

ATTACHMENT 5

**Arup, 1 Spring Street – Tower
Conversion: Structural
Strategy, September 2026**



1 Spring Street – Tower Conversion

Structural Strategy

Reference: REPORT-STR-001

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This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number

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1. Introduction

This report sets out the structural strategy for the proposed conversion of 1 Spring Street commercial tower to residential use. It identifies the principal structural interventions required to support the change in use, including seismic strengthening, integration of residential amenities and services, and broader building upgrades such as new roof plant and maintenance access systems.

The strategy described herein remains subject to further design development, multidisciplinary coordination, and detailed technical assessment.

The memorandum also outlines the anticipated regulatory compliance pathway, including areas where dispensation from full compliance with current requirements may be sought in accordance with accepted industry practice. This approach will require confirmation by the project Building Surveyor.

2. Existing Building Structure

The existing building structure comprises a central lift and services core that provides the primary lateral stability system, supplemented by perimeter shear walls on the northern elevation east of the core and on the western elevation. The typical floor plate is formed by a clear-span floor system supported by perimeter blade columns. At the plaza level fronting Spring and Flinders Streets, an expressed fanned transfer column collects loads from three vertical building columns and directs these down to a singular basement column. The foundations at basement level 6 comprise of a deep raft beneath the core, pad footings to typical north columns, and large-diameter piles along the southern and eastern elevation where the basement interfaces with the Melbourne Underground Rail Loop (MURL).

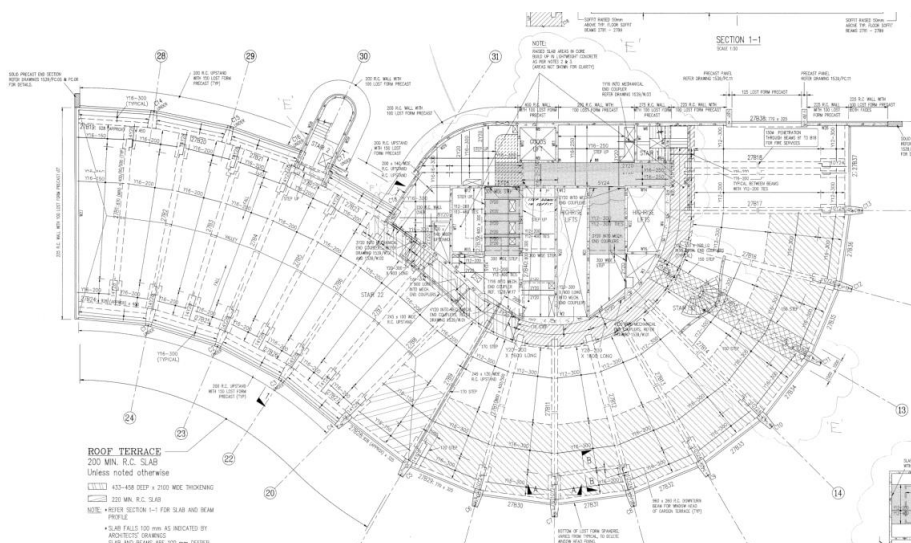


Figure 1 Typical Floor Structure Plan

3. Compliance with Current Building Regulations

For a change in building use, the Building Regulations generally require compliance with current requirements, including the National Construction Code (NCC) and the referenced Australian Standards. As the tower was constructed in the late 1980s, it is expected to have been designed in accordance with the standards current at that time, however, is unlikely to have been designed for modern earthquake loading requirements, noting that the first nationwide Australian earthquake standard was introduced in the mid-1990s.

Consistent with standard industry practice for the seismic assessment and upgrade of existing buildings, Arup has assessed the building's lateral stability system against an equivalent 67% New Building Standard (NBS) earthquake demand. This approach also aligns with the proposed amendment to the Australian Earthquake Standard Appendix D 'Earthquake Actions on Existing Buildings' (draft amendment currently out for public comment). The assessment identified that local strengthening is required to the slender internal lift shaft walls and to the western shear wall.

Formal dispensation from full compliance with the current earthquake standard and associated structural detailing requirements will need to be confirmed by the project Building Surveyor. The proposed compliance pathway should also be agreed with the third-party Certifying Structural Engineer.

A material condition investigation and assessment will also be required to identify any deterioration or defects within the existing structure and to define remedial works necessary to support the intended service life of the asset.

4. Proposed Structural Modifications

The principal structural modifications proposed for the building are summarised below. Collectively, these interventions are intended to enable the change in use from commercial to residential, while addressing the associated seismic strengthening, new amenity and servicing requirements, and broader building upgrade works. The scope remains subject to further design development, detailed analysis and coordination with architectural, building services, fire, acoustic and construction methodology requirements.

4.1 Lateral Stability System - Seismic Upgrade

The seismic assessment completed to date, based on a target demand equivalent to 67% New Building Standard (NBS), indicates that local strengthening is required to select core walls forming the lift shafts and to the western shear wall.

The proposed strengthening is expected to comprise of new in-situ reinforced concrete cross walls (buttress walls) located between existing lift shaft door openings, together with local thickening to the ends of the western shear wall where elevated stress demands occur under lateral loading. The final strengthening configuration will be confirmed through detailed design, including assessment of load transfer, local anchorage, constructability and integration with existing reinforcement.

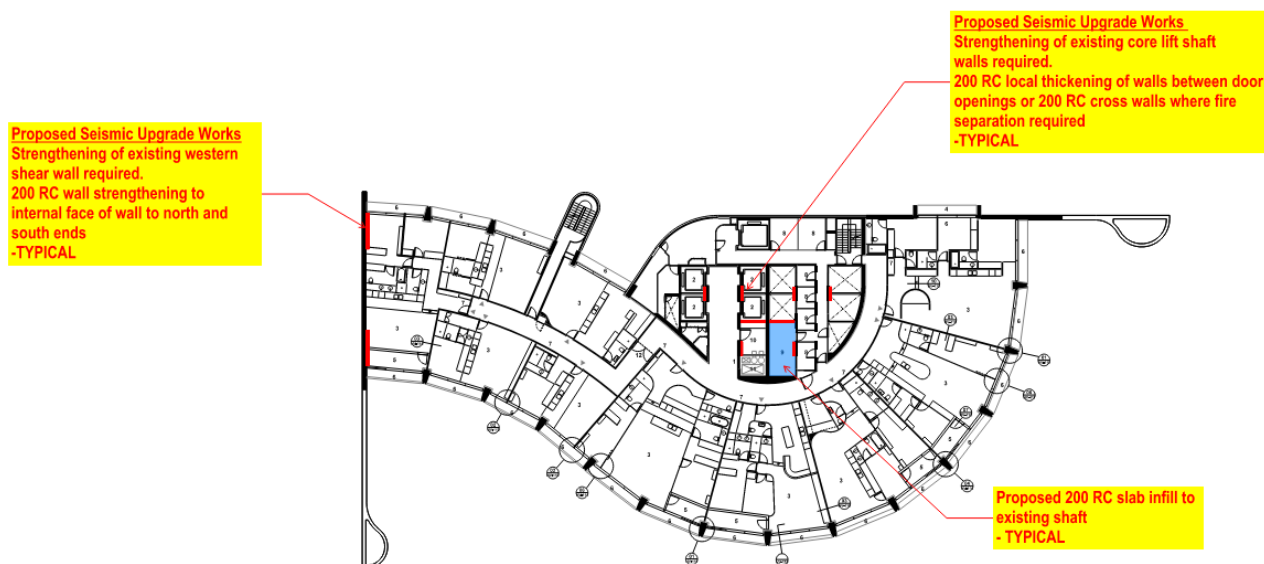


Figure 3 Strengthening to Lateral Stability System

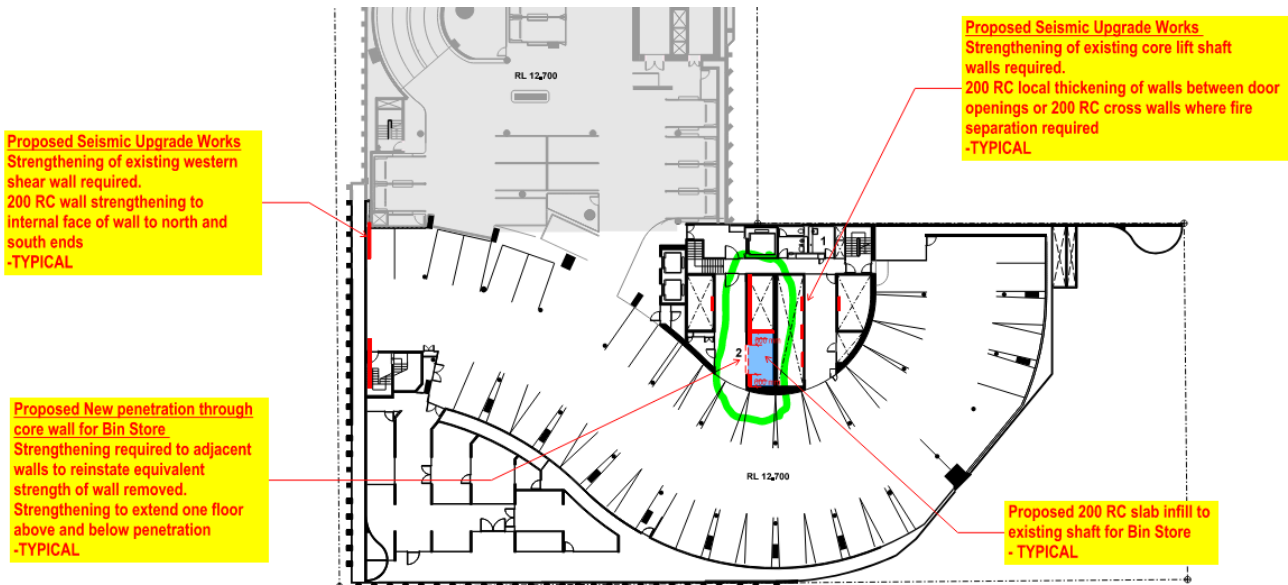
4.2 Infills of existing lift shafts & service risers

The proposed residential scheme requires fewer lifts than the existing commercial arrangement. Redundant lift shafts and selected service risers are therefore proposed to be infilled with new concrete floor structure.

This will allow these areas to be incorporated into the usable residential floor plate and associated amenity or support spaces, subject to confirmation of fire separation, services coordination, acoustic performance and the structural interface with the existing core walls and floor framing.

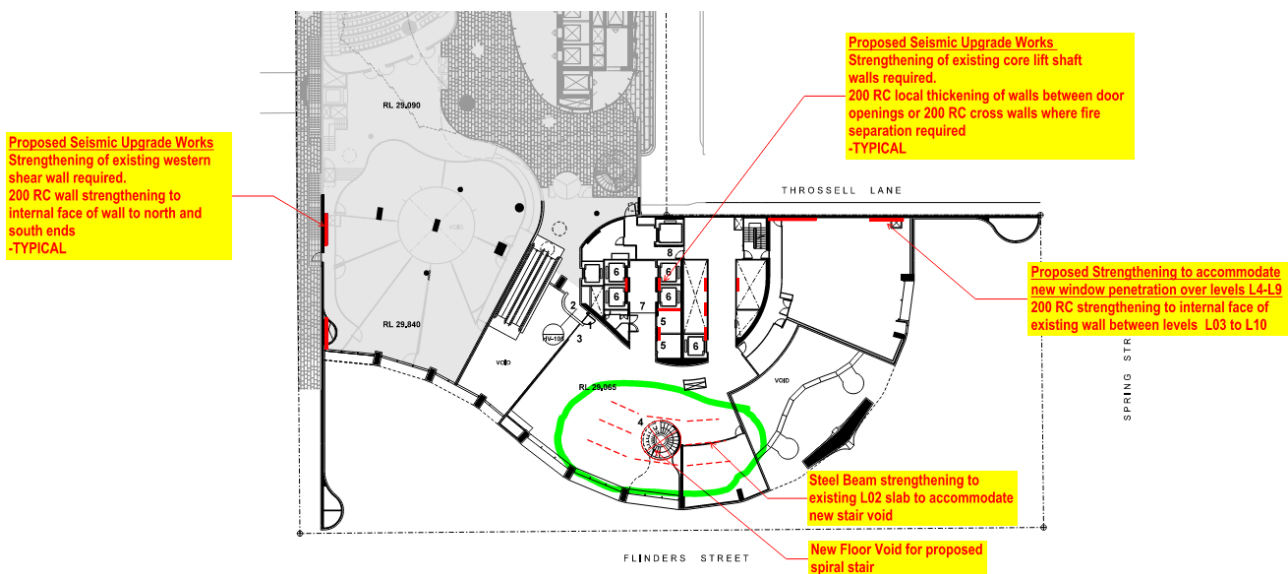
4.3 Basement Level P5 Bin Storage

A major penetration is proposed through an internal core wall at basement level P5 to provide access to the bin store. Strengthening will be required around the opening to reinstate the strength and stiffness removed by the penetration and to avoid a reduction in the wall's contribution to the lateral load-resisting system. The strengthening is currently envisaged as local wall thickening around the opening, extending approximately one level above and one level below the penetration, subject to detailed verification of stress flow, coupling actions and reinforcement anchorage.



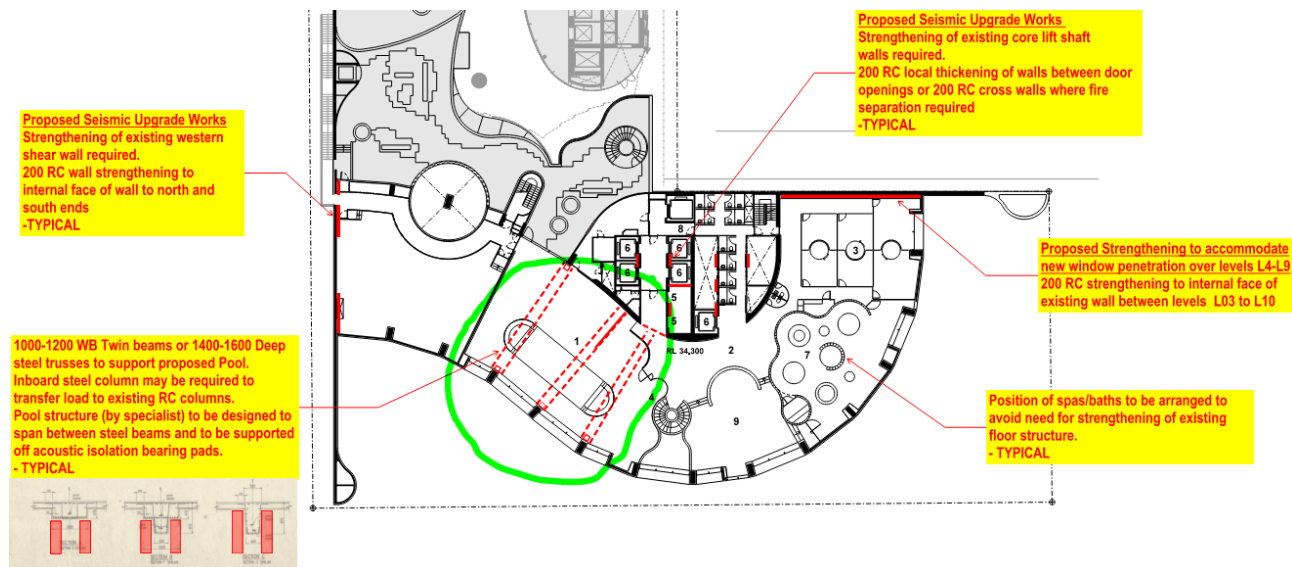
4.4 New Spiral Stair Void to Level 02

A new spiral stair is proposed between levels L02 and L03, requiring a circular void to be introduced through the L03 floor structure. Perimeter strengthening will be required around the new void to redistribute local slab actions and maintain the integrity of the surrounding floor system. The strengthening is expected to comprise steel framing spanning between adjacent existing floor beams, with the final arrangement to be coordinated with stair geometry architectural set-out.



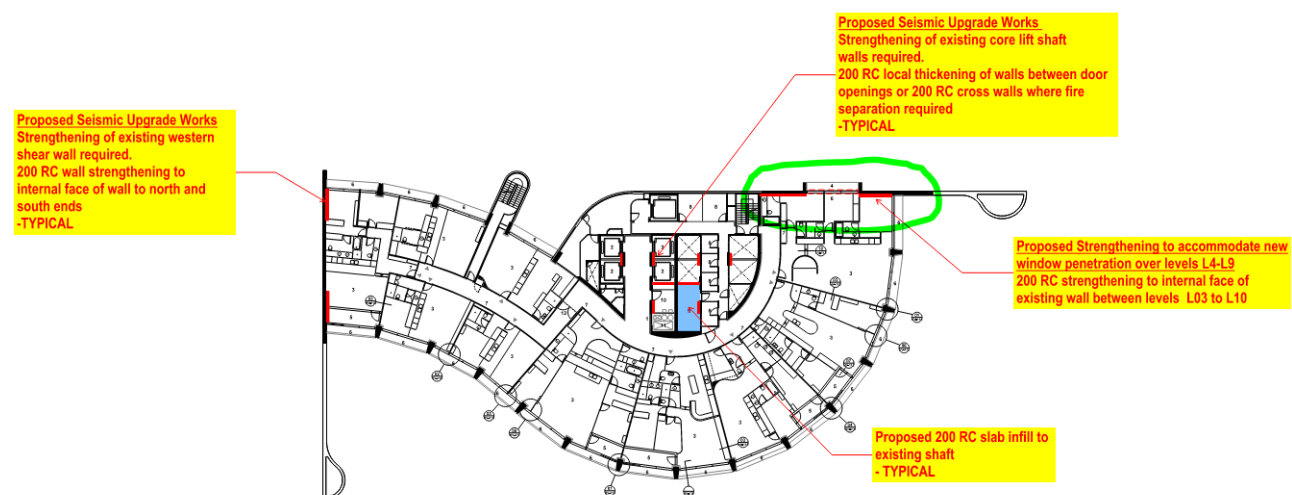
4.5 Pool, Gymnasium and Wellness centre to Level 3

A wellness centre, gymnasium and pool are proposed at level 3. The pool is anticipated to be constructed above the existing floor level and supported on acoustic bearing pads located over strengthened existing floor beams. Strengthening is expected to comprise of deep fabricated twin steel beams spanning between the core and perimeter columns. The gymnasium floor structure will require assessment for both imposed loading and dynamic response under rhythmic activity, and may require strengthening to satisfy strength, serviceability and vibration performance criteria. The dynamic performance of the floor will be assessed in the next design stage. Spas and baths within the wellness centre should be located, where practicable, to align with existing primary framing and minimise the extent of strengthening required to the surrounding floor structure.



4.6 New Windows North Wall Elevation L03-L09

New window openings are proposed in the north wall between levels L04 and L09 to provide natural light to the residential apartments. Strengthening will be required to the wall in the vicinity of the openings to maintain the wall's vertical and lateral load path. The strengthening will be by means of internal wall thickening extending approximately one level below and one level above the affected opening zone, subject to detailed assessment of local stress redistribution, reinforcement continuity and constructability.

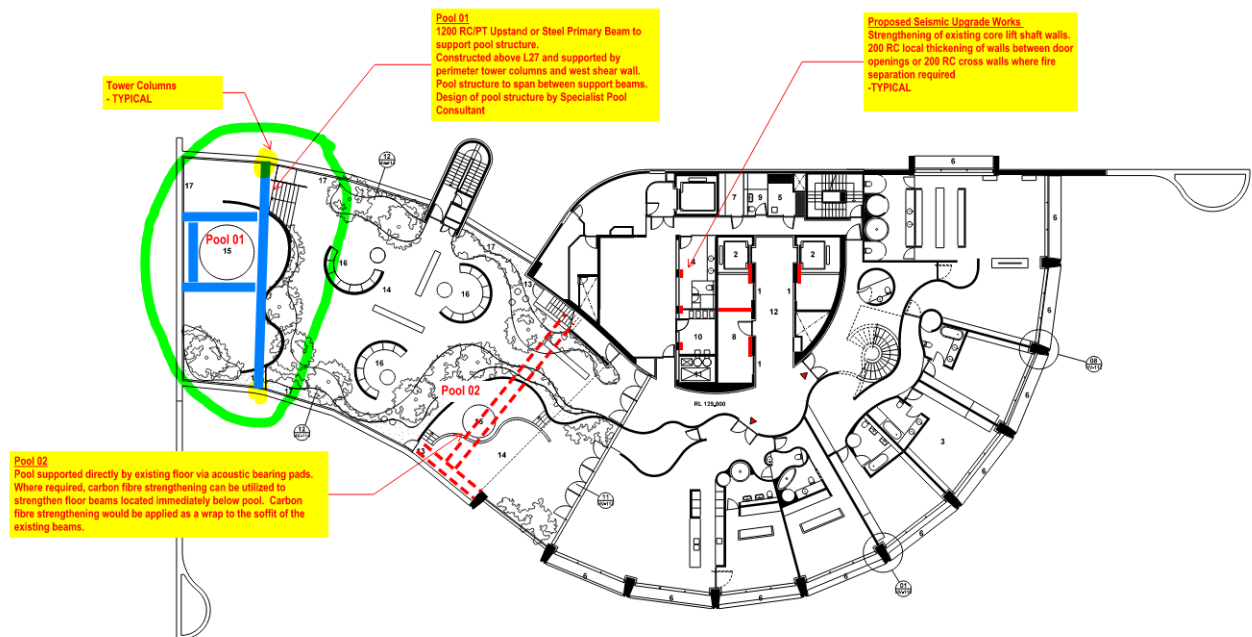


4.7 Pools to L27 Terrace

Two pools are proposed on the level 27 terrace. Pool 01 is anticipated to be constructed above the existing floor level and supported by new reinforced concrete or steel beams spanning between perimeter columns and walls. These beams would be constructed below the existing L27 parapet level and supported on acoustic bearing pads located over the perimeter columns and wall supports. The pool structure will then span between the new support beams.

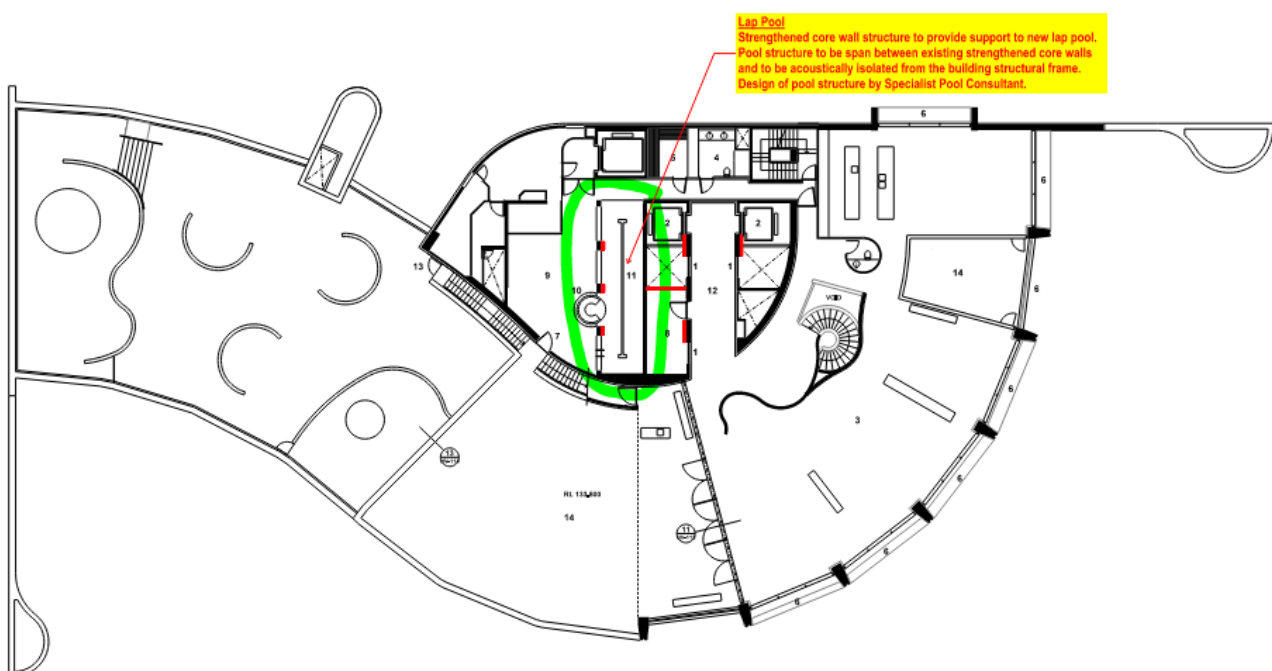
Pool 2 is smaller in diameter and therefore would be supported directly by the existing floor structure via acoustic bearing pads. Any strengthening to the floor could be undertaken from soffit level. Carbon fibre strengthening could be utilized to strengthen the floor beams and would be applied as a wrap to the soffit of the beams.

The final schemes for strengthening works would require verification of gravity load effects, lateral load implications, deflection compatibility, waterproofing interfaces and construction sequencing.



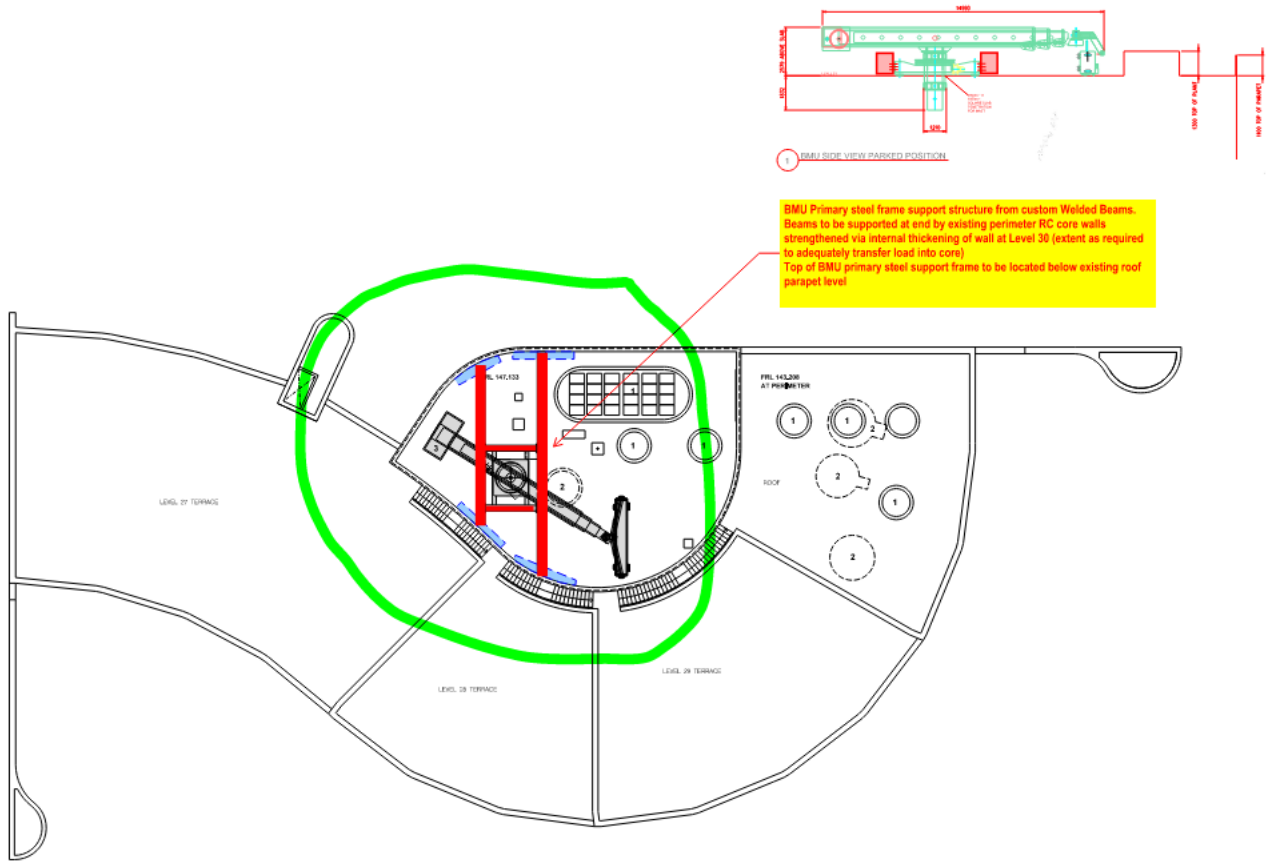
4.8 Lap Pool to L28

The lap pool located at level 28 is located between two existing core walls. These walls will be strengthened as part of the seismic upgrade works and can be designed to provide support to the new pool structure. The pool structure would need to be designed to span between the strengthened walls and is to be acoustically isolated from the base building structure.



4.9 New BMU to L31 Roof

A new Building Maintenance Unit (BMU) is proposed at the level 31 roof. The BMU is expected to comprise of a telescopic boom capable of providing access to the building façade. The unit will be supported on deep fabricated steel beams, which in turn will transfer loads to the perimeter core walls. Local strengthening of the supporting core walls is expected to be required over the storey below to accommodate the concentrated vertical actions generated by the BMU under operating and parked conditions.



5. Conclusion

The structural strategy for the proposed conversion may be summarised as follows:

- The proposed structural modifications are not expected to impact the external building envelope, with the majority of interventions occurring internally.
- Further detailed assessment of the lateral stability system is required for current wind loading and serviceability criteria. This will be confirmed following completion of wind tunnel testing.
- Compliance of the existing building frame with the current Earthquake standard and other structural standards will require dispensation from the Building Surveyor. Particularly with regards to the 67% New Building Standard (NBS) earthquake design approach and in relation to general reinforcement detailing. However, the imposed floor loading for residential use is significantly lower than for office use, and the vertical structure is therefore likely to retain a degree of reserve capacity, subject to verification against the original design assumptions and further assessment.
- A detailed condition assessment of the existing concrete structure will be required to confirm its current condition and to identify any remedial works necessary to support the proposed conversion and ongoing service life.