Architecture. Conservation. Urban Design. Surveying

Bernard Taylor Partnership Limited
Elizabeth House 486 Didsbury Road Heaton Mersey Stockport SK4 3BS
0161 443 1221 info@btparchitects.co.uk www.btparchitects.co.uk

Condition 3 Material Specification and Methodology

Project Name:	**India House**	Report drafted by:	**Vicky Saunders**
Job No:	**4545**	Material	**Mortar for Brickwork and Terracotta**
Client:	**The Guinness Partnership**	Report Number	**1**
Contractor:	**Recclesia c/o Casey**	Revision	**A**

1. Project Overview

This Method Statement sets out the procedure for repointing the masonry for India House which is a
Grade2*listed building in Manchester, ensuring compliance with historic building conserv ation
principles, BS 7913:2013, and Historic England guidance. The works prioritise retention of original fabric, appropriate mortar composition, and minimal visual disturbance.

India House was built in 1906 for Lloyds Packing Warehouse and the original use was as a shipping warehouse. Currently India House is residential apartments.

The use of traditional materials and methods is essential to preserve the fabric and prevent water ingress.

There has been recent repair undertaken to the terracotta features at roof level, leadwork and roofing around the terracotta features, but more remediation work is required to the roof, as water ingress is occurring.

The structure is designed in Edwardian Baroque Style, with a steel frame with elaborate buff terracotta work and red brick work walls, with a slate roof with large terracotta features on the roof levels. The building is seven-story.

2. Purpose

To carry out necessary repointing works safely and sympathetically, preserving the structural integrity, with appropriate
porosity, and aesthetic character of the listed building while preventing damage to original bricks and terracotta.
To this purpose it is essential to understand the existing mortars.

Directors: M Atkinson BA(Hons), M.Arch, ARB, RIBA. S J Dennis BSc, B.Arch(Hons), ARB, RIBA. E M Denby BA(Hons), M.Arch, ARB, RIBA. L J Beirne BA(Hons), M.Arch(Hons), ARB. RIBA. A (Kwok) Wan BA(Hons), M.Arch, ARB, RIBA. E L Cross BA(Hons). Company No. 4168609.

RIBA Chartered Practice CHAS CfA ISO 14001 CfA ISO 9001

Architecture. Conservation. Urban Design. Surveying

Bernard Taylor Partnership Limited
Elizabeth House 486 Didsbury Road Heaton Mersey Stockport SK4 3BS
0161 443 1221 info@btparchitects.co.uk www.btparchitects.co.uk

The building mortar has been tested, and early cement has been identified in the original samples taken. This is supported by historical evidence in Michells Building Books which cites the use of cement during this period.

An historic mortar analysis has been carried out by M Wormersleys Ltd. Terracotta was bedded on a stronger mix, as the original mortar analysis shows.

The mix for the new mortar must not enable water to be pulled in and it should not exceed the original mortar's ability to pull in water. If an incorrect mix is used on the new mortar, it would remain saturated, grow moss and the mortar would start to leach lime, stain and allow water ingress. The latest pointing is an NHL 3.5 mix; it is staining, has moss growth and water ingress is evident.

Different mortar, if exposed to water, perform differently, and matching the appropriate mix to the existing condition is paramount.

Capillary suction and vapour permeability needs to be the main consideration in the specification.

Following a programme of on-site trials and discussions with Mark Womersley Ltd, Reclessia and BTP Architects, the proposed repair mortars have been refined to achieve the closest practical match to the original material in both appearance and performance. Of the mixes trialled, the following have been approved:

Terracotta – 4 parts brown sand, 2 parts red sand, 1 part hydrated lime and 1 part Portland cement (1:1:6 mix).

Brickwork – 4 parts brown sand, 2 parts red sand, 1 part hydrated lime, 1 part Portland cement and approximately 2% iron oxide pigment (1:1:6 mix).

3. Scope of Works

- Elevations have been surveyed to identify repointing. All the NHL 3.5 pointing to the face of the terracotta is to be removed. The NHL 3.5 mortar mix has been applied to the surface of the joint and is on the face of the terracotta pieces.



Fig 1: Example of terracotta repointing in NHL3.5 Northeast Elevation

Architecture. Conservation. Urban Design. Surveying

Bernard Taylor Partnership Limited
Elizabeth House 486 Didsbury Road Heaton Mersey Stockport SK4 3BS
0161 443 1221 info@btparchitects.co.uk www.btparchitects.co.uk

- Limit repointing to red brickwork
areas demonstrating weathering, failed mortar, or moisture ingress. Sound historic mortar shall remain undisturbed.



Fig 2: Example of lighter over pointing onto original black mortar to red brickwork. Pointing generally in good condition, minor failed areas. Northeast Elevation

- Match new mortar in composition, colour, and texture to original materials, informed by sampling and analysis.

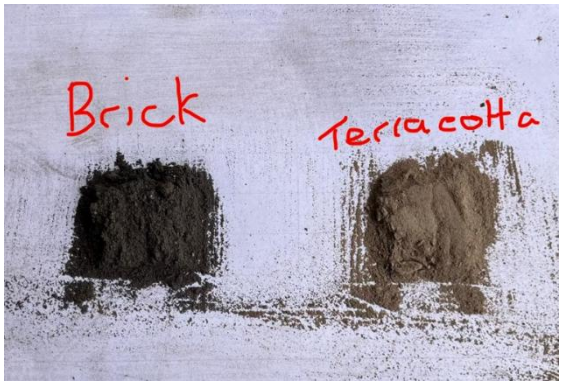


Fig 3: Samples of colours

Image shows the mix proposed to best match the original mortar colours

- Repoint using mortars compatible with original construction.

4. Materials

- Mortar: Approved repair mortars shall comprise:
- Terracotta – 4 parts brown sand, 2 parts red sand, 1 part hydrated lime and 1 part Portland cement (1:1:6).
- Brickwork – 4 parts brown sand, 2 parts red sand, 1 part hydrated lime, 1 part Portland cement with approximately 2% iron oxide pigment (1:1:6).

  These mixes were selected following mortar analysis, site trials and discussions with Mark Womersley Ltd, providing the closest practical match to the original historic mortar in terms of colour, capillary suction, vapour permeability and long-term performance.

- **Replacement Terracotta**: New complete replacement terracotta units to be manufactured by Darwen Terracotta to match the existing profiles, dimensions and detailing. The darker "coffee brown" samples B26072-1170 and B26071-1170 were reviewed on site and are the preferred colour options, providing the closest visual match to the existing weathered terracotta.
- **Water**: Clean potable water.
- **Tools**: Hand chisels, pointing trowels, soft brushes, and dust extraction-connected angle grinders if minimal mechanical intervention is required.



Fig 4: Removal of mortar by hand on Northeast elevation for sample

- **Personal Protective Equipment (PPE)**: Safety boots, gloves, P3 dust respirators, eye protection

5. Methodology

5.1 Preparation

1. Survey and mark areas requiring repointing.
2. Protect adjacent surfaces, including windows, sills, and decorative features.
3. Ensure scaffolding and access comply with health and safety regulations.

5.2 Removal of Existing Mortar

1. Where cement or inappropriate mortar exists, carefully rake out joints using hand tools to avoid damaging soft bricks or stones.
2. Where unavoidable, lightly score joints with an angle grinder fitted with a dust shroud and extraction to limit vibration and dust.
3. Joints should be raked out to approximately three times the joint width or a nominal 20mm depth, maintaining a square cross-section.
4. Vacuum out all loose debris and dust.

5.3 Joint Preparation

1. Thoroughly soak exposed joints with clean water to prevent premature drying and shrinkage of new mortar.
2. Ensure surrounding masonry is damp but not saturated.

5.4 Repointing

1. Apply cement mortar in two layers (butt layers), filling joints completely up to the surface.
2. Compact each layer carefully using wood or plastic battens to eliminate voids.
3. Texture the surface to match historic mortar finish, avoiding recessed or strap pointing.
4. Repointing works will be undertaken across all elevations where required to address inappropriate previous pointing and areas of failed or deteriorated mortar. Sound historic mortar will be retained wherever practicable. Sample workmanship and colour were reviewed on site with Manchester City Council.

5.5 Finishing

1. Brush off excess mortar gently.
2. Keep newly repointed areas moist for initial curing if necessary.
3. Inspect all joints to ensure uniformity and compatibility with surrounding fabric.

5.6 Cleaning Methodology

As part of the conservation strategy, all terracotta elements above parapet level shall be carefully cleaned using the Thermatech superheated steam cleaning system. The cleaning methodology has been developed following on-site trials undertaken by Recclesia Ltd and forms part of the proposed materials and workmanship reviewed with Manchester City Council during the site inspection in support of the discharge of Condition 3.

The objective of the cleaning process is to remove organic growth, airborne pollutants and superficial surface deposits whilst preserving the original fired weathering surface of the terracotta. The cleaning methodology has been specifically selected to avoid abrasion or damage to the historic fabric and therefore no abrasive media or chemical cleaning products will be used.

Trial Cleaning

Representative cleaning trials were undertaken to Chimney 208-2, selected as a typical example of the condition of the roof-level terracotta.

The trials evaluated the Thermatech system at:

- 125°C @ 110 bar
- 140°C @ 110 bar
- 150°C @ 110 bar

The trial demonstrated that:

- **125°C** removed some biological growth but left significant residual soiling.
- **140°C** substantially improved the cleaning performance, although minor deposits remained.

- **150°C** provided the optimum result, successfully removing organic growth and the majority of superficial deposits whilst causing no damage whatsoever to the original terracotta surface. Inspection confirmed no evidence of friability, loss of weathering surface or increased surface absorption.

Relationship with Repointing

The cleaning trials also confirmed that previous inappropriate over-pointing creates visible "ghosting" around the joints. Consequently, where later cementitious pointing is to be removed, cleaning shall generally be undertaken after, or in conjunction with, the raking out of these mortar joints to achieve a consistent appearance. This forms part of the approved repointing works and does not represent additional intervention beyond the agreed conservation scope.

Limescale Staining

Some historic lime leaching and limescale staining is expected to remain following steam cleaning. Chemical cleaning has deliberately not been proposed, as this would introduce unnecessary risk to the historic fabric. Remaining mineral staining will therefore be left to weather naturally over time as part of the building's continued ageing process.

Approved Cleaning Specification

The proposed cleaning methodology is therefore:

- Equipment: Thermatech superheated steam cleaning system.
- Operating temperature: 150°C
- Operating pressure: 110 bar
- Cleaning medium: Superheated steam only (no abrasive media).
- Chemicals: None.
- Monitoring**:** Each terracotta element shall be monitored throughout the cleaning process to ensure the achieved finish remains consistent with the approved trial panel.

The approved trial panel is presented as the benchmark for the cleaning of all terracotta elements above parapet level.

6. Health, Safety, and Environmental Considerations

- All work conducted in accordance with COSHH regulations where appropriate.
- Minimise dust creation and manage debris responsibly.
- PPE must be worn at all times during masonry and mortar handling.

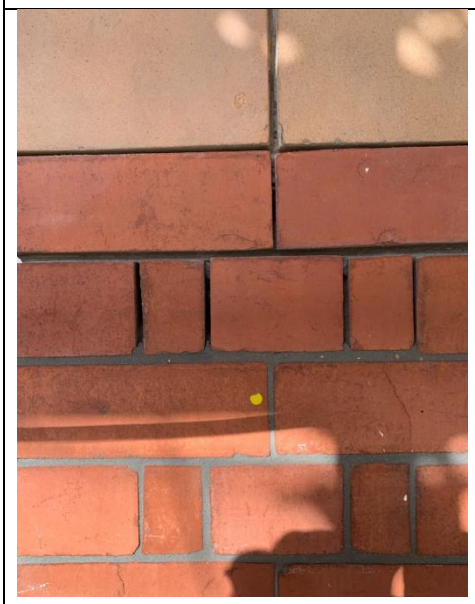
7. Quality Control

- Samples of new mortar should be approved prior to commencement.
- Final inspection will confirm visual match, mortar adhesion, and absence of damage to historic fabric.
- Recording and photographic documentation of works applied is recommended to inform future maintenance.

Bernard Taylor Partnership Limited
Elizabeth House 486 Didsbury Road Heaton Mersey Stockport SK4 3BS
0161 443 1221 info@btparchitects.co.uk www.btparchitects.co.uk

- Complete replacement terracotta units shall be manufactured to the colour range established by Darwen Terracotta samples B26072-1170 and B26071-1170, subject to final confirmation by Manchester City Council. Replacement units shall be checked against the approved sample and adjacent historic fabric prior to installation.
- Cleaning shall be undertaken using the Thermatech superheated steam cleaning system. Whilst the original cleaning trial established that 150°C at approximately 110 bar achieved the optimum results on the trial panel, the operative shall adjust the operating temperature and pressure as necessary to suit the varying condition of the terracotta across the building. No abrasive media or chemical cleaning products shall be used at any stage.

8. Outcomes: Photographic evidence of repointing samples

Fig 1:	**Fig 2:**
	
Red brick sample panel	Terracotta sample panel

Bernard Taylor Partnership Limited
Elizabeth House 486 Didsbury Road Heaton Mersey Stockport SK4 3BS
0161 443 1221 info@btparchitects.co.uk www.btparchitects.co.uk

9. References

- Historic England, *Repointing Brick and Stone Walls* (HEAG144)
- BS 7913:2013 *Guide to the Conservation of Historic Buildings*
- Listed Building Maintenance Guidance, Communities NI
- Case-specific pre-works survey reports and mortar analysis.

This Method Statement ensures that repointing is executed in a manner that respects historical fabr ic, preserves visual authenticity, and maintains the structural and porosity characteristics of the mas onry.

Directors: M Atkinson BA(Hons), M.Arch, ARB, RIBA. S J Dennis BSc, B.Arch(Hons), ARB, RIBA. E M Denby BA(Hons), M.Arch, ARB, RIBA. L J Beirne BA(Hons), M.Arch(Hons), ARB. RIBA. A (Kwok) Wan BA(Hons), M.Arch, ARB, RIBA. E L Cross BA(Hons). Company No. 4168609.