

ARADA Australia Pty Ltd, Sydney Metro Plan & Impact Review

Carrington Road, Castle Hill

Date: 26 August 2025

Introduction & Context

Introduction

ARADA Australia and Impact Group have requested Arcadis complete a review of various sites against Sydney Metro (SM) infrastructure information within proximity of the sites that we have access to informally, and to provide an assessment of these proposed sites and development proposal against Sydney Metro parameters of 1st or 2nd reserves.

Subsequent to our initial assessment issued on 22nd July 2025, Sydney Metro provided formal WAE documentation on the 20th August 2025 to allow a detailed review of the proposed development site against Sydney Metro Infrastructure.

Site address as provided by Impact Group.

- Properties bounded by
 - 16-20 Carrington Road,
 - 2-12 Middleton Avenue,
 - 4-6 Fishburn Crescent &
 - 25-31 Sexton Avenue, Castle Hill NSW 2154

Development proposal Basement Assumptions

- 2 basement levels proposed as shown in the 16-20 Carrington Rd Plans
- Basis of review:
 - 2 basements/ underground carparking to RL 93.10
 - Assume additional for base slab, pits, lift overruns etc = say 2.0m , i,e RL 91.10

Note:

- Sydney Metro Showground Station property boundary confirmed via formal issue of work-as-executed station drawings received 20th August 2025.



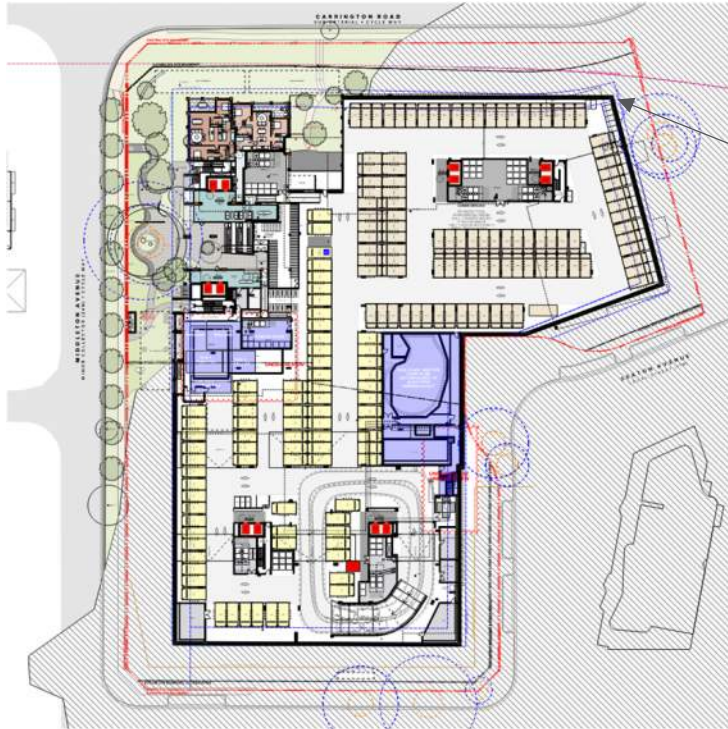
Proposed Site Proximity to Sydney Metro Station



* Actual Sydney Metro Property Survey Boundary TBC by Sydney Metro



Proposed ARADA development Site Plans



Lower Ground Floor Plan

Basement extent



Ground Floor Plan

Notes:

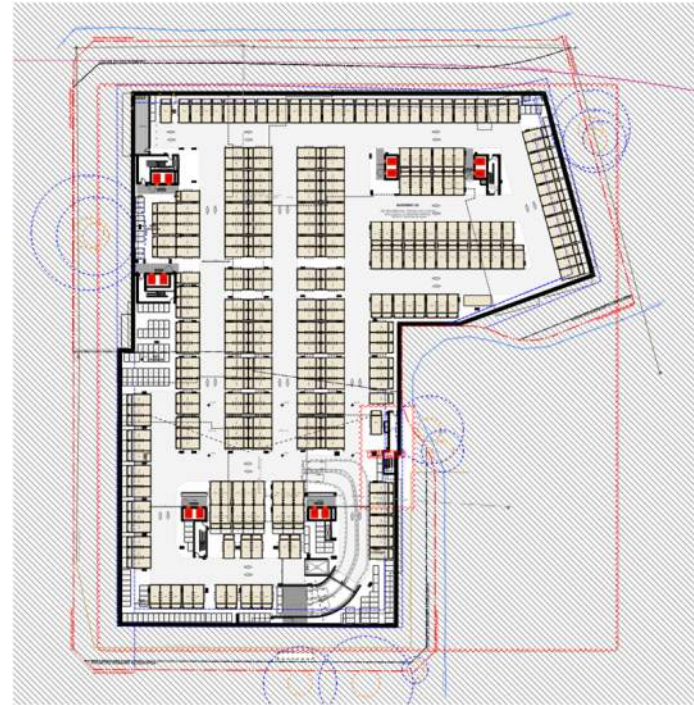
- The basement extent indicated on the LG floor plan is the same for B01 & B02
- Plans taken from PDF Titled 'Castlehill Plans' provided by ARADA



Proposed ARADA development Basement Plans



Basement 01 Plan



Basement 02 Plan

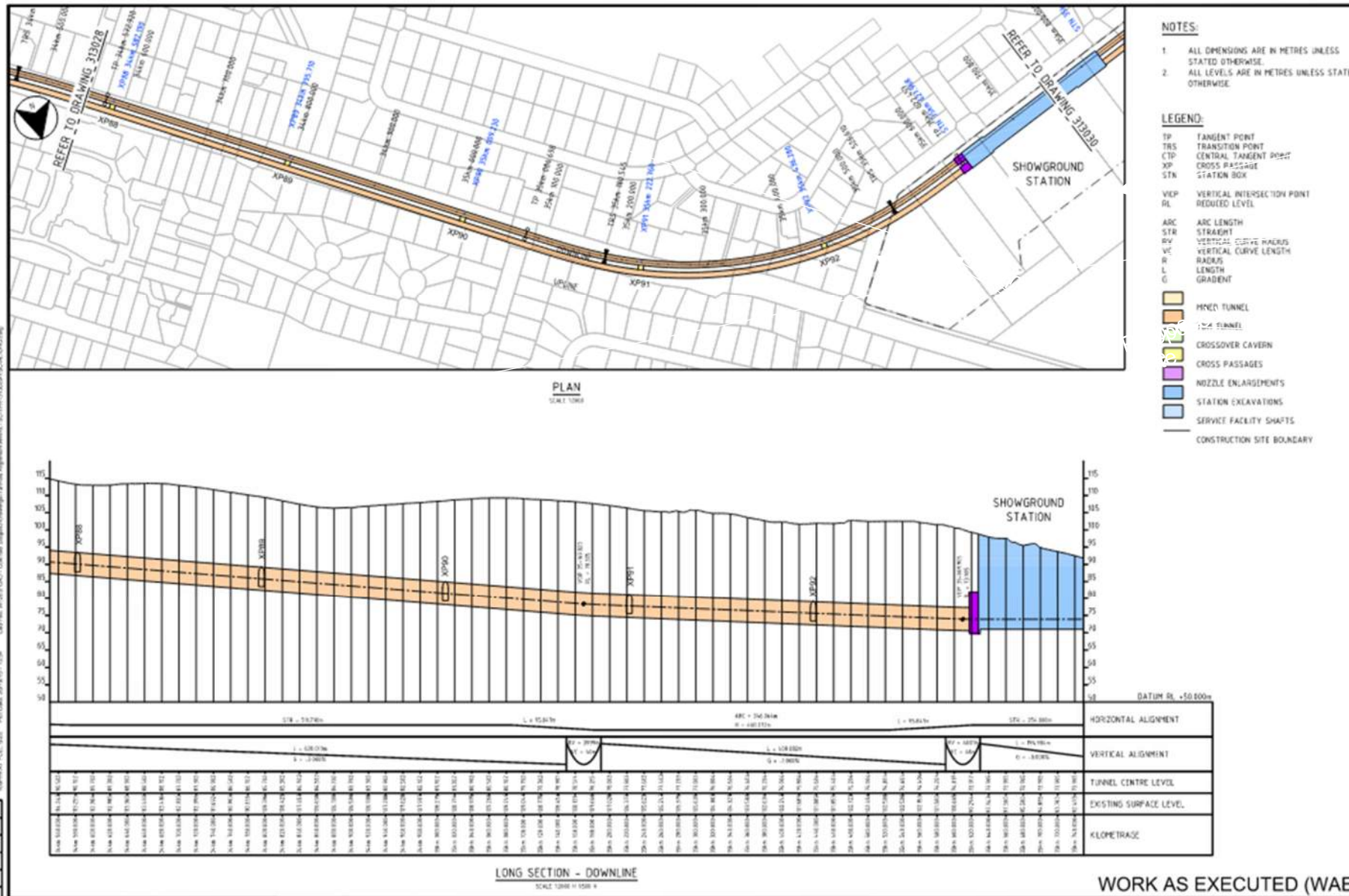
North



Notes:

- The basement extent indicated on the LG floor plan is the same for B01 & B02
- Plans taken from PDF Titled ' *Castlehill Plans* ' provided by ARADA

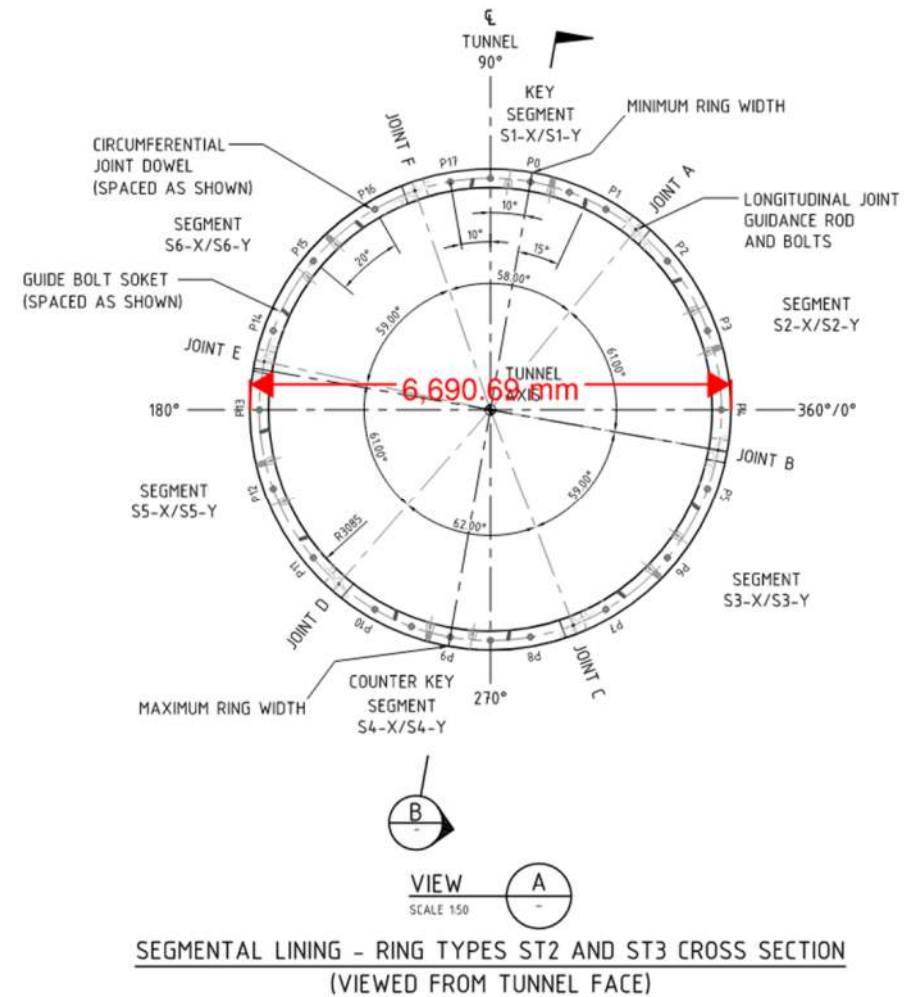
Sydney Metro Tunnel alignment



Tunnel Diameter

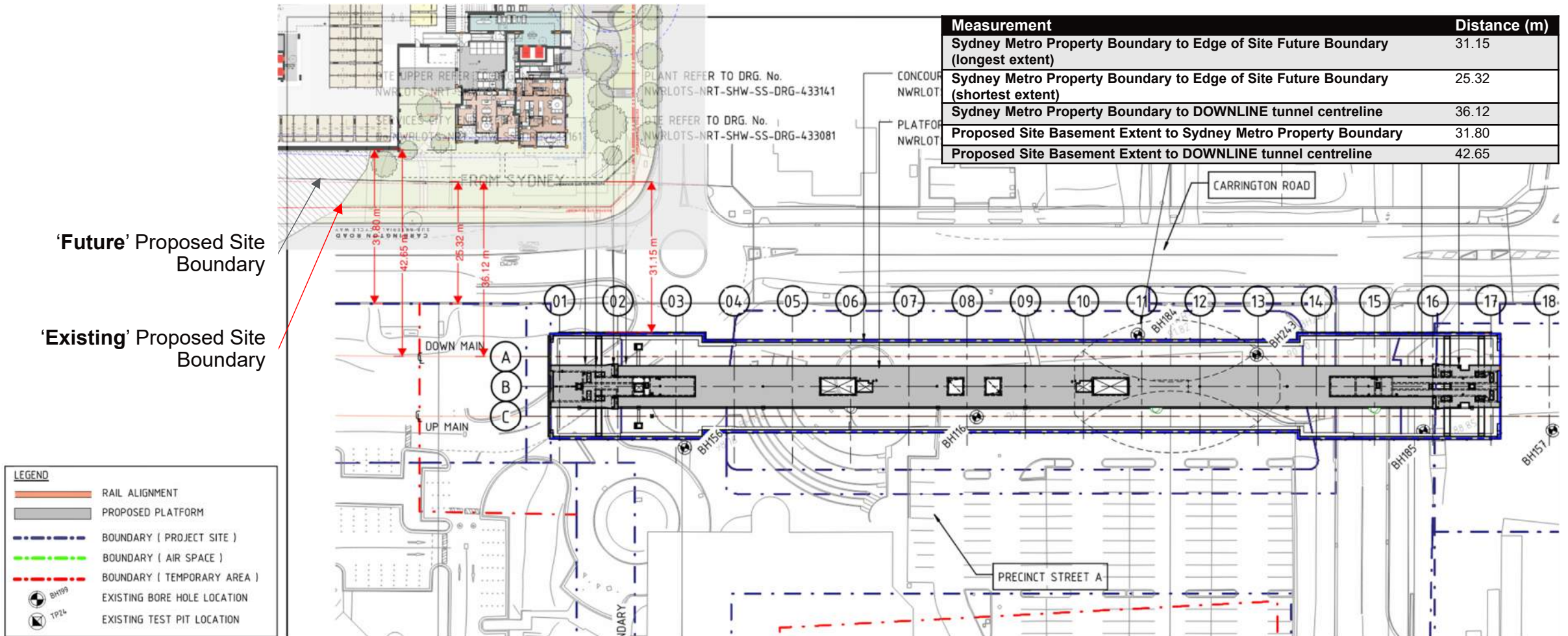
From the NORTH WEST RAIL LINK SEGMENTAL LINING DESIGN PACKAGE TD2, drawing title 'RING TYPES ST2 AND ST3', it is confirmed that the external tunnel diameter is:

6.690m \approx 7.00m



Analysis

Sydney Metro Boundary against Proposed Site 'Future' Boundary



Proposed Site Boundaries to SM Tunnel Alignment

LEGEND

- TBM TUNNEL
- NOZZLE ENLARGEMENTS
- STATION EXCAVATIONS
- CONSTRUCTION SITE BOUNDARY
- CONFIRMED SYDNEY METRO BOUNDARY

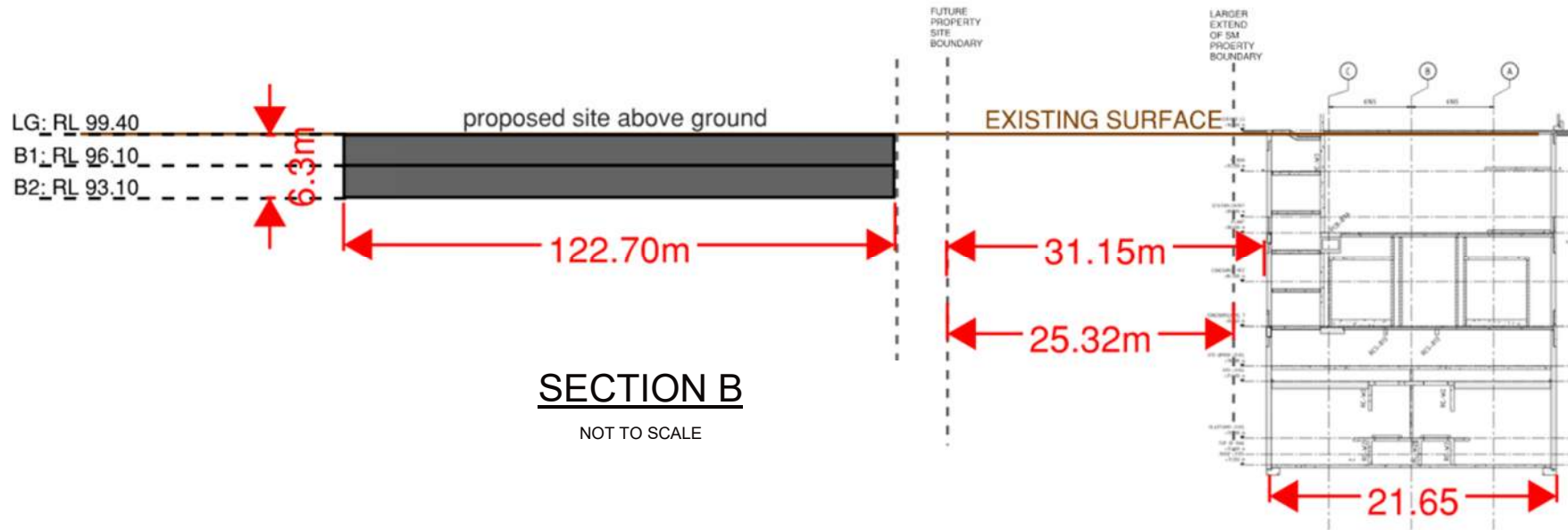


Measurement	Distance (m)
Sydney Metro Property Boundary to Edge of Site Future Boundary (shortest extent)	25.32
Proposed Site Basement Extent to Sydney Metro Property Boundary	31.80
Proposed Site Basement Extent to DOWNLINE tunnel centreline	42.65

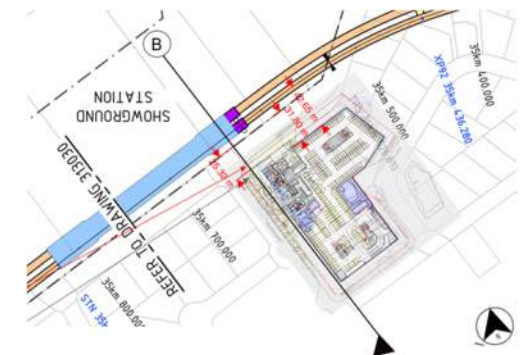
'Existing' Proposed Site Boundary

'Future' Proposed Site Boundary

Proposed Site Proximity to SM Boundary – Section B



Measurement	Distance (m)
Sydney Metro Property Boundary to Edge of Site Future Boundary (longest extent)	31.15
Sydney Metro Property Boundary to Edge of Site Future Boundary (shortest extent)	25.32
Edge of Site Future Boundary to DOWNLINE tunnel centreline	36.12
Proposed Site Basement Extent to Sydney Metro Property Boundary	31.80
Proposed Site Basement Extent to DOWNLINE tunnel centreline	42.65



SM Protection Guideline requirements - Stations

Review of SM Underground Corridor Protection Technical Guidelines

B = Sydney Metro Property Boundary (refer to Figure 4.2 below)
 Y = 25.0m

Distance from SM property boundary to the edge of the proposed site 'future' boundary is circa. 25.0m. Proposed OSD tanks and basement extent are thus greater than 25.0m.

∴ **Proposed site basement is outside second reserve** (> 25.0m)

* Based on use of Future site boundary

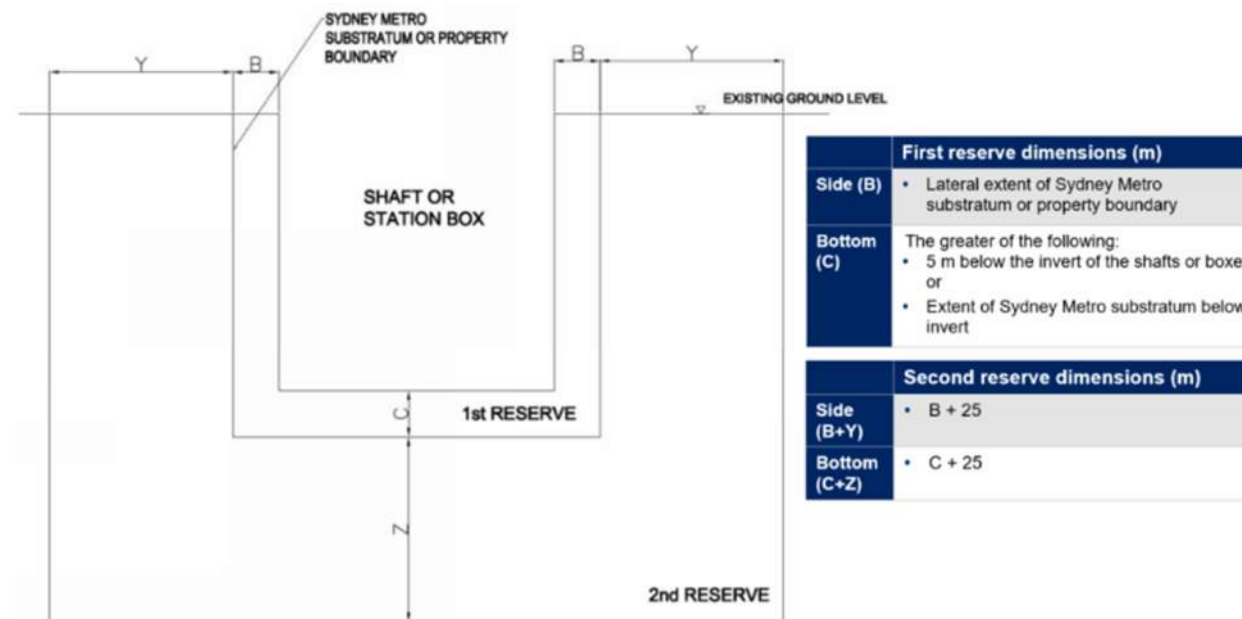


Figure 4.2 Protection reserves for shafts and station boxes

SM Protection Guideline requirements – Tunnels

Review of SM Underground Corridor Protection Technical Guidelines

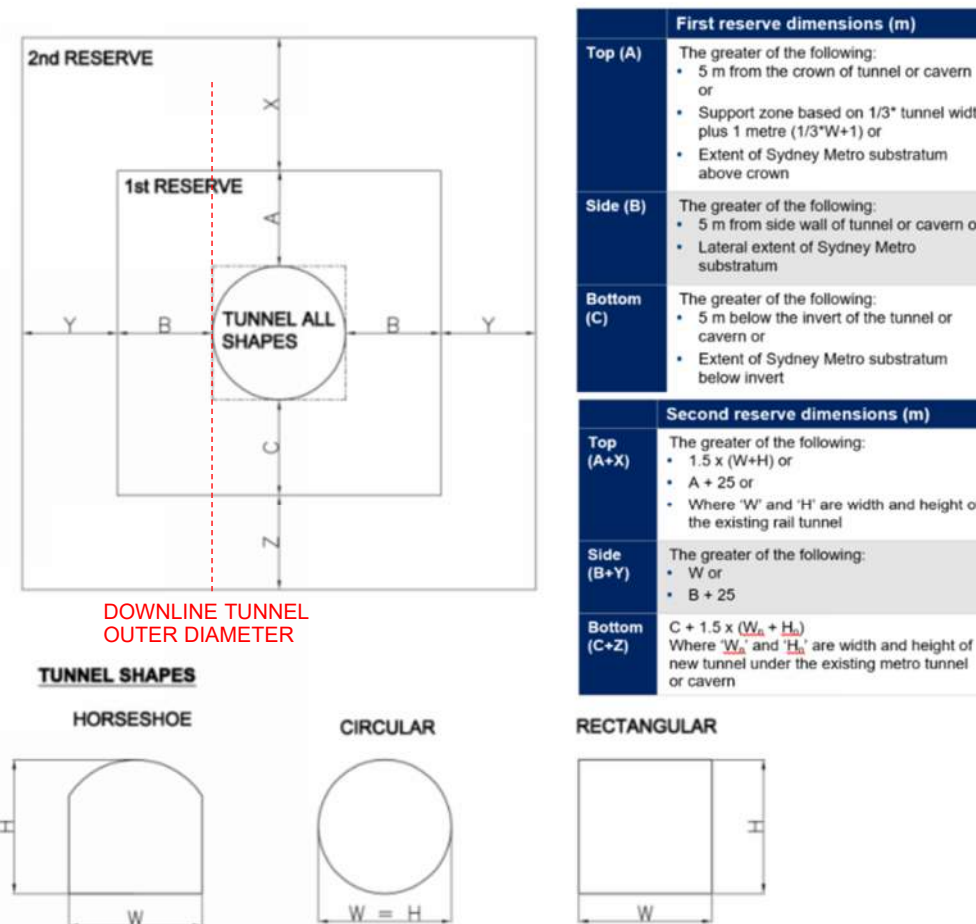
The adjacent twin running tunnels have an external diameter of approximately 7.0 m (refer to slide 5 – from formal segmental lining drawings)

- $B = 5\text{m}$
- $B + Y = B + 25 = 30\text{m}$

Distance from edge of tunnel to the proposed site ‘future’ boundary is circa. $36.12 - 3.5 = 32.62\text{m}$. Proposed OSD tanks and basement extent are thus greater than 30.0m.

∴ **Proposed site section is outside second reserve** ($> 30.0\text{m}$)

* Based on use of Future site boundary



Note: all dimensions are taken from the excavated profile of tunnels and caverns

Figure 4.1 Protection reserves for metro tunnels and caverns

SM Protection Guideline requirements

- SM Protection Guidelines provide construction / development restrictions as per Table 4.5 (extract provided), thus proposed development site is located within the second reserve.
- Arcadis highlight that **consideration of basement design concept and construction methodology** will be required to ensure no encroachment of temporary or permanent works extend into the **second reserve, for tunnels or station boxes**.
- Proposed development of the site is outside of the second reserve *and any projection into the second reserve* of temporary works, anchors or basement construction would be viable based on approval from Sydney Metro and engineering assessment being completed of the works to demonstrate that induced effects on the underground rail infrastructure are acceptable to Sydney Metro.

Table 4.5 Construction restrictions

Types of construction	First reserve	Second reserve
Excavation for basements, footings	Not allowed	<ul style="list-style-type: none"> • Excavations less than 2.0 m depth from surface level, assessment not required. • Excavation greater than 2.0 m depth, assessment required.
Shallow footings or pile foundations	Not allowed	Allowed, subject to load restrictions. Assessment required.
Tunnels and underground excavations	Not allowed	Allowed, subject to assessment.
Ground anchors	Not allowed	Allowed, subject to assessment.
Demolition of existing subsurface structures	Not allowed	Allowed, subject to assessment.
Penetrative subsurface investigations e.g. boreholes, instrumentation	Allowed away from support zone. Assessment required.	Allowed, subject to assessment (refer to Section 7.1 for requirements)

Next Steps

- Site location, actual property boundaries and proposed scheme to be confirmed by ARADA / Impact.
- Site boundary and Sydney Metro, surrounding boundaries to be confirmed via a registered Land Surveyor to confirm this assessment. Arcadis notes that the proposed development *Future property boundary* is on the boundary I,e (25m limit) of the second reserve and thus will be required to be confirmed via detailed survey drawings.
- It is noted that if the existing property boundary applies then Sydney Metro approvals may be required due to being within the second reserve, and thus Submission and approval requirements and scheme concept to be reviewed in accordance with TfNSW / Sydney Metro requirements, in particular
 - Sydney Metro Underground Corridor Protection Technical Guideline, and
 - TfNSW Airspace and External Developments Standard T HR CI 12090 ST
 - TAO designers to be included.

Arcadis Australia Pacific is a leader in built and natural asset design and management. From major road and rail infrastructure to innovative waste, water, residential, retail and heritage projects, we strive to create smart, sustainable solutions for our valued clients.