

01 Mar 2023
Ref:SY221516
Pontiac Lands Group
C/- Built
Level 4/185 Clarence St
Sydney NSW 2000

Attention: Matt Seelin

Dear Matt,

Re: Heritage Engineering at Lands Building – Response to Heritage NSW Advice on Lath and Plaster Ceilings (SSD-7484-Mod-18 RTS)

To assist Pontiac Lands in their submissions associated with the Instrument of Modification 18 and in response to your request to provide responses to the queries raised by the Heritage Council of NSW's and City of Sydney Heritage please see below table:

Northrop Comments

Ref	Matter Raised	Response
11.20	Concern was expressed by the applicant that delamination and imminent failure could not be predicted or observed without invasive monitoring. Remote survey methods, such as point cloud laser scanning and high-resolution photogrammetry, allow production of reflected ceiling plan spot level or distortion maps. These ceiling maps have up to a $\pm 3\text{mm}$ accuracy and when compared to baseline data can detect even minor movement. Where movement is observed this can be followed up with a physical examination of the ceiling but only as necessary. Remote testing will also reduce the level of disruption to hotel operations.	<p>As detailed in our previous ceiling stabilisation design, a monitoring and inspection regime can be implemented to support likelihood of detection of failures/defects.</p> <p>Follow-on maintenance work has the potential disruption hotel operations.</p> <p>Notwithstanding, we reiterate that even with the implementation of a periodic inspection and monitoring regime, inclusive of the measures raised by the authorities, an absolute guarantee, cannot be provided that a ceiling collapse or failure will not occur. As previously noted, we categorise the risk of this failure as 'very low' and the likelihood of a major ceiling failure as improbable.</p> <p>Notwithstanding, Northrop understands that any risk, however low, does not satisfy the clients requirements.</p>
11.50	It is noted that the condition of the ceilings in the Lands Building has deteriorated considerably from generally good and fair in 2015 to poor and very poor in 2022. It is not clear from the documentation the exact cause of the ceiling deterioration. It is likely that the deterioration is related to localised water ingress, a lack	<p>Northrop were engaged by the Main Contractor (Built) in October 2021 in the role of the Heritage/Remedial Engineer for the Lands Building.</p> <p>As part the tender and our engagement, Northrop were provided with documents relevant to the Heritage Ceilings.</p> <p>The key documents included:</p> <ul style="list-style-type: none"> • CMP dated May 2017 prepared by GBP.

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	<p>of regular maintenance and possibly the vibrations from the current construction activities. Furthermore, it is understood that ~34% of the ceilings were not given a condition rating because ceiling protection is installed and there are floorboards above the ceiling.</p>	<ul style="list-style-type: none"> • Scope of Works for Ceiling Stabilisation prepared by Barry Copper of Westox dated 02/05/2020. • Specification of the rectification of L&P and Coke Breeze Ceilings, Westox Spec 117 – Restoration and stabilisation of Heritage Ceilings (Dept Lands Building). • Letter discussing the condition and approach to the repair of the heritage ceilings prepared by Purcell date 03/02/2020. <p>From our review of the above documents, it was our understanding that the condition of the ceilings had been determined by visual inspections completed from the existing floor level from below the ceilings while the building was furnished and floor coverings intact. Northrop was not aware of any inspections completed within the ceiling cavity (to view the rear face of the ceiling) or any material testing of the ceiling being completed (apart from a single stabilization trial completed by Westox for a section of EMF Ceiling).</p> <p>Northrop undertook preliminary visual inspection of the heritage ceilings from a scissor lift at close range, to determine their condition from below. These inspections provided a preliminary understanding of the ceiling condition. We observed signs of deflection, cracking and delamination.</p> <p>Northrop provided advice regarding temporary stabilisation of ceilings, where access was required below and the ceiling condition was not able to be fully assessed including plaster keys above.</p> <p>Following the installation of temporary stabilisation measures (timber battens) and progressively with the removal of the existing floorboards above, the rear face of the ceilings were able to be inspected by Northrop.</p> <p>An invasive investigation was required to fully assess the ceiling condition. With the removal of floor boards, the inspection of the top face of the ceiling, combined with the outcomes of the visual inspections from below and results of the materials testing regime, gave a more complete picture of the ceiling construction and condition.</p> <p>The key defects identified included the shearing of plaster keys, corrosion of nails and localised corrosion of expanded metal sheeting, longitudinal cracking in beam coffers, cracking in cornices and localized cracking in flat sections of ceilings.</p> <p>With respect to the extent of inspections complete on the heritage ceilings, a table has been previously provided by Northrop which details the extent of both inspections complete from below ceiling and to the rear face of ceiling. Based on these inspections and our understanding of heritage ceiling condition, it is likely that</p>

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		<p>the ceiling condition of the rooms not yet inspected would representative of the rooms inspected to date.</p> <p>In our opinion, there has been minor deterioration since 2015. With the intrusive investigations, a more thorough understanding of the ceiling condition has been gained, particularly of previously un-inspected elements such as concealed plaster keys and the like.</p> <p>It is this enhanced understanding that leads Northrop to rate these ceilings more accurately than previous inspections.</p> <p>Taking due consideration of Conservation Management Plan Lands Department Building, 23-33 Bridge Street, Sydney, May 2017 prepared by GBA Heritage Policy 6.14.16</p> <p>POLICY 6.14.16 CEILING PROTECTION Lath and plaster ceilings must be protected during construction - particularly when construction vibration occurs. Strategies, such as temporary battening, should be investigated in order to ensure that failing plaster keys or snots do not lead to ceiling failure.</p> <p>Northrop were engaged by the main contractor (Built) to develop a temporary stabilisation design to respond to the above policy. This design is based upon engineering principles and best practice guidance (<i>English Heritage Practical Building Conservation - Mortars, Renders and Plasters – Temporary support for plaster Ceilings p362</i>).</p> <p>There is no evidence to support that ceilings have been negatively impacted by recent construction activities.</p>

I trust this commentary addresses your concerns. Please get in touch should you have any further queries.

Regards,



Ian McDaid
Principal | Structural Engineer