



LAYSTALL STREET, MANCHESTER

Repair Specification.
Chambers Conservation Ltd.

CHAMBERS

ARCHITECTURE · CONSERVATION



Mercury House,

High St,

Tattenhall

Chester

CH3 9PX

Chambers Conservation Ltd

www.chambersconservation.com

1. Material Specification

C40 Masonry Cleaning

200 CLEANING SURFACES SCHEDULE OF OPERATIONS

201 APPROVED MASONS

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

221 REMOVAL OF SULPHATES AND SURFACE DEPOSITS FROM BRICKWORK, TERRACOTTA, WALLING AND DRESSINGS, PRIOR TO REPAIRS - HEAVY SOILING - 'JOS' CLEANING "TORC (JOS)" SYSTEM

- Stonehealth Ltd
Bowers Court
Broadwell
Dursley
GL11 4JE
Tel (+44) (0)1453-540600 Fax (+44) (0)1453 540609
Email: workshop@stonehealth.co.uk
www.stonehealth.com
- This is to be carried out to all existing faces where indicated on drawings.

Water: C40 256
Abrasive C40 253
Sequence: C40 261
Recording: C40 266
Preparation: C40 291A-293A & C40 294A-296A

225 REMOVAL OF PAINT FROM STEPS, MOULDINGS, FLOORS ETC.

- This is to be carried out to all existing faces where indicated drawings, schedules and data sheets.

Solvent: C40/250
Sequence: C40/261
Recording: C40/266
Preparation: C40/280
Treatment: C40/287-290

211* REMOVAL OF SULPHATES AND SURFACE DEPOSITS FROM WALLING AND DRESSINGS PRIOR TO REPAIRS: LIGHT SOILING:WATER WASHING

- This is to be carried out to all existing facework where indicated on drawings.

Water: C40/256
Neutral Soap C40/251
Sequence: C40/261
Recording: C40/266
Preparation: C40/271-3
Treatment: C40/274-9

232* REMOVAL OF EFFLORESCENCE FROM BRICKWORK, AND DRESSINGS HEAVY SOILING: POULTICING

- This is to be carried out to all existing facework where indicated on drawings and schedules.

Poultice C40 257
Sealing Membrane C40 257

Sequence	C40 261
Recording	C40 266
Preparation	C40 271
Cleaning Process	As per trials (refer to 257).

235 REMOVAL OF ALGAL SLIMES, LICHENS, MOSSES AND SMALL PLANTS TO WALLING AND DRESSINGS, AND RENDER "DOFF" SYSTEM

This is to be carried out to all existing facework where indicated on the drawings and in the schedule.

System to be supplied by as below and used by approved operatives.

Stonehealth Ltd
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Water:	C40 256
Sequence:	C40 261
Recording:	C40 266
Preparation:	C40 281-3
Treatment:	C40 284-6

MATERIALS

250* SOLVENT: Dichloromethane

Manufacturer and reference: Green Nitromors

251* NEUTRAL SOAP • Contractor's choice to CA approval.

253 ABRASIVE

- Calcite Powder. Manufacturer/Reference: To contractors choice and to stonehealth/Jos operator's recommendations.

256 WATER

- Clean tap water only.

WORKMANSHIP

261 SEQUENCE OF OPERATIONS

- Inspection with CA
- Recording
- Preparation (including protection)
- Treatment.

266 RECORDING

Following inspection with CA mark out areas to be treated on site and transfer onto record drawing. Photograph areas to be treated and cross reference photograph to record drawing.

274* TREATMENT WATER WASHING

- Use fine water spray nozzles at least 300mm away from the wall face to provide intermittent (or pulsed), nebulous (or atomised) sprays of water playing on the masonry surface.
 - The sprays shall be controlled by hand pumps.
 - The washing interval will be initially established during the trial and may be varied as the washing is monitored but allow for ten second spraying times interspersed by four minute drying periods until the deposits are loosened.
- 275* TREATMENT WATER WASHING
- Monitor the washing closely and commence scrubbing as soon as the dirt becomes responsive to brushing. Brush with a soft bristle or phosphor bronze wire brushes making sure that masonry surface is not marked or scored.
- 276* TREATMENT WATER WASHING
- Monitor the washing closely to ensure that just enough water is applied to remove surface dirt but not saturate the masonry.
 - Inform CA if masonry is becoming saturated or the dirt is not responding the brushing.
- 277* TREATMENT WATER WASHING
- Continue the washing and brushing until the agreed level of cleanliness is achieved or the agreed cycle is complete
- 278* TREATMENT WATER WASHING
- Arrange for CA to inspect when the above stage is reached.
 - Receive further instructions
- 279* TREATMENT WATER WASHING
- When it is agreed by the CA that washing is complete, remove all temporary protection, plugging or masking and clear all waste and debris.
- 280 PREPARATION:
- Protect surrounding surfaces against damage, spread of chemicals, control dust and waste.
- 281 PREPARATION FOR 'DOFF' CLEANING
- Open joints or cracks should be temporarily plugged in a method approved by the CA to avoid excessive ingress of water into the building fabric.
- 282 PREPARATION FOR 'DOFF' CLEANING
- Protect surrounding surfaces that could be damaged by the subsequent treatment, including temporary masking of adjacent openings to avoid ingress of water into the interior of the building.
 - Methods of protection to be approved by the CA prior to commencement.
- 283 PREPARATION FOR 'DOFF' CLEANING
- Obtain CA's approval to temporary protection
 - Carry out a trial clean (according to 284*-286* incl. below) to an area of 1M2 in a location agreed with the CA and obtain approval to this prior to commencement. This trial sample will then be considered as a 'control' for the general standard of clean.
 - Provide wind protection and control waste as necessary.
 - Undertake any preparation recommended by specialist operatives.
- 284 TREATMENT 'DOFF' CLEANING
- This treatment is to be carried out by an approved specialist firm using identified and approved operatives that have demonstrated their ability to control the method to achieve the required level of clean but without damage to the face. The required level of clean is the removal of loose dirt and organic growth to give a moderately even level of clean over the surface of the masonry. A control sample should be provided on site to demonstrate the level of clean required. Typical types of soiling to be removed are: "Picture frame" marks around periphery of masonry, leopard skin" marks from previous organic growth. Other types of soiling will be identified by CA on site
- 285 TREATMENT 'DOFF' CLEANING

- Arrange for CA to inspect when the above stage is reached.
- Receive further instructions.

286 TREATMENT 'DOFF' CLEANING

- When it is agreed by the CA that washing is complete, remove all temporary protection, plugging or masking and clear all waste and debris.

287* TREATMENT: Application of Solvent

- Apply solvent in one coat by brush according to manufacturers recommendation.
- Leave insitu until paint is dissolved or no more than 30 minutes whichever is the sooner.
- Do not allow the solvent to dry out.
- Comply with all safety precautions recommended by the manufacturer.
- Control waste in a safe manner.

288* TREATMENT: Scraping

- Once paint has softened scrape off as much as possible using nylon scrapers or spatulas.
- Control waste in a safe manner.

289* TREATMENT: Scrubbing

- Scrub down the surface with white spirit using a nylon bristle brush to remove the remaining dissolved paint residue.
- Control waste in a safe manner.

290* TREATMENT: Washing

- Wash down the treated surface using nylon bristle brushes and water containing a little detergent to leave a clean surface.
- Control waste water in a safe manner.

C41 REPAIRING/ RENOVATING/ CONSERVING MASONRY

TO BE READ WITH PRELIMINARIES/ GENERAL CONDITIONS

GENERALLY/ PREPARATION

101* APPROVED BRICKWORK & TERRACOTTA 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 BRICKWORK & TERRACOTTA

1. Agree repair type with CA and photograph areas to be cut out. Review against drawings.
2. Cut out renewals.
3. Remove cramps if not to be retained (where applicable).
4. Treat cramps to be retained (where applicable).
5. Deep point open joints to face.
6. Clean retained brickwork/Terracotta as per C40.
7. Carry out consolidation as required.
8. Carry out repairs: Photograph areas to be repaired. Choose colour of mortar (samples provided and agreed before works undertaken).
9. Deep point joints for depth of repair and grout voids.

110 SCOPE OF WORK

- refer to drawings and schedule of works.

112 CUT OUT DEFECTIVE BRICKWORK AND INDENT NEW

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

- Brickwork
- Mortar: C41/225A
- Archaeological attendance: C41/301
- 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 dressings/copings indicated on the drawings.

- Terracotta/Brickwork: Existing.
- Mortar: C41/225A
- Archaeological attendance: C41/301
- Recording: C41/306
- Preparation: C41/810A
- Pointing: C41/820 & 840.
- Joint treatment/finish: C41/331 & F10/887

114 DISMANTLE SECTION OF WALLING (TERRACOTTA/BRICK) AND REBUILD

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

- a. Brickwork & Terracotta: as/to match existing and cl. 201.
- b. Mortar: C41/225A
- c. Archaeological attendance: C41/301
- d. Recording: C41/306
- e. Releasing/Dismantling: C41/311
- f. Preparing Salvaged Units: C41/321
- g. Preparing Beds/Backing: C41/316
- h. Laying/Bonding: C41/326
- i. Joint treatment/finish: C41/331
- j. Grouting voids: C41/356
- k. Cramps (where present): C41/257.

115 CUT OUT DEFECTIVE TERRACOTTA DRESSINGS/COPINGS: INDENT NEW

This is to be carried out to all existing terracotta dressings/copings indicated drawings and schedules. Note: Colour and profiles are to match existing, precisely.

- Terracotta: C41/201 (to match existing).
- Mortar: C41/225A
- Archaeological attendance: C41/301
- 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

117 DESCALE/DEFRASS/CONSOLIDATE DEFECTIVE TERRACOTTA/BRICKWORK 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.

- Archaeological Attendance C41/301

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

118 REMOVAL OF OLD CEMENT REPAIRS FROM TERRACOTTA.

- This is to be carried out to all areas where indicated on the drawings.
 - a) Archaeological Attendance C41/301
 - b) Recording: C41/306
 - c) Remove Cement Renders: C41/406

119 RESIN PINNING SPALLING/ FRACTURED TERRACOTTA.

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

120 REPAIR TO CERAMIC TILED FLOORING.

- Carefully remove detritus and dust from surface of tiles.
- Photographically record in format agreed with CA.
- Number individual tiles (in situ and displaced).
- Lay out on separate board (ply) to identify requirement for additional tiles to match existing.
- Matching tiles from source below.
- Relay tiles (2mm joints) on floor (Floor to OMI architect's specification).
- Bedding mortar as C41/225A but NHL 3.5 and with no sharp sand. Samples to be provided for approval by CA.

Source Matching/Replacement tiles from:

Craven Dunnill & Co Ltd.

Stourbridge Road
Bridgnorth, Shropshire
WV15 6AS

<https://www.cravendunnill.co.uk>

Refer also to HES guide: <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=7211d5d9-cfde-49bd-bac9-a59500af7b72>

121 CRAMP REPAIR: RELEASE DETACHED PIECE OF TERRACOTTA WALLING/ DRESSINGS: RENEW CRAMP AND REFIX PIECE.

This is to be carried out to existing terracotta where agreed with CA.

- Terracotta: Existing (the existing is to be very carefully removed and re-used unless agreed otherwise by the CA and stated on drawings).
- Mortar: C41/225A
- Resin: C41/251
- Pins: C41/256
- Cramps: C41/257
- Recording: C41/306
- Releasing masonry: C41/311
- Preparing Beds/Backings: C41/316
- Dressing: C41/341
- Fixing: C41/351
- Joint treatment/finish: C41/331
- Grouting voids: C41/356

MATERIALS

128 REVIEWING SCOPE OF THE WORK

- a. Inspection: Arrange before starting work. Confirm type and extent of work required.
- b. 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.

129 REDUNDANT FITTINGS/ FIXINGS

Items to be removed: as indicated on drawings .

Removal: Minimize disturbance to surfaces.

Make good to match existing (piecing in brick 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 C41/112.

141* TREAT FIXED ITEMS INSITU

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

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 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.

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 TERRACOTTA

Type and Source: colour and finish to match existing precisely. Samples to be provided for approval by CA. Source from:

Darwen Terracotta Ltd, Building O, Ribble House, Ribble Business Park, Challenge Way, Blackburn, Lancs, BB1 5RB.

Or

Hathern Terracotta (through Michelmersh Brick co), Freshfield Lane, Danehill, Haywards Heath, West Sussex RH17 7HH

212 PROTECTION DURING CONSERVATION WORKS

The scaffold is to be roofed 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.

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
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221* MORTAR Preparation Generally.

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

223 MORTAR Repair mortar slurry coat/grouting of voids.

•Mix: as 225.

•Source:

Lime: St Astier, NHL 2. Obtained from Setra Marketing Ltd: 01372-465779, (fax: 01372-801302).

Sands: Well-graded local sands to match existing, mixing building sands and sharp sand to approved mix. Refer also to 220A.

225A MORTAR

Repair Mortar, Repointing to Terracotta and Brickwork Generally Assumed Mix: Hydraulic Lime (NHL 2): Sand (1: 2.5). Mix to be confirmed following provision of samples in discussion with the CA.

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 or equal approved.
- 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

•Resin: C41/251

•Sizes to suit lengths of cramps required (to match existing dimensions). Carefully release existing cramp avoiding damage to adjoining work (with hand tools only) and set aside for recording.

•Supply and fix new cramps made of 5mm stainless steel threaded bar (grade 316L minimum), bent to shape and inserted into existing holes unless stated otherwise. New cramps should match the originals in size.

DISMANTLING/ REBUILDING

WORKMANSHIP

301* ARCHAEOLOGICAL ATTENDANCE

- a. The Contractor is to be aware at all times that any particular operation involving Terracotta (or brickwork) especially during taking down, opening up, or removal of vegetation operations, may be of interest to the county archaeologist/CA or someone appointed by him to watch operations. Every facility is to be given to this person, to provide access and information upon request.
- b. Any object or anything at all that may be of interest to the archaeologist that is found/uncovered during such operations listed in a) above must immediately be advised to the CA, and further works in the immediate location of the find must be ceased for 2 days or less if the site is investigated and the 'all clear' given to proceed.
- c. In scheduled items noting the need for archaeological attendance, the Contractor is to give said person sufficient advance notice, minimum 24 hours, prior to carrying out that item.
- d. Certain objects, decorative terracotta (where to be removed), etc. are to be taken out/detached and taken down and delivered to the CA, all under his advice and attention. The object is to be labelled and logged, recording exact location and condition when found/taken out.

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 in units from their backing, by adopting such methods necessary to prevent damage to brick or terracotta 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 units on their underside as they are released,
- f. Wash each unit 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 TERRACOTTA

- a. Thoroughly clean bricks/terracotta 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 units.

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/terracottawork (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 Terracotta units or brickwork, starting from the centre and working outwards.
- b. NB Decorative or profiled terracotta, 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 units have been removed.

341 DRESSING

- a. Finish new work on all exposed faces to achieve a finish to match the original finish of existing, 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 units 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).

356 GROUTING OF VOIDS IN MASONRY: GRAVITY SYSTEM

- Assume machine (gravity) grouting is to be used but hand grouting with a clay grout cup and pouring can may be appropriate in some cases.

• **GROUTING APPARATUS:** The grouting apparatus required for filling large voids consists of one or two open galvanised iron pans with outlets in the bottoms. A union with a 38mm diameter galvanised pipe is fitted to the outlet, which in turn is connected by means of coupling to several lengths of 38mm diameter rubber hose terminating in a galvanised iron nozzle 19mm in diameter fitted with a stopcock. Each grout pan is provided with a wooden plug about 460mm long to fit into the hole in the pan bottom, and with a plunger in the form of a rubber cup on a wooden handle. This plunger is used when the grout is flowing to give an added impetus to the flow in the event of an airlock or other stoppage in the tube.

• **PREPARATION:** Small holes are drilled into the wall where voids have been located or are anticipated. They should be about one metre apart horizontally and 500mm vertically on a staggered pattern. As the holes are drilled they should be washed through thoroughly with clean water, pouring in at the top holes and continuing to pour until the water runs out clean at the bottom. During this process a note should be taken of the joints through which the water runs out; before grouting is commenced these joints must be tightly filled with tow or clay, pressed well into a depth of 38 - 50mm. The nozzle of the delivery hose is then inserted into the lowest hole and plugged round with tow.

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.

406 CEMENT REMOVAL

- Remove cement patch repairs to terracotta using hand tools. This is best achieved by continual gentle tapping with a hammer at the centre of the repair until the different mechanical properties between the masonry and the cementitious mix causes the two to part without damage. The process is lengthy and time should be allowed for it. Care is to be taken to avoid damage to the substrate, particularly where the repairs are deep and well-adhered. Avoid damage to edges of sound masonry. Remove cement pointing by using hand tools such as quirks or narrow chisels. Clean out joints using dry air sprays and non-ferrous or stiff bristle brushes.

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* PINNING???

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

601* ARCHAEOLOGICAL ATTENDANCE

- a. The Contractor is to be aware at all times that any particular operation involving stonework (or brickwork) especially during taking down, opening up, or removal of vegetation operations, may be of interest to the site archaeologist or someone appointed by him to watch operations. Every facility is to be given to this person, to provide access and information upon request.
- b. Any object or anything at all that may be of interest to the archaeologist that is found/uncovered during such operations listed in a) above must immediately be advised to the CA or the archaeologist, and further works in the immediate location of the find must be ceased for 2 days or less if the site is investigated and the 'all clear' given to proceed.
- c. In scheduled items noting the need for archaeological attendance, the Contractor is to give said person sufficient advance notice, minimum 24 hours, prior to carrying out that item.
- d. Certain objects, carved stones, etc. are to be taken out/detached and taken down and delivered to the archaeologist, all under his advice and attention. The object is to be labelled and logged, recording exact location and condition when found/taken out.

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 & Terracotta.

- 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: as cl.225A - To match original – Samples to be provided for approval.
- d. Sand source/ type: ref. 225.
- 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.

C51 REPAIRING/ RENOVATING/ CONSERVING TIMBER

To be read with Preliminaries/ General conditions

GENERAL

110 INSPECTION

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

Parties involved:

- d. Contract administrator;
- e. Contractor's representative; and
- f. Structural engineer.

Timing: At least 2 weeks before starting each section of work.

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

150 TIMBER PROCUREMENT

- Timber (including timber for wood based products): Obtained from well managed forests and/ or plantations in accordance with:
 - The laws governing forest management in the producer country or countries.
 - International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
 - Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied, including FSC certification.
 - Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood based products.

160 TIMBER SUPPLIER

- Supplier: Submit proposals.

TIMBER REPAIRS/ ALTERATIONS

172 SOFTWOOD FOR REPAIRS

Timber: Generally to BS EN 942.

- Species: Douglas Fir. FSC CERTIFIED – CONTRACTOR MUST PROVIDE EVIDENCE.
- Quality: Generally to BS EN 942; free from decay and insect attack (except pinhole borers).
 - Appearance class: Class J2 free of knots
- Treatment: Primed and painted as M60/120
- Moisture content on delivery: to match existing +/- 2%

173 HARDWOOD FOR CILL REPAIRS/RENEWAL

Timber: Generally to BS EN 942.

- Species: Sapele or as agreed with CA prior to commencement. FSC CERTIFIED – CONTRACTOR MUST PROVIDE EVIDENCE.
- Quality: Generally to BS EN 942; free from decay and insect attack (except pinhole borers).
 - Appearance class: Class J2 free of knots
- Treatment: Primed and painted as M60/120.
- Moisture content on delivery: to match existing +/- 2%

176 PIECING IN SMALL REPAIR SECTIONS

Read in Conjunction with all associated drawings and schedules.

- SCOPE
 - Letting in new timber to repair damage, replace damaged or missing parts, plant on new timber to close gaps in frames, filling and patching.

- PREPARATION
 - Clean out area of repair with brushes and scrapers.
 - Cut back damaged timber to neat sound straight edges on all sides and at back to provide smooth clean surfaces for new timber to adhere to.
- FILLING AND PATCHING
 - Fill small holes less than 3mm diameter and scratches in polished timber with Brummer interior stopping of the right shade or wax. Avoid staining round repair.
 - Fill larger holes 3mm to 15mm in polished timber with tapered pellets fitted so that the grain runs with the filled timber. Select pellets from identical timber matched for grain and colour. Glue pellets. Finish flush with surface.
 - Fill larger holes with patches of identical timber let into surface. Patches must taper in depth and be glued and must be matched for grain and colour. Finish flush with surface.
- NEW TIMBER SECTIONS
 - New items must be exactly to match existing.
 - New items made to match must be copied exactly in all particulars. Carvings must be identical in all aspects to the original.
 - New items must be finished by hand. All machine marks must be removed. A surface which is not dead flat is preferred.
 - Polished timber is to be finished with a cabinet scraper and sanded as little as possible.
 - Control sample must be provided and agreed with CA before proceeding with all repair works.
- FINISHING
 - As section M60.
- MATERIALS
 - Timber for repairs should be as C51/172.
 - The moisture content of timber should be closely matched to the intended location within the range +/- 2%.
 - Glue should be P.V.A. water soluble, eg. Evo-stick Resin W.
- GENERAL REQUIREMENTS FOR WORKMANSHIP
 - It is essential that as much of the original work as possible should be protected and preserved.
 - The desired finished result is not that the woodwork should look new. It should look as old as it is but well cared for. Evidence of age is desirable.
- QUALITY STANDARDS

Reference is made to the following document which establishes the desired approach and standards in the repair of historic timber windows:-

SPAB Technical Pamphlet No.13 Repair of Wood Windows.

It is expected that a copy will be obtained by the contractor for retention and use on site.

177 PIECING IN LARGE REPAIR SECTIONS

Read in Conjunction with all associated drawings and schedules.

- SCOPE
 - As shown on drawings or as described in other clause.
 - Letting in new timber to repair damage, replace damaged or missing parts, plant on new timber to close gaps in frames, filling and patching.
- PREPARATION
 - Clean out area of repair with brushes and scrapers.
 - Cut back damaged timber to neat sound straight edges on all sides and at back to provide smooth clean surfaces for new timber to adhere to.

- **FILLING AND PATCHING**
 - Fill small holes less than 3mm diameter and scratches in polished timber with Brummer interior stopping of the right shade or wax. Avoid staining round repair.
 - Fill larger holes 3mm to 15mm in polished timber with tapered pellets fitted so that the grain runs with the filled timber. Select pellets from identical timber matched for grain and colour. Glue pellets. Finish flush with surface.
 - Fill larger holes with patches of identical timber let into surface. Patches must taper in depth and be glued and must be matched for grain and colour. Finish flush with surface.
- **NEW TIMBER SECTIONS**
 - New items must be exactly as drawn. Full size sections must match exactly.
 - New items made to match must be copied exactly in all particulars. Carvings must be identical in all aspects to the original.
 - New items must be finished by hand. All machine marks must be removed. A surface which is not dead flat is preferred.
 - Polished timber is to be finished with a cabinet scraper and sanded as little as possible.
- **FINISHING**
 - Painted surfaces are not to be stripped unless specified.
 - Redecorate as detailed in M60 work group.
- **MATERIALS**
 - Timber for repairs should be as C51/172.
 - The moisture content of timber should be closely matched to the intended location within the range +/- 2%.
 - Glue should be P.V.A. water soluble, eg. Evo-stick Resin W.
- **GENERAL REQUIREMENTS FOR WORKMANSHIP**
 - It is essential that as much of the original work as possible should be protected and preserved.
 - The desired finished result is not that the woodwork should look new. It should look as old as it is but well cared for. Evidence of age is desirable.
- **QUALITY STANDARDS**

Reference is made to the following document which establishes the desired approach and standards in the repair of historic timber windows:-

SPAB Technical Pamphlet No.13 Repair of Wood Windows.

It is expected that a copy will be obtained by the contractor for retention and use on site.

420 STAINLESS STEEL SECTIONS AND PLATES FOR SPLICE REPAIRS

- Standard: To BS EN 10088.
- Grade: austenitic stainless steel 1.4301.
- Source: Obtain steel from a source accredited to a national or internationally accepted quality standard.

430 PROPRIETARY FRAMING ANCHORS AND CLEATS

- Manufacturer: To contractors choice.
 - Product reference: Suitable for application.
- Material/ finish: Stainless steel, austenitic grade 16..
- Fasteners: Galvanized or sherardized nails, size as recommended by product manufacturer..

450 STAINLESS STEEL BOLT ASSEMBLIES GENERALLY

- Bolts: To BS EN ISO 3506-1.
 - Designation: A4.
- Nuts and washers: To suit grade of bolt.
 - Washer size:

In contact with timber: Diameter: 2 times bolt diameter; thickness: 0.2 times bolt diameter.

In contact with steel section/ plate (required when surface finish may be damaged by nut or bolt head rotating): To BS 4320.

- 480 **SCREWS GENERALLY**
- Standard: As section Z20.
 - Material: Stainless steel.
 - Tensile strength (minimum): 550 N/mm².
 - Finish as delivered: N/A.

EXECUTION

- 600A **WORKMANSHIP**
- Skill and experience of site operatives: Appropriate for types of work on which they are employed.
 - Documentary evidence: Submit details of team, projects completed (listed buildings), skills and qualifications.
- 610 **TEMPORARY SUPPORTS/ PROPPING**
- General: Provide adequate temporary support at each stage of repair work to prevent damage, oversteering or uncontrolled collapse of any part of the structure.
 - Bearings for temporary supports/ propping: Suitable to carry loads throughout repair operations.
- 620 **PROTECTION OF TIMBER AND WOOD COMPONENTS BEFORE AND DURING INSTALLATION**
- Storage: Keep dry, under cover, clear of the ground and with good ventilation. Support sections/ components on regularly spaced, level bearers on a dry, firm base.
 - Handling: Do not oversteer, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- 630 **MATERIAL SAMPLES**
- Representative samples of designated materials: Submit before placing orders.
 - Designated materials: douglas fir for repairs.
- 650 **DIMENSIONS GENERALLY**
- Site dimensions: Take as necessary before starting fabrication.
 - Discrepancies with drawings: Report without delay and obtain instructions before proceeding.
- 680 **WARPING OF TIMBER**
- Bow, spring, twist and cup: Not greater than the limits set down in BS 4978, BS EN 519 or BS EN 14081-1 for softwood, or BS 5756 for hardwood.
- 690 **PROCESSING TREATED TIMBER**
- Cutting and machining: Carry out as much as possible before treatment.
 - Extensively processed timber: Retreat timber sawn lengthways, thickened, planed, ploughed, etc.
 - Surfaces exposed by minor cutting and/ or drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.
- 700 **WOOD COMPONENTS - AS DELIVERED FINISH**
- Components to be painted: Primed.
 - Components to be clear finished: Natural.
- 710 **REUSE OF TIMBER SECTIONS/ WOOD COMPONENTS**
- Sections/ components scheduled to be removed but not reused in existing locations: Agree extent of retention for reuse elsewhere in the works.
 - Treatment following removal: as specified elsewhere.
 - Storage: Protect against damage, and store until required. Storage location: On site.
 - Reuse: Adapt sections/ components, as necessary, and install in agreed locations.
- 720 **TEMPORARY REMOVAL AND REINSTATEMENT OF FITTINGS/ FIXTURES**
- Items to be removed, and reinstated on completion of repair work:
 - Identification: Attach labels or otherwise mark items using durable, non-permanent means, to identify location and refixing instructions, where applicable.
 - Treatment following removal: As window schedule/specialists schedule .
 - Storage: Protect against damage, and store until required. Storage location: On site.
 - Reinstatement: Refit in original locations using original installation methods.
 - Items unsuitable or not required for reuse: Obtain instructions regarding disposal.
- 730 **PARTIAL REMOVAL OF EXISTING DECORATIVE/ PROTECTIVE FINISH TO WINDOWS**

- Extent: Remove minimum necessary to expose damaged or decayed wood. Feather the edge of remaining coating around repair site.
 - Method: Careful abrasion using moistened waterproof abrasive paper .
- 750 CLEANING DIRTY OR STAINED WOOD
- Generally: Scrub with neutral pH soap and clean, warm water.
 - Old varnish: Remove using mixture of turpentine (not turpentine substitute) and acetone in proportions determined by experiment, followed by washing down.
- 760A REPAIR OF MEMBERS - CUTTING OUT MEMBERS
- Extent of timber removal: Cut out full cross section of member where wood is defective or decayed, plus 50 mm of sound wood, generally as indicated on repair drawings.
 - Distance from face of support to cut end of existing timber: Obtain instructions if dimension exceeds 200mm.
 - Joint profile: as indicated on drawings appropriate for relevant repair situation .
- 780 REPAIR OF DISTORTED TIMBER MEMBERS
- Generally: Repair to shape that member has assumed.
- 850 ADHESIVE JOINTS
- Moisture content of sections to be joined: Within 5% of equilibrium moisture content for conditions of service, and differing from each other by not more than 3%.
 - Surfaces to be bonded: Close fitting, structurally sound, dry, and free from contamination by dirt, dust, grease or other deleterious substances.
- 860 MOISTURE CONTENT CHECKING
- Procedure: When instructed, check moisture content of timber sections with an approved electrical moisture meter.
 - Test results: Keep records of all tests. If moisture content falls outside specified range obtain instructions.

COMPLETION

- 910 MECHANICALLY FASTENED JOINTS
- General: Inspect accessible bolted, coach screwed and timber pegged joints and tighten fasteners if necessary.
 - Timing: On Completion and at end of Defects Liability Period or Rectification Period.

H71 LEADWORK

- To be read with Preliminaries/ General conditions.

GENERAL REQUIREMENTS/PREPARATORY WORK

- 112 LEAD FLASHINGS & WEATHERINGS 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

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.
- 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, firings 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.

M20 PLASTER & RENDER

To be read with Preliminaries/General conditions and drawings.

Traditional lime plastering and rendering is a highly skilled activity and the level of competence required must not be under-estimated. All lime plasterwork and rendering is to be undertaken by experienced specialist plasterers, and in accordance with current best practice. It is appreciated that such craftsmen have a superior knowledge of plaster techniques than the architect, and any suggested amendments or alternative working methods to the specification which such specialists consider necessary are to be brought to the attention of the architect before commencement. Specified sands may be substituted upon agreement with the architect, especially if plasterers have tried and tested preferred substitutions.

All specialist sub-contractors involved in historic plasterwork conservation or renewal are to provide suitable references and are to be agreed with the architect.

TYPES OF COATING

100 MATERIALS:

- **Sand:**

- For lime render: Sand for render: ½ parts Master's fine washed plastering sand to 1½ parts Morton Cullimore limestone grit sand – both available through Rose of Jericho (01935-83676) or similar with the architect's agreement.

- For lime plaster: to BS 1199, sharp pit sand, free from organic impurities, washed and evenly graded between 150µm-2.36mm particle size. Fine sharp silver sand is to be used for top coats. All sand is to be agreed with the architect prior to commencement, and sieve test results may be required.

- **Lime:**

Lime putty lime plaster:

Obtain pre-made putty lime made from quicklime to BS890:1972, screened through a 600 micron sieve and kept covered for a minimum of three months after slaking. Store in air tight bins.

- Lime for hydraulic render: St Astier NHL2 or similar with the architect's agreement.

- **Hair:**

For lime plaster. Ox, yak or goat hair. Long, strong and free from grease and other impurities.

- **Water:**

Clean and potable.

240 THREE COAT LIME PLASTER ON MASONRY:

- Location: As drawings
- Background: Rubble/ brick
- All coats to be as clause 241.

241 THREE COAT LIME PLASTER ON LATH:

- Location: Interior walls and ceilings as drawings.
- Background: Well seasoned split sweet chestnut or oak lath as clause 626.
- **Scratch/ Pricking up/ Render coat:**

Thickness (excluding dubbing out): 9 mm

Mix proportions 1:2½ lime: sand with 1lb/2 cubic feet (0,5kg/66 litres) of hair well beaten in to mix.

Cross key with lath scratcher to take:

- **Floating coat:**

Mix proportions 1:3 lime: sand with 1lb/2 cubic feet of hair well beaten in to mix.

Thickness: 6mm

Scour and then key with a devil float to take:

- **Top/ Setting coat:**

Mix proportions 1:3 lime: silver sand (depending on successful trial to match desired hardness and existing finish).

Thickness: 3mm

Trowel on with a laying-on trowel, then lay on a second layer with a wooden skimming float, then compact by scouring with a cross-grained wood float lubricated with water, and finally trowel up with a steel trowel and gone over with a stock brush three times in opposite directions. The texture of finish is to match existing plaster and is to be determined by the use of sample panels.

- Corners are to be protected with run staff beads, to match existing.

250 THREE COAT LIME:SAND EXTERNAL RENDER

- Locations: Castle Green House Front (main villa), 43 St Mary's street front (street frontage) range, repairs and making good to Green Street Villas and Ty Castell. Note that the render to Castle Green House is to be five coats (comprising 3 scratch coats) to make up thickness to match existing.

- **First (scratch) coat:**

Mix proportions:

1:1½:½ hydraulic lime: Morton sand: Master's sand (or alternative by agreement).

Thickness: 12mm

Finish: rule level and comb scratch

- **Second (float) coat:**

Mix proportions:

1:1½:½ hydraulic lime: Morton sand: Master's sand (or alternative by agreement).

Thickness: 10mm

Finish: rule level and comb scratch

- **Final (finishing) coat:**

Mix proportions:

1:1½:½ hydraulic lime: Morton sand: Master's sand.

Thickness: 8mm

Finish: Trowel on with a laying on trowel, lay a second layer with a wooden skimming float, then compact by scouring with a cross-grained wood float. Final finish texture is to be agreed from sample panels. Finish to be limewash as Section M60, colour to be confirmed. Render to Castle Green House is to be smooth finished and lined exactly as existing (detailed measurements are to be taken by the contractor prior to removal)

- Note: Ty Castell render is to be a roughcast self-coloured finish to match existing, for which 5 no. samples will be required.
- 4/5 days minimum is to be allowed between coats.
Note: Castle Green House render is up to 80mm thick in places. For pricing purposes assume an average reinstatement depth of 50mm.

SAMPLES

300 SAMPLE PANELS

- 1000x1000mm sample panels of all plaster finishes are to be constructed at the beginning of the contract. Where matching of the existing finish is required these will be constructed in the nearest convenient location or be portable where practical. Further panels may be required in order to reach a satisfactory match with the existing. Allowance should be made for two sets panels of lime plaster.

GENERAL REQUIREMENTS FOR WORKMANSHIP

410 BASIC WORKMANSHIP: Comply with the clauses of BS 8000:Part 10 relevant to this section.

- 423 UNIFORMITY OF COLOUR AND TEXTURE: Once samples of coatings have been approved do not change type or proportion of constituent materials. Ensure that supplies of materials are sufficient to give consistent and uniform colour and texture. Obtain each material from one source and mix different loads if necessary.
- 424 MEASUREMENT: All materials used for lime plastering and rendering shall be proportioned with guage boxes. Hair is to be weighed with scales. There is to be no substitute to accurately measured quantities.
- 449 ADMIXTURES: Do not use, unless specified or approved.
- 453 MIXING:
- Proportions of specified mixes are by volume and for dry sand. Adjust proportions if damp sand is used.
 - Do not use mortar-mill type mixers for mixing gypsum plasters.
- 458 CONTAMINATION: Do not allow contamination of one type of material by another, or by any set material.
- 461 INITIAL SET: Do not use mixes after initial set has taken place. Do not retemper or reconstitute mixes, unless permitted by the manufacturer of proprietary mixes.
- 466 SCAFFOLDING: use independent scaffolding to avoid putlog holes and other breaks in coatings.
- 469 CLEANLINESS: Protect thoroughly all existing work and approaches using suitable boards, sheets, etc. Clean off all droppings on to finished work immediately.
- 474 WEATHER:
- Do not plaster or render with lime bound materials when the air temperature is below or is likely to fall below 5°C during the setting period.
 - Protect all plasterwork and render from frost and cold, and ensure that internal and external areas are heated so that the air temperature does not fall below 5°C.
 - The provision and running of suitable heating apparatus is the contractor's responsibility.
 - Do not use frozen materials and do not apply coatings to frozen or frost bound backgrounds.
 - During periods of low humidity or heat ensure plasters and renders are regularly damped down with a fine mist spray to prevent premature drying. Avoid working in conditions where it is possible that the plaster or render will dry out overnight.
 - Plaster and render should be protected from drying out as clauses 791 and 880.
- 481 READY PREPARED LIME PUTTY:
- Use lime putty slaked directly from CL 90 (high calcium) quicklime to BS 890, using an excess of water and matured in pits/containers that allow excess water to drain away.
 - Density of matured lime putty: 1.3 to 1.4 kg/litre.
 - Maturity of lime putty before use: Not less than 90 days after slaking.
 - Prevent lime putty from drying out and protect from frost.
- 492 HAIR REINFORCEMENT:
- Type: Ox, yak or goat.
Proportions: As clause 241.
 - Hair to be clean and free from grease and other impurities. Length of chopped fibres: 20-75 mm and well teased before adding to the mix.
 - Mix thoroughly into lime:sand mortar during final mixing stage or knocking up stage as appropriate for the type of lime. Ensure that hair is well distributed throughout the mix without balling into lumps. Do not add hair to lime:sand mortar which is to be stored for more than 4 weeks. Paddle type mixers are not to be used for mixing in hair.
- 496 WORK TO HISTORIC PLASTER/RENDERS GENERALLY:
- Materials, and methods of working for the repair and replacement of plasterwork (decorative and plain) must match that of the original work as closely as possible, unless specified otherwise.
 - Before commencing work, agree mixes, preparation and application methods with the architect.
 - Use plasterers who are skilled and experienced in the repair and replacement of historic plasterwork including ceilings with cornices and decorative mouldings. Satisfactory references are to be provided and approved by the architect prior to commencement.
- 498 PROTECTION OF HISTORIC PLASTERWORK: Prevent damage and disfigurement to plain and decorative plasterwork during the course of the works:

- Provide or ensure provision of protection and/or temporary support to all vulnerable areas of plasterwork using methods agreed with the architect. All work above areas of original plaster is to be carried out with the utmost care.
- Adopt careful working methods when working alongside or above plasterwork to prevent disturbance from vibration and impact.
- Do not make temporary fixings into decorative plasterwork or apply adhesive tape to plaster surfaces.
- Do not allow rigid boards, battens, etc. to touch plasterwork directly. Sandwich an isolating layer of mineral wool or other approved soft material between the boards and plaster face. Ensure that the isolating layer is firmly pressed against the plaster face.

PREPARING BACKGROUNDS

- 507 ACCEPTANCE OF BACKGROUNDS: Before preparation or application of coatings ensure that:
- All existing render is removed.
 - Backgrounds are secure, adequately true and level to achieve specified tolerances, free from contamination and loose areas, reasonably dry and in a suitable condition to receive specified coatings.
 - All cutting, chasing, fixing of concealed conduits, service outlets and the like, and making good of the background, is completed.
- 511 PREPARATION GENERALLY:
- Remove efflorescence, dust and other loose material by thoroughly dry brushing.
 - Remove all traces of paint, grease, dirt and other materials incompatible with coating by scrubbing with water containing detergent and washing off with plenty of clean water. Allow to dry before applying coatings unless specified otherwise.
- 515 KEYING/BONDING: Prepare backgrounds as specified for the type of coating to be applied. Where not specified, comply with BS 8000:Part 10, clause 2.2.2.2. Methods other than those specified may be submitted for approval.
- 524 PREVIOUSLY PAINTED SURFACES: Rub down paint by hand until a smooth substrate is achieved.
- 526 PREPARING EXISTING MASONRY FOR PLASTER OR RENDER: For porous surfaces carefully damp down the night before plastering and once more immediately before work. Rake out all joints to a depth equal to the width of the joint. Brush out joints to remove dust. Hack back all non-porous surfaces to provide a key, and coat with limewash. The first plaster or render coat can be splattered onto the substrate in a similar to a harl coat to improve the key.
- 551 EXISTING PLASTER/RENDER: The extent and location of renewal of existing coatings must be agreed, at least on a provisional basis, with the CA before the work is started. Remove existing coatings in ways which will reasonably minimise the amount of removal and renewal.
- 556 REPAIRING EXISTING RENDER:
- Cut out all loose, hollow, soft, friable, badly cracked or otherwise damaged areas to form rectangular patches with straight horizontal and vertical edges, square cut or slightly undercut.
 - Cut back to imitation joint lines where they occur.
 - Cut out cracks other than hairline cracks to a width of not less than 75 mm, undercutting all edges but the bottom.
 - Wash and brush exposed backgrounds and edges to remove dust and loose material.
- 573 TREATMENT OF ORGANIC GROWTHS: Use only biocides recommended for the purpose and cleared under the Pesticides Safety Precautions Scheme.
- 581 ESTABLISH ORIGINAL PLASTER FACE:
- Removal of decorative finishes: generally
 - Before carrying out repairs to plasterwork ensure that decorative finishes and fillers have been removed from: Repair area(s) at junctions with new plasterwork.
 - Decorative plasterwork before making any castings.
 - Where paint coatings are suspected of containing lead, obtain instructions before proceeding.
- 592 REPAIRING TIMBER LATH AND PLASTER CEILINGS:
- Areas of plasterwork to be repaired are to be thoroughly photographed and measured by the contractor and kept as a record
 - Ensure that each repair is dry and effective before commencing repairs to immediately adjacent areas.

- Remove floor finishes from above to allow access to top of plaster for conservation.
- Clear all dust, debris and pugging from between the joists using soft brushes and a vacuum cleaner.
- Fully support area(s) of plasterwork to be repaired with 12mm plywood panels and bearers and props from below, or by drilling through the plaster at intervals and supporting the panels and bearers with wire loops threaded through the plaster and secured to the joists. All ply panels are to be separated from the plaster with felt pads, and adequate support is to be given to bulges or modeled plaster so that the plaster is unable to move when the laths are removed.
- The condition of the laths is to be examined with the architect. Decayed laths or those spaced too close together are to be removed.
- Very carefully cut through defective laths so as to retain plaster nibs or where laths are sound, cut through alternate laths. Remove cut laths. Carefully vacuum surface of plaster to remove debris and dust. Apply diluted (10%) PVAC solution to the existing plaster and surrounding laths to control suction.
- For small areas of repair (one or two laths) form a key to surrounding joists with brass screws left projecting 40-50mm and fill area with retarded plaster of Paris.
- For larger areas of repair form woven wire troughs from copper or brass small-mesh wire and press through plaster of Paris to form key. Turn up margins of mesh and secure to joists with timber battens.
- Where a key between existing plaster and plaster of Paris is likely to fail (for example where plaster nibs have come away with laths) a timber frame is to be screwed between the joists so that a timber panel lies across the top of the plaster. The plaster can then be fixed as clause 593.
- Repair cracks after removal of support as clause 596.
- Thorough descriptions of these methods can be found in the English Heritage Technical Handbook Volume 3; Mortars, Plasters & Renders.

593 REFIXING EXISTING PLASTER:

- Where plaster is sagging due to laths having pulled away from the backing, or loss of key with the substrate, drill through the plaster into the backing and secure with:
Screws: no. 10 brass with countersunk heads at 300 mm centres.
Washers: brass 25 mm diameter inner washer and brass 38 mm diameter fine mesh outer washers (mesh size 1.5 mm).
- Cut away the plaster under the washer so that it bears against the lath, not the plaster. then tighten the screw gradually so that any sagging plaster is pulled gently back into place. Cover the washer with a second washer of gauze made from the same material as the fixing to provide a key for the plaster patch.
- Fill fixing recesses with 1:1 gypsum:lime putty finished flush with existing plaster surface.
- This method of fixing is to be undertaken in accordance the technique described in Mortars, Plasters & Renders in Conservation by John Ashurst.

594 REPAIRING EXISTING PLASTER:

- Remove plaster that is loose, soft, friable, badly cracked or affected by efflorescence. Gently tap all remaining intact surfaces and remove hollow sounding areas of plaster, unless otherwise agreed with the CA.
- Remove stained plaster to 300 mm beyond last point of visible staining, unless otherwise agreed with the CA.
- Cut back to straight horizontal and vertical edges. Remove plaster only where indicated on the repairs schedule, and with the specific approval of the architect.
- Advise CA if any built-in timbers, structural deficiencies or sources of damp are revealed.
- Thoroughly dry brush the background and edges to remove dust, loose material and efflorescence.
- Apply casein glue or dilute PVAC to hollows in old lime plaster before repairing with new plaster.

596 REPAIRING HOLES AND CRACKS IN PLASTER

- Repair areas with missing or unsound laths as clause 592.
- Carefully cut away any loose plaster from around edges of holes or along lines of cracks. Do not disturb adjacent sound plaster.
- Remove all loose plaster and dust by brushing and vacuuming, especially after cutting around cracks.
- For fine cracks carefully cut back edges of plaster either side of cracks to produce a firm edge where necessary. Lightly dampen cracks to control suction, fill with 1:1 gypsum:lime:putty and finish flush with surrounding plaster. For decorative plasterwork, ensure that surface profiles/patterns are continued accurately.
- Larger cracks are to be carefully cut out to form a dovetail key. Dampen laths or substrate and edges of plaster to control suction before applying plaster as above or for larger areas as clause 241.

BACKINGS/BEADS/JOINTS

626 TIMBER LATHING:

- Type: Well-seasoned split/riven sweet chestnut or oak (**NOT** sawn)
Size: 900-1500x32x8mm.

- Free from decay, insect attack (except pinhole borers), splits, shakes and with no knots wider than half the width of the section.
- Moisture content at time of installation: Not exceeding 16%.
 - Space laths 8-10 mm apart in straight lines with 3 mm wide staggered butt joints (to allow for swelling of the laths when wet) centred accurately over supports. Lath joints are to be staggered between joists every eighth lath.
 - Laths are to be dry when fixed.
 - Nails at every support: 25 mm long stainless clout nails. Laths are to be fixed at 14" centers maximum. SS screws into pre-drilled laths and joists are to be used in sensitive locations where hammering in clouts is likely to unlodge fragile existing plasterwork.
 - Laths are to be wetted prior to plastering as clause 788.
- 630 BEADS:
Corner and stop beads are to be traditional softwood round edged beads, firmly fixed to substrate.
- 648 DISSIMILAR SOLID BACKGROUNDS FOR PLASTERING/ RENDERING: Where coating is to be continued without break across joints between dissimilar solid backgrounds which are in the same plane and rigidly bonded or tied together, cover joints with a 150 mm wide strip of building paper to BS 1521 and overlay with 300 mm wide expanded stainless steel lathing. Orientate lathing in accordance with manufacturer's recommendations and fix securely at 300 mm staggered centres along both edges using 38mm brass screws and plugs with large brass washers
- 655 CONDUITS bedded in undercoat to be covered with 90 mm wide jute scrim bedded in finishing coat mix, pressed flat and trowelled in. Do not lap ends of scrim.
- 670 RUN MOULDINGS
- Location: As Repair Schedules.
 - Material: Lime or gypsum plaster to match the existing plasterwork, determined from chemical analysis (as 641 unless stated otherwise). Mixes are to be agreed with the architect.
 - Work is to be carried out by skilled and experienced craftsmen. References are to be provided and agreed with the architect prior to commencement.
 - Zinc templates of existing mouldings are to be taken and horsed up into running moulds. Screwed running rules are to be used to guide the running moulds. Timber lath is to be built up to form the base of the mould. Mouldings are to be run after the second plaster coat has set. The moulding is to be run in not less than three successive coats. The final setting coat is to be gauged with gypsum.
 - After completion mitres are to be made good by hand with the aid of joint rules.
- 680 FIBROUS PLASTER/ CAST MOULDINGS
- Location: As Repair Schedules.
 - Agree section(s) of mouldings to be reproduced and casting methods with the architect before commencing work.
 - Ensure that any paint is removed from the original moulding (model) as clause 581.
 - Type: Moulding types are to be reproduced to identically match existing.
 - Material: Plaster of Paris (British gypsum Class A casting plaster).
 - Work is to be carried out by skilled and experienced craftsmen. References are to be provided and agreed with the architect prior to commencement.
 - Form reverse mould using methods and materials which allow the profile and detail of the original to be reproduced accurately and without damaging original moulding. Make sufficient moulds to complete the required number of casts and maintain a consistent appearance.
 - Squeezes are to be taken of existing mouldings to obtain a match. Squeezes are to be over-moulded to account for loss of original definition.
 - Mouldings are to be reinforced with canvas and lath.
 - Fixing: Concealed stainless steel screws and cups to timber grounds and noggins.
 - Ensure that noggins, bearers, etc. required to support mouldings are accurately positioned and securely fixed.
 - Fill all joints and holes and finish flush and smooth to correct profile.
 - Fix securely, true to line and level. Bed direct fixed mouldings solid.
 - Reinforce framing, fixing points and joints with wads.
- 692 REFIXING EXISTING PLASTER MOULDINGS:
- Location: As Repair Schedules.
 - Prepare or ensure preparation of suitable backgrounds to receive mouldings and enable them to finish flush with existing abutting work.

- Clean background and contact surfaces of mouldings. Apply diluted PVAC sealer to control suction.
- Fix securely and accurately on solid bed of gypsum based cove adhesive.
- Additional mechanical fixing(s): concealed stainless steel screws and cups.
- Fill all joints and any holes with plaster of paris and finish flush and smooth to correct profile.

697 REPAIRING CRACKS/STEPS IN PLASTER MOULDINGS:

- Remove any applied ornament and keep for reuse. Cut back moulded plasterwork carefully each side of crack to an extent agreed with the CA.
- Clean surfaces and apply diluted PVAC sealer to control suction.
- Build up plaster to follow and finish flush with the existing moulding profile:
Backing coat: Gypsum guaged coarse stuff compatible with existing. Key to receive finishing coat.
Final coat: plaster of Paris
- Refix any applied ornaments accurately using gypsum based cove adhesive.
- Sample repairs to be completed for CA approval.

PLASTERING

710 APPLICATION GENERALLY:

- Plastering is not to be undertaken until all work involving vibration has been completed in that area of the building.
- Successive coats of plaster are not to be applied until the undercoat has sufficiently set. It should not be possible to indent the plaster with a thumb, but possible with the edge of a thumbnail. The period between coats is not likely to be less than a week, and allowance must be made for the long period of time that plastering will therefore take.
- Coats should be brushed to remove loose material and lightly damped with water before applying another coat.
- Apply each coating firmly to achieve good adhesion and in one continuous operation between angles and joints.
- All coatings to be not less than the thickness specified, firmly bonded, of even and consistent appearance, free from rippling, hollows, ridges, cracks and crazing.
- Finish surfaces to a true plane, to correct line and level, with all angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
- Prevent excessively rapid or localised drying out.

715 ACCURACY of plaster 13 mm thick or more: The variation in gap under 1.8 m straight edge (with feet) placed anywhere on the surface to be not more than 3 mm.

718 JUNCTION OF NEW PLASTERWORK WITH EXISTING:

Finish new plasterwork flush with the original face of existing work to form a seamless junction.

720 DUBBING OUT: If necessary to correct inaccuracies, dub out in thicknesses of not more than 10 mm in same mix as first coat. Allow each coat to set before the next is applied. Cross scratch surface of each dubbing out coat immediately after set. Dubbing out beneath lime & gypsum plaster is to be undertaken with a 1:1 lime putty: class B gypsum mix. Polyfilla or similar products are not to be used.

721 DUBBING OUT will not be permitted on smooth dense concrete surfaces except as recommended by the plaster manufacturer.

742 THIN COAT PLASTER: Before applying single coat plaster of less than 3 mm thickness, prepare surface by filling holes, scratches and voids with finishing plaster.

767 DISSIMILAR BACKGROUNDS: Where scrim or lathing or beads are not specified, cut through plaster with a fine blade in a neat, straight line at junctions of:

- Plastered rigid sheet and plastered solid backgrounds
- Dissimilar solid backgrounds.

777 SMOOTH FINISH: Trowel or float to produce a tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks. Do not use water brush and avoid excessive trowelling and over polishing.

778 WOOD FLOAT FINISH: Finish with a dry wood float as soon as wet sheen has disappeared from surface to give an even overall texture.

- 786 TIMBER LATHING: Apply undercoat with sufficient pressure to force it between laths and form continuous keys.
- 788 NON-HYDRAULIC LIME PLASTER UNDERCOATS:
- Dampen background to control suction. Dampening is to be undertaken the night before plastering and a couple of hours before commencement of work. The background is to be soaked but not have surface water.
 - Apply plaster firmly and trowel to an even surface. Allow to stiffen and cross scratch to provide an undercut key for the next coat. Do not penetrate through the coat. After completion of consolidation/scouring, lightly scratch the second undercoat using a wood 'devil' float to provide a key for the final coat.
- 789 THREE LAYER NON-HYDRAULIC LIME PLASTER FINAL COAT:
- Remove any dust from undercoat and dampen to control suction.
 - Apply first layer with a steel trowel. Apply second layer with a wood float in the opposite direction to the first layer. Apply third layer with a steel trowel in the same direction.
 - Thoroughly consolidate/scour the plaster with a wood cross grain float. Dampen the surface using a stock brush and polish with a steel trowel. Finish with a damp stock brush.
- 791 DRYING OF NON-HYDRAULIC LIME PLASTER:
- Work in the shade and out of drying winds. Protect from excessive ventilation.
 - Keep each undercoat and final coat damp by spraying with water until coating is sufficiently firm.
 - Thoroughly consolidate/scour second and final coats one or more times as necessary to control shrinkage.
- RENDERING**
- 810 APPLICATION GENERALLY:
- Apply each coating firmly to achieve good adhesion and in one continuous operation between angles and joints.
 - All coatings to be not less than the thickness specified, firmly bonded, of even and consistent appearance, free from rippling, hollows and ridges.
 - Finish surfaces to a true plane, to correct line and level, with all angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
 - Prevent excessively rapid or localised drying out.
- 820 DUBBING OUT:
- If necessary to correct background inaccuracies dub out in thicknesses of not more than 13 mm in same mix as undercoat. Total thickness of dubbing must not exceed 25 mm unless approved otherwise.
 - In areas where thickness of dubbing will exceed 20 mm, first apply an approved keying/bonding treatment.
 - Comb surface of each dubbing out coat. Allow each coat to set but not dry before the next is applied.
- 840 UNDERCOATS GENERALLY:
- Apply first undercoat or dubbing out coat by throwing from a trowel.
 - Allow to stiffen and comb to provide a key for the next coat. Comb to produce evenly spaced wavy horizontal lines, approximately 20 mm apart and 5 mm deep. Do not penetrate through the coat.
 - Brush down each undercoat to remove dust and loose particles and dampen to control suction before applying next coat.
- 856 FINAL COAT - PLAIN FLOATED FINISH: Finish with wood or other suitably faced float to give an even, open texture. Do not apply water while working up. Do not draw excessive laitance to surface (either by overworking or by use of steel trowel).
- 880 DRYING:
- Work in the shade and out of drying winds whenever possible.
 - Keep each undercoat and final coat damp by covering with hessian and spraying with water until coating is sufficiently firm. Hang plastic sheeting clear of coatings to control evaporation.
 - Thoroughly consolidate/scour each coat one or more times as necessary to control shrinkage.
 - Allow each coat to dry out thoroughly to ensure that drying shrinkage is substantially complete before applying next coat.
- 890 PROTECTION: Cordon-off and protect new coatings for the duration of setting.

M60 PAINTING & CLEAR FINISHING

To be read with Preliminaries/General conditions.

COATING SYSTEMS

117 PAINT TO METALWORK

- Location: **All** Metalwork (guttering, pipework, trusses etc).
- Manufacturer: Leigh's Paints, Tower Works, Kestor Street, Bolton BL2 2AL. Tel 01204 S21771, fax 01204 38211S
- Colour: TBC (Generally a matt finish is required).
- Preparation: As clause M60/400 and to manufacturer's recommendations.
- New metalwork: Degrease as necessary, wire brush to remove loose rust and any deposits likely to cause poor adhesion of subsequent coatings.
- Existing coated metal surfaces: Thoroughly clean with water containing suitable detergent and rinse with clean water. Any areas showing rust or corrosion should be abraded to remove any loose deposits, feathering into sound paintwork.
 - Initial coat(s): Epigrip L42S: Apply 1no Stipple coat then 2no coats @ 75 microns dft.
 - Finishing coat(s): Resistex 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

125 LIMEWASH

- Location: As schedule of works.
- Surface(s): Stripped and new masonry
- Type: Rose of Jericho at St Blaise Ltd, (01935 83676/83662) or similar to architect's approval or made up in accordance with SPAB Information sheet no. 1.
- Colour: Lime white. A painted sample (not a colour card) is to be made up for agreement with the architect and client.
- Preparation: Surface must be firm, clean and porous.
- Thoroughly mix limewash, preferably with a mechanical whisk to instructions.
- Dampen surface as manufacturers recommendations.
- Application: Apply 5 no. thin full coats of limewash to CA approval, working the finish -well into the textured surface.
- Allow each coat to dry before applying the next.
- Allow for a final additional coat at Practical Completion.
- Each coat must be protected from drying too quickly by regular mist spraying, and a reasonable time allowed between coats.
- It is important to re-moisten the previous coat with a fine mist spray prior to the application of the next coat.
- If limewash is allowed to dry too fast, or is exposed to frost before carbonation, it will fail. Limewash must not be applied in temperatures less than 8°C, and must be protected from frost until it has fully carbonated.

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 affected 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.