BLACKETT-ORD CONSERVATION ENGINEERING

Email: engineering@blackett-ordconservation.co.uk Tel: Appleby (017683) 52572

Technical Advice Note 01

Date: 22nd September 2025

Project: People's History Museum, Manchester **Job No:** B75

Subject: Structural Condition Report **Author:** AR **Check:** CBO

1. Introduction

The People's History Museum in Manchester is located in a former hydraulic pumping station which is grade II listed. The building was constructed in 1907-09 and is one of three that was built as part of a system for supplying hydraulic power to the commercial warehouses in the city centre.

This appraisal report summarises the structural condition of the building at present and provides recommendations for repair in general terms.

This report has been prepared for the sole use of the People's History Museum, their agents and statutory authorities. It is not to be relied upon by any third party and shall not be distributed to other parties, other than statutory authorities or insurers, without the consent of Blackett-Ord Conservation Ltd.

2. Inspection

The building was inspected on Friday 12th September 2025 by Charles Blackett-Ord and Amy Rooke. It was a clear, dry day. Access was made available to all areas of the building by staff from the museum, Shubhankar Anwekar from Donald Insall Associates was also in attendance.

This visit follows an initial visit to inspect and comment on the overhead travelling crane in the Engine Hall on 14th August 2025 – see site inspection report 01.

The survey was limited to a visual inspection. We have not inspected parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.

3. General Description

The former hydraulic power station is constructed of red brick with sandstone dressings. To the east is the former engine room which comprises a two-storey double height space. Adjacent is the open three-storey accumulator tower and octagonal chimney flue. To the

west is the former boiler room which is three storeys in total and still features the original cast iron panelled water tanks.

The duo-pitched slated roof over the engine house is supported on 5No slender wrought iron trusses, one of which has previously been altered to accommodate a lift shaft. There are 4No timber purlins each slope, the upper providing support to a central glass lantern projection.

Over the ground floor former boiler room is a double height space currently used as a conference room. The roof is supported on 3No steel trusses with timber purlins. The trusses are much more substantial in this area, also providing support to 2No crane girders, with the primary triangular frame spanning down to mid-height. There is tubular steel cross bracing between the trusses and purlins which appears to be a more modern intervention.

4. Structural Defects

The following defects are outlined on the accompanying drawing B75-101 and highlighted in the appended photographs.

4.1 Foundations Generally

No trial pits or foundation investigations were carried out at the time of inspection. There were no signs of recent settlement or foundation failure.

4.2 Engine Room

There is evidence of previous movement of the roof structure. The pediment in the east gable leans out at high level by an estimated 50mm and the trusses are racking over in the same direction. The purlins and timber roof boarding have pulled away from the west gable masonry. 3No tie bars with pattress plates have previously been inserted along each roof slope and movement does not appear to be ongoing.

Rust jacking and dislodging of the surrounding masonry was noted at the bearing ends of all the trusses where they bear into the north east wall and 2No of the bearings at the opposite end. On truss No.1 the bearing flanges were missing, likely a result of corrosion. Water ingress is an ongoing issue in this area, evident by the staining and efflorescence on the external walls.

At the bearing of the steel beam over the opening to the accumulator tower there is an area of missing brickwork.

At roof level, there is a corroding iron lintel over the outlet of the parapet gutter with is lifting and cracking the masonry over. Vegetation has also become established under the coping stones in this area causing them to become dislodged. Also on the east gable, another loose coping stone was noted with open joints each side.

4.3 Conference Room 2.06

Diagonal cracking has propagated from the ends of the upper rafter members of the trusses where they bear into the brickwork on the south side. Under the northern bearing of truss No.7 there is a localised area of loose and cracked brickwork. Spalling brickwork was also noted along the eastern jambs of the 2No high level door openings. The brickwork over the southern door appeared to be bulging, although cannot be confirmed due to lack of access.

The cracking and movement was not evident externally. However an open joint was noted between the façade masonry and abutting external brickwork on the south side suggesting it is not adequately tied.

4.4 Water Tanks

The cast iron water tanks are in reasonable condition. They are built of standard cast iron panels with wrought iron stays connecting the panels to the base. The southern tank is a single large open tank currently largely filled with M&E equipment. The northern tanks feature a more complex arrangement on multiple levels. In the lowest tank there are three sets of steel portal frames which provide support to the tank above, comprising the original framework which has been made redundant by the addition of a new modern twin frame.

The original support frames are in very poor condition, particularly the frame adjacent to the east wall where the web of the beam has corroded away leaving only the flanges. The bases of the newer columns are also suffering from corrosion.

The existing inadequate drainage system is currently blocked and vegetation has become established in the base of the tanks.

Below the northern most tank there are 2No steel beam ends that are exposed on the outside of the building.

5. Recommendations

Intrusive investigations will be required to determine the condition of the truss ends over the engine room where they bear into the masonry, particularly truss No.1 where the

flanges appear to be missing. As a minimum allow for cleaning and painting with an anti-corrosion paint system and localised repair of the surrounding cracked and dislodged brickwork.

Localised repointing or repair will also be required to the internal cracked and dislodged brickwork in the conference room following investigations to confirm the condition of the bearings of the steelwork into the masonry. The open joint between the gable façade masonry and south elevation should be packed and repointed. Any additional remedial measures required could be confirmed once access can be provided to allow high level inspection.

The corroding iron lintel should be replaced and the brickwork over made good. Any dislodged coping stones should be rebeded.

The corroded column bases of the water tank support frames will require replacement. There is an existing bolted column splice detail that could be replicated. Consideration should also be given to removing some of the most corroded elements of the original support frames. The exposed steel beams should be cleaned by wire brushing and repainted.

An adequate drainage system should be provided for the water tanks, particularly as the roof downpipes discharge into these, and the vegetation should be removed.

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Photo 1: East Elevation



Photo 2: Pediment Leans Out



Photo 3: West Elevation



Photo 4: Exposed Ends of Steel Beams



Photo 5: Roof Over Former Engine Room



Photo 6: Purlins & Roof Boarding Pulled Away from Gable Masonry - Tie Rods Previously Inserted



Photo 7: Rust Jacking at Bearings of Trusses



Photo 8: Corroding Iron Lintel Dislodging Brickwork Above



Photo 9: Conference Room 2.06



Photo 10: Diagonal Cracking in Brickwork



Photo 11: Bulging Brickwork Over High Level Doorway



Photo 12: Open Joint Between Facade Brickwork and South Elevation



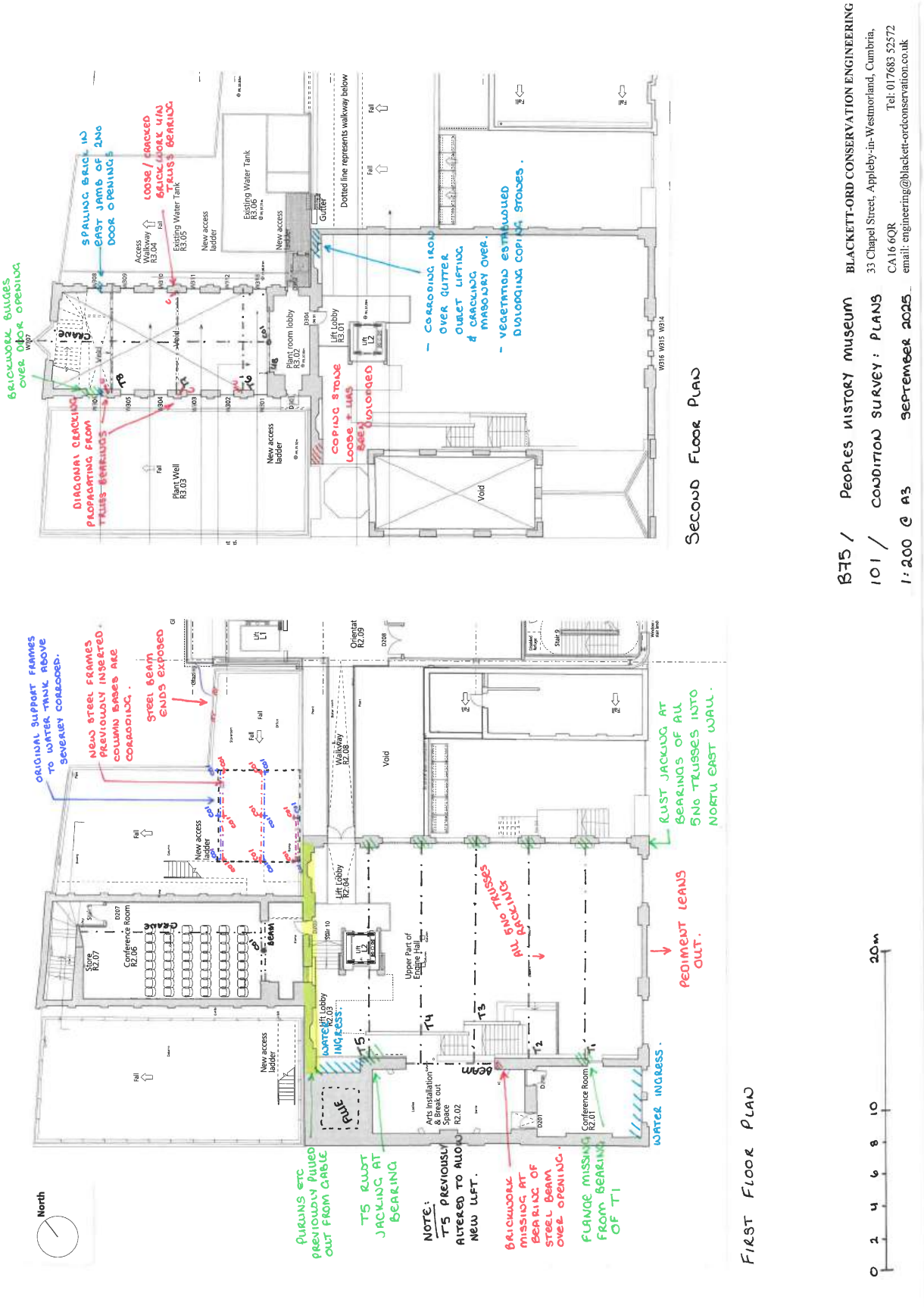
Photo 13: North Low Level Water Tank - Standing Water & Vegetation Established



Photo 14: Corroding Column Bases to Support Frames (Left: New Frame Previously Added, Right: Original Frame)



Photo 15: Severe Corrosion Resulting in Loss of Web of Beam in Original Frame (Left)


BLACKETT-ORD CONSERVATION ENGINEERING
33 Chapel Street, Appleby-in-Westmorland, Cumbria, CA16 6QR
Tel: 017683 52572
email: engineering@blackett-ordconservation.co.uk
875 / PEOPLES HISTORY MUSEUM
101 / CONDITION SURVEY : PLANS
1:200 @ A3 SEPTEMBER 2025
SECOND FLOOR PLAN
FIRST FLOOR PLAN
North
0 2 4 6 8 10 20m
Void
Plant Well R3.03
Plant room lobby R3.02
Lift Lobby R3.01
Existing Water Tank R3.05
Existing Water Tank R3.06
Access Walkway R3.04
New access ladder
Gutter
Dotted line represents walkway below
Lift L1
Lift L2
Orientat R2.09
Walkway R2.08
Lift Lobby R2.04
Lift Lobby R2.03
Store R2.07
Conference Room R2.06
Upper Part of Engine Hall
Arts Installation & Break out Space R2.02
Conference Room R2.01
Stair 9
Stair 10
Cradle
Beam
Pulley
T1
T2
T3
T4
T5
BRICKWORK BULGES OVER DOOR OPENING
DIAGONAL CRACKING PROPAGATING FROM TRUSS BEARINGS
SPALLING BRICK TO EAST JAMB OF 2ND DOOR OPENINGS
LOOSE / CRACKED BRICKWORK VIA TRUSS BEARING
COPING STONE LOOSE + HAS BEEN DISLODGED
- CORRODING IRON OVER GUTTER OUTLET LIFTING & CRACKING MASONRY OVER.
- VEGETATION ESTABLISHED DISLODGING COPING STONES.
ORIGINAL SUPPORT FRAMES TO WATER TANK ABOVE SEVERELY CORRODED.
NEW STEEL FRAMES PREVIOUSLY INSERTED. COLUMN BASES ARE CORRODING.
STEEL BEAM ENDS EXPOSED
RUST JACKING AT BEARINGS OF ALL 5NO TRUSSES INTO NORTH EAST WALL.
SEDIMENT LEANS OUT.
ALL 5NO TRUSSES ALL RACKING
WATER INGRESS.
WATER INGRESS.
NOTE: T5 PREVIOUSLY ALTERED TO ALLOW NEW LIFT.
BRICKWORK MISSING AT BEARING OF STEEL BEAM OVER OPENING.
FLANGE MISSING FROM BEARING OF T1
RUSTS ETC PREVIOUSLY PULLED OUT FROM CABLE
T5 RUST JACKING AT BEARING