

Structural Statement for the proposed alterations to the former anti-chambers alongside the Rochdale Canal at Victoria Mill, Manchester.

I, Anthony Clarke, a Conservation Accredited Structural Engineer have been asked to comment on the ADS proposals to repair the external chambers to Victoria Mill, in Lower Vickers Lane, Manchester. They occur at the lower ground floor alongside the Rochdale Canal.

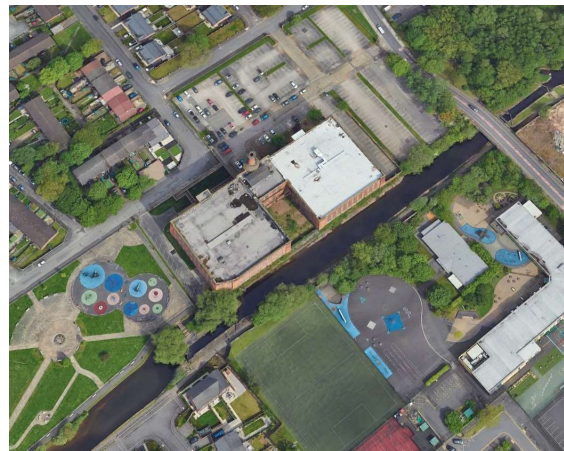
I would comment as follows:

Existing building construction.

Victoria Mill is a six storey double mill arranged around a shared engine house. The building is a grade II* listed building that was completed in 1869 and worked until 1960. It has since been partially converted to office and residential space.

<https://historicengland.org.uk/listing/the-list/list-entry/1197924?section=official-list-entry>

The undersigned has not visited the building but I have been provided with a series of photographs. From these photographs I can see that the building has a traditional form of construction typical of a Victorian built warehouse: Load bearing brickwork facades with a framework of cast iron (possibly wrought iron) beams and presumed columns supporting what appears to be a filler joist floor construction.



Plan view on Victoria Mill showing the canal to the south side of the building.

Image courtesy of Google Earth Pro

The external chambers in question are located on the south side of the building. I presume that when the warehouse was operational, these chambers would have allowed goods to be off loaded from canal barges directly into the warehouse ground floor. The southside external wall is positioned immediately alongside the Rochdale Canal. A narrow walkway typically 2m in width occurs between the outside face of the wall and the water's edge.



Photo 2: Internal view on the south wall of the warehouse, south block. The chambers can be seen between the pillars forming the external wall at that level.



Photo 3 Left: Close up view of the chambers.

Note that the base of the external chamber terminates above the lower ground floor level and that the wall below has a sloping surface. The chamber wall is both curved on plan and has a vertical inclination.

From photograph No 2 I can see that:

- Floor beams span across the warehouse onto the external wall alongside the canal. The wall at the canal level is punctured by a series of openings leaving a series of pillars typically 5 bricks wide and deep at 3-4m apart.
- A curved wall (on plan) extends outside the line of the external wall to create the chamber. I understand that the wall is inclined to the vertical: This is a typical construction technique for buildings of this warehouse's age. The curved wall will be structural in that it resists the pressure of the canal water across the opening. The wall has been rendered. The render appears to be in a poor condition. I presume that the main body of the wall behind is masonry construction.

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- The base of each of the chambers occur above the lower ground floor level, leaving a band of brickwork on the external wall line. I estimate that the lower ground floor level is approximately 2.5 - 3m below the canal walkway. A narrow chase has been formed in each bay in the lower wall section. Originally this may have accommodated a drainage outlet.
- From the above photographs it is not possible to tell the condition of the external wall of the chamber masonry. There is evidence of slight movement of the masonry below the floor beam bearings but elsewhere in the visible section of the wall, the masonry appears satisfactory. I presume that ADS will undertake their own detailed inspection of each chamber and the external wall.
- I note that there is a one brick wide arch over the opening to the chamber at canal water level. The external wall above must rely for its support on this arch acting in conjunction with the ground floor structure.
- The lower ground floor appears wet alongside the chambers but elsewhere the floors are relatively dry. This is probably rainwater entering the open roof space of the chamber. Typically canals relied on either puddled clay or asphalt applied to the external face of masonry buildings to act as a waterproofing membrane. Neither are visible in the photographs. The render is unlikely to be capable of preventing water ingress.

Proposals.

I understand that the proposal is to refurbish the interior of the warehouse and when repaired these chambers will act as lightwells. An un-numbered sketch has been provided in which I note the following:

- The chamber is to have a new tanking membrane applied to the face of the wall.
- A window will be formed below the arched lintels on the line of the external wall.
- As the base of the lightwell will be exposed it will be drained by new pipework connected to an internal drainage system.
- I have no details of the proposals for the rest of the building, so this remains outside the scope of this appraisal.

Recommendations

I would recommend that:

- a. Checks are made to establish the type of render that exist on the chamber walls. Originally it is likely that this wall either had no render or a lime based render was applied. This type of render is relatively easy to remove and will allow for checks to be made on the type of mortar used within the presumed chamber brickwork. If the render has been more recently applied then it is probably a cement based render: Such renders are difficult to remove and often bring the face of the brick with it. This will reduce the structural capacity of the wall.
- b. A sample of the existing mortar should be removed from the inside face of the chamber wall and be sent to a laboratory for constituents part analysis.
- c. Each of the chamber walls need careful examination.
 - The junction of the chamber wall with the warehouse external wall should be checked for integrity of bond. If found to be unbonded then install stainless steel stitch dowels across the joint and repoint the face.
 - Any horizontal cracking should be checked to establish the cause. There may be embedded ironwork that is corroding.
 - Any local rebuilding of the wall should use brickwork of a similar strength and water absorption to the base brickwork. The masonry should be set in a mortar compatible with the findings of item b) above.
- d. The introduction of a reinforced concrete capping beam to the perimeter of the chamber, as shown on the sketch, will help to restrain the head of the wall and allow for fixing of handrailing. The level of this beam needs discussing further with the architect. Consideration should be given to dowelling the capping beam into the warehouse external wall as well as to the top of the chamber wall. All such dowels should be stainless steel bars fixed into site drilled holes and secured using an appropriate resin to suit the moisture content of the brickwork.
- e. The detail shows a new external concrete slab in the base of the chamber. I would suggest that trial holes should be excavated to check the level of the base of the inclined wall. The base of the existing inclined wall or the warehouse, external wall should not be undermined by any part of the new construction.
- f. The substrate at the formation level of the slab's sub-base needs checking in each location. if the substrate is solid brickwork, then the slab should bear onto a concrete blinding. If the substate is a filled ground, then the slab should bear onto visqueen onto a sand blinded granular hardcore compacted in place.
- g. The top face of the new lightwell slab should be laid to a fall towards the new drainage gulley.

- h. Depending on the integrity of the waterproofing to the existing construction and or the canal, this base slab may be subject to an upward pressure. Consideration should be given to dowelling this slab into the chamber's wall and the slab / reinforcement be designed to resist an assumed head of water pressure. This may require an engineering judgement to be made.
- i. The type of waterproofing membrane needs to be discussed further with a specialist supplier based on the findings of item a) above and the required level of waterproofing.

Statement Prepared By:

A handwritten signature in black ink that reads 'Anthony M Clarke'.

Anthony Clarke
Consultant
For and on behalf of
ADS Structural Limited.

Statement prepared 13.11.23