Proposed Structural System

1-2 Murray Rose Avenue, Sydney Olympic Park

80818416

Prepared for
Austino Property Group

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Cardno
Shaping the Future

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1 Background Information

This document describes the proposed structural system for submission to Sydney Olympic Park Authority (SOPA) to support the Development Application for the proposed multistorey residential development at 1-2 Murray Rose Avenue, Sydney Olympic Park (SOP).

2 Site Context

The proposed 1-2 Murray Rose Avenue, Sydney Olympic Park development is to be situated on Lot 1 DP1185060 (herein referred to as “site 1”) with a site area of approximately 3931m², and on Lot 2 DP1185060 (herein referred to as “site 2”) with a site area of approximately 2522m².

Site 1 is an undeveloped area with a 40m long bituminous path. The development site is bound to the:

- North by undeveloped Lot 161 DP1155500.
- East by Bennelong Parkway.
- South by Murray Rose Avenue.
- West by a multistorey office building on 3 Murray Rose Avenue.

Bennelong Parkway grades down to the south at approximately 0.3% grade over the section adjoining site 1. Murray Rose Avenue grades down to the east at approximately 7% grade over the section that site 1 fronts.

Site 2 is currently occupied by temporary site offices and associated car parks set up for construction work on 4 Murray Rose Avenue. Buildings and improvements currently located on the site will be demolished as part of the proposed works. The development site is bound to the:

- North by Murray Rose Avenue.
- East by Bennelong Parkway.
- South by Parkview Drive.
- West by development on 4 Murray Rose Avenue which is currently under construction.

Bennelong Parkway grades down to the south at approximately 0.3% grade over the section adjoining site 2. Murray Rose Avenue grades down to the east at approximately 7% grade over the section that site 2 fronts. Parkview Drive grades down to the east at approximately 9%.

Aerial photography of the existing sites is presented in Figure 2-1.

Based upon geological conditions encountered as part of the geotechnical investigations carried out, it is expected that sandstone rock will be encountered as part of the proposed bulk earthworks excavations.

The site is not flood prone, as presented in Auburn Local Environmental Plan 2010, Flood Planning Map, Sheet FLD_006 (reproduced in Figure 2-2).

Figure 2-1 Existing site (Source – Nearmap 2018)

3 Proposed Development

The proposed development consists of 2 multi-storey residential buildings over 3 levels of basements carparking. The construction works include:

- Demolition works;
- Shoring & excavation works;
- Bulk earthworks;
- Construction of a multi storey basement car park and 12 storey residential tower on no 1 Murray Rose Ave;
- Construction of a multi storey basement car park and 15 storey residential tower on no 2 Murray Rose Ave;

4 Summary of Relevant Authorities and Structural Design Standards

Relevant authorities having jurisdiction over this project are as follows:

- Sydney Olympic Park Authority (SOPA) ;
- Building Code of Australia;
- Work Cover;
- Relevant Australian Standards, in particular the following:

AS	1170-2002	Structural Design Actions
	Part 0	General Principles
	Part 1	Permanent, Imposed and other Actions
	Part 2	Wind Actions
	Part 4	Earthquake Loads
AS	3600 - 2001	Concrete Structures
AS	3700 - 2001	Masonry Structures
AS	4100 - 1998	Steel Structures
AS	2159 - 2009	Piling Design & Installation

5 Proposed Structural System

We propose a robust and cost-effective framed structural system, with vertical forces carried by reinforced concrete columns and shear walls, and earthquake and wind forces resisted by reinforced concrete shear/lift /stair walls, with post--tensioned suspended slabs , and a reinforced concrete piled shoring system with soldier piles and infill shotcrete walls, and columns/walls founded on pad and strip footings, as described below.

Shoring System

Based on the recommendations of the geotechnical report by JK Geotechnics dated 9 Oct 2017 ref 30808YFrpt, and hydrogeological analysis also by JK Geotechnics dated 29 June 2018 , we propose a shoring system consisting of reinforced concrete soldier piles 600 mm diameter at 2400 mm centres , with infill 180 thick shotcrete.

These piles will be socketed into the shale bedrock at bulk excavation level, laterally restrained by temporary rock anchors during construction, and by the suspended basement and ground floor slabs thereafter.

The above hydrogeological analysis by JK Geotechnics notes in part that " *in summary, we consider the proposed development will not have any adverse impact on the surrounding developments and that any groundwater inflows should be manageable using conventional drainage techniques, such as sump and pump techniques, without the need for basement tanking."*

Footing System

Based on the recommendations of the above geotechnical report, it is likely that Class 1 or 2 shale bedrock will be encountered at bulk excavation level.

The columns and walls are proposed to be supported on pad and strip footings founded on the Class 1 or 2 shale bedrock .

Columns

We propose a column grid of approx. 8.4 metres by 7.5 metres over the aisles in the basements, with shorter backspans.

In the residential floors, we propose a column grid of approx 7.5 metres by 7.5 metres with 6.5 metre end spans and with a slab cantilever typically 2.5 metres to optimize slab design.

Based on the above assumed columns grids, the reinforced concrete columns will range in size from 270 x 800 mm in the upper floors, to 400 x 1000 at the lowest basement level (please see schedule below).

Shear Walls

The reinforced concrete lift and stair walls, supplemented by additional shear walls as required, will resist earthquake and wind forces.

The reinforced concrete shear, lift and stair walls will range in thickness from 200 thick in the upper floors to 300 thick at the basement (please see schedule below).

Suspended and Transfer slabs

With the exception of the transfer slabs, the post-tensioned concrete suspended slabs in the basement and residential floors will generally be 200 mm flat plates, with 250 thick reinforced concrete slabs in the basement ramps.

Indicative transfer slab and slab member sizes are summarized on the table below.

6 Indicative Member Sizes

Indicative member sizes are summarized on the table below. The indicative member sizes are for planning purposes only.

Structural Element	Location	Indicative Size (mm)	Notes
P/T Suspended Slab	All floors except transfer slabs as noted below	200 thick	
P/T Transfer Slab	T1 Level 02	600 thick	
P/T Transfer Slab	T1 Level 00	900 thick	
P/T Transfer Slab	T2 Level 01	1000 thick	
P/T Drop panels	T2 Level 09	500 thick	
Slab on ground	Basement Level 3	120 thick	
Column	All Carpark Levels	400 X 1000	
Column	T1 L01 to L04	270 x 1300	
Column	T1 L04 to L08	270 x 1000	
Column	T1 L08 to L12	270 x 800	
Column	T2 L01 to L05	270 x 1500	
Column	T2 L05 to L10	270 x 1100	
Column	T2 L10 to L15	270 x 800	
Lift/Stair/Shear Walls	All Carpark Levels	300 thick	
Lift/Stair/Shear Walls	T1 L01 to L04	250 thick	
Lift/Stair/Shear Walls	T1 L04 to L12	200 thick	
Lift/Stair/Shear Walls	T2 L01 to L05	250 thick	
Lift/Stair/Shear Walls	T2 L05 to L15	200 thick	
Pad & Strip footings	Basement Level 3	As per detailed design	On shale bedrock
Shoring	Basement Level 3 to Ground	soldier piles 600 mm diameter @ 2400 mm centres with 180 thick infill shotcrete	Socketed into shale bedrock