UCL Student Union Building
25 Gordon Street, London WC1H 0AY

Terracotta Balcony Replacement

Works Specification – RIBA Stage 4

This specification is to be read in conjunction with AKS Ward design drawings and specification.

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Schedule of Revisions

Issue No.	Date	Amendments	
00	30 April 2024	RIBA Stage 4 works specification – First issue	

Content

C41 Replacing and Rebuilding Architectural Terracotta

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To be read with AKS Ward design drawings and specification.

Generally

5 Site Context

UCL Student Union Building at 25 Gordon Street is of historic interest and lies within the London Borough of Camden, Bloomsbury Conservation Area. The building is not a listed building in accordance with the Planning (Listed Buildings). The building is believed to have been built in the early 1900s and is built in red brickwork with architectural details and enrichment in a buff coloured architectural terracotta.

The terracotta is a traditional moulded hollow block which is infilled with clinker concrete. The terracotta is a buff sandstone colour. Past abrasive cleaning and textured the original smooth unglazed surface.

The balcony slab appears to be an unreinforced lightweight clinker concrete encasing twelve structural steel beams, arranged as small I-beam sections supported by a curved I-beam bracket. The structural steel supports are concealed within the large terracotta consoles (large, scrolled brackets). The balcony soffit is clad with terracotta tiles which may have been used as a permanent formwork for casting the balcony slab, although limited intrusive investigation works indicates the terracotta may have been applied to the balcony soffit using a mortar. the junction between the façade wall and balcony soffit is enriched with a terracotta egg and dart bandcourse which extends around the consoles.

The balcony parapet wall is built into terracotta blocks in stretcher bond, with two lines of blocks, once facing outward and one facing inward. The wall is capped with terracotta copings.

The balcony is waterproofed with asphalt with very low falls towards two central outlets.

The balcony has suffered extensive past damage and poorly executed repair above the central entrance. The balcony slab may have been replaced in this area and the entire cornice has been removed and crudely replaced with in-situ concrete. Extensive damage is present on the terracotta soffit tiles, egg and dart course, coping and consoles. There is localised damage on the parapet wall blocks.

The terracotta was original built with a low strength Portland cement mortar.

10 Rationale for repair and replacement

Repair scope and rationale

Extensive cracking and damage is present in the terracotta balcony elements. Intrusive investigation indicates the steep balcony support beams are corroded. Calcite deposits on the balcony soffit indicates long term water leaks through the balcony surface.

The balcony will need to be carefully dismantled and replaced with new architectural terracotta. It may be possible to salvage and reuse some of the parapet blocks. Replacement terracotta is shown in the design drawing but is summarised as follows:

- **Terracotta consoles** (large, scrolled brackets) in at least two design variations. One is built into the brickwork façade, the second has a terracotta ashlar facing block built into the surrounding terracotta ashlar façade.
- **Terracotta egg and dart band course.** Extensive damage and cracking is present and complete replacement is likely.
- **Terracotta cornice.** There are three cornice block variants. The main cornice block with extended soffit and a left and right hand stooling block.
- **Soffit tiles.** There are two soffit tile sizes. Tile sizes vary in size and shape at the junctions of the console brackets and the two brick bay windows. It is unknown whether the tiles are site cut around these details of manufactured to the various sizes and shapes.
- **Parapet wall blocks.** The parapet wall is built with two back-to-back blocks. Some damage is present. It may be possible to retain some of the blocks but complete replacement would avoid creating a patchwork with old and new blocks.

- **Parapet wall coping.** Some of the coping blocks are damaged and have been replaced with in-situ concrete. It is advisable to replace all coping blocks to avoid a patchwork of old and new blocks.

20 Control Samples

1. The following samples are to be provided, to ensure the specification can be achieved, and to set an approved standard of work.
2. **Terracotta:** 3nr 200 x 200mm terracotta samples are to be provided to confirm colour and surface finish. The samples can be in a tile format.
3. **Mortars**: the following samples are to be provided to demonstrate mortar colour and composition, materials, and quality of work:
   3.1. 3nr 100mm diameter x 30mm thick mortar tables for the terracotta and brick construction mortar.
4. **Facing bricks.** 3nr facing bricks
5. **New terracotta installation.** The first bay of terracotta is to be installed as a control sample for inspection and agreement before proceeding further. The bay is to include all terracotta elements.
6. Samples are to be carried out in close discussion with the Conservation Consultant and are to incorporate all aspects of the specification techniques. Each crafts person/conservator is to record their sample work in writing and by photography.

Conservation/Repair Methodology & Materials

100 Dismantling Terracotta Elements

1. Carefully cut through existing cementitious mortar joints in terracotta blocks using an oscillating cutter ensuring no overcutting into the terracotta blocks.
2. Salvage all blocks and tiles where no cracks or damage are present for inspections and possible reuse. Agree the scope of re-use with the Contract Administrator.
3. Ensure at least two of each block type are retained and sent to the terracotta manufacturer for replication. Discuss this with the manufacturer below the balcony is dismantled to confirm and agree what blocks need to be retained.
4. Dispose of all terracotta blocks with extensive damage.
5. Once the terracotta has been removed, the balcony slab should be carefully removed preventing damage to surrounding retained elements.

105 Installing new terracotta balcony cornice

1. Description: Installing new terracotta balcony cornice blocks
2. Drawing: refer to document register
3. Location: Gordon Street first floor balcony
4. Substrate: Structural concrete slab
5. Terracotta: as clause 305
6. Method:
   6.1. Fill terracotta blocks with hydraulic lime Lytag concrete and allow to cure in a controlled environment before installation.
   6.2. Cornice blocks to be set out and installed following line established from existing bay window cornice at each end of the balcony.
   6.3. Instal each cornice block using stainless-steel fixings installed into Halfen channels. Use stainless steel shims between each fixing and the concrete balcony to achieve the correct alignment.

6.4. Pre-wet the perpend joint face and apply mortar ensure the perpend joint is fully filled and compacted with mortar. Once the mortar has stiffened finish the joint slightly recessed with a trowel finish.

6.5. Continue to install the cornice blocks repeating the process. Ensure the terracotta face is kept clean of all mortar. The terracotta is to be kept clean at all times.

6.6. Ensure the new work is protected from the heat of the sun and any wind. In warm weather ensure that the masonry is are kept damp for at least 10 days to control mortar curing.

7. Mortar: As section Z21.

7.1. Terracotta construction mortar: 1 part NHL 3.5 with 2½ parts well graded buff coloured sharp sand graded from 2.36mm or 3mm down

7.2. Sand source/ type: contractor to propose.

110 Installing new terracotta soffit tiles

1. Description: Installing new terracotta balcony soffit tiles
2. Drawing: refer to document register
3. Location: Gordon Street first floor balcony
4. Substrate: Structural concrete slab
5. Terracotta: as clause 305
6. Method:

6.1. Soffit tiles to be set out and installed following design drawings create a half bond with the cornice blocks and each soffit course.

6.2. Instal each soffit tile using stainless-steel fixings installed into Halfen channels. Use stainless steel shims between each fixing and the concrete balcony to achieve the correct alignment.

6.3. Pre-wet the perpend joint face and apply mortar ensure the perpend joint is fully filled and compacted with mortar. Apply a mortar haunch over the joint on the back face. Once the mortar has stiffened finish the joint slightly recessed with a trowel finish.

6.4. Continue to install the soffit tiles repeating the process. Ensure the terracotta face is kept clean of all mortar. The terracotta is to be kept clean at all times.

6.5. Ensure the new work is protected from the heat of the sun and any wind. In warm weather ensure that the masonry is are kept damp for at least 10 days to control mortar curing.

7. Mortar: As section Z21.

7.1. Terracotta construction mortar: 1 part NHL 3.5 with 2½ parts well graded buff coloured sharp sand graded from 2.36mm or 3mm down

7.2. Sand source/ type: contractor to propose.

115 Installing new terracotta console blocks

1. Description: Installing new terracotta console
2. Drawing: refer to document register
3. Location: Gordon Street first floor balcony
4. Substrate: Structural concrete slab
5. Terracotta: as clause 305
6. Method:

6.1. Install the stainless steel support frame inside the console and fill each terracotta block with hydraulic lime Lytag concrete, ensuring the fixings are kept clean of mortar. Allow to cure in a controlled environment before installation.

6.2. The console blocks are fitted into the façade wall and suspended at the front with a stainless steel support/restraint.

6.3. Ensure the cavity within the wall is prepared to allow the console to be slid into place.

6.4. Thoroughly pre-wet the wall cavity. Slide the console into position and use temporary timber wedges between the console and façade wall to level the console and achieve consistent joint widths. Support the console while the front fixing is installed.

6.5. Install the stainless all-thread rod down through the balcony slab and screw into place to secure the console. Ensure the correct level and alignment.

6.6. Fill the mortar joints in the façade wall and between the console and terracotta soffit tiles. Install grouting tubes so that all joint voids can be filled with a hydraulic lime grout. Once the mortar has stiffened finish the joint slightly recessed with a trowel finish.

6.7. Complete the grouting work once the mortars are fully cured.

6.8. Continue to install the console blocks repeating the process. Ensure the terracotta face is kept clean of all mortar. The terracotta is to be kept clean at all times.

6.9. Ensure the new work is protected from the heat of the sun and any wind. In warm weather ensure that the masonry is are kept damp for at least 10 days to control mortar curing.

7. Mortar: As section Z21.

7.1. Terracotta construction mortar: 1 part NHL 3.5 with 2½ parts well graded buff coloured sharp sand graded from 2.36mm or 3mm down

7.2. Sand source/ type: contractor to propose.

7.3. Grout: Cornerstone Medium Strength Masonry Grout. 1 part NHL 3.5 and 1.5 parts blended aggregate.

- Supplier: Cornish Lime, Brims Park, Old Callywith Road, Bodmin, Cornwall PL31 2DZ. Tel. 01208 79 779. www.cornishlime.co.cuk

120 Installing new terracotta egg and dart string course blocks

1. Description: Installing new terracotta egg and dart string course blocks
2. Drawing: refer to document register
3. Location: Gordon Street first floor balcony
4. Substrate: Façade wall
5. Terracotta: as clause 305
6. Method:

6.1. Fill terracotta blocks with hydraulic lime Lytag concrete and allow to cure in a controlled environment before installation.

6.2. Ensure the cavity within the wall is prepared to allow the terracotta blocks to be slid into place.

6.3. Thoroughly pre-wet the wall cavity. Apply mortar to the cavity bed, back face, and perpend face. Pre-wet the terracotta block and slide into place. Gently tap to achieve the correct line and level.

6.4. Install the stainless all-thread rod down through the balcony slab and screw into place to secure the console. Ensure the correct level and alignment.

6.5. Continue to install the egg and dart blocks repeating the process. Fill the top bed joint with mortar ensuring the joint is fully filled and the mortar is compacted.

6.6. Ensure the terracotta face is kept clean of all mortar. The terracotta is to be kept clean at all times. Once the mortar has stiffened finish the joint slightly recessed with a trowel finish.

6.7. Ensure the new work is protected from the heat of the sun and any wind. In warm weather ensure that the masonry is are kept damp for at least 10 days to control mortar curing.

7. Mortar: As section Z21.

7.1. Terracotta construction mortar: 1 part NHL 3.5 with 2½ parts well graded buff coloured sharp sand graded from 2.36mm or 3mm down

7.2. Sand source/ type: contractor to propose.

125 Installing new terracotta balcony parapet wall

1. Description: Installing new terracotta wall blocks and coping
2. Drawing: refer to document register
3. Location: Gordon Street first floor balcony
4. Substrate: Façade wall
5. Terracotta: as clause 305
6. Method:
    6.1. Fill terracotta blocks with hydraulic lime Lytag concrete and allow to cure in a controlled environment before installation.
    6.2. The parapet wall is to be set out and installed following a line established from existing bay window parapet wall interface at each end of the balcony.
    6.3. Install each block on a full mortar bed ensure joint and bond is maintained with line and level. Install stainless steel mortar bed joint reinforcement.
    6.4. Ensure the terracotta face is kept clean of all mortar. The terracotta is to be kept clean at all times. Once the mortar has stiffened finish the joint slightly recessed with a trowel finish.
    6.5. Ensure the new work is protected from the heat of the sun and any wind. In warm weather ensure that the masonry is are kept damp for at least 10 days to control mortar curing.
7. Mortar: As section Z21.
    7.1. Terracotta construction mortar: 1 part NHL 3.5 with 2½ parts well graded buff coloured sharp sand graded from 2.36mm or 3mm down
    7.2. Sand source/ type: contractor to propose.

130 Brick indenting

1. Description: brickwork replacement around each console
2. Drawing: refer to document register
3. Location: Gordon Street first floor balcony
4. Substrate: Façade wall
5. Bricks: Facing bricks to match existing as clause 310
6. Method:
    6.1. Place drill holes into the brick across the brick keeping away from the joint. Carefully cut out the brick using a sharp chisel taking care not to damage the surrounding bricks.
    6.2. Once the decayed brick has been removed, clean away any remaining mortar residue from the surrounding bricks to leave a clean aperture for the replacement brick.
    6.3. Removal all dust and debris using a class M vacuum cleaner. Wash out the back of the aperture with clean, cold water ensuring that the substrate is sufficiently wet to control mortar curing.
    6.4. Pre-wet the replacement brick in a bucket of clean water for a few minutes and leave to stand while the mortar is prepared. Butter each face of the brick with sufficient mortar to allow the brick to be pushed into the aperture with the mortar completely filling the joints. Lightly tap the brick flush with the surrounding brickwork, ensuring that the joints are in line and the width of the joint is maintained. Fill any void in the mortar joints leaving the mortar slightly recessed from the face of the brick and surrounding brick arris.
    6.5. Allow the mortar to harden slightly and finish the joint by tamping with a stiff bristle brush to expose the aggregates. No mortar smearing will be acceptable.
7. Finish: Slightly recessed to match existing original joints.
8. Mortar: As section Z21.
    8.1. Bedding mortar mix: 1 part NHL 3.5 with 2½ parts well graded buff coloured sharp sand graded from 2.36mm or 3mm down

8.2. Sand source/ type: provide samples to match existing

9. Mortar joints: as existing.

135 Grouting consoles

1. Description: Grouting new terracotta console
2. Drawing: refer to document register
3. Location: Gordon Street first floor balcony
4. Substrate: façade wall
5. Method:
   5.1. Install grouting tubes into the mortar joint whilst the console is installed. Install hoses at relatively close centres of approximately 100 to 150mm and to a depth of about 100mm. Using a large syringe with a blunt needle Inject water into the holes to flush through the fracture void and provide an indication of how the grout will spread. Repeat the process at each hole until the substrate is sufficiently wet to improve grout flow and control grout shrinkage.
   5.2. Seal the face of the fracture or joint face with dry cotton wool to minimise grout loss. Use a small tool to press and secure the cotton wool into the front of the fracture or joint.
   5.3. Before using the grout, thoroughly stir the jug to ensure even consistency of the grout and that all solids are in suspension.
   5.4. Once the substrate is sufficiently wet, inject grout into the lowest hole by placing the syringe need to the full depth of the hole and slowly withdrawing as grout pressure builds. Use dry cotton wool to seal around the grouting hole. When grout appears at the next hole up, stop grouting and plug the hole with cotton wool. Place grout into the next hole up repeating the process until all holes are grouted. For long fractures the operation may need to be completed over several days to prevent excessive hydraulic pressure forcing the grout out of fracture.
   5.5. Leave the grout to stiffen before removing the cotton wool. Carefully scrape back the grout from the face of the fracture or joint to a depth of 8 to 10mm and fill with mortar.
6. Joint/fracture finish: Slightly recessed and brush tamped to expose the mortar aggregates.
7. Mortar: As section Z21.
   7.1. Type: Terracotta construction mortar: 1 part NHL 3.5 with 2½ parts well graded buff coloured sharp sand graded from 2.36mm or 3mm down
   7.2. Sand source/ type: contractor to propose.
8. Grout: As section Z21
   8.1. Type: Cornerstone Medium Strength Masonry Grout. 1 part NHL 3.5 and 1.5 parts blended aggregate.
   8.2. Supplier: Supplier: Cornish Lime, Brims Park, Old Callywith Road, Bodmin, Cornwall PL31 2DZ. Tel. 01208 79 779. www.cornishlime.co.uk

140 Pointing with tools/ irons

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

155 Site Inspection

1. Purpose: To confirm type and extent of repair/ renovation/ conservation work shown on drawings and described in survey reports and schedules of work.
2. Parties involved: Contract Administrator and Contractor's Site Manager and archaeologist as appropriate
3. Timing: At least 5 days before starting each section of work

4. Instructions issued during inspection: To be confirmed by the C.A.

160 Record of work

1. General: Record work carried out to masonry clearly and accurately using written descriptions, sketches, drawings and photographs, as necessary.
2. Specific records:
   2.1. Maintain a photographic record of the work of all samples showing cutting out and preparation, placing the repair and the completed repair once approved.
   2.2. Maintain a general photographic record to document progress of work to the general site area.
   2.3. The photographic record is to be saved as digital JPEG files with a minimum resolution of 600dpi or 6 megapixels.
3. Documentation: Submit on completion of the work.

Workmanship Generally

200 Power tools

1. For removing mortar and bricks for replacement: Non percussive rotary drills or oscillating disc cutters may be used to weaken hard repointing and bedding mortars. Cut or holes should be placed into the centre of the joint without damage to the surrounding mason. Damage to original and historically significant masonry is not acceptable.
2. Seek written agreement to use all other power tools.
3. On tool class M vacuum dust extraction must be used to prevent airborne dust for safety reasons and dust contamination on building surfaces and

205 Protection of terracotta units and masonry

1. Terracotta units: Prevent overstressing during transit, storage, handling and fixing. Store on level bearers clear of the ground, separated with resilient spacers. Protect from adverse weather and keep dry. Prevent soiling, chipping, and contamination. Lift units at designed lifting points, where provided.
2. Masonry and terracotta: 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.
3. Remove protection on completion of the work.

210 Structural stability

1. General: Maintain stability of masonry. Report defects, including signs of movement, which are exposed or become apparent during the removal of masonry units.

211 Cutting bricks

1. General: All brick should be cut down in length or in some cases height as required. Bricks must be cut on a table saw or similar to ensure a clean cut without impact damage that may weaken of damage the brick. Bricks should not be cut down with a trowel or hammer and bolster.

212 Cutting terracotta

1. Only cut terracotta blocks and tile with the manufacture's agreement and follow the manufacturers guidance. All cuts should be accurate and free from chips and damage along the cut edge.

213 Filling small voids during rebuilding

1. General: There will be some instances where gaps created by the terracotta blocks and tile at complex junctions will create gaps which are too small to fill with a cut brick. In these instances, the void is to be filled with mortar and waste brick fragments to create a 'lime concrete'. The mortar must be compacted down into the void to ensure long term strength and durability.
2. All voids should be filled as work proceeds to ensure good adhesion and composition throughout the wall.
3. The wall must be built as a composite, cohesive structure with no voids.

220 Disturbance to retained masonry

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

225 Workmanship

1. Skill and experience of site personnel: Appropriate for types of work on which they are employed.
2. Documentary evidence: Submit on request.
3. The works must be supervised on site by an accredited conservator [PACR] (Institute of Conservation or another suitable organisation).

230 Adverse weather

1. General: Do not use frozen materials or lay masonry units on frozen surfaces.
2. Air temperature: Do not bed masonry units or repoint:
3. In hydraulic lime:sand mortars when ambient air temperature is at or below 5°C and falling unless it is at least 5°C and rising.
4. In non-hydraulic lime:sand mortars in cold weather [below 10°C] unless approval is given.
5. Temperature of the work: Maintain above freezing until mortar has fully set.
6. Rain, snow, and dew: Protect masonry by covering during precipitation, and at all times when work is not proceeding.
7. Hot conditions and drying winds: Prevent masonry from drying out rapidly.
8. New mortar damaged by frost: Rake out and replace.

Materials/ production/ accessories

300 Material samples

1. Representative samples of designated materials: Submit before placing orders.
2. Designated materials:
   - 2.1. Mortars, grouts and mortar aggregates
   - 2.2. New yellow gauged bricks
   - 2.3. New Yorkstone
3. Retention of samples: Unless instructed otherwise, retain samples on site for reference. Protect from damage and contamination.

305 Terracotta blocks and tiles

1. Standard: Blocks and tile are to replicate the original design with some alteration to accommodate fixings
2. Manufacturer: Hathern Terra Cotta, Charnwood, Old Station Close, Shepshed, Nr Loughborough, Leicestershire LE12 9NJ. Tel. 0844 931 0022 Email. sales@mbhplc.co.uk
   2.1. Product reference: traditional hand pressed terracotta blocks and tiles
   2.2. Size: to match existing
   2.3. Special shapes: to match original details
   2.4. Recycled content: Bulmer Bricks to advise
3. Detailed design. Terracotta design is subject to detailed design by Hathern Terra Cotta in coordinating with the fixings designer at RIBA Stage 5, manufacturing design.

310 Facing bricks

1. Standard: To BS EN 771-1.
2. Manufacturer: Bulmer Brick & Tile Company, The Brickfields, Bulmer, Sudbury, Suffolk CO10 7EF. Tel 01787 269 232
   2.1. Product reference: red facing brick to match the originals. Sizes to be agreed
   2.2. Size: Sizes to be agreed
   2.3. Recycled content: Bulmer Bricks to advise

315 Halfen fixing channels

1. Standard: To BS EN 1990 to 1999
2. Manufacturer: Leviat, A1/A2 Portland Close, Houghton Regis, LU5 5AW. Tel. 01582 470 300. Email. info@leviat.com
   2.1. Product reference: Halfen cast-in stainless steel channels. Type to be confirmed at RIBA Stage 5. RIBA Stage 4 design includes following provisional items. HTA-CE 28/15 channel with HS 25/15 M8 bolts. Grade 316 stainless steel (1.4401)
   2.2. Size: 28 x 15mm channel with M8 bolts.
3. Detailed design. Fixing design is subject to detailed design by a specialist fixings designer at RIBA Stage 5, manufacturing design.

320 Terracotta restraint/support fixings

1. Standard: To BS EN 1990 to 1999
2. Manufacturer: Leviat, A1/A2 Portland Close, Houghton Regis, LU5 5AW. Tel. 01582 470 300. Email. info@leviat.com
   2.1. Product reference: Ancon bespoke fixings
   2.2. Size: Sizes to be agreed
3. Detailed design. Fixing design is subject to detailed design by a specialist fixings designer at RIBA Stage 5, manufacturing design.

325 Terracotta parapet wall bed joint reinforcement

4. Standard: To BS EN 1990 to 1999
5. Manufacturer: Leviat, A1/A2 Portland Close, Houghton Regis, LU5 5AW. Tel. 01582 470 300. Email. info@leviat.com
   5.1. Product reference: Ancon Masonry Reinforcement. AMR/S/D3.0/150
   5.2. Size: 150mm wide x 3mm diameter.

330 Recording profiles

1. Profiles: Take measurements from existing masonry units to allow accurate matching of replacements.
2. Recording in situ: Use a metal profile gauge unless existing joints are open to allow tracings to be made on card. Do not cut out mortar joints to produce templates
3. Drawings and templates: Prepare as necessary. Templates must be clearly and indelibly marked to identify use and location.
4. Produce drawings at full scale indicating the existing weathered profile and the original profile
5. Obtain written approval of all profiles.

335 Inspection of drawings, templates, casts, etc

1. Timing: Before starting production of masonry units associated with the following items:
2. New Yorkstone copings
3. Period of notice (minimum): 3 days

J21 Mastic asphalt roofing/finishes

J21 Mastic asphalt roofing/finishes

To be read with AKS Ward design drawings and specification.

Clauses

5 Site Context

UCL Student Union Building at 25 Gordon Street is of historic interest and lies within the London Borough of Camden, Bloomsbury Conservation Area. The building is not a listed building in accordance with the Planning (Listed Buildings and Conservation Areas) Act 1990. The building is believed to have been built in the early 1900s and is built in red brickwork with architectural details and enrichment in a buff coloured architectural terracotta.

The terracotta is a traditional handmade moulded hollow block which is infilled with clinker concrete and terracotta tiles on the balcony soffit. The terracotta is a buff sandstone colour. Past abrasive cleaning and textured the original smooth unglazed surface.

The balcony slab appears to be an unreinforced lightweight clinker concrete encasing twelve structural steel beams, arranged as small I-beam sections supported by a curved I-beam bracket. The structural steel supports are concealed within the large terracotta consoles (large, scrolled brackets). The balcony soffit is clad with terracotta tiles which may have been used as a permanent formwork for casting the balcony slab, although limited intrusive investigation works indicates the terracotta may have been applied to the balcony soffit using a mortar. The junction between the façade wall and balcony soffit is enriched with a terracotta egg and dart bandcourse which extends around the consoles.

The balcony parapet wall is built in terracotta blocks in stretcher bond, with two lines of blocks, one facing outward and one facing inward. The wall is capped with a terracotta coping.

The balcony is waterproofed with asphalt with very low falls towards two central outlets.

The balcony has suffered extensive past damage and poorly executed repair above the central entrance. The balcony slab may have been replaced in this area and the entire cornice has been removed and crudely replaced with in-situ concrete. Extensive damage is present on the terracotta soffit tiles, egg and dart course, coping and consoles. There is localised damage on the parapet wall blocks.

The terracotta was original built with a low strength Portland cement mortar.

The proposed works include replacement of the balcony slab, repairing existing corroded support beams, replacing existing damage terracotta with new traditional handmade terracotta to match original details, laying a lightweight cement/Lytag balcony screed, laid to falls, installing new drainage outlets, installing conduits for cables and lightning conductors which pass through the balcony slab and installing a new mastic asphalt waterproof surface with heritage grey solar reflective paint.

Types of coating/ paving

100 Mastic asphalt roofing

1. Location: First floor balcony
2. Substrate: Lightweight cement/Lytag screed finished with a smooth cement sand finish laid to 1:80 falls towards 2nr cast iron rainwater outlets. Refer to specification sections M10 and R10
    2.1. Preparation: New concrete slab is to be textured/roughened to provide a key for the bonded screed
3. Vapour control layer: None required
4. Insulation: None required
5. Overlay: Not applicable
6. Separation layer: Not applicable
    6.1. Laps: N/A

7. Coating: Mastic asphalt
    7.1. Manufacturer: Briggs Amasco
    7.2. Product reference: Flexiphalte Pommar
    7.3. Application: 20mm nominal thickness in two coats applied over Flexiphalte Baryprene high performance polymer modified membrane
    7.4. Primer: refer to clause 300.
8. Surface protection: solar reflective paint as clause 320
9. Accessories: Harmer cast iron roof drainage spigot outlets as specification section R10

105 Skirtings/vertical work

1. Location: First floor balcony
2. Substrate: Surrounding brick walls and terracotta balcony parapet wall
    2.1. Preparation: Clean brickwork to remove all organic growth
3. Separating layer: Not applicable
4. Keying: Briggs Amasco primer. Refer to clause 300.
5. Coating: Mastic asphalt
    5.1. Manufacturer: Briggs Amasco
    5.2. Product reference: Flexiphalte Pommar
    5.3. Application: 20mm nominal thickness in two coats applied over Flexiphalte Baryprene high performance polymer modified membrane
    5.4. Height above roof finish; 150mm
    5.5. Fillet profile: 45 degree angle, 40mm minimum width on face
6. Surface protection. Solar reflective paint as clause 320

110 Control samples

1. Type of mastic asphalt: mastic asphalt balcony surface
2. Sample area:
3. Location: to be agreed on site
4. Details: 5m2 area
5. Approval of appearance: Obtain before proceeding

Performance

200 Roof performance

1. General: Secure, free draining and weathertight.

Products

300 Primer for concrete screed

1. Type: Adhesive primer.
2. Manufacturer and product reference: As recommended by Briggs Amasco.

305 Bonding compound

1. Type: Bitumen to BS 3690.
2. Manufacturer and product reference: As recommended by Briggs Amasco.

310 Cable conduits

1. Locations: At locations to be agreed with the client. Conduits need to be fixed to the screed before asphalt is applied.
2. Type: Axter 50mm diameter or 100mm diameter cable penetration unit.
3. Manufacturer: Axter Ltd, Harbour Landing, Fox's Marina, The Strand, Wherstead, Ipswich IP2 8NJ. Tel. 01473 724 056. info@axterltd.co.uk www.axter.co.uk

315 Lightning conductor conduits

1. Locations: 2nr locations where existing lightning conductor tapes are located.
2. Type: Axter 50mm diameter cable penetration unit with plastic cowling removed.
3. Manufacturer: Axter Ltd, Harbour Landing, Fox's Marina, The Strand, Wherstead, Ipswich IP2 8NJ. Tel. 01473 724 056. info@axterltd.co.uk www.axter.co.uk

320 Solar reflective paint

1. Manufacturer: Corline Coatings Ltd, 53 Old Church Lane, Stanmore, Middlesex HA7 2RG. Tel 020 8420 6488. Email frdmphl@oal.com

    1.1. Product reference: Dugganite, Heritage Grey solar reflective paint

325 Lytag concrete screed

1. Description: Screed to be laid to create a 1:80 fall towards 2nr cast iron rainwater outlets. Refer to specification section M10.

330 Adverse weather

1. General: Do not lay mastic asphalt in wet or damp conditions unless effective temporary cover is provided over working area.
2. Unfinished areas of the roof: Keep dry.

335 Incomplete work

1. Daywork joints in warm roofs and edges of phased roofing: Adequately protected and fully weathertight.

340 Applying primers

1. Coverage per coat (minimum): 1 L/m^2.
2. Surface coverage: Even and full.
3. Coats: Fully bonded. Allow volatiles to dry off thoroughly between coats.

345 Suitability of substrates

1. Substrates generally:

    1.1. Secure, even textured, clean, dry and frost free.

2. Preliminary work: Completed including

2.1. Chases (minimum): 25 x 25 mm.

2.2. External angles: Chamfered where required to maintain full thickness of mastic asphalt. – Formation of upstands and kerbs.

2.3. Grading to correct falls.

2.4. Movement joints.

2.5. Penetrations/ Outlets.

3. Moisture content and stability of substrate: Must not impair integrity of roof.

350 Removing existing mastic asphalt

1. Areas to be removed: existing balcony surface
2. Existing Roof: balcony concrete slab to be demolished and replaced once asphalt has been removed

355 Keying to existing brickwork

1. Joints: Sound and flush pointed.
2. Surface protection: Clean and apply proprietary high bond primer.

360 Laying vapour control layer

1. Attachment: Secure

1.1. Bond: Continuous with no air pockets.

1.2. Appearance on completion: Smooth.

2. Side and headed laps: Seal using materials and method recommended by membrane manufacturer. Joints in second layer (if any): Stagger by half a sheet.
3. Upstands, kerbs, and other penetrations: Enclose edges of insulation. Fully seal at abutment by bonding or taping.

365 Separating layer

1. Give notice: Where it is or becomes apparent that a separating layer is required.

Asphalting

400 Hot works

1. Permits: ensure a hot works permit is obtained from UCL before works commences.
2. Restrictions: ensure all hot work is carried out in accordance with the agreed methodology and hot works permit

405 Delivery

1. Condition of mastic asphalt as delivered to site: – Hot prepared, do not remelt on site.

410 Transport

1. Transport distances: Minimize to avoid excessive cooling of molten mastic asphalt.
2. Buckets, barrows or dumpers used for mastic asphalt: Line with minimum quantity of fine inert dust. Use silica or similar acid resisting dust where acid resisting mastic asphalt is being used.

415 Localised heating

1. Permits: ensure a hot works permit is obtained from UCL before works commences.
2. Restrictions: ensure all hot work is carried out in accordance with the agreed methodology and hot works permit
3. Blowlamps and gas torches: Use only types with controlled gradual heating during laying, removal and repair of mastic asphalt.

420 Laying mastic asphalt

1. Standard: To BS 8218.
2. Application:
   2.1. In bays to even thickness.
   2.2. Re-heated asphalt: Do not use.
3. External angles, junctions, and tuck-ins: Maintain full thickness of asphalt. Fillets at internal angles: Solid, fully fused to asphalt coating.
4. Previously laid coats: Protect whilst exposed.
5. Successive coats:
   5.1. Timing: Apply without delay and within same working period.
   5.2. Coats: Apply at right angles to preceding.
   5.3. Stagger joints between bays in consecutive coats (minimum): 75 mm. Condition of contact edges of previously laid bays: Warm and clean.
6. Blowing: Pierce and make good affected areas while mastic asphalt is still at working temperature.
7. Completion: During final floating operation, whilst asphalt is still warm, apply sand to horizontal surfaces and rub in well using wooden float. Remove surplus material.
8. Surface condition at completion: Firmly adhered, weatherproof and free draining.

425 Mastic asphalt skirting and vertical work

1. Top edge: Tuck into 25 x 25 mm continuous splayed chase or groove. External angles: Maintain full thickness of asphalt.
2. Splayed top: Form to shed water away from substrate.

Surfacing

500 Applying solar reflective paints

1. Number of coats: 2
   1.1. Coverage per coat: 7 m^2/L.
2. Surface coverage: Even and full.
3. Coats: Fully bonded.

Completion

600 Inspection

1. Interim and final roof inspections: Submit reports.

605 Electronic roof integrity test

1. Testing authority: Independent tester (i.e. TCG)
2. Timing of test: Before applying solar reflective paint.
3. Condition of roof prior to testing:
    3.1. Complete to a stage where integrity can be tested.
    3.2. Surface: Clean.
4. Test results and waterproof integrity certificate: Submit on completion of testing.

610 Completion

1. Roof areas: Clean.
    1.1. Outlets: Clear.
2. Work necessary to provide a watertight finish: Complete.
3. Storage of materials on finished surface: Not permitted.
4. Completed mastic asphalt roof coating: Do not damage. Protect from petroleum based solvents and other chemicals, traffic and adjacent or high level working.

615 Subcontractor employed

1. The Briggs Amasco will be held responsible for the performance of the Flexiphalte Roofing specification and for the execution of all works including all waterproofing, insulation and any vapour control layer.
2. Briggs Amasco shall design all details which shall be approved by the Main Contractor and CA. Briggs Amasco so employed by the Main Contractor shall have professional indemnity cover of 10m Euros.

620 Guarantee

1. A guarantee is required on the installation
2. Such guarantee must include the following:
3. Completely undivided responsibility between asphalt manufacturer and installer.
4. Cover for defects in design as well as workmanship and materials.
5. Cover for consequential damage in the event of water ingress being proved to be due to defective design, workmanship or materials in the Flexiphalte Roofing System.
6. The guarantee period for 20 years.

625 Annual inspection/maintenance

1. As with all waterproofing and surfacing systems, proper maintenance is essential to obtain maximum performance and ensure the longest life expectancy for the Flexiphalte system as a whole.

2. It is an integral part of the guarantee. Any deficiencies should be reported immediately to Briggs Amasco. BS 6229: 2003 gives guidance on the content of maintenance manuals and the scope and frequency or routine maintenance inspections applicable to flat roofing. All Flexiphalte installations should be inspected at least once each year.

3. Ideally, there should be inspections in Spring and Autumn, to enable the effects of annual extremes of weather to be checked. Roofs exposed to high levels of pollution or in close proximity to trees require more frequent inspection.

4. An inspection/maintenance Contract can be arranged with the installing Branch of Briggs Amasco following the defects liability period.

M10 Cement Sand Screed

M10 Cement sand screed

To be read with AKS Ward design drawings and specification.

Clauses

5 Site Context

UCL Student Union Building at 25 Gordon Street is of historic interest and lies within the London Borough of Camden, Bloomsbury Conservation Area. The building is not a listed building in accordance with the Planning (Listed Buildings and Conservation Areas) Act 1990. The building is believed to have been built in the early 1900s and is built in red brickwork with architectural details and enrichment in a buff coloured architectural terracotta.

The terracotta is a traditional handmade moulded hollow block which is infilled with clinker concrete and terracotta tiles on the balcony soffit. The terracotta is a buff sandstone colour. Past abrasive cleaning and textured the original smooth unglazed surface.

The balcony slab appears to be an unreinforced lightweight clinker concrete encasing twelve structural steel beams, arranged as small I-beam sections supported by a curved I-beam bracket. The structural steel supports are concealed within the large terracotta consoles (large, scrolled brackets). The balcony soffit is clad with terracotta tiles which may have been used as a permanent formwork for casting the balcony slab, although limited intrusive investigation works indicates the terracotta may have been applied to the balcony soffit using a mortar. The junction between the façade wall and balcony soffit is enriched with a terracotta egg and dart bandcourse which extends around the consoles.

The balcony parapet wall is built in terracotta blocks in stretcher bond, with two lines of blocks, one facing outward and one facing inward. The wall is capped with a terracotta coping.

The balcony is waterproofed with asphalt with very low falls towards two central outlets.

The balcony has suffered extensive past damage and poorly executed repair above the central entrance. The balcony slab may have been replaced in this area and the entire cornice has been removed and crudely replaced with in-situ concrete. Extensive damage is present on the terracotta soffit tiles, egg and dart course, coping and consoles. There is localised damage on the parapet wall blocks.

The terracotta was original built with a low strength Portland cement mortar.

The proposed works include replacement of the balcony slab, repairing existing corroded support beams, replacing existing damage terracotta with new traditional handmade terracotta to match original details, laying a lightweight cement/Lytag balcony screed, laid to falls, installing new drainage outlets, installing conduits for cables and lightning conductors which pass through the balcony slab and installing a new mastic asphalt waterproof surface with heritage grey solar reflective paint.

Types of screed

100 Lightweight bonded screed roof screed

1. Location: First floor balcony
2. Purposed: The screed to be laid to achieve a 1:80 roof drainage fall towards the balcony rainwater outlets.
3. Substrate: Structural concrete slab
   - 3.1. Preparation: remove surface laitance from new concrete slab by grinding to create a textured surface. On-tool dust extraction must be used.
   - 3.2. Bonding agent. Ronarfix SBR (screeds) mixed 1 part Ronarfix SBR with 1 part OPC. Apply at a rate of 3-1-4m2 per litre of Ronarfix SBR. Ensure screed basecoat is applied to the wet bonding coat.
4. Basecoat: 1 part OPC and 8 parts 4/8mm Lytag lightweight aggregate

5. Levelling: Basecoat and finish coats are to be laid to achieve a 1:80 fall towards the drainage outlets.
6. Finish coat: 1 part OPC and 4 parts washed sharp sand graded from 2.36mm down. Finish coat to be 15mm thick

210 Suitability of the substrate

1. General:
   1.1. Suitable for specified levels and flatness/ regularity of finished surfaces. Consider permissible minimum and maximum thicknesses of screeds.
   1.2. Sound and free from significant cracks and gaps.
   1.3. Concrete strength: Minimum 25N/mm² in accordance with BS 8204-1
2. Cleanliness: Remove debris and dirt.
3. Moisture content: To suit screed type. New concrete slabs to receive fully or partially bonded construction must be dried out by exposure to the air for minimum six weeks. Rooms and buildings without a basement are to be sealed against rising dampness in compliance with the relevant standard.

215 Surface hardness of substrates to receive the bonded screed

1. General: Substrates must restrain stresses that occur during setting and hardening of wearing screeds.
2. Test for surface hardness: To BS EN 12504-2 using a rebound hammer with compliance values as follows:
3. Rebound hammer value (minimum):
4. Screed thickness 15 mm or less: Not applicable
5. Screed thickness greater than 15 mm: 30.
6. Report: Submit details of areas where substrate surface hardness does not comply with these values

230 Control samples

1. General: Complete areas of finished work and obtain approval of appearance before proceeding
2. Screed type: Polymer Modified Cement

260 Fully bonded construction

1. Preparation: Generally, in accordance with manufacturer's instructions
2. Texture of Surface: suitable to accept screed and achieve a full bond over complete area.
3. Bonding coat: Ronarfix SBR (screeds) mixed 1 part Ronarfix SBR with 1 part OPC. Apply at a rate of 3-1-4m2 per litre of Ronarfix SBR. Ensure screed basecoat is applied to the wet bonding coat. Please consult manufacturer's data sheet.

330 Mixing

1. Water content: as per manufacturer's instructions, typically 4.5ltrs per 25kg bag.
2. Mixing: Mix materials thoroughly to uniform consistency using paddle and drill mixer. Do not use a free fall drum type mixer.
3. Consistency: Use while material is still in a fluid state.

Laying

345 Levelling of screed surfaces

1. Set up datums so that screed can be laid to achieve a 1:80 fall towards the drainage outlets.
2. Ensure the gradient in even and the finish surface is straight and free from hollows or bulges so that the surface is suitable to achieve a consistent gradient in the mastic asphalt finish.

405 Joints in the screed

1. Laying screeds: Lay continuously using 'wet screeds' between strips or bays. Minimize defined joints.
2. Joint Sealant: Not applicable

Finishing/curing

510 Finishing generally

1. Timing: Carry out all finishing operations at optimum times in relation to setting and hardening of screed material.
2. Prohibited treatments to screed surfaces:
3. Wetting to assist surface working
4. Sprinkling cement

540 Trowelled finish to the screed finishing coat

1. Floating: To an even texture with no ridges or steps.
2. Trowelling: To a uniform, smooth but not polished surface, free from trowel marks and other blemishes, and suitable to receive specified flooring material.

650 Curing

1. General: Prevent premature drying. Immediately after laying, protect surface from wind, draughts and strong sunlight.
2. Drying after curing: Allow screeds to dry gradually. Do not subject screeds to artificial drying conditions that will cause cracking or other shrinkage related problems

R10 Rainwater Drainage Systems

R10 Rainwater drainage systems

To be read with AKS Ward design drawings and specification.

Clauses

5 Site Context

UCL Student Union Building at 25 Gordon Street is of historic interest and lies within the London Borough of Camden, Bloomsbury Conservation Area. The building is not a listed building in accordance with the Planning (Listed Buildings and Conservation Areas) Act 1990. The building is believed to have been built in the early 1900s and is built in red brickwork with architectural details and enrichment in a buff coloured architectural terracotta.

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The balcony slab appears to be an unreinforced lightweight clinker concrete encasing twelve structural steel beams, arranged as small I-beam sections supported by a curved I-beam bracket. The structural steel supports are concealed within the large terracotta consoles (large, scrolled brackets). The balcony soffit is clad with terracotta tiles which may have been used as a permanent formwork for casting the balcony slab, although limited intrusive investigation works indicates the terracotta may have been applied to the balcony soffit using a mortar. The junction between the façade wall and balcony soffit is enriched with a terracotta egg and dart bandcourse which extends around the consoles.

The balcony parapet wall is built in terracotta blocks in stretcher bond, with two lines of blocks, one facing outward and one facing inward. The wall is capped with a terracotta coping.

The balcony is waterproofed with asphalt with very low falls towards two central outlets.

The balcony has suffered extensive past damage and poorly executed repair above the central entrance. The balcony slab may have been replaced in this area and the entire cornice has been removed and crudely replaced with in-situ concrete. Extensive damage is present on the terracotta soffit tiles, egg and dart course, coping and consoles. There is localised damage on the parapet wall blocks.

The terracotta was original built with a low strength Portland cement mortar.

The proposed works include replacement of the balcony slab, repairing existing corroded support beams, replacing existing damage terracotta with new traditional handmade terracotta to match original details, laying a lightweight cement/Lytag balcony screed, laid to falls, installing new drainage outlets, installing conduits for cables and lightning conductors which pass through the balcony slab and installing a new mastic asphalt waterproof surface with heritage grey solar reflective paint.

100 Scope of work

The scope of work I includes the installation of two new cast iron rainwater outlets on the balcony.

The outlets are to be located at the same position as the existing outlets. The outlets have a 50mm diameter screw in spigot outlet which must be cut to length to suit the balcony thickness and connection with the existing cast iron pipes.

It is unclear whether the existing cast iron pipes can be separated to allow connection of the new outlets. If the pipes cannot be separated and/or the internal pipe collar diameter is too small for the new outlets both existing cast iron rainwater pipes should be replaced with new cast iron. A specification clause is provisionally included for this work.

Products

316 Cast iron balcony outlets

1. Standard: BS EN 877 and BS 416
2. Manufacturer: Alumasc Water Management Solutions, Station Road, Burton Latimer, Kettering NN15 5JP. 01536 383 810 www.harmerdrainage.co.uk
3. Product reference: Harmer vertical threaded outlet with domical grate (product code C200T) with 600mm long threaded spigot adapter cut to length (product code 2ADP/600_
   1.1 Profile: Cone shaped with round outlet
   1.2 Jointing type: threaded spigot.
   1.3 Nominal size: 50mm diameter.
4. Finish as supplied:
5. Accessories: threaded spigot adapter as above.

316 Cast iron downpipes

6. Standard: BS 460.
7. Manufacturer: Harrison Thompson & Co Ltd, Yeoman House, Whitehall Estate, Whitehall Road, Leeds LS12 5JB. Tel 0113 279 5854. www.rainguard.co.uk.
8. Product reference: Round with plain round ears.
   1.4 Profile: Round.
   1.5 Jointing type: Spigot and socket.
   1.6 Nominal size: 75mm but check on site once balcony outlets installed
9. Finish as supplied: Primary coating, to receive paint finish to be specified if required.
10. Fixings: Downpipe nails driven into end grain oak plugs set into masonry wall.
11. Size: to downpipe.
12. Accessories: downpipe shoe.

Execution

600 Preparation

1. Work to be completed before commencing work specified in this section:
2. Below ground drainage. Alternatively, make temporary arrangements for dispersal of rainwater without damage or disfigurement of the building fabric and surroundings.
3. Painting of surfaces which will be concealed or inaccessible.

605 Installation generally

1. Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
2. Plastics and galvanized steel pipes: Do not bend.
3. Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
4. Protection:
   4.1 Fit purpose made temporary caps to prevent ingress of debris.
   4.2 Fit access covers, cleaning eyes and blanking plates as the work proceeds.

635 Fixing pipework

1. Pipework: Fix securely, plumb and/ or true to line.

2. Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
3. Externally socketed pipes and fittings: Fix with sockets facing upstream.
4. Additional supports: Provide as necessary to support junctions and changes in direction.
5. Vertical pipes:
6. Provide a load bearing support at least at every storey level.
7. Tighten fixings as work proceeds so that every storey is self-supporting.
8. Wedge joints in unsealed metal pipes to prevent rattling.
9. Wall and floor penetrations: Isolate pipework from structure.
10. Pipe sleeves: Not applicable.
11. Masking plates: Fix at penetrations if visible in the finished work.
12. Expansion joint pipe sockets: Fix rigidly to buildings. Elsewhere, provide brackets and fixings that allow pipes to slide.

640 Fixing vertical pipework

1. Bracket fixings: fixed with traditional downpipe nails driven into end grain oak plugs set into the masonry wall.
2. Distance between bracket fixing centres (maximum): to suit pipe lengths.

660 Jointing external pipework

1. Jointing: leave downpipe joints uncaulked. Use small lead wedges to align pipes and prevent rattling.

675 Cutting coated pipework and gutters

1. Cutting: Recoat bare metal

Z21 Mortars & Grouts

Z21 Mortars & Grouts

To be read with AKS Ward design drawings and specification.

Clauses

10 Mortar mixes

1. Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

15 Mortar samples

1. Following approval of a range of aggregate types, mortars samples are to be prepared to confirm colour, texture, and composition.
2. Samples should be prepared as tablets of cured mortar that can be broken in half to allow the mortar to be viewed without surface laitance present.
3. Mortar samples should be approximately 75mm x 75mm x 25mm thick.
4. Samples must be prepared for each aggregate type and source.

25 Sand for lime:sand masonry mortars

1. Type: Sharp, well graded.
   1.1. Quality, sampling and testing: To BS EN 13139.
   1.2. Grading/ Source: As specified elsewhere.

50 Admixtures

1. Admixtures are not to be used in mortars unless specified or agreed in writing by the C.A.

55 Blending aggregates

1. Care must be taken when blending aggregates to ensure that all aggregates within the mortar are clean and well graded and conform to the requirements of BS EN 13139.

65 Natural hydraulic limes: types & suppliers

1. Where mortar mixes specify the use of natural hydraulic lime, the following manufacturers should be used unless agreed in writing by the C.A:
2. Manufacturer: Saint-Astier UK, 75 Cowcross Street, London EC1M 6ELTel: 0203 445 5490
   Contact: Scott Sigal
   2.1. Product reference: NHL 3.5
3. Manufacturer: Castle Cement Ltd, 0121 606 4000
   3.1. Product reference: SOCLI NHL 3.5

70 Hydraulic lime grouts

1. Manufacturer: Cornish Lime, Brims Park, Old Callywith Road, Bodmin, Cornwall PL31 2DZ. Tel. 01208 79 779. www.cornishlime.co.cuk
   1.1. Product reference: Cornerstone Medium Strength Masonry Grout. 1 part NHL 3.5 and 1.5 parts blended aggregate

100 Storage of lime:sand mortar materials

1. Sands and aggregates: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
2. Ready prepared non hydraulic lime putty: Prevent drying out and protect from frost.
3. Non hydraulic lime:sand mortar: Store on clean bases or in clean containers that allow free drainage. Prevent drying out or wetting and protect from frost.
4. Bagged hydrated hydraulic lime: Store off the ground in dry conditions.

105 Making mortars generally

1. Batching: By volume. Use clean and accurate gauge boxes or buckets.
2. Mix proportions: Based on dry sand. Allow for bulking of damp sand.
3. Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
   3.1. Mortars containing air entraining admixtures: Mix mechanically. Do not overmix.
4. Contamination: Prevent intermixing with other materials.

110 Making hydraulic lime:sand mortars

1. Mixing hydrated hydraulic lime:sand: Follow the lime manufacturer's recommendations for each stage of the mix.
   1.1. Water quantity: Only sufficient to produce a workable mix.

115 Ready prepared lime putty

1. Type: Slaked directly from CL 90 quicklime to BS 890, using an excess of water.
2. Maturation: In pits/ containers that allow excess water to drain away.
3. Density of matured lime putty: 1.3 - 1.4 kg/litre.
4. Maturation period before use (minimum): 6 months

120 Site prepared non hydraulic lime:sand mortars

1. Mixing: Mix materials thoroughly by compressing, beating and chopping. Do not add water.
2. Equipment: Roller pan mixer or submit proposals.
3. Maturation period before use (maximum): Seek instructions

125 knocking up non hydraulic lime:sand mortars

1. Knocking up before and during use: Achieve and maintain a workable consistency by compressing, beating and chopping. Do not add water.
   1.1. Equipment: Roller pan mixer or submit proposals.
2. Working time: Within limits recommended by the hydraulic lime manufacturer.

135 Workmanship on site: hydraulic lime mortars

1. Keep tools, equipment, and plant clean at all times to avoid mortar contamination.
2. When using mortar in any repair or reconstruction work, protect exposed surfaces from the effects of rain and the heat of the sun and drying wind. Sections of work should be protected with waterproof ventilated covers that allow air to circulate around the curing mortars but prevent the effects of frost.
3. In warm weather ensure that the surrounding masonry and face of the mortar repair/joints are kept damp for at least 3 days to control mortar curing.

4. In wet and humid weather, the curing and initial set of the mortar may be significantly retarded and the contractor should expect to monitor and protect the mortars throughout to ensure satisfactory curing. Lime mortars must be protected from the weather and effects of frost until the mortar is firm, dry and frost resistant.
5. Recompact mortars once they have stiffened to close up any voids and minor shrinkage cracking taking care not to over work the surface drawing laitance to the surface.
6. Do not re-temper or re-float mortars once the initial set has taken place.

140 Workmanship on site: nonhydraulic lime mortars

1. Keep tools, equipment, and plant clean at all times to avoid mortar contamination.
2. When using mortar in any repair or reconstruction work, protect exposed surfaces from the effects of rain and the heat of the sun and drying wind. Sections of work should be protected with waterproof ventilated covers that allow air to circulate around the curing mortars but prevent the effects of frost.
3. In warm weather ensure that the surrounding masonry and face of the mortar repair/joints are kept damp for at least 7 days to control mortar curing.
4. In wet and humid weather, the curing and initial set of the mortar may be significantly retarded and the contractor should expect to monitor and protect the mortars throughout to ensure satisfactory curing. Lime mortars must be protected from the weather and effects of frost until the mortar is firm, dry and frost resistant.
5. Recompact mortars once they have stiffened to close up any voids and minor shrinkage cracking taking care not to over work the surface drawing laitance to the surface.