Architecture. Conservation. Urban Design. Surveying

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INDIA HOUSE

BTP Job No. 4545

India House survey of high level terracotta features and roof areas adjacent.

Report 3

For Guinness Partnership



6th December 2024

Directors: V J Saunders BA(Hons), B.Arch, ARB, RIBA, SCA, AABC. 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.

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3.0 Roof Condition survey to include, the faience features at high level, small areas of liquid plastic, ubink and leadwork.
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Appendices

1. **Photograph Schedule**
2. **Location Plan.**

1.0 INTRODUCTORY INFORMATION

1.1 India House, Whitworth Street, Manchester, M1 6LG.

1.2 Surveyed By: Vicky J. Saunders BA (Hons), B. Arch, ARB, RIBA, SCA, AABC

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1.3 Inspection carried out on 24th September 2024 with conditions being cold, dry and overcast. Updated following pre application advise and further research.

1.4 The report has been commissioned to evaluate the workmanship to recent repair to the existing Faience features at roof level, leadwork and roofing around faience features. The objective is to assess the course of water ingress in the flats below.

1.5 India House is Grade 2* listed.

1.6 India House is situated on Whitworth Street between Oxford Road and Princess Street. India House has road frontage which is onto Whitworth Street with the River Medlock running to South (rear).

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1.7 India House was built in 1906 for Lloyds Packing Warehouse Ltd, designed by Harry S Fairhurst. The original use was as a shipping warehouse. It was a dominant commercial packing centre in the early 20th Century.

1.8 The structure is designed in Edwardian Baroque Style, with a steel frame with elaborate buff faience work and red brick work walls, with a slate roof with large faience features at roof levels. The building is seven-storeys. Symmetrical elevation with two entrance bays capped by ornate gables. Composition combined the basement and first two storeys into a rusticated base, the main order comprised the next four storeys, while above the cornice is a further storey with more decorative detailing.

Extract from Listed Building register:
Heritage Category: Listed Building
Grade: II*
List Entry Number: 1254836
Date first listed: 02-Oct-1974
List Entry Name:
INDIA HOUSE (INCLUDING ATTACHED WROUGHT IRON GATEWAY LINKED TO LANCASTER HOUSE)
Statutory Address:
INDIA HOUSE (INCLUDING ATTACHED WROUGHT IRON GATEWAY LINKED TO LANCASTER HOUSE), 73 AND 75, WHITWORTH STREET

Details

Packing warehouse, converted as apartments 1988-9. Dated 1906, built between 1905 and 1912; by Harry S.Fairhurst. Steel-framed, with cladding of buff terracotta and red brick with buff terracotta dressings (roof concealed). Large rectangular plan. Edwardian Baroque style. Six storeys with basement and attic, 3:4:6:4:3 windows at 1st floor, symmetrical; rock-faced plinth, channelled buff terracotta to ground and 1st floors with mutuled cornice on brackets (a cartouche under this at each corner lettered "INDIA HOUSE"), giant arcades to the next 4 floors with brick pilasters, very heavily enriched terracotta frieze (swags, volutes, cartouches, etc.) and modillioned cornice, and attic treated as a parapet. The strong horizontal emphasis of the facade is relieved by vertical features flanking the 6-bay centre: these have entrances at ground floor with elaborate surrounds of grey ashlar including large semi-circular open pediments with mutules over recessed doorways with flanking Ionic semi-columns, and panelled side-bays under mutuled cornices supported by cartouches (lettered "73" and "75" respectively); canted bay windows of terracotta tiered from 2nd to 5th floors, with various forms of enrichment including corbelled plaques at the top lettered "1906", and flanked by broad banded terracotta pilasters; and attics under hefty semi-circular open pediments with mutules and cartouches. The other bays have segmental-headed windows at 1st floor, round-headed at 5th floor, and square-headed elsewhere, mostly containing 3-light sashes and mostly also with triple keystones; and the attic has low recessed 3-light windows. Return walls similar. Attached at the left end, and linked to No.71 (Lancaster House), is a large gateway composed of double gates with ramped tops and

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semicircular 4-strand overthrow forming a complete circle from the apex of which is suspended a slender lamp in Art Nouveau style. Forms group with Nos 67 to 71 (Lancaster House) to the left (q.v.), with Refuge Assurance building to the right (Oxford Road, q.v.), and with Nos 58 to 60 (Bridgewater House) opposite (q.v.). Interior not inspected.

1.9 Lloyds packing warehouses background information

Lloyd's Packing Warehouses Limited was founded in 1896 when three established packers for the Manchester export trade joined forces. The company was created following observations in the existing way in which packers worked in the city.



LLOYD'S PACKING WAREHOUSES

LIMITED,

Head Office: 20, Princess Street, Manchester.

PACKING WAREHOUSES

Twelve in Manchester with COMPLETE FACILITIES for MAKING-UP and PACKING all classes of TEXTILES and YARNS for export. Also in BRADFORD, YORKS, and BLACKBURN.

WOODWORKING FACTORIES

With most modern equipment for making CASES, BOXES, and LAPPING BOARDS, for export and home trade use.

WATERSIDE WAREHOUSES

Including a BONDED STORE, specially constructed and adapted for the STORAGE, HANDLING, FORWARDING and DISTRIBUTION of all classes of goods, including machinery and foodstuffs, Direct access to the Manchester Ship Canal and the inland waterways of the Kingdom.

WORKS FOR THE MANUFACTURE OF WATERPROOF WRAPPINGS AND LININGS FOR EXPORT BALES AND CASES.

BRANCH SALES DEPARTMENT IN LONDON.

SHIPPING AND FORWARDING OFFICES IN LIVERPOOL AND MANCHESTER.

2.0 EXECUTIVE SUMMARY

Scaffolding has been erected off the footpath to enable the roof level to be inspected. This is an inspection scaffold and not suitable for carrying out works and additional loadings due to carrying out works.

Repair works have been undertaken in 2023/2024 to include re-roofing with slates, patch repointing and leadwork flashing.

This report follows on from the second report issued in Sept 2024, following further site survey and consultations with a lead specialist, terracotta specialist, mortar specialist and Wates photographs showing lead repairs. The report identifies issues with workmanship, materials and historic defects. The repairs listed in this report supersede the repairs identified in the Sept 2024 report.

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Review with a Heritage Contractor: Leadwork
Turret:
A specialist has reviewed the evidence and highlighted areas where one piece of lead had been used instead of a soaker and flashing. See photograph below, although this may be weathering the joint currently, long term it may fail. The photo on the RHS is the damage to the flat below caused by the water ingress. The saturation may lead to dry rot and wet rot.




Photographic evidence has been presented by Wates in a meeting held with Guinness, although no copies of photographs have been forwarded. The photographs show a reasonable sized secret lead gutter beneath the slates. Therefore, water ingress at this junction is unlikely.

Liquid plastic flat roof outlet, central:
There is loose flashing at outlet either side of Tympanum Pediment Chimney Detail, the size of outlet is not sufficient when considering the amount of roof area falling into the flat roof. There is no overflow, an overflow should be introduced, and the outlet needs altering to be larger. There is insufficient depth on the lead covering on the parapet wall at junction with roof, the length of the coverage should be to the 2nd terracotta parapet stone.





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Liquid plastic flat roof:



The liquid plastic roof is delaminating, not laid to falls and is ponding. The materials are not suitable for a Grade 2* listed building. Falls should be introduced and a suitable material such as lead should be used. U bink flashing to plastic roofing joints is opened jointed and an inappropriate colour.



The lead caping which is at lower level than the roof line, this lead caping is a later addition. This caping lacks a soaker and a flashing and relies on a mastic joint. The mastic joint has gaps and cracks which will allow water ingress.

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Tympanum Pediment Chimney:



Details around the chimney area would benefit from protection from the weather to prevent plant growth and water ingress. Area of render are delaminating, and the fire skin of the red bricks is deteriorating and are in poor condition. Removal of plant and vegetation growth is required. The outlet drops to the lower-level flat roof

Generally, the workmanship to the lead is not in accordance with good practice or guidelines, (Rolled lead sheet complete manual.) The location of the terracotta and roof details receives extreme driven weather. Consideration should be given to additional protection afforded by lead to the head of the terracotta details. These pieces are authentic to the building, caping would prevent further deterioration and prevent water ingress into the fabric of the building.

The leadwork around the turret may be part of cause of water ingress but it cannot be conclusive this is whole the cause of the leak. There also has been historic movement as described in the next section.

Review with a Heritage Contractor and Darwen specialist manufacturer: Terracotta

Turrets
The original construction of the pieces would have been expected to have been set out on a 5mm or 6mm joint. It is unlikely to the turret was build with joints between 15 to 20mm, which is the current width of the joints. Some joints exceed this measure. The expansion is due to slight displacement of the pieces due to movement and the possibility of ferrous dowls causing oxide heave. The terracotta

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pieces are generally in reasonable condition al be it some pieces are misaligned. A few pieces have also cracked, they will receive either replacement if necessary or a good quality resin repair. The spreading of the joints is likely to be historic. Sky facing joints are an exposed location, they will pull in moisture and the larger the joint the more moisture will be pulled in. Drawing water into the joints is detrimental to any terracotta.

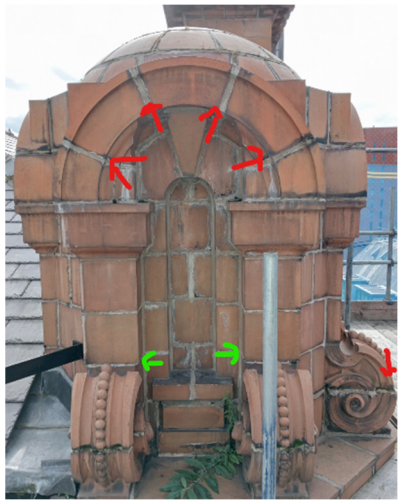
Darwen's specialist manufacturer of terracotta has advised a single replacement is not possible for the following reasons.

1. Multiple pieces bonded together make a stronger unit than one single piece.
2. Limits on physical size of pieces that could be manufactured.
3. Building aesthetics dictating jointing patterns.
4. Defection makes larger pieces more likely to fail.
5. They also commented that the original joints between the dome pieces are very wide, and their width is not recommended. This existing condition is not the best building practice.

One possibly would be resetting the original terracotta pieces; however, this carries risk in terms of damage to the original fabric. Resetting the pieces at 5 to 6mm joints would help the performance of sky facing joints to prevent drawing in moisture, however movement may occur again, and the turret joints may open up overtime again. The current condition could well be repeated even if the terracotta is reset. Stainless steel dowls, stainless steel brick tor and ties will be included in the rebuild to stabilize the turret and will stabilize the pieces to prevent spreading in the feature.
It is not to be encouraged to remove authentic fabric and replace it with new pieces on a Grade 2* building when the terracotta pieces are in reasonable, good condition.

A lead DPC can be introduced in the joints below the section of resetting, and this would prevent the water ingress. This intervention would offer a long-term solution, and it would protect the existing fabric, no harm would be caused by the introduction of the lead as it will not be visible.

The green indicated joints are tighter, and the red indicated joints are wider, there has been spread and movement.



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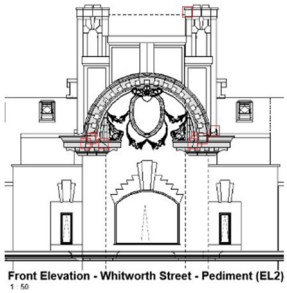
Scaffolding Rash is evident on the building.

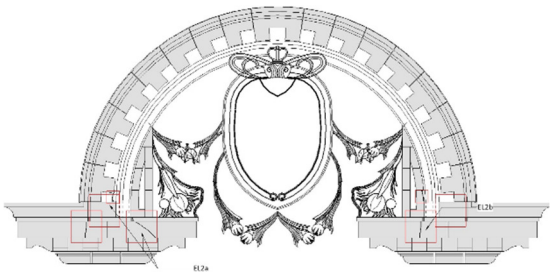
There is evidence of scaffolding tie damage throughout the elevation onto Whitworth Street. Repairs are proposed to be carried out to the terracotta where damaged. Darwen's can make circular 25mm plugs in terracotta which can be inserted into the existing terracotta by the main contractor to carry out patch repairs at the entry points of the scaffold. Consideration can be given to leaving some of the holes to prevent further damage in the future. Stainless steel bolts could be inserted in some of the apertures for future scaffold provision. This would prevent future damage. Below is a scaffolding tie which has been positioned in the joint and file, one which has been left and one drilled into the terracotta.





Tympanum Pediment and Chimney:
Front elevation



There is a variety of joint widths and misalignment. There is cracked terracotta present at the base of the circular feature. This movement is very likely historic movement. There is green staining on the tympanum terracotta. The above photo shows where heavier pieces of terracotta have cracked, and joints have opened due to movement. The movement is likely to be historic. Wider mortar joints pull in moisture more so than thinner joints. Plant growth and green staining is evident. A lead cap on this area would protect the original terracotta and prevent the joint from pulling in water and would protect the wider joints. It would also prevent plant growth.
See photo below which shows the green staining on the Tympanum.

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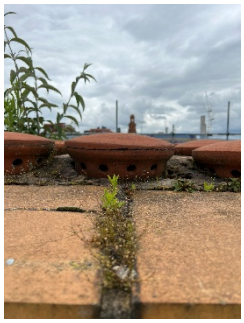
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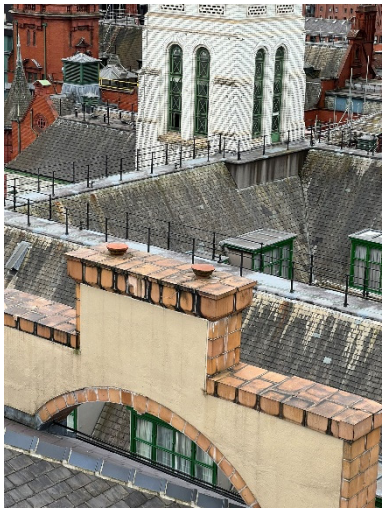




The above photo shows where heavier pieces of terracotta have cracked, and joints have opened due to movement. The movement is likely to be historic. Wider mortar joints pull in moisture more so than thinner joints. Plant growth and green staining is evident. Repointing on this area would protect the original terracotta and prevent the joint from pulling in water.

Chimneys and render


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The above photo shows the various chimneys and render behind the chimney. The terracotta has cracked, and joints show evidence of water ingress. Plant growth and green staining is evident. Sky facing joints are an exposed location, they will pull in moisture and the larger the joint the more moisture will be pulled in. Drawing water into the joints is detrimental to any terracotta. There are cracks in the cementitious mortar at chimney pots and broken chimney pots.

Removal of the 20th Century chimney pots which are not original features and repointing on this area would protect the original terracotta and prevent the joint from pulling in water and would protect the wider joints.

Mortars

Following on the previous reports the mortar has been sampled in various locations please see the summary and refer to the testing reports.

Building techniques at the turn of the century (1900's) by Mark Wormsley

Contractors started using more modern materials than traditional lime mortars as techniques advanced. Which can be seen in the Michells building guide for that period. Using a 1:2 natural cement or hydraulic lime mix would be usual.
The mix found in the original samples was 1:1.5; it may have been a 1:2 specification. What could have happened to increase the strength after the manufacturing process? Not all lime was burnt, and the mix was shipped and sent via canal routes, which took time. The lime could begin to slake, explaining the original stronger mix. OPC cement and natural types of cement are commonly used in buildings from this period.
The mix of the original samples identifies natural cement or hydraulic lime and fine sand at 1:1.5 mix. Historically, terracotta was bedded on a stronger mix, as the original mortar analysis shows. Wates repointed in a softer mix. NHL 3.5 as the specification. The ability for water to pull in would exceed the original mortar's ability to pull in water. Therefore, the new mortar would remain saturated, grow moss and start to leach lime, hence the staining. The original mortar would not pull in the same amount of water.
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 considered in the specification. For example, the original mix with today's materials at a 1 NHL5 :2 sand mix would pull 0.88 grams of water over 1m2 a minute and release 0.55g of water vapour. A 1:1:6 mix after curing when wet would draw 1 grams a minute and release 0.23 grams of moisture an hour, either mix would be suitable and closer in performance to the original specification.
A 1:2:9 mix would be very bad mix as this draws 7 grams of water and release 0.25 grams a minute over 1m2. Also, an NHL3.5 at a 1:2.5 would not be suitable as it pulls 4.7 grams of water and release 0.65 grams a minute over a 1m2.
The sand aggregate also need consideration and should be a third of the width of the joint, say in a 6mm joint it would be better it has a 2mm sized aggregate, a sharper well graded sand would also be beneficial.

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The above proposal using cement has been rejected by the Conservation officer. The proposed mix is one part NHL5 lime, 2 parts sand and 10% trass (Potzolan.)









Above photos show the pointing which has recently been patch repointed, there are open joints, and the new pointing is not a suitable mix. The joints have leached and caused white staining.

The existing yellow render is to remain, at the top of the render junction water needs to be prevented from getting behind the rendered panel. The existing building has been built using natural cement or hydraulic lime, a sample of render was removed, and it brought with it the fire skin of the soft red brick, removal of the render would damage the bricks. The heavy terracotta pieces are built in part of the red brickwork and structurally it would be unwise to remove the mortar, now the mix has been established and the presence of cementitious content.

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3.0 Schedules of Repair (red indicates revisions from Sept 2024 report)

	See section 4.0 for repair codes	**Repair Code**
3.0	**FAIENCE WORK**	
	1. Corner domed faience turret **2. Central arched chimney stack** **3. Two faience chimney stacks** **4. Parapets** **5. Two faience chimney stacks on central tower with semi-circular faience surround with ornate faience detailing.**	
3.01	**Corner domed faience turret** Ornate dome roof with four sides with niche. Scroll feature at base with lead flashings adjoining metal railing feature and slate roof.	
a	The leadwork has a secret gutter, welds are adequate and is adequately fixed. Query the quality of the mastic joint with faience, looks messy.	R1
b	The mortar joints have moss growing out of them and they are large joints, lime is leaching out of the edges and onto the face of the faience.	R2
c	Check faience is securely fixed	R2
3.02	**Central arched chimney stack**	
a	Leadwork was not inspected due to access	R1
b	Lime is leaching out of the edges of the mortar joints and onto the face of the faience.	R2
c	Remove any plants	R3
d	Existing render to remain due to damage caused to fire skin of brickwork	R4
3.03	**Two faience chimney stacks**	
a	Leadwork was not inspected due to access	R1
b	Lime is leaching out of the edges of the mortar joints and onto the face of the faience.	R2
c	Remove any plants	R3
3.04	**Parapets**	
a	The leadwork finishes at the first faience parapet.	R1
b	Lime is leaching out of the edges of the mortar joints and onto the face of the faience.	R2
c	Remove any plants	R3
3.05	**Two faience chimney stacks on central tower with semi-circular faience surround with ornate faience detailing**	
a	The leadwork is loose in places, not clipped, lack of. Query the quality of the mastic joint with faience, looks messy.	R1
b	Lime is leaching out of the edges of the mortar joints and onto the face of the faience.	R2
c	Remove any plants	R3
3.06	**RENDER TO REAR CENTRAL FEATURE**	
a	Render has gaps at the junction with faience	R4

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b	Test the render for cement, if cement is present carefully remove and apply a breathable render mix to be agreed	R4
3.07	**PLASTIC COATED ROOF AND UBINK FLASHING**	
a	Outlet is inadequate in size	R5
b	Debonding on LHS of feature to topcoat	R5
c	Ponding water on LHS of feature, no falls on roof	R5
d	Ubink flashing is black would look better in grey, mastic joint is not neat	R5

4.0 RECOMMENDATIONS AND PRIORITIES

Code			Priority	Cost Guide
R1	Leadwork	- Remove slates and investigate the weathering details below the slates at abutments with faience, consider if a secret gutter can be introduced below the slates to discharge water. - Remove lead where inappropriately fixed and tab remaining lead, rake out silicone on joints and check depth and make sure secured in a welt and re-bed in mastic - Allow for additional flashings where missing - Allow for new flashings over parapet extend to the second joint not the first parapet - Allow for lead DPC to dome and chimneys, remove chimney pots - Allow for lead covering to exposed brickwork and open corners of central features which would benefit from a roof. Allow for formation of small roof to cover the openings. - Allow for stripping off lead to plinth at 6th floor. - Allow for new lead flashing detail with crown rolls. Code 5 allow for all works in accordance with the lead sheet.	A	

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R2	Pointing	- Carefully rake out all mortar above the sixth-floor windows to include all ornate faience detailing, dental courses etc and repoint in in accordance with recommendations from Wormsley - Allow for raking out and repointing of all parapets repoint in in accordance with recommendations from Wormsley - Allow for a gentle clean with Doff cleaning product to all faience - Check all pieces are securely fixed	A	
R3	Vegetation growth	- Remove all vegetation growth, make sure no roots remain and weed kill, check faience for stability	A	
R4	Terracotta repairs	- Carefully repair existing scaffolding rash with scaffolding repairs, 25mm terracotta disk - Allow for broken faience work to be replicated and replaced with facsimile or carry out quality resin repair - Allow for resetting turret and chimneys to reestablish 5 to 6mm joint. Allow for stainless steel dowls, brick tor and ties.	A	
R5	Flat roof sections	- Remove Ubink and plastic roofing, unsuitable material for Grade 2* listed building form TSW base to receive a detailed leadwork with crown rolls, steps etc in Code 5 allow for all works in accordance with the lead sheet manual	A	

TOTAL

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Codes

A: These items are of the utmost priority
B: These items are important and should be addressed within 2 years
O: Observe
M: Monitor

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