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Trial Salvage & Prototype Off Site Repair and Reinstatement Report



Report A – TRIAL SALVAGE

DECORATIVE LATHE & PLASTER CORNICES – January 2023

Written for and on behalf of: BUILT

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Report A – Trial Salvage DECORATIVE LATHE & PLASTER CORNICES

1.0 AIM

The purpose of this report is to determine and verify whether fragile original decorative ‘Lathe & Plaster’ cornices and mouldings, situated in the principal formal offices and connecting boardroom (Refer to Image 1.1 below), could be:

- A. successfully salvaged from the site with a minimum of damage to the original fabric;
- B. once salvaged, the fabric could be safely packaged and transported to a factory in Sydney;
- C. be successfully consolidated and have its decorative surface repaired and then;
- D. be returned to site and reinstated back into their original positions within the principal rooms.

The salvaging process is extremely delicate as the age of the plaster and timber substrate framing and lathes coupled with the relative condition of the plaster after decades of life and usage, is such that consolidation of the cornice would be required even if it was intended to leave them in situ and restore them. The procedure used in the salvaging of the cornices and mouldings necessarily included the required process of consolidation as a matter of essential methodology to ensure success.

It takes a great deal of care, patience and learned skill to undertake the salvaging of such fragile historic fabric and only the most skilled of our trade trained craftsman conservators can be trusted to undertake this work.

This type of work takes a lot of time as every stage of the works can often only occur in a specified sequence and, more often than not, include multiple applications of chemicals and poultices that require specific dwelling periods of time to be effective. These time periods cannot be shortened and are generally time sensitive.

Although a detailed and informed methodology will be developed and implemented for the salvage and reinstatement works, absolute guarantees cannot be provided that the works as ‘planned’ will be able to be undertaken. Heritage fabric of this age and composition can vary significantly in its condition, configuration and construction techniques utilised even within the same room. It is not unusual to encounter varying conditions from those anticipated due to previous repairs and partial modifications undertaken to the heritage fabric completed by previous building occupants. Accordingly, and informed by our extensive experience in completing these works, contingencies are required to be included to accommodate for any unexpected or unknown matter which may arise during the completion of the works.

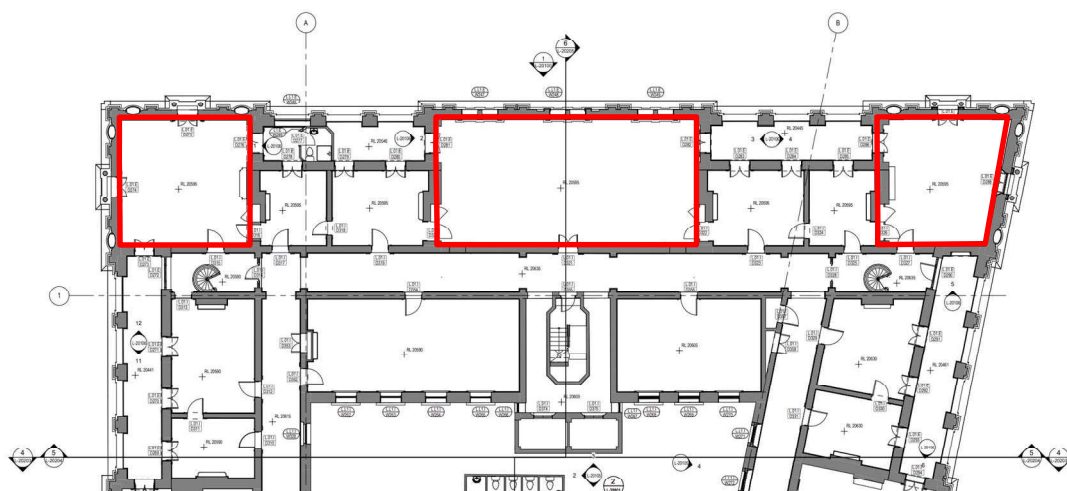
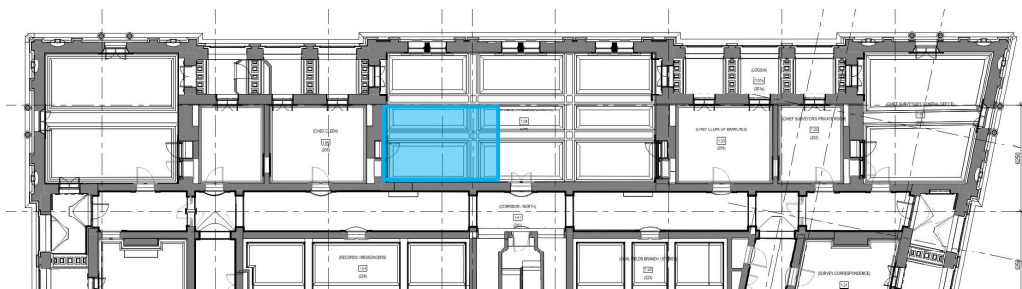


IMAGE 1.1 – Proposed Final Location of ‘Lathe & Plaster’ Cornice Salvage

This report covers the salvaging process outlined in Item A above. A location for the prototyping works has been chosen in a separate room (Refer to Image 1.2 below) in which, due to the previous spontaneous collapse of similar cornices and decorative beams mouldings the fabric is deemed to already compromised and therefore provides a unique opportunity to confirm the methodology previously submitted. A larger and more comprehensive report is to be progressively compiled whilst working through the remaining three processes and shall be issued as soon as each of the subsequential processes are completed.

**IMAGE 1.2 – Proposed Location of Prototype ‘Lathe & Plaster’ Cornice Salvage**

2.0 METHODOLOGY

Below is a copy of the Step by Step methodology submitted on the 29th of November 2022 for the prototype removal of a sample of cornice and Beam mouldings. This methodology was used as the basis for all of the works however minor changes may have occurred due to discoveries of latent conditions as the works progressed. Any major changes will be highlights in the Executive summary within this report.

The Department of Lands Building Heritage Cornice Salvaging Methodology

The step by step process outlined below is intended to provide the process upon which the original heritage listed lathe and plaster decorative cornices, Beam mouldings and horizontal string mouldings beneath the cornice shall be systematically salvaged, consolidated and reinstated post installation of a fire rated floor separating ceiling and beam lining.

1.0 Enabling Works

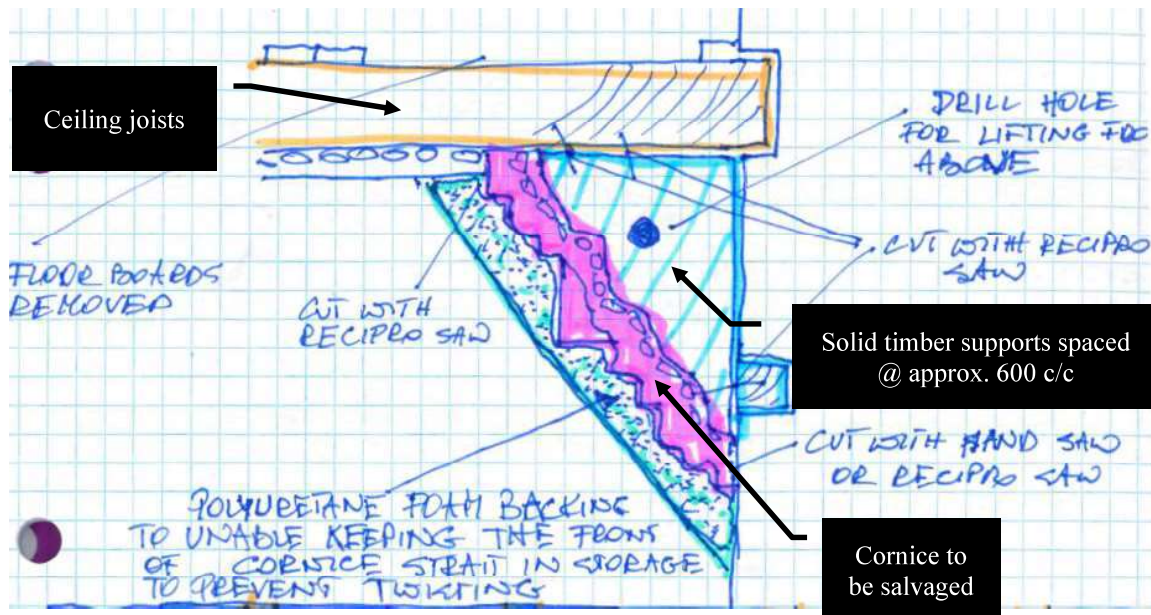
- 1.1 Create a CAD drawn reflected ceiling plan and annotate the plan to identify the size and location and unique ID code of each section of cornice to be salvaged.
- 1.2 Create a Heritage register for each piece being salvaged that will provide a unique ID code for each piece to be salvaged. The register is to include the following:
 - 1.2.1 Plan view of the location of the piece being salvaged
 - 1.2.2 Written and photographic condition of the cornice prior to commencement of any salvaging works.

- 1.2.3 General notes of fabric discovery during removal of the cornice
- 1.2.4 Written and photographic condition post removal.
- 1.3 Fabricate bespoke crates for eh cornice to be placed in once salvaged for transport to the TRC Factory for repairs and consolidation.

2.0 In Situ Salvaging Works

Wall cornice

- 2.1 Remove floorboards immediately above the cornice to be salvaged.
- 2.2 Under haz mat conditions, remove any coke breeze and accumulated debris by hand.
- 2.3 Vacuum out any dust to fully expose surface lime mortar, plaster and timber lathes.
- 2.4 Paint Strip the cornice using an alkaline based stripping agent back to plaster (90% strip) avoiding any damage to the surface of the cornice.
- 2.5 Spray the top surface of the cornice to saturation with Westox RAP primer.
- 2.6 After 24 hours respray to saturation with Westox RAP adhesive.
- 2.7 Apply a polyurethane foam mould lining to the paint stripped surface of the plaster to act as a softening to protect against impact damage as well as a cradling support to the cornice.
- 2.8 Remove the mould and set to one side for use prior to lowering the salvaged cornice to the floor below.
- 2.9 Drill holes in the solid timber supports to enable bolts and D shackles to be inserted for lifting the salvaged cornice once freed.
- 2.10 Using an A frame from the floor above, sling the D shakles and lift using the A Frame and block and tackle until mild tension in the slings has occurred.
- 2.11 Place a vertical cut through the cornice and lathes at the proposed joint lines, preferably at mid span between timber joist, where relevant, to create a piece between 1000mm and 1500mm in length. Ensure the vertical line is chosen to enable a seamless join during reinstatement (example: midpoint between projecting dentils)
- 2.12 Carefully remove 100-200mm of wall lime render below the cornice to provide access to the bottom fixing position.
- 2.13 Carefully remove 100-200mm of plaster ceiling and lathes from the leading edge of the top of the cornice to provide access to the top surface of the connection fo the cornice to the timber floor joists above.
- 2.14 Extraction of cornice is to be assessed when undertaking the works as below:
 - 2.14.1 Attempt to withdraw or cut through nails, using a reciprocating saw, which currently affix the solid timber supports to the timber floor joists (from above) and the timber wall fixing batten (from below). Or
 - 2.14.2 If fixings cannot be withdrawn or cut through, prop (design tbc) the ceiling around the cornice and then using a reciprocating saw cut the timber floor joists (from above) and the timber wall fixing batten (from below).
- 2.15 Once the cornice is loose, it can be gently lowered to the floor using the block and tackle and the unique ID code can be applied to the rear face.
- 2.16 Place the salvaged cornice into the polyurethan foam mould and gently strap to keep them together.
- 2.17 Place the strapped and salvage cornice with mould into the bespoke crate marked with the unique ID code and transport through the building to the loading dock on ground floor for transport to the TRC factory.



Horizontal String Mouldings

- 2.18 Carefully remove 100-200mm of wall lime render above and below the string moulding to provide access to rear vertical face of the moulding.
- 2.19 Paint Strip the string moulding using an alkaline based stripping agent back to plaster (90% strip) avoiding any damage to the surface of the moulding.
- 2.20 Apply a polyurethane foam mould lining to the paint stripped surface of the plaster to act as a softening to protect against impact damage as well as a cradling support to the moulding.
- 2.21 Cut through the plaster moulding using a knife to scribe a cut into the plaster and then by masonry hand saw to create 1000mm – 1500mm long lengths to salvage.
- 2.22 Gently scrape away lime render from behind the plaster mouldings using tungsten scribes until the moulding either comes free or the helicopter timber wedge wall fixings are exposed.
- 2.23 Cut through the helicopter timber wedge wall fixings using a reciprocating saw or hand saw and gently lower the mould whilst still in its supporting mould.
- 2.24 Mark the rear face of the moulding with its unique ID code.
- 2.25 Wrap salvaged mould in closed cell foam wrapping and transfer the unique ID code to the outside of the wrap.
- 2.26 Carry by hand the salvaged and wrapped items to the loading dock located on the ground floor and to the TRC factory.

3.0 Consolidation, Restoration, and installation of supporting structure

- 3.1 Unwrap the salvaged items and wash thoroughly with fresh water to remove any surface soiling and depositions.
- 3.2 Consolidation of the salvaged materials will be developed once the condition of the elements are fully known. Proposals may include the following:
 - 3.2.1 Reinforcement of thinning sections that appear too fragile to leave with casting plaster and sisal reinforcement applied to the rear of the cornice.
 - 3.2.2 Embedment of support stiffening structure under a layer or layers of fibreglass matting.
 - 3.2.3 Installation of fixing armatures to the rear of the cornice to allow for future fixing onto an engineer designs mounting system. (Design Pending)

4.0 Reinstatement on Site – To be advised

3.0 EXECUTIVE SUMMARY OF FINDINGS

It was important to have the floor boards above the affected cornices, be carefully removed without apply deflective forces down onto the fragile plaster. This was undertaken by others and the outcome showed no signs of adverse effects on the plaster below.

With the floor boards removed the accumulation of dust and debris were gently removed from the ceiling space and the exposed plaster surface wiped clean and vacuumed.

Consolidate and strengthen the plaster

Two coats of Westox RAP Primer were applied to the whole of the exposed plaster keys and timber lathes. The primer was applied to saturation of the surface to ensure the deepest possible penetration into the plaster. Once the primer was sufficiently cured, an additional 2 coats of Westox RAP Adhesive was applied over the whole of the exposed plaster keys and timber lathes. The adhesive was applied to saturation of the surface to ensure the deepest possible penetration of the adhesive into the plaster.

Remove surface lead contaminated paints

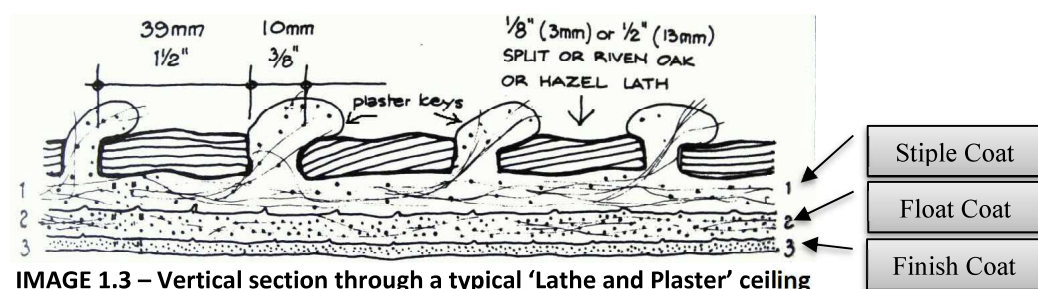
Adjacent ceiling, wall and floor surfaces were protected with plastic sheeting and an Alkaline based paint stripping poultice was applied to the painted surface of the cornice using soft paint brushes and plastic spatulas. The poultice was applied to an average thickness of between 5-10mm and then covered with thin plastic sheeting which was secured to the surrounding area with low bond tape. The plastic sheeting slows down the process of evaporation thus permitting a longer dwelling period for the alkaline stripper to soften the multiple coats of paint.

Everyday the poultice applied to the cornice the previous day was carefully removed along with any paint sufficiently softened to permit its removal by gently scraping with plastic spatulas and rubbing with steel wool. In the case of this prototype, the application was repeated three times before a sufficient level (>90%) of removal was achieved.

A mould was taken of the paint stripped surface to create a negative support frame for the plaster to enable transport to the offsite repair factory.

Attachment of support Frame

'Lathe and Plaster' is typically formed 'in situ' meaning that a timber main support frame is constructed and attached to the brick/masonry and steel substructure over which soaked timber lathes are nailed forming a continuous timber substrate over which plaster will be applied (Refer to Image 1.3 below).



The 'Lathe and Plaster' build up is generally as follows:

- I. Timber frame of either hardwood or softwood
- II. Soaked timber lathes fixed with flat head nails into the substrate spaced to allow for the passage of the first plaster 'Stipple' coat.
- III. Plaster 'Stipple' coat consisting of lime, sand and hoarse hair or sisal fibres for reinforcement. This coat is coursed pressed through the lathes to form plaster 'keys' above the timber lathes.
- IV. Float coat of mix without reinforcement is then applied over the 'Stipple Coat' and floated to a flat finish.
- V. A finishing coat of plaster is applied and cured fully prior to decoration.

The integrity of the build up is not based on any cement (Strong Hydraulic Lime) which modern construction would expect to use to secure the materials into place. The ceilings are usually fragile, subject to structural failure as a consequence of the sheering off or fracturing of the plaster 'Keys' by builders, tradesman and homeowners attempting to access subfloor cavities for services OR movement and vibration due to building works or seismic events.

The cornice, in the case of the Lands Department Building and this prototype work, is constructed in the same manner (Refer to Image 1.4 below).

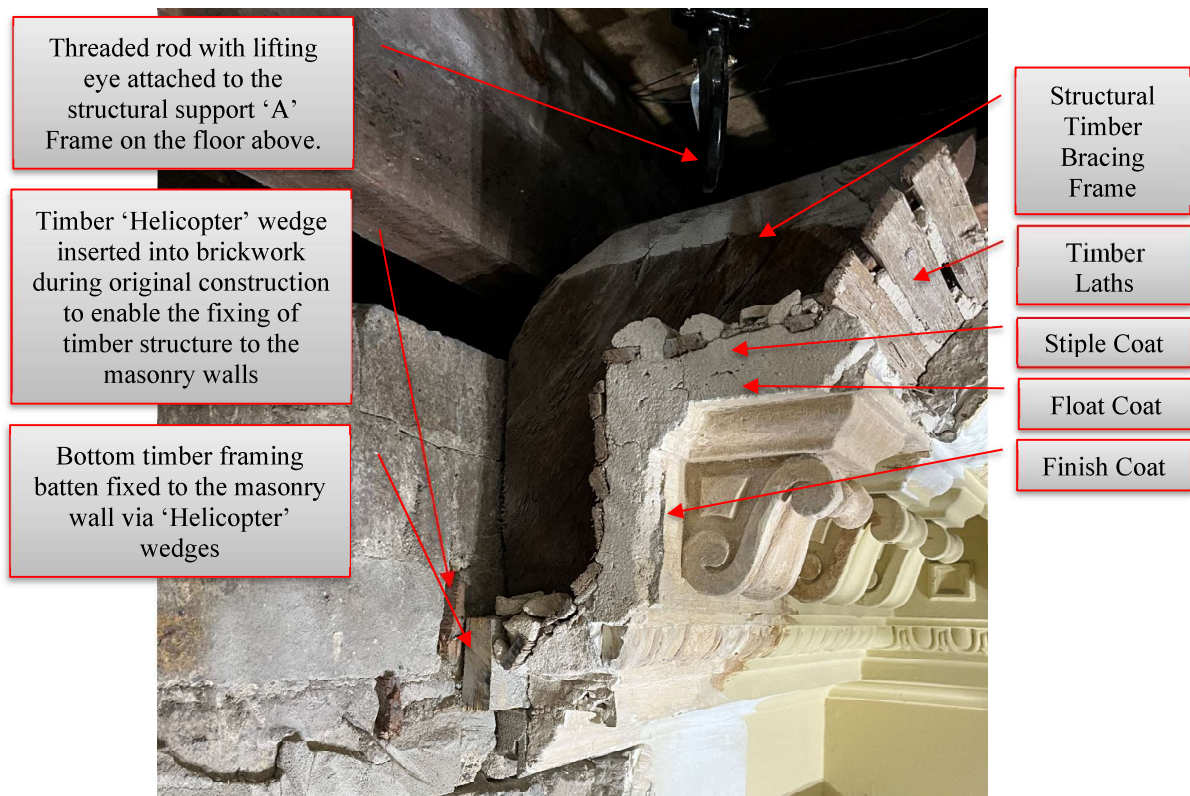


IMAGE 1.4 – Remnant compromised cornice in the prototype room

Once the cornices were consolidated and the paint removed, the structural timber bracing frame was accessed from the floor above and pilot holes drilled into the original timber support frames and threaded rods fitted with rated lifting eyes were carefully attached and then supported from a steel lifting system from above.

With lifting system in place on the floor above the lime wall render at the bottom of the cornice was removed to provide access to the bottom framing batten.

Using a reciprocal saw fitted with a metal cutting blade, the nails securing the bottom framing batten were severed. We discovered that this method of removal resulted in more vibration than the fragile cornice could sustain a clean fracture and detachment of the bottom 'Egg & Dart' moulding occurred. This repair and reattachment during the later phases of this prototype works is very simply achieved as the portion detached was salvaged complete and relatively unharmed. This repair shall be highlighted in Report C.

The methodology shall be altered in the final report to remove the use of reciprocal saw cutting tool and be replaced with the cutting and removal of a trough of brickwork below the structural fixing batten to enable the use of a thin blade angle grinder to cut the fixing nails connecting the structural fixing batten from the masonry wall. This alteration in method would present less of a vibration risk due to

the circular movement of the grinders cutting blade as opposed to the opposing directional forces applied by the reciprocating saw.

A strip of the lime ceiling plaster was gently cut and successfully removed from the ceiling exposing the timber lathes. The lifting system was adjusted and tensioned to ensure that as closely as can be determined, the full weight of the cornice was being taken up by the lifting system. The timber lathes were then cut using an oscillating tool fitted with a timber blade. This completed the disconnection of the cornice from the wall and ceiling.



IMAGE 1.4 – Oscillating cutter being used to cut through timber lathes

Once the cornice was considered to be disconnected and fully supported by the lifting system, the cornice piece was gently prised loose and left hanging on the support system.

The salvaged cornice was then gently lowered to the floor below for packaging and transport to the factory (Refer to Image 1.5 below)

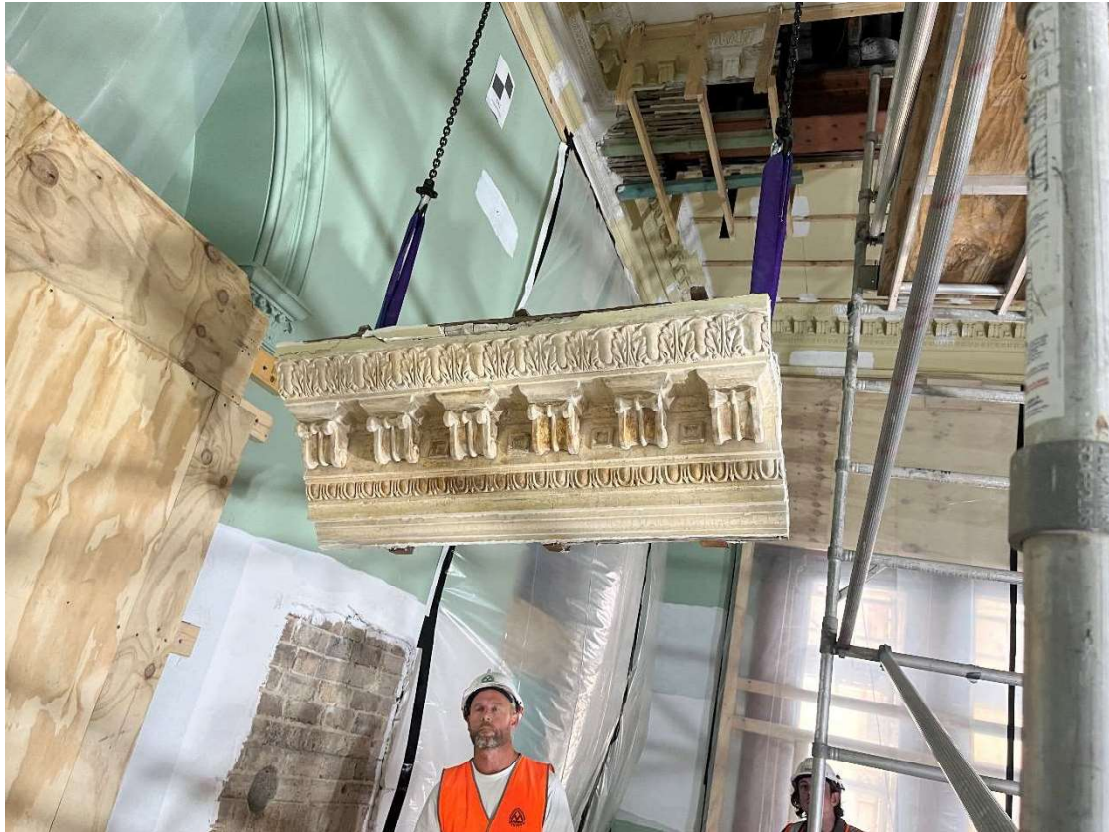


IMAGE 1.5 – Salvaged Cornice from Beams being lowered to the floor below

The coffered beam lathe and plaster was salvaged without any incident or breakage and is considered by TRC to be easier to remove than the cornices on the masonry walls, as the structural timber frame was not attached to the steel beam and only wedged in place. This makes the coffered beam cornice and moulded linings more fragile and subject to spontaneous detachment if disturbed by vibration, flexural movement or impact whilst presenting a more certain success for salvage if removed early before being disturbed.

4.0 CONCLUSION

In the opinion of the Traditional Restoration Company, and informed by the trial completed onsite, the three rooms of cornices proposed to be salvaged and reinstated can be achieved albeit with significant effort and complexity noting:

- Removal of cornice sections in sections greater than ~500 to 1500mm long is extremely difficult to avoid breakage. Contingencies will be required to allow for should any sections not be able to be salvaged as per the proposed methodology. For these sections, replica mouldings of the cornices will need to be utilised.
- Sections are both heavy and fragile with high potential for existing cement breaking off between lathe sections
- Cornice sections reinstated in ~500-1500mm sections would require a significant number of joints creating visual breaks in the intricate motif. These joints will be repaired to match the salvage cornice profiles to the best of the craftsman ability.

To complete the salvage and reinstatement of the full extent of the existing cornices would be an immense undertaking in the largest scale. We understand that if this became a requirement, the works may not be feasible for the developer. Within the confines of a scope that restricts this requirement to only three rooms within the building, then the existing active skills available within the Australian market can achieve the desired outcome requested.

The final design and methodology shall be developed with all stakeholders to ensure a robust and considered design solution and methodology is implemented. The final design will likely include:

1. Co-ordinated fixing and support details of the salvaged cornices which allows for the installation of the required fire rated linings and the serviceability performance requirements of both existing and new building fabric. This design will be developed to minimise the extent of required adjustments to cornice heights and profiles.
2. Jointing details of the salvage cornice segments which allow for a near seamless reinstatement of the cornice. Appropriate materials and techniques will be developed to achieve this. The definition of seamless must be understood as being discernible from a viewable distance of 5 meters.
3. A design solution shall be developed however it will not be possible to provide unqualified guarantees for the salvage and reinstatement works which includes the visual qualification described within item #2 above.

It is, however, imperative to appreciate the skill level required to achieve the desired aim of the salvaging works, and secure the relevant trade skills early to ensure availability when programmed to commence. It is also important to allow sufficient time within the overall project construction program to ensure the salvaging process is completed prior to the commencement of any large-scale demolition within the building that would impose vibrations through the steel and masonry structure that could potentially compromise the integrity and the fixity of the cornices.

Sincerely,

Traditional Stonemasonry (Consulting) P/L

James Ginter

Managing Director