

C41X REPAIRING/ RENOVATING/ CONSERVING MASONRY

To be read with Preliminaries/ General conditions.

GENERALLY/ PREPARATION

110 SCOPE OF WORK

- As described in the outline schedule and drawing ref SUR.000.AA Head of the River Survey 2023.

120 REVIEWING SCOPE OF THE WORK

- Inspection: After cleaning, arrange before starting work. Confirm type and extent of work required.
- Marking: Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced.
- Records of masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record existing condition and features.

121 INVESTIGATION

The scope of the work shall be confined using

- Opening up of stones / bricks

WORKMANSHIP GENERALLY

150 POWER TOOLS FOR REMOVAL OF MORTAR

- Usage: Only on hard mortar.
- Fien cutter.
- 100mm diamond bladed 1.2mm angle grinder

160 PROTECTION

- Handling of masonry units: Prevent overstressing during transit, storage and fixing. Lift units at designed lifting points where provided.
- Storage of masonry units: On level bearers clear of the ground, separated with resilient spacers. Protect from adverse weather and keep dry. Prevent soiling, chipping and contamination by salts and other deleterious substances.
- Protection of masonry: Suitable nonstaining slats, boards, etc. Remove at completion.
 - Prevent damage, particularly to arrises, projecting features and delicate, friable surfaces.
 - Prevent mortar/ grout splashes and other staining and marking.

165 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.

170 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.

180 OPERATIVES

- General: Skilled and experienced with the materials and procedures required.
- Evidence of training and previous experience: Provide on request.

185 ADVERSE WEATHER

- Frozen materials: Do not use. Do not lay masonry units on frozen surfaces.
- Air temperature: Do not bed masonry units or repoint:
 - In hydraulic lime:sand mortars when at or below 5°C and falling or unless it is at least 3°C and rising.
 - In nonhydraulic lime:sand mortars in cold weather without approval.
- Temperature of the work: Maintain above freezing until mortar has fully set.
- Rain and snow: Protect masonry by covering during precipitation and at all times when work is not proceeding.
- Hot conditions and drying winds: Prevent masonry from drying out too rapidly.
- New mortar damaged by frost: Rake out and replace.
- Protection: Protect from adverse weather and damage.

195 SAND SAMPLES

- Sand to be:
 - RMC Addlestone Sharp
 - Barden Washed White
 - Leighton Buzzard Washed

MATERIALS/ PRODUCTION/ ACCESSORIES

215 SAMPLES

- Inspection: Make arrangements for the inspection of samples of the following materials:
 - Replacement stone sample
 - Mortar sample
- Samples: Representative of the range of variation in appearance for each type of material to be matched.
- Appearance: Obtain approval before placing orders with suppliers or proceeding with production.
- Approved samples : Keep all for reference purposes. Protect from damage.

220 RECORDING PROFILES

- Profiles: Take measurements from existing masonry units, as instructed, to allow replacements to be matched accurately.
- Recording in situ: If there are no suitable joints for inserts, seek instructions.
- Drawings and templates: Prepare as necessary, clearly and indelibly marked to identify use and location.

235 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.

240 STONE

- Type: Bath Stone to match the existing.
- Requirements: Free from vents, cracks, fissures, discolouration, or other defects which may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with shop drawings prepared by the supplier.
- Finish: To match existing.
- Supplier: Contractor's Choice.

245 REPLACEMENT STONE UNITS

- Minimum bed depths and agreed face lines in relation to existing work: Maintain. Make suitable allowances for any final finishing carried out in situ.
- Sizes and profiles: To match existing masonry; existing joint widths maintained.
- Sinkings for fixings and joggles: Accurately aligned and positioned in relation to existing masonry. Provide sinkings for lifting devices.
- Marking: Each block/ dressing clearly marked on a concealed face to indicate the natural bed and position in the finished work.

250 ORIENTATION OF STONE

- Natural bed:
 - In plain walling: Horizontal
 - In projecting stones and copyings: Vertical and at right angles to wall face.
 - In arches: At right angles to line of thrust.

255 ASHLAR BLOCKS/ DRESSINGS

- Cutting and dressing stone: To true and regular surfaces, free from hollow or rough areas.

258 EXISTING TEMPLATES

- General: Templates for replacement stones are available for making copy templates.

DISMANTLING/ REBUILDING

305 Before rebuilding, the bricks/brickwork must be wetted sufficiently to control suction. This may require pre-wetting a number of times over a period.

310 DISMANTLING MASONRY FOR REUSE

- Masonry units to be reused: Remove carefully and in one piece.
- Identification: Where masonry is to be removed temporarily, identify each unit clearly and indelibly on concealed faces indicating their original positions in the walling.
- Old mortar, dirt and organic growths: Clean off and leave masonry in a suitable condition for rebuilding.

320 REBUILDING Generally

- Replacement materials: As above clauses.
- Mortar: Natural Hydraulic Lime.
 - Mix: 1 NHL 3.5 : 2 sand.
 - Sand source/ type: As above.
- Fixings: Duplex stainless steel dowels / cramps etc. to be installed.
- Rebuilding: To match previous face and joint lines, joint widths and bonding and adequately bonded to retained work and backing masonry, etc.
- Joint surfaces: Dampen to control suction as necessary.
- Laying: On a full bed of mortar, and all joints filled.
- Exposed faces: Keep clear of mortar and grout.
- Joints: To match existing.
- Other requirements: _____ .

REPLACEMENTS AND INSERTIONS

330 PREPARATION FOR REPLACEMENT MASONRY

- Defective material: Carefully remove to the extent agreed. Do not disturb, damage or mark adjacent retained masonry.
- Existing metal fixings, frame members, etc: Report when exposed.
- Redundant metal fixings: Remove completely.
- Recesses: Thoroughly clean to remove loose material and leave joint surfaces in a suitable condition to receive replacement units. Protect from adverse weather.

340 REPLACEMENT OF STONE

- Stone: Bath Stone as clause 240.
- Bedding depths: To match existing.
- Mortar: As section Z21.
 - Mix: 1:2 NHL 3.5 : Sharp sand (clause 195) .
 - Sand source/ type: _____ .
- Fixings: None.
- Joints: To match .
- Other requirements: _____ .

350 STONE INSERTS

- Stone: Bath Stone as clause 240.
- Finish: Flush and to match existing.
- Preparation and insertion: As clause 395.
- Mortar: As section Z21.
 - Mix: 1:2 NHL 3.5 : Sharp Sand .
 - Sand source/ type: As clause 195
- Fixings: _____ .
- Joints: Very fine with no adhesive visible
- Other requirements: _____ .

385 LAYING REPLACEMENT MASONRY

- Exposed faces of new material: Keep to approved face lines.

- Faces, angles and features: Accurately align. Set out carefully to ensure satisfactory junctions with existing masonry and maintain existing joint widths.
- Joint surfaces: Dampen to control suction as necessary.
- Laying: On a full bed of mortar, all joints filled.
- Exposed faces: Keep clear of mortar and grout.

390 GROUTING JOINTS

- Grout mix: 1 NHL 3.5 : 3 sand
- Joints that cannot be fully filled with bedding mortar:
Grout thoroughly around replacement masonry units
- Grouting: Keep grout back from exposed face to allow for the depth of pointing, using an approved temporary sealing material. Prevent grout staining exposed face.
- Grout mix can be modified with bentonite, HTI powder or PFA.

395 STONE INSERTS

- Pockets to receive inserts:
 - Cut out accurately. Undercut sides of pocket where necessary to provide space for bonding material.
 - Adjust depth so that insert stands proud of existing stone for finishing in situ. Clean out thoroughly.
- Inserts: Cut to the smallest rectangular shape necessary to replace the defective area and provide a firm seating. Install accurately and securely.
 - Exposed faces: Keep clear of bonding material.
- Existing joint widths: Maintain. Do not bridge joints.
- Replacement cramps: From new shoulders as required.

405 BONDED DOWELS to tie back dentils

- Dowels: Stainless steel 6mm rods.
 - Secured into clean, dry holes with Rotafix CB10T adhesive. Do not use adhesive to bond stones at joints unless agreed otherwise.
 - Adhesive: Rotafix CB10T.
- Holes:
 - Drilled in the background and the rear of the replacement, cleaned out to manufacturer's specification to receive dowels and adhesive.
 - Aligned to allow accurate positioning of the replacement/ insert.

TOOLING/ DRESSING STONE IN SITU**455 DESCALING STONE**

- Requirement: Carefully remove loose scaling and powdering from stones to the extent agreed.
- Method: Suitable bristle brushes or carborundum blocks. Do not use wire brushes.
- Where the descaling exceeds 10mm advise CA.

MORTAR REPAIRS**510 PREPARATION FOR MORTAR REPAIRS**

- Repair area: Scribe straight horizontal and vertical lines with edges parallel to joints. Where repair area abuts joints, maintain existing joint widths and do not bridge joints.
- Decayed masonry: Cut back carefully to a depth of not less than 20 mm and to a sound background. Where the depth of removal exceeds 50 mm seek instructions.
- Precautions: Do not weaken the masonry by removing excessive material. Do not damage adjacent masonry.
- Top and vertical edges of repair area: Undercut.

515 REINFORCEMENT FOR MORTAR REPAIRS

- Material: Austenitic stainless steel or copper alloy wire, diameter: 3mm.
- Armatures: Form to suit profiles of mortar repair and provide effective reinforcement.
- Cover to reinforcement: Not less than 18 mm.
- Drill holes into background to receive the reinforcement and bond firmly with a suitable epoxy resin.

520 MORTAR REPAIRS

- Reinforcement: _____ .
- Undercoats:
 - Mix: 1 NHL 3.5 : 1 stonedust : 1 sand.
 - Sand source/ type: such sand as to enable the dried mix to match the base stone.
 - Building up: In layers where necessary, each layer not exceeding 12 mm.
- Finishing coat: To match approved samples.
 - Mix: _____ .
 - Sand source/ type: _____ .
 - Finished thickness: _____ .
 - Finish: _____ .

540 APPLYING MORTAR

- Background: Clean thoroughly to remove all dust and debris and dampen to control suction.
- Building up: In layers to specified thickness. Apply firmly and ensure good adhesion with no voids. Form a mechanical key to undercoats by combing or scratching to produce evenly spaced lines.
- Applying coats: Allow each layer to achieve an initial set before applying subsequent coats. Prevent each layer from drying out too rapidly by covering immediately with plastics sheeting and/ or dampening intermittently with clean water.
- Finishing mortar coat: Form accurately to required planes/ profiles and flush with adjacent masonry.
- Protection: Protect completed mortar repairs from adverse weather until they have fully set.

545 THUMB REPAIRS

- Small holes are to be wetted and holes filled with mortar repair compound.

555 FLOAT FINISH TO MORTAR REPAIRS

- Finish: Use a wood float and/ or a felt faced float to give an even overall texture. Do not use steel floats.

CRACK REPAIRS/ TIES/ REINFORCEMENT

610 MORTAR REPAIR OF CRACKS

- Mortar:
 - Mix: 1 NHL 3.5 : 2 sand.
 - Sand source/ type: as clause 195.
- Preparation: Clean out cracks to remove loose debris, dust and dirt. Dampen joints to control suction as necessary.
- Applying mortar: Press well into joints so that they are fully filled. Ensure that no mortar encroaches upon exposed faces. Finish flush.
- Other requirements: _____ .

620 RESIN INJECTION OF CRACKS

- Resin injection system:
- Manufacturer: Rotafix.
 - Product reference: Rotafix CB10T.
- Preparation: Clean out cracks to remove loose debris, dust and dirt. Secure any loose masonry units.
- Plug crack with a suitable non-staining putty to ensure resin does not flow onto the face of the units.
- Exposed faces: Keep clean and free from stains.
- Injecting resin using 3mm holes @ 75mm centres starting at the lowest hole. The crack is injected with a hypodermic syringe until it is full and the process is then repeated upwards.
- Completion: After resin has cured remove any temporary crack plugging material and temporary protective coatings.
- Rub down surface.
- Where appropriate fill surface of crack with putty to avoid weeping of resin.

640 PINNING of large crack

- Dowels/ Pins:
 - Type: Duplex Stainless steel.
 - Diameter: 6mm
- Resin: Rotafix CB10T.
- Holes: Drill carefully, sloping downwards. Clean thoroughly to remove drilling dust and debris and keep dry.
- Filling holes:
 - Check that dowel lengths are correct before filling with resin.
 - Use sufficient resin so that when the dowel is inserted the resin is dispersed to achieve an effective repair.
- Exposed faces: Keep clean and free from resin stains. Use temporary plugging material and/ or isolating membranes as necessary.
- Clearances: Keep ends of ties and resin back from face of masonry.
- Making good after resin has cured: Mortar pointing .

690 MAKING GOOD OF INJECTION/ INSERTION HOLES

- Preparation: Clean out holes thoroughly.
- Repair mortar: To match existing masonry units/ joints in colour and texture. Fully fill holes and finish neatly and flush.
- Give notice: Before starting and obtain approval of appearance of first few holes before completing the remainder.

POINTING/ REPOINTING

810 PREPARATION FOR REPOINTING

- Removing mortar:
 - Work from the top of the wall downwards.
 - Remove carefully and without damaging adjacent masonry, arrises or widening joints.
- Recess for repointing: Form a neat recess of depth not less than 15mm. When mortar beyond this depth is loose and friable and/ or cavities are found seek instructions.
- Dust and loose debris. Remove. Dampen joints to control suction as necessary.

820 POINTING GENERALLY

- Preparation of joints: As clauses 150 and 810.
- Mortar:
 - Mix: 1 : 3.
 - premixed lime putty is also acceptable
 - Sand source/ type: To match existing.
- Joints: As existing.
- Other requirements: _____ .

840 POINTING WITH TOOLS/ IRONS

- General: Press mortar well into joints using pointing tools/ irons that fit into the joints, so that they are fully filled.
- Face of masonry: Keep clear of mortar. Use suitable temporary adhesive tape on each side of joints where necessary. Finish joints neatly.

860 BRUSHED FINISH TO JOINTS

- General: After the initial set has taken place, brush joints to remove laitance/ excess fines and give a coarse texture. Do not compact mortar.