



BURY FUSILIER MUSEUM, CHIMNEY

Repair & Material Specification.
Chambers Conservation Ltd.

CHAMBERS

ARCHITECTURE · CONSERVATION



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1. Material Specification

C41 REPAIRING/ RENOVATING/ CONSERVING MASONRY

TO BE READ WITH PRELIMINARIES/ GENERAL CONDITIONS

GENERALLY/ PREPARATION

101* APPROVED BRICKWORK/STONEWORK CONSERVATION SPECIALISTS

- The work described in this section should be carried out by qualified brickwork conservation specialists working for an approved sub-contractor whose name shall be supplied to the CA for approval before putting the work in hand.

102* GENERAL SEQUENCE OF REPAIRS TO MASONRY

1. Agree repair type with CA and photograph areas to be cut out.
2. cut out renewals.
3. Remove cramps if not to be retained.
4. Treat cramps to be retained.
5. Deep point open joints to face.
6. Clean retained brickwork as per C40.
7. Carry out consolidation as required.
8. Carry out repairs: Photograph areas to be repaired. Choose colour of mortar.
9. Deep point joints for depth of repair and grout voids.
10. Apply colour wash to repairs and retained stone as required and carry out final cleaning.

110 SCOPE OF WORK

- Refer to Drawings and Schedule of Works.

111 CUT OUT DEFECTIVE ASHLAR STONEWORK DRESSINGS/COPINGS (MOULDED OR CARVED): INDENT NEW (OR AS STATED ON DRAWINGS FOR NEW CHUTES, OUTLETS ETC)

• This is to be carried out to all existing ashlar stonework dressings/copings indicated drawings, schedules and data sheets. Note: plinth stones are tooled this, and any carving is to be undertaken by hand, to match existing, precisely.

- Stone: C41/201
- Mortar: C41/222 for bedding and pointing, C41/223 for grouting voids.
- Recording: C41/306
- Cutting out: C41/336
- Preparing Beds/Backing: C41/316
- Dressing: C41/341
- Laying/Bonding: C41/326
- Joint treatment/finish: C41/331
- Grouting voids: C41/356

112 CUT OUT DEFECTIVE BRICKWORK AND INDENT NEW

This is to be carried out to all existing ashlar stonework dressings/copings indicated on the drawings.

- Brickwork: to match existing.
- Mortar: C41/221 for bedding and pointing, C41/223 for grouting voids.
- Recording: C41/306
- Cutting out :C41/336
- Preparing Beds/Backing: C41/316
- Laying/Bonding: C41/326
- Joint treatment/finish: C41/331

- Grouting voids: C41/356

113 RAKE OUT CEMENT POINTING & REPOINT

- This is to be carried out to all existing ashlar stonework dressings/copings indicated on the drawings.
- Stone/Brickwork: Existing.
- Mortar: C41/221 for bedding and pointing, C41/223 for grouting voids, 225 for brick.
- Recording: C41/306
- Preparation: C41/810A & F10/880.
- Pointing: C41/820 & 840.
- Joint treatment/finish: C41/331 & F10/887

116* DESCALE/DEFRASS/CONSOLIDATE DEFECTIVE ASHLAR STONework DRESSINGS AND WALLING: PREPARE: SHALLOW MORTAR REPAIR

- This is to be carried out to all areas of plain ashlar face where indicated drawings, schedules and data sheets.
- Mortar: Slurry mix: C41/223
- Mortar: Repair mix: C41/224
- Archaeological Attendance C41/301
- Recording: C41/306
- Preparation: C41/411,416,421,426
- Mortar repairs: C41/431,436,461,466
- Average repair depth: 20mm (5mm-35mm range)
- Repair tending: C41/446
- Repair texturing: C41/451
- Joint treatment finish: C41/456

117 DESCALE/DEFRASS/CONSOLIDATE DEFECTIVE ASHLAR STONework DRESSINGS AND WALLING

This is to be carried out to all areas of plain and moulded ashlar where indicated on the drawings. General removal of loose material back to sound face using stiff brushes and hand tools – control sample to be agreed with CA prior to general work commencing.

- Recording: C41/306
- Preparation: C41/406, 411, 421

120 CRAMP (OR OTHER EMBEDDED IRONWORK) REPAIR: RELEASE DETACHED PIECE OF ASHLAR STONework WALLING/ DRESSINGS: RENEW CRAMP (OR PIN) AND REFIX OR INDENT NEW.

This is to be carried out to all existing stones agreed with or identified in schedule of works.

- Stone: C41/201
- Mortar: C41/222 for bedding and pointing, C41/223 for grouting voids, C41/224, 225 or 251 for repairs to face depending upon location.
- Resin: C41/251
- Pins: C41/256
- Cramps: C41/257
- Recording: C41/306
- Releasing stones: C41/311
- Preparing Beds/Backings: C41/316
- Dressing: C41/341
- Fixing: C41/351
- Joint treatment/finish: C41/331
- Grouting voids: C41/356

120A REVIEWING SCOPE OF THE WORK

- Inspection: 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.

- c. Identification of masonry units to be removed, replaced or repaired: Code number cross-referenced to drawings/ photographs.
- d. Records of masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.

121 REDUNDANT FITTINGS/ FIXINGS

Items to be removed: as indicated on drawings.
 Removal: Minimize disturbance to surfaces.
 Make good to match existing (piecing in brick/stone as required).

130 REMOVAL OF PLANT GROWTHS FROM MASONRY

- a. Plants, root systems and associated soil/ debris: Carefully remove from joints, voids and facework.
- b. Removal of roots: Use dampened temporary wood wedges or other approved method to assist removal. Where growths cannot be removed completely without disturbing masonry seek instructions.
- c. Plants to remain in the ground: Cut out a section of stem as close to the ground as possible. Peel bark back from stump and apply herbicide paste. Leave stump to wither.

136* REMOVE FIXED ITEMS/REPAIR HOLE WITH LIME MORTAR

- a. This is to be carried out where noted on drawings.
- b. Recording: C41/306
- c. Removal from walling: Generally as C41/223
- d. Fill hole with lime mortar as Clause C41/121.

141* TREAT FIXED ITEMS INSITU

- a. Wire brush, treat with 2 coats Fertan Rust converter
- b. Fertan UK, King & Queen House, High Street, Hamble, SO31 4HATel 02380 456600, Email info@fertan.co.uk, Facsimile: 01903 539595

146 RESIN PINNING SPALLING/ FRACTURED ASHLAR STONework

- Resin: C41/251
- Pins: C41/256
- Sizes: to suit lengths of pins required.
- Drilling and fixing generally as C41/456

WORKMANSHIP GENERALLY

166* LEAD WEATHERING

- a. Refer to Work Section H71 and detailed drawing for details of leadwork.
- b. This is to be carried out where indicated on the drawings
- c. Allow to cut chases prior to leadwork and make good with repair mortar C41/221 according to C41/126 following leadwork.
- d. Allow to fix s/s continuous clip (included in Section H71) into vertical stonework joints with stainless steel screws in nylon plugs.

167 DISTURBANCE TO RETAINED MASONRY

- a. Retained masonry in the vicinity of repair works: Disturb as little as possible.
- b. Existing retained masonry: Do not cut or adjust to accommodate new or reused units.
- c. Retained loose masonry units and those vulnerable to movement during repair works: Prop or wedge so as to be firmly and correctly positioned.

185 ADVERSE WEATHER

- a. Frozen materials: Do not use. Do not lay masonry units on frozen surfaces.
- b. Air temperature: Do not bed masonry units or repoint.
- c. In cement gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising (unless mortar has a temperature of not less than 4°C when laid and the masonry is thoroughly protected).
- d. In hydraulic lime:sand mortars when at or below 5°C and falling or unless it is at least 3°C and rising.
- e. In nonhydraulic lime:sand mortars in cold weather without approval.
- f. Temperature of the work: Maintain above freezing until mortar has fully set.
- g. Rain and snow: Protect masonry by covering during precipitation and at all times when work is not proceeding.
- h. Hot conditions and drying winds: Prevent masonry from drying out too rapidly.
- i. New mortar damaged by frost: Rake out and replace.

MATERIALS

195 SAND SAMPLES

Approval: Before placing order, submit for approval representative samples of: Sands for bedding and pointing .

200 WATER Clean Uncontaminated

Ensure that mains supply pressure is adequate for water spray system. If necessary, pump water to maintain adequate pressure.

201 STONE

•Ashlar walling, dressings mouldings and carving for renewal generally to match existing.
•Type and Source: buff sandstone. Provide representative samples of the following at the commencement of the project for review and confirmation by the CA:

- Representative buff sandstones presented by specialist stone masonry contractor. Which may include:
 - Dunhouse Blaxter
 - Dunhouse Northumberland buff
 - Blockstone Scotch Buff

Samples of new stone to be provided to CA at commencement for approval with source, geological and all other details.

•Finish: Rubbed, carved and/or tooled to match existing. All sizes and special features to match existing precisely.

212 PROTECTION DURING CONSERVATION WORKS

The scaffold is to be enclosed in the areas of work unless agreed otherwise. The exposed face and return ends of the scaffolding in the areas of masonry to be consolidated are to be sheeted with suitably reinforced, flame-resistant polythene sheet for two scaffold lifts above and below the working area.

Localised protection, sufficient to prevent water ingress is to be provided to the working areas when the roof areas, gutters or outlets are exposed. Temporary guttering shall be provided to ensure water cannot enter the building during the works as needed.

220A AGGREGATES FOR MORTAR

Are to be crushed brick dust and well-graded sand. Select for colour and texture to match the existing bedding material. Provide **5 no samples** not less than 1 lin m in agreed location.

Aggregate sizes to vary according to the mortar used:

USE		SIEVE SIZE FOR AGGREGATE
Repair Mortar		1.8mm to 0.4mm
Adhesive Mortars (for pre-cleaning repairs)		0.6mm to 0.3mm
Grout		0.6mm to 0.4mm
Shelter Coat		0.4mm to 0.3mm

221* MORTAR Preparation Generally.

- Measure materials by volume using clean gauge boxes.
- Proportions of mixes are for dry sand. Allow for bulking if sand is damp.
- Mix ingredients thoroughly to a consistency suitable for the work and free from lumps.
- Use mortar within four hours of mixing at normal temperatures. Do not use after initial set has taken place and do not retemper.
- Keep planks and banker boards clean at all times.
- Do not use additives other than those specified without the permission of the architect.

222 MORTAR Fine pointing/Bedding for Ashlar Walling and Dressings

- Mix: The mix for the mortar repairs is provisional and subject to the undertaking of trial samples. The
 - 1 part Hydraulic Lime, NHL St. Astier (3.5)
 - 3 part Silica Sand
 - 1 part Leighton Buzzard sand
- Sources:
- Lime: St Astier, NHL-3.

223 MORTAR Repair mortar slurry coat/grouting of voids if required

- Mix: Hydraulic Lime : Sand (1: 2.5)
 - Gauging: Stone Fines sieved to <1000 microns.
 - Source:
- Lime: St Astier, NHL 2
Sands: Local stone dust to be approved by CA.

224 MORTAR Repair Mortar, Ashlar Walling.

- 1 part NHL St. Astier (2)
 - 1/2 part Crushed sand stone
 - 1 part Leighton Buzzard sand
 - 1/4 Mersey grit
 - 3/4 Silica quartz
- Sources:
- Lime: St Astier, NHL-2
Crushed Stone;
Johnson wellfield Quarries Ltd,
Crosland Hill Rd,
Huddersfield,
01484 65231

225 MORTAR (Brick)

- TBC from site trials. Mix to include PVA (ash) and will be coarser than the repointing mortar for the ashlar. Seek guidance on mixes for trials from CA prior to proceeding.

PRECISE MIX TO BE CONFIRMED FOLLOWING SITE TRIALS AS NOTED.

235 INSPECTION OF MASONRY UNITS

- a. General: Before despatch to site, inspect and check completed units for:
- b. Match with approved samples.
- c. Compliance with drawings and specification.
- d. Give notice: At appropriate stages in production to allow inspection of masonry units before delivery to site.

251* RESIN For piecing in and fixing cramps, armatures etc.

- a. Type: Acrylic resin
- b. Manufacturer and reference: Sebralit Solid
- c. Source: As F21:426

256* PINS

Stairib 460 Deformed Round Bar 6mm diameter in Grade 18/8 Austenitic Stainless Steel 460 Nmm² complies with BS6744:1986. Spec 304531 - By George Clark (Sheffield) Ltd or similar supplier approved by the CA.

257 CRAMPS (AND SIMILAR EMBEDDED PINS, E.G. BETWEEN MULLIONS)

- Resin: C41/251
- Sizes to suit lengths of cramps required. Carefully release existing cramp avoiding damage to adjoining stonework (with hand tools only) and set aside for recording.
- Supply and fix new cramps made of 5mm and fix new cramps made of 5mm diameter. stainless steel threaded bar (grade 316L minimum), bent to shape and inserted 60mm in pre-drilled holes. The cramps are generally c.225mm in length – new cramps should match the originals in size.

DISMANTLING/ REBUILDING

WORKMANSHIP

306* RECORDING

- a. The schedules refer to take down and rebuild or to build up to match existing/adjacent areas.
- b. All areas are to be fully recorded by the contractor using photography and marked up record drawings prior to taking down, noting position of units, the nature and style of the walling and style of the bedding and pointing.
- c. All materials resulting from taking down operations are to be carefully handled, salvaged and stored on site. they will remain the property of the Authority until such time as they are instructed specifically for disposal.
- d. Following inspection with the CA mark out area to be treated on site and transfer onto record drawing. Photograph areas to be treated and cross refer photo to record drawing.

311* RELEASING

- a. Release by cutting out jointing material, cutting through anchors, fixings and the like and easing/levering stones from their backing, by adopting such methods necessary to prevent damage to brick or stone being removed and surrounding work:
- b. use manual tools only, i.e. chasing chisels and hacksaws. Power tools will not be permitted;
- c. Lay dust by adequate sprinkling with water;
- d. Notify the CA of any signs of structural movement found within walls when units have been removed.
- e. Number individual stones on their underside as they are released,
- f. Wash each stone in clean water, scrub off dirt, etc. Set out in courses on adjacent decking.

316* PREPARING BEDS/BACKINGS Generally to receive new work

- a. Thoroughly clear out void using hand tools and brushes.
- b. Treat voids with biocide as C40A
- c. Temporarily support surrounding work.
- d. Cut out and remove, label and set aside in store existing corroded metalwork/fixings.
- e. Provide new stainless steel or phosphor bronze fixings to match those removed and fix.

321* PREPARATION OF SALVAGED BRICK AND STONE

- a. Thoroughly clean bricks/Stone units set aside/stored for reuse to the approval of the CA removing any remaining adhering mortar.
- b. Move and handle, loading, unloading and lowering or hoisting into position by adopting such methods necessary to prevent damage.
- c. Provide to masons copies of all photographs, records, etc. necessary for the accurate resetting of the stones

326* LAYING AND BONDING

- a. In the exact position as previously occupied and as recorded.
- b. Ensure that bond, joint size and any other special or unusual features are replicated as recorded and to match existing.
- c. Provide and insert stainless steel ties; cramps and dowels as necessary for bonding in the rebuilt work to the surrounding structure.
- d. Clean out and flush out or moisten with clean water voids left after removal of brick/Stonework (preparation of void) to remove dust and reduce suction.
- e. Dampen units to be reset/rebuilt and tamp into place on a full and even bed of mortar, including any necessary temporary support shims (i.e. lead or slate).
- f. Pack remaining joint with mortar using a rammer and pointing key.

331* JOINT TREATMENT / FINISH

- a. Finish joints ensuring consistency of colour, texture, profile, and overall appearance to match the existing surrounding mortar.
- b. Set joint back from the face to match adjoining areas unless:
- c. the joints are very wide or arises are broken; and/or
- d. the CA instructs otherwise.
- e. Where masonry arises are eroded or damaged, set joint face further back, but avoiding the creation of ledges, which may trap or hold water.
- f. In order to match the existing texture:
- g. Carry out such surface treatments as water spraying and bristle brush stippling after the mortar has achieved an appropriate surface set (this may vary according to season from 1 to 30 hours)
- h. Bristle brush stippling should be carried out by tapping the brush into the mortar.

336* CUTTING OUT: COMPLETE UNITS

- a. Cut out single defective units, full depth by adopting such methods necessary to prevent damage to surrounding stone units or brickwork, starting from the centre and working outwards.
- b. NB Decorative or profiled stone, even where it is to be replaced, are to be removed as whole units, released as C41/311, location recorded, and stored carefully on site.
- c. Having drilled the whole face at 50mm horizontal and vertical centres to the required depth using manual tools only, i.e. bolster and chisel, carefully remove back to the adjoining units.
- d. Lay dust by adequate sprinkling with water;
- e. Notify the CA of any signs of structural movement found within walls when stones have been removed.

341 DRESSING

- a. Finish new stones on all exposed faces to achieve a finish to match the original finish of existing stonework, to the approval of the CA;
- b. Form all chamfers, mouldings, stoolings, shaped arises, and other such labours to match dimensions taken from site.
- c. Provide alternative tooled finish to replacement stones if required by the CA.

- d. No artificial distressing;
- e. Carve to accurate clean profiles before or after building in as agreed.

346* RELOCATE/PROTECT

- a. Provide temporary protection to item to be relocated to prevent damage.
- b. Provide adequate mobile lifting apparatus to take the weight of the item to be relocated.
- c. Carefully lift and move item to new location as shown on the drawings and set down in final position (either for storage or in preparation for refixing).

385A LAYING REPLACEMENT BRICKWORK

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

422 REPOINTING JOINTS

Rake out defective mortar to a depth equal to three times the width of the joint - 30mm minimum. Repoint with mortar to 'repair mortar' specification Clause C41/225A using a rammer and a pointing key to ensure full compaction.

456* JOINT REINFORCEMENT/FINISH

- a. All original joint lines are to be maintained.
- b. Deep pointing mortar to be applied with a mortar gun, and packed well in to the joints, leaving a square face 20mm from final surface.
- c. Apply final pointing using fine pointing tools. Take great care to avoid lime staining to the ashlar. Joint lines to ashlar repairs should be kept, and pointed as for sound stone. Other joints, e.g. window architraves, to be drawn in to match existing joints.
- d. Protect pointing and tend as for mortar repairs. Ensure ashlar arises are crisp and sharp matching the original quality.
- e. Pointing Across Mortar Repairs:
- f. It is impractical to cut joints out after mortar repair has been completed. Insert the steel rule the width the joint requires wedge into the surrounding existing stone joints. Rub oil onto both sides and mortar repair up to the steel rule. Remove carefully by sliding away whilst green hard. Inject pointing mix with suitable veterinary syringe into false joint taking care not to stain surrounding mortar repaired stone. Wash off any stains and check that your pointing corresponds with degree of texture on surrounding mortar repair.

461* MORTAR GENERALLY

A palette of mortars shall be prepared from the base mixes. Colours should be adjusted as necessary using more or less strongly pigmented aggregate and charcoal. Artificial pigments must not be used.

REPAIRING / RENOVATING BRICKWORK

500* SCHEDULE OF OPERATIONS

501* APPROVED BRICKLAYERS

The work described in this section should be carried out by qualified stonemasons working for an approved stonemasonry sub-contractor whose name shall be supplied to the CA for approval before putting the work in hand

502* GENERAL SEQUENCE OF REPAIRS TO BRICKWORK

- a. This is to be carried out to all existing areas of brickwork where indicated on the drawings

- b. Agree repair type with CA and photograph areas to be cut out.
- c. Cut out defective brickwork
- d. Archaeological attendance: C41/601
- e. Recording: C41/606
- f. Releasing: C41/611
- g. Preparing beds/Backing: C41/616
- h. Preparing Bricks for Re-use: C41/621
- i. Laying/Bonding: C41/626
- j. Cutting out: C41/631
- k. Raking out: C41/636
- l. Preparing Joints: C41/641
- m. Filling Joints: C41/646
- n. Joint Treatment/Finish: C41/651

WORKMANSHIP

606* RECORDING BRICKWORK

- a. The schedules refer to take down and rebuild or to build up to match existing/adjacent areas.
- b. All areas are to be fully recorded by the contractor using photography and marked up record drawings prior to taking down, noting position of stones, the nature and style of the walling and style of the bedding and pointing.
- c. All materials resulting from taking down operations are to be carefully handled, salvaged and stored on site. they will remain the property of the Authority until such time as they are instructed specifically for disposal.
- d. Following inspection with the CA mark out area to be treated on site and transfer onto record drawing. Photograph areas to be treated and cross refer photo to record drawing.

611* RELEASING BRICKWORK

- a. Provide temporary support as necessary
- b. Release bricks by cutting out jointing material, easing/levering bricks from their backing.
- c. Prevent damage to bricks being removed and surrounding work.
- d. Use manual tools only.
- e. Lay dust by sprinkling with water.
- f. Inspect voids with SO or notify any signs of structural movement found within walls.
- g. Set aside bricks for cleaning and reuse.

616* PREPARING BEDS/BACKINGS Generally to receive new work

- a. Thoroughly clear out void using hand tools and brushes.
- b. Treat voids with biocide as C40
- c. Temporarily support surrounding work.

641* PREPARING JOINTS

Clean out the joint with a bristle brush to remove all dust and loose material and thoroughly flush out with clean water, avoiding unnecessary saturation.

646* FILLING JOINTS

Re-wet the joint if necessary and tamp or grout deep cut joints or open voids to within 25 mm of the face, leaving a square face.

648* JOINT TREATMENT / FINISH

- a. Fill all joints evenly or solidly following on immediately from Laying/bonding or Filling joint operations.
- b. Iron well with a pointing key leaving a flush or struck finish slightly set back from this arris of bricks.
- c. Fresh work should be well protected until set.

- d. Stipple joint before fully set with a stiff bristle brush to expose aggregate and fully compress the mortar as approved sample on site.

692 MAKING GOOD OF TIE/ DOWEL INSERTION HOLES USING CORE DRILLED PLUGS

- a. Plugs: Before drilling hole for insertion of ties/ dowels drill out a plug of facing material.
- b. Diameter: Smallest practicable.
- c. Plugs unsuitable for reuse: Prepare a plug from matching masonry material.
- d. Holes: Thoroughly clean. Secure plug with a spot of epoxy resin and nonhydraulic lime:sand mortar .
- e. Joints: Fine and flush to match approved sample.

POINTING/ REPOINTING

810A PREPARATION FOR REPOINTING

- a. Removing mortar:
- b. Work from the top of the wall downwards.
- c. Remove carefully and without damaging adjacent masonry, arrises or widening joints.
- d. Recess for repointing: Form a neat recess of depth not less than 25 mm When mortar beyond this depth is loose and friable and/ or cavities are found seek instructions.
- e. Dust and loose debris. Remove. Dampen joints to control suction as necessary.

820 POINTING To Brickwork

- a. Preparation of joints: Generally as 810A. Remove all loose and friable material, dampen joints, as necessary, to control suction .
- b. Mortar: As section Z21.
- c. Mix: TBC - To match original – Samples to be provided for approval. To be based on feebly hydraulic lime (NHL 2) unless in exposed locations, where NHL 3.5 may be used at the direction of the CA.
- d. Sand source/ type: Coarse river sand, well graded, to match original. Samples to be provided for approval.
- e. Joints: To match existing .
- f. Other requirements: Grout deep voids as clause 720 .

840 POINTING WITH TOOLS/ IRONS

- a. General: Press mortar well into joints using pointing tools/ irons that fit into the joints, so that they are fully filled.
- b. 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

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

H71 LEADWORK

- To be read with Preliminaries/ General conditions.

GENERAL REQUIREMENTS/PREPARATORY WORK

110 GUTTERS

- Drawing reference: n/a refer to schedule of works. - Base: SW boarding as clause 635 below.
- Underlay: as stated In schedule.
- Pretreatment; Chalk Slurry (<http://www.plaspertex.com/pdf/tds-files/Chalk%20emulsion%20paint%20TDS.pdf>)
- Type of lead: milled as clause 550, codes as schedule of works or drawings. NEVER less than Code 6 unless stated.

- Fixing: Dress lead sheet over and beyond tilting fillets and welt edges where roofside gutter upstand is between 50-75mm. Fold & nail top edge of each sheet. Dress bottom end neatly into around cornice wood core roll.
 - Cross joints: drips. 65mm.
 - Roofside cover flashing where gutter upstand exceeds 75mm: Code 6
 - Roll over-flow flashing: Code 6
- 112 LEAD RIDGE ROLLS, VALLEYS, GUTTERS, DORMERS, ABUTMENTS, APRONS ETC.
- Drawing reference n/a refer to schedule of works.
 - Underlay: as stated in schedule.
 - Pretreatment; Chalk Slurry (<http://www.plaspertex.com/pdf/tds-files/Chalk%20emulsion%20paint%20TDS.pdf>)
 - Base: Treated SW boarding where required as clause 635.
 - Type of lead: milled as clause 550, codes 4-6 as stated in schedule.
 - Fixing: Lead clips @ 300 c/c
 - Cross joints: Lap joints minimum 200mm
- 113 LEAD TRAY
- Drawing reference no: A101, 102
 - Base: Existing stone to cornice (on sisalkraft building paper, back of lead treated with chalk-slurry as noted in SoW).
 - Type of lead: milled as clause 550, code 6.
 - Pretreatment; Chalk Slurry (<http://www.plaspertex.com/pdf/tdsfiles/Chalk%20emulsion%20paint%20TDS.pdf>)
 - Tray fully welded off site to suit dimensions/pattern taken on site (**NB** area A & Area B may vary in size), including spigot and recess into existing chase in cornice.
 - Construct tray as drawing & as *Lead Sheet Association Manual principles for forming hoppers and catchpits unless noted otherwise on drawings or in schedule of works. Outer edges to be turned down as shown, not finished cut.*
- 115 STAINLESS STEEL PIGEON PROTECTION MESH
- Drawing reference no: A101/102, also refer to schedule of works
 - Product: ½" woven stainless steel (Austentic grade 316) mesh.
 - Fixings: Lead clips welded to tray (welded off-site), folded over to retain mesh.
 - Supplier: Contractor's Choice.
- 116 LEAD COVERING TO HOPPERS (AREAS A&B)
- Drawing reference no: A102 refer to schedule of works
 - Product: Code 5 milled lead, formed to neatly sit over, dressed down over hopper edges to form drip. Spigot from tray to sit into covering (see section on drawing A102). Tray to have welded lead clips to retain covering.
- 130 CLADDING (UPSTAND OF GUTTER 14, ROOF AREA G)
- Substrate: Existing brickwork
 - Preparation: Remove all projecting metal fixings, snots of mortar or other protrusions to make surface suitable for installation of leadwork.
 - Underlay: Sisalkraft 234 building paper.
 - Type of lead: Milled Lead.
 - Thickness: Code 7 or as stated on drawings.
 - Pretreatment: Apply chalk slurry coat to underside of lead and allow to dry before laying, followed by chalk paste coat after bossing but before final fixing - manufacturer of chalk slurry
 - Chalk Slurry (<http://www.plaspertex.com/pdf/tds-files/Chalk%20emulsion%20paint%20TDS.pdf>) [Vertical](#)
 - joints: Welted seams .
 - Spacing: As drawings, maximum as LSA guidelines.
 - Bottom edge detail: Folded over continuous stainless steel clip.
 - Cross joints: 150 mm laps with terne coated stainless steel clip at centre of each bay .
 - Spacing: As drawings, maximum as LSA guidelines.
 - Alignment: Half staggered and in line on alternate bays (to be symmetrical unless otherwise stated).
 - Intermediate fixings: n/a.
 - Head detail: As drawings (Ventilator Cill).
 - Other requirements: Sacrificial sheets of code lead clipped all round in locations shown on drawings and under all outlets.

250A WEATHERING TO CORNICES AND PARAPETS

- Substrate: existing stonework
- Underlay: Sisalkraft 234 Building paper - pretreated with chalk slurry: manufacturer of chalk slurry - Rowan Technologies: 216 Church Road, Urmston, Manchester, M41 9DX, mail@rowantechnologies.co.uk, + 44 (0) 161 748 3644.
- Type of lead: Milled.
- Thickness: Code 7.
- Joints: Welts with hidden clips at 200mm cc's.
- Spacing: max 1500 mm.
- Edge details: Underlap to provide welted drip below moulding.
- Fixing: Stainless steel clips at 300 centres.
- Other requirements: Fixing of lightning conductor strips where applicable.

410 APRON FLASHINGS TO CHIMNEYS AND BRICKWORK PROJECTIONS

- Lead: Milled
- Thickness: Code 6.
- Dimensions: As drawings and minimum dimensions as LSA detail requirements for exposed locations.
- Lengths: Not more than 1500 mm.
- End to end joints: Laps of not less than 100 mm.
- Upstand: Not less than 75 mm.
- Cover to abutment: Not less than 150 mm.
- Fixing: Lead wedges into bed joint, clips to bottom edge and upstand at laps and 500 mm centres.

420 COVER FLASHINGS GENERALLY

- Lead: Milled
- Thickness: Code 6.
- Dimensions: As drawings and minimum dimensions as LSA detail requirements for exposed locations.
- Lengths: Not more than 1500 mm.
- End to end joints: Laps of not less than 100 mm.
- Cover: Overlap to upstand of not less than 75 mm.
- Fixing: Lead wedges into bed joint, clips to lead upstand at laps and 500 mm centres.

440 SOAKERS AND STEP FLASHINGS TO ABUTMENTS

- Lead soakers: As LSA details and drawings.
- Thickness: Code 5.
- Dimensions: As LSA requirements and specifications.
- Length: Slate/ tile gauge + lap + 25 mm. Upstand: Not less than 75 mm.
- Underlay: Not less than 100 mm.
- Fixing: lead wedges unless specified otherwise (Step flashings).
- Lead step flashings:
- Thickness: Code 6.
- Dimensions:
- Lengths: Not more than 1500 mm.
- End to end joints: Laps of not less than 100 mm.
- Cover: Overlap to soaker upstands of not less than 65 mm.
- Fixing: Lead wedges at every course.

498A LEAD DAMP PROOF COURSE TO PARAPET COPINGS

- Position: under new or replaced stone copings (as stated in drawings/Schedule of Works).
- Lead: Milled
- Thickness: code 6.
- Finish: Fully coated on both sides with high-build, bitumen based paint on the surfaces which are to be embedded.
- Length: Not more than 1500 mm.
- Cover of flashing: Not less than 75 mm.
- Joints: Leadweld gusset upstand not less than 100 mm from end of each length, coinciding with vertical mortar joint in wall. Lap adjoining length over gusset upstand.
- Laying: On a thin even bed of wet mortar.
- Next layer of overlying construction: Bed on mortar without delay and finish joint neatly.
- Fixing cover flashing: With clips at laps and at 500 mm centres..

WORKMANSHIP

- 510 WORKMANSHIP GENERALLY:
- Lead is not to be laid in wet weather.
 - All roofing materials are to be kept dry. Lead sheet is not to be exposed to rain.
 - Cut, joint and dress lead neatly and accurately, to provide fully waterproof coverings/flashings, free from ripples, kinks, buckling and cracks.
 - Comply with BS 6915 and current good practice as described in the latest editions of 'The Lead Sheet Manual' published by the Lead Sheet Association, unless specified or agreed otherwise
 - Do not use scribes or other sharp instruments to mark out lead.
 - Use solder only where specified.
- Ensure that finished leadwork is fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
- 516 IN SITU LEADWELDING:
- Not permitted unless specifically agreed in advance with CA in writing and hot-works permit system agreed and implemented with CA and Client.
- 520 LAYOUT: agree setting out of joints, drips, and laps with the architect before beginning work.
- 550 LEAD SHEET: Colour marked for thickness and weight and of the type and code specified:
- Milled to BS 1178.
- 610 SUITABILITY OF BASES:
- Bases to be dry and free of dust, debris, grease and other deleterious matter.
 - Laying of lead will be taken as joint acceptance by the Main Contractor and Subcontractor of the suitability of bases.
- 635 SUBSTRUCTURE
- Well seasoned softwood (Scandinavian Redwood, SC3 grade, deal or pine) treated with preservative as per Specification for Preservative Treatment (Section Z12).
 - Boarding to be laid with grain running in the direction of fall and heart side up. All projecting nails to be driven well home and edges and irregularities planed off to provide a continuous supporting surface. Boarding to be ex 250 x 25mm plain edged sawn finished on the upper surface and regularised by planing the other side. Minimum finished board thickness 22mm. Boards, firrings and gutter bearers are to be treated as per the Specification for Preservative Treatment (Clause Z12) and are to be secured with copper clout nails only. Cornice parapet gutter finished fall to be 1:80.
- 650 TIMBER FOR USE WITH LEADWORK:
- Planed, free from wane, pitch pockets, decay and insect attack except pinhole borers.
 - Moisture content: Not more than 22% at time of covering.
 - Preservative treatment: CCA as section Z12 and British Wood Preserving Association Commodity Specification C8.
- FIXING/JOINTING LEAD**
- 710 HEAD FIXING LEAD SHEET:
- Where not specified otherwise, secure top edge of lead sheets with two rows of fixings, 25 mm and 50 mm from top edge of sheet, at 75 mm centres in each row, evenly spaced and staggered.
 - Sheets less than 500 mm deep may be secured with one row of fixings, 25 mm from top edge of sheet and evenly spaced at 50 mm centres.
- 715 FIXINGS: - Where not specified otherwise, fix lead sheet to timber substrates with:
Copper clout nails to BS 1202:Part 2, table 2, with annular ring, helical ring or serrated shank, length not less than 20 mm, shank diameter not less than 3.35 mm and head diameter not less than 10 mm.
- Where not specified otherwise, fix lead sheet to concrete or masonry substrates with brass or stainless steel screws to BS 1210, table 3, length not less than 19 mm and diameter not less than 3.35 mm, with washers of the same material and plastics plugs of length and diameter to suit screws.
 - Lead 'dots' are to be formed to support all vertical faces as directed whether or not these were originally provided.
- 720 CLIPS:
- Generally 50 mm wide, length to suit detail.
 - Copper clips to be 0.6mm thick securely fixed with 2no brass or s/s screws. Clips to be at 600mm max for code 7 & 8 lead and 500mm for lesser thicknesses.

- Stainless steel clips may also be used where extra strength and stiffness is required.
- Where visible copper or s/s clips are to be hot dip coated with high lead content solder.

740 WOOD CORED ROLL JOINTS WITH SPLASH LAP:

- Ridge roll core: 55 x 55 mm rounded timber as clause 650 tapering to a flat base 35 mm wide. Fix to base with brass or stainless steel countersunk screws at not more than 300 mm centres.
- Cornice gutter roll core: 50x50mm round timber as clause 650 with no taper. Fix to cornice with 25x125mm stainless steel strip bracket with c/s stainless steel screws into pre-drilled holes in stonework.
- Dress overcloak around core and extend on to main surface to form a 175mm splash lap, dressed into Glidevale Premier leadvent.

810 FORMING OF DETAILS:

- All work should be bossed where at all possible. Lead welding other than as specified is to be carried out only with the specific permission of the architect and the issue of a hot works permit. - Where permitted, leadwelded seams must be neatly and consistently formed. Do not undercut or otherwise reduce the thickness of the sheets at seams. Filler strips are to be of the same composition as the sheets being joined. Butt joints are to be formed to a thickness one third more than the sheets being joined. Lap joints are to be formed with 25 mm laps and two loadings to the edge of the overlap.
- Bossing must be carried out without thinning, cutting or otherwise splitting the lead sheet.

820 WEDGE FIXING INTO JOINTS/CHASES:

- Carefully rake out joint/chase to a depth of not less than 25 mm.
- Dress lead into joint/chase and fix with lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Prepare joint/chase and apply sealant as section Z22. Sealant: Arbokol 2000 2 part polysulphide mastic by Ashead Radcliffe. Mastic colour to be confirmed. All repointing of externally visible joints to be with lime mortar as Z21. Masking tape to be used between lead and mortar.

880 FINISHING:

- As soon as practical, apply a smear coating of patination oil, evenly in one direction and in dry conditions. Oil to be applied no later than the end of the days work. Apply to all visible areas and between laps.

M60 PAINTING & CLEAR FINISHING

To be read with Preliminaries/General conditions.

COATING SYSTEMS

117 PAINT TO METALWORK

- Location: All ironwork (guttering, hoppers, and otherwise stated in schedule and drawings) Manufacturer: Sherwin-Williams
Unit 5,
The Glade Business Centre Eastern Avenue
West Thurrock
Essex. RM20 3FH
Colour: To Match Existing (generally black)
Preparation: As clause M60/400 and to manufacturer's recommendations (seek confirmation before application).
- Existing coated metal surfaces: Thoroughly clean with water containing suitable detergent andrinse with clean water. Any areas showing rust or corrosion should be abraded to remove any loose deposits, feathering into sound paintwork.
- Initial coat(s): Sherwin-Williams Macropoxy® L425: Apply 1no Stipple coat then 2no coats @ 75 microns dft.
- Finishing coat(s): Sherwin Williams Acrolon C237: Apply 2no coats @ 50microns dft

120 EXTERIOR TIMBER PAINT

- Location: Timberwork (dormers) etc.
- Manufacturer: Little Greene (www.littlegreene.com) or equal approved.
- Reference: Traditional Oil Gloss Paint.

- Apply as advice sheet: https://www.littlegreene.com/media/wysiwyg/data-sheets/LG_Intelligent_Gloss_Sept_18.pdf
 - Samples: Allow for 3 no. 300x500 painted samples onto spare wood
 - Colour: To be agreed with the CA.
 - Preparation: for timber as clauses 461 & 481
 - Application: Stain-block primer, Undercoat, plus 3 no. coats by brush
- 130 INTERIOR DECORATION TO EXISTING PLASTERWORK.
- Location: Existing Plasterwork as Schedule and Drawings
 - Manufacturer: Little Greene (www.littlegreene.com) or *equal approved*.
 - Reference: Intelligent Matt Emulsion Paint
 - Apply as advice sheet: <https://www.littlegreene.com/advice-hub/product-advice-sheets-paint>
 - Samples: Allow for 3 no. 300x500 painted samples onto adjacent walls.
 - Colour: To match existing exactly except first-floor gables which are a 'feature' colour TBC.
 - Preparation: for previously painted as clauses 400 & 440 and manufacturer's requirements.
 - Application: Stain-block primer (where water-stained) plus 3 no. coats by brush

GENERALLY

- 215 HANDLING AND STORAGE:
- Coating materials must be delivered in sealed containers, each clearly labeled with the brand name, type of material and manufacturer's batch number.
 - Wherever possible materials must be from one manufacturing batch. Inform the CA if materials from more than one batch are to be used, store separately and allocate to distinct parts or areas of the work.
 - Store materials in accordance with manufacturer's recommendations. Use in order of delivery and before expiry of any shelf life date. Note that soft distemper has a very short shelf life.
- 220 COMPATIBILITY:
- Check that all materials to be used are recommended by their manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other.
 - Undertake trial areas of paint onto all plaster substrates 2 months before painting is due to be undertaken.
 - Where surfaces have been treated with preservatives or fire retardants, check with treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance.
 - Inform the CA of any discrepancy in specification of coatings and obtain instructions before proceeding with application.
- 230 ANCILLARY SURFACES: The descriptions of areas to be coated given in schedules, etc. are of necessity simplified. All ancillary exposed surfaces and features are to be coated to match similar or adjacent materials or areas except where a fair faced natural finish is required or items are completely pre-finished. In cases of doubt obtain instructions before proceeding.
- 240 SURFACES NOT TO BE COATED:
Protect surfaces not to be coated from paint splashes or overspray.
- 270 OFF SITE WORK:
- All off site preparation and coating to be carried out under cover in a suitable environment with adequate lighting.
 - Store all items, both before and after coating, in a clean, dry area protected from the weather and mechanical damage, properly stacked with spaces to permit air circulation and prevent sticking of surfaces.
- 280 PROTECTION:
- Adequately protect internal and external surfaces, fixtures and fittings which are not to be coated, by covering with dust sheets, masking or other suitable materials.
 - Exhibit 'Wet paint' signs and provide barriers where necessary to protect other operatives and the general public, and to prevent damage to freshly applied coatings.
- 290 TESTING OF VISCOSITY, ETC: The CA may, with discretion, take samples of materials from each manufacturing batch as follows:
- Unopened containers, or samples from previously unopened containers, for submission to manufacturer for comparison with manufacturer's own retained samples from the same batch.
 - Unopened containers, or samples from previously unopened containers, as a control sample for assessment of samples taken from painters' kettles.

- Samples from painters' kettles for submission with control sample to manufacturer and/or independent testing laboratory for comparative testing.
- 320 INSPECTION OF WORK: Permit coating manufacturers to inspect the work in progress and take samples of their products from site if requested.
- 321 INSPECTION OF WORK: Inspection of the whole of the work at each of the stages set out below may be made, at the discretion of the architect. Agree with the architect a programme which will facilitate such inspections and notify him when each part and stage of the work is ready for inspection. Do not proceed with subsequent stages of the work until authorised.

Type(s) of coating	Inspection at completion of
M60/117	samples, Initial coat & Final Coat
M60/120	samples, Initial coat & Final Coat
M60/121	samples, Initial coat & Final Coat

PREPARATION

- 400 PREPARATION GENERALLY:
- To BS 6150, Section 4.
 - Materials used in preparation must be types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
 - Prevent or control exposure of operatives to dust, vapour and fumes exceeding occupational exposure standards set in the current Health and Safety Executive (HSE) document EH40.
 - Substrates must be sufficiently dry in depth to suit the coating to be applied.
 - Remove efflorescence salts from surfaces. Repeat removal if efflorescence recurs.
 - Clean off dirt, grease and oil from surfaces. If contamination of surfaces/substrates has occurred, obtain instructions before proceeding.
 - Smooth surface irregularities. Fill joints, cracks, holes and other depressions with stoppers/fillers worked well in and finished off flush with surface. Abrade to a smooth finish.
 - Apply oil based stoppers/fillers after priming. Apply water based stoppers/fillers before priming unless recommended otherwise by manufacturer. Patch prime water based stoppers/fillers when applied after priming.
 - Remove dust and particles from dry abrasive preparation of surfaces.
 - Remove residues from wet preparation of surfaces by rinsing with clean water, wiping and allowing to dry.
 - Ensure that doors, opening windows, etc, are 'eased' as necessary before coating. Prime any resulting bare areas.
- 410 SUITABILITY OF SURFACES AND CONDITIONS: Application of coatings will be taken as joint acceptance by the Main Contractor and the Painting Contractor of the suitability of surfaces and conditions within any given area to receive the specified coatings.
- 425 IRONMONGERY: Remove from surfaces to be coated and refix on completion. Do not remove hinges unless instructed to do so.
- 440 PREVIOUSLY COATED SURFACES GENERALLY:
- Prepare in accordance with BS 6150, Section 6.
 - When removing or partially removing coatings, use methods which will not damage the substrate or adjacent surfaces or adversely affect subsequent coatings. See spec C42.
 - Carefully remove all loose, flaking or otherwise defective areas to a firm edge.
 - Completely remove alkali affected coatings.
 - Where coatings are suspected of containing lead, obtain instructions before proceeding.
 - Where substrates containing asbestos are revealed, obtain instructions before proceeding.
 - Where significant rot, corrosion or other degradation of substrates is revealed, obtain instructions before proceeding.
 - Thoroughly clean retained coatings with appropriate detergent solutions or solvents to remove all dirt, grease and contaminants. Abrade gloss coated surfaces when still wet to provide a key.
 - Apply additional preparatory coats to areas of partial removal to restore original coating thicknesses. Abrade junctions to give a flush surface.
 - Where coatings are completely removed, prepare surfaces as specified for uncoated surfaces.
- 452 PREVIOUSLY COATED SURFACES - WIRE BRUSHING:

- Thoroughly wire brush all existing painted surfaces to remove all unsound or flaking materials. To be carried out manually, not by machine without the specific permission of the architect.
- 461 PREVIOUSLY COATED TIMBER:
- Remove any degraded or weathered surface timber by rubbing down by hand.
 - Ensure that repairs to degraded substrate timber have been carried out with sound timber of the same species.
 - Apply two coats of knotting to exposed resinous areas and knots and allow to dry.
- 471 PREPRIMED TIMBER: Abrade chalking, powdery and other defective primer back to bare timber, remove dust and re-prime resulting bare areas.
- 481 UNCOATED TIMBER:
- Abrade to a smooth, even finish with arises and moulding edges lightly rounded or eased.
 - Ensure that heads of fasteners are countersunk sufficiently to hold stoppers/fillers.
 - Apply two coats of knotting to resinous areas and knots and allow to dry.
- 622 TREATMENT OF ORGANIC GROWTHS:
- Remove all loose growths and infected coatings/decorations.
 - Apply appropriate biocidal solution to growth areas and surrounding surfaces.
 - Scrape or brush off all dead growth. Remove infected materials immediately to ensure that no other areas become infected.
 - Apply appropriate residual effect biocidal solution to inhibit re-establishment of growths.
 - Biocides must be approved and registered by the Health and Safety Executive (HSE) and listed in the current 'Reference Book 500', Part B, as surface biocides.

APPLICATION

- 700 UNSUITABLE CONDITIONS:
- Take all necessary precautions including restrictions on working hours, providing temporary protection and allowing extra drying time, to ensure that coatings are not adversely affected by climatic conditions during and after application.
 - Prevent or control exposure of operatives to solvent vapour levels exceeding occupational exposure standards set in the current Health and Safety Executive (HSE) document EH40.
 - Unless it is specifically permitted by the coating manufacturer, do not apply coatings:
 - To surfaces affect by moisture, frost or airborne dust.
 - When the air or substrate temperature is below 10°C.
 - When the relative humidity is above 80%.
 - When heat is likely to cause blistering or wrinkling.
- 711 COATING GENERALLY:
- To BS 6150, Section 5.
 - Do not use materials which show any bittiness or other defects when applied. Do not thin or intermix unless specified or recommended otherwise.
 - Apply priming coats as soon as possible on the same day as preparation is completed. They must be of adequate thickness and suit surface porosity.
 - Apply coatings by brush or roller unless otherwise specified or approved.
 - Keep brushes and equipment in a clean condition. Dispose safely of cleaning and waste materials, do not pour into sanitary appliances or drains.
 - Subsequent coats of the same pigmented material must be of a different tint to ensure that each coat provides complete coverage.
 - Apply coatings to clean, dry surfaces in accordance with the manufacturer's recommended intervals between coats.
 - Apply coatings evenly to give a smooth finish of uniform colour, free from brush marks, sags, runs and other defects. Cut in neatly and cleanly. Do not splash or mark adjacent surfaces.
 - Adequately protect drying and completed work from damage.
- 720 PRIMING JOINERY:
- Before priming preservative treated timber ensure that any cut surfaces have been retreated and that all preservatives are completely dry.
 - Liberally coat all end grain, allow to soak in and then recoat.

- 730 CONCEALED JOINERY SURFACES: Where one or more additional coats are specified to be applied in the factory, they must be applied to all surfaces, including those which will be concealed when components are fixed in place.
- 770 EXTERNAL DOORS: Prime and coat bottom edges before hanging.
- 820 COMPLETION: Ensure that opening lights and other moving parts move freely. Remove all masking tape and temporary coverings.