abc CONSULTANTS
structural&civilengineers

Structural Report

External Development Adjacent Metro Corridor

For Proposed Development:

At Fiveways,

Cnr Falcon St, Pacific Highway and Alexander St, Crows Nest

Prepared For:

Deicorp Pty Ltd

Level 3, 161 Redfern Street

REDFERN NSW 2016

Report Number: 23012-Structural Metro Report
Date: May 2025
Revision: Approval

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Document Control

Report Number: 23012-Structural Metro Report for 5 level basement - A

Revision	Date	Author	Approved
Approval - A	19th May 2025	Alan Meischke	Ryan Campbell

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Contents

1. Introduction

ABC Consultants has been engaged by Deicorp Pty Ltd to complete the structural engineering design for the proposed residential and commercial development at Fiveways, located at the corner of Falcon Street, Pacific Highway and Alexander Street in Crows Nest.

The purpose of this report is to provide an assessment of the impact of the proposed structure on the proposed Sydney Metro infrastructure and demonstrate compliance with structural design requirements outlined in TfNSW Technical Guidelines – NWRLSRT-PBA-SRT-TU-REP-000008 – Sydney Metro Underground Corridor Protection – Revision 1.

2. Project Description

The proposed development site is located at Fiveways, Crows Nest. The site is bound by Falcon St to the North West, Alexander St to the North East and Pacific Highway to the South.

The metro infrastructure adjacent to the development consists of a Metro tunnel that runs partially under the site on its Northern end with their location and depths having been confirmed by site surveys works undertaken by Stantec.

The total site area is approximately 3,280 m2. The site is currently occupied by a number of commercial brick/timber framed buildings with a maximum of 1 level of existing below ground basements. Refer to the existing site survey for survey details.

The proposed development is a mixed retail and residential development consisting of a single residential building above a retail/open space podium with associated basement parking. The residential tower is proposed to extend up to 21 stories in height with the proposed basement extending five levels below ground. Refer to architectural plans prepared by Turner architects for full development details.

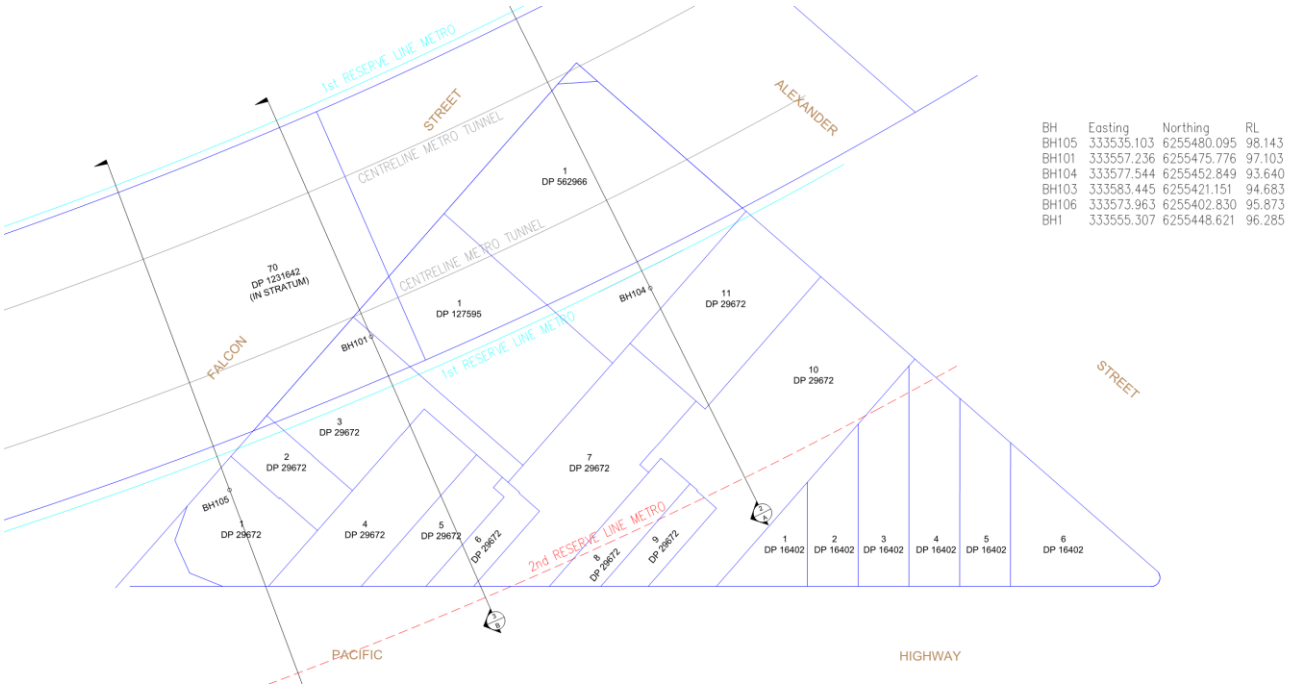

Figure 1 - Locality Map

3. Sydney Metro

The Sydney Metro is a rail infrastructure project which was completed in mid-2019. The project consists of twin metro tunnels serving stations from Tallawong through to Chatswood and extending through the Sydney CBD.

3.1. Protection Reserves

Protection reserves define the extent of zones that have been established to protect existing metro infrastructure and protect the feasibility of planned metro infrastructure from future adjacent developments.

The technical guideline defines two reserves for the protection of the Sydney Metro tunnels and station boxes. A first reserve is defined for a distance nearer to the tunnel where all works are heavily restricted and stringently reviewed. A second reserve is defined beyond the first reserve where any proposed works are still required to be assessed however less may proceed provided they meet the requirements set out by TfNSW. Table 4.5 of the technical guidelines provides a list of construction restrictions that apply to each reserve.

For the metro tunnels the reserves are defined as follows:

- First reserve extends from the tunnel edge inscribed with a square to a distance the greater of 5m or the extent of the Sydney Metro Substratum.
- Second reserve extends to a greater of 25m or the width of the tunnel from the first reserve.

For the metro station boxes the reserves are defined similarly as follows:

- First reserve extends up to the Sydney Metro Substratum or property boundary.
- Second reserve extends from the first reserve up to 25m.

The first reserve has been identified by the project survey and included in the structural drawings as can be seen in extracts below.

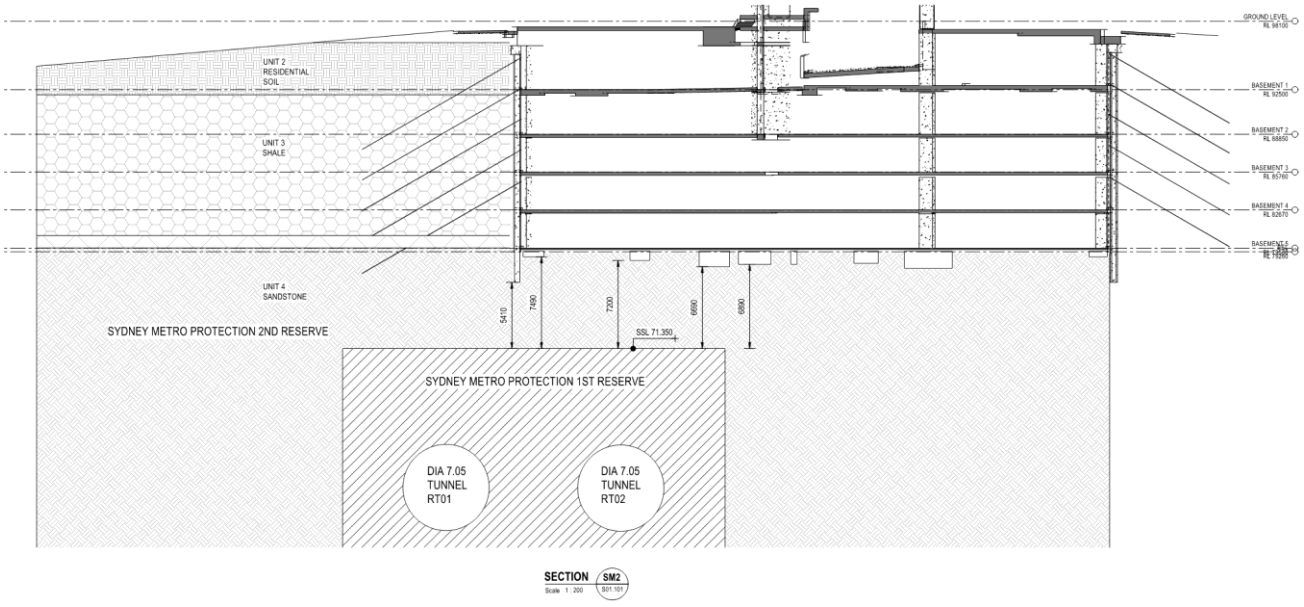

Figure 2 - Extract from structural plan S01.102 showing Metro tunnels beneath the site

3.2. Infrastructure location

The proposed development is located above the two Metro tunnels and as such the location of the infrastructure and protection reserves are based on the property boundary of the tunnel and train lines as defined in the survey.

Based on the survey drawings the distance between the Sydney Metro infrastructure and development site property boundaries ranges.

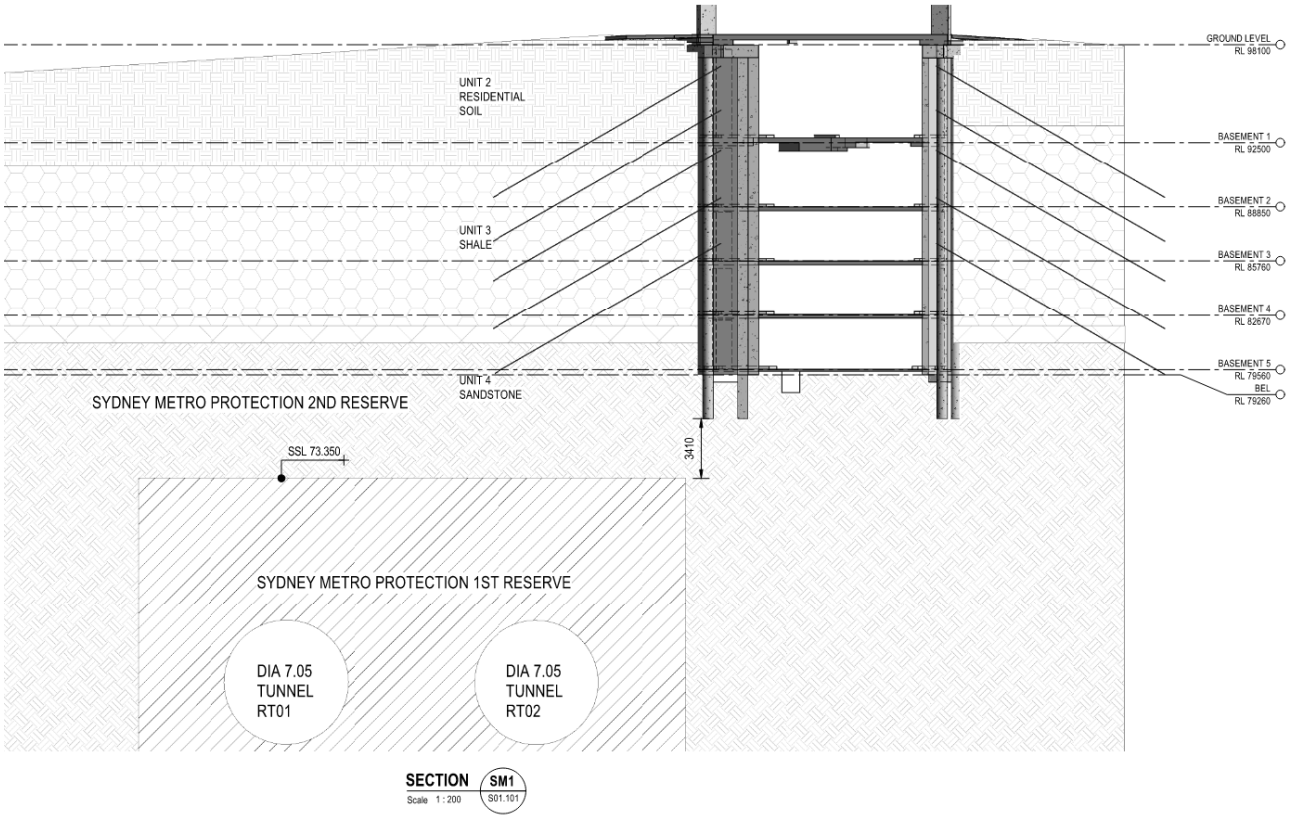

Figure 2 - Extract from structural plan S01.102

Given the second reserve is defined as extending 25m past the metro property boundary it can be seen that the development site exists inside the second reserve but completely outside the first reserve.

4. Geotechnical Investigation

A geotechnical engineering report has been completed for the subject project by Douglas Partners, Report No. 86645.03 dated March 2025. The report details a geotechnical investigation of the site which includes existing site condition, soil stratigraphy, ground water measurements and recommendations for foundation design and basement retention.

Below is a summary of the geotechnical report with relevance to the structural engineering design.

4.1. Stratigraphy

The sub-surface material below the existing basement is described in the geotechnical engineering report generally consists of fill, residual soil, Class V/IV sandstone and Class I/II sandstone.

Table 5: Summary of Geotechnical Model

Geotechnical Unit	Description	Detailed Description
Unit A	Fill / Residual Soils	Fill comprising sandy gravel, sandy and clayey soils / Residual, low to high plasticity, stiff to hard clay soils and dense sands.
Unit B	Class IV and III Shale and Laminite	Shale and laminite bedrock of very low and low strength with some medium strength bands. Mainly highly weathered then fresh, with extremely weathered bands, highly fractured to slightly fractured.
Unit C	Class IV and III Sandstone and Siltstone	Sandstone and siltstone bedrock of generally very low and low strength with medium strength bands, mainly fresh, fractured to slightly fractured.
Unit D	Class II Sandstone	Sandstone of medium to high and high strength. Mainly fresh, slightly fractured to unbroken.

Notes: Rock Class in accordance with Bertuzzi & Pells (2002) Application of Classification To A General Rock Profile

Six boreholes were completed for the site. The depth to each sub-surface material at each borehole is shown in Table 4 below.

Table 4: Results of UCS and Deformation Testing

Bore	Depth (m)	Uniaxial Compressive Strength (MPa)	Tangent		Secant	
			Elastic Modulus (GPa)	Poisson's Ratio	Elastic Modulus (GPa)	Poisson's Ratio
BH102	17.0-17.3	12.7	2.9	0.22	2.6	0.12
BH103	19.1–19.3	29.5	6.4	0.39*	5.1	0.21
BH104	16.2-16.5	29.6	6.3	0.40*	4.6	0.24
BH105	12.5-12.8	10.8	1.6	0.12	1.2	0.07
BH105	16.0-16.3	18.1	1.1	0.42*	2.3	0.31*
BH106	21.6-21.9	20.5	4.4	0.31*	3.7	0.25

* Poisson's ratio values should not be relied upon.

Table 1 - Approximate Depth to Sub-surface Material (m).

The geotechnical design parameters, including the earth pressure coefficients, cohesion, friction angle and unit weight adopted in the shoring wall design are shown below.

Table 7: Recommended Design Parameters for Shoring Systems

Material	Unit Weight (kN/m^3)	Earth Pressure Coefficient	
		Active (K_a)	At Rest (K_o)
Filling, and residual sand	20	0.30 (0.40)	(0.50)
Very low to low strength Shale / laminate / siltstone	22	0.25 (0.30)	(0.40)
Low to medium strength sandstone / siltstone	22	0.20 (0.25)	(0.35)
Medium strength or stronger sandstone	24	0	0

Table 2 – Geotechnical design parameters for site materials.

The geotechnical design parameters adopted in the foundation design are shown below.

Table 9: Recommended Design Parameters for Foundation Design

Foundation Stratum	Ultimate End Bearing Pressure (kPa)	Allowable End Bearing Pressure (kPa)	Field Elastic Modulus* (MPa)	Allowable Defects	Testing Requirements
Medium strength sandstone (Class III)	20,000	3,500	350 - 1200	< 5%	Minimum 4 cored bores with spoon testing in at least 1/3 of footings.
Medium to high strength sandstone (Class II)	60,000	6,000	900 - 2000	< 3% No seams >10mm in first 250mm or >20mm in first 500mm	Cored bores at max 10 m grid spacing or cored bores for 50% of footings, and spoon testing remainder.

Notes:

- Values for sandstone are in accordance with Pells et al AGS Dec 1998.
- Bearing pressure values assume a minimum embedment of one footing width into the relevant bearing stratum.
- Ultimate parameters are mobilized at large settlements (i.e., >5% foundation width).
- Additional analysis is required to calculate the modulus of subgrade reaction for individual footings.
- Allowable end bearing pressures to cause settlement of less than 1% of minimum footing dimension.

4.2. Ground Water

Geotechnical report has identified ground water at depths of 5m below current BEL which is above the future BEL during or immediately after boring the holes, based on the initial investigation. No long-term monitoring of water table levels has occurred and geotechnical engineer is of the opinion that a further borehole with piezometer added would confirm that only small volumes of seepage is present.

Due to the low permeability of the rock, the geotechnical engineer advises that ground water inflows should not have an adverse impact on the proposed development or neighbouring sites. The geotechnical engineer recommends that the drainage should be provided behind the shoring wall and below the basement floor slab to capture any seepage water.

It is recommended that adequate drainage is provided behind the proposed shoring walls to collect and drain any inflow water.

4.3. Excavation Support

The five-level basement excavation proposed for the site is not feasible to excavate using a batter slope. To ensure the stability of existing structures and infrastructure during construction the geotechnical engineer recommends an anchored soldier pile wall to support the fill, residual soil, shale and Class IV/III sandstone.

The Class II sandstone is considered suitable to be able to be vertically cut without support with some stabilisation measures such as rock bolts and shotcrete or dental treatment to be provided to local defects. The excavation of the unsupported rock must be completed in the presence of a geotechnical engineer however the piles have been taken to below BEL so this situation is not present for this site.

For all the boundaries, it is proposed to use a concrete soldier pile wall supported with temporary ground anchors that will be destressed once the final basement and ground floor slabs are constructed which will provide the permanent support to the shoring wall system. The concrete soldier piles are 600mm in diameter at typically 2.4m cts with a shotcrete wall between the piles and temporary ground anchors.

4.4. Foundation Design

The expected material to be encountered at the site following bulk excavation is expected to be Class II sandstone. In order to limit the potential for differential settlement, the footings will be founded in a uniform material.

Basement strip and pad footings will be proportioned to suit a maximum allowable bearing capacity of 6,000 kPa for the bedrock.

5. Structural Design

The building structure of the proposed development is a typical concrete framed building consisting of concrete footings, walls, columns and slabs. A copy of the structural engineering documentation for the shoring wall is provided in Appendix A.

The structural engineering design for the shoring wall has been completed in accordance with the following Australian Standards:

- AS1170.0:2002 – Structural Design Actions: General Design Principals
- AS1170.1:2002 – Structural Design Actions: Permanent Imposed and Other Actions
- AS1170.2:2021 – Structural Design Actions: Wind Actions
- AS1170.4:2007 – Structural Design Actions: Earthquake Actions in Australia
- AS2159:2009 – Piling Design and Installation
- AS3600:2018 – Concrete Structures
- AS4100:2020 – Steel Structures
- AS4678:2002 – Earth Retaining Structures

5.1. Shoring Wall

The proposed development includes five levels of basement excavation with a proposed bulk earth level of 79.26. Detailed excavations for footings, pits and services will be below this level.

The shoring wall on the boundaries is generally designed as a concrete pile spaced at typically 2.4m centres with an infill shotcrete wall and restrained with at least four rows of rock anchors with the base of the pile typically founded 2.5m below BEL into the Class II/I sandstone.

5.1.1. Loading

The shoring wall along the boundary is designed to withstand the dead load applied by the site soil conditions as well as live load surcharges as shown on the structural engineering documentation.

The design live load surcharge is as nominated below;

- General construction zone - 20kPa
- Road Traffic zone – 20 kPa

Nil surcharge is imposed on the shoring wall from the Sydney Metro tunnels as these tunnels are founded in the Class I/II sandstone below the depth of the proposed basement.

5.1.2. Basement Excavation Sequence

The proposed basement excavation will proceed in the following sequence:

1. Setout the location of the piles and capping beams as noted on plans, elevation and sections.
2. **Hold point** the geotechnical engineer (who shall be employed by the builder) is required to certify that the soil conditions comply with the design assumptions detailed in the geotechnical investigation report. The geotechnical engineer is to determine the level of supervision required to be able to provide this certificate. Supervision of the material removed as piles are drilled may be required.
3. Drill required bore holes to the diameter specified and depth shown on plans, elevations and sections. Ensure the socket is fully cleaned and all loose material is removed.
4. **Hold point** the structural engineer is to witness the reinforcement cages prior to placement in the bored piles. Placement of the cages within the piles for piles greater than 6m deep is to be witnessed on site
5. Place reinforcement cages in holes ensuring that cages are orientated so drilling through soldier piles for anchors / rock bolts will clear any vertical reinforcement in piles. End caps are to be placed at the base of the reinforcement cage and roller chairs placed at 2m intervals along the length of the pile (a minimum of 3 per section) to ensure minimum cover to the cage is maintained.
6. Using a tremie pipe or similar from the base of the bored hole to ensure no separation of concrete aggregate, place concrete from the base of the pile to underside of capping beam. Vibrate concrete progressively from the base of the pile as the pile is filled.
7. Install capping beam reinforcement in accordance with details on these drawings.
8. **Hold point** the structural engineer is to witness the reinforcement of the capping beam.
9. Place capping beam concrete and allow to cure for a minimum of 7 days.
10. **Hold point** project surveyor is to establish a datum of the capping beam location prior to any excavation past the capping beam. Refer to monitoring notes. Monitoring of the wall is to continue on a regular basis as detailed in the monitoring notes.
11. Excavate against the piles to maximum 500mm below the top level of rock anchors / bolts or to a maximum of 2.0m whichever is the lesser.
12. Drill and epoxy shotcrete dowels into shoring piles as nominated on drawings. Place reinforcement to the shotcrete wall.
13. **Hold point** the structural engineer is to witness the reinforcement of the shotcrete panels and ensure minimum depth is achieved to the panel.
14. Place concrete to shotcrete wall. Shotcrete panels are to be formed and poured or sprayed. If shotcrete walls are sprayed, the panels are to be over sprayed and then screeded back to the design thickness. Shotcrete is to be self-compacting in accordance with AS3600
15. If the excavation is at the level of the shoring anchor; scan pile for reinforcement prior to coring anchor hole, a maximum horizontal deviation of 5° to clear any reinforcement is permitted, otherwise contact the structural engineer for further advice. Drill anchor bore holes, install rock anchors / bolts with associated centralisers and grout tubes, place grout within the bore hole. (refer Rock Anchors – Post Tensioned Strand notes).
16. **Hold point** the geotechnical engineer is to witness the wedge lift off and anchor lift off tests as required.
17. Once the grout has achieved design strength and after a minimum 3 days, the rock anchors / bolts may be stressed.
18. Provided the shotcrete panels have reached 25mpa strength and the shoring anchors are fully stressed excavation may continue to the next stage. Repeat steps 10 to 17 until the final anchor is installed at the toe of the pile and then excavation continues to the nominated level.

19. Minimum 3 months after ground floor / level 1 slab has been cast, rebates at each slab / pile interface shall be cleaned out and grouted up with an approved non-shrink grout (monolith or equal). When f'c grout is at least 40 MPa. Typical anchors / rock bolts shall be destressed, anchor heads removed and piles made good.

5.1.3. Displacement

A major issue associated with deep excavation is the lateral displacement of the soil mass behind the shoring wall due to the shoring wall deflection. The shoring wall has been designed to limit soil movements around the proposed excavation and provide the temporary and long-term support to enable the excavation of the proposed basement.

The geotechnical engineer has undertaken FEM analysis to investigate the stress relief in the rock during the excavation works and hence the predicted movement of the rock around the Sydney Metro tunnel lines. Please refer to their report for more details on their assumptions, modelling and predicted results, Ref Douglas Partners Report “Report on Numerical Analysis – Sydney Metro”, Report No: 86645.03 dated 13 May 2025.

5.1.4. Monitoring

To ensure the maximum design displacement of the shoring wall discussed above is not exceeded, the shoring wall will be monitored by means of survey points installed along the wall at regular intervals prior to excavation.

A registered surveyor will monitor the points throughout excavation and construction for any lateral movement. A project specific monitoring report has been undertaken by the project geotechnical engineers Douglas Partners, refer "Sydney Metro Preliminary Tunnel Geotechnical Monitoring Plan, Fiveways Project", Report No: 86645.03 R.003.Rev 0 dated 1st September 2023

5.2. Foundations

The building foundations consist of a combination of strip and pad footings to support the concrete walls and columns above founded below the bulk earth levels at RL 79.26.

Based on the bulk earth levels above and allowing for a pad footing depth ranging depth of 800mm to 1400mm; the building footings will be founded at a level of RL78.46 – 77.86.

The footings will be uniformly founded on strong rock material with an Allowable Bearing pressure of 6,000 kPa as described in the geotechnical engineer's report and will be constructed using min 40 MPa concrete and 50mm cover.

5.3. Lateral Design

As part of the permanent design of the development, lateral loads due to wind and earthquake will be imposed on the structure throughout its lifetime.

In order to withstand these applied loads, the buildings will utilise concrete core walls to transfer the loads through the structure and down to foundation level. The bearing pressure at the foundation level will not exceed the design Allowable Bearing pressure of 6,000kPa.

6. Compliance with TfNSW Sydney Metro Technical Guidelines

The following sections aims to demonstrate compliance with TfNSW Sydney Metro Underground Corridor Protection Technical Guidelines NWRLSRT-PBA-SRT-TU-REP-000008 which outlines the specific design requirements for external developments near the Sydney Metro tunnel.

In accordance with the standard, the structural engineering design has been completed in accordance with relevant Australian Standards. Refer to the Section 5 of this report for a full list of standards which have been referenced in the design.

6.1. Construction Restrictions Within Tunnel Reserves

Table 4.5 of Section 4.4 of the technical guidelines outline specific construction restrictions within the first and second reserves. The table below summaries compliance with these restrictions.

Type of construction	Designer comment
Excavation for basements and footings	No excavations are proposed within the first protection reserves.
Shallow footings or pile foundations	No footings or piles are proposed within the first protection reserve.
Tunnels and underground excavations	No tunnels or underground excavations are proposed within the first reserve. Bore holes are proposed within the second reserve to allow installation of temporary ground anchors to restrain the proposed shoring piles. Refer to structural elevations and sections for full details on the extent of the proposed anchors.
Demolition of existing sub-surface structures	No demolition of existing structures is proposed within the first reserve. Demolition of existing sub-surface structures within the second reserve are presented in the referenced documentation for approval.
Penetrative subsurface investigations	No additional sub-surface investigations are proposed.

6.2. Imposed Loading

Section 9.1.1 of the technical guideline "*Any temporary or permanent works adjacent to the metro could be subject to the influence of train loading and as such will need to be assessed in accordance with AS5100 for live load surcharge".*

The level of the Sydney Metro tunnel is below the lowest level of the proposed excavation within the immediate vicinity of the site. As such, no loads are imposed from the Sydney Metro infrastructure on to the development site and no additional surcharge loading needs to be considered.

6.3. Induced Movement

Section 9.1.2 of the technical guideline "*Displacement of metro infrastructure as induced by the development must not affect the operational functionality and durability of the affected infrastructure. The developer must consider the possibility that future metro construction may induce movement on the development."*

In both the temporary and permanent case, please refer to the geotechnical modelling report undertaken by Douglas Partners for a more detailed and in-depth analysis of the movements.

In the long term, the shoring wall will be restrained by the basement slabs with lateral pressure acting on the back face of the pile towards the inner face of the basement.

"Any development activity, whether beneath or adjacent to contained metro tracks, that has the potential to cause track displacement must comply with the requirements of SPC 207 Track Monitoring Requirements for Undertrack Excavation"

In accordance with the requirements of the technical guideline the track is to be monitored in accordance with the requirements of SPC 207 Track Monitoring Requirements for Undertrack Excavation.

The project geotechnical engineer Douglas Partners and the tunnel engineer Delve Underground have both undertaken finite element analysis using Plaxis to assess the movement of the adjoining tunnels and train lines as a result of the proposed excavation and reference should be made to their reports for further details.

6.4. Induced Cracking

Section 9.1.3 outlines technical criteria regarding the monitoring and treatment of existing and new cracks to the tunnel lining.

A detailed assessment of the impact on the existing Metro tunnel structure has been undertaken by Delve which confirms the impact of the proposed development on the existing Metro tunnel satisfies the requirements of "Sydney Metro Underground Corridor Protection Technical Guidelines". Please refer to their report for more details, Ref: 6466-DLV-MEM-001 "Fiveways Crows Nest – Structural Impact Assessment".

6.5. Temporary Components

Section 9.2 requires "*Sections of temporary shoring installed to support excavations for the development must have a minimum service life of 3 years…"*

Compliance with the above clause has been achieved by the proposed shoring wall. The concrete components of the wall have all been designed for the permanent structure case and as such have a minimum design life of 50 years.

Shoring anchors which will be de-commissioned following completion of the final structure and are designed for a minimum life of 3 years.

6.6. Noise and vibration

Section 9.3 of T HR CI 12080 ST *"The effects of noise and vibration from rail operations shall be considered in the design of the development. The noise from construction and rail operation shall be considered against statutory and project noise vibration limit requirements."*

Refer to the geotechnical and acoustic engineers report for details regarding excavation and vibration considerations.

6.7. Stray currents and electrolysis from rail operations

An independent stray current electrolysis report has been completed by Corrosion Control Engineering dated 20th March 2025.

The report recommends the following details be incorporated into the structural design:

6 Recommendations

CCE recommends the following conservative protective measures, where possible/practical, to mitigate against long-term stray current corrosion at on-ground and in-ground metallic structures:

1. The installation of heavy plastic membrane (e.g. Fortecon) under (or behind) all reinforced concrete slabs, permanent retaining walls, permanent anchors, piers/piles, and metallic posts/bollards, to electrically isolate from soil and stray currents. Note: that this may not be possible/practical at piers/piles or where friction is relied upon for structural purposes.
2. The use of high strength (minimum 32 MPa), high cover (minimum 50 mm) concrete to effectively prevent/limit soil moisture penetrating through to the steel/metal.

These recommendations have been adopted in the structural engineering design.

7. Conclusion

The structural assessment report demonstrates that the proposed development at Fiveways ,Crows Nest can be completed within the requirements set by Transport for New South Wales for building adjacent to the Sydney Metro infrastructure.

The structural engineering design has been completed to ensure existing rail infrastructure is maintained and unaffected by the proposed development. Nil reliance has been placed on the rail infrastructure or corridor for support of the development in both the temporary and permanent case.

This structural assessment report is to be read in conjunction with the ABC Consultants structural engineering documentation, project 23012 – Fiveways, Crows Nest.

8. Appendix A – Structural Engineering Drawings

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title:	SITE RETENTION NOTES	Drawing No:	S00-005

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	12.11.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027

BORED PILES

1. REFER TO THE GEOTECHNICAL REPORT E24770.G03_REV 1 BY EI AUSTRALIA (DATED 31 OCTOBER 2024) FOR A DESCRIPTION OF THE ANTICIPATED SITE CONDITIONS. THE PILING CONTRACTOR IS TO STUDY THE REPORT AND MAKE HIS OWN EVALUATION OF THE SITE CONDITIONS. ANY ADDITIONAL COSTS INCURRED SHALL BE BORNE BY THE PILING CONTRACTOR.
2. THE BORED PILES ARE PROPORTIONED FOR THE SCHEDULED LOADS WITH ALLOWABLE SOCKET SKIN FRICTION AND END BEARING CAPACITY AS INDICATED IN THE REPORT. THE DEPTHS AND LENGTHS NOMINATED IN THE SCHEDULE ARE INDICATIVE ONLY. THEY MAY NEED TO BE VARIED DEPENDING ON THE SITE CONDITIONS ENCOUNTERED. THE PILING CONTRACTOR NEEDS TO INCORPORATE ANY DESIGN CHANGES REQUIRED AND ADVISE PROJECT ENGINEER WHO WILL ASSESS ANY DESIGN CHANGES RESULTING FROM THESE CHANGES THAT MAY BE REQUIRED BEFORE WORK RE-COMMENCE.
3. ALL WORKMANSHIP AND MATERIAL SHALL BE IN ACCORDANCE WITH AS 2159.
4. THE BORED PILES SHALL BE LOCATED CONCENTRIC WITH THE COLUMNS AND WALLS UNLESS NOTED OTHERWISE.
5. DRILL AND INSTALL THE BORED PILES IN THE LOCATIONS SHOWN ON THE DRAWINGS AND THE ABOVE REQUIREMENTS.
6. THE PILING CONTRACTOR SHALL ALLOW FOR THE COST OF INTEGRITY TESTING OF 10% ALL BORED PILES IN ACCORDANCE WITH AS2159 CLAUSE 8.8. ALL PILE INTEGRITY TESTING IS TO BE WITNESSED BY THE PROJECT GEOTECHNICAL ENGINEER .
7. BEFORE ANY CONCRETE IS POURED, ALL ROCK SOCKETS SHALL BE DEWATERED AND INSPECTED BY A GEOTECHNICAL ENGINEER, WHO SHALL BE EMPLOYED BY THE BUILDER, TO VERIFY THE SOIL PARAMETERS. THE SOCKET BASE AND WALLS MUST BE CLEAN AND FREE FROM CLAY.
8. IF THE CONCRETE NEEDS TO BE TREMIED, SUPER PLASTICIZER MUST BE ADDED TO THE MIX AND THE CONCRETE GRADE INCREASED BY 30% . REFER TO THE SPECIFICATIONS FOR THE INSPECTION OF THE HOLE PRIOR TO CONCRETING.
9. ANY ALTERNATIVE DESIGN SHALL MEET THE ABOVE REQUIREMENTS AND THE SCHEDULED LOADS. THE PILING CONTRACTOR SHALL OBTAIN CERTIFICATION FOR THE CALCULATIONS OF THE ALTERNATIVE SYSTEM. THE DETAILS AND CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE PERFORMANCE OF THE ALTERNATIVE BORED PILES.
10. PILING CONTRACTOR TO ALLOW FOR CASING OF ALL PILES IN LOOSE MATERIAL.
11. SPLICING TO LONGITUDINAL PILE REINFORCEMENT IS TO BE AVOIDED WHERE POSSIBLE IE: FOR PILE CAGE LENGTHS LESS THAN 12m. SPLICES OF CAGE REINFORCEMENT ARE TO ENSURE MINIMUM SPACING BETWEEN TIES ARE MAINTAINED. LOCATION OF SPLICED CAGES ARE TO BE APPROVED BY THE STRUCTURAL ENGINEER.

BULK EARTHWORKS AND SHORING NOTES

GEOTECHNICAL REPORT
REFER TO GEOTECHNICAL REPORT E24770.G03_REV 1 BY EI AUSTRALIA (DATED 31 OCTOBER 2024) AND THE CONTRACTOR IS TO ENSURE GEOTECH REPORT RECOMMENDATIONS ARE ADHERED TO.

SPECIFICATION
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THE HEAD SPECIFICATION.

EROSION AND SEDIMENT CONTROL
PROVIDE GRAVEL SHAKEDOWN AREA FOR 10 METRES AT BOUNDARY OF SITE AND OTHER SEDIMENT CONTROL MEASURES GENERALLY CONSISTENT WITH THE REQUIREMENTS OF THE PUBLICATION SOIL AND WATER MANAGEMENT FOR URBAN DEVELOPMENT NSW DEPARTMENT OF HOUSING 1993. (ISSN 0 7305 9423 0), FOR THE DURATION OF THE WORKS. NOTE THAT ALL WORKS ON SITE ARE TO COMPLY WITH COUNCIL SOIL AND EROSION CONTROL REQUIREMENTS. ALLOW TO SUBMIT DETAILS TO COUNCIL FOR APPROVAL IF REQUIRED. ENSURE STREETS ARE KEPT CLEAN OF ALL DEBRIS.

DUST CONTROL
THE CONTRACTOR IS TO ENSURE THAT THE DUST PREVENTION METHODS HE ADOPTS ARE SUFFICIENT TO MEET THE REQUIREMENTS OF THE COUNCIL. IT IS THE CONTRACTORS' RESPONSIBILITY TO ACQUAINT HIMSELF WITH THE REQUIREMENTS.

SITE SETOUT
REFER TO THE ARCHITECTS DRAWINGS FOR THE ACCURATE SETOUT OF ALL BUILDINGS, DRIVEWAYS, PARKING AREAS ETC. NOTE BULK EARTHWORKS PLAN IS INDICATIVE ONLY. CALCULATE AND CUT BATTERS FROM ARCHITECT'S PLANS AND SURVEY. CROSSOVER PROFILES TO COUNCIL REQUIREMENTS.

GENERALLY
PROCEED WITH BULK EARTHWORKS AND SHORING TO PROVIDE A STABLE SUBGRADE AND WORK SPACE FOR THE CONSTRUCTION OF THE PROPOSED DEVELOPMENT. STRIP AND DISPOSE OF TOPSOIL, REDUCE SITE TO LEVELS INDICATED AND DISPOSE OF ALL UNWANTED MATERIAL LEGALLY.

SUPERVISION
A GEOTECHNICAL ENGINEER IS TO PROVIDE SUPERVISION (AS3798) FOR ALL EARTHWORKS DURING THE COURSE OF CONSTRUCTION. AT THE COMPLETION OF THE BULK EXCAVATION CONTRACT, THE GEOTECHNICAL ENGINEER IS TO PROVIDE CERTIFICATION THAT THE WORKS HAVE BEEN CARRIED OUT IN ACCORDANCE WITH BULK EARTHWORKS SPECIFICATION.

DRAINAGE DURING CONSTRUCTION
PROVIDE ADEQUATE DRAINAGE DURING CONSTRUCTION TO ENSURE MINIMUM DISRUPTION FROM RAIN.

SERVICES
DURING EXCAVATION COORDINATE WITH ALL SERVICES INCLUDING SEWER, GAS AND POWER.

BULK EARTHWORKS PROCEDURE AND SPECIFICATION
- THE SITE IS TO BE STRIPPED OF TOPSOIL AND UNCONSOLIDATED EXISTING FILL.
- AT THE COMPLETION OF THE BULK EARTHWORKS, THE CONTRACTOR SHALL PROVIDE TEMPORARY OR PERMANENT DRAINAGE TO ENSURE NO SURFACE WATER IS RETAINED ON THE SITE, OR THAT SURFACE WATER FLOW DETRIMENTALLY SCOURS THE PREPARED BASE.

GEOTECHNICAL ENGINEER NOTES
- EXCAVATION TO BE CARRIED OUT UNDER GEOTECHNICAL ENGINEER'S SUPERVISION
- GEOTECHNICAL ENGINEER (GE) TO COMMENT ON SUITABILITY OF THE SUBCONTRACTOR'S METHOD OF EXCAVATION AS REMOVAL PROCEEDS.

HYDRAULICS ENGINEER
- DURING EXCAVATION COORDINATE WITH ALL HYDRAULIC ENGINEERS REQUIREMENTS FOR SEWER, GAS AND STORMWATER LINES.

AS-BUILT DRAWING
- PROVIDE AN AS-BUILT DRAWING PREPARED BY A REGISTERED SURVEYOR TO CONFIRM BULK EARTHWORKS IS COMPLETED TO REQUIRED DIMENSIONS AND LEVELS.

DILAPIDATION REPORT
- THE APPROVED SHORING WALL CONTRACTOR SHALL PREPARE A DILAPIDATION REPORT OF STREET, FOOTPATH, ROAD FEATURES AND ALL REQUESTED RAILCORP ASSETS PRIOR TO INSTALLATION OF SHORING WALL.

COMPACTION NOTES
- COMPACTION BEHIND INTERNAL FORMED RETAINING WALL BY EXCAVATION CONTRACTOR USING HAND HELD RAMMERS TO ACHIEVE 98% MODIFIED DENSITY.
- COMPACT IN MAXIMUM 300mm THICK LAYERS AT OPTIMUM MOISTURE CONTENT OF ±3%.

CONTRACTOR TO ALLOW FOR 15% INCREASE IN ANCHOR QUANTITIES OR SIZES TO ACCOMMODATE REQUIREMENTS BY GEOTECHNICAL CONSULTANT DURING EXCAVATION WORKS

BOND LENGTH AND DIAMETER OF ANCHOR HOLE TO BE CONFIRMED BY SHORING WALL CONTRACTOR. THE ANCHOR LENGTHS SHOWN ON THE STRUCTURAL DRAWINGS ARE INDICATIVE ONLY

SHORING DESIGN CRITERIA

STRUCTURE IMPORTANCE LEVEL:	3
DESIGN WORKING LIFE:	50 YEARS OR MORE
WIND ANNUAL PROBABILITY OF EXCEEDANCE:	1/1000
EARTHQUAKE ANNUAL PROBABILITY OF EXCEEDANCE:	1/1000
EARTHQUAKE DESIGN CATEGORY:	EDC II
CONCRETE EXPOSURE CLASSIFICATION:	B1
SURCHARGE:	REFER LOADING PLANS
GEOTECHNICAL REDUCTION FACTOR:	ϕ_g = 0.56

GEOTECHNICAL DESIGN PARAMETERS

ALLOWABLE END BEARING CAPACITY
CLASS II SANDSTONE 6000 kPa

ALLOWABLE SHAFT ADHESION
CLASS II SANDSTONE 600 kPa

PERMANENT SHORING WALLS HAVE BEEN DESIGNED IN ACCORDANCE WITH AS3600, AS1170, AS2159 WITH A DURABILITY DESIGN LIFE OF 50 YEARS

CONCRETE GRADE

ELEMENT CONCRETE QUALITY	STRENGTH f'c	MAX SIZE AGG. mm	SLUMP mm	CEMENT TYPE	ADMIXTURE
SHORING PILES	50	20	80	GP	-
SHOTCRETE	32	10	150 - 200	GP	-
CAPPING BEAM	50	20	80	GP	-

NOTE: ALL CEMENTITIOUS MATERIAL MUST CONFIRM TO TINSW SPECIFICATION 3211

COVERS			
ELEMENT	TOP	BTM	SIDES
PILES	60mm	60mm	60mm
CAPPING BEAM	50mm	50mm	50mm
SHOTCRETE	50mm	50mm	50mm

TOLERANCE

1. BORES SHALL BE CENTERED WITHIN 25mm OF THE 'DESIGN' CENTRE AS INDICATED ON THE PLANS.
2. MAXIMUM "OUT OF PLUMB" OF BORES SHALL BE 75mm OR 1:500, WHICHEVER IS LESS
3. GROUND ANCHORS

MONITORING

1. MONITORING OF THE ADJACENT BUILDINGS AND TOP AND MIDDLE OF THE SOLDIERS SHALL BE CARRIED OUT IN ACCORDANCE WITH GEOTECHNICAL AND VIBRATION MONITORING PLANS PREPARED BY GEOTECHNICAL ENGINEER.
2. MONITORING OF SURVEY POINTS SHALL BE BY A LICENSED SURVEYOR AND BE INITIALLY AT MAXIMUM THREE WEEK INTERVALS & FOR EVERY BASEMENT LEVEL EXCAVATED.
3. IF ANY MOVEMENTS ABOVE THE LIMITS NOMINATED BY THE GEOTECHNICAL ENGINEER ARE DETECTED, ALL WORKS SHALL BE CEASED, THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED. THE PROJECT MANAGER SHALL NOTIFY THE ADJOINING PROPERTY OWNERS.
4. RECORDS SHALL BE KEPT OF ALL MONITORING AND BE AVAILABLE FOR INSPECTION AT ANY TIME.

GEOTECHNICAL ENGINEER TO APPROVE ALL PILE SPACINGS ON SITE AND TO CONFIRM RETAINED MATERIALS ABILITY TO ARCH BETWEEN PILES TEMPORARILY.

CONSTRUCTION SEQUENCE FOR EXTERNALLY ANCHORED SOLDIER WALLS:

THE PROPOSED BASEMENT EXCAVATION WILL PROCEED IN THE FOLLOWING SEQUENCE:

1. SETOUT THE LOCATION OF THE PILES AND CAPPING BEAMS AS NOTED ON PLANS, ELEVATION AND SECTIONS.
2. **HOLD POINT** THE GEOTECHNICAL ENGINEER (WHO SHALL BE EMPLOYED BY THE BUILDER) IS REQUIRED TO CERTIFY THAT THE SOIL CONDITIONS COMPLY WITH THE DESIGN ASSUMPTIONS DETAILED IN THE GEOTECHNICAL INVESTIGATION REPORT. THE GEOTECHNICAL ENGINEER IS TO DETERMINE THE LEVEL OF SUPERVISION REQUIRED TO BE ABLE TO PROVIDE THIS CERTIFICATE. SUPERVISION OF THE MATERIAL REMOVED AS PILES ARE DRILLED MAY BE REQUIRED.
3. DRILL REQUIRED BORE HOLES TO THE DIAMETER SPECIFIED AND DEPTH SHOWN ON PLANS, ELEVATIONS AND SECTIONS. ENSURE THE SOCKET IS FULLY CLEANED AND ALL LOOSE MATERIAL IS REMOVED.
4. **HOLD POINT** THE STRUCTURAL ENGINEER IS TO WITNESS THE REINFORCEMENT CAGES PRIOR TO PLACEMENT IN THE BORED PILES. PLACEMENT OF THE CAGES WITHIN THE PILES FOR PILES GREATER THAN 6M DEEP IS TO BE WITNESSED ON SITE
5. PLACE REINFORCEMENT CAGES IN HOLES ENSURING THAT CAGES ARE ORIENTATED SO DRILLING THROUGH SOLDIER PILES FOR ANCHORS / ROCK BOLTS WILL CLEAR ANY VERTICAL REINFORCEMENT IN PILES. END CAPS ARE TO BE PLACED AT THE BASE OF THE REINFORCEMENT CAGE AND ROLLER CHAIRS PLACED AT 2M INTERVALS ALONG THE LENGTH OF THE PILE (A MINIMUM OF 3 PER SECTION) TO ENSURE MINIMUM COVER TO THE CAGE IS MAINTAINED.
6. USING A TREMIE PIPE OR SIMILAR FROM THE BASE OF THE BORED HOLE TO ENSURE NO SEPARATION OF CONCRETE AGGREGATE, PLACE CONCRETE FROM THE BASE OF THE PILE TO UNDERSIDE OF CAPPING BEAM. VIBRATE CONCRETE PROGRESSIVELY FROM THE BASE OF THE PILE AS THE PILE IS FILLED.
7. INSTALL CAPPING BEAM REINFORCEMENT IN ACCORDANCE WITH DETAILS ON THESE DRAWINGS.
8. **HOLD POINT** THE STRUCTURAL ENGINEER IS TO WITNESS THE REINFORCEMENT OF THE CAPPING BEAM.
9. PLACE CAPPING BEAM CONCRETE AND ALLOW TO CURE FOR A MINIMUM OF 7 DAYS.
10. **HOLD POINT** PROJECT SURVEYOR IS TO ESTABLISH A DATUM OF THE CAPPING BEAM LOCATION PRIOR TO ANY EXCAVATION PAST THE CAPPING BEAM. REFER TO MONITORING NOTES. MONITORING OF THE WALL IS TO CONTINUE ON A REGULAR BASIS AS DETAILED IN THE MONITORING NOTES.
11. EXCAVATE AGAINST THE PILES TO MAXIMUM 500MM BELOW THE TOP LEVEL OF ROCK ANCHORS / BOLTS OR TO A MAXIMUM OF 2.0M WHICHEVER IS THE LESSER.
12. DRILL AND EPOXY SHOTCRETE DOWELS INTO SHORING PILES AS NOMINATED ON DRAWINGS. PLACE REINFORCEMENT TO THE SHOTCRETE WALL.
13. **HOLD POINT** THE STRUCTURAL ENGINEER IS TO WITNESS THE REINFORCEMENT OF THE SHOTCRETE PANELS AND ENSURE MINIMUM DEPTH IS ACHIEVED TO THE PANEL.
14. PLACE CONCRETE TO SHOTCRETE WALL. SHOTCRETE PANELS ARE TO BE FORMED AND POURED OR SPRAYED. IF SHOTCRETE WALLS ARE SPRAYED, THE PANELS ARE TO BE OVERSPRAYED AND THEN SCREEDED BACK TO THE DESIGN THICKNESS. SHOTCTRETE IS TO BE SELF-COMPACTING IN ACCORDANCE WITH AS3600
15. IF THE EXCAVATION IS AT THE LEVEL OF THE SHORING ANCHOR; SCAN PILE FOR REINFORCEMENT PRIOR TO CORING ANCHOR HOLE. A MAXIMUM HORIZONTAL DEVIATION OF 5◦ TO CLEAR ANY REINFORCEMENT IS PERMITTED. OTHERWISE CONTACT THE STRUCTURAL ENGINEER FOR FURTHER ADVICE. DRILL ANCHOR BORE HOLES, INSTALL ROCK ANCHORS / BOLTS WITH ASSOCIATED CENTRALISERS AND GROUT TUBES, PLACE GROUT WITHIN THE BORE HOLE. (REFER ROCK ANCHORS – POST TENSIONED STRAND NOTES).
16. **HOLD POINT** THE GEOTECHNICAL ENGINEER IS TO WITNESS THE WEDGE LIFT OFF AND ACHOR LIFT OFF TESTS AS REQURIED.
17. ONCE THE GROUT HAS ACHIEVED DESIGN STRENGTH AND AFTER A MINIMUM 3 DAYS, THE ROCK ANCHORS / BOLTS MAY BE STRESSED.
18. PROVIDED THE SHOTCRETE PANELS HAVE REACHED 25MPA STRENGTH AND THE SHORING ANCHORS ARE FULLY STRESSED EXCAVATION MAY CONTINUE TO THE NEXT STAGE. REPEAT STEPS 10 TO 17 THE FINAL ANCHOR IS INSTALLED AT THE TOE OF THE PILE.
19. CONTINUE EXCAVATION INTO THE UNSUPPORTED CLASS II / III SANDSTONE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT AND ADVICE.
20. MINIMUM 3 MONTHS AFTER GROUND FLOOR / LEVEL 1 SLAB HAS BEEN CAST, REBATES AT EACH SLAB / PILE INTERFACE SHALL BE CLEANED OUT AND GROUTED UP WITH AN APPROVED NON-SHRINK GROUT (MONOLITH OR EQUAL). WHEN F'C GROUT IS AT LEAST 40 MPA. TYPICAL ANCHORS / ROCK BOLTS SHALL BE DESTRESSED, ANCHOR HEADS REMOVED AND PILES MADE GOOD.

ROCK ANCHORS - POST-TENSIONED STRAND

1. IN ADDITION TO ANY NOTES PROVIDED BELOW AND DETAILS SHOWN ON THESE DRAWINGS, ALL ROCK ANCHORS ARE TO BE INSTALLED IN ACCORDANCE WITH AS4678 AND TRANSPORT FOR NSW QA SPECIFICATION B114
2. ANCHORS SHALL CONSIST OF LOW RELAXATION STRESS-RELIEVED SUPERGRADE STEEL STRAND TO AS4672.1 AND AS4672.2 AND ANCHORAGES AND WEDGES SHALL CONFORM TO AS1314.
3. ALL STEEL ELEMENTS, INCLUDING BEARING PLATES AND WASHERS, MUST BE FABRICATED FROM GRADE 250 STEEL IN ACCORDANCE WITH AS3678. NUTS FOR THE ROCK BOLTS MUST BE GRADE C COMPLYING WITH AS1112.3 AND PROPERTY CLASS 5 COMPLYING WITH AS4291.2 OR EQUIVALENT TO SUIT THE END THREAD OF THE BOLT.
4. THE USE OF COUPLERS TO THE ANCHOR STRANDS IS NOT PERMITTED.
5. PRIOR TO ANY DRILLING OPERATIONS, THE BUILDER SHALL ACQUAINT THEMSELVES WITH ALL ADJACENT UNDERGROUND SERVICES AND ENSURE THAT NONE OF THESE ARE DISRUPTED BY ROCK ANCHORS. ALL APPROPRIATE APPROVALS, PERMITS AND AGREEMENTS SHALL BE OBTAINED BEFORE COmmENCEMENT OF THE WORK.
6. BORE HOLES FOR THE ROCK BOLTS MUST BE DRILLED USING ROTARY OR ROTARY PERCUSSION DRILLING EQUIPMENT. DRILLING FLUIDS AND CORE DRILLING ARE NOT PERMITTED. BORE HOLES MUST BE INSTALLED WITH A MAXIMUM DEVIATION FROM THE DESIGN INCLINATION IN ANY DIRECTION OF 2◦ AND A MAXIMUM DEVIATION FROM THE ENTRY POINT OF +/- 25mm.
7. CENTRALISERS MUST BE PROVIDED ALONG THE LENGTH OF THE STRAND AT 1000mm CENTRES WITHIN THE BOND LENGTH, 2000mm CENTRES WITHIN THE FREE LENGTH AND 300mm FROM EACH END TO ENSURE THE STRAND IS CENTRALISED TO THE CENTRE OF THE BOREHOLE. THE CENTRALISERS MUST BE; NON-CORRODIBLE. FIRMLY FIXED TO THE BOLT AND A SHAPE THAT PERMITS THE FREE FLOW OF GROUT TO FULLY ENCAPSULATE THE BOLT.
8. GROUT TUBES MUST EXTEND TO THE BASE OF THE LOWEST PORTION OF THE BORE HOLE AND BE SECURELY FIXED TO THE STRANDS. TUBING MUST BE OF ADEQUATE STRENGTH TO RESIST ANY DAMAGE DURING INSTALLATION AND GROUTING AND BE OF SUFFICIENT SIZE TO ALLOW PUMPING OF GROUT.
9. MATERIAL PROPERTIES OF THE GROUT MUST CONFORM TO TABLE B114.2 OF TfNSW QA SPECIFICATION R64. GROUTS MUST GENERALLY HAVE A HIGH BLEED RESISTANCE, LOW SHRINKAGE AND HIGH FLUIDITY. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 520MPA AT THREE (3) DAYS. GROUT CYLINDERS SHALL BE TAKEN ON THE BASIS OF ONE SAMPLE (TWO CYLINDERS) FOR EVERY TEN ANCHORS AND TESTED ON THE DAY OF STRESSING. THE GROUT SHALL BE MIXED IN A HIGH SPEED IMPELLER TYPE MACHINE.
10. THE STRANDS SHALL PULLED TAUT AND MARKED AT THE FACE OF THE WEDGE PRIOR TO UNDERTAKING THE TENSIONING PROCEDURE. MEASUREMENTS FROM THE FACE OF THE WEDGE TO THE MARKING SHALL BE TAKEN AT 25%, 50%, 75%, 100% AND 125% AS THE STRAND IS PROGRESSIVELY TENSIONED TO THE PROOF LOAD. RESULTS OF THE MEASUREMENTS SHALL BE PROVIDED TO THE ENGINEER FOR COMPARISON AGAINST THEORETICAL EXTENSIONS.
11. EACH ANCHOR SHALL BE PROOF LOADED I.E. STRESSED TO 125% OF THE WORKING LOAD, HELD FOR FIVE MINUTES, AND SLOWLY EASED BACK. THE ANCHOR SHALL BE THEN STRESSED TO WORKING LOAD AND LOCKED OFF. ANY ANCHOR WHICH FAILS TO HOLD THE LOAD SHALL BE REMOVED AND REPLACED WITH ANOTHER ANCHOR. SUCH WORK SHALL BE CARRIED OUT IN THE PRESENCE OF AN ENGINEER.
12. STRANDS WHICH EXTEND EXCESSIVELY BEYOND THE FACE OF THE PILE MAY BE CUT TO A MINIMUM LENGTH OF 300mm + THE EXTENSION LENGTH FROM THE PILE FACE.
13. ALL ANCHORS TO BE TESTED USING THE INDUSTRY STANDARD 'WEDGE LIFT-OFF' TEST METHODOLOGY AND IN ADDITION 10% OF ALL ANCHORS TO BE ADDITIONALLY TESTED USING THE 'ANCHOR LIFT-OFF' TESTING METHODOLOGY IMMEDIATELY FOLLOWING LOCK-OFF OF THE ANCHORS.
14. ALL ROCK ANCHORS TO BE INSPECTED BY GEOTECHNICAL ENGINEER DURING INSTALLATION TO CONFIRM CORRECT INSTALLATION AND ANCHOR LOADS ACHIEVED.
15. MINIMUM DESIGN LIFE OF ALL TEMPORARY ROCK ANCHORS TO BE 2 YEARS OR AS NOMINATED BY BUILDER.
16. THE BUILDER SHALL KEEP ON SITE AN ADEQUATE SUPPLY OF ANCHOR CABLES, GROUT ETC. FOR EMERGENCY USE.
17. THE BUILDER SHALL REGULARLY MONITOR THE STRESS IN THE ANCHORS REGULARLY BY MEANS OF A LIFT OFF TEST TO ENSURE NO MAJOR LOSSES ARE OCCURRING. IF STRESS LOSSES ARE DETECTED THEY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.

ROCK ANCHORS - SOLID BAR

1. IN ADDITION TO ANY NOTES PROVIDED BELOW AND DETAILS SHOWN ON THESE DRAWINGS, ALL ROCK BOLTS ARE TO BE INSTALLED IN ACCORDANCE WITH AS 4678 AND TRANSPORT FOR NSW QA SPECIFICATION R64.
2. ROCKS BOLTS MUST BE STEEL REINFORCEMENT BARS GRADE 500N DEFORMED BAR TO AS4671. THE BOLTS MUST BE THREADED AT ONE END TO SUIT ISO COARSE PITCH THREAD TO AS1275.
3. ALL STEEL COMPONENTS OF THE ROCK BOLT SYSTEM, INCLUDING THE BOLT, BEARING PLATES, WASHERS AND NUTS MUST BE HOT-DIP GALVANISED TO AS/NZS4680 WITH A MINIMUM AVERAGE COATING WEIGHT OF 600 G/M2.
4. ALL STEEL ELEMENTS, INCLUDING BEARING PLATES AND WASHERS, MUST BE FABRICATED FROM GRADE 250 STEEL IN ACCORDANCE WITH AS3678. NUTS FOR THE ROCK BOLTS MUST BE GRADE C COMPLYING WITH AS1112.3 AND PROPERTY CLASS 5 COMPLYING WITH AS 4291.2 OR EQUIVALENT TO SUIT THE END THREAD OF THE BOLT.
5. THE USE OF COUPLERS TO THE ROCK BOLTS IS NOT PERMITTED.
6. PRIOR TO ANY DRILLING OPERATIONS, THE BUILDER SHALL ACQUAINT THEMSELVES WITH ALL ADJACENT UNDERGROUND SERVICES AND ENSURE THAT NONE OF THESE ARE DISRUPTED BY ROCK ANCHORS. ALL APPROPRIATE APPROVALS, PERMITS AND AGREEMENTS SHALL BE OBTAINED BEFORE COMMENCEMENT OF THE WORK.
7. BORE HOLES FOR THE ROCK BOLTS MUST BE DRILLED USING ROTARY OR ROTARY PERCUSSION DRILLING EQUIPMENT. DRILLING FLUIDS AND CORE DRILLING ARE NOT PERMITTED. BORE HOLES MUST BE INSTALLED WITH A MAXIMUM DEVIATION FROM THE DESIGN INCLINATION IN ANY DIRECTION OF 2◦ AND A MAXIMUM DEVIATION FROM THE ENTRY POINT OF +/- 25mm.
8. CENTRALISERS MUST BE PROVIDED ALONG THE LENGTH OF THE BOLT AT 2000mm CENTRES AND 300mm FROM EACH END TO ENSURE THE BOLT IS CENTRALISED TO THE CENTRE OF THE BOREHOLE. THE CENTRALISERS MUST BE; NON-CORRODIBLE. FIRMLY FIXED TO THE BOLT AND A SHAPE THAT PERMITS THE FREE FLOW OF GROUT TO FULLY ENCAPSULATE THE BOLT.
9. GROUT TUBES MUST EXTEND TO THE BASE OF THE LOWEST PORTION OF THE BORE HOLE AND BE SECURELY FIXED TO THE ROCK BOLT. TUBING MUST BE OF ADEQUATE STRENGTH TO RESIST ANY DAMAGE DURING INSTALLATION AND GROUTING AND BE OF SUFFICIENT SIZE TO ALLOW PUMPING OF GROUT.
10. MATERIAL PROPERTIES OF THE GROUT MUST CONFORM TO TABLE R64.1 OF TfNSW QA SPECIFICATION R64. GROUTS MUST GENERALLY HAVE A HIGH BLEED RESISTANCE, LOW SHRINKAGE AND HIGH FLUIDITY. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 50MPA AT THREE (3) DAYS. GROUT CYLINDERS SHALL BE TAKEN ON THE BASIS OF ONE SAMPLE (TWO CYLINDERS) FOR EVERY TEN ANCHORS AND TESTED ON THE DAY OF STRESSING. THE GROUT SHALL BE MIXED IN A HIGH SPEED IMPELLER TYPE MACHINE.
11. A MINIMUM OF 1% OF THE ROCK BOLTS MUST BE TESTED IN ACCORDANCE WITH THE 'SUITABILITY TEST' AND A MINIMUM OF 3% OF THE ROCK BOLTS MUST BE TESTED IN ACCORDANCE WITH THE "ACCEPTANCE TEST" AS DEFINED IN TRANSPORT FOR NSW QA SPECIFICATION R64.
12. RE-BOLTING OF THE ROCK BOLTS AT THE DISCRETION OF THE GEOTECHNICAL AND STRUCTURAL ENGINEERS MAY BE REQUIRED WHERE THE BOLT BECOMES OVERSTRESSED DURING EXCAVATION OR EXCESSIVE DEFORMATION OF ANY INCLINED ROCK BEDS EXISTS.

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	DATE	REVISION DESCRIPTION	BY
1	12.11.24	APPROVED FOR CONSTRUCTION	SF
P04	10.07.24	ISSUED FOR PRELIMINARY INFORMATION	PKP
P3	05.09.23	ISSUED FOR PRELIMINARY INFORMATION	RCL
P2	09.06.23	ISSUED FOR PRELIMINARY INFORMATION	RCL
P1	22.05.23	ISSUED FOR PRELIMINARY INFORMATION	RCL

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DEICORP

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FIVEWAYS CROWS NEST
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

SITE RETENTION NOTES

JOB NUMBER:	ORG NUMBER:
23012	S00-005
DESIGNED BY: RC	DATE:
DRAWN BY: SF	SCALE: N/A @ A0
SIZE: A0	REV: 1

31/10/2024 12:01:31 PM

Regulated Design Record

Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065
Project Title:	FIVEWAYS CROWS NEST
Consent No:	SSD-66826207
Body Corporate Reg No:	DEP0000250
Drawing Title:	SITE RETENTION PLAN
Drawing No:	S01.001

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	16.04.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
4	07.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
5	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027

NOTE:
BULK EXCAVATION LEVELS FOR SLAB ON GROUND ALLOWS FOR SLAB THICKNESS AS NOTED ON BASEMENT PLANS AND A 50mm BLINDING LAYER. REFER WATER PROOFING CONTRACTORS DETAILS IF ADDITIONAL BLINDING LAYER IS REQUIRED. REFER BASEMENT PLANS FOR PILE CAPS & FOOTINGS. HYDRAULIC ENGINEER TO ADVISE ANY ADDITIONAL SUBSOIL DRAINAGE REQUIREMENTS.

NOTE:
GROUND LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE SURVEYOR

NOTE:
ROCK LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE GEOTECHNICAL ENGINEER

PILE TOE SCHEDULE

MARK	PILE TYPE	TOE RL
125	P1	76760
126	P1	76760
128	P1	76760
129	P1	76760
130	P1	76760

BULK EARTHWORK NOTES:

GEOTECHNICAL REPORT:
REFER TO GEOTECHNICAL REPORT PREPARED BY DOUGLAS PARTNERS. CONTRACTOR IS TO ENSURE GEOTECHNICAL REPORT RECOMMENDATIONS ARE ADHERED TO.

SITE SURVEY:
THE SITE HAS BEEN SURVEYED BY DAW & WALTON PTY LTD. REFER DRAWINGS FOR DETAILS. THIS IS A COMPILATION OF ENGINEERING AND SITE SURVEY DRAWING, DEPICTING SITE EARTHWORKS OVER THE SURVEY DRAWING.

SPECIFICATION:
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THE HEAD SPECIFICATION.

EROSION AND SEDIMENT CONTROL:
ALLOW TO SUBMIT AND EROSION AND SEDIMENT CONTROL (ESC) PROGRAM TO COUNCIL FOR ENDORSEMENT PRIOR TO SITE WORKS COMMENCING. THE ESC PROGRAM IS TO COMPLY WITH THE COUNCIL'S EROSION AND SEDIMENT CONTROL STANDARD AND IS TO BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.

DUST CONTROL:
THE CONTRACTOR IS TO ENSURE THAT THE DUST PREVENTION METHODS HE ADOPTS ARE SUFFICIENT TO MEET THE REQUIREMENTS OF THE ENVIRONMENTAL PROTECTION REGULATION 1998 PART 2A, ENVIRONMENTAL NUISANCE. IT IS THE CONTRACTORS RESPONSIBILITY TO ACQUAINT HIMSELF WITH THE REQUIREMENTS.

SITE SETOUT:
REFER TO ARCHITECTS DRAWINGS FOR THE ACCURATE SETOUT OF ALL BUILDINGS, DRIVEWAYS, PARKING AREAS ETC. NOTE BULK EARTHWORKS PLAN IS INDICATIVE ONLY. CALCULATE AND CUT BATTERS FROM ARCHITECTS PLANS AND SURVEY. CROSSOVER PROFILES TO COUNCIL REQUIREMENTS.

GENERALLY:
PROCEED WITH BULK EARTHWORKS AND SHORING TO PROVIDE A STABLE SUBGRADE AND WORK SPACE FOR THE CONSTRUCTION OF THE PROPOSED DEVELOPMENT. STRIP AND DISPOSE OF TOPSOIL. REDUCE SITE TO LEVELS INDICATED AND DISPOSE OF ALL UNWANTED MATERIAL LEGALLY.

SUPERVISION:
A GEOTECHNICAL ENGINEER IS TO PROVIDE LEVEL 1 SUPERVISION (AS3798) FOR ALL EARTHWORKS DURING THE COURSE OF CONSTRUCTION. AT THE COMPLETION OF THE BULK EXCAVATION CONTRACT, THE GEOTECHNICAL ENGINEER IS TO PROVIDE CERTIFICATION THAT THE WORKS HAVE BEEN CARRIED OUT IN ACCORDANCE WITH BULK EARTHWORKS SPECIFICATIONS.

BULK EARTHWORKS PROCEDURE AND SPECIFICATION:
THE SITE IS TO BE STRIPPED OF TOPSOIL AND UNCONSOLIDATED EXISTING FILL. AT THE COMPLETION OF THE BULK EARTHWORKS, THE CONTRACTOR SHALL PROVIDE TEMPORARY OR PERMANENT DRAINAGE TO ENSURE NO SURFACE WATER IS RETAINED ON THE SITE, OR THAT SURFACE WATER FLOW DETRIMENTALLY SCOURS THE PREPARED BASE.

GEOTECHNICAL ENGINEER NOTES:
EXCAVATION TO BE CARRIED OUT UNDER GEOTECHNICAL ENGINEERS SUPERVISION. GEOTECHNICAL ENGINEER (GE) TO COMMENT ON SUITABILITY OF THE SUBCONTRACTORS METHOD OF EXCAVATION AS REMOVAL PROCEEDS.

HYDRAULICS ENGINEER:
DURING EXCAVATION COORDINATE WITH ALL HYDRAULIC ENGINEERS REQUIREMENTS FOR SEWER, GAS AND STORMWATER LINES.

AS-BUILT DRAWING:
PROVIDE AND AS-BUILT DRAWING PREPARED BY A REGISTERED SURVEYOR TO CONFIRM BULK EARTHWORKS IS COMPLETED TO REQUIRED DIMENSIONS AND LEVELS.

DILAPIDATION REPORT:
THE APPROVED SHORING WALL CONTRACTOR SHALL PREPARE A DILAPIDATION REPORT OF STREET, FOOTPATH AND ROAD FEATURES PRIOR TO INSTALLATION OF SHORING WALL.

COMPACTION NOTES:
COMPACTION BEHIND INTERNAL FORMED RETAINING WALL BY EXCAVATION CONTRACTOR USING HAND HELD RAMMERS TO ACHIEVE 98% MODIFIED DENSITY. COMPACT IN MAXIMUM 300mm THICK LAYERS AT OPTIMUM MOISTURE CONTENT OF ± 3%.

LEGEND:
B.E.L.- DENOTES BULK EXCAVATION LEVEL
E.L. - DENOTES DETAILED EXCAVATION LEVEL

SHORING WALL SW1
SHORING WALL SW2
SHORING WALL SW3
SHORING WALL SW4
SHORING WALL SW5
SHORING WALL SW6
SHORING WALL SW6A
SHORING WALL SW7
SHORING WALL SW8
TOP OF KERB
BEL 79.260
BH101
BH102
BH103
BH104
BH105
BH106
BH1
BH2
SH1 S01.011
SH2 S01.011
SH3 S01.012
SH4 S01.012
SH5 S01.013
SH6 S01.013
SH7 S01.014
SH8 S01.014
SH9 S01.015
SH10 S01.015
SH11 S01.016
SH12 S01.016
SYDNEY WATER WATER MAIN 160DIA.
SYDNEY WATER WATER MAIN 315DIA.
SYDNEY WATER WATER MAIN 250DIA.
SYDNEY WATER SEWER MAIN 225DIA.
SYDNEY WATER SEWER MAIN 225DIA.
STORM WATER 300DIA.
SYDNEY WATER WATER MAIN 150DIA.
SYDNEY WATER WATER MAIN 250DIA.
SW-D TO BE DECOMMISSIONED AND CAPPED PRIOR TO PILING WORKS COMMENCING
EXISTING CONCRETE SLAB TO REMAIN + BUNDING INSTALL TO LIMIT EXTENT OF MACHINARY ACCESS OVER SEWER
NO MACHINARY WORK EXCLUSION ZONE ON PUBLIC FOOTPATH AREA
DEBRIS
SEWER
DP

SITE RETENTION PLAN
SCALE 1 : 100

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	DATE	REVISION DESCRIPTION	BY
05	19.05.25	ISSUED FOR CONSTRUCTION	PKP
04	07.05.25	ISSUED FOR CONSTRUCTION	PKP
03	09.04.25	ISSUED FOR CONSTRUCTION	PD
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF

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Postal Address: PO Box 77, NORTH RYDE BC, NSW, 1670

FIVEWAYS CROWS NEST
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

SITE RETENTION PLAN

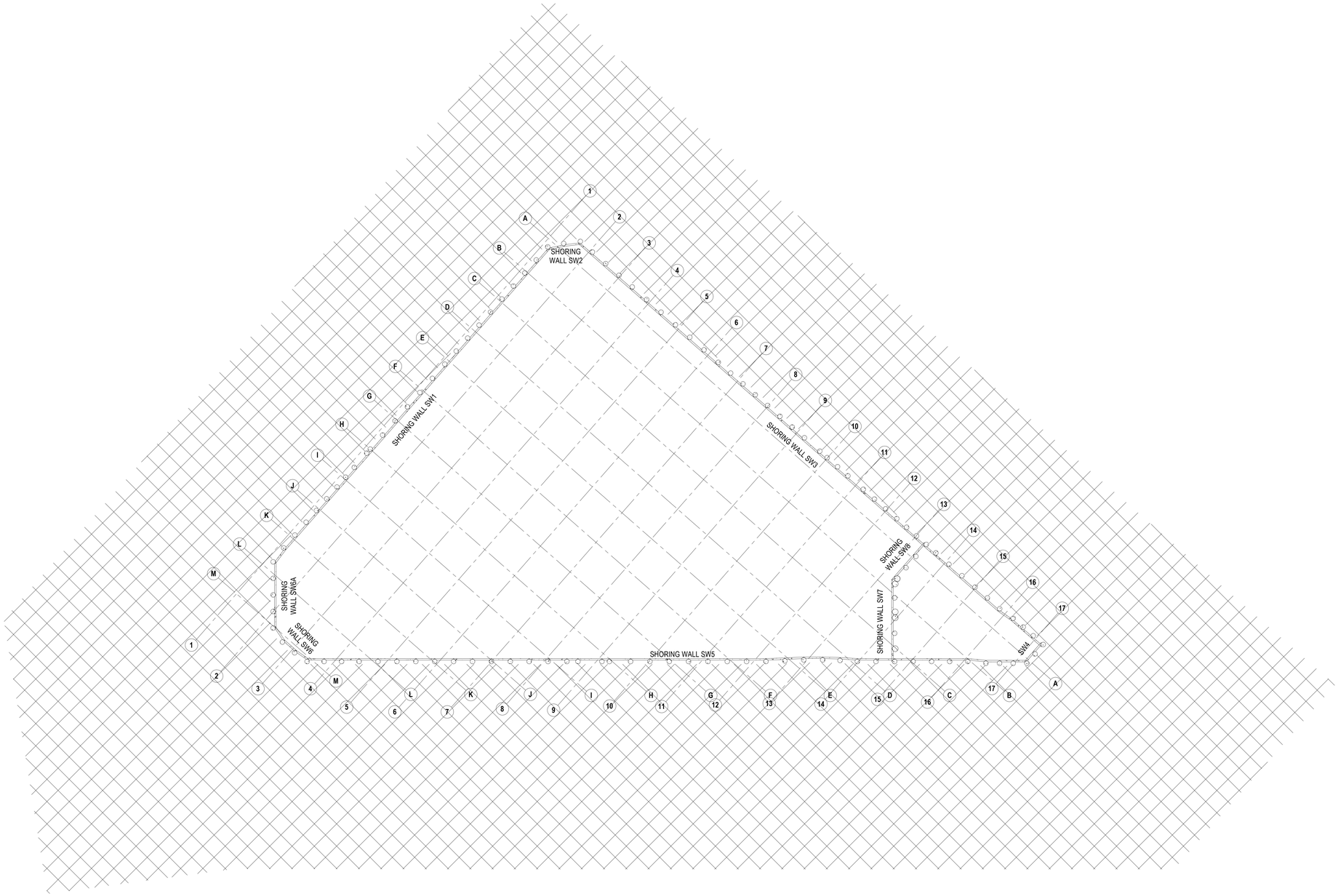
JOB NUMBER:	23012
DRG NUMBER:	S01.001
DESIGNED BY:	RC
DATE:	June 2024
DRAWN BY:	SF
SCALE:	1:100 @ A0
SIZE:	A0
REV:	05

19/05/2025 3:26:08 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title: SHORING SURCHARGE LOADING PLAN		Drawing No: S01.002	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027

20kPa SURCHARGE AFTER INSTALLATION OF FIRST ANCHOR



SHORING SURCHARGE LOADING PLAN

SCALE 1 : 200

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	REV	REVISION DESCRIPTION	BY
03	19.05.25	ISSUED FOR CONSTRUCTION	PKP
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P04	13.03.24	ISSUED FOR PRELIMINARY INFORMATION	PKP
P3	05.09.23	ISSUED FOR PRELIMINARY INFORMATION	RCL

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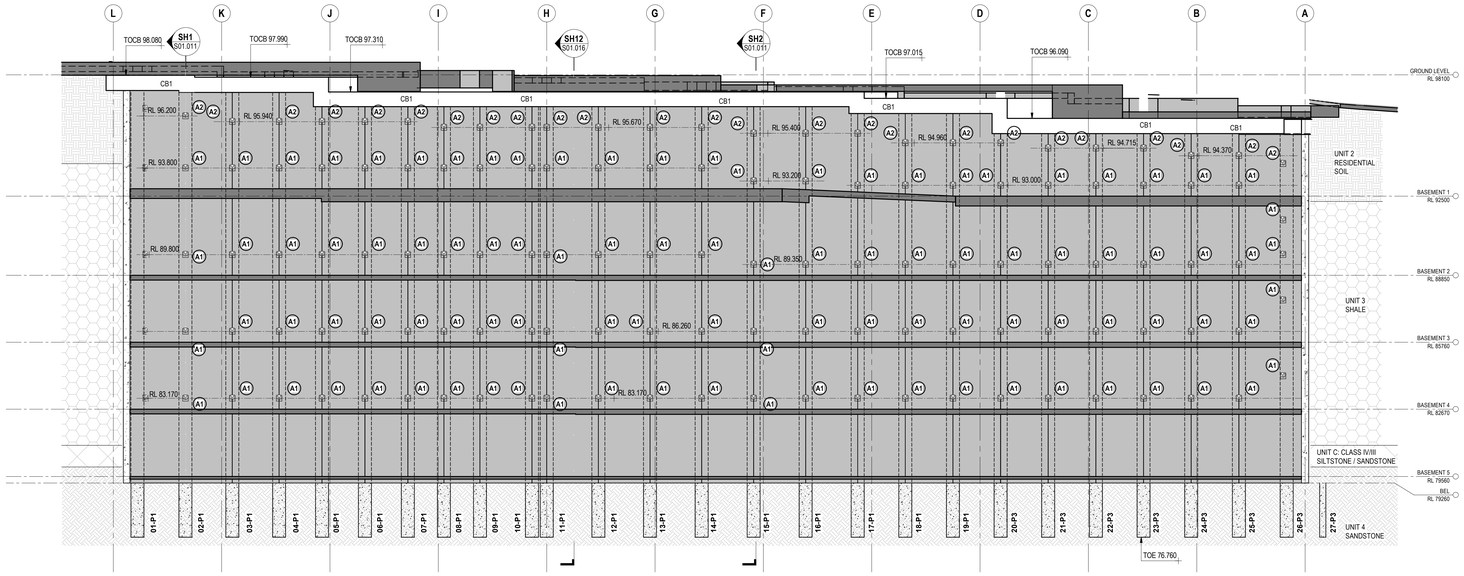
MACQUARIE PARK NSW 2113
Postal Address
PO Box 77
NORTH RYDE BC NSW 1670

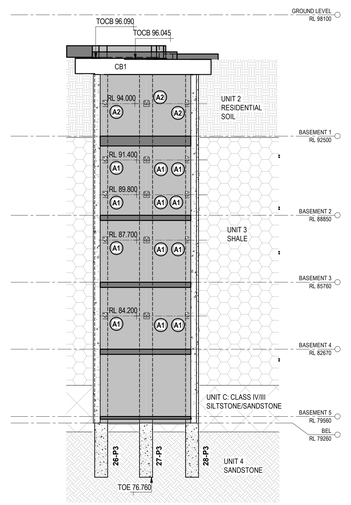
PROJECT:	FIVEWAYS CROWS NEST 391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065
TITLE:	SHORING SURCHARGE LOADING PLAN
JOB NUMBER:	23012
DRG NUMBER:	S01.002
DESIGNED BY:	RC
DATE:	June 2024
DRAWN BY:	SF
SCALE:	1:200 @ A0
SIZE:	A0
REV:	03

19052025 3:30:03 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title: SHORING WALL ELEVATIONS - SHEET 1		Drawing No: S01.005	

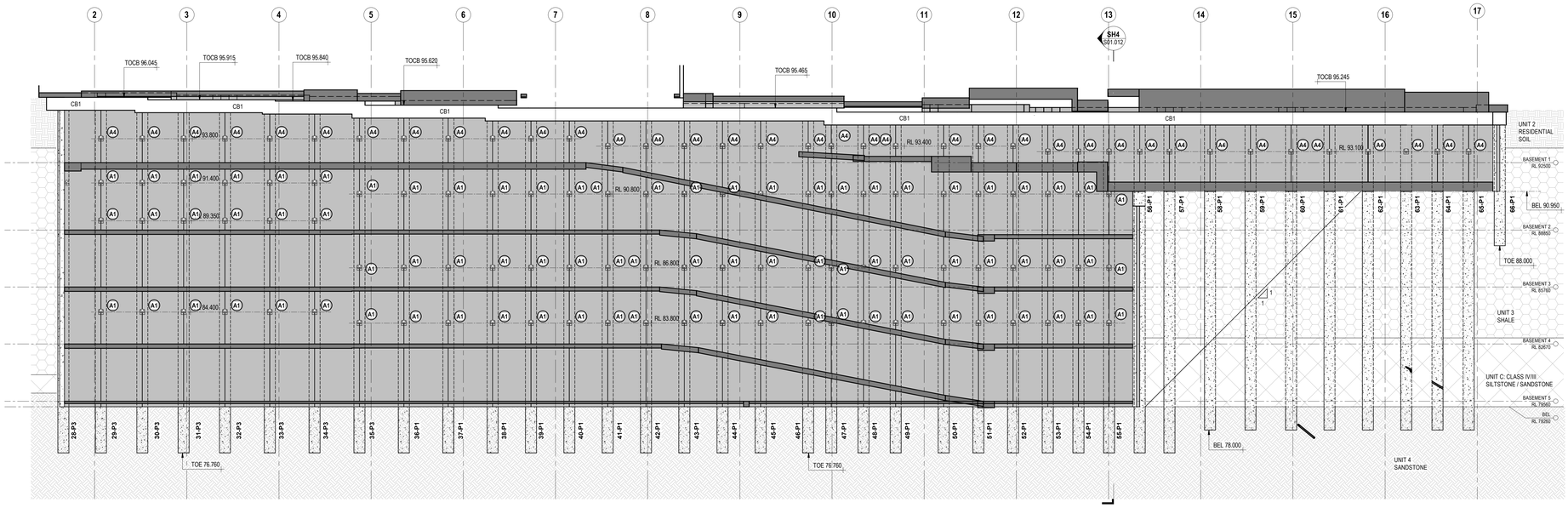
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	09.04.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
4	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027





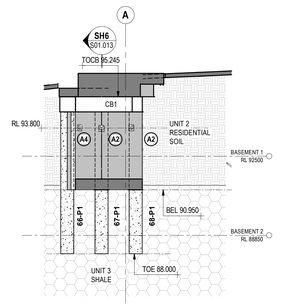
SHORING WALL SW1

SCALE 1 : 100



SHORING WALL SW2

SCALE 1 : 100



SHORING WALL SW4

SCALE 1 : 100

ANCHOR SCHEDULE				
MARK	SWL	LO	INCLINATION	MIN. BOND LENGTH
A1	51T	34T	30°	15m
A2	76T	50T	30°	20m
A4	64T	42T	30°	11m

SHORING PILE SCHEDULE					
MARK	DIA.	VERT. BARS	TIES	CONC GRADE	COVER (mm)
P1	600	8N28	N16-175	50 MPa	60
P2	600	8N32	N16-150	50 MPa	60
P3	600	6N32	N16-125	50 MPa	60
P4	750	8N28	N16-150	50 MPa	60

'SWL' DENOTES SAFE WORKING LOAD
'LO' DENOTES LOCK OFF LOAD

SHORING ANCHOR NOTES:
BOND LENGTH NOMINATED IN SHORING ANCHOR SCHEDULE FOR COORDINATION PURPOSES ONLY. SHORING CONTRACTOR IS RESPONSIBLE FOR FINAL ANCHOR DESIGN. BOND LENGTHS MAY NEED TO BE VARIED DEPENDING ON SITE CONDITIONS ENCOUNTERED.
BOND LENGTH BASED ON A 130mm HOLE WITH ALLOWABLE BOND STRESS OF 300 kPa.

HATCH DENOTES EXTENT OF 200 THICK SHOTCRETE BETWEEN SHORING PILES

HATCH DENOTES EXPOSED ROCK FACE TO BE RETAINED WITH SHOTCRETE AND ROCKBOLTS TO GEOTECHNICAL ENGINEER'S DETAILS

NOTE:
GROUND LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE SURVEYOR

NOTE:
ROCK LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE GEOTECHNICAL ENGINEER

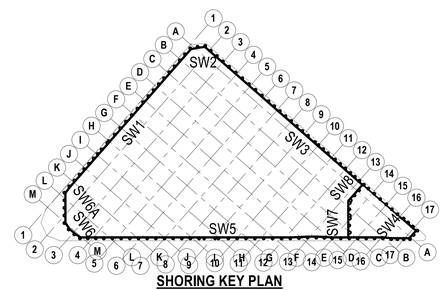
NOTE:
MAXIMUM 500mm EXCAVATION BELOW ANCHOR HEIGHT PERMITTED PRIOR TO INSTALLING ANCHOR

GEOTECHNICAL ENGINEER TO INSPECT EXPOSED SHALE FACE REGULARLY DURING EXCAVATION AND NOMINATE APPROPRIATE ROCK BOLTS AND SHOTCRETE AS REQUIRED TO ENSURE STABILITY AT ALL TIMES.

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRAWING S01-001 - SITE RETENTION PLAN FOR SHORING PILE SETOUT DIMENSIONS.

SHORING WALL SW3

SCALE 1 : 100



SHORING KEY PLAN

SCALE 1 : 600

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	REV	REVISION DESCRIPTION	BY
04	19.05.25	ISSUED FOR CONSTRUCTION	PKP
03	09.04.25	ISSUED FOR CONSTRUCTION	PD
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P06	24.09.24	ISSUED FOR PRELIMINARY INFORMATION	SF

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NORTH RYDE BC NSW 1670

PROJECT: FIVEWAYS CROWS NEST
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

TITLE: SHORING WALL ELEVATIONS - SHEET 1

JOB NUMBER	DRG NUMBER	REV
23012	S01.005	04

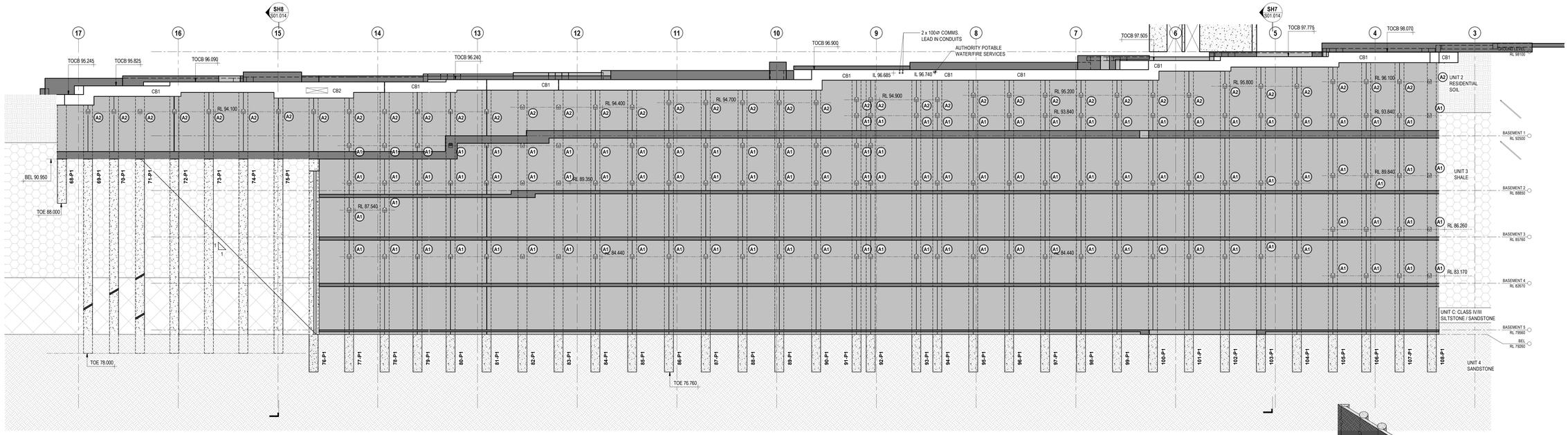
DESIGNED BY:	DATE:	SIZE:
RC	June 2024	A0

DRAWN BY:	SCALE:
SF	1:100, 1:600 @ A0

19/05/2025 3:36:14 PM

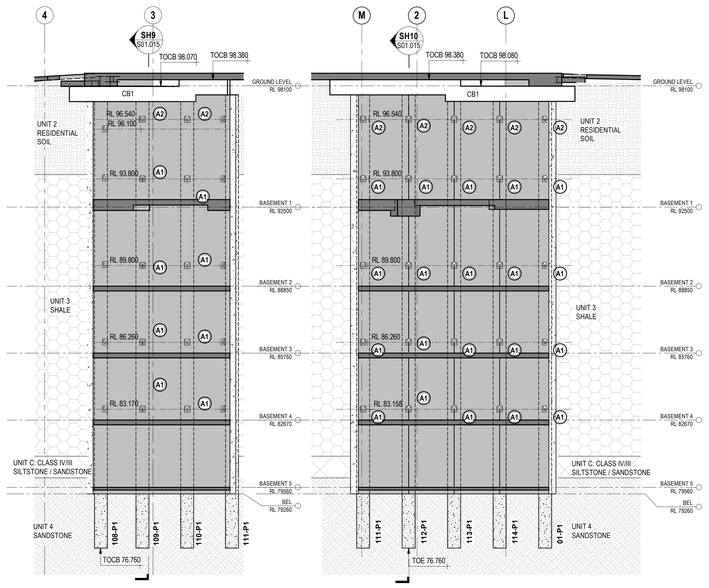
Regulated Design Record				
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065			
Project Title:	FIVEWAYS CROWS NEST			
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250	
Drawing Title:	SHORING WALL ELEVATIONS - SHEET 2		Drawing No:	S01.006

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	09.04.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
4	16.04.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
5	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027



SHORING WALL SW5

SCALE 1 : 100

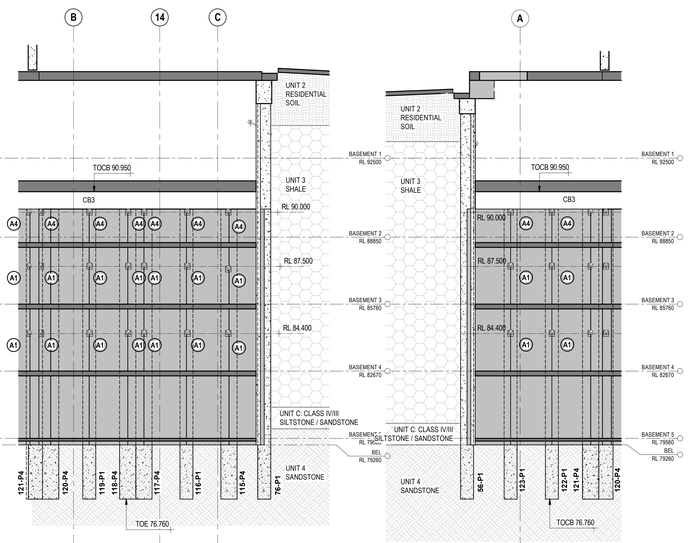


SHORING WALL SW6

SCALE 1 : 100

SHORING WALL SW6A

SCALE 1 : 100

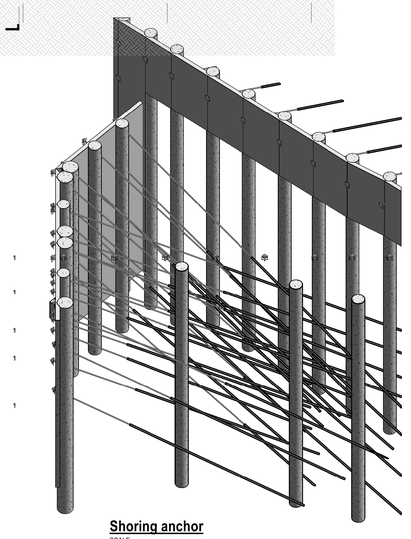


SHORING WALL SW7

SCALE 1 : 100

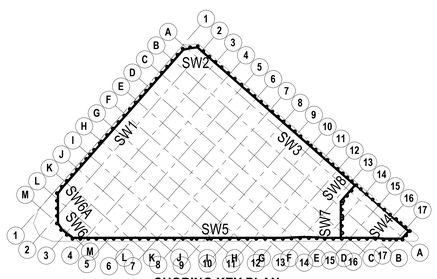
SHORING WALL SW8

SCALE 1 : 100



Shoring anchor

SCALE



SHORING KEY PLAN

SCALE 1 : 600

SHORING PILE SCHEDULE					
MARK	DIA.	VERT. BARS	TIES	CONC GRADE	COVER (mm)
P1	600	8N28	N16-175	50 MPa	60
P2	600	8N32	N16-150	50 MPa	60
P3	600	6N32	N16-125	50 MPa	60
P4	750	8N28	N16-150	50 MPa	60

ANCHOR SCHEDULE				
MARK	SWL	LO	INCLINATION	MIN. BOND LENGTH
A1	51T	34T	30°	15m
A2	76T	50T	30°	20m
A4	64T	42T	30°	11m

'SWL' DENOTES SAFE WORKING LOAD
'LO' DENOTES LOCK OFF LOAD

SHORING ANCHOR NOTES:
BOND LENGTH NOMINATED IN SHORING ANCHOR SCHEDULE FOR COORDINATION PURPOSES ONLY. SHORING CONTRACTOR IS RESPONSIBLE FOR FINAL ANCHOR DESIGN. BOND LENGTHS MAY NEED TO BE VARIED DEPENDING ON SITE CONDITIONS ENCOUNTERED.
BOND LENGTH BASED ON A 130mm HOLE WITH ALLOWABLE BOND STRESS OF 300 kPa.

HATCH DENOTES EXTENT OF 200 THICK SHOTCRETE BETWEEN SHORING PILES

HATCH DENOTES EXPOSED ROCK FACE TO BE RETAINED WITH SHOTCRETE AND ROCKBOLTS TO GEOTECHNICAL ENGINEER'S DETAILS

NOTE:
GROUND LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE SURVEYOR

NOTE:
ROCK LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE GEOTECHNICAL ENGINEER

NOTE:
MAXIMUM 500mm EXCAVATION BELOW ANCHOR HEIGHT PERMITTED PRIOR TO INSTALLING ANCHOR

GEOTECHNICAL ENGINEER TO INSPECT EXPOSED SHALE FACE REGULARLY DURING EXCAVATION AND NOMINATE APPROPRIATE ROCK BOLTS AND SHOTCRETE AS REQUIRED TO ENSURE STABILITY AT ALL TIMES.

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRAWING S01-001 - SITE RETENTION PLAN FOR SHORING PILE SETOUT DIMENSIONS.

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	DATE	REVISION DESCRIPTION	BY
05	19.05.25	ISSUED FOR CONSTRUCTION	PKP
04	16.04.25	ISSUED FOR CONSTRUCTION	PKP
03	09.04.25	ISSUED FOR CONSTRUCTION	PD
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF

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Postal Address: PO Box 77, NORTH RYDE BC NSW 1670

PROJECT: FIVEWAYS CROWS NEST
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

TITLE: SHORING WALL ELEVATIONS - SHEET 2

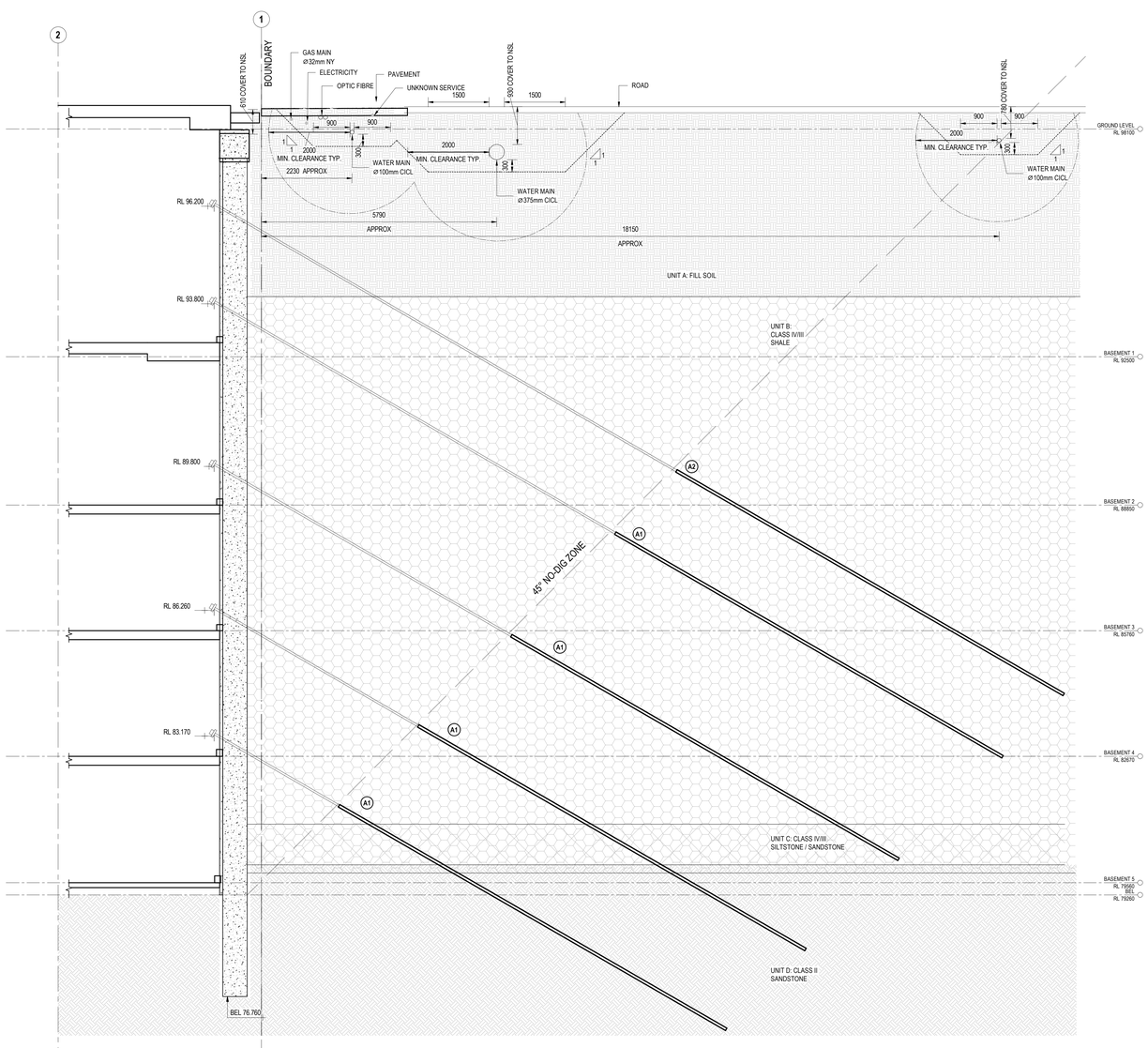
JOB NUMBER	DRG NUMBER	REV
23012	S01.006	05

DESIGNED BY: RC | DATE: June 2024
DRAWN BY: SF | SCALE: 1:100, 1:600 @ A0 | SIZE: A0

19/05/2025 3:36:03 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title: SHORING WALL SECTIONS - SHEET 1		Drawing No: S01.011	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027



SECTION SH1 (S01.001)
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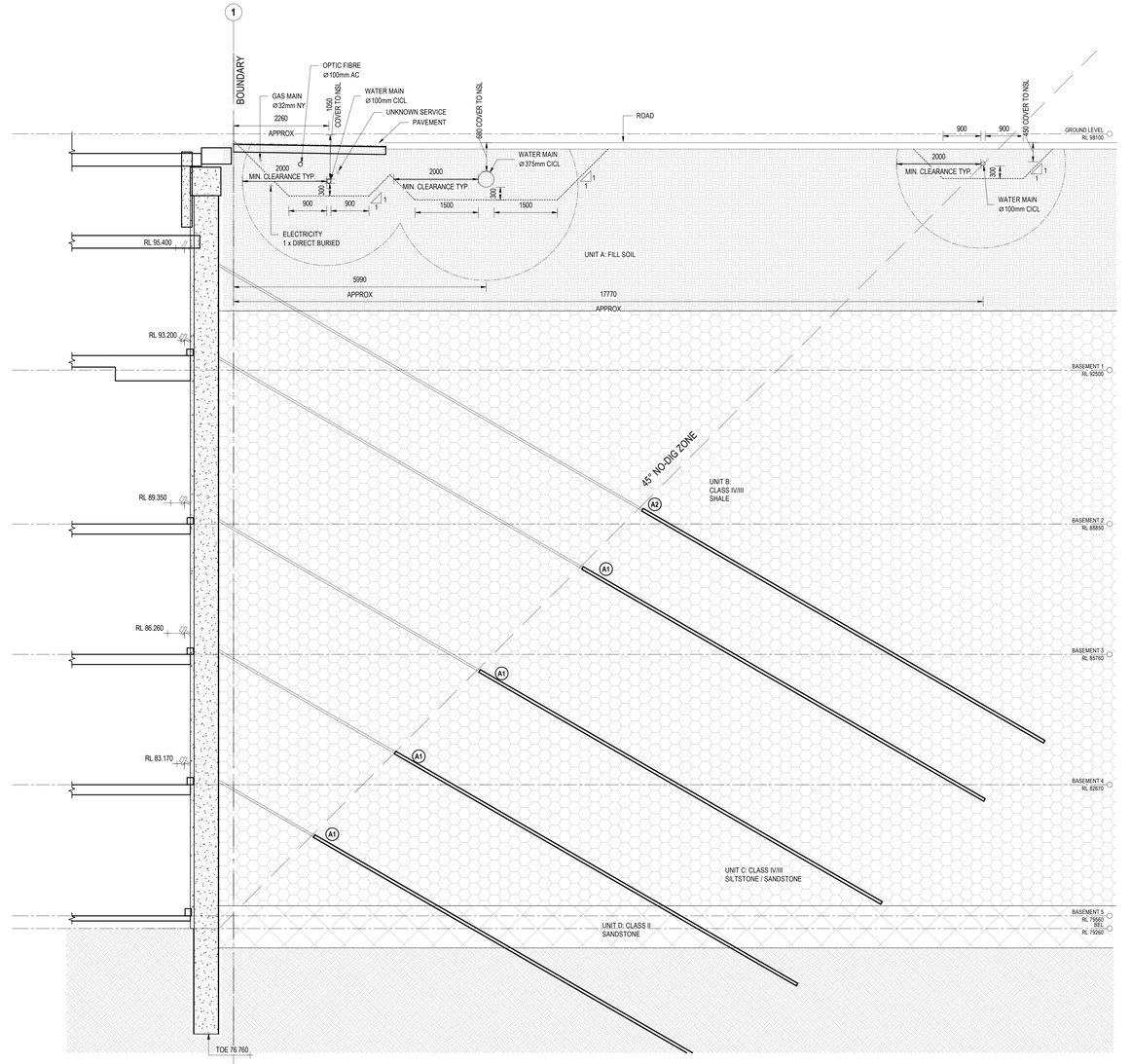

SECTION SH2 (S01.001)
Scale 1 : 50

NOTE:
GROUND LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE SURVEYOR

NOTE:
ROCK LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE GEOTECHNICAL ENGINEER

NOTE:
BUILDER TO PROVIDE TEMPORARY SHORING WHERE CAPPING BEAM IS MORE THAN 500mm BELOW N.G.L.

NOTES:
REFER TO DRAWING S01-001 FOR SHORING AND BULK EX PLAN

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

03	19.05.25	ISSUED FOR CONSTRUCTION	PKP
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P08	18.10.24	ISSUED FOR PRELIMINARY INFORMATION	SF
P07	27.09.24	ISSUED FOR PRELIMINARY INFORMATION	SF
REV	REV	REVISION DESCRIPTION	BY

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NORTH RYDE SC NSW 1670

PROJECT:
FIVEWAYS CROWS NEST
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

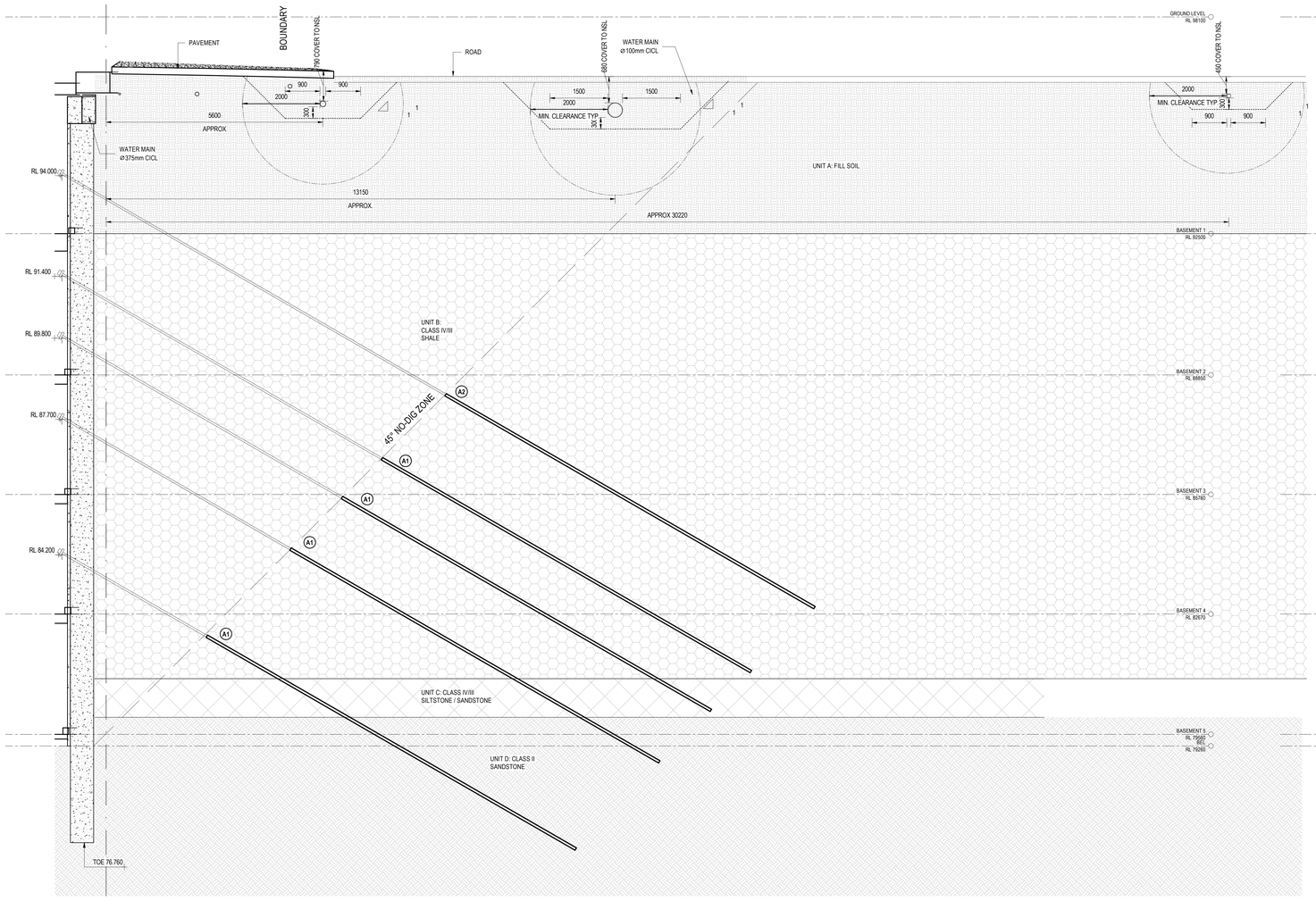
TITLE:
SHORING WALL SECTIONS - SHEET 1

JOB NUMBER:	DRG NUMBER:	
23012	S01.011	
DESIGNED BY: RC	DATE: June 2024	
DRAWN BY: SF	SCALE: 1:50 @ A0	SIZE: A0 / REV: 03

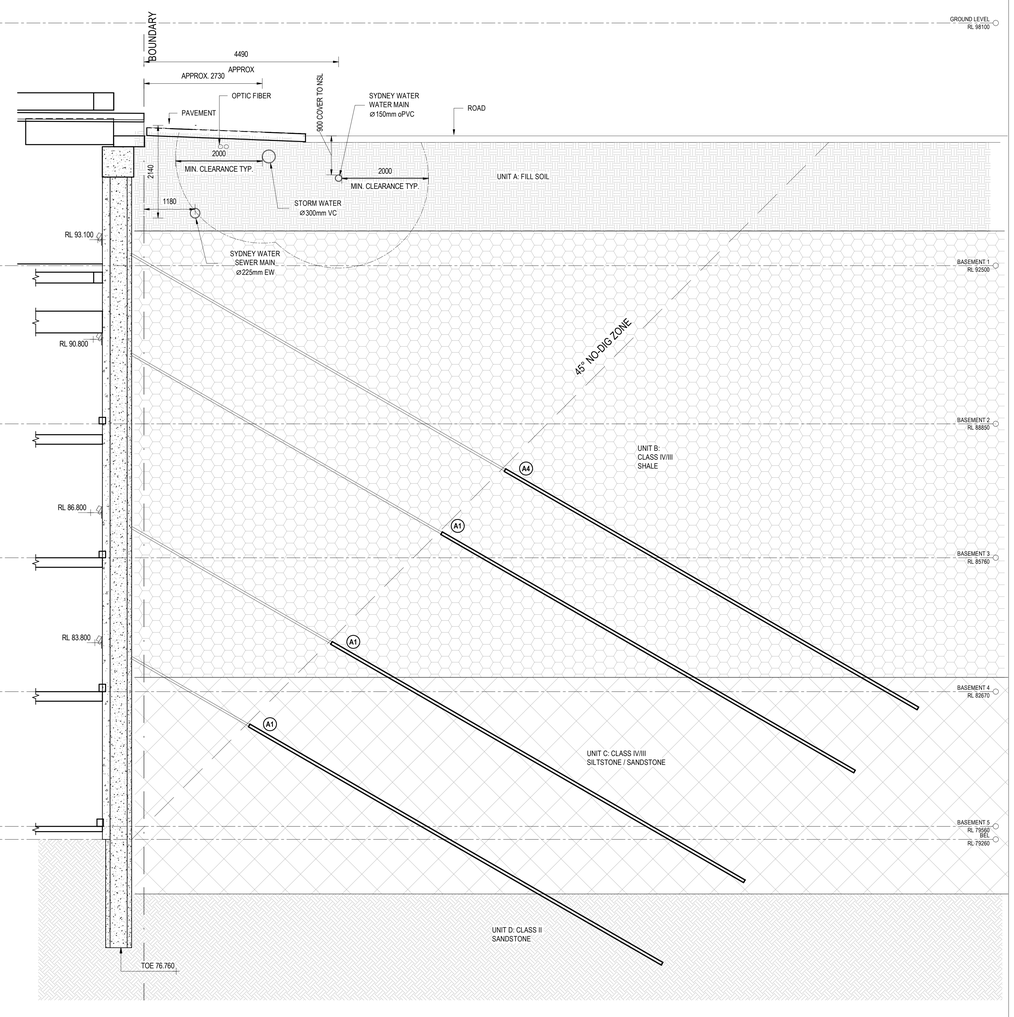
19052025 3:39:46 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title: SHORING WALL SECTIONS - SHEET 2		Drawing No: S01.012	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027



SECTION SH3 (S01.001) Scale 1 : 50



SECTION SH4 (S01.001) Scale 1 : 50

NOTE:
GROUND LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE SURVEYOR

NOTE:
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NOTE:
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NOTES:
REFER TO DRAWING S01-001 FOR SHORING AND BULK EX PLAN

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

03	19.05.25	ISSUED FOR CONSTRUCTION	PKP
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P08	18.10.24	ISSUED FOR PRELIMINARY INFORMATION	SF
P07	27.09.24	ISSUED FOR PRELIMINARY INFORMATION	SF
REV	REV	REVISION DESCRIPTION	BY

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PO Box 77
NORTH RYDE BC NSW 1670

PROJECT: **FIVEWAYS CROWS NEST**
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

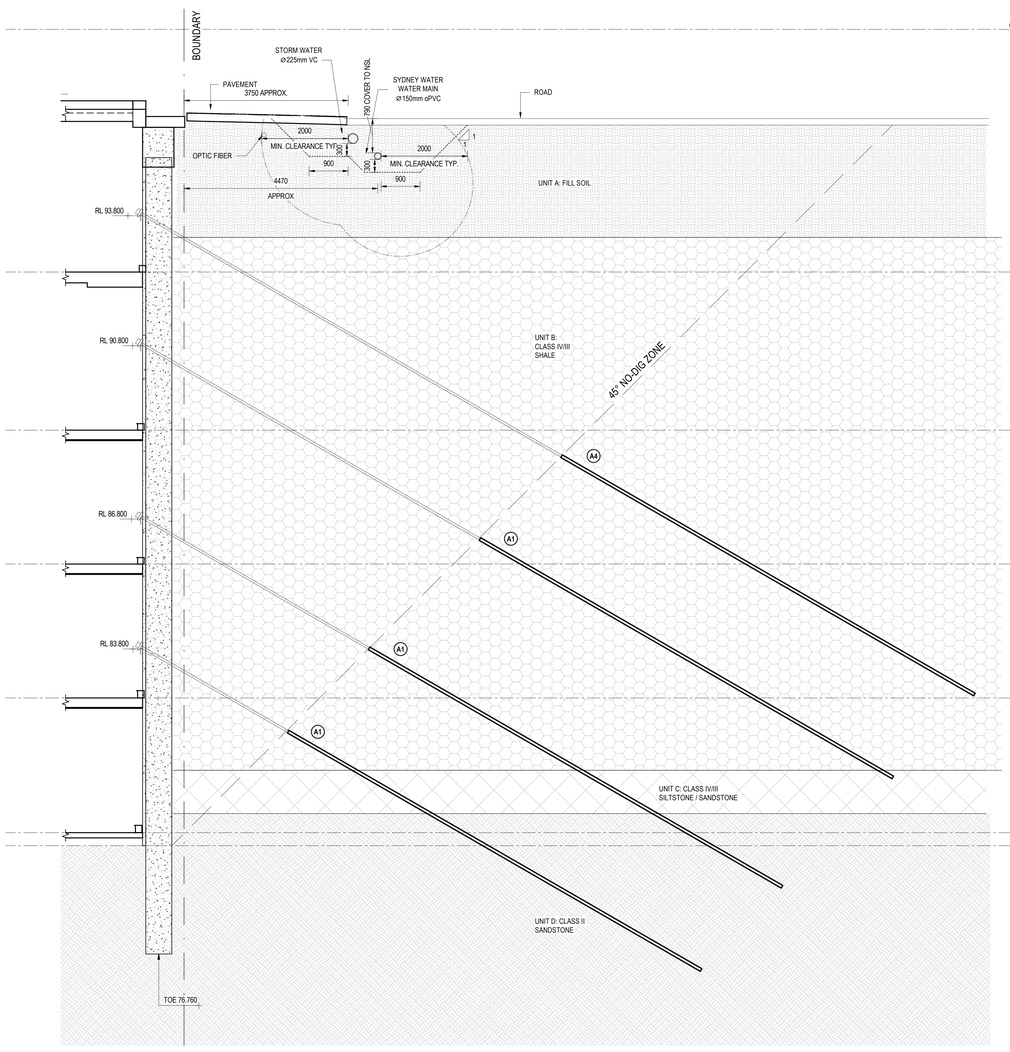
TITLE: **SHORING WALL SECTIONS - SHEET 2**

JOB NUMBER: 23012	DRG NUMBER: S01.012		
DESIGNED BY: RC	DATE: June 2024		
DRAWN BY: SF	SCALE: 1:50 @ A0	SIZE: A0	REV: 03

19/05/2025 3:36:49 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title: SHORING WALL SECTIONS - SHEET 3		Drawing No: S01.013	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027



SECTION SH5 (S01.001)
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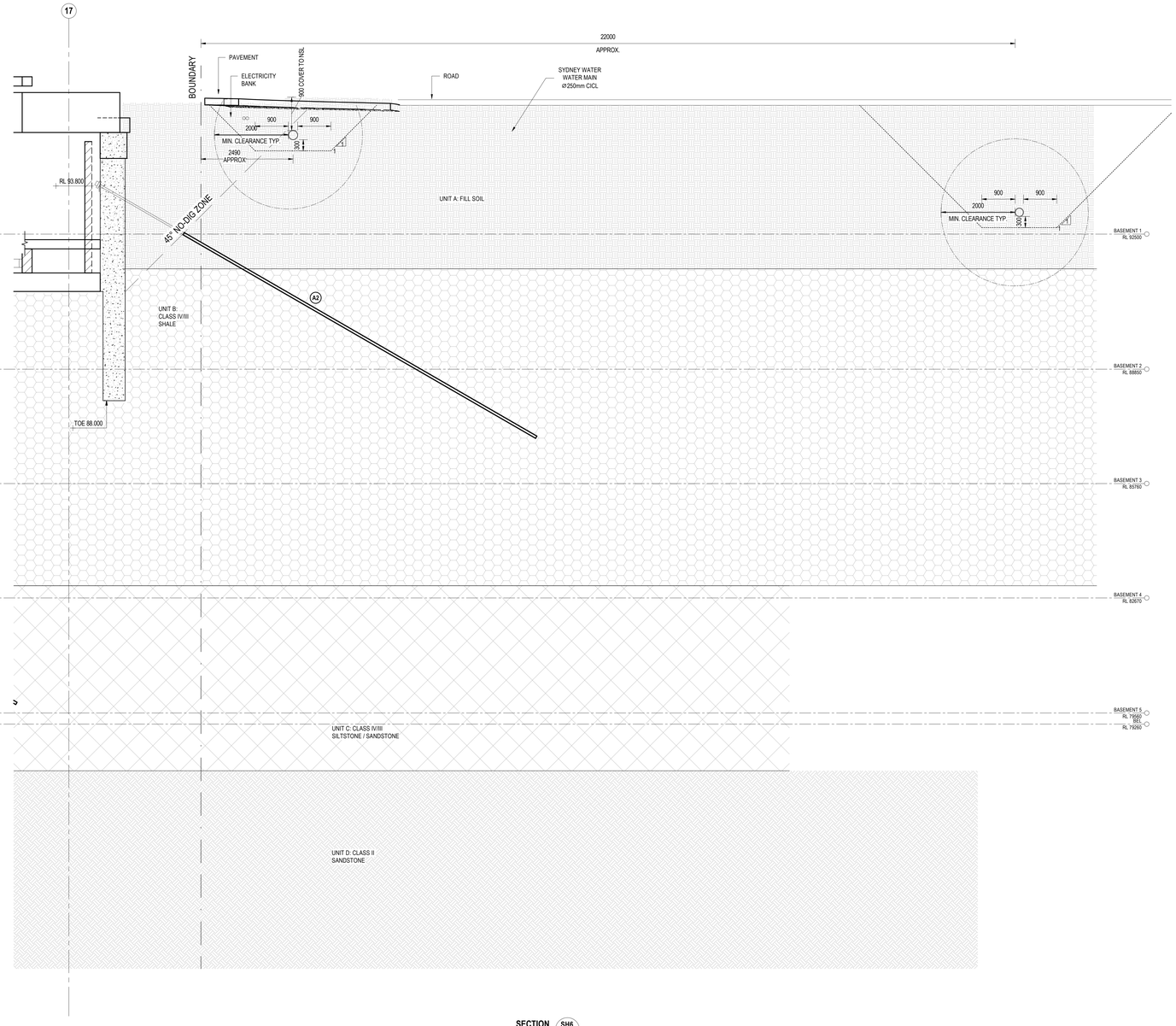

SECTION SH6 (S01.001)
Scale 1 : 50

NOTE:
GROUND LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE SURVEYOR

NOTE:
ROCK LEVEL SHOWN ON ELEVATIONS ARE APPROXIMATE ONLY AND NEED TO BE CONFIRMED ON SITE BY THE GEOTECHNICAL ENGINEER

NOTE:
BUILDER TO PROVIDE TEMPORARY SHORING WHERE CAPPING BEAM IS MORE THAN 500mm BELOW N.G.L.

NOTES:
REFER TO DRAWING S01-001 FOR SHORING AND BULK EX PLAN

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

03	19.05.25	ISSUED FOR CONSTRUCTION	PKP
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P08	18.10.24	ISSUED FOR PRELIMINARY INFORMATION	SF
P07	27.09.24	ISSUED FOR PRELIMINARY INFORMATION	SF
REV	REV	REVISION DESCRIPTION	BY

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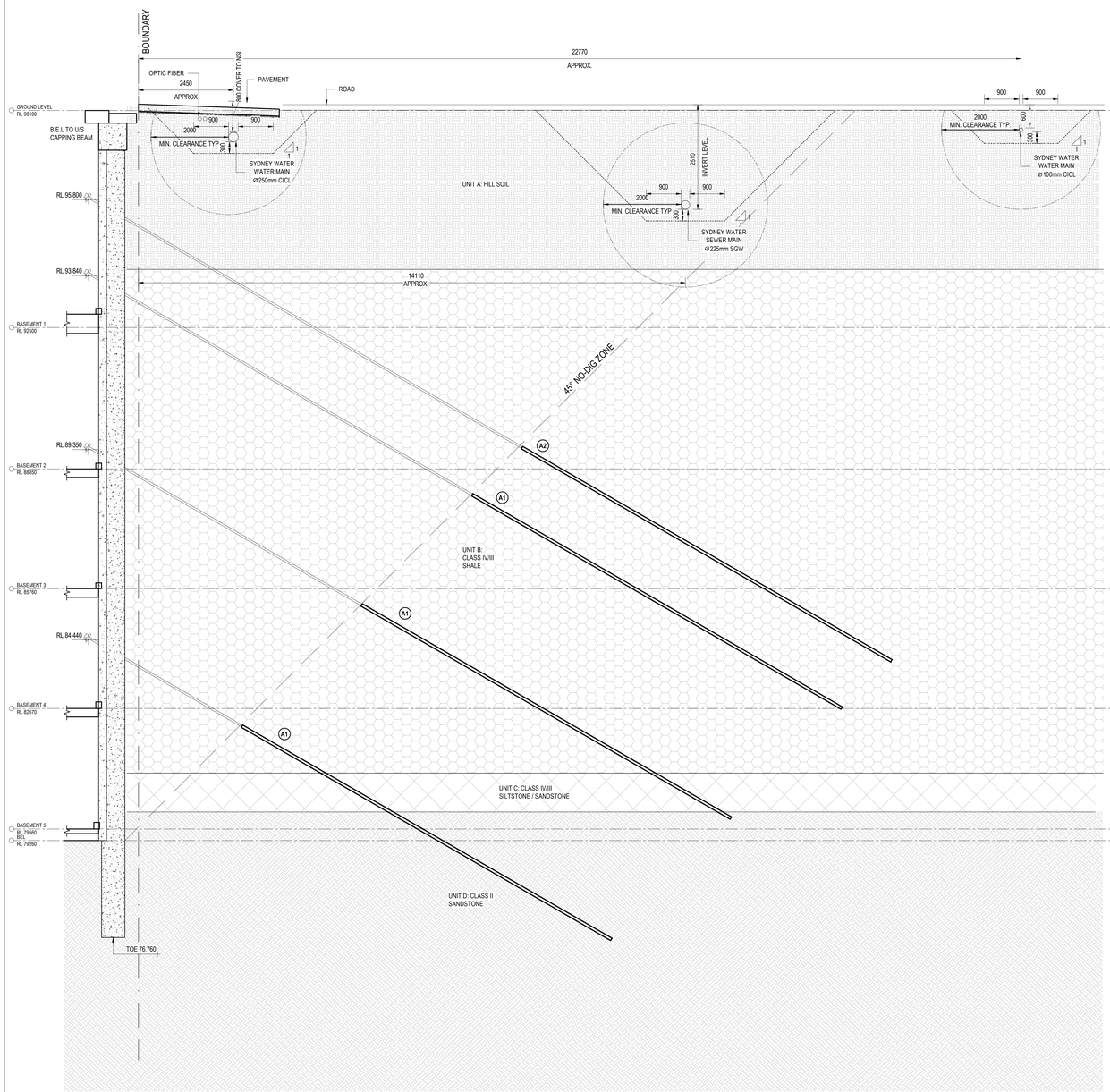
PROJECT:	FIVEWAYS CROWS NEST 391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065
TITLE:	SHORING WALL SECTIONS - SHEET 3
JOB NUMBER:	23012
DRG NUMBER:	S01.013
DESIGNED BY:	RC
DATE:	June 2024
DRAWN BY:	SF
SCALE:	1:50 @ A0
SIZE:	A0
REV:	03

19/05/2025 3:35:51 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title: SHORING WALL SECTIONS - SHEET 4		Drawing No: S01.014	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027



SECTION SH7 (S01.001)
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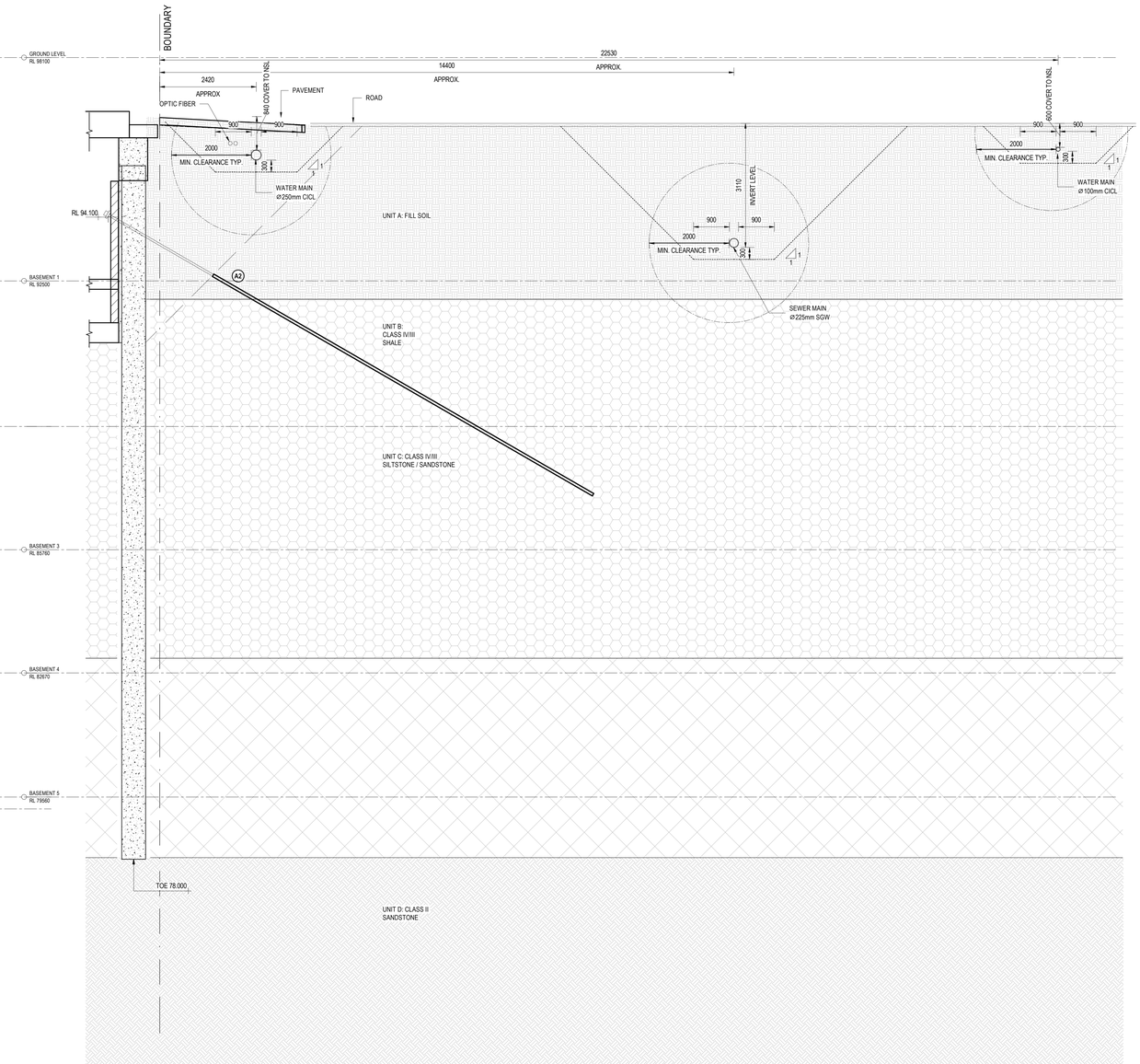

SECTION SH8 (S01.001)
Scale 1 : 50

NOTE:
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NOTES:
REFER TO DRAWING S01-001 FOR SHORING AND BULK EX PLAN

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	DATE	REVISION DESCRIPTION	BY
03	19.05.25	ISSUED FOR CONSTRUCTION	PKP
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P08	18.10.24	ISSUED FOR PRELIMINARY INFORMATION	SF
P07	27.09.24	ISSUED FOR PRELIMINARY INFORMATION	SF

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NORTH RYDE SC NSW 1670

PROJECT:
FIVEWAYS CROWS NEST
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

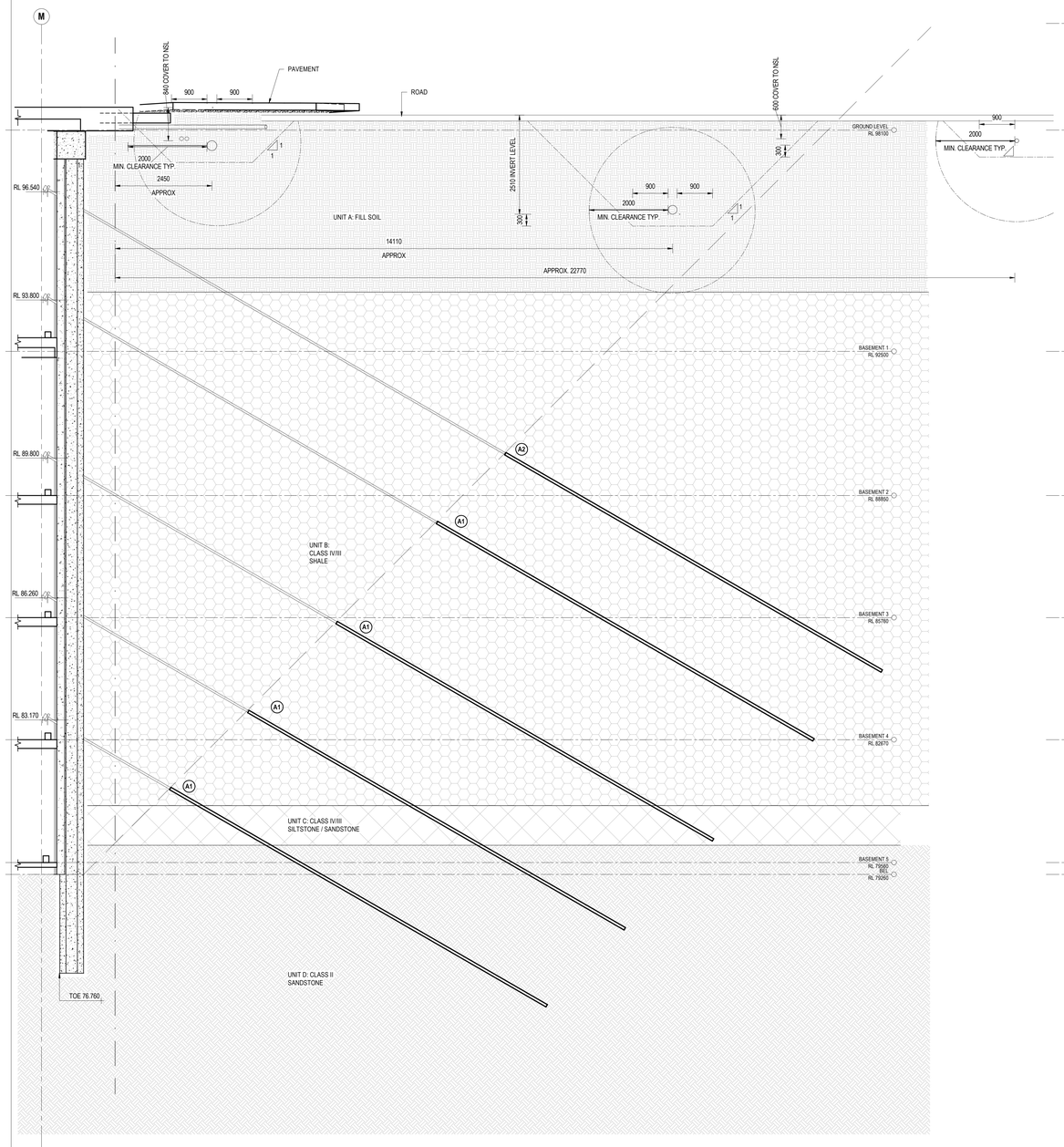
TITLE:
SHORING WALL SECTIONS - SHEET 4

JOB NUMBER:	DRG NUMBER:	REV:
23012	S01.014	03
DESIGNED BY: RC	DATE: June 2024	
DRAWN BY: SF	SCALE: 1:50 @ A0	SIZE: A0

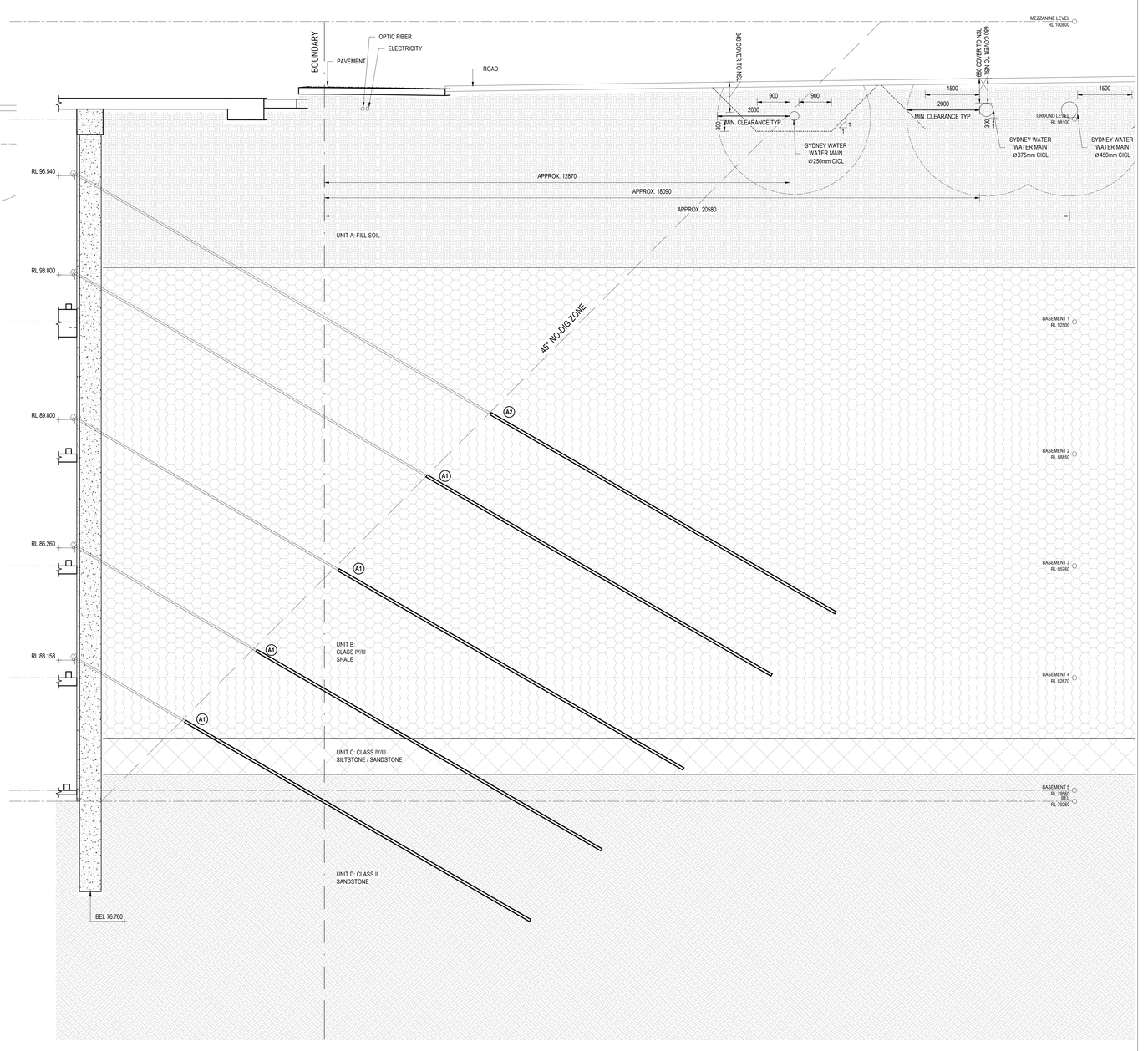
19/05/2025 3:36:52 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title: SHORING WALL SECTIONS - SHEET 5		Drawing No: S01.015	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027



SECTION SH9 (S01.001)
Scale 1 : 50



SECTION SH10 (S01.001)
Scale 1 : 50

NOTE:
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NOTES:
REFER TO DRAWING S01-001 FOR SHORING AND BULK EX PLAN

CONSTRUCTION DESIGN

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REV		REVISION DESCRIPTION	BY
03	19.05.25	ISSUED FOR CONSTRUCTION	PKP
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P08	18.10.24	ISSUED FOR PRELIMINARY INFORMATION	SF
P07	27.09.24	ISSUED FOR PRELIMINARY INFORMATION	SF

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PROJECT:
FIVEWAYS CROWS NEST
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

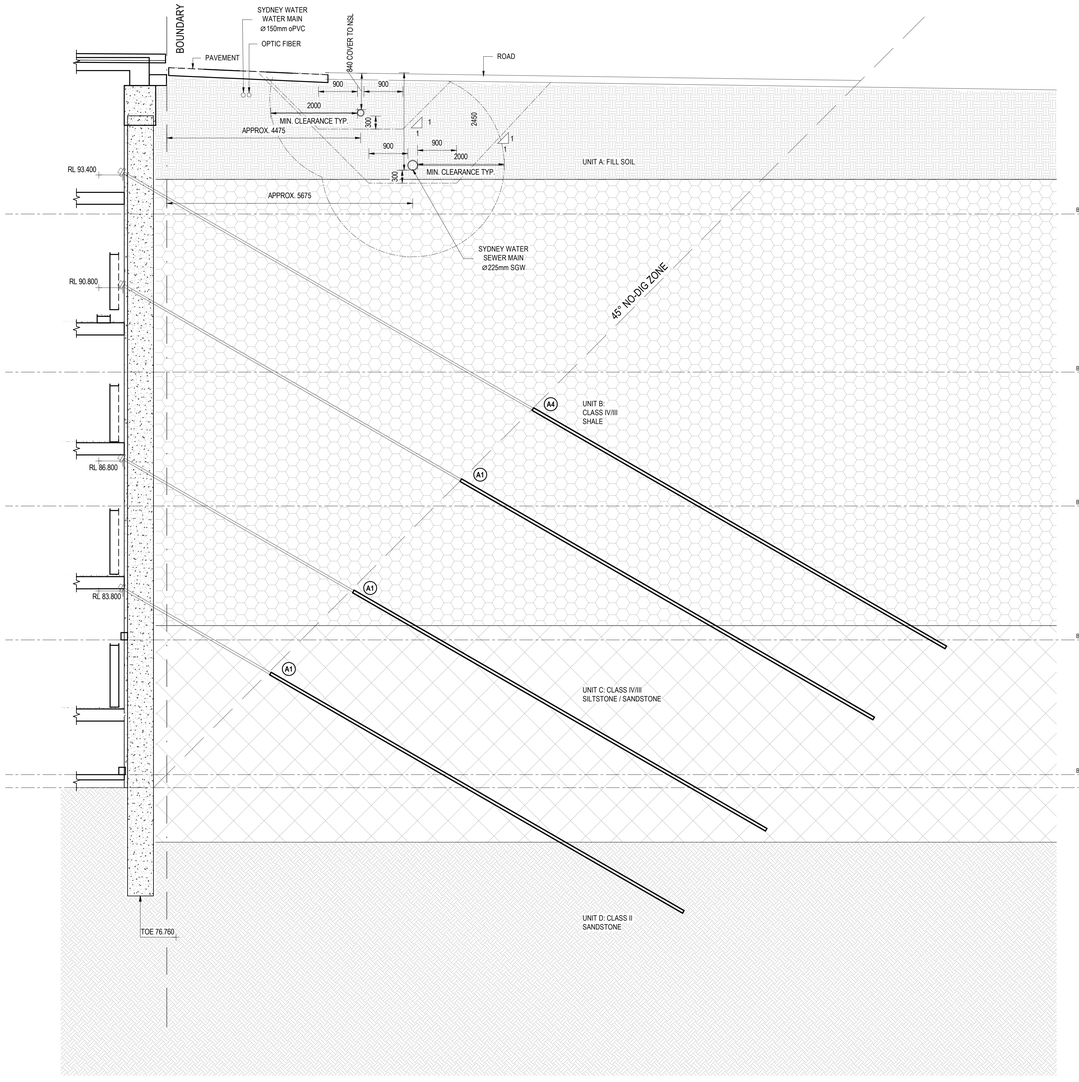
TITLE:
SHORING WALL SECTIONS - SHEET 5

JOB NUMBER:	DRG NUMBER:	
23012	S01.015	
DESIGNED BY:	DATE:	
RC	June 2024	
DRAWN BY:	SCALE:	SIZE / REV:
SF	1:50 @ A0	A0 / 03

19/05/2025 3:36:55 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title:	SHORING WALL SECTIONS - SHEET 6	Drawing No:	S01.016

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
3	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027



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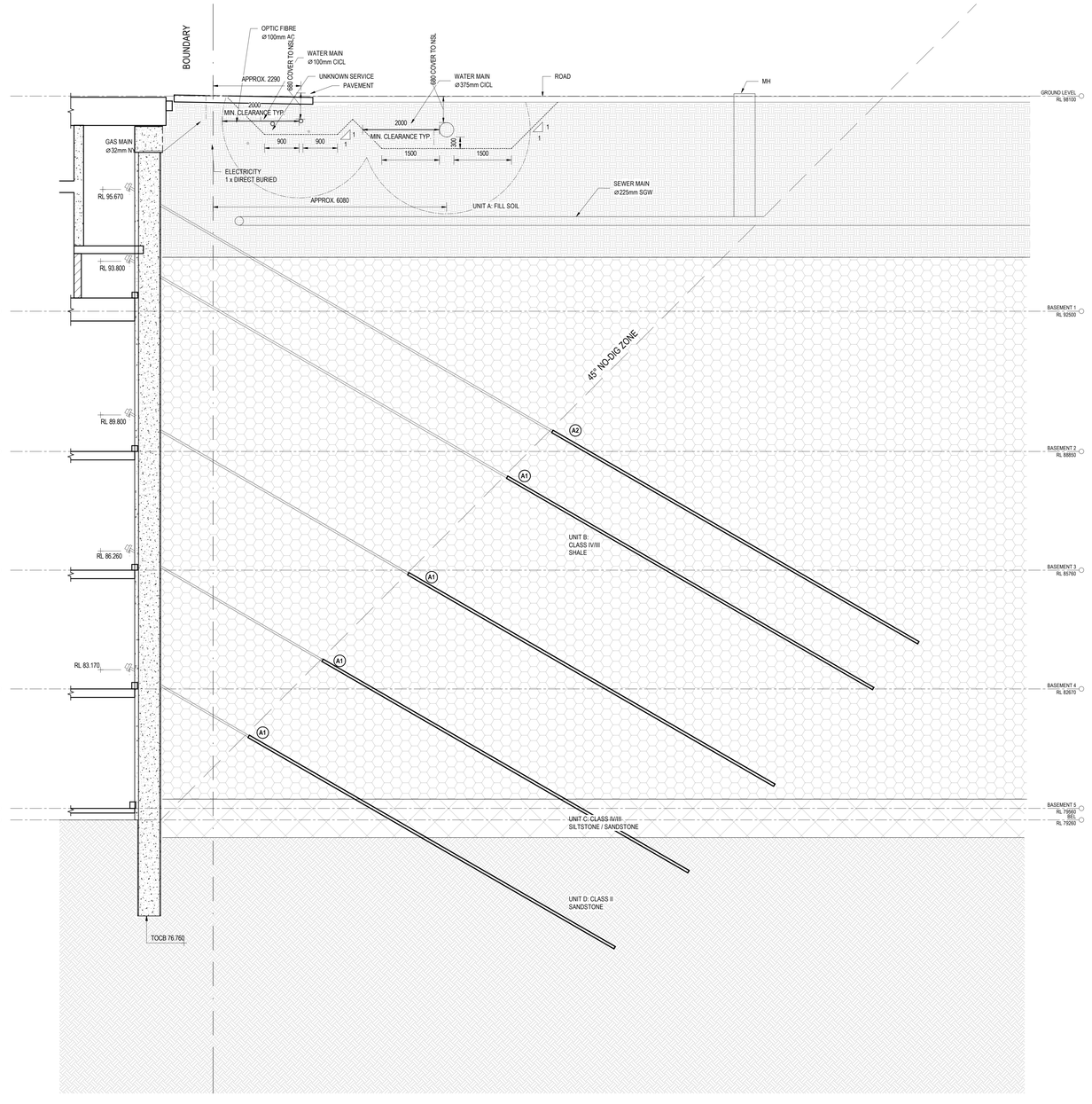

SECTION SH12 / S01.001
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NOTES:
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CONSTRUCTION DESIGN

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03	19.05.25	ISSUED FOR CONSTRUCTION	PKP
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P02	18.10.24	ISSUED FOR PRELIMINARY INFORMATION	SF
P01	27.09.24	ISSUED FOR PRELIMINARY INFORMATION	SF
REV	REV	REVISION DESCRIPTION	BY

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PROJECT:
FIVEWAYS CROWS NEST
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

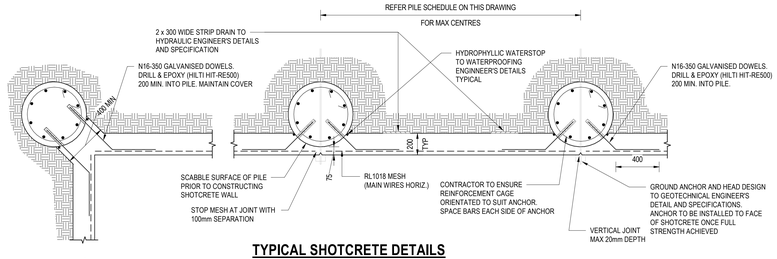
TITLE:
SHORING WALL SECTIONS - SHEET 6

JOB NUMBER:	DRG NUMBER:	
23012	S01.016	
DESIGNED BY: RC	DATE: June 2024	
DRAWN BY: SF	SCALE: 1:50 @ A0	SIZE: A0 / REV: 03

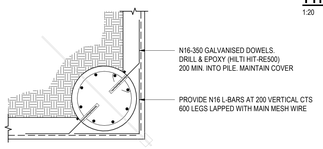
19/05/2025 3:26:58 PM

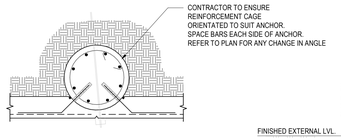
Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title: TYPICAL SITE RETENTION DETAILS		Drawing No: S01.021	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	31.10.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000227
2	03.12.24	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000227
3	09.04.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000227
4	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000227

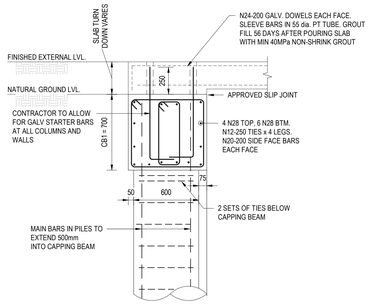


TYPICAL SHOTCRETE DETAILS
1:20

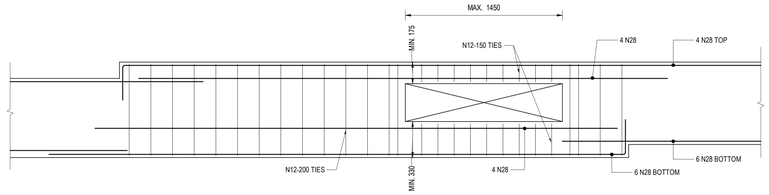




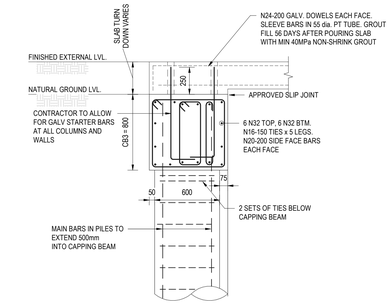
PILE DETAIL WITH SKEWED ANCHOR
1:20



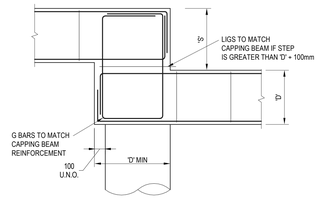
CAPPING BEAM - CB1
NOTE: SHOTCRETE WALL OMITTED FOR CLARITY



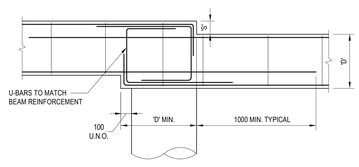
CAPPING BEAM - CB2
NOTE: WITH THE SAME AS CB1



CAPPING BEAM - CB3
NOTE: SHOTCRETE WALL OMITTED FOR CLARITY

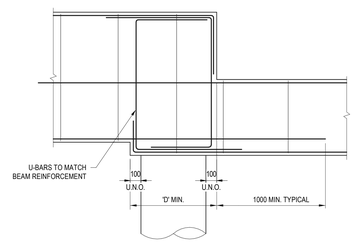


SETDOWN : 'S'= STEP GREATER THAN 'D'-50mm

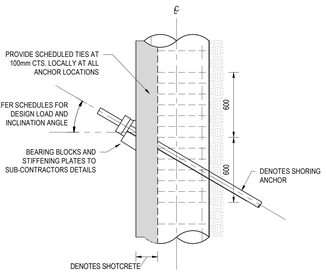


SETDOWN : 'S'= STEP LESS THAN 'D'-50mm

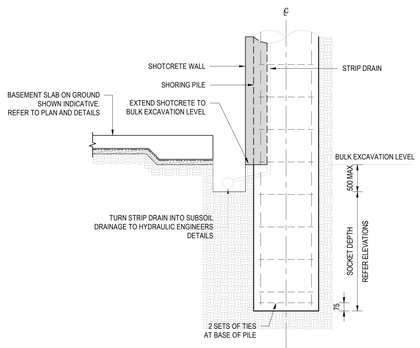
TYPICAL CAPPING BEAM STEP DETAILS - CB1



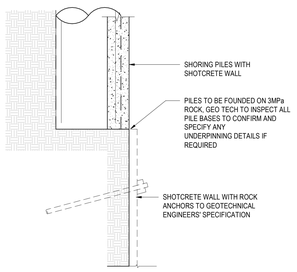
TYPICALCAPPING BEAM STEP DETAIL - CB1 TO CB2



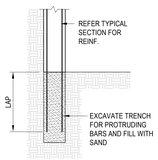
TYPICAL PILE & ANCHOR DETAIL
1:20



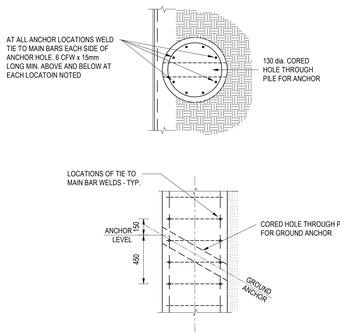
TYPICAL PILE SOCKET DETAILS
1:20



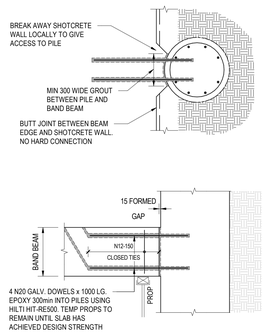
TYPICAL MID-LEVEL PILE BASE



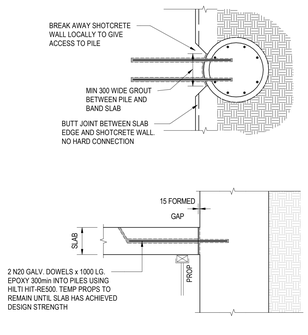
HORIZONTAL SHOTCRETE CONSTRUCTION JOINT



TYPICAL PILE REINFORCEMENT AT ANCHOR



TYPICAL PILE TO BAND BEAM CONNECTION DETAIL



TYPICAL PILE TO SLAB CONNECTION DETAIL

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	REV	REVISION DESCRIPTION	BY
04	19.05.25	ISSUED FOR CONSTRUCTION	PKP
03	09.04.25	ISSUED FOR CONSTRUCTION	PD
02	03.12.24	APPROVED FOR CONSTRUCTION	SF
1	31.10.24	APPROVED FOR CONSTRUCTION	SF
P3	05.09.23	ISSUED FOR PRELIMINARY INFORMATION	RCL

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MACQUARIE PARK NSW 2113
Postal Address
PO Box 77
NORTH RYDE BC NSW 1670

PROJECT:	FIVEWAYS CROWS NEST 391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065
TITLE:	TYPICAL SITE RETENTION DETAILS
JOB NUMBER:	23012
DRG NUMBER:	S01.021
DESIGNED BY:	RC
DATE:	June 2024
DRAWN BY:	SF
SCALE:	1:20 @ A0
SIZE:	A0
REV:	04

19/05/2025 3:36:59 PM

Regulated Design Record			
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065		
Project Title:	FIVEWAYS CROWS NEST		
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250
Drawing Title:	SITE RETENTION PLAN WITH METRO RAIL TUNNEL	Drawing No:	S01.101

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	24.03.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027
2	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027

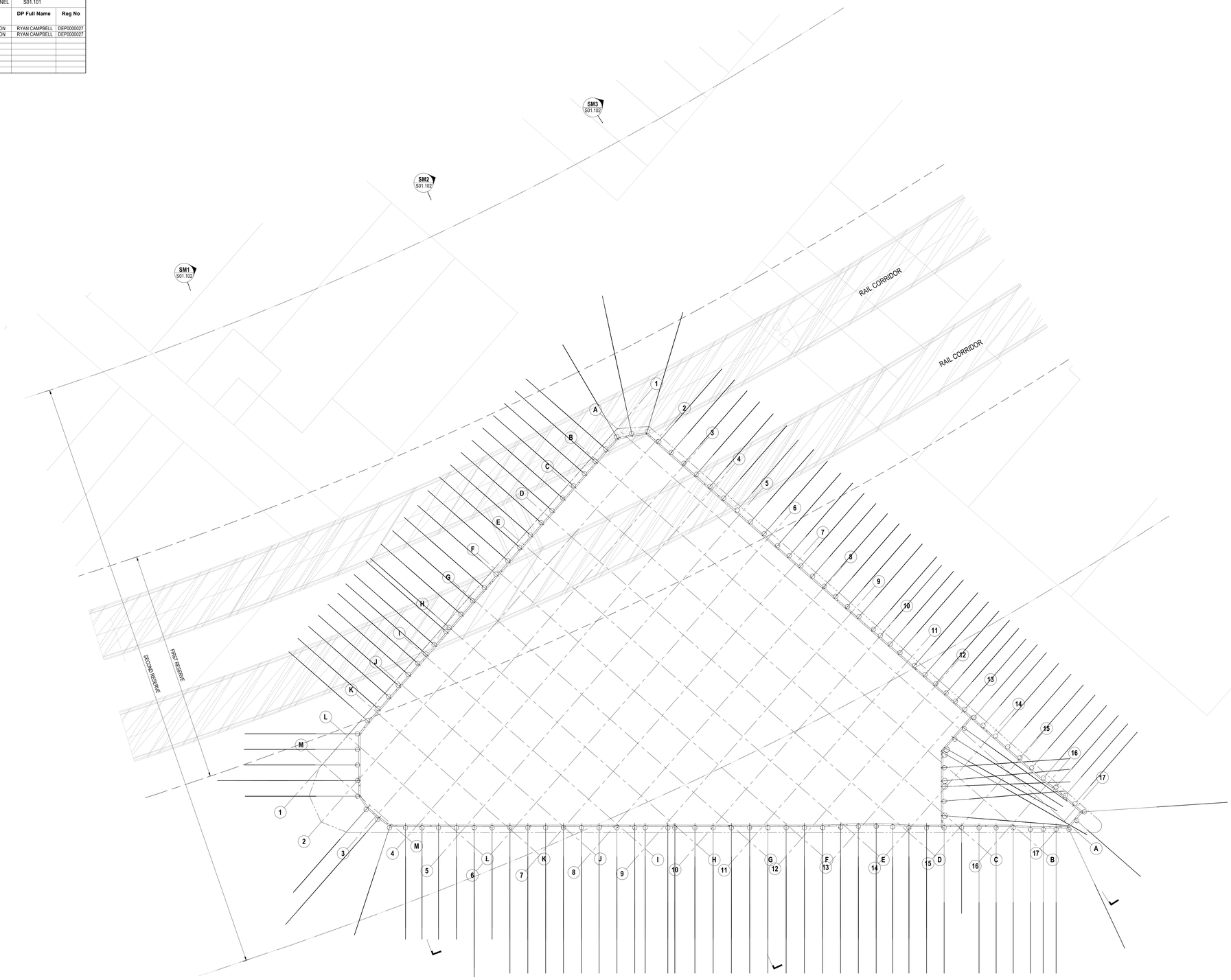
REFERENCED DRAWINGS

SURVEY - JOB NUMBER 4950-20 REVISION 02 DATE 23-04-20 BY DAW & WALTON CONSULTING SURVEYORS

DESIGN APPROACH BASEMENT DRAWINGS BY TURNER
DESIGN APPROACH METRO SECTION DRAWING BY TURNER

SWCSWTSE-JAB-TPW-AL-DRG-505123 REVISION 02 DATE 17-05-19, CLIENT TRANSPORT FOR NSW

SYDNEY METRO UNDERGROUND CORRIDOR PROTECTION TECHNICAL GUIDELINES, REFERENCE iCentral SM-20-00081444 VERSION 2 DATE APRIL 2021 BY WSP



SITE RETENTION PLAN WITH METRO RAIL TUNNEL

SCALE 1 : 200

CONSTRUCTION DESIGN

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	DATE	REVISION DESCRIPTION	BY
02	19.05.25	ISSUED FOR CONSTRUCTION	PKP
1	24.03.25	APPROVED FOR CONSTRUCTION	SF
P4	05.09.23	ISSUED FOR PRELIMINARY INFORMATION	RCL
P3	09.08.23	ISSUED FOR PRELIMINARY INFORMATION	RCL
P2	09.06.23	ISSUED FOR PRELIMINARY INFORMATION	RCL

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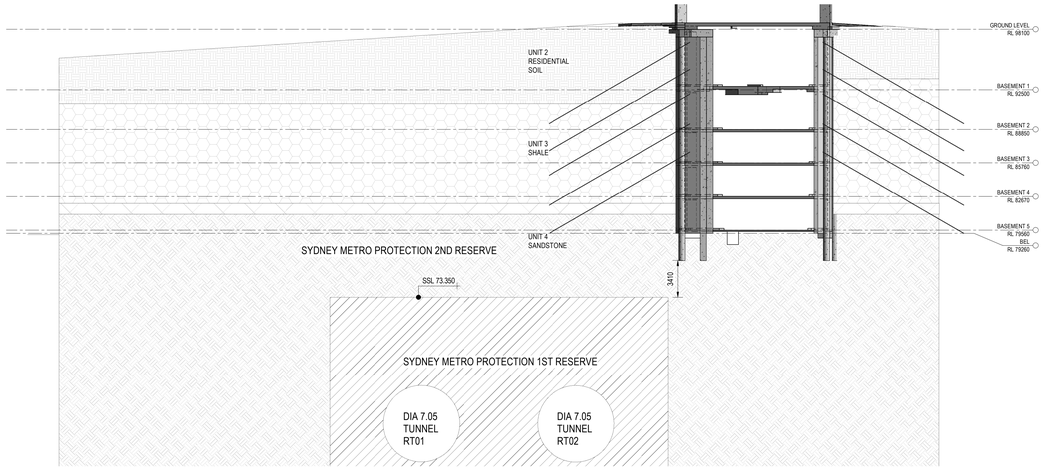
PROJECT:	FIVEWAYS CROWS NEST 391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065
TITLE:	SITE RETENTION PLAN WITH METRO RAIL TUNNEL
JOB NUMBER:	23012
DRG NUMBER:	S01.101
DESIGNED BY:	RC
DATE:	June 2024
DRAWN BY:	RCL
SCALE:	1:200 @ A0
SIZE:	A0
REV:	02

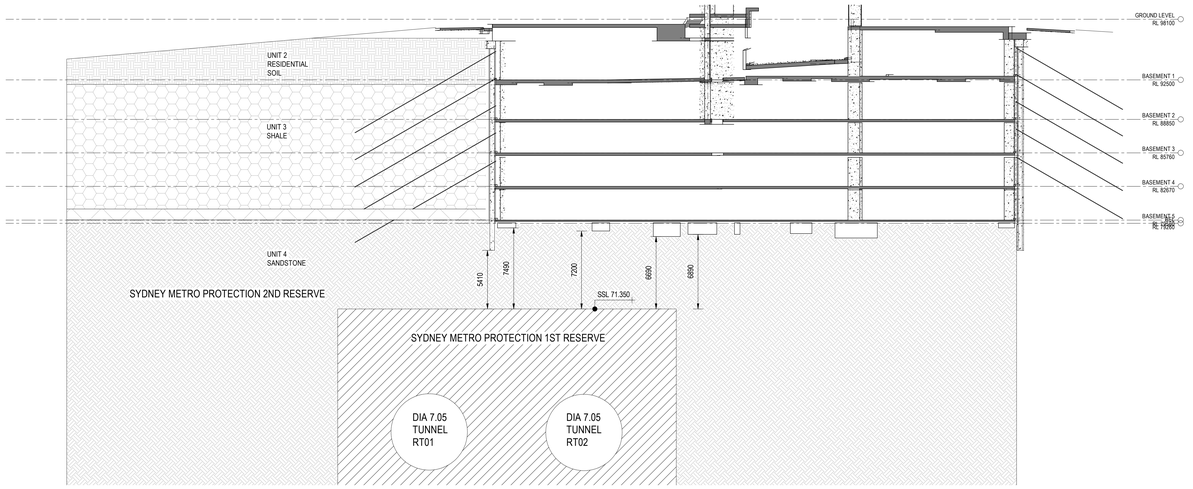
19/05/2025 3:37:00 PM

Regulated Design Record				
Project Address:	391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065			
Project Title:	FIVEWAYS CROWS NEST			
Consent No:	SSD-66826207	Body Corporate Reg No:	DEP0000250	
Drawing Title: SITE SECTIONS WITH METRO RAIL TUNNEL		Drawing No: S01.102		

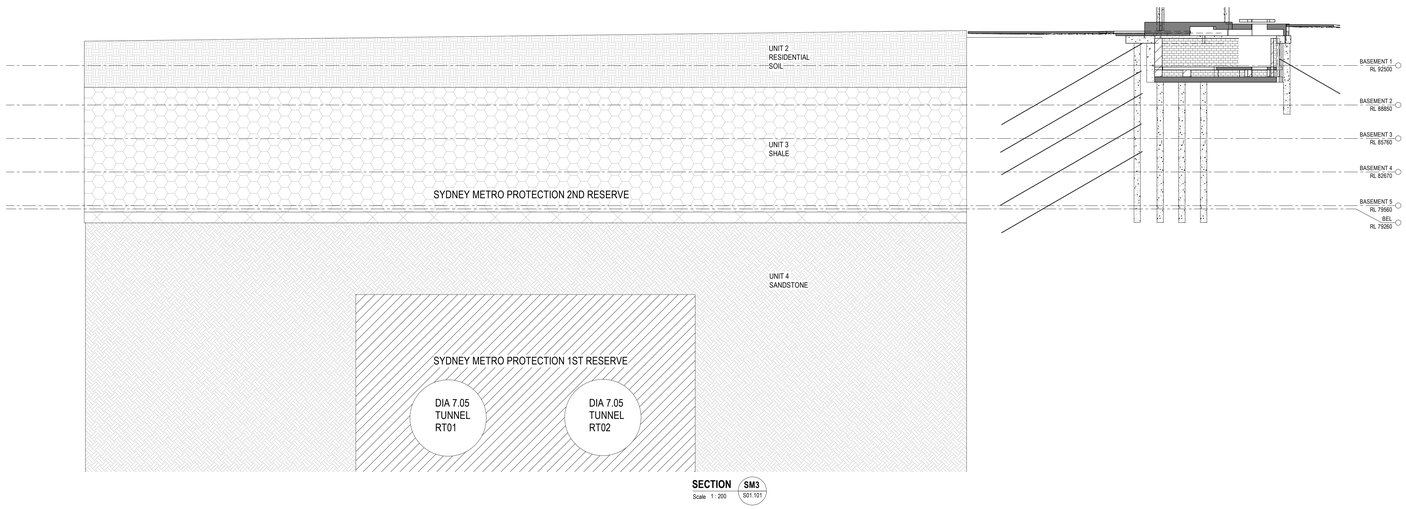
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.05.25	APPROVED FOR CONSTRUCTION	RYAN CAMPBELL	DEP0000027



SECTION SM1 — Scale 1 : 200 — S01.101



SECTION SM2 — Scale 1 : 200 — S01.101



SECTION SM3 — Scale 1 : 200 — S01.101

PRELIMINARY ISSUE

NOTE: DO NOT SCALE OFF DRAWINGS. REFER TO ARCHITECTURAL PLANS. VERIFY DIMENSIONS ON SITE.

REV	DATE	REVISION DESCRIPTION	BY
1	19.05.25	ISSUED FOR CONSTRUCTION	PKP
P05	10.07.24	PRELIMINARY ISSUE	PKP
P4	05.09.23	ISSUED FOR PRELIMINARY INFORMATION	RCL
P3	09.08.23	ISSUED FOR PRELIMINARY INFORMATION	RCL
P2	09.06.23	ISSUED FOR PRELIMINARY INFORMATION	RCL

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PROJECT:	FIVEWAYS CROWS NEST 391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065
TITLE:	SITE SECTIONS WITH METRO RAIL TUNNEL
JOB NUMBER:	23012
DRG NUMBER:	S01.102
DESIGNED BY:	RC
DATE:	June 2024
DRAWN BY:	RCL
SCALE:	1:200 @ A0
SIZE:	A0
REV:	1

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FOUNDATION PLAN

SCALE 1 : 100

MISCELLANEOUS NOTES:

REFER TO DRAWING S00.001 FOR GENERAL NOTES.

REINFORCEMENT COVERS		
FOOTING		INTERIOR
ELEMENT	TOP BTM SIDES	50mm 75mm 75mm

PRELIMINARY ISSUE

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REV	DATE	REVISION DESCRIPTION	BY
P07	08.05.25	ISSUED FOR PRELIMINARY INFORMATION	PKP
P06	08.05.25	PRELIMINARY ISSUE	PKP
P5	07.03.25	ISSUED FOR PRELIMINARY INFORMATION	SF
P4	20.12.24	ISSUED FOR PRELIMINARY INFORMATION	SF
P03	10.07.24	PRELIMINARY ISSUE	PKP

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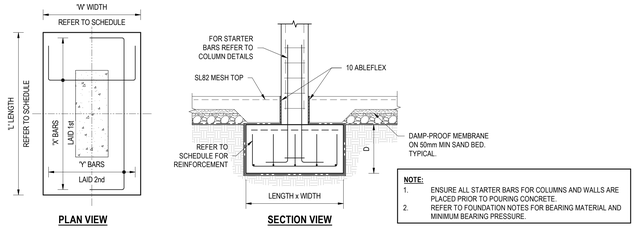
PROJECT: **FIVEWAYS CROWS NEST**
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

TITLE: **FOUNDATION PLAN**

JOB NUMBER:	DRG NUMBER:	
23012	S02.001	
DESIGNED BY: RC	DATE: June 2024	
DRAWN BY: SF	SCALE: 1:1, 1:100 @ A0	SIZE: A0 / REV: P07

8/5/2025 4:49:55 PM

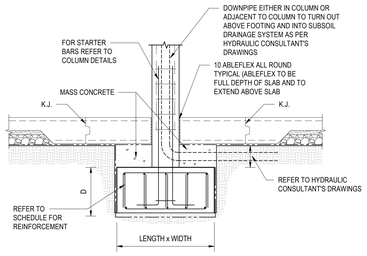


NOTE:
1. ENSURE ALL STARTER BARS FOR COLUMNS AND WALLS ARE PLACED PRIOR TO POURING CONCRETE.
2. REFER TO FOUNDATION NOTES FOR BEARING MATERIAL AND MINIMUM BEARING PRESSURE.

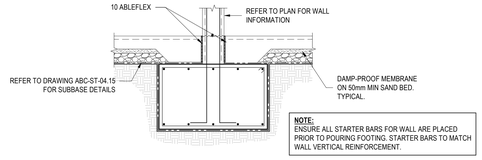
TYPICAL COLUMN PAD FOOTING DETAIL

SCALE 1 : 20

★ PROVIDED SPOON TESTING OF 50% OF FOOTINGS IS UNDERTAKEN AS PER GEOTECHNICAL ENGINEER'S REQUIREMENTS



TYPICAL PAD FOOTING SECTION VIEW WITH DOWNPIPE PRESENT



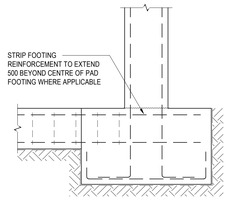
NOTE:
ENSURE ALL STARTER BARS FOR WALL ARE PLACED PRIOR TO POURING FOOTING. STARTER BARS TO MATCH WALL VERTICAL REINFORCEMENT.

TYPICAL STRIP FOOTING 'SF1' DETAIL

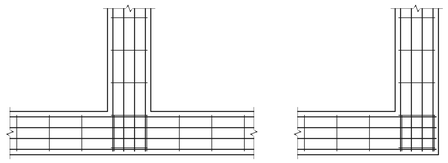
SCALE 1 : 20

STRIP FOOTING SCHEDULE				
MARK	WIDTH	DEPTH	TOP&BTM REO	TIES
SF1	1400	1200	7N20 TOP & BTM	N16-200 TIES

PAD FOOTING SCHEDULE FOR 3000 kPa							PAD FOOTING SCHEDULE FOR 6000 kPa					
MARK	LENGTH	WIDTH	DEPTH	'X' BARS	'Y' BARS	CONCRETE STRENGTH f'c	LENGTH	WIDTH	DEPTH	'X' BARS	'Y' BARS	CONCRETE STRENGTH f'c
PF1	1400	800	500	N20-300	N20-300	40 MPa	1200	600	400	N20-300	N20-300	40 MPa
PF2	1800	1200	600	N20-300	N20-300	40 MPa	1500	900	600	N20-300	N20-300	40 MPa
PF3	2800	2200	1200	N24-200	N24-200	40 MPa	1800	1200	800	N24-250	N24-250	40 MPa
PF4	3000	2200	1000	N28-250	N28-250	40 MPa	2200	1600	800	N24-200	N24-200	40 MPa
PF5	2700	2500	1200	N28-250	N28-250	40 MPa	2000	1800	800	N28-200	N28-200	40 MPa
PF6	2800	2800	1400	N28-200	N28-200	40 MPa	2200	2000	1000	N28-200	N28-200	40 MPa
PF7	3200	3000	1400	N28-150	N28-150	40 MPa	2200	2000	1000	N28-150	N28-150	40 MPa
PF8	2800	2300	1000	N28-250	N28-250	40 MPa	2100	1600	800	N24-300	N24-300	40 MPa
PF9	3000	1900	1000	N28-250	N28-250	40 MPa	2400	1300	800	N28-300	N28-300	40 MPa
PF10	3500	2000	1200	N28-250	N28-250	40 MPa	2900	1400	800	N28-250	N28-250	40 MPa
PF11	3200	3200	1400	N28-150	N28-150	40 MPa	2300	2300	1000	N28-200	N28-200	40 MPa
PF12	3700	2600	1400	N28-200	N28-200	40 MPa	2900	1800	1000	N28-200	N28-200	40 MPa
PF13	3500	1800	1500	N28-150	N28-150	40 MPa	3000	1500	1500	N28-200	N28-200	40 MPa
PF14	2000	1200	1000	N28-250	N28-250	40 MPa	1800	1000	1000	N28-250	N28-250	40 MPa
PF15	5600	1000	900	N24-200	N24-200	40 MPa	5600	1000	900	N24-200	N24-200	40 MPa
PF16	5400	2500	1200	N28-250	N28-250	40 MPa	4600	1800	800	N28-200	N28-200	40 MPa



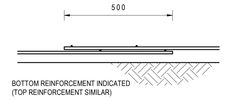
STRIP / PAD FOOTING JUNCTION



'T' INTERSECTION

CROSS INTERSECTION SIMILAR

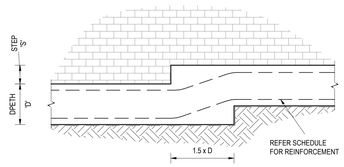
'L' CORNER



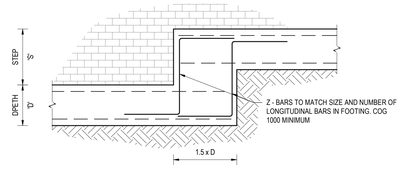
REINFORCEMENT SPLICE DETAIL

NOTE: EACH LAYER OF TRENCH MESH IS TO BE MADE 'CONTINUOUS' BY LAPPING WHERE REQUIRED AS FOLLOWS -
- AT 'T' INTERSECTIONS AND '+' INTERSECTIONS - FOR THE FULL WIDTH OF THE TRENCH MESH
- AT 'L' CORNERS - FOR FULL WIDTH OF TRENCH MESH
- AT SPLICES WHERE NEEDED - 500mm MINIMUM

PLAN VIEWS - STRIP FOOTINGS

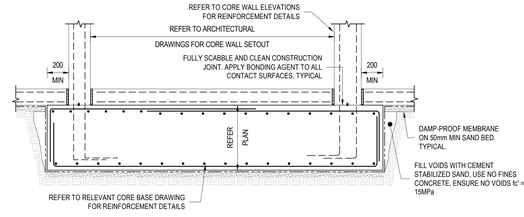


'S' LESS THAN OR EQUAL TO 200mm



'S' GREATER THAN 'D' BUT LESS THAN 1.5 x 'D'

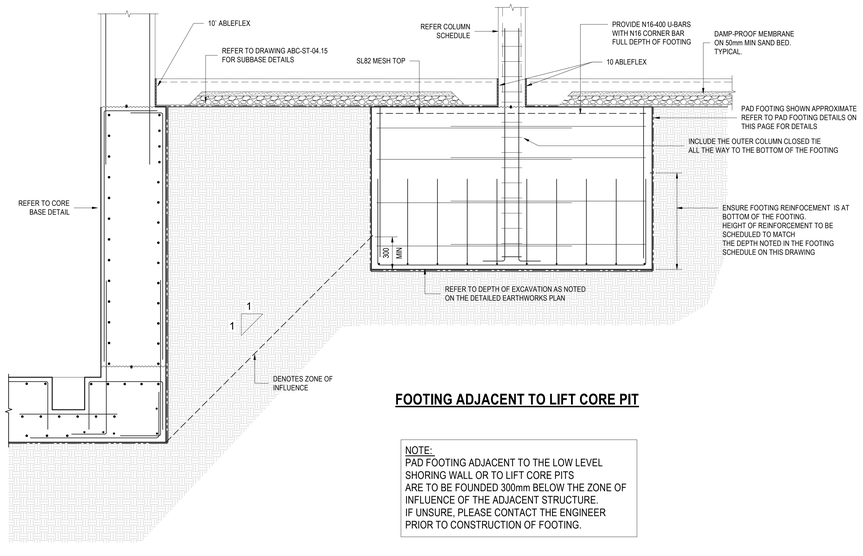
STRIP FOOTING STEPPING DETAILS



NOTE:
1. ENSURE ALL STARTER BARS FOR WALLS ARE PLACED PRIOR TO POURING CONCRETE.
2. REFER TO FOUNDATION NOTES FOR BEARING MATERIAL AND MINIMUM BEARING PRESSURE.

TYPICAL STAIR BASE DETAIL

1:20



FOOTING ADJACENT TO LIFT CORE PIT

NOTE:
PAD FOOTING ADJACENT TO THE LOW LEVEL SHORING WALL OR TO LIFT CORE PITS ARE TO BE FOUNDED 300mm BELOW THE ZONE OF INFLUENCE OF THE ADJACENT STRUCTURE. IF UNSURE, PLEASE CONTACT THE ENGINEER PRIOR TO CONSTRUCTION OF FOOTING.

PRELIMINARY ISSUE

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P4	07.03.25	ISSUED FOR PRELIMINARY INFORMATION	SF
P3	20.12.24	ISSUED FOR PRELIMINARY INFORMATION	SF
P2	05.09.23	ISSUED FOR PRELIMINARY INFORMATION	RCL
P1	22.05.23	ISSUED FOR PRELIMINARY INFORMATION	RCL

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PROJECT: **FIVEWAYS CROWS NEST**
391/423 PACIFIC HIGHWAY CROWS NEST NSW 2065

TITLE: **TYPICAL FOUNDATION DETAILS**

JOB NUMBER:	DRG NUMBER:	
23012	S02.011	
DESIGNED BY: RC	DATE: June 2024	
DRAWN BY: SF	SCALE: 1:20 @ A0	SIZE: A0 / REV: P5

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