

4 June 2025

Cox Architecture
70 George Street
The Rocks NSW 2000

Attention: Mark Davey

VIBRATION IMPACT TO LENNOX BRIDGE FROM RIVERSIDE THEATRES CONSTRUCTION

Dear Mark

It is understood that Heritage NSW has raised questions regarding impacts to Lennox Bridge due to construction of the Riverside Theatres. Specifically, the Heritage NSW submission following the exhibition of the SSDA states:

The HIS does not include an assessment of potential vibration impacts to Lennox Bridge. Given the proximity of the proposed works to this item, the revised assessment should include consideration of this. It is noted that 4.7.2 of the Noise and Vibration Impact Assessment provided with the EIS states that 'we are not aware of any indications that it is structurally unsound or more vibration sensitive than other surrounding structures, and in fact now carries the Parramatta Light Rail which is likely to impose vibration levels on the structure significantly in excess of any resulting from Riverside construction works'.

Please clarify how this determination was made and outline whether any specific mitigation measures are required to ensure that Lennox Bridge is not impacted by Vibration during construction.

As noted in the Noise and Vibration Impact Assessment (NVIA), in the absence of a relevant Australian Standard, the German standard *DIN4150-3 Structure vibration- Effects of vibration on structure- 1999* is utilised to set parameters for vibration impacts to structures.

As the light rail operates on the Lennox Bridge, the expectation that the structure is sound and would not be unduly affected by the vibration generated by the construction stages is a reasonable assumption. Consequently, the NVIA recommended a vibration criteria in line with buildings used for commercial or industrial purposes.

Notwithstanding the above and considering Heritage NSW's comments, a review of the Light Rail State Significant Infrastructure application has been undertaken. The NVIA prepared for this application did not recommend more stringent criteria for Lennox Bridge than other structures, i.e. a similar approach to that proposed for the Riverside Theatres project. The report also noted that Lennox Bridge was to be fitted with "embedded slab track, direct-fix to existing masonry arch bridge deck" which would transmit light rail vibration to the structure without any additional isolation measures.

As outlined in the NVIA, the vibration impacts of construction of Riverside Theatres will be dependent on the construction methodology and selection of equipment by the appointed contractor (which will be undertaken following determination of the SSDA). Works associated with the Riverside Theatre development adjacent to the Lennox Bridge include:

- Demolition of the elevated walkway, steel supports, concrete columns and footings.
- Demolition of the concrete pedestrian/ cycle path (along the foreshore level).
- Repaving at the Church Street level.
- Construction of new retaining walls perpendicular to the bridge

- Construction of a new pedestrian / cycle path

To further address the concerns raised by Heritage NSW, amended mitigation measures in respect of vibration impacts to Lennox Bridge are proposed to supplement those included within the NVIA. It is proposed that the Construction Noise and Vibration Management Plan (CNVMP) to be developed by the construction contractor prior to construction would also include:

- An inspection of Lennox Bridge by appropriately qualified personnel is to be carried out to investigate whether it is sensitive to damage from vibration and/or structurally unsound. A condition report should be prepared prior to commencement of works.
- A vibration criteria of Line III of DIN 4150-3 (see Table 11 of NVIA) where the inspection finds the structure is unsound or particularly sensitive to vibration. Otherwise a vibration criteria from Line II of DIN 4150-3 (see Table 11 of NVIA) is to be used (rather than Line I as initially proposed).
- Vibration monitoring is to be carried out by the construction contractor where vibration intensive works are to be undertaken adjacent to Lennox Bridge. The works expected to trigger the need for such monitoring must be determined during preparation of the CNVMP, referencing the Line II or Line III DIN criteria (as determined to be applicable) and the proposed construction methodology / plant selection / locations.

Augmentation of the mitigation measures included within the NVIA with those above would ensure appropriate management of vibration impacts to Lennox Bridge.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD



Matthew Ottley

Senior Associate