trowel as the work proceeds.

56 FROGS
lay single frogged bricks frog uppermost and double frogged bricks with the deeper frog uppermost

60 REPAIRS
Extent of all brickwork repairs as per Architect's drawings and any further repairs to be agreed before starting any cutting out or repointing

65 STITCHING
carefully cut out bricks as agreed between the by Design Team:
- remove all mortar from all faces of the hole. Do not damage the arrisses of the retained brickwork
- install reinforcement / ties in accordance with Particular Specification
- fill hole with facing brickwork to match existing
- point to match in with the wall

70 REPAIR OF GAUGED BRICK ARCHES
is to be carried out by a qualified craftsman bricklayer experienced in repair/renovation of historic gauged brickwork.
72 REPAIR OF GAUGED BRICK ARCHES USING WHOLE VOUSSOIRS
install temporary centring as necessary to support existing and new voussoirs
- carefully cut out damaged voussoirs
- bed new voussoirs with lime putty between them, and bedding mortar behind
- point with lime putty as C40/1.27

73 REPAIR OF DROPPED VOUSSOIRS
where one or two voussoirs have dropped but are still sound
- clean off the remaining mortar using a purpose made or hacksaw blade
- ease the bricks back into position
- wedge with a sliver of lead or slate
- point in lime putty as C40/1.27

74 KEYED POINTING
rake out joints to a depth of 20 mm as the work proceeds. Point and form joints to approved profile with mortar in a continuous operation as scaffolding is taken down.

75 FINE POINTING gauged brickwork and other fine joints
- lay a strip of carpet tape over the joint to be pointed
- slit the tape into the joint with a sharp knife, and press the edges of the tape into the cut
- point with mortar mix as Section Z21
- press the mortar home with a pointing key until the joint is full
- strike off and peel off the tape

76 RE-POINTING
clean out joints to a minimum of 25 mm using hand, not power tools
- Do not use angle grinders for cutting back joints
- tamp or hand grout empty joints with mortar to a depth of 25 mm from the face of the masonry
- clean the prepared face using a bristle brush
  flush the joint out thoroughly with clean water, taking care to avoid saturation
- remove all dust and loose material working from the top to the bottom of the wall
- Lightly wet the joints and point neatly in the appropriate mortar mix from Section Z21
- Brush over lightly with a stiff bristle brush or dab with a piece of coarse sacking after the initial set has taken to leave a slightly textured finish

77 TUCK POINTING
Prepare joints for pointing or re-pointing as clause C42/76
- Mortar to match the colour of the brick
- finish with a flush face
- immediately afterwards cut a 3 mm deep groove carefully along each joint, width to match existing or approved sample
- tuck in the groove with the aid of a pointing rule and a flat-edged jointer, with lime putty gauged with a small amount of silver sand
- allow the putty to project 3 mm or to match existing brickwork adjoining
- cut both top and bottom joints off neatly
- form the bed joints first, followed by the vertical joints