CAMDEN TOWN HALL

CTH-PUR-XXX-RP-21-A-7004

PLANNING REPORT - REPAIRS METHODOLOGY

1 NOVEMBER 2019

PURCELL

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CAMDEN TOWN HALL - PLANNING REPORT - REPAIRS METHODOLOGY

CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report builds on the *Outline Conservation Strategy - Key Areas* document that formed part of the Planning and Listed Building Consent Application. The report provides details of the repairs to be undertaken to discharge Listed Building Consent Condition no. 5 noted as follows;

5 Cleaning/repairs

Details of repairs including a sample patch of cleaning shall be submitted to an approved by the Council prior to commencement of works.

Reason: To safeguard the historic appearance and character of the building in accordance with the requirements of Camden Local Plan policies D2.

The external cleaning and repair samples have been submitted separately as sample approval sheets, whilst the report focusses on the repairs. It categorises the repair types under the following headings:

- REMOVAL
- STONE REPAIRS
- LEAD REPAIRS
- REFURBISHMENT OF ARCHITECTURAL METALWORK
- CLEANING / REPAIR OF EXISTING DOORS
- BRICK REPAIRS
- WATERPROOFING REPAIRS
- RE-RENDER DEBONDED RENDER

Repairs have been categorised in response to defects observed during condition surveys undertaken by PAYE; captured in photographs, and these have been included for reference. The extent of repairs remains subject to verification once scaffold access has been made available.

Types of repairs are substantiated by NBS specification clauses included in Appendix A.

2.0 CATEGORIES OF REPAIRS

Repair types are categorised, a brief explanation provided of the repair process and the repair cross-referenced to the appropriate NBS specification section. Photographs of the typical defect described are included for reference.

2.1 REMOVAL

2.1.1 Remove metal bolts, anchors and lightning conductors

Infill holes with lime mortar along the length of the removed lightning conductor as required where stonework is damaged incl. where fixings e.g. metal bolts and anchors have been removed.

- *NBS Ref. C41*

2.1.2 Remove existing wiring, fixings and redundant containment

Infill holes with lime mortar where stonework is damaged by the removal of fixings/service routes.

- *NBS Ref. C41*

2.1.3 Remove existing light fittings/CCTV cameras

Infill holes with lime mortar where redundant alarm box/lights/CCTV cameras are to be removed.

- *NBS Ref. C41*









2.2 STONE REPAIRS

It should be noted that as part of the stone repairs corrosion treatment will also be applied to the existing steel structure behind the stonework. Corrosive treatment will be applied where it is believed stone fracturing and/or displacement is as a result of corrosion. The process typically follows the principals set out below;

- Stonework to be removed is cut joint to joint to ensure that the original arrangement isn't disrupted and maintains the historic architectural design.

- Exposed corroded steel to be cleaned and treated with a preparatory paint system such as systems from Jotun or Sherwin Williams to inhibit the risk of future oxidation. The feasibility of installing new Portland stone with an air gap; between the stone and backing structure, will be further investigated as a potential additional preventative measure against the risk of corrosion once the stone specialist is appointed.

- Where new joints are to be introduced these should be a minimum 100-150mm distance away from existing joints in both vertical and horizontal planes to provide continued support and bond of associated masonry.

2.2.1 Re-grout joints

Repair joints to stone with lime mortar following cleaning and remedial works.

- *NBS Ref. C41*

2.2.2 Repair to crack / fracture in stonework

Lime mortar repair to cracks or fractures in stonework.

- *NBS Ref. C41*

2.2.3 Indent Repair / Stone Replacement

Carefully cut out and remove damaged section of stone or moulded details and infill repair with new Portland stone indent to match.

- *NBS Ref. C41*

2.2.4 Stone mortar repairs

Shallow mortar repair with lime mortar.

- *NBS Ref. C41*

2.2.5 Minor holes filling and making good to match

Infill holes with lime mortar where stone is damaged.

- *NBS Ref. C41*

2.2.6 Stone infill

Cut back fractured and displaced rusticated Ashlar stone along the joint lines, expose corroded steel frame. Clean and treat steel frame with corrosion treatment. Supply and fix new Portland Ashlar to match, secured using Stainless steel fixings and grout joints to match the benchmark sample.

- *NBS Ref. C41*

2.2.7 Rake out poor historic and failing mortar joints in stonework and repoint.

Where visible signs of failing mortar to stonework is observed, mortar is to be raked out with hand tools, prepare mortar key and re-point with lime to match existing.

- *NBS Ref. C41*

2.2.8 Full stone sill / parapet coping replacement.

Existing sills to be carefully removed to ensure minimal damage to surrounding brickwork and replaced with new. Brickwork repairs as Section 2.6 - BRICK REPAIRS.

- *NBS Ref. F30 - 720A*

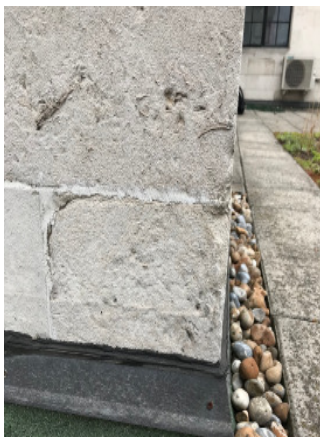
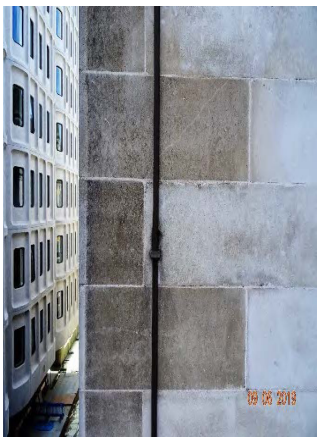











2.3 LEAD REPAIRS

2.3.1 Replace lead capping and abutment flashing.

Replace lead capping and abutment, ensure appropriate Lead Code is used for application, allow min. upstand heights, allow for expansion joints where appropriate and as required turn into raglet and/or screw with lead tacks.

- *NBS Ref. H71*




2.4 REFURBISHMENT OF ARCHITECTURAL METALWORK

2.4.1 Refurbish existing railings and/or decorative grilles.

Temporarily remove metal balustrades and decorative grilles, strip off lead paint (off site), refurbish, decorate and reinstall. Allow for new concealed fixings to match the existing as appropriate.

- *NBS Ref. C50B*





2.5 CLEANING / REPAIR OF EXISTING DOORS

2.5.1 Cleaning, repair and reinstatement of existing doors

Refurbish and clean existing bronze doors. Cleaning trials should be carefully undertaken in-situ in a discreet location to the door to remove damaging deposits and/or deteriorating coatings and to check for hidden corrosion. Any repairs can then be advised.

- *NBS Ref. L20*

2.6 BRICK REPAIRS

Similar to the stone repairs; as part of the brick repairs, corrosion treatment will also be applied to the existing steel structure behind the brickwork. Corrosive treatment will be applied where it is believed brick fracturing and/or displacement is as a result of corrosion. The process typically follows the principals set out below;

- Brickwork to be removed is cut joint to joint to ensure that the original arrangement isn't disrupted and maintains the historic architectural design.

- Exposed corroded steel to be cleaned and treated with a preparatory paint system such as systems from Jotun or Sherwin Williams to inhibit the risk of future oxidation.

2.6.1 Repair to brick crack

Where fractures through glazed brickwork is observed, cut out and remove fractured and displaced glazed brickwork to expose steel. Clean and treat exposed corroded steel frame, infill with new brick to match existing, prepare joints and re-point to match.

- *NBS Ref. C41*

2.6.2 Replace bricks

Cut out by hand individual damaged bricks with minimal disturbance to the surrounding brickwork. Clean and treat exposed steelwork if appropriate and infill with new brick to match existing, prepare joints and re-point to match.

- *NBS Ref. C41*

2.6.3 Minor holes filling and making good to match

Carefully cut out by hand individual damaged bricks with minimal disturbance to the surrounding brickwork and replace damaged bricks as per item 2.6.2. An alternative to be discussed with Faience restorer would be an insitu repair which involves removing the defective surface back to a sound substrate and restoring forward or vertically back to original lines and levels. Any filler to be a compatible restoration filler (incl. colour & level of sheen matched) as advised by restorer and is to be carefully shaped, smoothed and finished as appropriate with protective lacquer finish (if applicable) to match existing.

- *NBS Ref. C41*

2.6.4 Brick Infill

Indent new bricks in existing holes where services/fittings have been removed. Prepare opening by removing any loose material and dust to receive indent and ensure adjacent brickwork is stable and suitable for toothing. Lime mortar re-point to match existing.

- *NBS Ref. C41*

2.6.5 Re-point / rake out poor historic mortar filling and re-point

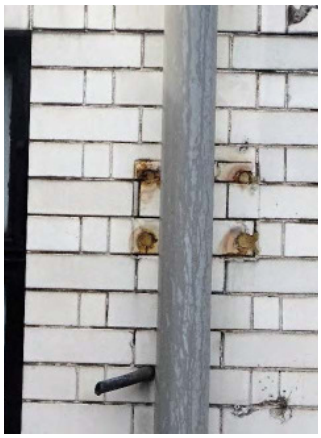
Where visible signs of failing mortar to stonework is observed, mortar to be raked out with hand tools, prepare mortar key and re-point with lime to match existing.

- *NBS Ref. C41*











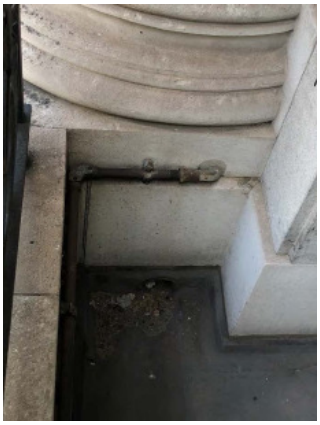


2.7 WATERPROOFING REPAIRS

2.7.1 Repairs to waterproofing - balconies

Overlay existing substrate with new liquid applied cold melt flexible seamless Polyurethane waterproofing membrane.

- *NBS Ref. J31*

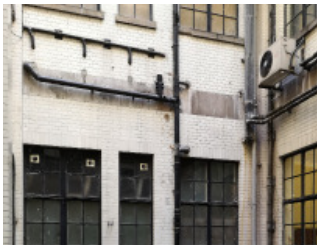


2.8 RE-RENDER DEBONDED RENDER

2.8.1 Re-render of debonded rendered bands

Cut back loose and de-bonded rendered band. Re-render to original profiles at 25mm thick - match colour/to be approved by Conservation Architect.

- *NBS Ref. M20 - 110 & M20 - 310*



3.0 APPENDIX A:
NBS SPECIFICATION

CTH-PUR-XXX-SP-09-A-9020

S4 - ISSUED FOR STAGE APPROVAL

30 September 2019

This document includes:

Code	Section	Revision	Dated
C41*	Repairing/ renovating/ conserving masonry (Historic Buildings)	1	27 Sep 2019

Table of Contents

C41*
Repairing/ renovating/ conserving masonry (Historic Buildings)
Revision 1

Section Revision History

No.	Purpose	
0	RIBA Stage 3 Amendments	25th Apr 2019
1	s4	27th Sep 2019

Clauses amended in Revision 1

No.	Clause	
2!	To be read with Preliminaries/ General conditions	Added
3*	TO BE READ WITH PRELIMINARIES/ GENERAL CONDITIONS	Revised
9!	GENERALLY/ PREPARATION	Added
20	REVIEWING SCOPE OF WORKS	Added
50	MATERIALS SET ASIDE FOR RE-USE	Added
100*	REPAIR PRINCIPLES	Revised
100A	REPAIRS INTERNAL GENERAL SCOPE	Added
101*	APPROVED STONEMASONS	Revised
102*	GENERAL SEQUENCE OF REPAIRS TO ASHLAR STONE	Revised
104	GENERAL SEQUENCE FOR REPAIR OF STRUCTURAL CRACKING WITHIN MASONRY	Added
106*	REMOVE COPING STONEWORK: REBUILD/REBED	Revised
110	SCOPE OF WORK	Revised
110A	SCOPE OF WORK	Added
111*	CUT OUT DEFECTIVE ASHLAR STONEWORK DRESSINGS/COPINGS (MOULDED OR CARVED): INDENT NEW	Revised
116*	DESCALE/DEFRASS/CONSOLIDATE DEFECTIVE ASHLAR STONEWORK DRESSINGS AND WALLING: PREPARE: SHALLOW MORTAR REPAIR	Revised
120	REVIEWING SCOPE OF THE WORK	Deleted
120A	SITE INSPECTION	Added
121*	REMOVE CEMENT RENDERS: CLEAN: DESCALE/DEFRASS DEFECTIVE ASHLAR STONEWORK DRESSINGS: PREPARE: REMOULD DEEP MORTAR REPAIR TO PROFILE	Revised
122	SITE INSPECTION	Added
125	REDUNDANT FITTINGS/ FIXINGS	Revised
126*	RAKE OUT: PREPARE: DEEP REPOINTING/GROUTING OF ASHLAR STONEWORK/ PACKING AND PINNING OF ASHLAR STONEWORK JOINTS/CRACKS	Deleted
127	RECYCLING/ RE-USE OF STONE FROM DAMAGED UNITS	Added
130	REMOVAL OF PLANT GROWTHS FROM MASONRY	Added
131*	RAKE OUT: PREPARE: REPOINTING OF FINE SURFACE JOINTS IN ASHLAR STONEWORK	Revised
136*	REMOVE FIXED ITEMS/REPAIR HOLE WITH LIME MORTAR	Revised
140A	RECORD OF WORK	Added

141*	TREAT FIXED ITEMS INSITU	Revised
146*	RESIN PINNING SPALLING/FRACTURED ASHLAR STONEWORK	Deleted
149!	WORKMANSHIP GENERALLY	Added
150	POWER TOOLS FOR REMOVAL OF MORTAR	Deleted
150A	POWER TOOLS FOR REMOVAL OF MORTAR EXTERNAL	Added
150B	POWER TOOLS FOR REMOVAL OF MORTAR INTERNAL	Added
151*	REMOVAL OF CRAMPS BETWEEN STONES: RENEW	Deleted
155*	TREATMENT OF EXISTING CRAMPS BETWEEN STONES	Deleted
160	PROTECTION	Deleted
160A	PROTECTION OF MASONRY UNITS AND MASONRY	Added
161*	REMOVAL OF ASSOCIATED FIXED ITEMS/MATERIALS: PREPARE: TREAT: REFIX	Deleted
165	STRUCTURAL STABILITY	Added
166*	LEAD WEATHERING	Revised
170	DISTURBANCE TO RETAINED MASONRY	Added
171	RELEAD HORIZONTAL JOINTS TO COPING STONES	Revised
175	CONTROL AND DISPOSAL OF WASH WATER AND DETRITUS	Added
180	OPERATIVES	Added
185	ADVERSE WEATHER	Added
190	CONTROL SAMPLES	Deleted
190A	CONTROL SAMPLES	Added
190B	CONTROL SAMPLES	Added
199!	MATERIALS/ PRODUCTION/ ACCESSORIES	Added
199*	MATERIALS	Deleted
200	STONE [EW_03]	Added
201*	STONE	Deleted
211*	SURFACE TEXTURE DETAILS	Revised
211A	STONE	Added
211B	MORTAR: REPOINTING / REGROUTING FOR STONEWORK	Added
211C	MORTAR: REPAIRS TO STONEWORK	Added
212	BRICK [EW_08]	Added
214	SURFACE TEXTURE DETAILS	Added
214A	BRICKS	Added
214B	MORTAR: REPOINTING BRICKWORK	Added
215	SAMPLES	Deleted
215A	SAMPLES	Added
216	SAMPLES	Added
220	RECORDING PROFILES	Added
221*	MORTAR	Revised
222*	MORTAR	Revised
223*	MORTAR	Revised
224*	MORTAR	Revised
225*	MORTAR	Revised
229	STONE MASON'S DRAWINGS AND SCHEDULES	Added
230	INSPECTION OF DRAWINGS/ TEMPLATES	Added
235	INSPECTION OF MASONRY UNITS	Added
240	STONE	Deleted
240A	STONE FOR REPAIR OF PORTLAND STONE PAVINGS TO PORTICO	Added
240B	STONE FOR REPAIR OF DECORATIVE MARBLE FLOOR ON GROUND FLOOR	Added
241	STONE	Added
241A	INTERNAL WORKS PREPARATION – GENERALLY	Added

242	INTERNAL FIXING	Added
242A	INTERNAL FINISHING – GENERALLY	Added
245	REPLACEMENT STONE UNITS	Added
247	DRESSING AND FINISHING REPLACEMENT STONE UNITS	Added
250	ORIENTATION OF STONE	Added
251*	RESIN	Deleted
255	ASHLAR BLOCKS/ DRESSINGS	Added
256*	PINS	Revised
265	SALVAGED/ SECOND HAND BRICKS	Added
281	FIXINGS FOR	Deleted
281A	FIXINGS FOR REPLACEMENT/REFURBISHMENT OF BALUSTRADES AND DECORATIVE GRILLES	Added
299	DISMANTLING/ REBUILDING	Deleted
299*	WORKMANSHIP	Deleted
299A	REPAIRING / RENOVATING STONEWORK - REPAIR TYPE EW_03	Added
299B	SCHEDULE OF OPERATIONS	Added
300	APPROVED STONEMASONS	Added
300A	STONE REPAIR TYPE - EW_03/05	Added
300B	RE-GROUTING JOINTS	Added
300C	STONE REPAIR - EW_3/10	Added
300D	MORTAR REPAIR OF CRACKS	Added
300E	STONE REPAIR TYPE - EW_3/15 AND EW_03/35	Added
300F	STONE INDENT REPAIR	Added
300G	CUTTING OUT STONE	Added
300H	NEW STONE	Added
300I	STONE REPAIR - EW_3/20	Added
301*	ARCHAEOLOGICAL ATTENDANCE	Deleted
305	STONE MORTAR REPAIRS	Added
306*	RECORDING STONEWORK	Revised
307	STONE REPAIR - EW_3/30	Added
308	FILL MINOR HOLES WITH MORTAR AND MAKE GOOD	Added
310	DISMANTLING MASONRY FOR REUSE	Added
310A	DISMANTLING INTERNAL MASONRY FOR REUSE	Added
311*	RELEASING STONES	Revised
316*	PREPARING BEDS/BACKINGS	Revised
321*	PREPARATION OF STONES	Revised
326*	LAYING AND BONDING	Revised
331*	JOINT TREATMENT / FINISH	Revised
336*	CUTTING OUT: COMPLETE STONES	Revised
341*	DRESSING	Revised
346*	RELOCATE/PROTECT	Revised
351*	REFIX	Revised
356*	GROUTING OF VOIDS IN MASONRY : GRAVITY SYSTEM	Revised
358	LAYING REPLACEMENT MASONRY UNITS	Added
385	LAYING REPLACEMENT MASONRY	Added
399*	MORTAR REPAIRS GENERALLY	Revised
401*	RAKE OUT LIME MORTAR JOINTS	Revised
406*	CEMENT REMOVAL	Revised
411*	SURFACE CLEANING	Revised
416*	REPAIRS	Revised
421*	DEEP POINTING	Revised
426*	SLURRY MIX	Revised

431*	APPLICATION OF MORTAR REPAIR	Revised
436	APPEARANCE	Revised
441*	MORTAR REPAIRS: ARMATURES	Revised
446*	MORTAR REPAIRS: TENDING	Revised
449!	TOOLING/ DRESSING STONE IN SITU	Added
450	WEATHERING LEDGES AT JOINTS	Added
451*	MORTAR REPAIRS: TEXTURING	Revised
455	DESCALING STONE	Added
456*	JOINT REINFORCEMENT/FINISH: ASHLAR REPAIRS	Revised
461*	MORTAR GENERALLY	Revised
466*	MORTAR REPAIRS	Revised
499*	REPAIRING / RENOVATING BRICKWORK - REPAIR TYPE EW_08	Revised
500*	SCHEDULE OF OPERATIONS	Revised
501*	APPROVED BRICKLAYERS	Revised
502*	GENERAL SEQUENCE OF REPAIRS TO BRICKWORK	Revised
503	BRICK REPAIR TYPE - EW 08/05	Added
518	MORTAR REPAIRS	Added
549	MATERIALS	Revised
551*	BRICKS	Revised
555	FLOAT FINISH TO MORTAR REPAIRS	Added
556*	MORTAR	Revised
599!	CRACK REPAIRS/ TIES/ REINFORCEMENT	Added
599*	WORKMANSHIP	Deleted
606*	RECORDING BRICKWORK	Revised
610	MORTAR REPAIR OF CRACKS	Deleted
610A	MORTAR REPAIR OF CRACKS	Added
610B	BRICK REPAIR TYPE - EW_08/10 AND REPAIR TYPE - EW_08/20	Added
610C	GENERAL SEQUENCE OF REPLACEMENT OF BRICK AND BRICK INFILL REPAIRS	Added
611*	RELEASING BRICKWORK FOR REPLACEMENT	Revised
616*	PREPARING BEDS/BACKINGS	Revised
620	RESIN INJECTION OF CRACKS	Deleted
621*	PREPARING BRICKS	Revised
623	REPLACEMENT OF BRICKS SLAVAGED FROM REMOVALS AS 611 OR IN NEW TO MATCH EXISTING AS 214A	Added
626*	LAYING/BONDING	Revised
631*	CUTTING OUT	Deleted
636*	RAKING OUT	Revised
641*	PREPARING JOINTS	Revised
646*	FILLING JOINTS	Revised
648*	JOINT TREATMENT / FINISH	Revised
689	BRICK REPAIR TYPE - EW_08/15	Added
690A	MAKING GOOD OF HOLES IN BRICKWORK	Added
712	FLUSHING OUT	Added
720	HAND GROUTING	Added
740	APPLICATION OF GROUTING	Added
809	BRICK REPAIR TYPE - EW_08/25	Added
810	PREPARATION FOR REPOINTING	Added
812	PREPARATION FOR REPOINTING ASHLAR STONE	Added
815	REPOINTING	Added
840	POINTING WITH TOOLS/ IRONS	Added
860	BRUSHED FINISH TO JOINTS	Added

C41* Repairing/ renovating/ conserving masonry (Historic Buildings)

To be read with Preliminaries/ General conditions
(Added - C41* revision 1 - 27th Sep 2019)

TO BE READ WITH PRELIMINARIES/ GENERAL CONDITIONS

EXTERNAL Refer to Purcell's drawings CTH-PUR-XXX-DR-21-A-3901 to CTH-PUR-XXX-DR-21-A -3912 describing proposed repairs and associated schedule External Works Repairs - Schedule of Work of proposed repairs, ref.CTH-PUR-XXX-SCH-00-A-3901 and AKTII Envelopes BUILDING ENVELOPE – Technical Performance Specification Ref. CTH_AKT_XXX_SP_25_R_003
ALSO REFER TO WORK SECTION C40 for CLEANING OF MASONRY and F21 NATURAL STONE ASHLAR WALLING/DRESSINGS for general requirements for new masonry.

INTERNAL
All of the clauses are to be read with Preliminaries/ General conditions; schedules and drawings: CTH-PUR-XXX-RP-08-A-7003 Internal Conservation Schedule of Works
(Revised - C41* revision 1 - 27th Sep 2019)

GENERALLY/ PREPARATION
(Added - C41* revision 1 - 27th Sep 2019)

20 REVIEWING SCOPE OF WORKS

- Inspection: Following completion of scaffolding, arrange before starting work a meeting with the Architect and Structural Engineer to confirm type and extent of work required. Refer to the preliminaries for programming requirements and period required for inspection.
  - Notice: Provide minimum of 2 weeks notice for meeting.
- Marking: Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced.
- Identification of masonry units to be removed, replaced or repaired: Code number cross-referenced to drawings/ photographs.
- Records of masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.
- Programme/timing: From inspection allow 2 weeks for the Architect and Structural Engineer to confirm the scope of works.

(Added - C41* revision 1 - 27th Sep 2019)

50 MATERIALS SET ASIDE FOR RE-USE

- Location: Refer to drawings and schedules.
- Store: Store materials within the site compound(s).
- Labelling: Prior to removal, label materials which are to be salvaged with permanant markerings to underside / non exposed face.
- Components and materials to remain the property of the Employer: Bricks, stone (walling and pavings) balustrades and decorative grilles which are to be sorted into those which are salvageable/reusable and water/brush cleaned to remove deleterious matter and mortar.
- Storage/protection: Contractor to store and protect from damage/weather within compound for duration of works.
- At completion: Unused material will become teh property of teh contractor and is to remove the materials from site.
- Recycled Materials: Those arising from deconstruction/ demolition work can be recycled or reused elsewhere in the project, subject to compliance with the appropriate specification and in accordance with any site waste management plan.
  - Evidence of compliance: Submit full details and supporting documentation.
  - Verification: Allow adequate time in programme for verification of compliance.

(Added - C41* revision 1 - 27th Sep 2019)

100* REPAIR PRINCIPLES

- The use of mortar repairs should be limited to filling holes, fractures and relatively minor damage. They should not be used to build up complex mouldings or repair areas that will be exposed or difficult to access in the future.
- Where projecting weathering features such as string courses or moulded cornices are damaged, the defective elements should be replaced with new matching sections to a sufficient compressive bed depth (nominally 125mm) without the need for new supporting dowels or the use of modern adhesives. Where new stone is required to be secured with fixings, use Stainless Steel threaded dowels and restraint brackets.
- Where facing stones are very heavily eroded they should be replaced with new stone components to a sufficient compressive bed depth (nominally 125mm) with the height respecting the original coursing. The width of replacement stones can be varied to reduce the loss of original fabric whilst ensuring logical spacing of vertical joints.
- Where indent repairs are carried out the size and shape of the repair and position of the dowels should avoid reliance on adhesives for retaining the stone unless recommended by Stone Specialist. Remedial works to steel behind Ashlar stone as Section 3.5 in AKTIIE Performance Specification CTH_AKT_XXX_SP_25_R_003.
- Upon completion of the works drawings are to be provided highlighting the works undertaken in a format agreed with CA / PM / Architect (to be confirmed based on contractual make-up).
  Further intrusive investigations are required to verify causes of defects and develop suitable repaire strategyfully, this incl. bit is not limited to treatment of corroded steel structure behind stonework and improvements in the water management and stone detailing - once scaffold acces is available to review these areas in detail.
  (Revised - C41* revision 1 - 27th Sep 2019)

100A REPAIRS INTERNAL GENERAL SCOPE

- Scope: C41/110, C41/120 and C41/140.
  Stone/general: C41/240.
  Preparation: C41/241.
  Grouting of voids: Provisionally as C41/712, C41/720 and C41/740.
  Fixing: C41/242
  Finishing: C41/243
  (Added - C41* revision 1 - 27th Sep 2019)

101* APPROVED STONEMASONS

- 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 Conservation Architect for approval before putting the work in hand.
  (Revised - C41* revision 1 - 27th Sep 2019)

102* GENERAL SEQUENCE OF REPAIRS TO ASHLAR STONE

- 1. Agree repair type with Contract Administrator and photograph areas to be cut out.
  2. Defrass stone if to be retained as required and cut out renewals.
  3. Carefully remove stonework to expose steel structure behind.
  4. Treat steelwork to be retained.
  5. Deep point open joints to face of defrassed stone.
  6. Water clean retained stone.
  7. Carry out consolidation as required.
  8. Carry out repairs: Photograph areas to be repaired. Choose colour of mortar.
  9 Deep point joints for depth of repair and grout voids.
  10. Apply colour wash to repairs and retained stone as required and carry out final cleaning.
  (Revised - C41* revision 1 - 27th Sep 2019)

104 GENERAL SEQUENCE FOR REPAIR OF STRUCTURAL CRACKING WITHIN MASONRY

NOTE: The following sequencing and repairs are provided for information purposes. Refer to structural engineers documentation for scope of temporary works and structural repairs incl. treatment of the steel frame.

- Location: Refer to drawings and schedules.
  - Review scope of works as: C41/110 and C41/20
  - Recording: C41/306
  - Opening up/releasing of fractured stones: C41/310 and 311
  - Cement removal: Generally as C41/406
  - Stone: Existing
  - Stone indent: C41/300F
  - Mortar pointing: C41/221 and C41/223 for grouting voids.
  - Mortar repair: C41/224
  - Preparing beds/backing: C41/316
  - Joint treatment/finish: C41/331

(Added - C41* revision 1 - 27th Sep 2019)

106* REMOVE COPING STONEWORK: REBUILD/REBED

- This is to be carried out to all existing stones where indicated on the drawings and schedules. Review scope of works as: C41/20
  - Recording: C41/306
  - Stone: Existing
  - Mortar: C41/221 for bedding and pointing, C41/223 for grouting voids.
  - Releasing: C41/310 and 311
  - Preparing Beds/Backing: C41/316
  - Grouting voids: C41/356
  - Preparation of Stones: C41/321
  - Laying/Bonding: C41/326
  - Joint treatment/finish: C41/331.

(Revised - C41* revision 1 - 27th Sep 2019)

110 SCOPE OF WORK EXTERNAL

- Refer to Purcell's drawings CTH-PUR-XXX-DR-21-A-3901 to CTH-PUR-XXX-DR-21-A-3912 describing proposed repairs and associated schedule External Works Repairs - Schedule of Work of proposed repairs, ref.CTH-PUR-XXX-SCH-00-A-3901 and AKTII Envelopes BUILDING ENVELOPE – Technical Performance Specification Ref. CTH_AKT_XXX_SP_25_R_003.

  THE EXTERNAL MASONRY REPAIRS AND ALTERATIONS CONSISTS OF THE FOLLOWING WORKS:
  - Alterations to stonework to existing facades to create new entrances and other features and alterations to stonework to existing entrance areas and other features.
  - Works associated with the expected corrosion of the existing steel frame.
  - Rebuilding of sections of displaced or damaged stonework.
  - Dismantling and rebuilding of sections of stone facades.
  - Replacement of damaged or eroded stone details and facing work.
  - Poor previous patch repairs such as, repointing using a cement mortar instead of lime mortar, are to be cut back and repaired in appropriate materials.
  - Repointing to select areas to stone and brick facades, copings, hood moulds, string courses and cills and selective repointing in other areas.
  - Decluttering and removal of redundant services, light fittings, wiring, lighting conductors and embeded metal fixings in walls. Where existing holes are not re-used, they are to be filled and makde good other damage.
  - Temporary removal of metal balustrades and decorative grilles to refurbish, repaint and re-install and works associated with re-fixing.
- Records of masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.
- Identification of masonry units to be removed, replaced or repaired: Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced. Transcribe markings to drawings/ photographs.

  (Revised - C41* revision 1 - 27th Sep 2019)

110A SCOPE OF WORK INTERNAL

- Schedule: crack repairs; grouting of voids; replacing stones; repointing.
  Records of masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.
  Identification of masonry units to be removed, replaced or repaired: Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced. Transcribe markings to drawings/photographs.

  (Added - C41* revision 1 - 27th Sep 2019)

111* CUT OUT DEFECTIVE ASHLAR STONEWORK DRESSINGS/COPINGS (MOULDED OR CARVED): INDENT NEW

- This is to be carried out to all existing ashlar stonework dressings/copings indicated on the drawings.
  - Stone: C41/211A
  - Mortar: C41/221 for bedding and pointing, C41/223 for grouting voids.
  - Recording: C41/306
  - Cutting out :C41/336
  - Preparing Beds/Backing: C41/316
  - Dressing: C41/341
  - Laying/Bonding: C41/326
  - Joint treatment/finish: C41/331
  - Grouting voids: C41/356

  (Revised - C41* revision 1 - 27th Sep 2019)

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

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

(Revised - C41* revision 1 - 27th Sep 2019)

~~120 REVIEWING SCOPE OF THE WORK~~

(Deleted - C41* revision 1 - 27th Sep 2019)

120A SITE INSPECTION

- Purpose: To confirm type and extent of repair/ renovation/ conservation work shown on drawings and described in survey reports and schedules of work.
  Parties involved: Architect; client; contractor's representative; foreman mason; and structural engineer.
  Timing: At least 5 working days before starting each section of work.
  Instructions issued during inspection: Confirm in writing, with drawings and schedules as required, before commencing work.

(Added - C41* revision 1 - 27th Sep 2019)

121* REMOVE CEMENT RENDERS: CLEAN: DESCALE/DEFRASS DEFECTIVE ASHLAR STONEWORK DRESSINGS: PREPARE: REMOULD DEEP MORTAR REPAIR TO PROFILE

- This is to be carried out to all areas of moulded dressing where indicated on the drawings.
  - Mortar: Slurry mix: C41/223
  - Mortar: Repair mix (mouldings): C41/225
  - Recording: C41/306
  - Remove Cement Renders: C41/406
  - Preparation: C41/411,416,421,426
  - Average repair depth: 50mm (35mm-65mm range)
    Mortar repairs:C41/431,436,461,466
  - Armatures: C41/441
  - Repair tending: C41/446
  - Repair texturing: C41/451
  - Joint treatment finish: C41/456

(Revised - C41* revision 1 - 27th Sep 2019)

122 SITE INSPECTION

- Purpose: To confirm type and extent of repair/ renovation/ conservation work shown on drawings and described in survey reports and schedules of work.
- Parties involved: Architect.
- Timing: After cleaning as C40.
- Purpose of inspection: To verify extent of repairs

(Added - C41* revision 1 - 27th Sep 2019)

125 REDUNDANT FITTINGS/ FIXINGS

- Items to be removed: All redundant surface mounted electrical and mechanical fittings incl. but not limited to;
  light fittings, security cameras, fire alarm sounders, flagpole brackets, metal bolts / anchors and fixings where signage, flower boxes, containment, pipes, ducts, mesh, bird deterrents have been removed, lighting conductors etc.
- Removal: Minimize disturbance to surfaces.

(Revised - C41* revision 1 - 27th Sep 2019)

~~126* RAKE OUT: PREPARE: DEEP REPOINTING/GROUTING OF ASHLAR STONEWORK/ PACKING AND PINNING OF ASHLAR STONEWORK JOINTS/CRACKS~~

(Deleted - C41* revision 1 - 27th Sep 2019)

127 RECYCLING/ RE-USE OF STONE FROM DAMAGED UNITS

- It is intended to retain sound sections of stone from damaged units that are removed and re-use them for repairs where the stone can be cut to suit a smaller repair sectons to reduce the requirement for new stone.
- To accommodate the above requirement stone units to be replaced are to be carefully removed and set aside in a designated area for assessment of potential for re-use.
- Existing stone is to be recut in the workshop to an agreed size and profile.

(Added - C41* revision 1 - 27th Sep 2019)

130 REMOVAL OF PLANT GROWTHS FROM MASONRY

- Plants, root systems and associated soil/ debris: Carefully remove from joints, voids and facework.
- 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.
- 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.

(Added - C41* revision 1 - 27th Sep 2019)

131* RAKE OUT: PREPARE: REPOINTING OF FINE SURFACE JOINTS IN ASHLAR STONEWORK

- This is to be carried out to all stonework where indicated on the drawings.
  - Mortar: Fine pointing: C41/222
  - Rake out lime mortar: C41/401
  - Joint treatment/finish: C41/456
  - Grouting of voids: C41/356

(Revised - C41* revision 1 - 27th Sep 2019)

136* REMOVE FIXED ITEMS/REPAIR HOLE WITH LIME MORTAR REMOVAL OF BOLTS, SCREWS, NAILS, THREADED SLEEVES AND OTHER METAL FIXINGS

This is to be carried out where noted on drawings.

- Recording:C41/306
- Removal: Cut out carefully, causing the least possible disturbance to surrounding masonry and remove any associated rust debris.
- Making good: As clause C41/308 and C41/518.
  - Fill hole with lime mortar - Clause C41/305 and C41/308.

(Revised - C41* revision 1 - 27th Sep 2019)

140A RECORD OF WORK

General: Record work carried out to masonry clearly and accurately using written descriptions, sketches, drawings and photographs, as necessary.
Specific records: drawings marked up to show replacement stones, areas of grouting, repointing, resin repairs to cracked stones.
Documentation: Submit on completion of the work.

- Number of sets: Two.

(Added - C41* revision 1 - 27th Sep 2019)

141* TREAT FIXED ITEMS INSITU To be agreed with CA.

- Wire brush, treat with 2 coats Fertan Rust converter
  Fertan UK, King & Queen House, High Street, Hamble, SO31 4HATel 02380 456600, Email info@fertan.co.uk, Facsimile:01903 539595
  (Revised - C41* revision 1 - 27th Sep 2019)

~~**146* RESIN PINNING SPALLING/FRACTURED ASHLAR STONEWORK**~~
(Deleted - C41* revision 1 - 27th Sep 2019)

WORKMANSHIP GENERALLY
(Deleted - C41* revision 1 - 27th Sep 2019)

~~**150 POWER TOOLS FOR REMOVAL OF MORTAR**~~
(Deleted - C41* revision 1 - 27th Sep 2019)

150A POWER TOOLS FOR REMOVAL OF MORTAR EXTERNAL

- Usage: Use of fine bladed multi-tool cutters for removal of mortar will be permitted subject to the following requirements:
  - Method statement for proposed use to be submitted for approval.
  - Specific tools and blades to be agreed before use.
  - Methodology to be demonstrated on site in an agreed sample area. .
  (Added - C41* revision 1 - 27th Sep 2019)

150B POWER TOOLS FOR REMOVAL OF MORTAR INTERNAL
Usage for removal of mortar: Not permitted.
(Added - C41* revision 1 - 27th Sep 2019)

~~**151* REMOVAL OF CRAMPS BETWEEN STONES: RENEW**~~
(Deleted - C41* revision 1 - 27th Sep 2019)

~~**155* TREATMENT OF EXISTING CRAMPS BETWEEN STONES**~~
(Deleted - C41* revision 1 - 27th Sep 2019)

~~**160 PROTECTION**~~
(Deleted - C41* revision 1 - 27th Sep 2019)

160A PROTECTION OF MASONRY UNITS AND MASONRY

- Temporary mechanical fastenings:
  - In masonry: Locate in joints.
  - In other surfaces: Seek instructions.
- Handling of masonry units: Prevent overstressing during transit, storage and fixing. Lift units at designed lifting points where provided.
- Storage of masonry units: On level bearers clear of the ground, separated with resilient spacers. Protect from adverse weather and keep dry. Prevent soiling, chipping and contamination by salts and other deleterious substances.
- Protection of masonry: Suitable nonstaining slats, boards, etc. Remove at completion.
  - Prevent damage, particularly to arrises, projecting features and delicate, friable surfaces.
  - Prevent mortar/ grout splashes and other staining and marking on facework. Protect using suitable non-staining slats, boards, tarpaulins etc. Remove protection on completion of the work.
  (Added - C41* revision 1 - 27th Sep 2019)

~~**161* REMOVAL OF ASSOCIATED FIXED ITEMS/MATERIALS: PREPARE: TREAT: REFIX**~~
(Deleted - C41* revision 1 - 27th Sep 2019)

165 STRUCTURAL STABILITY

- General: Maintain stability of masonry. Report defects, including signs of movement, that are exposed or become apparent during the removal of masonry units.
  (Added - C41* revision 1 - 27th Sep 2019)

166* LEAD WEATHERING

- Refer to Work Section H71 for details of leadwork.
- This is to be carried out where indicated on the drawings
- Allow to cut chases prior to leadwork and make good with repair mortar C41/224 and C41/225 according to C41/211C following leadwork.
- Allow to fix s/s continuous clip (included in Section H71) into vertical stonework joints with stainless steel screws in nylon plugs.

(Revised - C41* revision 1 - 27th Sep 2019)

170 DISTURBANCE TO RETAINED MASONRY

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

(Added - C41* revision 1 - 27th Sep 2019)

171 RELEAD HORIZONTAL JOINTS TO COPING STONES

- Refer to Work Section H71 for details of leadwork.
- This is to be carried out where indicated on the drawings / schedules.
- Carefully cut out old mortar with hand tools to a depth of 50mm and clear out/dry out joints in preparation for leadwork: C41/401 and C41/406.

(Revised - C41* revision 1 - 27th Sep 2019)

175 CONTROL AND DISPOSAL OF WASH WATER AND DETRITUS

- Disposal: Safely: Obtain approvals from relative Authority.
- Control of wash water: Collect and divert to prevent ingress and damage to building fabric and adjacent areas.
- Above and below ground drainage systems: Keep free from detritus and maintain normal operation.

(Added - C41* revision 1 - 27th Sep 2019)

180 OPERATIVES

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

(Added - C41* revision 1 - 27th Sep 2019)

185 ADVERSE WEATHER

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

(Added - C41* revision 1 - 27th Sep 2019)

~~190 CONTROL SAMPLES~~

(Deleted - C41* revision 1 - 27th Sep 2019)

190A CONTROL SAMPLES EXTERNAL

- General: Obtain approval of the following before proceeding with the remainder:
- General: Complete an area of each of the following types of work, and arrange for inspection before proceeding with the remainder:
  - Replacement facing stone
  - Replacement stone detail
  - Stone insert
  - Replacement of brick incl. stock brick and glazed bricks
  - Mortar repair
  - Repointing to ashlar stone
  - Repointing to brick incl. stock brick and glazed bricks .
- Protection: Protect from adverse weather and damage.

(Added - C41* revision 1 - 27th Sep 2019)

190B CONTROL SAMPLES INTERNAL

- General: Complete an area of each of the following types of work, and arrange for inspection before proceeding with the remainder: in situ replacement of 3 pavings (to include 1no. small diamond) grouted, pointed and ageing as M40/116.

(Added - C41* revision 1 - 27th Sep 2019)

MATERIALS/ PRODUCTION/ ACCESSORIES
(Deleted - C41* revision 1 - 27th Sep 2019)

~~**MATERIALS**~~
(Deleted - C41* revision 1 - 27th Sep 2019)

STONE [EW_03]
(Deleted - C41* revision 1 - 27th Sep 2019)

~~**201***~~ ~~**STONE**~~
(Deleted - C41* revision 1 - 27th Sep 2019)

211* SURFACE TEXTURE DETAILS [EW_03/15, EW_03/35]

- Generally provide samples of new stone to match existing for approval of Conservation Architect showing any surface texture, finish or special detail - Refer to 211A. Once approved this sample will be used as a model standard.

(Revised - C41* revision 1 - 27th Sep 2019)

211A STONE EW_03/15, EW_03/35

Stone for the replacement or infilling of damaged or missing stone should be of the same geological type and appearance, both in colour and tecture as the original.
Type: [Portland stone - Portland Jordans Whitbed TBC] .
Requirements: Free from vents, cracks, fissures, discolouration, or other defects which may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with shop drawings prepared by the supplier.

- Finish: [To match existing - samples to be obtained and approved by Conservation Architect]
- Supplier: [Albion Stone or similar approved].
- Additional:
  Lab analysis must be undertaken to confirm exact stone composition shoud there be any concern to match.
  Where feasible bricks should also be salvaged from site for re-use.

(Added - C41* revision 1 - 27th Sep 2019)

211B MORTAR: REPOINTING / REGROUTING FOR STONEWORK [EW_03/10, EW_03/15, EW_03/35, EW_03/40]

Trial sample reference: CTH-PAY-XXX-SA-25-X-002 has been agreed as benchmark for repointing.

(Added - C41* revision 1 - 27th Sep 2019)

211C MORTAR: REPAIRS TO STONEWORK EW_03/15, EW_03/20, EW_03/30, EW_03/35

Trial sample reference: CTH-PAY-XXX-SA-25-X-002 agreed for the repointing has the correct aesthetic apprearance and can be used for the mortar repairs, should the mix be appropriate - Stone specialist to advise.

Lab analysis must be undertaken of the original mortar to obtain information about its constituants and proportions in order that the results can assist the definition of the mortar for repairs shoud there be any concerns to chemically and aesthetically match.

Stone dust must be used as a filler to provide the appropriate appearance for both texture and colour.

Biscuit samples are to be provided. The most suitable of these are to be trialled in situ for the Conservation Architects approval.

(Added - C41* revision 1 - 27th Sep 2019)

BRICK [EW_08]

(Added - C41* revision 1 - 27th Sep 2019)

214 SURFACE TEXTURE DETAILS [EW_08/10, EW_08/20]

- Generally provide samples of new stone to match existing for approval of Conservation Architect showing any surface texture, finish or special detail - Refer to 214A. Once approved this sample will be used as a model standard.

(Added - C41* revision 1 - 27th Sep 2019)

214A BRICKS EW_08/10, EW_08/20

Bricks for the replacement or infilling of damaged or missing sections of brickwork should match the original in type, size, appearance, texture and finish to the following areas;

- Yellow bricks to 1940's extension and parapet walls (from Weinerberger or similar approved)
- White glazed facing bricks to lightwells (from Weinerberger or similar approved)

Contractor to provide sample for Conservation Architect agreement.

Where feasible bricks should also be salvaged from site for re-use.

(Added - C41* revision 1 - 27th Sep 2019)

214B MORTAR: REPOINTING BRICKWORK [EW_03/10, EW_03/15, EW_03/35, EW_03/40]

Trial sample reference: CTH-PAY-XXX-SA-25-X-002 has been agreed as benchmark for repointing.

(Added - C41* revision 1 - 27th Sep 2019)

~~215 SAMPLES~~

(Deleted - C41* revision 1 - 27th Sep 2019)

215A SAMPLES

- Representative samples of designated materials: Submit before placing orders.

- Designated materials: All samples of stone tiles, marble finishes, parquet flooring, and timber panelling remain outstanding so representative samples of each must be presented for each type of stone and timber must be presented to the conservation architect for approval.

Retention of samples: Unless instructed otherwise, retain samples on site for reference. Protect from damage and contamination.

(Added - C41* revision 1 - 27th Sep 2019)

216 SAMPLES

- Inspection: Make arrangements for the inspection of samples of the following materials: As noted in Clauses 211 and 214 .
- Samples: Representative of the range of variation in appearance for each type of material to be matched.
- Appearance: Obtain approval before placing orders with suppliers or proceeding with production.
- Approved samples: Unless instructed otherwise, keep at site for reference purposes. Protect from damage and contamination.

(Added - C41* revision 1 - 27th Sep 2019)

220 RECORDING PROFILES

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

(Added - C41* revision 1 - 27th Sep 2019)

221* MORTAR Deep pointing/Bedding for Ashlar Walling and Dressings.

- Mix:
  - Bedding and pointing in normal exposure - 1:2:8/9 ratio - White Portland Cement:Hydrated Lime:Portland Stone Dust - TBC by Lab sample testing.
  - Bedding and pointing in severe exposure - 1:1:5/6 ratio - White Portland Cement:Hydrated Lime:Portland Stone Dust - TBC by Lab sample testing.
- Gauging:
  - 1 part pit sand sieved to <2.36mm.
  - ½ part fine yellow sand sieved to <600 microns
  - 1½ parts silica quartz sand sieved to <1000 microns
- Source:
  Lime: St Astier, NHL 3.5. Obtained from Setra Marketing Ltd: 01372-465779, (fax: 01372-801302).
  Sands: Pit sand: obtained from Reservoir Aggregates, Staines, Middlesex, or similar local source approved by Conservation Architect.

(Revised - C41* revision 1 - 27th Sep 2019)

222* MORTAR Fine pointing/Bedding for Ashlar Walling and Dressings
NOTE: Mix to be confirmed following Contractors laboratory analysis/testing of original pointing mortar mix.

- Mix:
  - Bedding and pointing in normal exposure - 1:2:8/9 ratio - White Portland Cement:Hydrated Lime:Portland Stone Dust - TBC by Lab sample testing.
  - Bedding and pointing in severe exposure - 1:1:5/6 ratio - White Portland Cement:Hydrated Lime:Portland Stone Dust - TBC by Lab sample testing.
- Gauging: Fine yellow sand sieved to <600 microns
- Source:
  Lime: St Astier, NHL 3.5. Obtained from Setra Marketing Ltd: 01372-465779, (fax: 01372-801302).
  Sands: Pit sand: obtained from Reservoir Aggregates, Staines, Middlesex, or similar local source approved by Conservation Architect.

(Revised - C41* revision 1 - 27th Sep 2019)

223* MORTAR Repair mortar slurry coat/grouting of voids.
NOTE: Mix to be confirmed following Contractors laboratory analysis/testing of original pointing mortar mix.

- Mix: Hydraulic Lime : Sand (1: 2.5)
- Gauging: Stone Fines sieved to <1000 microns.
- Source:
  Lime: St Astier, NHL 3.5 obtained from Setra Marketing Ltd: 01372-465779, (fax: 01372-801302).
  Sands: Local stone dust to be approved by Conservation Architect.

(Revised - C41* revision 1 - 27th Sep 2019)

224* **MORTAR** Repair Mortar, Ashlar Walling.
NOTE: Mix to be confirmed following Contractors laboratory analysis/testing of original pointing mortar mix.

- Mix: Hydraulic Lime: Sand (1:3).
- Gauging:
  - 1 part pit sand sieved to <2.36mm.
  - ½ part fine yellow sand sieved to <600 microns
  - 1½ parts silica quartz sand sieved to <1000 microns
- Source:
  Lime: St Astier, NHL 3.5 obtained from Setra Marketing Ltd: 01372-465779, (fax: 01372-801302).
  Sands: Pit sand obtained from local source approved by CA.
  (Revised - C41* revision 1 - 27th Sep 2019)

225* **MORTAR** Repair Mortar, Ashlar Walling repairs to plinth
NOTE: Mix to be confirmed following Contractors laboratory analysis/testing of original pointing mortar mix.

- Mix: Hydraulic Lime : Sand (1: 2.5)
- Gauging:
  1 part pit sand sieved to <2.36mm.
  ½ part fine yellow sand sieved to <600 microns
  1½ parts silica quartz sand sieved to <1000 microns
- Source:
  Lime: St Astier, NHL 3.5. Obtained from Setra Marketing Ltd: 01372-465779, (fax: 01372-801302).
  Sands: Pit sand: obtained from Reservoir Aggregates, Staines, Middlesex, or similar local source approved by Conservation Architect.
  (Revised - C41* revision 1 - 27th Sep 2019)

229 STONE MASON'S DRAWINGS AND SCHEDULES

- Accurately record profiles of all units to be replaced.
- Ensure unique references for each unit to be replaced are marked on drawings.
- Prepare schedule recording the following information:
  - Unique stone reference based on Architects's repair drawings.
  - Drawing reference and detail number showing profile.
  - Overall length, course height and bed depth of stone unit.
  - Existing joint arrangement.
  - Stone finish.
  (Added - C41* revision 1 - 27th Sep 2019)

230 INSPECTION OF DRAWINGS/ TEMPLATES

- Give notice: Before commencing production of the following replacement masonry units: Profiles for all stone features .
  - Period of notice (minimum): Two weeks prior to commencement of manufacture of components .
  (Added - C41* revision 1 - 27th Sep 2019)

235 INSPECTION OF MASONRY UNITS

- General: Before despatch to site, inspect and check completed units for:
  - Match with approved samples.
  - Compliance with drawings and specification.
- Give notice: At appropriate stages in production to allow inspection of masonry units before delivery to site.
  (Added - C41* revision 1 - 27th Sep 2019)

~~240~~ ~~STONE~~
(Deleted - C41* revision 1 - 27th Sep 2019)

240A STONE FOR REPAIR OF PORTLAND STONE PAVINGS TO PORTICO

Preparation/scope:

- Record masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.
- Identification of masonry units to be removed, replaced or repaired: Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced. Transcribe markings to drawings/ photographs.
- Site inspection: To confirm type and extent of repair/ renovation/ conservation work shown on drawings; parties involved to include Architect, contractor's representative, foreman mason and structural engineer.

Tiles: Prior to commencement of the works, the Contractor is to undertake geological analysis to determine the natural stone type for each scheduled replacement identified on drawings and submit 3 representative 250x250mm samples of each proposal for Architects approval.

- Allow to provide temporarily making good of apertures bedding stone and bedding and grouting in lime mortar.

Manufacturer/ Supplier: Contractor's choice; submit proposals; reclaimed stone will be considered.

- Colour/shade: To match existing replacement stone.
- Finish: Honed and toned in to match existing adjacent finishes.
- Size: To match existing and maintaining existing joint width.
- Thickness: Allow 40mm but to be determined following lifting of floor.
- Quality: Free from vents, cracks, fissures, discolouration, or other defects that may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with shop drawings prepared by the supplier.

Background/ Base: Existing solid floor construction.

- Preparation: Carefully take up existing pavings and set aside for potential reuse; those which are not reused to be offered to client stores.

Joint width: As existing.

(Added - C41* revision 1 - 27th Sep 2019)

240B STONE FOR REPAIR OF DECORATIVE MARBLE FLOOR ON GROUND FLOOR

Preparation/scope:

- Record masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.
- Identification of masonry units to be removed, replaced or repaired: Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced. Transcribe markings to drawings/ photographs.
- Site inspection: To confirm type and extent of repair/ renovation/ conservation work shown on drawings; parties involved to include Architect, contractor's representative, foreman mason and structural engineer.

Tiles: Prior to commencement of the works, the Contractor is to undertake geological analysis to determine the natural stone type for each scheduled replacement identified on drawings and submit 3 representative 250x250mm samples of each proposal for Architects approval.

- Allow to provide temporarily making good of apertures bedding stone and bedding and grouting in lime mortar.

Manufacturer/ Supplier: Contractor's choice; submit proposals; reclaimed stone will be considered.

- Colour/shade: To match existing replacement stone.
- Finish: Polished and toned in to match existing adjacent finishes.
- Size: To match existing and maintaining existing joint width.
- Thickness: Allow 30mm but to be determined following lifting of floor.
- Quality: Free from vents, cracks, fissures, discolouration, or other defects that may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with shop drawings prepared by the supplier.

Background/ Base: Existing solid floor construction.

- Preparation: Carefully take up existing flooring and set aside for potential reuse; those which are not reused to be offered to client stores.

Joint width: As existing.

(Added - C41* revision 1 - 27th Sep 2019)

241 STONE

- Supplier: [Albion Stone plc, Independent Offices, Easton Street, Portland, Dorset DT5 1BW; Tel: 01305 860369 or similar approved] .
- Type: Portland stone - Portland Jordans Whitbed TBC .
- Requirements: Free from vents, cracks, fissures, discolouration, or other defects which may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with shop drawings prepared by the supplier.
- Finish: Plain rubbed to match existing

(Added - C41* revision 1 - 27th Sep 2019)

241A INTERNAL WORKS PREPARATION – GENERALLY

- EXISTING BACKGROUNDS/BASES GENERALLY:
  Efflorescence, laitance, dirt and other loose material: Remove.
  Deposits of oil, grease and other materials incompatible with the bedding: Remove.
  Tile, paint and other nonporous surfaces: Clean.
  Wet backgrounds: Dry before tiling.
  EXISTING CONCRETE/SCREEDS:
  Loose or hollow portions: Cut out.
  Making good: 1:3 cement:sand mortar applied over cement slurry bonding coat.
  OLD ADHESIVE RESIDUES ON CONCRETE/SCREED BASES:
  Soft or unsound adhesive residues: Remove without damaging base.

  PREPARING CONCRETE BASES FOR FULLY BONDED BEDDING:
  Surface cement:sand matrix: Remove to expose coarse aggregate.
  Surface preparation: Suitable to achieve a full bond with bedding.
  Keep well wetted for several hours. Remove free water then brush in a slurry bonding coat.
  Slurry: NHL5 slurry mix.
  (Added - C41* revision 1 - 27th Sep 2019)

242 INTERNAL FIXING

FIXING GENERALLY:
Colour/ shade: Unintended variations within tiles for use in each area/ room are not permitted.
Variegated tiles: Mix thoroughly.
Adhesive: Compatible with background/ base. Prime if recommended by adhesive manufacturer.
Use of admixtures with cementitious adhesives: Only admixtures approved by adhesive manufacturer.
Cut tiles: Neat and accurate.
Fixing: Provide adhesion over entire background/ base and tile backs.
Thoroughly wet the whole base a few hours prior to laying with a further wetting of smaller areas and the slabs immediately prior to laying to ensure the suction of the dry base and slabs doesn't cause the mortar to dry out too quickly.
Final appearance: Before bedding material sets, make adjustments necessary to give true, regular appearance to tiles and joints when viewed under final lighting conditions.
Surplus bedding material: Clean from joints and face of tiles without disturbing tiles.
LEVEL OF FLOOR TILING:
Permissible deviation in level from existing finished floor levels 1mm; allow for specialist to spin off nominal 1mm at each existing stone floor finish.
LEVEL OF TILING ACROSS JOINTS:
Deviation (maximum) between tile surfaces either side of any type of joint: 1mm for joints less than 6mm wide and 2mm for joints 6mm or greater in width.
POROUS TILES:
Tiles to be bedded in cement:sand: Soak in clean water for at least 30 minutes. Fix as soon as surface water has drained.
NATURAL HYDRAULIC LIME MORTAR BEDDING (FLOORS):
Mortar: As section Z21.
Mix: 2:5 NHL5 hydraulic lime:sharp well graded sand.
Sand: Fine aggregate to BS EN 13139, Annex B.
Consistency: Stiff plastic. A film of water must not form on the surface of bed when fully compacted.
Additional requirements: Sharp well graded sand to approval.
Laying: Lay and compact bed to level.
Finished bed thickness (minimum): 15 mm.
Finished bed thickness (maximum): 25 mm.
Tiling: Tamp tiles firmly into position.
(Added - C41* revision 1 - 27th Sep 2019)

242A INTERNAL FINISHING – GENERALLY

LIME SAND GROUTING MIX:
Mortar: As section Z21.
Mix: 1:2 NHL5 hydraulic lime:graded sand.
Sand: Fine aggregate to BS EN 13139, Annex B.
Joint width 1-5mm: 1-2mm to 0.075mm.
Joint width 5-10mm: 3-5mm to 0.075mm
Pigment: Only use natural pigments to closely match the existing adjacent finish.
Mixing: Mix thoroughly. Use the minimum of clean water needed for workability.
Completion: Conservator to tone down/in new areas of grouting to match adjacent.
GROUTING - GENERALLY:
Sequence: Grout when bed/adhesive has set sufficient to prevent disturbance of tiles.
Joints: Fill to depth of tile and free from dust and debris.
Grouting: Fill joints completely, tool to profile, clean off surface. Leave free from blemishes.
Profile: Flush.
C41.245 REPLACEMENT STONE UNITS
Sizes and profiles: To match existing masonry. Maintain existing joint widths.
C41.310 DISMANTLING MASONRY FOR REUSE
Masonry units to be reused: Remove carefully and in one piece.
- Treatment: Clean off old mortar, organic growths and dirt, and leave units in a suitable condition for rebuilding.
- Identification: Mark each unit clearly and indelibly on a concealed face, indicating its original position in the construction. Transcribe makings to drawings/ photographs.
- Store in dry, stable conditions in location to be agreed with conservation architect

(Added - C41* revision 1 - 27th Sep 2019)

245 REPLACEMENT STONE UNITS

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

(Added - C41* revision 1 - 27th Sep 2019)

247 DRESSING AND FINISHING REPLACEMENT STONE UNITS

Replacement stons is to be finished to match the original as closely as possible.
All machined stones are to be left with an allowance for hand finishing by complete removal of the mechanical surface.
Stone to be free of snips, spalling or other defects.
(Added - C41* revision 1 - 27th Sep 2019)

250 ORIENTATION OF STONE

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

(Added - C41* revision 1 - 27th Sep 2019)

~~251*~~ ~~RESIN~~

(Deleted - C41* revision 1 - 27th Sep 2019)

255 ASHLAR BLOCKS/ DRESSINGS

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

(Added - C41* revision 1 - 27th Sep 2019)

256* PINS

- Stairib 460 Deformed Round Bar 6mm diameter in Grade 18/8 Austenitic Stainless Steel 460 Nmm^2 complies with BS6744:1986. Spec 304531 - By George Clark (Sheffield) Ltd or similar approved or as recommended by Stone specialist and approved by the Conservation Architect.

(Revised - C41* revision 1 - 27th Sep 2019)

265 SALVAGED/ SECOND HAND BRICKS

- Condition:
  - Free from matter such as mortar, plaster, paint, bituminous materials and organic growths.
  - Sound, clean and reasonably free from cracks and chipped arrises.

(Added - C41* revision 1 - 27th Sep 2019)

~~281~~ ~~FIXINGS FOR~~

(Deleted - C41* revision 1 - 27th Sep 2019)

281A FIXINGS FOR REPLACEMENT/REFURBISHMENT OF BALUSTRADES AND DECORATIVE GRILLES

- **Scope:**
  - Handrail to main entrance and decorative balustrades to 1st floor balconies - Judd Street.
  - Decorative balustrades to 1st floor balconies - Euston Road.
  - Decorative balustrade and gate - Tonbridge Walk
  - Decorative grilles to Basement lights - Euston Road and Bidborough Street - Also Refer to C50B
- Procurement: Selected by the specialist contractor/ supplier - Submit details for refurbishing the existing fixings once intrusive investigations revelaed type etc. Also submit details for replacement fixings.
- For pricing purposes the Tender should allow for a provisional sum to cover potential replacement of fixings to the elements listed above - replicating the character of the current fixings.
- Material: Wrought or continuously cast copper alloy - or advise alternative for agreement.
- Type, size, strength and number: As necessary to resist all loads likely to occur during the life of the building, and to prevent any lateral displacement or pulling apart of the construction.
  (Added - C41* revision 1 - 27th Sep 2019)

~~DISMANTLING/ REBUILDING~~
(Deleted - C41* revision 1 - 27th Sep 2019)

~~WORKMANSHIP~~
(Deleted - C41* revision 1 - 27th Sep 2019)

REPAIRING / RENOVATING STONEWORK - REPAIR TYPE EW_03
(Added - C41* revision 1 - 27th Sep 2019)

SCHEDULE OF OPERATIONS
(Added - C41* revision 1 - 27th Sep 2019)

300 APPROVED STONEMASONS

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 Conservation Architect for approval before putting the work in hand.
(Added - C41* revision 1 - 27th Sep 2019)

STONE REPAIR TYPE - EW_03/05

(Added - C41* revision 1 - 27th Sep 2019)

300B RE-GROUTING JOINTS

- Mortar: As section 211B.
  - Mix: [C41:211B]
  - Sand source/ type: [C41:211B] .
- Preparation: Clean out joints to remove loose debris, dust and dirt. Dampen joints to control suction as necessary.
- Applying mortar: Press well into joints so that they are fully filled. Ensure that no mortar encroaches upon exposed faces. Finish flush.
- Other requirements: [Exclude isolated hair line cracks (less than about 1.0 mm wide).
  (Added - C41* revision 1 - 27th Sep 2019)

STONE REPAIR - EW_3/10
(Added - C41* revision 1 - 27th Sep 2019)

300D MORTAR REPAIR OF CRACKS

- Mortar: As section 211B.
  - Mix: [C41:211B]
  - Sand source/ type: [C41:211B] .
- Preparation: Clean out cracks to remove loose debris, dust and dirt. Dampen joints to control suction as necessary.
- Applying mortar: Press well into joints so that they are fully filled. Ensure that no mortar encroaches upon exposed faces. Finish flush.
- Other requirements: [Exclude isolated hair line cracks (less than about 1.0 mm wide).

(Added - C41* revision 1 - 27th Sep 2019)

STONE REPAIR TYPE - EW_3/15 AND EW_03/35

(Added - C41* revision 1 - 27th Sep 2019)

300F STONE INDENT REPAIR

Refer to Purcell's drawings CTH-PUR-XXX-DR-21-A-3901 to CTH-PUR-XXX-DR-21-A-3912 describing proposed repairs and associated schedule External Works Repairs - Schedule of Work of proposed repairs, ref.CTH-PUR-XXX-SCH-00-A-3901.
This is to be carried out to all existing portland stonework dressings/copings indicated on the drawings.

- Stone: C41/211, 211A
- Mortar: C41/211B for bedding and pointing,
- Cutting out and preparing beds / backing:C41/300G
- New stone: C41/300H

(Added - C41* revision 1 - 27th Sep 2019)

300G CUTTING OUT STONE

Also refer to C41/336.

- The minimum amount of decayed stone should be removed, with particular care being taken not to damage adjacent material.
- Hand tools only (sharp chisels and stone saws) should be used for cutting out small areas of stone.
- Once the area of stone is removed the cavity must be cleared of all debris.

(Added - C41* revision 1 - 27th Sep 2019)

300H NEW STONE

- Finish new stones on all exposed faces to achieve a finish to match the original finish of existing stonework, to the approval of the Conservation Architect.
- Form all chamfers, mouldings, stoolings, shaped + arises, and other such labours to match dimensions taken from site.
- Provide alternative tooled finish to replacement stones if required by the Conservation Architect.
- New stone should be cut accurately that the width of the joints that run within the original stone are as small as possible (a maximum of 2mm).
- Original joint lines should match wherever they coincide.
- If the replacement or indent requires the support of dowels or cramps, these should be of a size appropriate to the loads, and inserted on hidden faces and should be secured with lime based grout. Proposals for fixing types and methodologies to be discussed and agreed with tith Conservation Architect.
- All replacement stones should be left to settle for a minimum of 24 hours, or until the mortar has set.
- Point any joints.

(Added - C41* revision 1 - 27th Sep 2019)

STONE REPAIR - EW_3/20

(Added - C41* revision 1 - 27th Sep 2019)

~~301* ARCHAEOLOGICAL ATTENDANCE~~

(Deleted - C41* revision 1 - 27th Sep 2019)

305 STONE MORTAR REPAIRS

- The texture and colour of the repair mortar must match the original stone as closely as possible- refer to clause C41:211C.
- Stone preperation - The damaged, decayed or friable stonework should be cut back to a sound substrate with the perimeter slightly undercut to avoid feather edges on the repair.
- Flush out small gaps and fissures with water and grout any surface cracks and scales.
- Armatures - Repairs deeper than 50mm will require an armature. Suitable ceramic armatures should be installed. The armature should be set back at least 10mm from the surface of the repair. Use a non-percussive drill to make holes at least 10mm deep and slightly wider than the diameter of the armature. Flush out holes using water and fix the armature in place using lime-based grout.
- Mortar application - The stone should be thoroughly dampened, and the mortar built up in layers no thicker than 10mm. Allow each layer to stiffen and then score to provide a key for the next layer. Subsequent layers of mortar must be applied to pre-wetted substrate. The repair should be built up until it stands slightly proud of the final surface; when the final layer is hard, it can be scraped back to the correct profile using a wooden tool or float.
- Finishing- Mortar repairs shoiuld be obvious to the eye at a short distance, but overall should blend in with the building. Profiles should blend in with the original as closely as possible. The surface of the repair should be textured by using a brush or piece of stone. Avoid metal tools for finishing.
- Aftercare - Controlled drying is essential. Completed mortar repairs should be protected from the weather and prevented from drying too rapidly by covering them with damp cloths. Regular light spraying of the repair and surrounding stone over a period of one to three weeks.

(Added - C41* revision 1 - 27th Sep 2019)

306* RECORDING STONEWORK

- The schedules refer to take down and rebuild or to build up to match existing/adjacent areas.
- 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.
- 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.
- 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.

(Revised - C41* revision 1 - 27th Sep 2019)

STONE REPAIR - EW_3/30

(Added - C41* revision 1 - 27th Sep 2019)

308 FILL MINOR HOLES WITH MORTAR AND MAKE GOOD

- Remove fixed items as Clause C40:142.
- Preperation - Thoroughly clean and flush out holes with water. Ensure hole/ stonework is thoroughly dampened.
- Application - Apply mortar to holes in layers not exceeding 15mm in depth.
- Finishing - The surface of the repair should be textured by using a brush or piece of stone. Avoid metal tools for finishing.
- Aftercare- Controlled drying is essential. Completed mortar repairs should be protected from the weather and prevented from drying too rapidly by covering them with damp cloths. Regular light spraying of the repair and surrounding stone over a period of one to three weeks.

(Added - C41* revision 1 - 27th Sep 2019)

310 DISMANTLING MASONRY FOR REUSE

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

(Added - C41* revision 1 - 27th Sep 2019)

310A DISMANTLING INTERNAL MASONRY FOR REUSE

- Masonry units to be reused: Remove carefully and in one piece.
  - Treatment: Clean off old mortar, organic growths and dirt, and leave units in a suitable condition for rebuilding.
  - Identification: Mark each unit clearly and indelibly on a concealed face, indicating its original position in the construction. Transcribe makings to drawings/ photographs.
  - Store in dry, stable conditions in location to be agreed with conservation architect

(Added - C41* revision 1 - 27th Sep 2019)

311* RELEASING STONES

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

(Revised - C41* revision 1 - 27th Sep 2019)

316* PREPARING BEDS/BACKINGS Generally to receive new work

- Thoroughly clear out void using hand tools and brushes.
- Treat voids with biocide as C40A
- Temporarily support surrounding work.
- Cut out and remove, label and set aside in store existing corroded cramp/cramps from stone and bed.
- Provide new stainless steel cramps to match those removed and fix.

(Revised - C41* revision 1 - 27th Sep 2019)

321* PREPARATION OF STONES

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

(Revised - C41* revision 1 - 27th Sep 2019)

326* LAYING AND BONDING

- In the exact position as previously occupied by the (original) stones and as recorded.
- Ensure that bond, joint size and any other special or unusual features are replicated as recorded and to match existing.
- Provide and insert stainless steel ties; cramps and dowels as necessary for bonding in the rebuilt work to the surrounding structure.
- Clean out and flush out or moisten with clean water voids left after removal of stonework (preparation of void) to remove dust and reduce suction.
- Dampen stones 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).
- Pack remaining joint with mortar using a rammer and pointing key.

(Revised - C41* revision 1 - 27th Sep 2019)

331* JOINT TREATMENT / FINISH

- Finish joints ensuring consistency of colour, texture, profile, and overall appearance to match the existing surrounding mortar.
- Set joint face flush with the face of stonework unless:
  - i) this is at difference with the existing surrounding mortar, and/or
  - ii) the joints are very wide or arises are broken; and/or
  - iii) the CA instructs otherwise.
- Where masonry arises are eroded, set joint face further back, but avoiding the creation of ledges, which may trap or hold water.
- In order to match the existing texture:

  a) 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 to 30 hours)

  b) Bristle brush stippling should be carried out by tapping the brush into the mortar.

  (Revised - C41* revision 1 - 27th Sep 2019)

336* CUTTING OUT: COMPLETE STONES

- Cut out single defective stones or group of stones to 125mm depth measured on bed by adopting such methods necessary to prevent damage to surrounding stonework, starting from the centre and working outwards.
- Having drilled the whole face of the stone at 50mm horizontal and vertical centres to the required depth using manual tools only, i.e. bolster and chisel.
- Lay dust by adequate sprinkling with water;
- Notify the CA of any signs of structural movement found within walls when stones have been removed.

  (Revised - C41* revision 1 - 27th Sep 2019)

341* DRESSING

- Finish new stones on all exposed faces to achieve a finish to match the original finish of existing stonework, to the approval of the CA;
- Form all chamfers, mouldings, stoolings, shaped arises, and other such labours to match dimensions taken from site.
- Provide alternative tooled finish to replacement stones if required by the CA.
- No artificial distressing;
- Carve to accurate clean profiles before or after building in as agreed.
- Carve the date to selected replaced stones in style/manner as approved by the CA.

  (Revised - C41* revision 1 - 27th Sep 2019)

346* RELOCATE/PROTECT

- Provide temporary protection to item to be relocated to prevent damage.
- Provide adequate mobile lifting apparatus to take the weight of the item to be relocated.
- 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).

  (Revised - C41* revision 1 - 27th Sep 2019)

351* REFIX

- Provide new stainless steel fixings to substitute existing.
- Re-set stone item in new location generally as C41/326.
- Grout all voids as C41/356.
- Remove temporary protection.

  (Revised - C41* revision 1 - 27th Sep 2019)

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.

(Revised - C41* revision 1 - 27th Sep 2019)

358 LAYING REPLACEMENT MASONRY UNITS

Faces, angles and features: Align accurately. Set out carefully to ensure satisfactory junctions with existing masonry and maintain existing joint widths.
Joint surfaces: Dampen to control suction as necessary.
Laying units: On a full bed of mortar, all joints filled.
Exposed faces: Keep clear of mortar and grout.
(Added - C41* revision 1 - 27th Sep 2019)

385 LAYING REPLACEMENT MASONRY

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

(Added - C41* revision 1 - 27th Sep 2019)

MORTAR REPAIRS GENERALLY

(Revised - C41* revision 1 - 27th Sep 2019)

401* RAKE OUT LIME MORTAR JOINTS

- Rake out well to a depth of 35mm min. using chisels or hacksaw blades of appropriate width so as not to damage existing arises and flush out with water.

(Revised - C41* revision 1 - 27th Sep 2019)

406* CEMENT REMOVAL

- Remove cement patch repairs to rustication and ashlar 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 stone 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 stone substrate, particularly where the repairs are deep and well-adhered. Avoid damage to edges of sound stone.

  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.

(Revised - C41* revision 1 - 27th Sep 2019)

411* SURFACE CLEANING Read with C40

- Pre-clean all retained work revealed to such standard to match surrounding cleaned work.
- Carry out consolidation as C40/300 and inspect with CA to agree exact areas to be repaired.
- Friable stone faces should be descaled and defrassed and a key cut where necessary using hand tools. Undercut top edges to protect feather edges from weather.

(Revised - C41* revision 1 - 27th Sep 2019)

416* REPAIRS

- The area to be repaired should be well wetted and particularly friable stone should be treated with 3 coats of slurry mix.
- Water is added to this mix to achieve a thin creamy consistency.
- Brush on the slurry coat and work well into the stone. Allow to tack dry before applying second and third slightly thicker coats

(Revised - C41* revision 1 - 27th Sep 2019)

421* DEEP POINTING

- Carry out deep pointing as clause C41/221 before and during mortar repairs

(Revised - C41* revision 1 - 27th Sep 2019)

426* SLURRY MIX

- A coat of slurry mix is to be applied immediately prior to mortar repair and allowed to dry to tack

(Revised - C41* revision 1 - 27th Sep 2019)

431* APPLICATION OF MORTAR REPAIR

- Repair mortar should be as dry as possible. Repair mortar to be applied using small trowels and spatulas to a depth of no more than 12mm per application.
- Repairs to be tended between applications, and each stage allowed to go off to a leathery consistency but still green before application of the next coat
- Repairs to be tapped by hand to establish any areas of failure. Each stage must be sound before work can continue.
- Repairs to be kept damp and protected from frost, wind and direct sunlight to prevent rapid drying out and subsequent cracking, shrinking, and failure. Use damp hessian as protection. Particular attention needs to be paid to overnight protection.

(Revised - C41* revision 1 - 27th Sep 2019)

436 APPEARANCE

- modelling, finish and texture of repairs: Care to be taken over final tending and finishing off. Texture repairs to match adjacent stonework by working over with hessian, spatulas, plaster modelling and sculpture tools to the approval of the CA.

- Repairs to the vermiculation, rustication, window architraves, balusters and modillions require a high degree of sculptural skills, experience and a finely tuned eye to achieve good results. It is very important that care is taken over accuracy of dimensions, cleanness of line and overall final appearance in order to produce a satisfactory and successful repair. The conservator must be able to stand back and look at the work in overall context. It must look appropriate from every angle and in its overall context

(Revised - C41* revision 1 - 27th Sep 2019)

441* MORTAR REPAIRS: ARMATURES

- Drill at 50mm centres, vertically and horizontally, 5mm. diameter holes and insert stiff stainless steel wire (C40G:M035) twisted to a spiral up 25mm in diameter. Ensure the surface of the armature is 10-13mm below the final surface. Do not use armatures on single coat work. Increase the gauge of the wire and if necessary the whole size of the armature for deeper repairs such that the armature remains moderately rigid.

(Revised - C41* revision 1 - 27th Sep 2019)

446* MORTAR REPAIRS: TENDING

- Tending is the key to successful mortar repairs.
- Lime mortars only carbonate successfully in the presence of water.
- This should happen over a period of at least 10 days. It is imperative to control the rate of drying out and adjust it to the ambient environment to ensure consistency.
- Allow for programme implications, especially for deep mortar repairs, of the time required.
- Tend By: Protecting each mortar repair with damp hessian and polythene in warm drying conditions and damp hessian and bubble wrap in winter. Ensure that mortar repairs are fully protected for four months after application in winter working conditions. Check repairs at regular intervals and spray with clear limewater to keep damp. Avoid and take care not to allow run off as lime mortar causes stains which are invisible until they have dried out.
- Carry out any texturing or keying on deep coats before final set or 'turn'.

(Revised - C41* revision 1 - 27th Sep 2019)

TOOLING/ DRESSING STONE IN SITU

(Added - C41* revision 1 - 27th Sep 2019)

450 WEATHERING LEDGES AT JOINTS

- Locations: Where stones project or are recessed.
- Requirement: Carefully weather the ledge, to approval.
- Method: Suitably graded carborundum blocks or tooling as appropriate.

(Added - C41* revision 1 - 27th Sep 2019)

451* MORTAR REPAIRS: TEXTURING

- Unless otherwise directed texture mortar repairs to match the general level of decay of surrounding stone.
- A mortar repair should blend into the stonework when viewed from more than 1.5m. If it 'looks right it is right'. The degree of texturing will be determined in conjunction with the architect.
- An accomplished eye is required and recourse to various tools applied in various manners including spatulas, modellers riffs, different coarseness of, stiff cloth and the like.
- Patination is occasionally required using natural pigments including charcoal bound by casein in a solution of water. The requested skills are acquired with experience.

(Revised - C41* revision 1 - 27th Sep 2019)

455 DESCALING STONE

- Requirement: Carefully remove loose scaling and powdering from stones to the extent agreed.
- Method: Suitable bristle brushes or carborundum blocks. Do not use wire brushes.

(Added - C41* revision 1 - 27th Sep 2019)

456* JOINT REINFORCEMENT/FINISH: ASHLAR REPAIRS

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

(Revised - C41* revision 1 - 27th Sep 2019)

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.

(Revised - C41* revision 1 - 27th Sep 2019)

466* MORTAR REPAIRS Mixing and Storing

- To be confirmed by investigation works but generally as Z21

(Revised - C41* revision 1 - 27th Sep 2019)

REPAIRING / RENOVATING BRICKWORK - REPAIR TYPE EW_08

REFER TO F10 FOR GENERAL REQUIREMENTS FOR NEW BRICKWORK

(Revised - C41* revision 1 - 27th Sep 2019)

500* SCHEDULE OF OPERATIONS

(Revised - C41* revision 1 - 27th Sep 2019)

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 Conservation Architect for approval before putting the work in hand.

(Revised - C41* revision 1 - 27th Sep 2019)

502* GENERAL SEQUENCE OF REPAIRS TO BRICKWORK

- This is to be carried out to all existing stones where indicated on the drawings

1. Agree repair type with CA and photograph areas to be cut out.
2. Cut out defective brickwork
3. Recording: C41/606
4. Releasing: C41/611
5. Preparing beds/Backing: C41/616
6. Preparing Bricks for Re-use: C41/621
7. Laying/|Bonding: C41/626
8. Cutting out: C41/611
9. Raking out: C41/636
10. Preparing Joints: C41/641
11. Filling Joints: C41/646
12. Joint Treatment/Finish: C41/648

(Revised - C41* revision 1 - 27th Sep 2019)

503 BRICK REPAIR TYPE - EW 08/05

(Added - C41* revision 1 - 27th Sep 2019)

518 MORTAR REPAIRS FOR REPAIRS TO HOLES AND FISSURES.

- Remove redundant fixings, bolts and metal sleeves etc. as C41/812.
- Dampen inside of hole and surrounding stone to control suction.

- Mortar: As clause C41/225.
  Finish: Flush with surrounding stone as clause C41/555

(Added - C41* revision 1 - 27th Sep 2019)

MATERIALS

(Revised - C41* revision 1 - 27th Sep 2019)

551* BRICKS Handmade Clay Stock Facing Bricks

- Salvaged second hand from site or new to match existing exactly (to approved sample)
- Sizes: Match existing adjacent bricks
- Colour: Buff or Red/brown to match adjacent wall area.

(Revised - C41* revision 1 - 27th Sep 2019)

555 FLOAT FINISH TO MORTAR REPAIRS

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

(Added - C41* revision 1 - 27th Sep 2019)

556* **MORTAR** FOR BEDDING AND JOINTING EXTERNAL WALL BACKING

- Mix: 1 part Hydraulic Lime, 3.5 NHL
  1 part pit sand sieved to <2.36 mm.
  ½ part fine red sand sieved to <600 microns
  1 parts silica quartz sand sieved to <1000 microns
- Lime: St Astier NHL 3.5. Obtained from Setra Marketing Ltd: 01372-465779, (fax: 01372-801302).
- Sands: to CA's approval, Heritage mix to above grading obtained from Tarmac Tilcon as agreed on site.

(Revised - C41* revision 1 - 27th Sep 2019)

CRACK REPAIRS/ TIES/ REINFORCEMENT

(Deleted - C41* revision 1 - 27th Sep 2019)

~~WORKMANSHIP~~

(Deleted - C41* revision 1 - 27th Sep 2019)

606* RECORDING BRICKWORK

- The schedules refer to take down and rebuild or to build up to match existing/adjacent areas.
- 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.
- 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.
- 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.

(Revised - C41* revision 1 - 27th Sep 2019)

~~610 MORTAR REPAIR OF CRACKS~~

(Deleted - C41* revision 1 - 27th Sep 2019)

610A MORTAR REPAIR OF CRACKS EW_8/05

- Mortar: As section 214B.
  - Mix: C41:214B
  - Sand source/ type: C41:214B .
- Preparation: Clean out cracks to remove loose debris, dust and dirt. Dampen joints to control suction as necessary.
- Applying mortar: Press well into joints so that they are fully filled. Ensure that no mortar encroaches upon exposed faces. Finish flush.
- Other requirements: Exclude isolated hair line cracks (less than about 1.0 mm wide) .

(Added - C41* revision 1 - 27th Sep 2019)

610B BRICK REPAIR TYPE - EW_08/10 AND REPAIR TYPE - EW_08/20

(Added - C41* revision 1 - 27th Sep 2019)

610C GENERAL SEQUENCE OF REPLACEMENT OF BRICK AND BRICK INFILL REPAIRS

This is to be carried out to all existing bricks where indicated on the drawings
1.Agree repair type with Conservation Architect and photograph areas to be cut out.
2.Cut out defective brickwork (where specified on drawings and schedules)
3.Releasing: C41/611
4.Preparing beds/Backing: C41/616
5.Preparing Bricks for Re-use: C41/621
6.Replacement of bricks: C41/623
7.Laying/Bonding: C41/626
8. Raking out: C41/636
9. Preparing Joints: C41/641
10. Filling Joints: C41/646
11. Joint Treatment/Finish: C41/648
(Added - C41* revision 1 - 27th Sep 2019)

611* RELEASING BRICKWORK FOR REPLACEMENT

- Following recording and agreement of Conservation Architect, any bricks that have lost their face or have unsound face to a depth of 10mm should be carefully cut out using hand tools.
- Provide temporary support as necessary
- Release bricks by cutting out jointing material, easing/levering bricks from their backing.
- Prevent damage to bricks being removed and surrounding work.
- Use manual tools only.
- Lay dust by sprinkling with water.
- Inspect voids with SO or notify any signs of structural movement found within walls.
- Set aside bricks for cleaning and reuse.

(Revised - C41* revision 1 - 27th Sep 2019)

616* PREPARING BEDS/BACKINGS Generally to receive new work

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

(Revised - C41* revision 1 - 27th Sep 2019)

~~620 RESIN INJECTION OF CRACKS~~

(Deleted - C41* revision 1 - 27th Sep 2019)

621* PREPARING BRICKS For re-use / use as indents

- Thoroughly clean bricks set aside for re-use to the approval of the CA removing all remaining adhered mortar.
- After agreement with CA dispose of any bricks not to be re-used and supplement with others stored to match or new as C41/551.

(Revised - C41* revision 1 - 27th Sep 2019)

623 REPLACEMENT OF BRICKS SLAVAGED FROM REMOVALS AS 611 OR IN NEW TO MATCH EXISTING AS 214A

- Bricks: [To match existing or salvaged and clause 214A].
- Mortar: As section C41-214B.
- Joints: [Refer to C41-214A].
- Other requirements: [N/A].

(Added - C41* revision 1 - 27th Sep 2019)

626* LAYING/BONDING

- In positions as previously occupied as recorded or as agreed with CA.
- Ensure that bond, joint size and any other special or unusual features are replicated as recorded and to match existing.
- Clean out and flush out or moisten in with clean water, voids to remove dust and reduce suction.
- Dampen bricks and tamp into place on a full and even bed of mortar.
- Pack remaining joints with mortar using a rammer and pointing key.

(Revised - C41* revision 1 - 27th Sep 2019)

~~631*~~ ~~CUTTING OUT~~
(Deleted - C41* revision 1 - 27th Sep 2019)

636* RAKING OUT Existing joints where shown on the drawings.
- Carefully rake out the existing mortar using hand chisels (quirks, plugging chisels only) and a 2½ lb. lump hammer taking care not spall the arris of the bricks. Rake out to a minimum depth of 25 mm. Rake out all decayed or friable lime mortar and leave a clean and square prepared face of existing sound mortar.
- The use of a 6mm mechanical joint raker may be considered by the Conservation Architect having approved a sample of workmanship on site.

(Revised - C41* revision 1 - 27th Sep 2019)

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.

(Revised - C41* revision 1 - 27th Sep 2019)

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.

(Revised - C41* revision 1 - 27th Sep 2019)

648* JOINT TREATMENT / FINISH
- Fill all joints evenly or solidly following on immediately from Laying/bonding or Filling joint operations.
- Iron well with a pointing key leaving a flush or struck finish slightly set back from this arris of bricks.
- Fresh work should be well protected until set.
- Stipple joint before fully set with a stiff bristle brush to expose aggregate and fully compress the mortar as approved sample on site.

(Revised - C41* revision 1 - 27th Sep 2019)

BRICK REPAIR TYPE - EW_08/15
(Added - C41* revision 1 - 27th Sep 2019)

690A MAKING GOOD OF HOLES IN BRICKWORK
- Preparation: Clean out holes thoroughly.
- Repair mortar: Tmatch existing masonry units/ joints in colour and texture. Fully fill holes and finish neatly and flush.
- Give notice: Before starting and obtain approval of appearance of first few holes from Conservation Architect before completing the remainder.
- NOTE: No quantity for this repair type (EW_08/15) yet to be fully identified on drawings subject to cleaning, demolitions and scaffold access. Provisional quantity (1% area per elevation) tbe allowed subject to detailed inspection once scaffold is available.

(Added - C41* revision 1 - 27th Sep 2019)

712 FLUSHING OUT
- Timing: Before grouting.
- Requirement: Flush out delivery holes thoroughly with clean water.

(Added - C41* revision 1 - 27th Sep 2019)

720 HAND GROUTING VOIDS BELOW EXISTING PAVINGS
- Grout mix: NHL5 slurry mix .
- Method: Pour grout into clay cups formed against masonry surface.

(Added - C41* revision 1 - 27th Sep 2019)

740 APPLICATION OF GROUTING

- Grouting: Continuous operation during each lift. Allow grout to set before commencing with subsequent lifts.
- Monitoring: Monitor grouting carefully and continuously at each delivery point (flow and delivered pressure) and at adjacent/ opposite wall faces to ensure that there is an effective distribution of grout with no leaking, staining, or disruption to the masonry.
- Temporary seals: Remove from joints and leave in a suitable condition for repointing.

(Added - C41* revision 1 - 27th Sep 2019)

BRICK REPAIR TYPE - EW_08/25

(Added - C41* revision 1 - 27th Sep 2019)

810 PREPARATION FOR REPOINTING

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

(Added - C41* revision 1 - 27th Sep 2019)

812 PREPARATION FOR REPOINTING ASHLAR STONE

- Existing mortar:
  - Working from top of wall downwards, remove mortar carefully to a minimum depth of 15mm without damaging adjacent masonry or widening joints.
  - Mortar is loose or missing from some perp joints to a depth of 40 to 50mm ensure deeply recessed perps are identified and all loose material is removed.
- Raked joints: Remove dust and debris.

(Added - C41* revision 1 - 27th Sep 2019)

815 REPOINTING

- Careful and sympathetic repointing is of the utmost importance in preserving the colour, texture and general character of old brickwork. The following instructions are tbe brought to the notice of every bricklayer and mason employed on the work and are tbe carefully and fully carried out.
  - Rake out joints to a depth to suit the original raked joint or more if the old mortar has perished; remove loose particles tmake a good key for the new mortar.
  - Press the new mortar well into the joints to assist adhesion and to ensure that no voids are left. When the joints are filled the mortar is to be finished to match the surrounding original raked mortar joints.

(Added - C41* revision 1 - 27th Sep 2019)

840 POINTING WITH TOOLS/ IRONS

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

(Added - C41* revision 1 - 27th Sep 2019)

860 BRUSHED FINISH TO JOINTS

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

(Added - C41* revision 1 - 27th Sep 2019)

CTH-PUR-XXX-SP-09-A-9031

S4 - ISSUED FOR STAGE APPROVAL

30 September 2019

This document includes:

Code	Section	Revision	Dated
C50B	Repairing/Renovating Metalwork	T00	25 Sep 2019

Table of Contents

C50B
Repairing/Renovating Metalwork

Section Revision History

No.	Purpose	
T00	Issue for Tender	25th Sep 2019

Clauses amended in Revision T00

This is the first revision stamp for this section. For all future revision stamps, details of all clauses amended at that revision will be included here.

C50B Repairing/Renovating Metalwork

GENERALLY & WORKMANSHIP

Carry out ironwork repairs in accordance with current 'Conservation Principals' by the National Heritage Ironwork Group.

50 HOT WORKS

In situ welding and pouring of molten lead is permitted on site but must be limited to minimum and will be subject to compliance with the 'Hot Works Permit' procedures.

100 APPROVED METALWORKERS

- The work in this section (to include metalwork repairs and preparations) is to be carried out by metalworker conservators such as noted below or Contractor to submit alternatives before return of tender and agreed in writing by the CA.:

a) Calibre Metalwork Ltd
Hazel Knoll Farm, Torkington Road, Hazel Grove, Stockport SK7 6NW
Tel: 0845 6044553

b) Mullins Studio (co. Colin Mullins),
5 Huntersfield, Shavington, Crewe, CW2 5FB
Tel: 07948 309 677

c) Lost Art Ltd
1 Yewdale Crescent, Wigan, Lancashire, WN1 2HP
Tel: 01257 464 601

d) Hall Conservation Ltd (co. Brian Hall)
36 Shrewsbury Lane, London, SE18 3JF
Tel. 020 8855 8567
Mob. 07714 895072

e) Topp & Co. (co. Chris Topp)
Unit 5, The Airfield, Tholthorpe, North Yorkshire, YO61 1ST
United Kingdom
Tel: 01347 833173

109A CLEANING DECORATIVE METAL BALUSTRADES AND GRILLES

Refer to Purcell drwgs CTH-PUR-XXX-21-A-3902, 3903 and 3904 describing proposed repairs and associated schedule External Works Repairs - Schedule of Work of proposed repairs, ref.CTH-PUR-XXX-SCH-00-A-3901

- Locations:
  Handrail to main entrance and decorative balustrades to 1st floor balconies - Judd Street.
  Decorative balustrades to 1st floor balconies - Euston Road.
  Decorative balustrade and gate - Tonbridge Walk
  Decorative grilles to Basement lights - Euston Road and Bidborough Street.

  - The elements above require a full overhaul and it is assumed the elements noted are lead painted.
  - This and the type of metal is to be confirmed by sample testing - it is assumed that the metalwork will be carefully temporarily removed and treated off-site.
  - After initial cleaning is completed the Conservation Architect can complete an inspection and be identify the full extent of repairs.
  - The cleaning process is not only to remove deleterious materials and allow further detailed inspections, but also to prepare the surface to receive protective coatings.
  - The level and type of cleaning required will depend on the proposed painting system to be agreed with the Conservation Architect prior to cleaning and the application of the paint or protective coating.
  - To be suitable for coating the surface should have no loose materials, no hydroscopic contaminents or other deposits and should be sufficiently rough to allow good adhesion.
  - All dirt should be removed prior to painting, BUT earlier coating should be left on so long as they are well adhered.
  - Defective paint layers should be cleaned back, and the cleaned metal primed, built up to the thickness of surrounding sound paint with fillers, and then rubbed back down to form a smooth surface.
  - Rust should never be painted over as moisture will remain trapped in the rust layer, and this may compromise the adhesion of the paint.
  - The best cleaning method will depend on a number of variables including the type of coating system that is to be applied and this should be advised by metalworker conservators for the agreement of the Conservation Architect. It may require localised trial samples of cleaning methods - refer to Clause 109H, 109I and 109K.

109B PREPERATION

- Surfaces not designated for cleaning: Prevent damage, including marking and staining.
- Openings: Prevent ingress of water, cleaning agents and detritus.
  - Vents and grilles: Seek instruction from Conservation Architect before sealing up / protecting.

109C CONTROL AND DISPOSAL OF WASH WATER AND DETRITUS

- Disposal: Safely. Obtain approvals from relevant Authority.
- Control of wash water: Collect and divert to prevent ingress and damage to building fabric and adjacent areas.
- Above and below ground drainage systems: Keep free from detritus and maintain normal operation.

109D COLD WEATHER

- Cleaning procedures using water: Do not use when air temperature is at or below 5°C. Protect damp surfaces from frost.
- Chemical cleaning agents: Do not use when surface temperatures are below those recommended by manufacturer.

109E CLEANING GENERALLY

- Operatives: Appropriately trained and experienced for each type of cleaning work.
  - Evidence of training: Submit on request.
- Control of cleaning: Confine cleaning processes and materials to designated areas.
  - Prevent wind drift.
- Detritus: Remove regularly. Dispose of safely.
- Monitoring: Frequently check results of cleaning compared to approved trial samples. If results established by trials are not achieved, seek instructions from Conservation Architect.
- Modifications to cleaning methods and materials: Seek instructions from Conservation Architect.

109F RECORD OF CLEANING WORKS

Written report: Record cleaning methods and procedures used for each type of surface and deposit.

- Content: Relevant attributes of cleaning methods used including:
  - Equipment and settings.
  - Dwell times.
  - Number of applications.
  - Ambient temperatures.
- Additional documentation: [Survey before cleaning: Photogrammetric drawings of each location / element].
- Submission: At completion of cleaning works.

109G WATER BASED CLEANING

- Water washing is an effective way to remove dirt, loose paint and rust. It is important to thoroughly dry ferrous metalwork after water washing, especially before applying coatings.
  Warm water and brushes -
- Soluble salts can be removed by warm water and brushes, or more quickly by pressure washing, using water pressures up to 200 bar.

109H TRIAL SAMPLES

- Trial sample reference: [TBC].
  - Surface: [Existing metalwork - wrought iron TBC].
  - Location/ Size: [0.5m x 0.5m].
  - Cleaning methods: [Warm Water and brushes].
- Records: Maintain written records for each trial area, including cleaning methods and conditions, to enable replication of results elsewhere.

109I TRIAL SAMPLES

- Trial sample reference: [TBC].
  - Surface: [Existing metalwork - wrought iron TBC].
  - Location/ Size: [0.5m x 0.5m].
  - Cleaning methods: [Pressure washing, using water pressures up to 200 ba].
- Records: Maintain written records for each trial area, including cleaning methods and conditions, to enable replication of results elsewhere.

109J CHEMICAL CLEANING

Many products are available to remove different types of paint but these must always be tested before use to assess not only the materials they contain, but the way they must be applied, and how the residues will need to be neutralised and removed. It is important to clear away all traces of cleaning chemicals by first neutralising them and then cleaning with water or steam, since residues may well cause problems for the adhesion of later coatings.

109K TRIAL SAMPLES

- Trial sample reference: [TBC].
  - Surface: [Existing metalwork - wrought iron TBC].
  - Location/ Size: [0.5m x 0.5m].
  - Cleaning methods: [Mild phosphoric acid (2-5%].
- Records: Maintain written records for each trial area, including cleaning methods and conditions, to enable replication of results elsewhere.

115 REPAIRS

Aslo see Clauses 150 and 155.

- The full extent of repairs are to be determined by the Conservation Architect following further inspections after the cleaning process is complete.
- Repairs will not be required where damage is minor and works will only cover what is necessary to maintain or restore functionality.Where these elements are balustrades to balconies, Struct. Eng. to be consulted to verify structural stability and integrity.
- Gates should be restored to provide ongoing physical security, to close smoothly and accurately and lock as required.

117 COATINGS

- The choice of paint system and colour must take account of the context and materials of the ironwork, any compatibility and maintenance issues and the budget.
- Paint analysis should be undertaken to determine whether any original paint survives.
- The choice of coating is therefore to be agreed with the Conservation Architect prior to application and prior to cleaning (refer to clause 109A).

118 APPLICATION

- Most architectural coatings are applied with brushes, rollers or sprays, or a combination of these.
- The application method will depend on the type of paint to be applied (refer to Clause 117) and should be undertaken in line with manufacturers recommendations in terms of number of coats, drying times and best methods of application. However for the nature of the iron to be painted it is recommended that brush application is used to provide good control and coverage on the difficult, decorative surfaces.
- Moisture, temperature and air movement affect application and setting, so painting should only be scheduled when conditions are suitable.

140 IN SITU RE-TIPPING OF STRUCTURAL METALWORK BUILT INTO MASONRY

- As C50B/335.

150 GENERAL IN SITU OVERHAUL/REPAIR OF METALWORK - NO STRUCTURAL REPAIR

- Locations: Refer to schedules and drawings
- Partial removal of decorations: as C50B/301
- In situ hand cleaning: as C50B/305
- Wrought iron repairs: as C50B/312
- Repair of corroded metalwork: as C50B/323
- Renewal of corroded/missing components and modern inappropriate repairs: as C50B/325
- Fixing horizontal metalwork into masonry pockets: as C50B/328
- Re-tipping of metalwork at abutment with masonry: as C50B/330
- Decoration of metalwork generally: as M60/192

155 GENERAL WORKSHOP OVERHAUL/REPAIR OF METALWORK - NO STRUCTURAL REPAIR

- Locations: Refer to schedules and drawings
- Recording: as C50B/200
- Releasing railings from molten lead pockets: as C50B/210
- Releasing railings from masonry /cement pockets: as C50B/215
- Wrought iron repairs: as C50B/312
- Cleaning and treatment: C50B/321
- Repair of corroded metalwork: as C50B/323
- Renewal of corroded/missing components and modern inappropriate repairs: as C50B/325
- Fixing vertical metalwork into concrete: as C50B/326
- Fixing vertical metalwork into masonry/molten lead pockets: as C50B/327
- Fixing horizontal metalwork into masonry pockets: as C50B/328
- Re-tipping of metalwork at abutment with masonry: as C50B/330
- Decoration of metalwork generally: as M60/192

200 RECORDING - IF REMOVAL OF MASONRY/METALWORK REQUIRED

- Prior to removal robustly double tag each section to include room/space audit reference where the railing belongs.
- The schedules refer to take down and rebuild or to build up to match existing/adjacent areas.
- All areas are to be fully recorded by the contractor using photography and marked up record drawings prior to work commencing, and following removal of flaking/unsound paint build-up and corrosion.
- All materials resulting from and dismantling operations are to be carefully handled, salvaged and stored on site and will remain the property of the client until such time as they are instructed specifically for disposal.
- Following inspection with the CA mark out area to be treated or repaired on site and transfer onto record drawing. Photograph areas to be treated and cross refer photo to record drawing.

210 RELEASING RAILINGS FROM MOLTEN LEAD POCKETS

Notes:

- Corrosive expansion may have created radiating fractures around the stump, notify Architect as soon as this becomes apparent and await instruction.
- Removal of the lead from around the stanchion has to be completed carefully as the stone evaporates when a flame is applied.
- Provide method statement (including H&S) for Architects comment and undertake trial removal before progressing with remainder.

The following work description is based on minimising the risk of damaging the masonry and the visual impact of too large a cored pocket:

- The weather and stonework must be dry.
- Cut iron stanchion nominal 20mm from the stone.
- Drill and tap a thread into the stump, no less than 25mm deep.
- Using a bridging piece, run a set screw into the tapped hole.
- Apply a gently load to the screw.
- Using a gas welding oxy-acetylene / propane torch, (not a cutting torch) wash out the lead whilst continuing to apply the tension on the screw.
- Dress pocket to square off to only loose 2mm to each side of pocket.
- Ensure pocket is fully cleaned out and allowed to dry prior to reinstatement.

215 RELEASING RAILINGS FROM MASONRY/CEMENT POCKETS

Notes:

- Corrosive expansion may have created radiating fractures around the stump, notify Architect as soon as this becomes apparent and await instruction.
- Removal of the stanchion has to be completed carefully so not to cause unnecessary damage to the surrounding masonry.
- Provide method statement (including H&S) for Architects comment and undertake trial removal before progressing with remainder.

The following work description is based on minimising the risk of damaging the masonry and the visual impact of too large a cored pocket:

- Carefully release the surrounding brickwork and masonry drill out the metalwork and cement infill from the pocket using as smaller drill as allows so not to loose stonework.
- Prepare pocket by dressing off loose material and dependant upon size of damage allow to indent a section of stone or repair with approved lime mortar mix.
- Ensure pocket is fully cleaned out and allowed to dry prior to reinstatement.

CLEANING

301 PARTIAL REMOVAL OF DECORATIONS

- Principal to be applied when areas of existing paint layers are sound. Ensure complete protection from all cleaning works to the Strict approval of CA.
- Clean surface with a wet air micro grit abrasive and aluminium oxide using a non aggressive high pressure needle guns with fine/medium/large attachments to suit element to be cleaned. The nozzle must have independent control over air, water and abrasive. Cleaning to begin at a pressure of 40psi and not exceed 70psi unless otherwise agreed with the Architect.
- Thoroughly go over to remove all oil, grease, dust and dirt and also scale, rust, old defective/unsound paint layers/coatings and foreign matter including in joints back to a sound metal and paint finish.

302 BLAST CLEANING - FULL LENGTHS/UNITS ONLY

- Principal to be applied when full lengths/units of existing paint layers are defective. Ensure complete protection from all cleaning works to the Strict approval of CA. Adequately protect adjacent sound finishes when undertaking blast cleaning.
- Thoroughly blast clean to level 'SA½' of BS7079: Part A1: 1989, to remove all visible oil, grease, dust and dirt and also scale, rust, old defective/unsound paint coatings and foreign matter including in joints back to a sound metal finish.
- Use hot air guns or an abrasive blast system using a non aggressive medium such as walnut or coconut shell in a dry formula.

305 IN SITU HAND CLEANING

- Thorough hand power tool cleaning to level "St2" of BS7079 : Part A1 to be carried out in situ to leave the component free from visible oil, grease and dirt, and free from poorly adhering scale, rust, paint coatings and foreign matter.

MATERIALS

312 WROUGHT IRON REPAIRS

- Hand forged solid wrought iron with profiles to match original component.
- Source:
  The Real Wrought Iron Company
  Carlton Husthwaite, Thirsk
  North Yorkshire
  Tel: 01845 501415
- Provide sample of each replacement embellishment for Conservation Architect approval prior to proceeding.

316 STITCH PINS TO REPAIR CRACKING OF CAST IRON

- Manufacturer: Contractors choice.
  - Material: 316 grade stainless steel.
  - Type: Threaded bolts.
  - Size: Allow M10; to be confirmed by specialist to suit size of cracking.

317 METAL FILLER

Following cleaning preparation of metalwork, fill defect/opening between embellishment and framework with car body filler (pure epoxy resin) to prevent passage of moisture to forge weld; use sparingly and do not use to feather out paint layers. Specialist sub-contractor to submit written proposals to CA including confirmation of the suitability of the proposed filler for the purpose proposed and then undertake in situ sample repair for Architects approval. Allow 3 weeks prior to commencement of works.

SCHEDULE OF OPERATIONS

321 CLEANING AND TREATMENT OF METALWORK

- If removal to the workshop is scheduled, record ironwork within the workshop as C50B/200 and allow inspection by Conservation Architect and to confirm precise scope of works.
- Preparation: Part removal as C50B/301 or full removal as C50B/302; including feathering-in of paint finishes by sanding.
- Scope of repairs:
  - Treatment of bare metalwork below areas of filler only as C50B/315.
  - Fill minor defect/opening up between embellishment and framework as C50B/317.
- Finish as M60/192 including application of high build primer to build up at edges of existing paint layers.

323 REPAIR OF CORRODED METALWORK

- If removal to the workshop is scheduled, record ironwork as C50B/200 and allow inspection with the Architect and Conservation Architect to confirm precise scope of works.

The following works are to be completed following release and removal to the workshop:

- Preparation: Part removal as C50B/301 or full removal as C50B/302; including feathering-in of paint finishes by sanding.
- Scope of repairs:
  - Treatment of bare metalwork below areas of filler only as C50B/315.
  - Feather-in paint finishes by sanding.
  - Build up corroded areas using filler as C50B/317.
  - Scribe filler using hand tools as C50B/317 to replicate missing decorative work where instructed; generally missing elements are to be replaced with hand forged iron.
  - Fill minor defect/opening up between embellishment and framework as C50B/317.
- Finish as M60/192 and application of high build primer to build up at edges of existing paint layers.

325 RENEWAL OF CORRODED/MISSING COMPONENTS & MODERN INAPPROPRIATE REPAIRS

If removal to the workshop is scheduled, record ironwork as C50B/200 and allow inspection with the Architect and Conservation Architect to confirm precise scope of works.

The following works are to be completed following release and removal to the workshop:

- Record ironwork as C50B/200 and allow inspection with the Conservation Architect to confirm precise scope of works.
- Preparation: Cut out or remove defective/modern component.
- Scope of repairs:
  - Provide new hand forged wrought iron component as C50B/312.
- Finish as M60/192.

326 FIXING VERTICAL METALWORK INTO POCKETS - RESIN WITH WATERPROOFING

- Metalwork to be fixed within existing/newly prepared pockets within concrete/stone unless otherwise stated.
  - New pockets: Cut neat, squared off aperture with nominal 5mm clearance to bar and provisionally 20mm deep.
- Pockets in masonry to be fully cleaned out of all previous lead and debris, ensuring they are also fully dry before fixing.
- Place retipped ironwork into pocket and set with resin as C41/251 ready for waterproofing.
- Touch in decorations to match adjacent.

327 FIXING VERTICAL METALWORK INTO POCKETS - MOLTEN LEAD

The following is to be undertaken with 'Hot Works Permit' procedures in place.

- Metalwork to be fixed within existing pockets within the stonework unless otherwise stated.
  - New pockets: Cut neat, squared off aperture with nominal 5mm clearance to bar.
- Pockets in masonry to be fully cleaned out of all previous lead and debris, ensuring they are also fully dry before fixing.
- Place retipped ironwork into pocket and set with resin as C41/251 to finish 25mm from face of masonry.
- Following setting of resin pour in molten lead into the pocket around the retipped iron bar to finish nominal 2-5mm proud of the surrounding level.
- Tamp down the lead when cooled, ensuring it is still slightly proud of the surrounding level to ensure water is shed.
- Finish off by removing any overrun with a chisel and brushing any flakes away with a wire brush.
- Touch in decorations to match adjacent.

328 FIXING HORIZONTAL METALWORK INTO MASONRY POCKETS

The following is to be undertaken with 'Hot Works Permit' procedures in place.

- Provide lifting gear as necessary to reinstate.
- Metalwork to be reinstated within existing pockets within the masonry unless otherwise stated and where design permits.
  - New pockets: Cut neat, squared off aperture with nominal 5mm clearance to bar.
- Pockets to be fully cleaned out of all previous lead (if applicable), debris and pointing.
- Place retipped ironwork into pocket packing up with slate which is to finish nominal 15mm from the finished face of masonry.
- Touch in decorations to match adjacent.
- Following completion of touching in of decorations, fully point void with approved mortar mix.

329 SPECIALIST COLD STITCH REPAIRS TO CRACKED CAST IRON

The following is provided for guidance purposes; refer to structural engineers documentation for further details. The following works are to be undertaken by a specialist/metal fabricator who is competent in this type of repair. Refer to the pricing document for allowances.

- Drill a row of hit-and-miss blind holes along the length of the crack using a jig to suit the width/centres of the stitch pins as C50B/316.
- Provide threads to the holes to suit the stitch pins.
- Smear holes with araldite glue and immediately screw in stitch pins.
- Break/cut off stitch pins nominal 2mm proud of metalwork.
- Grind off stitch pins to finish flush, being careful not to damage the adjacent metalwork.
- Complete the above process to fill the intermediate spacings.
- Finish: Decorate as adjacent and included/specified elsewhere.
- Other requirements: Indicate location of repair(s) on drawings within the Health & Safety File.

330 RE-TIPPING OF NON STRUCTURAL METALWORK AT ABUTMENT WITH MASONRY

- Locations: Refer to drawings and schedules; exact locations/scope to be agreed on site with Architect following erection of scaffolding.
- Undertake the following works within the workshop where possible and prior to any decorations.
- Where existing metalwork is to be retained, re-tip with a half lap repair in stainless steel to match existing section size and gauge or larger section reduced to match, as Structural Engineers details.
  - Length of tip: Lap to extend nominal 100mm from face of masonry and into full depth of existing pocket. To be confirmed following confirmation of pocket depth; for pricing purposes allow 200mm length of stainless steel with 100mm lap.
- Provisionally use 2no. M10 flush fitting bolts at equal centres to locate/fix.
- Braise weld to existing and de-burr/remove step in section width.
- Finish exposed length to match adjacent new decoration.

335 IN SITU RE-TIPPING OF STRUCTURAL METALWORK BUILT INTO MASONRY

NOTE: The following scope of works is provisional and subject to Structural Engineers design/details.

- Locations: Refer to the structural engineers schedules and drawings for locations and specification for retipping; the following provides guidance to minimise disturbance and damage to the masonry. Exact locations/scope to be agreed on site with Architect following erection of scaffolding.
- Corrosive expansion has created radiating fractures around the beam; refer to schedules, drawings and the B of Q for repairs. Notify the Architect as soon as possible where the masonry looks to be unstable and await instruction from the CA.
- Carry out trial opening up of masonry to expose full depth of existing bearing for Architect and Structural Engineers inspection/review prior to commenecemnt of remainder re-tipping and await further instruction to confirm actual scope.
- Photograph masonry prior to proceeding and label for reinstatement.
- Release the minimum amount of stone/brickwork necessary to complete the repair.
- Retipping of the beam has to be completed carefully so not to cause unnecessary damage to the surrounding masonry.
- Undertake re-tipping in accordance with structural engineers details.
- Finish beam as M60/192 and application of high build primer to build up at edges of existing paint layers.
- Reinstate masonry as existing arrangements only modifying to match new steel arrangements; refer to BoQ for repair allowances.
- Repair by indenting new stone / brickwork to match existing, repointing in approved lime mortar.

CTH-PUR-XXX-SP-09-A-9065

S4 - ISSUED FOR STAGE APPROVAL

30 September 2019

This document includes:

Code	Section	Revision	Dated
F10	Brick/ block walling	T00	29 Sep 2019

Table of Contents

F10
Brick/ block walling
Revision T00

Section Revision History

No.	Purpose	
0	RIBA Stage 3 Amendments	24th Apr 2019
T00	TENDER	29th Sep 2019

Clauses amended in Revision T00

No.	Clause	
109	CONTRACTOR'S DESIGN	Added
110A	GLAZED CLAY BRICKWORK	Revised
110B	BRICKWORK	Added
355A	CONCRETE LIGHTWEIGHT BLOCKWORK	Revised
355B	CONCRETE DENSE BLOCKWORK	Revised

F10 Brick/ block walling

To be read with Preliminaries/ General conditions.

TYPES OF WALLING

109 CONTRACTOR'S DESIGN

Design responsibility:

- The Contract Documents describe the Design Intent and define the performance criteria, the mandatory geometry of visible elements, dimensions, positions and detail the required principle materials and visible finishes. The Contractor shall be responsible for developing and completing the design in accordance with the Contract Documents. Any suggested solutions described in the Contract Documents shall not in any way relieve the contractor from their responsibility for the design and construction of the Works.
- The Contractor is to develop and complete the design of the glass balustrade system and associated components to achieve visual criteria described on Architects drawings and achieve all necessary structural requirements defined by Structural Engineer, Building Control and relevant British Standards.

Scope of work:
All pre-stressed or proprietary lintels over openings in masonry walls for doors, windows and services routes will be designed by and be the responsibility of the relevant subcontractor

(Added - F10 revision T00 - 29th Sep 2019)

110A GLAZED CLAY BRICKWORK Courtyards

- Bricks: To BS EN 771-1.
  - Manufacturer: Ibstock or equivalent,
    Leicestershire, LE67 6HS
    Tel +44 (0)1530 261999
    Fax +44 (0)1530 257457
    www.ibstockbrick.co.uk
    enquiries@ibstock.co.uk .
    Product reference: Ibstock White Glazed - Standard Gloss, or equivalent .
  - Recycled content: As Manufacturer's rquirements .
  - Special shapes: As shown on drawings .
- Mortar: As section Z21.
  - Standard: To BS EN 998-2 .
  - Mix: 1:1:5 sulfate resisting cement:lime:sand .
  - Additional requirements: Additional items for mortar to BS EN 998-2: Select from: .
- Bond: To match existing .
- Joints: To match existing .
- Features: Brick capping as detailed .

(Revised - F10 revision T00 - 29th Sep 2019)

110B BRICKWORK -

- Aston Bricks
  " Manufacturer: AAB
  Web: www.aab.build
  Email: rebecca@aab.build
  Tel: +448452300941
  Address: unit 10 Maises Way, South Normanton, Alfreton, Derbyshire DE55 2DS
  " Product reference: Aston NZ091
  " Size: /215 x 102 x 65 mm
  MIN Compressive strength of 20N/mm
  Water absorbency less than 23%

(Added - F10 revision T00 - 29th Sep 2019)

355A CONCRETE LIGHTWEIGHT BLOCKWORK Lightweight Concrete Blockwork

- Manufacturer
  Name:Thomas Armstrong (Concrete Blocks) Ltd
  Web:www.thomasarmstrong.co.uk
  Tel:+44 0)1748 810204
  Product reference
  Insulite Concrete Block
  Compressive strength
  [7.3 N/mm²]
  Thickness [100 mm]
  Expand Icon 2 more options...
  Finish[[Standard]-Provides an excellent surface for mortars, renders and plasters.

(Revised - F10 revision T00 - 29th Sep 2019)

355B CONCRETE DENSE BLOCKWORK Dense Concrete Blockwork

- Dense Concrete Block
  " Manufacturer: Thomas Armstrong (Concrete Blocks) Ltd
  Web: www.thomasarmstrong.co.uk
  Email: airtec@thomasarmstrong.co.uk
  Tel: +44 (0)1748 810204
  Fax: +44 (0)1748 813950
  Address: Bridge Road, Brompton-on-Swale, Richmond, North Yorkshire DL10 7HW
  " Product reference: Dense Concrete Block
  " Compressive strength: 10.4 N/mm²
  " Thickness: 140 mm
  " Finish: Fairtex

(Revised - F10 revision T00 - 29th Sep 2019)

WORKMANSHIP GENERALLY

430 CONDITIONING OF CLAY AND CALCIUM SILICATE BRICKS AND CLAY BLOCKS

- Bricks and blocks delivered warm from manufacturing process: Do not use until cold.
- Absorbent bricks in warm weather: Wet to reduce suction. Do not soak.

440 CONDITIONING OF CONCRETE BRICKS/ BLOCKS

- Autoclaved concrete bricks/ blocks delivered warm from manufacturing process: Do not use.
- Age of nonautoclaved concrete bricks/ blocks: Do not use until at least four weeks old.
- Avoidance of suction in concrete bricks/ blocks: Do not wet.
  - Use of water retaining mortar admixture: Submit details.

460 MORTAR GROUPS

- Mix proportions: For a specified group select a mix design from the following:
  - Group 1:
    1:0–0.25:3 (Portland cement:lime:sand with or without air entraining additive).
    1:3 (Portland cement:sand and air entraining additive).
  - Group 2:
    1:0.5:4–5 (Portland cement:lime:sand with or without air entraining additive).
    1:3 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
    1:2.5–3.5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
    1:3–4 (Portland cement:sand and air entraining additive.)
  - Group 3:
    1:1:5–6 (Portland cement:lime:sand with or without air entraining additive).
    1:3.5–4 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
    1:4–5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
    1:5–6 (Portland cement:sand and air entraining additive).
  - Group 4:
    1:2:8–9 (Portland cement:lime:sand with or without air entraining additive).
    1:4.5 (masonry cement:sand containing Portland cement and lime in approximate ratio 1:1, and an air entraining additive).
    1:5.5–6.5 (masonry cement:sand containing Portland cement and inorganic materials other than lime and air entraining additive).
    1:7–8 (Portland cement:sand and air entraining additive).
- Batching: Mix proportions by volume.
- Mortar type: Continuous throughout any one type of masonry work.

500 LAYING GENERALLY

- Mortar joints: Fill vertical joints. Lay bricks, solid and cellular blocks on a full bed.
- AAC block thin mortar adhesive and gypsum block adhesive joints: Fill vertical joints. Lay blocks on a full bed.
- Clay block joints:
  - Thin layer mortar: Lay blocks on a full bed.
  - Interlocking perpends: Butted.
- Bond where not specified: Half lap stretcher.
- Vertical joints in brick and concrete block facework: Even widths. Plumb at every fifth cross joint.

520 ACCURACY

- Courses: Level and true to line.
- Faces, angles and features: Plumb.
- Permissible deviations:
  - Position in plan of any point in relation to the specified building reference line and/ or point at the same level ± 10 mm.
  - Straightness in any 5 m length ± 5 mm.
  - Verticality up to 3 m height ± 10 mm.
  - Verticality up to 7 m height ± 14 mm.
  - Overall thickness of walls ± 10 mm.
  - Level of bed joints up to 5 m (brick masonry) ± 11 mm.
  - Level of bed joints up to 5 m (block masonry) ± 13 mm.

535 HEIGHT OF LIFTS IN WALLING USING CEMENT GAUGED OR HYDRAULIC LIME MORTAR

- Quoins and advance work: Rack back.
- Lift height (maximum): 1.2 m above any other part of work at any time.
- Daily lift height (maximum): 1.5 m for any one leaf.

545 LEVELLING OF SEPARATE LEAVES

- Locations for equal levelling of cavity wall leaves: As follows:
  - Every course containing vertical twist type ties or other rigid ties.
  - Every third tie course for double triangle/ butterfly ties.
  - Courses in which lintels are to be bedded.

560 COURSING BRICKWORK

- Gauge: Four brick courses including bed joints to 300 mm.

561 COURSING BRICKWORK WITH EXISTING

- Gauge: Line up with existing brick courses.

595 LINTELS

- Bearing: Ensure full length masonry units occur immediately under lintel ends.

620 BLOCK BONDING NEW WALLS TO EXISTING

- Pocket requirements: Formed as follows:
  - Width: Full thickness of new wall.
  - Depth (minimum): 100 mm.
  - Vertical spacing:
    Brick to brick: 4 courses high at 8 course centres.
    Block to block: Every other course.
- Pocket joints: Fully filled with mortar.

635 JOINTING

- Profile: Consistent in appearance.

645 ACCESSIBLE JOINTS NOT EXPOSED TO VIEW

- Jointing: Struck flush as work proceeds.

671 FIRE STOPPING

- Avoidance of fire and smoke penetration: Fit tightly between cavity barriers and masonry. Leave no gaps.

690 ADVERSE WEATHER

- General: Do not use frozen materials or lay on frozen surfaces.
- Air temperature requirements: Do not lay bricks/ blocks:
  - In cement gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising.
  - In hydraulic lime:sand mortars when at or below 5°C and falling or below 3°C and rising.
  - In thin joint mortar glue when outside the limits set by the mortar manufacturer.
- Temperature of walling during curing: Above freezing until hardened.
- Newly erected walling: Protect at all times from:
  - Rain and snow.
  - Drying out too rapidly in hot conditions and in drying winds.

ADDITIONAL REQUIREMENTS FOR FACEWORK

710 THE TERM FACEWORK

- Definition: Applicable in this specification to brick/ block walling finished fair.
  - Painted facework: The only requirement to be waived is that relating to colour.

730 BRICK/ CONCRETE BLOCK SAMPLES

- General: Before placing orders with suppliers submit for approval of appearance labelled samples of the following: F10/355A & F10/355B .
- Selection of samples: Representative of the range in variation of appearance.

745 MASONRY SAMPLE PANELS

- Sampling frequency: A panel for each type and delivery of masonry unit.
- Selection of masonry units: Reasonably representative of the average quality of the whole order to be delivered .
- Panel types: As clause 740.

750 COLOUR CONSISTENCY OF MASONRY UNITS

- Colour range: Submit proposals of methods taken to ensure that units are of consistent and even appearance within deliveries.
- Conformity: Check each delivery for consistency of appearance with previous deliveries and with approved reference panels; do not use if variation is excessive.
- Finished work: Free from patches, horizontal stripes and racking back marks.

760 APPEARANCE

- Brick/ block selection: Do not use units with damaged faces or arrises.
- Cut masonry units: Where cut faces or edges are exposed cut with table masonry saw.
- Quality control: Lay masonry units to match relevant reference panels.
  - Setting out: To produce satisfactory junctions and joints with built-in elements and components.
  - Coursing: Evenly spaced using gauge rods.
- Lifts: Complete in one operation.
- Methods of protecting facework: Submit proposals.

780 GROUND LEVEL

- Commencement of facework: Not less than 150 mm below finished level of adjoining ground or external works level.

800 TOOTHED BOND

- New and existing facework in same plane: Bond together at every course to achieve continuity.

830 CLEANLINESS

- Facework: Keep clean.
- Mortar on facework: Allow to dry before removing with stiff bristled brush.
- Removal of marks and stains: Rubbing not permitted.

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S4 - ISSUED FOR STAGE APPROVAL

30 September 2019

This document includes:

Code	Section	Revision	Dated
F30	Accessories/ sundry items for brick/ block/ stone walling	T00	29 Sep 2019

Table of Contents

F30
Accessories/ sundry items for brick/ block/ stone walling

Section Revision History

No.	Purpose	
T00	Issue for Tender	29th Sep 2019

Clauses amended in Revision T00

This is the first revision stamp for this section. For all future revision stamps, details of all clauses amended at that revision will be included here.

F30 Accessories/ sundry items for brick/ block/ stone walling

To be read with Preliminaries/ General conditions.

CAVITIES

120 CLEANLINESS

- Cavity base and faces, ties, insulation and exposed dpcs: Free from mortar and debris.

131 BED JOINT WEEP HOLES

- Form: Open 10 mm diameter hole.
- Locations: Through outer leaf immediately above base of cavity at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
- Provision: At not greater than 1000 mm centres and not less than two over each opening.

132 PERPEND JOINT PLASTICS WEEP HOLES

- Manufacturer: Cavity Trays Ltd or equivalent.
  - Web: www.cavitytrays.com.
  - Email: enquiries@cavitytrays.co.uk.
  - Product reference: Euroweep-vent.
- Locations: Through outer leaf immediately above base of cavity, at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
- Provision: At not greater than 1000 mm centres and not less than two over each opening.

132A PERPEND JOINT PLASTICS WEEP HOLES

- Manufacturer: Cavity Trays Ltd or Equal and Approved.
  - Web: www.cavitytrays.com.
  - Email: enquiries@cavitytrays.co.uk.
  - Product reference: Euroweep-vent.
- Colour: [Black].
- Duct extension: [Not required].
- Render front cover: [Not required].
- Locations: Through outer leaf immediately above base of cavity, at cavity trays, stepped dpcs and external openings. 75 mm above top of cavity fill at base of cavity.
- Provision: At not greater than 1000 mm centres and not less than two over each opening.

155 PARTIAL FILL CAVITY INSULATION

- Insulation: Rock wool batts to BS EN 13162.
  - Product certification: British Board of Agrement (BBA) Certificate number or to Local Building Standard's recognised certification scheme.
- Manufacturer: ROCKWOOL..
  - Product reference: ROCKWOOL HP Partial Fill Cavity Slabs.
- Recycled content: Submit proposals.
- Face size (length x width): 1200 x 450 mm.
- Thickness (nominal): Thickness varies - refer to Drawings. Submit proposals for thickness and board that achieves overall external cavity wall maximum U-value of 0.7W/m2K.
- Thermal conductivity: 0.037 W/(m·K).
- Reaction to fire class: A1 or Class 0.
- Additional requirements: None.
- Placement: Secure against face of inner leaf.
  - Residual cavity: Clear and unobstructed.
- Joints between boards, at closures and penetrations: No gaps and free from mortar and debris.

155A RAINSCREEN CLADDING INSULATION

- Rainscreen Duo-Slab
  " Manufacturer: ROCKWOOL Ltd
  Web: www.rockwool.co.uk
  Email: info@rockwool.com
  Tel: +44 (0)1656 862621
  Address: ROCKWOOL Ltd, 14th Floor, Chiswick Tower, 389 Chiswick High Road, London W4 4AJ
  " Product reference: Rainscreen Duo-Slab
  " Thickness: 150 mm

180A CAVITY CLOSERS TO EXTERNALL WALLS/WINDOWS/DOORS

- ROCKWOOL RockClose
  " Manufacturer: ROCKWOOL Ltd
  Web: www.rockwool.co.uk
  Email: info@rockwool.com
  Tel: +44 (0)1656 862621
  Address: ROCKWOOL Ltd, 14th Floor, Chiswick Tower, 389 Chiswick High Road, London W4 4AJ
  " Product reference: ROCKWOOL RockClose
  " Insulation: 1200 x 100 mm
  " Thickness: 50 mm

180C CAVITY CLOSERS W01D

ROCKWOOL SP Firestop OSCB 60 and 120
" Manufacturer: ROCKWOOL Ltd
Web: www.rockwool.co.uk
Email: info@rockwool.com
Tel: +44 (0)1656 862621
Address: ROCKWOOL Ltd, 14th Floor, Chiswick Tower, 389 Chiswick High Road, London W4 4AJ
" Product reference: ROCKWOOL SP Firestop OSCB 60 /ROCKWOOL SP Firestop OSCB 120
" Overall cavity width:
" Accessories: None /OSCB fixing brackets /Pig tail screws

180D CAVITY CLOSERS TO EXTERNAL WALLS/PARAPETS

- Manufacturer: avity Trays Ltd or equivalent & approved.
  - Web: www.cavitytrays.com
  - Email: enquires@cavitytrays.co.uk.
  - Product reference: Type J DPC Support and Closerr.
- - Type: [J1, J2 and J3 (refer to drawings].
  - Integral Insulation: [Not required]
    Accessories: [To include integral fixing cramp and DPC illustrated in BS 5628-3.]

REINFORCING/ FIXING ACCESSORIES

211 CAVITY WALL TIES USED WITH PARTIAL FILL INSULATION FOR ALL CAVITY WALLS USING PARTIAL FILL INSULATION

- Standard: To BS 1243.
  - Type: 2 (Masonry general purpose) .
- Manufacturer: Ancon Building Products. or equivalent & approved
  - Web: www.ancon.co.uk.
  - Email: info@ancon.co.uk.
  - Product reference: SD1 Wall Tie.
- Material/ finish: Stainless steel .
- Sizes: 200 mm .
- Tie mounted insulation retaining clips: As recommended by the manufacturer.

236 FIXING TIES IN MASONRY CLADDING TO TIMBER FRAMES

- Fixing ties to timber frame studs through sheathing: Securely with 50 mm x 11 gauge stainless steel annular ringed shank nails.
- Embedment in mortar beds (minimum): 50 mm.
- Placement: Slope downwards away from timber frame, without bending.
- Spacing:
  - Horizontal centres: To suit stud centres.
  - Vertical centres: 375 mm.
- Provision of additional ties: Within 225 mm of reveals of openings and at no more than 300 mm centres vertically.

241A WALL STARTERS/ CONNECTORS TO STEEL COLUMNS

- Manufacturer: Ancon Building Products. or equivalent & approved
  - Web: www.ancon.co.uk.
  - Email: info@ancon.co.uk.
  - Product reference: Staifix Universal Wall Starter System.
- Material/ finish: NON DRILL Masonry to stell fixing system.
- Sizes: To manufacturer instructions.

241B WALL STARTERS/ CONNECTORS TO CONCRETE COLUMNS/MASONRY WALLS

- Manufacturer: Ancon Building Products. or equivalent & approved
  - Web: www.ancon.co.uk.
  - Email: info@ancon.co.uk.
  - Product reference: Staifix Universal Wall Starter System.
- Material/ finish: Stainless steel grade 1.4301.
- Sizes: To manufacturer instructions.

251A WALL HEAD RESTRAINT SLIP TIES TO STEEL BEAMS

- Manufacturer: Ancon Building Products. or equivalent & approved
  - Web: www.ancon.co.uk.
  - Email: info@ancon.co.uk.
  - Product reference: IHR-V.
- Material/ Finish: Stainless steel grade 1.4301 (304).
- Sizes: 215mm.
- Shear load capacity: To SE design.
- End types: To manufacturer's standards.
- Stem length: To manufacturer's standards.
- Design embedment length (minimum): 50mm.
- Allowable joint thickness (minimum): 10 mm.
- Additional requirements: None.

251B WALL HEAD RESTRAINT SLIP TIES TO CONCRETE SLABS

- Manufacturer: Ancon Building Products. or equivalent & approved
  - Web: www.ancon.co.uk.
  - Email: info@ancon.co.uk.
  - Product reference: IHR-H.
- Material/ Finish: Stainless steel grade 1.4301 (304).
- Sizes: 215mm.
- Shear load capacity: To SE design.
- End types: To manufacturer's standards.
- Stem length: To manufacturer's standards.
- Design embedment length (minimum): 50mm.
- Allowable joint thickness (minimum): 10 mm.
- Additional requirements: None.

281 LATERAL RESTRAINT PROPRIETARY SLIP TIES FOR MOVEMENT JOINTS IN EXTERNAL LEAF

- Manufacturer: Ancon Building Products. or similar approved.
  - Web: www.ancon.co.uk.
  - Email: info@ancon.co.uk.
  - Product reference: PPS.
- Material/ finish: Austenitic stainless steel - material/ coating reference 1.
- Fixing centres: Alternate courses.

FLEXIBLE DAMP PROOF COURSES/ CAVITY TRAYS

310 DAMP PROOF COURSE - BITUMEN BASED

- Standard: To BS 6398.
  - Class: E.
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.

330A DAMP PROOF COURSE - POLYMERIC BASED

- Manufacturer: Icopal Limited, or equivalent & approved
  - Web: www.icopal.co.uk.
  - Email: info.uk@icopal.com..
  - Product reference: Xtra-Load Probuild.
- Accessories:
  - Preformed cavity trays.
  - Xtra-Load DPC jointing tape.
  - Xtra-Load joint support system.
  - Xtra-Load DPC Fixing Strip.
  - Xtra-Seal QD Bitumen Primer

340 SITE FORMED FLEXIBLE SHEET CAVITY TRAYS - BITUMEN BASED

- Standard: To BS 6398.
  - Class: E.
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.

345A SITE FORMED FLEXIBLE SHEET CAVITY TRAYS

- Material: Bitumen polymer.
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.

380 PREFORMED DPC/ CAVITY TRAY JUNCTION CLOAKS/ STOP ENDS

- Manufacturer: Icopal Limited, or equivalent & approved
  - Web: www.icopal.co.uk.
  - Email: info.uk@icopal.com.
  - Product references and locations: Xtra-Load Probuild - As per Architect's drawings.
- Placement: To provide a free draining and watertight installation. Seal laps with dpcs and/ or cavity trays.

390 SITE FORMED DPC/ CAVITY TRAY JUNCTIONS/ STOP ENDS

- Three dimensional changes in shape: Form to provide a free draining and watertight installation. Seal laps.
- Alternative use of preformed junction cloaks/ stop ends: Submit proposals.

INSTALLATION OF DPCS/ CAVITY TRAYS

415 HORIZONTAL DPCS
- Placement: In continuous lengths on full even bed of fresh mortar, with 100 mm laps at joints and full laps at angles.
- Width: At least full width of leaf unless otherwise specified. Edges of dpc not covered with mortar or projecting into cavity.
- Overlying construction: Immediately cover with full even bed of mortar to receive next masonry course.
- Overall finished joint thickness: As close to normal as practicable.

425 GROUND LEVEL DPCS
- Joint with damp proof membrane: Continuous and effectively sealed.

435 STEPPED DPCS IN EXTERNAL WALLS
- External walls on sloping ground: Install dpcs not less than 150 mm above adjoining finished ground level.

445 SILL DPCS
- Form and placement: In one piece and turned up at back when sill is in contact with inner leaf.

455 COPING/ CAPPING DPCS
- Placement: Bed in one operation to ensure maximum bond between masonry units, mortar and dpc.
- Dpcs crossing cavity: Provide rigid support to prevent sagging.

465 SEALING DPCS TO PARAPET WALLS
- Overlaps and junctions: Seal with Adhesive recommended by dpc manufacturer .

475 SITE FORMED CAVITY TRAYS
- Requirements to prevent downward ingress of water:
  - Profiles: To match those shown on drawings. Firmly secured.
  - Joint treatment: Use unjointed wherever possible, otherwise lap at least 100 mm and seal to produce a free draining and watertight installation.
  - Horizontal cavity trays: Support using cavity closer.
  - Sloping cavity trays: Prevent sagging.
  - Cleanliness: Free from debris and mortar droppings.

485 CAVITY TRAYS OVER OPENINGS AND OTHER CAVITY BRIDGINGS
- Length: To extend not less than 150 mm beyond ends of lintels/ bridgings.

515 DPC/ CAVITY TRAY LEADING EDGE IN FACEWORK - FLUSH
- Treatment at face of masonry: Finish flush and clear of mortar at the following locations: Generally .

560 VERTICAL DPCS GENERALLY
- Form: In one piece wherever possible.
  - Joints: Upper part overlapping lower not less than 100 mm.

570 JAMB DPCS AT OPENINGS
- Joint with cavity tray/ lintel at head: Full underlap.
- Joint with sill/ horizontal dpc at base: Full overlap.
- Projection into cavity: Not less than 25 mm.
- Relationship with frame: In full contact.

580 JAMB DPCS TO BUILT IN TIMBER FRAMES
- Fixing: Securely fastened to back of frame.
  - Fasteners: Galvanized clout nails or staples.

JOINTS

610A MOVEMENT JOINTS WITH SEALANT TO EXTERNAL WALL STARTER LOCATIONS

To be confirmed at stage 4

- Joint preparation and sealant application: As section Z22.
- Filler: Closed cell polyethylene foam.
  - Thickness: To match design width of joint.
  - Manufacturer: Submit proposals.
    Product reference: Contractor's choice.
  - Placement: Build in as work proceeds with no projections into cavities and to correct depth to receive sealant system.
- Sealant:
  - Designation: ISO 11600-F-20HM.
  - Manufacturer: Submit proposals.
    Product reference: Submit proposals.
  - Colour: To match adjoining masonry.

630 UNEXPOSED CONTRACTION JOINTS

- Formation: Close butt as work proceeds.

650 POINTING IN FLASHINGS

- Joint preparation: Free of debris and lightly wetted.
- Pointing mortar: As for adjacent walling.
- Placement: Fill joint and finish flush.

655 POINTING IN ASPHALT SKIRTINGS

- Joint preparation: Free of debris and lightly wetted.
- Pointing mortar: 1:4 cement: sand incorporating a bonding agent.
  - Colour: Match adjacent work.
- Placement: Fill joint and finish flush.

660 PINNING UP TO SOFFITS

- Top joint of loadbearing walls: Fill and consolidate with mortar.

670A TOPS OF NONLOADBEARING WALLS FOR JUCTION OF NEW STRUCTURE AND NEW MASONRY WALLS

- ROCKWOOL FirePro Intumescent Expansion Joint Seal
  " Manufacturer: ROCKWOOL Ltd
  Web: www.rockwool.co.uk
  Email: info@rockwool.com
  Tel: +44 (0)1656 862621
  Address: ROCKWOOL Ltd, 14th Floor, Chiswick Tower, 389 Chiswick High Road, London W4 4AJ
  " Product reference: ROCKWOOL Intumescent Expansion Joint Seal
  " Size: 30 x 25 mm /75 x 50 mm
  " Length: 1000 mm
  " Seal: Single /Dual
  - Tolerance: 35mm
    Thickness: as per specialist recommendation to accommodate tolerance required

680 POINTING TO WINDOW/DOOR FRAMES/SASH BOXES

Preparation: Remove existing sealant pointing, thoroughly clean the joint recess, remove all dust and seal joint surfaces.
Sealant type: Burnt sand mastic.
- Manufacturer: Masons Mortar, 77 Salamander Street, Leith, Edinburgh, EH6 7JZ,
  -Tel: 0131 555 0503,
  -Fax: 0131 553 7158
- web: www.masonsmortar.co.uk (or similar to CA approval).
  Application:
- 20-25mm fillet, ensure that mastic does not bridge any drips.
- Do not overpaint.
- Apply in accordance with manufacturers recommendations.
- Provide sample of finished pointing to full window for Architects approval.
  Colour: To match adjacent pointing/masonry; TBC following preparation of sample biscuits for CA approval.

PROPRIETARY SILLS/ LINTELS/ COPINGS/ DRESSINGS

720A NATURAL STONE SILLS

- Standard: To BS 5642-1.
- Material: Natural stone - To match existing
  Refer to PAYE schedule of replacement, for repairs see C41.
  Defective stones should be carefully cut or sawn out, without overruns, to a depth sufficient to remove all decay and to give a good seating for replacements.
  The minimum depth for replacement ashlar units should be 100 mm (greater depth required for overhanging stone.
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.
- Dimensions: As shown on drawings TBC.
- Finish: To match sample.
- Mortar for bedding/ jointing: Cement gauged as section Z21.
  - Standard: To BS EN 998-2.
  - Mix: To be confirmed when stone sample is approved.
  - Additional requirements: None.
- Joints: Flush.
- Bedding one piece sills: Leave bed joints open except under end bearings and masonry mullions. On completion, point to match adjacent work.

720B ALUMINIUM THRESHOLDS TO 3rd FLOOR ROOF EXTENSION DOORS

- Standard: to BS EN 485, BS EN 515 and BS EN 573
- Material: [Aluminium alloy sheet (Grade 1050A-H14/4015-H12) with a minimum thickness of 2 mm.].
- Manufacturer: [Submit proposals].
  - Product reference: [Submit proposals].
- Dimensions: As shown on drawings [Refer to drawings].
  Finish: [Polyester powder coated as section Z31].
- Support Brackets: [Constructed from extruded aluminium profiles and applied to the window sill at regular intervals];
- Joints: [No joints].
- Colour: [to match window].
- End Caps: [Required - Submit proposals].

735A PRECAST CONCRETE LINTELS TO NEW DOOR / WINDOW OPENINGS

- Standard: To BS EN 845-2.
- Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Types: As schedule.
- Sizes: As schedule
- Additional requirements: As schedule.
- Placement: Bed on mortar used for adjacent work.
  - Bearing length (minimum): 150 mm.

750 PRESTRESSED CONCRETE LINTELS

Hi-Spec Lintels

- Manufacturer: Naylor Concrete Products Ltd
  Web: www.naylor.co.uk
  Email: lintels@naylor.co.uk
  Tel: +44 (0)1226 320810
  Fax: +44 (0)1226 320811
  Address: Whaley Road, Barugh Green, Barnsley, South Yorkshire S75 1HT
- Product reference: Hi-Spec Lintels
- Type: As drawing /As schedule
- Length:as per door schedule
- Finish: Chem /Colour /Faced

750A PRESTRESSED CONCRETE FIRE LINTELS

- Fire-Spec Lintels
  " Manufacturer: Naylor Concrete Products Ltd
  Web: www.naylor.co.uk
  Email: lintels@naylor.co.uk
  Tel: +44 (0)1226 320810
  Fax: +44 (0)1226 320811
  Address: Whaley Road, Barugh Green, Barnsley, South Yorkshire S75 1HT
  " Product reference: Fair-faced Fire-Spec Lintels /Fire-Spec Lintels
  " Type: Fire R3 /Fire R5 /Fire R8 /Fire R11 /Fire R2 /Fire R190 /Fire R13 /Fire R7 /Fire S8 /Fire R14 /As drawing /As schedule
  " Length: as per door schedule and fire strategy drawings
  " Fire resistance: 60 minutes /90 minutes /120 minutes
  " Finish: Colour /Faced

761A NATURAL STONE COPING UNITS LAID IN HYDRAULIC LIME:SAND MORTAR

- Standard: To BS 5642-2.
- Manufacturer: Submit proposals.
  - Product reference: Natural stone - To match existing
    Refer to PAYE schedule of replacement, for repairs see C41.
    Defective stones should be carefully cut or sawn out, without overruns, to a depth sufficient to remove all decay and to give a good seating for replacements.
    The minimum depth for replacement ashlar units should be 100 mm (greater depth required for overhanging stone.
- Dimensions: As shown on drawings.
- Finish: To match sample.
- Mortar for bedding/ jointing: Hydraulic lime:sand as section Z21.
  - Hydraulic lime: To be confirmed when stone sample is approved.
  - Sand source/ type: To be confirmed when stone sample is approved.
  - Mix: To be confirmed when stone sample is approved.
- Joints: Full and finished flush.
- Placement: Lay on a full bed of mortar to line and level.

840 OPENINGS FOR FRAMES

- Formation: Use accurate, rigid templates to required size.

850 WALL PLATES

- Placement: On full bed of mortar to correct horizontal level.

CTH-PUR-XXX-SP-09-A-9120

S4 - ISSUED FOR STAGE APPROVAL

30 September 2019

This document includes:

Code	Section	Revision	Dated
H71	Lead sheet coverings/ flashings	T00	29 Sep 2019

Table of Contents

H71
Lead sheet coverings/ flashings
Revision T00

Section Revision History

No.	Purpose	
0	RIBA Stage 3 Amendments	24th Apr 2019
T00	Issue for Tender	29th Sep 2019

Clauses amended in Revision T00

No.	Clause	
110	ROOFI95 ROOFING OF PROPOSED DORMERS:NG	Deleted
110B	PROPOSED DORMERS	Added
155	CLADDING OF PROPOSED DORMER CHEEK/RETURNS	Added
230A	VALLEY GUTTER LINING TO SLATE/ TILE ROOFS	Added
250	WEATHERING TO	Revised
251	WEATHERING TO	Deleted
251A	SACRIFICIAL WEATHERING AT SLATE EAVES	Added
252A	WEATHERING TO	Added
322	SOAKERS FOR MITRED HIPS TO SLATE/ PLAIN TILE ROOFS	Added
410B	APRON FLASHINGS	Added
420A	COVER FLASHINGS	Revised
437	SOAKERS	Added
440	SOAKERS AND STEP FLASHINGS	Added
450	STEP AND COVER FLASHINGS	Added
470A	RAINWATER CHUTE OUTLET FLASHINGS THROUGH MANSARD	Added
472A	CHIMNEY FLASHINGS TO SLATE ROOFS	Revised
480A	LEAD SLATES	Added
510	WORKMANSHIP GENERALLY	Deleted
510A	WORKMANSHIP GENERALLY	Added
550	LIGHTNING PROTECTION	Revised
705	HEAD FIXING LEAD SHEET	Added
715	CLIPS	Deleted
715A	CLIPS	Added
760	CONTINUOUS CLIPS	Deleted
760A	CONTINUOUS CLIPS	Added

H71 Lead sheet coverings/ flashings

To be read with Preliminaries/ General conditions.

TYPES OF LEADWORK

~~**110 ROOFI95 ROOFING OF PROPOSED DORMERS:NG**~~
(Deleted - H71 revision T00 - 29th Sep 2019)

110B PROPOSED DORMERS

Substrate: [New 150x25mm timber boarding as H71/640 on rafters with air gaps].
- Preparation: [Not required].
  Underlay: [2 layers of class A building paper].
  Type of lead: [Sand cast].
- Thickness: [2.50 or 2.65 mm (Code 6)].
  Pretreatment: [Apply patination oil as H71/970].
  Joints in direction of fall: [Wood cored rolls with splashlap].
- Spacing: [equal centres at maximum 675mm centres; contractor to set out with details to match existing].
  Eaves detail: [Roll turned down and welted over eaves maintaining ventilation of roof void].
  Cross joints: [220mm laps with lead clips].
- Spacing: [Regular, not more than 400mm].
- Alignment: [In line with adjacent bays].
  Intermediate fixings: [NA].
  Ridge/ Hip detail: [Capped wood ridge roll as H71/310].
  Accessories: [Ventilated eaves as H71/436; provide sample for review of detail on site prior to placing order].

(Added - H71 revision T00 - 29th Sep 2019)

155 CLADDING OF PROPOSED DORMER CHEEK/RETURNS

Main roof covering: [Lead sheet].
Substrate: [New 150x25mm timber boarding as H71/640 on studs with air gaps with zone of studwork fully filled with insulation].
- Preparation: [Not required].
  Underlay: [2 layers of class A building paper].
  Type of lead: [Sand cast].
- Thickness: [2.50 or 2.65 mm (Code 6)].
  Pretreatment: [Apply patination oil as H71/970].
  Joints in top/ sill: [Dress and fix behind cornice].
  Joints in cheeks: [Vertical welted seams; setting out TBA on site with Architect].
  Intermediate fixings in cheeks: [Brass cup and screw with lead welded diamond shaped cap where required to LSA details].

(Added - H71 revision T00 - 29th Sep 2019)

230A VALLEY GUTTER LINING TO SLATE/ TILE ROOFS

- Underlay: [roofing membrane as specified elsewhere].
  Type of lead: [Code 6 (sand cast)].
- Thickness: [2.50 or 2.65 mm (Code 6)].
  Pretreatment: [Apply patination oil as H71/970].
  Laying: Over and beyond tilting fillets.
  Lengths: Not more than [1500 mm].
- Cross joints: Lapped not less than [175 mm].
  Fixing: Welt edges. Nail top edge of each sheet. Dress bottom end neatly into eaves gutter.

(Added - H71 revision T00 - 29th Sep 2019)

250 WEATHERING TO PROJECTING STRING COURSES/CORNICE

- Substrate: [Existing stone].
  Location: Refer to schedules.
  Preparation: If lead cover flashing at abutment retained, release/turn back to allow installation of weathering and redress on completion; repair of abutment specified elsewhere.
  Underlay: [Not required].
  Pretreatment: Apply patination oil as H71/970.
  Continuous clip: To full length as H71/760.
  Type of lead: [Sand cast].
  - Thickness: [Code 6].
    Joints: [Laps (100 mm minimum)].
  - Spacing: [1500 mm].
    Edge details: [Welted drip at front, upstand at rear either dressed/tucked into new chase in masonry or dressed over secret gutter].
    Fixing: [within masonry chases provide stainless steel screws at 500mm centres and (provisionally) row of copper nails to secret gutter].
    Accessories: [Sleeves for stair balustrade].
    Other requirements: Point in lime mortar as C41/221.

(Revised - H71 revision T00 - 29th Sep 2019)

~~251 WEATHERING TO~~

(Deleted - H71 revision T00 - 29th Sep 2019)

251A SACRIFICIAL WEATHERING AT SLATE EAVES Roofing

- Substrate: [Existing/new roof structure].
  Location: Refer to schedules.
  Preparation: Refer to slate roofing clause(s).
  Underlay: [Not required].
  Pretreatment: Apply patination oil as H71/970.
  Type of lead: [Sand cast].
  - Thickness: [2.00 or 2.24 mm (Code 5) minimum].
    Joints: [Laps (100mm minimum)].
  - Spacing: [1500mm].
    Edge details: [Welted drip at front and rear to prevent capillary action].
    Fixing: [Lead wedges below slates (ensuring no kicking of the slates) and lead clips at 500mm centres and at laps].
    Accessories: [none].
    Other requirements: Weathering to extend nominal 20mm beyond vertical line of slates.

(Added - H71 revision T00 - 29th Sep 2019)

252A WEATHERING TO Parapet

- Substrate: [Existing masonry].
  Location: Refer to schedules.
  Preparation: Release existing lead coverings and associated fixings and provisionallyt allow to level substrate with lime mortar.
  Underlay: [Not required].
  Pretreatment: Apply patination oil as H71/970.
  Continuous clip: To full length as H71/760.
  Type of lead: [Sand cast].
  - Thickness: [Code 6].
    Joints: [Laps (100 mm minimum); location to be confirmed on site and centred with windows where possible].
  - Spacing: [max 1500mm].
    Edge details: [Welted drip over clip at front and rear].
    Fixing: [none required].
    Accessories: [Sleeves for balustrades].
    Other requirements: None.

(Added - H71 revision T00 - 29th Sep 2019)

315A RIDGE/ HIP ROLLS TO SLATE ROOFS

If required following Condition survey.

- Clips: At capping laps and not more than 500 mm.
  - Fixing: Nail to top of ridge/ hip board before fixing core. Nail each side not more than 50 mm from edge of capping (drill slates as necessary).
- Core: Rounded timber.
  - Size: 45 mm high x 45 mm wide.
  - Shape: Tapered to a flat base 30 mm wide.
  - Fixing: To ridge/ hip board with brass or stainless steel screws at not more than 600 mm centres, with base not less than 5 mm above slates.
- Lead capping:
  - Thickness: 2.50 or 2.65 mm (Code 6).
  - Lengths: Not more than 1500 mm.
  - Hip capping: Nail head of each length around core.
  - Laps: Not less than 150 mm for ridges, 100 mm for hips.
  - Cover: Wings of capping to extend not less than 150 mm on to roof.

322 SOAKERS FOR MITRED HIPS TO SLATE/ PLAIN TILE ROOFS

- Lead:
  - Thickness: 1.25 or 1.32 mm (Code 3).
- Dimensions:
  - Length: Slate/ tile gauge + lap + 25 mm.
  - Underlaps: Not less than 100 mm Apply Patonation oil ..

(Added - H71 revision T00 - 29th Sep 2019)

410A APRON FLASHINGS Generally

If required following Condition survey

- Lead:
  - Thickness: 2.00 or 2.24 mm (Code 5).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps of not less than 100 mm.
  - Upstand: Not less than 75 mm.
  - Cover to abutment: Not less than 75 mm.
- Fixing: Lead wedges into bed joint, clips to bottom edge at laps and 500 mm centres.

410B APRON FLASHINGS CILLS & LEAN-TO TOP ABUTMENT

- Lead:
  - Thickness: [Code 6 (sand cast)].
    Pretreatment: Apply patination oil as H71/970.
    Dimensions:
  - Lengths: Not more than [1500 mm].
  - End to end joints: Laps of not less than 100 mm.
  - Upstand: Dress up and over upstand and stainless steel screw fix to substrate, ready for mastic asphalt dressing as J21. Exact girth to be determined on site to comply with Lead Sheet Association guidelines.
  - Cover to abutment: Not less than [250mm].
    Fixing: [clips to bottom edge at laps and 500 mm centres fixed into substrate].
    Other requirements: Use stainless steel fixings only.

(Added - H71 revision T00 - 29th Sep 2019)

420A COVER FLASHINGS Generally

- lead:
  - Thickness: [Code 6 (sand cast)].
    Dimensions:
  - Pretreatment: Apply patination oil as H71/970.
  - Lengths: Not more than [1500 mm].
  - End to end joints: Laps of not less than 100 mm.
  - Overlap to upstand: Not less than 50 mm.
  - Cover to roof: Not less than 75 mm.
    Fixing: [Stainless steel screw fixed into bed joint, clips to lead upstand at laps and 500 mm centres].
    Other requirements: Point in lime mortar as C41/221.

(Revised - H71 revision T00 - 29th Sep 2019)

437 SOAKERS

Lead soakers:

- Thickness: [1.75-2.00 mm (Code 4)].
- Dimensions:
  Length: Slate/ tile gauge + lap + 25 mm.
  Upstand: Not less than 75 mm.
  Underlay: Not less than 100 mm.
- Fixing: By roofer.
  Sidelap: To BS 5534, clause 5.3, to suit slate size, roof pitch and exposure.

(Added - H71 revision T00 - 29th Sep 2019)

440 SOAKERS AND STEP FLASHINGS AT WALL ABUTMENTS

- Lead soakers:
  - Thickness: 1.75-2.00 mm (Code 4).
  - Dimensions:
    Length: Slate/ tile gauge + lap + 25 mm.
    Upstand: Not less than 75 mm.
    Underlay: Not less than 100 mm.
  - Fixing: By roofer.
- Lead step flashings:
  - Thickness: 2.00 or 2.24 mm (Code 5).
  - Dimensions:
    Lengths: Not more than 1500 mm.
    End to end joints: Laps of not less than 100 mm.
    Cover: Overlap to soaker upstands of not less than 65 mm.
  - Fixing: Lead wedges at every course.

(Added - H71 revision T00 - 29th Sep 2019)

450 STEP AND COVER FLASHINGS -

- Lead:
  - Thickness: 2.00 or 2.24 mm (Code 5).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps of not less than 100 mm.
  - Upstand: Not less than 85 mm.
  - Cover to roof: Not less than 150 mm.
- Fixing: Lead wedges at every course and clips at not more than 500 mm centres along free edge.

(Added - H71 revision T00 - 29th Sep 2019)

460 CHANGE OF ROOF PITCH FLASHINGS TO SLATE PITCHED ROOF ABUSTMENTS WITH GUTTERS

- Lead:
  - Thickness: 2.00 or 2.24 mm (Code 5).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps of not less than 150 mm.
  - Under course of slates/ tiles above: Not less than 150 mm.
  - Over course of slates/ tiles below: Not less than 150 mm.
- Fixing: Nail top edge at 150 mm centres and welt edge. Clip bottom edge at laps and 500 mm centres.

470A RAINWATER CHUTE OUTLET FLASHINGS THROUGH MANSARD -

- Lead:
  - Thickness: [Code 6 sand cast].
    Dimensions/setting out: Refer to drawings.
    Cover flashing at penetration through roof: as H71/430.
    Apron flashing: generally as H71/410.
    Other requirements:
  - Detail to be in accordnace with LSA details.
  - Co-ordinate with waterproofing membrane design

  (Added - H71 revision T00 - 29th Sep 2019)

472A CHIMNEY FLASHINGS TO SLATE ROOFS

Lead front apron:
- Thickness: [Code 6 (sand cast)].
- Dimensions:
  Length: Not more than 1500mm/width of chimney plus not less than 150mm underlap to each side flashing.
  Upstand: Not less than 75mm.
  Cover to roof: Not less than [15–20° = 300mm; 20–30° = 220mm; above 30° = 150mm].
- Fixing: Stainless steel screws into bed joint.
  Lead soakers:
- Thickness: Code 4 (milled).
- Dimensions:
  Length: Slate/ tile gauge + lap + 25mm.
  Upstand: Not less than 75mm.
  Underlap: Not less than 100mm.
  Lead step flashings:
- Thickness: [Code 6 (sand cast)].
- Dimensions:
  Lengths: Not more than 1500mm.
  End to end joints: Laps of not less than 100mm.
  Front end: Turn 75mm around chimney over apron.
  Cover: Overlap to soaker upstands of not less than 65mm.
- Fixing: Lead wedges at every course.
  Lead back gutter:
- Thickness: [Code 6 (sand cast)].
- Dimensions:
  Length: Not more than 1500mm/width of chimney plus not less than 100mm overlap to each side flashing.
  Upstand: Not less than 100mm.
  Gutter sole: Not less than 150mm.
  Cover up roof: Not less than 225mm.
  Lead back gutter cover flashing:
- Thickness: [Code 6 (sand cast)].
- Dimensions:
  Length: Not more than 1500mm/width of chimney plus not less than 100mm overlap to each side flashing.
  Cover: Overlap to back gutter upstand of not less than 75mm.
- Fixing: Stainless steel screws into bed joint.
  Pretreatment: Apply patination oil as H71/970.
  Other requirements generally: Point masonry in lime mortar as C41/221.

(Revised - H71 revision T00 - 29th Sep 2019)

480A LEAD SLATESSERVICES PENETRATIONS

Manufacturer: [Contractor's choice].
Lead:
- Thickness: [2.00 or 2.24 mm (Code 5)].
  Dimensions:
- Base: Not less than 400 x 400 mm.
- Upstand/offset: Not less than 150 mm, to fit services/pipe and at angle to suit wall/roof pitch.

(Added - H71 revision T00 - 29th Sep 2019)

GENERAL REQUIREMENTS/ PREPARATORY WORK

~~510 WORKMANSHIP GENERALLY~~

(Deleted - H71 revision T00 - 29th Sep 2019)

510A WORKMANSHIP GENERALLY

Standard: To BS 6915 and latest edition of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Association.
Fabrication and fixing: To provide a secure, free draining and completely weathertight installation.
Operatives: Trained in the application of lead coverings/ flashings. Submit records of experience on request.
Preforming: Measure, mark, cut and form lead prior to assembly wherever possible.
Marking out: With pencil, chalk of crayon. Do no use scribers or other sharp instruments without approval.
Bossing and forming: Straight and regular bends, leaving sheets free from ripples, kinks, buckling and cracks.
Solder: Use only where specified.
Sharp metal edges: Fold under or remove as work proceeds.
Finished work: Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
- Protection: Prevent staining, discolouration and damage by subsequent works.

NOTE: All leadwelding to be undertaken in accordance with H71/516.
(Added - H71 revision T00 - 29th Sep 2019)

516 LEADWELDING

- In situ leadwelding: Is permitted, subject to completion of a 'hot work permit' form and compliance with its requirements.

520 LEAD SHEET

- Production method:
  - Rolled, to BS EN 12588, or
  - Machine cast and BBA certified, or
  - Sand cast, from lead free from bitumen, solder, other impurities, inclusions, laminations, cracks, air, pinholes and blowholes; to code thicknesses but with a tolerance (by weight) of ±10%.
- Identification: Labelled to show thickness/ code, weight and type.

550 LIGHTNING PROTECTION

- Lead coverings: Attach the following to a lightning protection system: Refer to MEP design/specification .
  - Electrical continuity: Provide between lead sheets. Discontinuous sections must be separately bonded.

(Revised - H71 revision T00 - 29th Sep 2019)

555 LAYOUT

- Setting out of longitudinal and cross joints: Submit proposals.

560 CONTROL SAMPLES

- General: Complete areas of the finished work, and obtain approval of appearance before proceeding:
- Size: Submit proposals.
- Location: Submit proposals.

585 EXISTING METAL REMOVED TO REMAIN THE PROPERTY OF THE EMPLOYER

- Refer to prelims

610 SUITABILITY OF SUBSTRATES

- Condition: Dry and free of dust, debris, grease and other deleterious matter.

640 TIMBER FOR USE WITH LEADWORK

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
- Moisture content: Not more than 22% at time of fixing and covering. Give notice if greater than 16%.
- Preservative treatment: Organic solvent as section Z12 and Wood Protection Association Commodity Specification C8.

645 NEEDLE PUNCHED NONWOVEN POLYESTER GEOTEXTILE UNDERLAY

- Manufacturer: BLM British Lead.
  - Product reference: Standard Underlay.
- Weight: 220 g/m².
- Recycled content: None permitted.

650 LAYING UNDERLAY

- Handling: Prevent tears and punctures.
- Laying: Butt or overlap jointed onto a dry substrate.
  - Fixing edges: With copper or stainless steel staples or clout nails.
  - Do not lay over roof edges but do turn up at abutments.
  - Wood core rolls: Fixed over underlay.
  - Protection: Keep dry and cover with lead at the earliest opportunity.

652* PRE-PATINATION (PRIMING) TO UNDERSIDE OF LEAD COVERINGS

- Prior to laying lead roofing the following operations are to be undertaken.
- Preliminary trials are to be carried out to ensure that operatives are fully conversant with the priming treatments. Refer to clause H71/512 sample panels.
- Pre-patination: Obtain via Rowan Technologies Ltd (216 Church Road Urmston, Manchester M41 9DX Tel0161 748 3644) Chalk Emulsion ,Colour Green, for application to the under side of the lead prior to laying.
- The underside of the sheets should be pre-cleaned using a wire wool or similar material to remove any corrosion products/deposits.
- Appropriate health and safety precautions must be adhered to.
- The emulsion should be applied to the underside of the lead so that the surface can no longer be seen.
- The emulsion should be allowed to dry before laying of the lead.
- Follow the manufacturers instructions concerning application.

FIXING LEAD

705 HEAD FIXING LEAD SHEET

- Top edge: Secured 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.

(Added - H71 revision T00 - 29th Sep 2019)

710 FIXINGS

- Nails to timber substrates: Copper clout nails to BS 1202-2, or stainless steel (austenitic) clout nails to BS 1202-1.
  - Shank type: Annular ringed, helical threaded or serrated.
  - Shank diameter: Not less than 2.65 mm for light duty or 3.35 mm for heavy duty.
  - Length: Not less than 20 mm or equal to substrate thickness.
- Screws to concrete or masonry substrates: Brass or stainless steel to BS 1210, tables 3 or 4.
  - Diameter: Not less than 3.35 mm.
  - Length: Not less than 19 mm.
  - Washers and plastic plugs: Compatible with screws and lead.
- Screws to composite metal decks: Self tapping as recommended by the deck and lead manufacturer/ supplier for clips.

~~715~~ ~~CLIPS~~

(Deleted - H71 revision T00 - 29th Sep 2019)

715A CLIPS

- Manufacturer: [Contractor's choice].
  Material:
  - Lead clips: Cut from sheets of same thickness/ code as sheet being secured.
    Dimensions:
  - Width: 50 mm where not continuous.
  - Length: To suit detail.
    Fixing clips: Secure each to substrate with either two screw or three nail fixings not more than 50 mm from edge of lead sheet. Use additional fixings where lead downstands exceed 75 mm.
    Fixing lead sheet: Welt clips around edges and turn over 25 mm.

(Added - H71 revision T00 - 29th Sep 2019)

~~760 CONTINUOUS CLIPS~~

(Deleted - H71 revision T00 - 29th Sep 2019)

760A CONTINUOUS CLIPS

- Material:
  - Stainless steel continuous clips:
    Thickness: [2mm].
    Grade: BS EN 10088, 1.4301(304).
    Dimensions:
  - Width: To suit detail.
    Fixing clips: Secure at [100mm centres with stainless steel screws, washers and plugs].
    Fixing lead sheet: Welt/dress edge around continuous clip.

(Added - H71 revision T00 - 29th Sep 2019)

770 WEDGE FIXING INTO JOINTS/ CHASES

- Joint/ chase: Rake out to a depth of not less than 25 mm.
- Lead: Dress into joint/chase.
  - Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Sealant: Submit proposals.
  - Application: As section Z22.

780 WEDGE FIXING INTO DAMP PROOF COURSE JOINTS

- Joint: Rake/ cut out under damp proof course to a depth of not less than 25 mm.
- Lead: Dress lead into joint.
  - Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Sealant: Submit proposals.
  - Application: As section Z22.

JOINTING LEAD

810 FORMING DETAILS

- Method: Bossing or leadwelding except where bossing is specifically required.
- Leadwelded seams: Neatly and consistently formed.
  - Seams: Do not undercut or reduce sheet thickness.
  - Filler strips: Of the same composition as the sheets being joined.
  - Butt joints: Formed to a thickness one third more than the sheets being joined.
  - Lap joints: Formed with 25 mm laps and two loadings to the edge of the overlap.
- Bossing: Carried out without thinning, cutting or otherwise splitting the lead sheet.
  - Details where bossing must be used: Not applicable .

840 WOOD CORED ROLL JOINTS WITHOUT SPLASH LAP

- Wood core:
  - Size: 45 x 45 mm round tapering to a flat base 25 mm wide.
  - Fixing to substrate: Brass or stainless steel countersunk screws at not more than 300 mm centres.
- Undercloak: Dress half way around core.
- Copper or stainless steel clips. Fix to core at not more than 450 mm centres. Do not restrict thermal movement of the undercloak.
- Overcloak: Dress around core with edge welted around ends of clips, finishing 5 mm clear of main surface.

847 HOLLOW ROLL JOINTS

- Joint allowance: 125 mm overcloak and 100 mm undercloak.
- Copper or stainless steel clips: Fix to substrate at not more than 450 mm centres.
- Overcloak: Welt with clips around undercloak to form a roll of consistent cross section.

860 DRIPS WITH SPLASH LAPS

- Underlap: Dress into rebate along top edge of drip.
  - Fixing: One row of nails at 50 mm centres on centre line of rebate.
- Overlap: Dress over drip and form a 40 mm splash lap.

862 DRIPS WITH SPLASH LAPS

- Underlap: Dress up full height of drip upstand.
  - Fixing: Two rows of nails to lower level substrate, 25 mm and 50 mm from face of drip. At 75 mm centres in each row, evenly spaced and staggered. Seal over nails with a soldered or leadwelded dot.
- Overlap: Dress over drip and form a 75 mm splash lap.
  - Fixing: Lead clips, leadwelded to underlap, with not less than one per bay.

865 DRIPS WITHOUT SPLASH LAPS

- Underlap: Dress into rebate along top edge of drip.
  - Fixing: One row of nails at 50 mm centres on centre line of rebate.
- Overlap: Dress over drip to just short of lower level.

880 WELTED JOINTS

- Joint allowance: 50 mm overlap and 25 mm underlap.
- Copper or stainless steel clips: Fix to substrate at not more than 450 mm centres.
- Overlap: Welt around underlap and clips and lightly dress down.

970 PATINATION OIL

- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.
- Location: Porch roof and east wing.
- Application: As soon as practical, apply a smear coating to lead, evenly in one direction and in dry conditions.

CTH-PUR-XXX-SP-09-A-9150

S4 - ISSUED FOR STAGE APPROVAL

30 September 2019

This document includes:

Code	Section	Revision	Dated
J31	Liquid applied waterproof roof coatings	T00	29 Sep 2019

Table of Contents

J31
Liquid applied waterproof roof coatings
Revision T00

Section Revision History

No.	Purpose	
0	RIBA Stage 3 Amendments	25th Apr 2019
T00	Issue for Tender	29th Sep 2019

Clauses amended in Revision T00

No.	Clause	
110A	COLD DECK ROOF COATING	Deleted
111A	COLD DECK ROOF COATING	Added
116A	COATING	Added
130A	INVERTED ROOF COATING	Added
356	ROOF DRAINAGE OUTLETS	Added
356A	ROOF DRAINAGE OUTLETS	Added
357A	PIPE/PENETRATION COLLARS	Added
505	EXISTING PLANT	Added
510	REMOVING EXISTING COVERINGS	Deleted
515	EXISTING FLASHINGS	Added
540A	MAKING GOOD EXISTING MASTIC ASPHALT COVERING	Added
710	ADHESION TESTS	Added

J31 Liquid applied waterproof roof coatings

To be read with Preliminaries/General Conditions.

TYPES OF COATING

~~110A~~ ~~COLD DECK ROOF COATING~~
(Deleted - J31 revision T00 - 29th Sep 2019)

111A COLD DECK ROOF COATING TO EXISTING PITCHED ROOF GUTTERS

Generally: Before applying coatings ensure that the surfaces to be coated are firmly fixed dry, smooth and free
from any contaminants that could inhibit adhesion. When cleaning, remove the bulk of contamination then
clean any remaining residue by suitable means e.g. power washing, grit blasting or mechanical abrading. Use
approved detergents for more effective washing and to remove oil and grease. Organic growth can be treated
using an approved fungicidal wash. For cleaning or degreasing small areas use Kemco MEK Clening Agent
where appropriate to do so.
All preliminary work including formation of upstands, kerbs, box gutters, sumps, grooves, chases, expansion
"
joints, etc. and fixing of battens, fillets, anchoring plugs/strips, etc. is complete and satisfactory. For a given
substrate, only use the primer recommended by Kemper System.
Waterproof coating:
"
Type: 2 component, cold liquid applied, fully reinforced waterproofing system based on solvent and odour free
polyurethane resin.
System manufacturer: Kemper System Ltd.

- Web: www.Kemper-system.com/UK/eng/.
- Email: technical@kempersystem.co.uk.
- Tel: 01925 445532
- Fax: 01925
- Address: Kemper House, 30 Kingsland Grange, Woolston, Warrington, Cheshire. WA1 4RW.

Substrate(s):
"
Type: Weathered Asphalt

- Preparation: Where applicable remove chippings. Any blisters or defects in the asphalt should be cut out
and filled level to give a sound supporting substrate. Any voids greater than 2mm should be filled prior to the
application of the system. All areas should be swept or power washed to remove any contamination that could
impair system adhesion.

Type: Other substrates/surfaces to receive Kemperol waterproofing system.

- Preparation: As appropriate for substrate and as Kemper System Ltd "Essential Information for Planning and
Installation" (latest edition) to provide a clean, dry, smooth, continuous and stable surface for the expected life
of the waterproofing.

Primers:
"
Principle/main substrate/surface: Weathered Asphalt

- Primer Reference: D Primer
- Mixing and application: as Kemper System Technical Data Sheets and Kemper System Ltd "Essential Information for Planning and Installation" (latest edition).

Other surfaces to receive Kemperol waterproofing system

- Primer Reference: Appropriate Kempertec Primer for substrate(s) as Kemper System Technical Data Sheets
and Kemper System Ltd "Essential Information for Planning and Installation" (latest edition). Only the primer
recommended by Kemper System Limited may be used. Consult Kemper System Limited for additional
substrate guidance.
- Mixing and application: As Kemper System Technical Data Sheets and Kemper System Ltd "Essential

Information for Planning and Installation" (latest edition]
Waterproofing;
"

Coating reference: Kemperol 2K-PUR.

- Mixing and Application: As Kemper System Ltd guidance, Technical Data Sheets and as Kemper System Ltd
  "Essential Information for Planning and Installation" (latest edition).
- Reinforcement: Kemperol 165 Reinforcement Fleece.
- Minimum dry film thickness: 2 mm.
  Colour: Anthracite; Target RAL 7016.

Surface Protection:
"

- Generally: The system will accept, without damage, the limited foot traffic and loads associated with installation and maintenance.
- Locally: The system will accept a range of finishes and protective surfaces and is project/substrate dependant; consult Kemper System Ltd for specific project guidance.
  Accessories: Kemper System Ltd manufacture drip edge trims and will accept a variety of accessories which
  "

may be project specific; please consult Kemper System Ltd for further guidance.
Detailing: The waterproofing should be installed in conformance to Kemper System standard detailing
methodology.

- Drip edge trims/profiles: Refer to J31/355A/B & J31/660A
- Outlets: Refer to J31/356
- Pipes and Penetrations: Refer to J31/357A
- Upstands and skirtings: Refer to J31/770A
- Waterproofing Terminations: Refer to J31/771

(Added - J31 revision T00 - 29th Sep 2019)

116A COATING

Kemperol 2K-PUR

- Manufacturer: Kemper System Ltd
  Web: www.kempersystem.co.uk
  Email: enquiries@kempersystem.co.uk
  Tel: +44 (0)1925 445532
  Fax: +44 (0)1925 575096
  Address: Kemper House, 30 Kingsland Grange, Woolston, Warrington, Cheshire WA1 4RW
- Product reference: Kemperol 2K-PUR
- Primer: Kemperol primer
- Coating application: Kemperol 2K-PUR
- Colour: Brick /Jade /Slate /Stone
- Reinforcement: Kemperol AP fleece embedded in coating
- Minimum dry film thickness: 2 mm
- Coating protection: None /Scattered sand finish /Trowelled sand and resin finish /Kemperdur decorative finish - Deko /Kemperdur decorative finish - Deko 2K /Kemperdur decorative finish - High Build /Kemperdur decorative finish - Sand Coating

(Added - J31 revision T00 - 29th Sep 2019)

130A INVERTED ROOF COATING TO EXISTING JULIET BALCONIES TO EUSTON ROAD AND JUDD STREET ELEVATIONS

Refer to Purcell drwgs CTH-PUR-XXX-DR-21-A-3902 and CTH-PUR-XXX-DR-21-A-3903.

- Scope: Overlay existing substrate with new cold liquid applied, fast curing waterproofing resin].
- Substrate: Existing substrate - It is recommended that core samples are taken to determine the substrates.
  - **Preparation:** Make good existing membrane. Prepare the surface of the deck/screed by removing rough edges and surface defects. Scarify, grind or lightly bead blast before priming.
  " **Required surface finish:** The substrate shall be prepared in such a way that it is suitable for a resin system, i.e. there is no bond breaking contamination or deformation and no smooth shiny surface patina. Smooth, level, free from exposed aggregate, latents and without abrupt irregularities greater than 2mm.
  " **Hardness:** Cementitious substrates must have a minimum hardness of 25N/mm2.
  " All areas are to be cleaned using power washing techniques.
  " Ensure all surfaces are sound, clean and dry, free from defects, visible dampness, fungal growth, dust, dirt particles and any other form of contamination before continuing.
  " **Moisture content:** The Contractor is to take readings from concrete and confirm moisture levels. It is advisable that all areas have an adhesion test carried out prior to application.
  " **Falls:** A design fall of minimum 1:40 is recommended in order to achieve a constructed fall of minimum 1:80.
  " The contractor is to ensure the substrates to be overlaid are sound to last the guarantee period of the overlay.
  " Any complex area to be waterproofed, should boxing in be required the contractor at the time of pricing is to identify these areas.
  " All items that have penetrated the waterproofing must either be reinstated onto pavers on supports or have suitable waterproofing to ensure the waterproofing integrity is maintained.
  " Any items that can be removed or lifted on a temporary basis to allow waterproofing to be carried out should be lifted or removed.
  Note: The Contractor is to take readings from concrete and confirm moisture levels. It is advisable that all areas have an adhesion test carried out prior to application. Refer to Clause 710 Surface Condition Assessment.
- Waterproof coating: Cold liquid applied, fast curing waterproofing resin.
- System manufacturer: Bauder Ltd. or similar approved, 70 Landseer Road, Ipswich, Suffolk IP3 0DH, T: +44 (0)1473 257671 E: info@bauder.co.uk.
  Product Ref: LiquiTEC Balcony System.
- **PRIMER** :
  - Before application: All surfaces must be dry, clean and free from dust, laitance, dirt, oil, grease, loose material and any other contaminants.
  - Main balcony surface receiving the new Cold Applied Liquid Waterproofing System are to be thoroughly primed with Bauder Cryl Primer 287 or as recommended by Manufacturer.
  a) Application method: Add catalyst to the primer at the rate indicated on the container. Apply catalysed primer using a synthetic deep pile roller to upstands and details first, before applying to the main area.
  b) Application rate: 0.4kg/m² min.
  c) Rainproof Times: After approx. 30 minutes.
  d) Next Coat / Subject to Stress: Can be walked upon/next coat applied after approx. 45 minutes.
  - **Details and Upstands** receiving the new Cold Applied Liquid Waterproofing System are to be thoroughly primed with Bauder LiquiPRIME 1 or as recommended by Manufacturer.
  a) Application method: Add catalyst to the primer at the rate indicated on the container (except Pox R106 & Special Primer 610). Apply catalysed primer using a synthetic deep pile roller to upstands and details first, before applying to the main area. Ensure that primer is applied into the joints between panels to fill the gaps.
  Note: When using LiquiPRIME on upstand details in excess of 250mm high, add 1% (by weight) Liquid Thixo to the catalysed resin and stir thoroughly prior to application.
  - **Substrate repairs and filling:**
  To be applied after priming:
  - Bauder LiquiPASTE: Minor indentations, cracks and voids
  - Bauder LiquiPASTE Mortar: Larger indentations
  - Cryl RS 240: Cementitious substrates and Asphalt substrates

  Application: Add catalyst at the rate indicated on the container (except RS 240). In the case of

LiquiPASTE Mortar, catalyst must be added before adding the filler.
Apply catalysed resin using a suitable smoothing trowel and allow to cure for a minimum of 1 hour.

- **WATERPROOFING**
  - **Details and Upstands -** Bauder LiquiDETAIL incorporating Bauder 110g Reinforcement Fleece must be used wherever it is practical to incorporate a reinforcement fleece. Bauder LiquiFIBRE may only be used for waterproofing complex shapes or in areas where the use of a fleece is impractical.
  - **Linear upstands / details -** Bauder LiquiDETAIL, Blue grey (Approx. RAL 7031) two layer 'wet-on-wet' liquid applied cold roof covering system, with encapsulated Bauder 110g Reinforcement Fleece, to be used wherever it is practical to incorporate a reinforcement fleece.
    a) Application: Add catalyst to the Bauder LiquiDETAIL at the rate indicated on the container. Apply catalysed Bauder LiquiDETAIL (2.0 kg/m² min.) with a synthetic deep pile roller. Roll a strip of Bauder 110g Reinforcement Fleece into the wet resin, pressing trapped air free using the synthetic deep pile roller, ensuring a minimum 50mm overlap between adjacent sections of Bauder 110g Reinforcement Fleece.
    Ensure the Bauder 110g Reinforcement Fleece is always fully saturated before applying a further coat of catalysed Bauder LiquiDETAIL (1.0 kg/m² min.) wet on wet.
    b) Rainproof Times: After approx. 30 minutes.
    c) Next Coat / Subject to Stress: Can be walked on/next coat applied after approx. 45 minutes.

  - **Details and Upstands - complex areas / non-linear details -** Bauder LiquiFIBRE, Blue grey (Approx. RAL 7031), may ONLY be used for waterproofing complex shapes or in areas where the use of a fleece is impractical.
    a) Application: Add catalyst to the Bauder LiquiFIBRE at the rate indicated on the container. Apply catalysed Bauder LiquiFIBRE (1.5 kg/m² min.) with a brush and allow to cure for a minimum of 45 minutes.
    b) Apply a further layer of catalysed Bauder LiquiFIBRE (1.5 kg/m² min.) by brush, using brush strokes at 90° to the first layer.
    c) Rainproof Times: After approx. 30 minutes.
    d) Next Coat / Subject to Stress: Can be walked on/next coat applied after approx. 45 minutes.

  - **Main flat areas** - Bauder LiquiBALKON, Pebble grey (Approx. RAL 7032) two layer 'wet-on-wet' liquid applied cold roof covering system, with encapsulated Bauder 110g Reinforcement Fleece.
    a) Application: Add catalyst to the Bauder LiquiBALKON at the rate indicated on the container. Apply an even layer of catalysed Bauder LiquiBALKON (2.0 Kg/m2 min) with a synthetic deep pile roller. Roll Bauder 110g Reinforcement Fleece into the wet resin, pressing trapped air free using the synthetic deep pile roller, ensuring a minimum 50mm overlap between adjacent sections of Bauder 110g Reinforcement Fleece.
    Ensure the Bauder 110g Reinforcement Fleece is always fully saturated before applying a further coat of catalysed Bauder LiquiBALKON (1.0Kg/m2 min) wet on wet.
    b) Rainproof Times: After approx. 30 minutes.
    c) Next Coat / Subject to Stress: Can be walked on/next coat applied after approx. 45 minutes.

- **FINISH COAT TO WHOLE AREA**
  Bauder LiquiFINISH Traffic grey (approx. RAL 7043)
  a) Application: Add catalyst to the LiquiFINISH at the rate indicated on the container and apply using a synthetic deep pile roller at the rates indicated below.
  Upstands & Details: Apply LiquiFINISH (0.5kg/m² min). For upstand details in excess of 250mm high, add 1% Liquid Thixo to the catalysed resin and stir thoroughly prior to application.
  Main Area: Apply LiquiFINISH (0.65kg/m² min).
  b) Rainproof Times: After Approx. 30 minutes.
  Note: Subject to Stress: Can be walked upon after approx. 1 hours. Able to withstand stress after approx. 3 hours.
- Other:
  - Roof drainage outlets as Clause 356 where relevant.

  (Added - J31 revision T00 - 29th Sep 2019)

PERFORMANCE

210 ROOF PERFORMANCE

- General: Firmly adhered, free draining and weathertight.

220 AVOIDANCE OF INTERSTITIAL CONDENSATION IN WARM AND INVERTED ROOFS

- Interstitial condensation risk of roof construction: Assess as recommended in BS 6229.
- Basic design data:
  - Outdoor notional psychrometric conditions, winter:
    Temperature: -5°C.
    Relative humidity: 90%.
    Vapour pressure: 0.36 kPa.
    Duration: 60 days.
  - Outdoor notional psychrometric conditions, summer:
    Temperature: 18°C.
    Relative humidity: 65%.
    Vapour pressure: 1.34 kPa.
    Duration: 60 days.
  - Indoor notional psychrometric conditions:
    Temperature: 30°C.
    Relative humidity: Varies.
    Vapour pressure: 2.54 kPa.
- Winter interstitial condensate (warm roof):
  - Calculated amount (maximum): 0.35kg/m².
  - Calculated annual net retention: Nil.
- Vapour control layer: If necessary, provide a suitable membrane so that damage and nuisance from interstitial condensation do not occur.

230 INSULATION

- Requirement: Determine type and thickness of insulation and integral or separate overlay to satisfy the following criteria:
  - Thermal transmittance of roof (maximum): 0.16 W/m²K.
  - Compressive strength of insulation (minimum) at 10% compression: 150 kPa.
  - Substrate surface: Suitably even, stable and robust to receive roof coatings.
  - Insulation compliance: To a relevant European Standard, or Agrément certified.

PRODUCTS

315 TIMBER TRIMS

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (except ambrosia beetle damage).
- Moisture content at time of covering (maximum): 22%.
- Preservative treatment: As recommended for purpose by waterproof coating manufacturer.

320A PLYWOOD OVERLAY TO EXISTING STRUCTURE

- Plywood: To BS EN 636, section 8 (plywood for use in humid conditions).
  - Quality: Naturally durable timber, free from preservative.
- Thickness: 18 mm.

330 VAPOUR CONTROL LAYER

- Type: SBS-modified bituminous membrane reinforced .
- Manufacturer: Icopal Limited, or equal approved.
  - Address: Barton Dock Road, Stretford, Manchester, M32 OYL.
  - Tel: +44(0)161 865 4444
  - Fax: +44(0)161 654 2616
  - Web: www.icopal.co.uk.
  - Email: info.uk@icopal.com.
  - Product reference: Micotherm SK Vapour Control Layer or equivalent & approved.
- Thickness: 3.0 mm.
- Vapour resistance: 1300 MN s/g.
  All side laps must follow the manufactured selvedge and all end/head laps must be a minimum of 150mm and be bonded by torching ensuring a complete bond between stripes is achieved and a 5mm continuous bead of bitumen extrudes from all lap joints as work proceeds and all lap joints must be checked for security as work proceeds - Contractor to ensure that the vapour control layer accross the main roof is fully sealed / taped to ensure robust performance.

333 RIGID URETHANE FOAM WARM DECK ROOF INSULATION

- Manufacturer: Kingspan Insulation Ltd. or equivalent & approved.
  - Web: www.kingspaninsulation.co.uk.
  - Email: technical@kingspaninsulation.co.uk.
  - Product reference: Thermataper® TT47 LPC/ FM or equivalent & approved.
- Standard: Rigid polyisocyanurate foam (PIR) roofboard to BS 4841-3.
  - Reaction to fire: Euroclass E, flame retardant boards.
  - Thermal conductivity (minimum): 0.016 W/mK.
  - Thickness: 100 mm.
  - Compressive strength (minimum): 350 kPa.
  - Other characteristics: None.
- Edges: Square.
- Facing: Foil.

356 ROOF DRAINAGE OUTLETS Balconys

- Manufacturer: Wade or similar approved with clamping ring arrangement. Cold Metal.
- Product Reference: As recommended by the manufacturer.
- Size: To achieve the required flow rates required by the engineers.
- Fixing: As recommended by the manufacturer.

(Added - J31 revision T00 - 29th Sep 2019)

356A ROOF DRAINAGE OUTLETS Roof

- Type: Existing
  Requirement: Consideration must be given to the use of refurbishment type outlets where the existing units are
  "
  either damaged or not considered to last the expected life of the new waterproofing system.
  Manufacturer: Clients Choice.
  "
  Fixing: As manufacturers instructions.
  "
  Preparation for waterproofing: Prepare and prime outlet as per Kemper recommendations appropriate for
  "
  substrate.
  Application of waterproofing: Two thirds of the mixed resin is applied directly to the primed outlet, Kemperol
  "
  reinforcement fleece neatly cut to the correct size and shape is embedded and saturated. The final one third of
  the mixed resin is then applied whilst the first application is still wet, ensuring removal of any air pockets or
  bubbles. The Kemperol waterproofing should lap onto the primed outlet 150mm and any fleece on fleece laps
  to be 50mm minimum
  (Added - J31 revision T00 - 29th Sep 2019)

357A PIPE/PENETRATION COLLARS

- To be formed from Kemperol waterproofing and reinforcement fleece of the same specification as main field
  area and J31/ 111A.
  Preparation for waterproofing: Prepare and prime detail as per Kemper recommendations appropriate for
  "
  substrate.
  Application of waterproofing: Apply two thirds of the mixed resin directly to the primed detail, Kemperol
  "
  reinforcement fleece that has been neatly cut to the correct size and shape is embedded and saturated. The
  final one third of the mixed resin is then applied whilst the first application is still wet, ensuring removal of any
  air pockets or bubbles. The Kemperol waterproofing should lap onto the primed detail 150mm beyond any
  existing waterproofing and any fleece on fleece laps to be 50mm minimum
  (Added - J31 revision T00 - 29th Sep 2019)

385A WALKWAY PROTECTIVE COATING/UV RESITANT SEALER

- Manufacturer: Icopal Limited, or equal approved.
  - Address: Barton Dock Road, Stretford, Manchester, M32 OYL.
  - Tel: +44(0)161 865 4444
  - Fax: +44(0)161 654 2616
  - Web: www.icopal.co.uk.
  - Email: info.uk@icopal.com.
  - Product reference: Enviroflex™ Wearcoat Clear or equivalent & approved.
  - Colour: Translucent.
  - Additives: Not required.

EXECUTION GENERALLY

410 ADVERSE WEATHER

- Do not apply coatings:
  - In wet conditions or at temperatures below 5°C, unless otherwise permitted by coating manufacturer.
  - In high winds (speeds > 7 m/s), unless adequate temporary windbreaks are erected adjacent to working area.
- Unfinished areas of roof: Keep dry.

420 SUITABILITY OF SUBSTRATE

- Substrates generally:
  - Secure, clean, dry, smooth, free from frost, contaminants, loose material, voids, protrusions and organic growths.
  - Compatible with coating system.
- Preliminary work: Complete, including:
  - Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
  - Fixing of battens, fillets and anchoring plugs/ strips.
- Moisture content and stability: Must not impair integrity of roof.

EXISTING SUBSTRATES

505 EXISTING PLANT

- Remove/temporally set aside to allow unhindered application of the waterproofing system.

(Added - J31 revision T00 - 29th Sep 2019)

~~510 REMOVING EXISTING COVERINGS~~

(Deleted - J31 revision T00 - 29th Sep 2019)

515 EXISTING FLASHINGS

- General: Raise to facilitate cleaning of surfaces to receive coatings.
- Timing: Leave raised during coating application and lower only after full curing.
- Damaged lengths: Replace with new, specified in section: Replace with new as H71..

(Added - J31 revision T00 - 29th Sep 2019)

525 RENEWING EXISTING SUBSTRATES/ COVERINGS

- Areas to be renewed: Full extend of existing gutters of slate pitched roofs.
- Timing: Remove only sufficient substrates/ coverings as will be renewed and made weathertight on same day.

540A MAKING GOOD EXISTING MASTIC ASPHALT COVERING

Defective areas: Soften and carefully cut out.
"

- Hammers, chisels, etc: Do not use to cut cold mastic asphalt.
- Substrate: Dry out.
- Separating membrane: Make good.
- Mastic asphalt: Patch level with existing surface using repair mortar as clause 557A

(Added - J31 revision T00 - 29th Sep 2019)

560 EXISTING EDGE TRIMS

- Fasteners: Check security. Replace as necessary.
- Existing coverings: Cut out from edge trim recess sufficient to accommodate coatings.

610 FIXING TIMBER TRIMS

- Fasteners: Sherardized steel screws.
- Fixing centres (maximum): 400 mm.

620A LAYING OVERLAY TO EXISTING STRUCTURE

- Setting out: Lay boards with staggered joints and long edges at right angles to troughs in deck.
  - Joints: 2 mm.
  - End joints: Centred over crowns of deck.
- Fasteners:
  - Type: As recommended for purpose by fastener manufacturer.
  - Fixing centres: One fastener per crown along each long edge and at 300 mm centres along every alternate crown.
  - Fastener heads: Flush with, or below board surface.

630 LAYING VAPOUR CONTROL LAYER

- Membrane: Bonded to all crowns of the profiled sheet.
- Laps: Sealed using materials and method recommended by membrane manufacturer.
- Upstands, kerbs and other penetrations: Enclose edges of insulation. Lap with coatings to form a complete seal.

640A LAYING WARM DECK ROOF INSULATION

- Setting out:
  - The insulation shall be set out so as to ensure all falls to drains, gutters and outlets are even and consistent.
  - Tapered profiled sheets will be delivered to site cross referenced to a plan to ensure each element is correctly placed to achieve falls.
  - Long edges: Fully supported and running at right angles to [Fully supported and running at right angles to direction of span unless designed otherwise].
  - End edges: Adequately supported.
  - Joints: Butted together.
  - End joints: Staggered.

    Attachment: [Contractors proposed membrane sytem will dictacte requirements which shall be developed as part of the contractors design proposals].

    Mechanical fixing: [Not required].

    Completion: Boards must be in good condition, well fitting and secure.

GUTTER COATING SYSTEM

710 ADHESION TESTS

- Requirement: Carry out a trial coating to determine priming requirements and/ or system suitability.
- Nature of test: Outgassing - assess moisture content and surface condition of any concrete.
- Test results: Submit and arrange for inspection.

(Added - J31 revision T00 - 29th Sep 2019)

720 APPLYING PRIMERS/ CONDITIONERS

- Coverage per coat (minimum): To manufacturer's requirements.
- Surface coverage: Brushed well in to ensure local or full area coverage according to type.
- Coats: Allow to dry before overcoating.

740 MOVEMENT JOINTS IN SUBSTRATE

- Debonding tape: Apply over movement joints.
- Reinforcement strip: Apply over debonding tape.
  - Bedding: Preliminary coating application.
  - Joints: Lap in length.
  - Bond: Continuous over whole surface, with no air pockets.
  - Condition at completion: Smooth.

750 PRELIMINARY LOCAL REINFORCEMENT

- Reinforcement strip: Apply to junctions at upstands, penetrations and outlets, joints and fixings in discontinuous unit substrates.
  - Bedding: Preliminary coating application.
  - Joints: Lap in length.
  - Bond: Continuous over whole surface, with no air pockets.
  - Condition at completion: Smooth.

760 APPLICATION OF ROOF COATINGS

- Thickness: Monitor by taking wet/ dry film thickness readings.
- Continuity: Maintain full thickness of coatings around angles, junctions and features.
- Rainwater outlets: Form with watertight joints.
- Drainage systems: Do not allow liquid coatings to enter piped rainwater or foul systems.
- Edge trims: Apply coatings over horizontal leg of trim and into recess.

770 SKIRTINGS AND UPSTANDS

- Top edges of coatings: Where not protected by flashings, apply into chases cut to a minimum depth of 10 mm.
- Completion of chases: When coatings are fully cured, prepare chase and apply sealant as section Z22.
  - Sealant: To BS EN ISO 11600.
    Colour: As coating.

SURFACING

810 BLINDING

- Applying dusting powder: To coating surfaces at end of curing period to neutralize tackiness.

880 APPLYING UV RESISTANT SEALER

- Coverage per coat (minimum): To manufacturer's requirements.
- Surface coverage: Even and full.

890 APPLYING WALKWAY PROTECTIVE COATING

- Coverage per coat (minimum): To manufacturer's requirements.
- Surface coverage: Even and full.

COMPLETION

910 INSPECTION

- Coating surfaces: Check when cured for discontinuities.
  - Defective areas: Apply another coating.

940 COMPLETION

- Roof areas: Clean.
  - Outlets: Clear.
  - Flashings: Dressed into place.
- Work necessary to provide a weathertight finish: Complete.
- Storage of materials on finished surface: Not permitted.
- Completed coatings: Protect against damage.

CTH-PUR-XXX-SP-09-A-9187

S4 - ISSUED FOR STAGE APPROVAL

30 September 2019

This document includes:

Code	Section	Revision	Dated
L20	Doors/ shutters/ hatches	T00	29 Sep 2019

Table of Contents

L20
Doors/ shutters/ hatches

Section Revision History

No.	Purpose	
T00	ISSUE FOR TENDER	29th Sep 2019

Clauses amended in Revision T00

This is the first revision stamp for this section. For all future revision stamps, details of all clauses amended at that revision will be included here.

L20 Doors/ shutters/ hatches

To be read with Preliminaries/ General conditions.

GENERAL

109A CLEANING EXISTING EXTERNAL BRONZE DOORS

Refer to Purcell drwgs CTH-PUR-XXX-21-A-3902 describing proposed repairs and associated schedule External Works Repairs - Schedule of Work of proposed repairs, ref.CTH-PUR-XXX-SCH-00-A-3901

- Locations:
  2x pairs of existing doors to Stairs F (Ref. DG.EX-27) and G (Ref. DG.EX-26) on Euston Road.

  - The existing doors above is assumed to be in reasonable working order and therefore require in-situ cleaning only.
  - After initial cleaning is completed the Conservation Architect can complete an inspection and can verify the door operation and ironmongery and identify the extent of any repairs.
  - The cleaning process is not purely for aesthetic reasons, but rather to remove damaging deposits or deteriorating coatings and to check for hidden corrosion.
  - Cleaning should remove soot, dust, bird droppings, pollutants, disfiguring stains as well as surface coatings.
  - Cleaning also refers to localised removal of active corrosion products.
  - Aggresive cleaning methods e.g. air abrasives, lasers or chemical should be avoided with medium-pressure water or high-pressure steam recommended.
  - Low-pressure water cleaning can usually be effective, especiallywith the addition of a non-ionic detergent with a neutral pH. The surface should first be wetted with a 1% solution of the detergent in a hand spray; it may be necessary to scrub the surface with medium-stiff natural-bristle brushes.
  - After cleaning, surfaces should be rinsed with low-pressure clean water, and the cleaned surface should then be very varefully inspected for active corrosion.
  - Ensure all corrosive products, together with loose surface coatings and pollutants are removed.Where necessary slightly more aggresive techniques may be feasible such as solvents applied by hand, high pressure steam, or low-pressure wet abrasive cleaning. Any remaining corrosion products may also require a localised cleaning method such as micro air-abrasion or chelating poultices or by hand with fine stainless steel picks. The requirement for these methods should be agreed with the Conservation Architect.
  - It should be established whether an Inappropriate caoting such a black wax or linseed oil is present and this should be removed by high-pressure steam cleaning.
  - Areas of limescale should be levered away by hand using wooden or plastic picks and scrapers, avoiding abrasive cleaning.
  - For larger areas with smooth or waxed surfaces, high-pressure steam cleaning can be used. Chemical cleaning with buffered acid gels or poultices requires careful application and the area is to be very thoroughly rinsed and neutralised.
  - Following cleaning the type of protective coating should be recommended by the metal conservator for agreement by the Conservation Architect e.g. microcrystalline wax coating ('hot waxing' - 4x coats).

109B SEQUENCE OF OPERATIONS

a) Preparation - Clause 109C - 109E
b) Cleaning of bronze doors incl. recording of process - 109A and 109F - 109G
c) Inspection by Conservation Architect and issue of further detail to confirm / clarify scope of works.
d) Repairs - TBC
e) Coating - TBC

109C PREPARATION

- Surfaces not designated for cleaning: Prevent damage, including marking and staining.
  " Openings: Prevent ingress of water, cleaning agents and detritus.
  - Vents and grilles: Seek instructions from Conservation Architect before sealing up / protecting.

109D CONTROL AND DISPOSAL OF WASH WATER AND DETRITUS

- Disposal: Safely. Obtain approvals from relevant Authority.
- Control of wash water: Collect and divert to prevent ingress and damage to building fabric and adjacent areas.
- Above and below ground drainage systems: Keep free from detritus and maintain normal operation.

109E COLD WEATHER

- Cleaning procedures using water: Do not use when air temperature is at or below 5°C. Protect damp surfaces from frost.
- Chemical cleaning agents: Do not use when surface temperatures are below those recommended by manufacturer.

109F CLEANING GENERALLY

- Operatives: Appropriately trained and experienced for each type of cleaning work.
  - Evidence of training: Submit on request.
- Control of cleaning: Confine cleaning processes and materials to designated areas.
  - Prevent wind drift.
    Detritus: Remove regularly. Dispose of safely.
- Monitoring: Frequently check results of cleaning compared to approved trial samples. If results established by trials are not achieved, seek instructions from Conservation Architect.
- Modifications to cleaning methods and materials: Seek instructions from Conservation Architect.

109G RECORD OF CLEANING WORKS

110 EVIDENCE OF PERFORMANCE

- Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

112 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.
  - Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.
- Certification scheme: Canadian Standards Association (CSA) or Programme for the Endorsement of Forest Certification (PEFC).
  - Other evidence: UK Timber procurement policy Category B evidence: Completed supply chain information within attached proforma ???.

115 FIRE RESISTING DOORS/ DOOR ASSEMBLIES/ DOORSETS

- Door products: As defined in BS EN 12519.
- Evidence of fire performance: Provide certified evidence, in the form of a product conformity certificate, directly relevant fire test report or engineering assessment, that each door/ door assembly/ doorset supplied will comply with the specified requirements for fire or smoke resistance if tested to BS 476-22, BS EN 1634-1 or BS EN 1634-3. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.
- Components, assemblies or sets will be marked to the relevant product standard and/ or third party certification rating.

120 NON FIRE RESISTING DOORS/ DOOR ASSEMBLIES/ DOORSETS

- Provide certified evidence, in the form of a product conformity certificate or engineering assessment, that each door/ doorset/ assembly supplied will comply with the specified requirements to BS EN 14351-1. Such certification must cover door and frame materials, glass and glazing materials and their installation, essential and ancillary ironmongery, hinges and seals.
- Components and assemblies will be marked to the relevant product standard and/ or third party certification rating.

150 SITE DIMENSIONS

- Procedure: Before starting work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
- Designated items: Any replacement components or doors.

170 CONTROL SAMPLES

- Procedure:
  - Finalize component details.
  - Fabricate one of each of the following designated items as part of the quantity required for the project.
  - Obtain approval of appearance and quality before proceeding with manufacture of the remaining quantity.
- Designated items: Localised trial sample of cleaning to bronze external doors on Euston Road.

610 ROLLER SHUTTERS/ CURTAINS **Judd Street**

- Manufacturer: Roller Shutter Insureguard Range SR2, SR3, SR4
  " Manufacturer: HAG Ltd. - The Door Specialists
  Web: www.hag.co.uk
  Email: info@hag.co.uk
  Tel: +44 (0)800 072 3444
  Fax: +44 (0)117 965 7773
  Address: 1 Oak Lane, Fishponds, Bristol BS5 7UY
  " Product reference: Roller Shutter Insureguard Range SR4
  " Size: AS PER DRAWINGS
  " Colour/ Finish: Polyester powder-coated, BS 4800 /Polyester powder-coated, RAL 7015 - SLATE GREY
  " Fixing: Face .
  - Product reference: -.
- Performance: -.
- Arrangement: -.
- Shutter/ curtain material: -.
  - Finish as delivered: -.
- Frame/ Guides: -.
  - Finish as delivered: -.
- Operation: -.
- Ironmongery: -.
- Other requirements: -.

611 ROOLER SHUTTERS

FireMaster® A1

- Manufacturer: Coopers Fire Ltd
  Web: www.coopersfire.com
  Email: info@coopersfire.com
  Tel: +44 (0)23 9245 4405
  Fax: +44 (0)23 9249 2732
  Address: Edward House, Penner Road, Havant, Hampshire PO9 1QZ
- Product reference: FireMaster® A1 /FireMaster® A1 (S)
- Size: Site Dm - refer to drawings - cover full width
- Extras: None /Beam protection and obstruction warning /Emergency retract /Split drop delay /Visual alert system /Voice warning

EXECUTION

710 PROTECTION OF COMPONENTS

- General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry, floored and covered storage.
- Stored components: Stacked on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

730 PRIMING/ SEALING

- Wood surfaces inaccessible after installation: Primed or sealed as specified before fixing components.

750 FIXING DOORSETS

- Timing: After associated rooms have been made weathertight and the work of wet trades is finished and dried out.

760 BUILDING IN

- General: Not permitted unless indicated on drawings.

770 DAMP PROOF COURSES ASSOCIATED WITH BUILT IN WOOD FRAMES

- Method of fixing: To backs of frames using galvanized clout nails.

780 DAMP PROOF COURSES IN PREPARED OPENINGS

- Location: Correctly positioned in relation to door frames. Do not displace during fixing operations.

790 FIXING OF WOOD FRAMES

- Spacing of fixings (frames not predrilled): Maximum 150 mm from ends of each jamb and at 600 mm maximum centres.

800 FIXING OF LOOSE THRESHOLDS

- Spacing of fixings: Maximum 150 mm from each end and at 600 mm maximum centres.

809 FIRE RESISTING/ SMOKE CONTROL DOORS/ DOORSETS/ ROLLER SHUTTERS/ CURTAINS

- Installation: By a firm currently registered under a third party accredited fire door installer scheme in accordance with instructions supplied with the product conformity certificate, test report or engineering assessment.

810 FIRE RESISTING/ SMOKE CONTROL DOORS/ DOORSETS/ ROLLER SHUTTERS/ CURTAINS

- Gaps between frames and supporting construction: Filled as necessary in accordance with requirements for certification and/ or door/ doorset manufacturer's instructions.

830 FIXING IRONMONGERY GENERALLY

- Fasteners: Supplied by ironmongery manufacturer.
  - Finish/ Corrosion resistance: To match ironmongery.
- Holes for components: No larger than required for satisfactory fit/ operation.
- Adjacent surfaces: Undamaged.
- Moving parts: Adjusted, lubricated and functioning correctly at completion.

840 FIXING IRONMONGERY TO FIRE RESISTING DOOR ASSEMBLIES

- General: All items fixed in accordance with door leaf manufacturer's recommendations ensuring that integrity of the assembly, as established by testing, is not compromised.
- Holes for through fixings and components: Accurately cut.
  - Clearances: Not more than 8 mm unless protected by intumescent paste or similar.
  - Lock/ Latch cases for fire doors requiring $\geq$ 60 minutes integrity performance: Coated with intumescent paint or paste before installation.

860 INSTALLATION OF EMERGENCY EXIT DEVICES

- Standard: Unless specified otherwise, install panic bolts/ latches in accordance with BS EN 1125.

CTH-PUR-XXX-SP-09-A-9225

S4 - ISSUED FOR STAGE APPROVAL

30 September 2019

This document includes:

Code	Section	Revision	Dated
M20	Plastered/ Rendered/ Roughcast coatings	T00	28 Sep 2019

Table of Contents

M20
Plastered/ Rendered/ Roughcast coatings

Section Revision History

No.	Purpose	
T00	Issue for Tender	28th Sep 2019

Clauses amended in Revision T00

This is the first revision stamp for this section. For all future revision stamps, details of all clauses amended at that revision will be included here.

M20 Plastered/ Rendered/ Roughcast coatings

To be read with Preliminaries/ General conditions.

TYPES OF COATING

TYPES OF COATING

Traditional lime plaster as EH guidance to repair existing lime plaster in accordance with Manufacturer's instructions – where damage has occurred or making good is required = give a rate per sqm in accordance with manufacturer's instructions.

110 CEMENT:LIME:SAND EXTERNAL RENDER

- Substrate: Concrete blockwork, as section F10.
  - Preparation: Spatterdash keying coat.
- Cement:lime:sand mortar:
  - Type: Contractor's choice.
  - Pigment: Not required.
- Undercoats:
  - Mix (cement:lime:sand): First and second coats 1:1:5–6.
    Cement type: Contractor's choice.
  - Thickness (excluding dubbing out and keys): First coat 8–12 mm (exclusive of keys) and second coat 6–10 mm.
- Final coat:
  - Mix (cement:lime:sand): 1:1:5–6.
    Cement type: White Portland.
    Other requirements: None.
  - Thickness: 6–8 mm.
  - Finish: Plain.
- Accessories: Stops and beads.

200A LIME PUTTY FOR PLASTERING Repair work to principal, ground and first floors.

- Repair work to principal, ground and first floors. Best mature lime putty ready prepared by slaking high calcium quicklime (CL90) to BS890. Lime putty shall have been sieved through a fine BS sieve to remove all unslaked material and shall be at least three months old at time of delivery. Wet and sloppy batches of lime putty failing to come out cleanly when tipped from the container are to be rejected. Do not use lime putty prepared from magnesian (Dolomitic) lime. Maturation period before use: (minimum) 90 days. Obtain and store in air tight containers until ready for use. Protect from frost. Handle containers with care to avoid mixing water seals with lime putty. Drain off water seals before using lime putty.

201 REPAIR PLASTER **Repair work to principal, ground and first floors.**

- Survey: To the areas identified on the Purcell drawings and schedules, particularly where new services are inserted into the ceilings of highly significant rooms and corridors on the first floor.
  Allow to inspect each area with the architect to ascertain the scope of remedial work. The final extent of removal of modern plasters is to be determined on site. For tender purposes, to the areas described on the drawings and schedule, allow for repairing with the following specification.
  Each corridor on the first and ground floor where existing penetrations have been made in walls and for making good surrounding new penetrations through walls.

  Background: Various masonry backgrounds including cement-based renders. Scratch coat: (3-5mm) St Astier Natural Hydraulic Lime NHL 3.5 (moderately hydraulic): sand mix (course stuff). Mix proportions: 1:2 Applied with Tyrolean Gun. Backing coat: (Bring forward to 6mm to apply finish plaster, max 20mm) St Astier Natural Hydraulic Lime NHL 3.5 (modenratley hydraulic): sand mix (coarse stuff). Mix proportions 1:2.5 Final coat: Max 6mm St Astier Ecomortar UF R50 with a USC additive: sharp sand. Mix 1:2.5 finished with a wood float (buffed with hessian). Contact Douglas Johnson 07710 446 871 Different substrates: Where there is a difference in substrates apply a 10x10mm mesh on a 3mm layer of the Ecomortar, all in accordance with the manufacturers recommendations. Leave 1.5 weeks curing time between coats.

210A SAND FOR PLASTERING -

- Clean washed sand complying with BS1199 type A, substantially dried before use.

225 WATER

Mains supply kept free from impurities. Do not add water to plasters/mortars prepared with lime putty.

230 ADMIXTURES: DO NOT USE

280 GYPSUM PLASTER SKIM COAT ON PLASTERBOARD

- Plasterboard: As per K10 .
  - Preparation: Bonding agent recommended by plaster manufacturer .
- Plaster: Board finish/ finish plaster to BS EN 13279-1.
  - Manufacturer: British Gypsum, or similar approved.
    - Web: www.british-gypsum.com.
    - Tel: +44 (0)844 800 1991 .

    Product reference: Thistle Multi Finish .
  - Thickness: As manufacturer's recommendations .
  - Finish: Smooth.
- Accessories: Beads and stops .

310 LIME:SAND BLOCKWORK OUTERLEAF MASONRY

- Substrate: Blockwork as section F10.
  - Preparation: Brush clean.
- External render repair work should be carried out in accordance with BS 5262. On historic buildings, work should be based on information in technical references Ashurst, J. and N., Practical building conservation - Vol. 3, Mortars, plasters and render. English Heritage Technical Handbooks, Aldershot, Gower Technical Press, 1988. Monks, W., External rendering, Appearance Matters 2, British Cement Association, 1992.
- Re-rendering and render repairs generally should be carried out in a lime mortar mix or an appropriate mix based on an analysis of original material. The mix and character chosen should match the strength of the original rendering or stucco, unless otherwise agreed.
- New rendering should generally be applied in three coats, and no metal beads or stops should be used externally; arises and angles should be formed in the traditional manner. Cracks in existing render should be cut back to the masonry face and the surrounding render undercut to provide a key, repairs to masonry cracks to be treated as C41/620. Coursing (or blocking) lines should be reinstated in areas of new render, where appropriate.
- Samples of new render to be agreed before the commencement of work. Consideration should be given to the moisture content of the masonry where cement based render has been removed - and possible drying out time needed before re-coating.
- Cornices, window surrounds and other mouldings should be re-run in situ with a template in the traditional manner, building up in coats to the full original profile and accurately formed: mouldings should be copied from an undamaged existing section cleaned of all paint. Refer to Architect's drawings, but note exact extent of repairs to be assessed once scaffold is erected.
- Subsequent redecoration of rendered areas should be with traditional lime wash or with a smooth, water-permeable masonry paint system. The proposed colour scheme for redecoration to be agreed.
- Lime manufacturer: Contractor's choice.
  - Product reference/ Type: Hydraulic NHL5.
- Undercoats:
  - Mix: Subject to site trials.
    Sand: To BS EN 13139, grading to approval.
  - Thickness (excluding dubbing out and keys): As existing.
- Final coat:
  - Mix: As undercoat.
    Sand: To BS EN 13139, grading to approval.
  - Thickness: As existing.
  - Finish: To match existing.
- Accessories: None.
- Other requirements: See drawings.

GENERAL

400 PROTECT AREAS (INTERNALLY)

In addition to general protection adequately protect any areas adjacent to the working area against water during cleaning, plaster droppings during plastering, or, any other damage which might reasonably result from the carrying out of the works described in this section. In particular carefully protect any decorative plaster, polished or varnished joinery, and hearths.

413 SAMPLES

- General: Provide representative samples of the following: Sands for undercoats and final coat for external render and skim plaster internally.

421 SCAFFOLDING

- General: Prevent putlog holes and other breaks in coatings.

423 UNIFORMITY OF COLOUR AND TEXTURE

General: Maintain consistent colour and texture. Obtain materials from one source. Mix different loads if necessary.

MATERIALS AND MARKING OF MORTAR

438 CEMENTS FOR MORTARS

- Cement: To BS EN 197-1.
  - Types: Portland cement, CEM I.
    Portland slag cement, CEM II.
    Portland fly ash cement, CEM II.
  - Strength class: 32.5, 42.5 or 52.5.
- White cement: To BS EN 197-1.
  - Type: Portland cement, CEM1.
  - Strength class: 52.5.
- Sulfate resisting Portland cement: To BS EN 197-1.
  - Strength class: 42.5.
- Masonry cement: To BS EN 998-1 and Kitemarked.

440 SAND FOR CEMENT GAUGED MORTARS

- Standard: To BS EN 13139.
  - Grading: 0/2 or 0/4 (CP or MP); Category 2 fines.
- Colour and texture: Consistent. Obtain from one source.

441 SITE PREPARED LIME

- Permitted use: Where a special colour is not required and in lieu of factory made ready-mixed material.
- Lime: Hydrated nonhydraulic lime to BS 890.
- Mixing: Thoroughly mixed. Allow to stand, without drying out, for at least 16 hours before using.

445 PIGMENT FOR COLOURED MORTARS

- Standard: To BS EN 12878.

449 ADMIXTURES FOR CEMENT GAUGED MORTARS

- Suitable admixtures: Select from:
  - Air entraining (plasticizing) admixtures: To BS EN 934-2 and compatible with other mortar constituents.
  - Other admixtures: Submit proposals.
- Prohibited admixtures: Calcium chloride and any admixture containing calcium chloride.

450 CHLORIDE CONTENT OF MORTARS

- Chloride content (maximum): 0.1% by dry mass.

478 HYDRAULIC LIME

- Standard: To BS EN 459-1.
  - Type: Natural hydraulic lime (NHL).

492 HAIR REINFORCEMENT

- Manufacturer/ Supplier: Chembond Products, or similar approved.
  - 259 Heage Road, Ripley, Derbyshire, DE5 3GH.
  - Tel: 01773 742233.
  - Product reference: polyprolene fibres.
- Proportions (approximate): 5 kg hair to 1 m^3 of coarse stuff.
- Condition: Clean, free from grease and other impurities. Well teased before adding to the mix.
- Distribution: Evenly throughout with no balling into lumps.
- Storage period for haired mortar (maximum): Four weeks.

495 MIXING

- Render mortars (site prepared):
  - Batching: By volume. Use clean and accurate gauge boxes or buckets.
  - Mix proportions: Based on damp sand. Adjust for dry sand.
  - Lime:sand: Mix thoroughly. Allow to stand, without drying out, for at least 16 hours before using.
- Mixes: Of uniform consistence and free from lumps. Do not retemper or reconstitute mixes.
- Contamination: Prevent intermixing with other materials.

497 COLD WEATHER

- General: Do not use frozen materials or apply coatings on frozen or frost bound substrates.
- External work: Avoid when air temperature is at or below 5°C and falling or below 3°C and rising. Maintain temperature of work above freezing until coatings have fully hardened.
- Internal work: Take precautions to enable internal coating work to proceed without detriment when air temperature is below 3°C.

PREPARING SUBSTRATES

500 BEADS/STOPS

Do not use metal angle beads. Form external angles with straight, square and plumb screeding rails in floating coat plaster. Ease the arris and finish in setting coat plaster to match existing radius (nominally 1mm). Use timber plaster stops/grounds (not included in this section) at junctions with joinery unless specified otherwise.

501 PREPARE OLD PLASTER

Carefully cut back loose and friable plaster to sound square edges either perpendicular to or parallel with lathing or masonry substrate. Align perpendicular edges just behind supporting timber to expose lath fixings. Slightly under-cut plaster edges to key in new work. Remove dust by dry brushing.

502 PREPARE OLD PLASTER (PRICKING-UP COAT INTACT)

- Carefully cut back loose and friable plaster to sound edge. Slightly under-cut plaster edges to key in new work.

507 FILL CRACKS

Remove loose materials with a sharp pointed instrument, brush and blow out dust and fine debris, dampen both sides of the crack to control suction and neatly fill with the appropriate setting coat plaster. Omit hair and replace coarse aggregate with fine for very fine filling

508 FILL HOLES

Remove loose material with a sharp pointed instrument, brush and blow out dust and fine debris, dampen plaster to control suction and neatly fill holes with setting coat plaster, omitting hair

510 SUITABILITY OF SUBSTRATES

- Soundness: Free from loose areas and significant cracks and gaps.
- Cutting, chasing, making good, fixing of conduits and services outlets and the like: Completed.
- Tolerances: Permitting specified flatness/ regularity of finished coatings.
- Cleanliness: Free from dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.

511 DUBBING OUT

If necessary to correct background inaccuracies, dub out in thicknesses of not more than 10mm in same mix as first coat. Allow each coat to set but not dry before the next is applied. Cross scratch surface of each dubbing out coat immediately after set. (M20/820)

512 PLASTERING GENERALLY

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, ridges, cracks and crazing. Finish surfaces to a true plane, to correct line and level, with all angles and corners to right angle unless specified otherwise, and with walls and reveals plumb and square. Prevent excessively rapid or localised drying out. (M20/710)

512A SETTING / DRYING

Leave each coat for at least 2 days in summer and 7 days in winter to ensure that initial shrinkage is over before applying subsequent coats. Test for adhesion and strength before applying a second coat.

513 CONTROL OF SUCTION

Lightly dampen dry work with clean water using a small garden spray to control suction and prevent rapid removal of moisture from new plaster

PREPARING SUBSTRATES: IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS

515 CRACKS IN LIME PLASTER

- Fill cracks less than 3mm wide with Lime putty.

520 FILL CRACKS IN RENDER

- Remove all loose materials with a sharp pointed instrument, brush and blow out dust and fine debris, dampen both side of the crack to control suction and neatly fill with appropriate setting coat render.

525 FILL HOLES IN RENDER

- Remove all loose materials with a sharp pointed instrument, brush and blow out dust and fine debris, dampen both side of the crack to control suction and neatly fill holes with appropriate setting coat render.

531 ROUGHENING FOR KEY

- Substrates: Roughen thoroughly and evenly.
  - Depth of surface removal: Minimum necessary to provide an effective key.

541 BONDING AGENT APPLICATION

- General: Apply evenly to substrate to achieve effective bond of plaster/ render coat. Protect adjacent joinery and other surfaces.

541A INTERNAL PLASTER BONDING AGENT APPLICATION

- in accordance with Manufacturer's instructions gypsum only – not historic lime plaster.

545 SUITABILITY OF BACKGROUNDS

in accordance with Manufacturer's instructions.
General: Suitable to receive coatings/ backings.
Soundness: Free from loose areas and significant cracks and gaps.
Cutting, chasing, making good, fixing of conduits and services outlets and the like: Completed.
Tolerances: Permitting specified flatness/ regularity of finished coatings.
Cleanliness: Remove dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.
Location: External angles and stop ends except where specified otherwise.

BACKINGS/ BEADS/ JOINTS

640 BEADS/ STOPS GENERALLY

- Location: External angles and stop ends except where specified otherwise.
- Corners: Neat mitres at return angles.
- Fixing: Secure, using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
  - Beads/ stops for external render: Fix mechanically.
- Finishing: After coatings have been applied, remove surplus material while still wet, from surfaces of beads/ stops exposed to view.

646 CRACK CONTROL AT JUNCTIONS BETWEEN DISSIMILAR SOLID SUBSTRATES

- Locations: Where defined movement joints are not required. Where dissimilar solid substrate materials are in same plane and rigidly bonded or tied together.
- Crack control materials:
  - Isolating layer: Building paper to BS 1521.
  - Metal lathing: Externally: Stainless steel ribbed expanded metal.
- Installation: Fix metal lathing over isolating layer. Stagger fixings along both edges of lathing.
- Width of installation over single junctions:
  - Isolating layer: 150 mm.
  - Lathing: 300 mm.
- Width of installation across face of dissimilar substrate material (column, beam, etc. with face width not greater than 450 mm):
  - Isolating layer: 25 mm (minimum) beyond junctions with adjacent substrate.
  - Lathing: 100 mm (minimum) beyond edges of isolating layer.

659 PLASTERBOARD JOINTS

- Joints and angles (except where coincident with metal beads). Reinforce with continuous lengths of jointing tape.

673 PLASTERING OVER CONDUITS/ SERVICE CHASES

- General: Prevent cracking over conduits and other services.
- Services chased into substrate: Isolate from coating by covering with galvanized metal lathing, fixed at staggered centres along both edges.

INTERNAL PLASTERING

710 APPLICATION GENERALLY

- Application of coatings: Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
- Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
  - Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
- Drying out: Prevent excessively rapid or localized drying out.

715 FLATNESS/ SURFACE REGULARITY

- Sudden irregularities: Not permitted.
- Deviation of plaster surface: Measure from underside of a straight edge placed anywhere on surface.
  - Permissible deviation (maximum) for plaster not less than 13 mm thick: 3 mm in any consecutive length of 1800 mm.

718 JUNCTION OF NEW PLASTERWORK WITH EXISTING

- New plasterwork: Finish flush with original face of existing plasterwork to form a seamless junction.

777 SMOOTH FINISH

- Appearance: A tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks. Avoid water brush, excessive trowelling and over polishing.

778 WOOD FLOAT FINISH

- Appearance: An even overall texture. Finish with a dry wood float as soon as wet sheen has disappeared.

782 TEXTURED/ PATTERNED FINISHES

- Appearance: Consistent and even. Carry out work on each surface as one continuous operation.

EXTERNAL RENDERING

810 APPLICATION GENERALLY

- Application of coatings: Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
- Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
  - Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
- Drying: Prevent excessively rapid or localized drying out.

830 ANCHORED MESH REINFORCEMENT

- Application of first undercoat: Through and round mesh to fully bond with solid substrate.

840 UNDERCOATS GENERALLY

- General: Rule to an even surface. Comb to provide a key for the next coat. Do not penetrate the coat.
- Undercoats on metal lathing: Work well into interstices to obtain maximum key.

850 FINAL COAT - 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 waterbrush and avoid excessive trowelling and over polishing. (M20/777)

880 CURING AND DRYING

- General: Prevent premature setting and uneven drying of each coat.
- Curing coatings: Keep each coat damp by covering with polyethylene sheet and/ or spraying with water.
  - Curing period (minimum): As the hydraulic lime manufacturer's recommendations.
  - Final coat: Hang sheeting clear of the final coat.
- Drying: Allow each coat to dry thoroughly, with drying shrinkage substantially complete before applying next coat.
- Protection: Protect from frost and rain.

890 COMPLETION

On completion remove guide rails and make good wall and ceiling plaster
COMPLETION DECORATION: See M60