

Insitu Vs Offsite Restoration

Rylands Building, Manchester

Deciding whether to repair ironwork on or offsite needs to be carefully considered for a number of reasons.

Where only minor, localised areas of corrosion have occurred and minimal amounts of work are required, the decision to repair ironwork in situ can be a relatively easy one. However, where ironwork needs to be cleaned thoroughly to remove more serious corrosion, it is impossible to remove all rust without dismantling the ironwork and removing it off-site.

By cleaning ironwork in situ, areas of corrosion are likely to remain in joints between components and cracks. These will continue to develop and may damage and stain new paintwork and surrounding stonework.

Repairs are usually more difficult and time consuming to carry out in situ working around other trades, limited access, cleaned stonework etc. Controlling lead contaminated dust and debris also provides difficulties and time consuming.

Some processes are impossible to carry out on site, fire welding wrought iron for example, is only possible in a workshop / forge.

Cleaning and repairing ironwork in situ has the added disadvantage that it is impossible to control the environment. Where iron has been cleaned back to bare metal, it needs to be dry before it is painted. Rain, dew and even high relative humidity can cause moisture to soak into the iron causing the iron the “ginger” almost immediately with any water run off rust staining surrounding stone etc. If paint is applied to damp bare metal, the evaporating moisture will be trapped beneath the paint when the temperature rises allowing corrosion to begin again.

Removing ironwork offsite allows it to be cleaned thoroughly and painted under controlled conditions ensuring the effective performance of the new paint. Dismantling and thorough cleaning may also reveal further problems that might not be noticed where work is done in situ. e.g. Structural integrity of fixings etc

Nevertheless, cleaning and repairing ironwork in situ can have its advantages and may be necessary where ironwork is built into stonework or the items are simply too large or difficult to remove. The decision to repair in situ or offsite will usually require some form of compromise and must be made on a case by case basis.

As a general rule of thumb, if only localised painting and/or repairs are required, or where the corrosion is limited to areas without connections or interfaces then it may be feasible to carry out the work in situ. If work is to be conducted in situ, surrounding materials such as stone and render should be adequately protected to prevent staining

by any dust or corrosion runoff as the metal is cleaned. However, where corrosion or damage of the ironwork is severe, fixings need to be checked or where it is intended to clean the ironwork back to bare metal, the most effective way of doing this is usually offsite.

There is a misconception that on site restoration is more cost effective, however in most instances the time taken to carry out works onsite involves working alongside other trades, cleaned stone etc and the time needed to protect these and to clear up often outweighs the benefit in terms of time and related labour costs. More often the time needed to remove items and install again following a thorough restoration saves cost, reduces the risk of damage to surrounding listed masonry as the work is less labour intensive. In addition, and often is the case, the stone masons can access their works more effectively whilst the metalwork is away from site.

To sum up the benefit of removing and restoring metalwork offsite

- Allows the structure to be thoroughly restored under controlled conditions
- Saves site time in most instances and hence cost
- Allows the structural elements to be assessed more effectively
- Removal of lead based paints and the related dust can be collected and correctly disposed of within our works.
- Allows inaccessible areas to be restored fully – For example where frames are tight against reveals etc.
- Reduces the risk of damage / staining to the building fabric.

Only where metalwork is fixed directly into stone, it would damage other building materials to remove or where corrosion is not present and only redecoration is required should on site restoration be considered.

Issues of public safety may also influence the decision on whether to restore on or offsite.

Project Specific – Rylands Building, Manchester

Clock Restoration Proposal

As discussed on site, we recommend the removal of as much of the decorative clock components for offsite restoration, leaving only the structural components onsite for inspection by a structural engineer. This decision is driven by concerns following our recent site inspection inside the clock enclosure.

The clock is an incredibly prominent feature of the finished building and as such needs a thorough restoration of visible finishes and at the same time checking the structural integrity of the clock and the many components attached to it, given its position above a public right of way.

Current Condition and Proposed Approach

Whilst the clock appears to be in good complete condition externally, our brief site visit including access inside the clock revealed areas of the supporting internal steel framework within that was water logged and heavily corroded in several areas. This poses concerns and doubts as to the condition and its long term structural integrity.

The clock should be carefully surveyed by note and photograph, the components tagged and carefully removed as far as possible to allow the structure to be assessed by a structural engineer and a specification of repair developed. All removed items will be restored offsite and reinstated to their original positions upon installation at a later date. The remaining structural elements remaining on site could then be restored insitu.

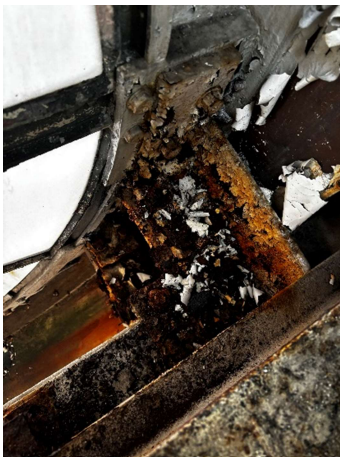


Figure 1 - Evident corrosion on the internal structure of the clock

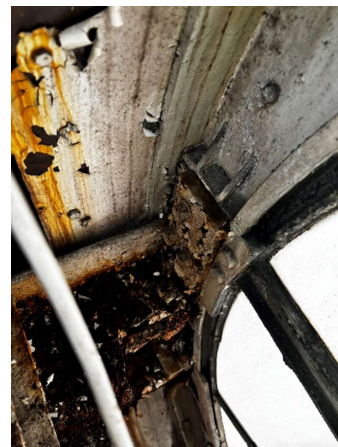


Figure 2 - Evident corrosion on the internal structure of the clock

Currently we propose to take the following steps:

1. **Tagging and Recording:** Each section of the clock will be carefully tagged and recorded for proper reassembly.
2. **Removal of Components:** We will carefully remove each component, exposing the internal steel structure.
3. **Structural Assessment:** Once the internal structure is exposed, we will assess its condition, particularly the connection points between the clock and the supporting I-beams. This will be done in collaboration with a suitably qualified Structural Engineer (SE).
4. **Off-Site Restoration:** If the internal structure can be safely removed without significant disruption to the building, we will:
 - **Blast Clean:** Thoroughly clean all sections to remove rust and debris.
 - **Condition Survey:** Conduct a detailed condition survey within our workshop and provide a formal report for your approval.
 - **Full Restoration:** Undertake a comprehensive restoration of the clock, ensuring all surfaces (including areas not accessible in-situ) are properly treated. This will include replacing or repairing fixings as necessary, ensuring a 'like-new' finish.

Concerns with In-Situ Restoration

Attempting an in-situ restoration would present several challenges:

- **Limited Access:** We would not be able to properly access the joints within the castings, where water tends to trap, potentially causing further deterioration.
- **Inadequate Finishing:** Without full access to all surfaces, we would not be able to apply finishes according to the manufacturer's specifications, limiting the longevity and effectiveness of the restoration.
- **Uncertain Longevity:** An in-situ restoration might provide a temporary aesthetic improvement, but it would not address any underlying structural issues. This approach risks leaving the corroded internal structure and fixings unresolved, compromising the clock's long-term integrity.

Honeycomb Decorative Panel

(Limited access currently and assumed to be brass / bronze)

The honeycomb decorative panels appeared to be in good condition but considering the age of the building and the time the panels have been in place, it is reasonable to assume that the fixings may be degraded and will require replacement. The panels are currently painted, and if the intention is to achieve a finish of "lacquered brass," the existing paint will need to be removed. However, due to the intricate nature of the panels, achieving a thorough removal of the paint to attain a consistent finish would be difficult on-site, and the result could be inconsistent.

An offsite restoration approach would offer several benefits. Removing the panels to our works would address any issues with the fixings and would provide a consistent finish throughout. In addition any cracks from building settlement could be repaired.

The panels can be reassembled on site with new, quality fixings to ensure longevity and performance.

This offsite restoration approach would not only enhance the appearance of the panels but also ensure that all components are treated and restored to a high standard, contributing to the overall integrity of the building's aesthetic.

Corner Spandrels & Balconies

Both the spandrels & balconies appeared complete and in good condition aesthetically (all items appear to be present with no visible damage) however, similarly to those previously mentioned above, there is evident rust build up at the joints / fixings. Corrosion in connections causes pressure to increase over time until eventually the casting or fixing fails to relieve the stress within, potentially allowing heavy components to break away. There are obvious health and safety concerns connected to this that need to be considered.

With both the balconies and corner spandrels being constructed of cast iron, regular maintenance, paint touch up of any damaged is imperative to structural longevity. This has evidently been neglected over the years.



Figure 3 - Evidence of corrosion & detritus on the connection detail

These heavy decorative castings are secured to the building with screwed connections into first fix iron stubs embedded into the stone. Following our brief site inspection of the stubs, where access was possible, it appears that they are in good condition and have not corroded significantly to cause issues to the surrounding stone. It is our intention to remove the heavy castings, leaving the stubs in the stone for subsequent inspection by a structural engineer. We propose to restore just these first fix items on site, as to remove them would likely cause damage to the stone and to remove the decorative castings for offsite restoration.

This approach would provide the most comprehensive restoration and would allow the attachments to be reviewed and replaced to retain the structural integrity of the structure.

Without this thorough restoration there is a likelihood that the fixings could fail in the future allowing heavy castings to fall away over public areas.

Following removal of the panels back to our workshop, we will blast clean to SA 2.5 standard (in controlled conditions due to lead based paint being assumed), undertake a condition survey of all removed items to determine their true condition, carry out any agreed repairs noted, then drill and tap any fixings and make ready for installation, then finish paint using our heritage approved paint system to all areas of the ironwork.

Once fully restored, we will install into the original stubs with new fixings throughout. Providing long lasting paintwork and structural integrity.

Conclusion:

While in-situ restoration may be viable in certain cases, we recommend that as much as possible is removed from site for restoration as outlined above.

On site restoration is generally not as thorough, does not address structural concerns and will likely have longevity implications.

We have many many years of experience working with similar listed buildings and regularly carry out restorations of this nature and always recommend the removal of as much of the components as possible to provide longevity and reassurance that the structure is again structurally sound for the future. Many past examples can be viewed on our website www.calibremetalwork.co.uk

We are long term members of the National Heritage Ironwork Group <https://nhig.org.uk/standards/conservation-principles/> and adhere to their advice on conserving historic metalwork.

Below are a selection of examples of previous projects taken offsite for a full restoration.

