CADIGAL GROUP

849-859, PACIFIC HIGHWAY AND 2-8 WILSON STREET, CHATSWOOD

Structural Engineering Report on shoring arrangement adjacent to the railway corridor

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12/06/2025

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Rev No	Details	Prepared by	Reviewed by	Date
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1. INTRODUCTION

Cadigal Group has been engaged to carry out a structural engineering work for the proposed development. As part of the services, preliminary structural analysis of the proposed development was performed to assist DA submission. This report specifically embellishes the shoring arrangement adjacent to the Chatswood railway corridor and provides further reference material to the Transport for NSW (TfNSW).

We have conducted a visual inspection of the site including its surroundings. The project will require the demolition of the following lots to allow for the construction of new mixed-use development:

- Lot SP52947, address: 2 Wilson Street, Chatswood;
- Lot DP1189541, address: 8 Wilson Street, Chatswood.
- Lot SP1496, address: 849 Pacific Highway, Chatswood;
- Lot SP60178, address: 853 Pacific Highway, Chatswood;
- Lot SP10110, address: 859 Pacific Highway, Chatswood;

The proposed development consists of 2 towers of 36-storey mixed use residential and commercial development with an activated commercial podium and 6 levels of basements. The existing site area of the combined 5 lots amounted to 4,752 m^2.

This report is inclusive of the site condition, geo technical investigation references, construction methodology of the shoring arrangement for the proposed development and a statement & documentation requirement relating to the interface of the proposed development on the adjacent rail corridor at Chatswood.

All designs mentioned within this report are adhered to all necessary standards including BCA requirements, AS3600, AS4100, AS1170.0, AS1170.1, AS1170.2, and AS1170.4.

2. PROPOSED DEVELOPMENT AT 849-859, PACIFIC HIGHWAY, CHATSWOOD

2.1 EXISTING SITE

The site which is approximately of 4,294 m^2 in extent is demarcated by Wilson Street on the north direction, Pacific highway on the west direction, O'Brien Street on the south and by the rail corridor at the east direction. A substation is also located in the edge of the land. The site has a land use classification as R4 – High Density Residential and comprises of four separate residential buildings with four access driveways on Wilson Street, Pacific Highway and O'Brien Street and a two-storey commercial building. The surrounding properties mostly including a mix of residential towers, commercial buildings and low and medium residential dwellings.

2.2 PROPOSED DEVELOPMENT

The multipurpose development project proposed in this land consists of two towers, which sit on a three-storey high podium. The two towers share six basements together. Both towers will have 36 stories. All designed as PT slabs.

As per the architectural design the four basements have been assigned for car park facilities, while Ground and Level 1 have been nominated as commercial space along with live-work units. Level 2 has been allocated for communal gatherings, child care facilities and the swimming pool. Level 3 and 4 will again host space for live-work units. From 5th floor upwards the two towers will provide space for apartment units. The roof slabs on both towers have been assigned for service and terrace space.

2.3 PROPOSED CONSTRUCTION METHODOLOGY

The construction sequence is proposed as below:

2.3.1 DEMOLITION OF THE EXISTING BUILDINGS.

- The existing apartment buildings and the commercial building at 849-859, Pacific Highway, Chatswood plot will be entirely demolished.

2.3.2 BASEMENT AND FOUNDATION CONSTRUCTION.

- Basement excavation is expected to reach depths of approximately 21.6 m to 18.6 m in medium to high strength shale/laminate.
- The foundation of the structure will be supported on either pad footings or pile footing with design maximum allowable bearing pressures stated in the geotechnical report (Class II to Class I Ashfield Shale) depending on the founding conditions reached. Reference is made with the geotechnical investigation report submitted by Fortify Geotech (Date 06/12/2023).
- During the excavations, 600mm diameter soldier pile with infill shotcrete will be used which typically consist 2.9m centres with tie-back anchors for stability as required has been proposed for the retaining wall structures at the three boundaries of the land neighbouring O' Brien Street, Wilson Street and Pacific Highway. For the Eastern side of the property near the TfNSW corridor 900mm diameter soldier piles have been proposed with 2m centre to centre spacing.

- During construction and in the long term, the seepage into the excavation will be controlled by perimeter drains connected to a "sump-and-pump" system. It is recommended to accommodate a drained basement in the geotechnical report with permanent drainage below the floor slab to direct seepage to the stormwater drainage system subjected to council approval.

2.3.3 TOWER CONSTRUCTION

- All columns, foundations and core walls will be constructed of reinforced concrete with grades starting from N40. The grade of the concrete will vary according to the table shown below.

Table 2.1: Concrete grade types recommended for the structure

Range in floor levels	Concrete grade used
Basement 6 to level 5	N65
Level 6 to Level 25	N50
Level 26 to Roof	N40

- The building has two sets of core walls, separately on the two towers. The core walls layout is regular enough to permit an economic jump-form construction. However, the initial cost associated with jump-form setup versus speed of construction require financial viability to adopt jump construction. The jump-form construction is economical with tall building and generally typical cycle is 5-7 days per floor. The cores of the two towers may be constructed using jump form system since it is a financially feasible system to be used in buildings greater than 15 storeys. Alternatively, conventional formwork method of building wall is acceptable. Other core walls may require conventional formwork for construction.
- The floor plates will typically be post-tensioned concrete floors given the shape of the building and the spans involved. Temporarily back propping may typically extend to 2-3 floors below.

3. CONDITIONAL REQUIREMENT OF TfNSW

The site is located adjacent to the Chatswood Rail corridor from the west orientation and surrounded by various roads and associated infrastructure from other orientations. The proposed development shoring wall and the retention system near the rail corridors are subjected to Transport for NSW (TfNSW) conditions.

As per the specifications mentioned in the standards of T HR CI 12090 ST: Airspace and External Developments Version 1.0 published by the Transport Assert Standards Authority following criterion were considered.

Clause 14.2 “Engineering analysis and impact assessment” specifies that where ground penetration exceeds 2 meters within a 25-meter proximity to the rail corridor, unless otherwise instructed by TfNSW, the developer must conduct an engineering analysis and impact assessment. This is to ensure that the proposed development will not adversely affect existing rail infrastructure facilities. The findings of this assessment must be documented in an engineering assessment report.

The engineering analysis and impact assessment should consider neighbouring developments and future planned activities, which can be obtained from TfNSW. Depending on the complexity of the project, either two-dimensional or three-dimensional numerical modelling (using finite element (FE) or finite difference (FD) methods) must be performed. This modelling is necessary to evaluate the effects on rail infrastructure facilities during various stages of construction and throughout operation post-commissioning, including the impacts of temporary works.

The numerical modelling must be based on a realistic geological model derived from subsurface data obtained through geotechnical investigations. It should incorporate key geological features such as bedding planes, weak layers, joints, and other discontinuities. The results of the numerical modelling must be verified and validated during construction using carefully designed field monitoring instrumentation.

Additionally, the numerical modelling should account for existing conditions of rail infrastructure facilities, considering factors such as defects (e.g., cracks), drainage conditions, and support conditions identified through dilapidation surveys and in-situ strength tests where appropriate.

The standards further to the risk assessment also specifies it requirements in clause “14.4: Ground penetrations”, “14.5: Approved ground anchors” and “15: Basements”. In this report it has been stated in “Section 7: Verification of conditions imposed by TfNSW” that all conditions have been met and stratified in the design of this building.

3.1 OVERVIEW OF BASEMENT

The project dives the natural ground level through four basements terminating its stretch at 85.220 RL level at the Basement 6 level. The basement will be designed as a drained basement with 120mm thick slab on grade concrete. The existing ground surface varies between RL 103.5 and 107 which creates a basement depth of approximately 14m.

During fulfilling the conditional requirement of the TfNSW, a geo technical assessment on the risk impact has been carried out on the following assets;

1. Rail retaining wall along the rail corridor along Easter side boundary of the site.
2. Wilson Street vehicle overbridge at the North-eastern corner of the building.
3. O’Brien St. Pedestrian bridge at the South- Eastern corner of the site.

The geotechnical modelling has been conducted to simulate the accepted surcharge conditions and underlaying soil and rock strata conditions. “Section 4.8: Critical locations selected for the analysis” depicts the location in par with these assets

3.2 REGIONAL GEOLOGICAL CONDITION

As per the geological information provided by the Department of Regional NSW it has been notified that the area to be underlain by Middle Triassic age Ashfield Shale. Ashfield Shale consists of black to light grey marine shale and mudstone unit with minor siltstone that outcrops in easter Australia. Residual soils are expected above the shale bedrock.

3.3 SUBSURFACE CONDITION

According to the six borehole investigations carried out by Fortify Geotechnical engineers, it could be identified that the excavated depth for the basements of the project runs all the way from extremely weathered to slightly weathered shale rock conditions condition. Figure 3.1: Subsurface conditions extracted from the Geotechnical report illustrates the classifications and related depths for each rock type.

Bore hole ID.	Approximate ground surface RL [1]	Top of Residual soils (Unit 2) (RL) [2]	Top of XW (Unit 3a) Bedrock (RL) [2]	Top of HW (Unit 3b) Bedrock (RL) [2]	Top of HW/MW (Unit 3c) Bedrock (RL) [2]	Top of MW (Unit 3d) Bedrock (RL) [2]	Top of SW (Unit 3e) Bedrock (RL) [2]
BH1	103.6	103.3	98.8	95.8	92.8	90.2	88.6
BH2	104.9	104.3	100.4	97.3	95.5	94.0	88.4
BH3	105.8	105.3	101.3	98.3	97.7	96.7	90.7
BH4	105.9	105.7	103.1	99.5	98.4	97.0	91.7
BH5	105.7	105.1	102.5	99.7	97.3	96.2	89.7
BH6	105.0	104.6	102.0	98.5	97.0	95.8	90.7

[1] RL's have been interpolated between survey points off the site survey.

[2] RL's have been calculated based on the interpolated RL at the top of each borehole.

Figure 3.1: Extract from the geotechnical report provided by Fortify geo technical experts

3.4 DESIGN GROUND WATER LEVELS

According to the geotechnical investigations and the Dewatering Management Plan (DMP), after 3 months of monitoring it has been identified that the ground water level in proximity to the railway line is in 97m RL. As per the proposed bulk excavation level the basement 6 level will be met at 85.12 RL which in return will intersect with the existing ground water level. With the proposed arrangement of drained basement construction, the long term draw down of the ground water level will bring in repercussions for an extent of 21.3m from the proposed excavation. This risk has been taken into consideration at the time of numerical modelling of the shoring arrangement.

4. SHORING DESIGN

The shoring methodology has been carried out with the basic concept of casting soldier piles within a designed spacing and then proceeding with the excavation. The staged excavation will be supported through tie back anchors which will be connected to the shoring wall as temporary supports. The entire process is sequential and all calculations for the shoring wall arrangements are reinforced with finite element geotechnical simulations.

4.1 DESIGN INTENT

The shoring arrangement for the project has been designed with allowing for a tolerance of 500mm away from the rail corridor retaining wall to the edge of each tie back anchor. Temporary bracing arrangements have been used along one shoring wall that resides in NE direction of the premises to ensure that the clearance is maintained and the boundary lines are not encroached. SW3 wall has been supported with temporary internal bracing as mentioned above. All anchors have been designed as temporary anchors and will be destressed after the permanent slabs are cast.

It should also be noted that the excavation for six basement levels significantly increases the zone of influence, potentially causing the anchor bond lengths to extend into the retaining wall associated with TfNSW assets. To prevent this encroachment, a rock berm has been introduced on the SW3 side at the basement 5 level. This berm effectively reduces the extent of the zone of influence, thereby improving the feasibility of anchor placement. Additionally, the installation of the top anchor on SW3 would result in the anchor bond length extending too close to the TfNSW retaining wall. To address this, the first layer of anchors has been replaced with an internal steel bracing system.

Figure 4.1 below elaborates the scenario more elaboratively. It clearly distinguishes the possibility of splaying the anchors without interfering the retaining wall of TfNSW by introducing the rock berm and the internal bracing arrangement.

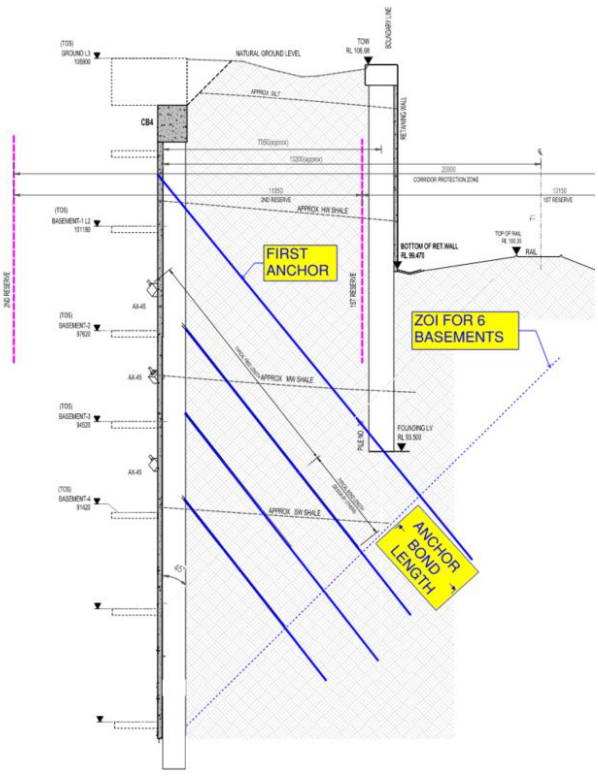


Figure 4.1a: Extension of zone of influence of the six basements

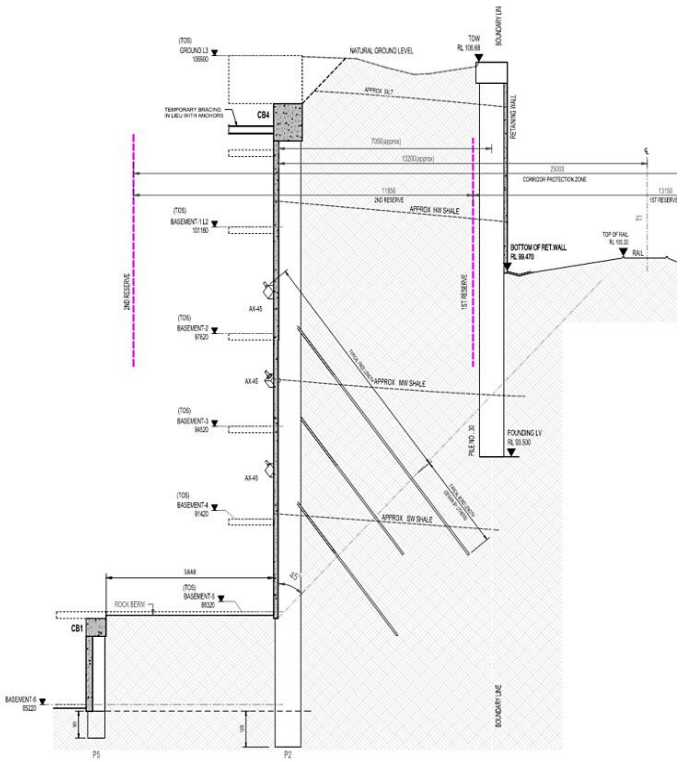


Figure 4.1b: Impact on the ZOI after the introduction of rock berm and internal steel bracings

Forces imposed on the shoring wall at each level of tie back anchors have been extracted from the Geotechnical Railway Impact Assessment report (Rev 1) provided by Fortify Geotech. The anchors have been then designed as per the load and the minimum proof load each anchor can undergo. Details have been illustrated on Annexure C.

Drawings and calculations will be submitted to the TfNSW and related authorities for approval during the construction phase of the project.

4.2 SIMULATION OF SHORING WALL IN GEOTECHNICAL FINITE ELEMENT MODELLING

Currently the proposed shoring methodology consists of soldier piles throughout all four sides of the proposed development. However, this option requires temporary anchors throughout all four sides of the property. As mentioned above, eastern side boundary next to rail line, the temporary anchors need to be coordinated to avoid any clashes with rail influence zone, which is under the scrutiny of TfNSW. Figure 4.2: Plan view of shoring arrangement of the project illustrates the arrangement below.

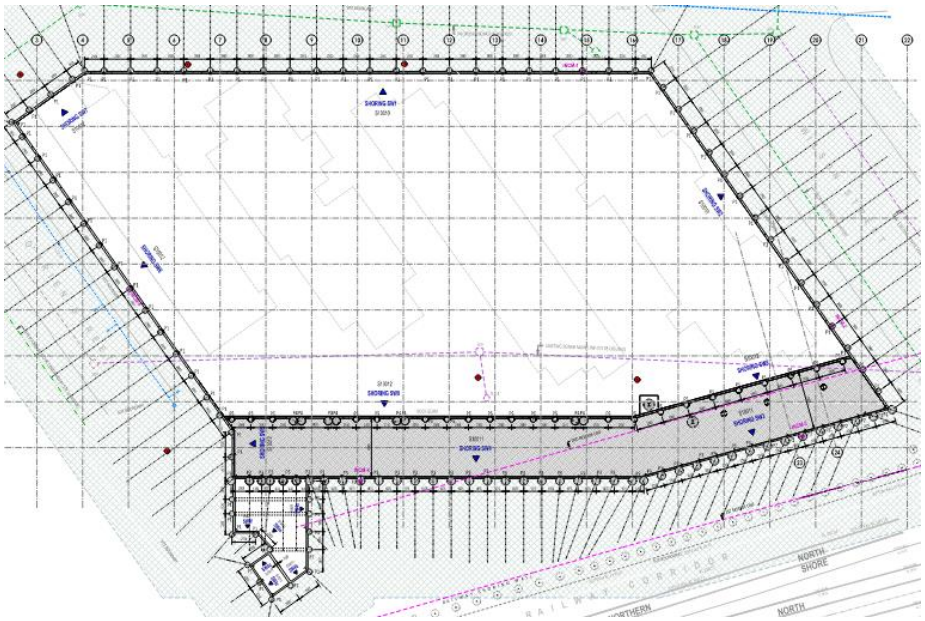


Figure 4.2: Plan view of shoring wall arrangement

Two types of piles have been used in the design. 600mm diameter soldier piles have been used with 2.9m centre to centre spacing in the three main boundaries along Wilson Street, O'Brien Street and the Pacific Highway. The Eastern side boundary which is neighboured by the railway line has been designed with 900mm diameter soldier piles. The spacing has been maintained as 2m centre to centre. The surcharge loading imposed on the rail way boundary has impacted in increasing the pile diameter and the decreasing the spacing between the piles. The heavy loads have also impacted in the tension capacity of the temporary tie back anchors utilized in the design. The retaining arrangement of the rock berm area will be also designed as soldier piles comprised of shotcreting. The piles have been designed as 600 diameter cantilevered piles with no tie back anchors.

Most importantly the internal bracing arrangement that has been installed along SW3 was simulated on SPACEGAS structural FEM software to supply with the relevant reaction forces to the geotechnical engineer. The forces verified by Cadigal group was then used in the geotechnical model to simulate the actual retaining condition at the site. An elaborated methodology for the construction sequence of the internal bracing arrangement is provided in Section 5.

It has to be emphasized that the introduction of the rock berm and the internal bracing arrangement have assisted in managing the tie back anchors of SW3 (which is at the closest proximity to TfNSW assets) to not encroach the retaining wall

or its pile foundations. Therefore, it is believed that no additional approval needs to be granted from TfNSW and related authorities for the placement of anchors.

The numerical analysis carried out on PLAXIS-2D (V2024.1) by Fortify Geotechnical Engineers are Annexed in Annexure A. This analysis has taken into the consideration of the construction sequence proposed by the Cadigal Group. The geometry and the properties of the assets attached to the railway line has been extracted from the details and drawings provided by the Client. (Refer Annexure B).

4.3 SURCHARGE AND LOADING PLAN FOR SHORING DESIGN

The report specifically focuses on the shoring wall arrangement adjacent to the railway line in the Eastern direction of the land, thus the surcharge imposed on the specific area has been tabulated below.

Table 4.1: Surcharge loads considered for the analysis

Type of load / surcharge	Value of the load / surcharge (kPa)
Pedestrian traffic loading	5
Existing dwelling loading	10/ per floor
Communication hut loading	10
Train loading (300 LA train) Applied at the underside of the rail sleepers as per AS 5100:2:2017	131

4.4 ASSUMPTIONS CONSIDERED BY THE GEOTECHNICAL ENGINEER DURING SIMULATION

The following assumptions could be considered staple in the assessment. Please refer "Geotechnical Railway Impact Assessment- 849,853 & 859 Pacific Highway, Chatswood (Rev 1)" report dated on June 2025 prepared by Fortify Geotech for more elaborated details on the assumptions.

- Modelling of the railway assets have been carried out in accordance with the as built drawings received by the client. (Refer Annexure B) Therefore, it has been assumed that the data reflected on the drawings and documents are true and correct.
- In par with Clause 8.3.1 of AS 5100.3 an over excavation of 0.5m has been considered for the assessment of the impact. The passive resistance generated along the retaining wall has also been neglected to create more conservative approach in the assessment.
- The long-term impact on the ground water level due to the continuous drawdown inferred on the Dewatering Management plan has been considered in the assessment.
- Since the temporary condition has been considered for the shoring wall arrangement, no earthquake loadings have been included in the loading combinations.

4.5 DETAILS OF EXISTING STRUCTURES

4.4.1 RAIL RETAINING WALL

The retaining wall alongside the lower track from chainage 12.17 to 12.24 is approximately constructed as a cantilever piled wall filled with shotcrete, as detailed in the as-built drawings. The piles are specified as reinforced concrete with a diameter of 850mm, spaced variably from 1760 to 2370mm apart, and with toe levels ranging from RL 93.5 to RL 94.5 as-built. Selected excerpts from the as-built drawings are provided below.

Since this design was executed in 2003, it may not conform to current requirements outlined in AS5100.2, AS5100.3, and THR CI 12060 ST "Retaining Walls." The as-built drawings indicate that the retaining wall was designed according to the Australian Bridge Design Code (ABDC), which was superseded by AS 5100 in 2004. They also detail the transient loadings and surcharges at the retained surface level that the wall was designed to accommodate. Notably, there is no reference to additional permanent loads above the retained surface level.

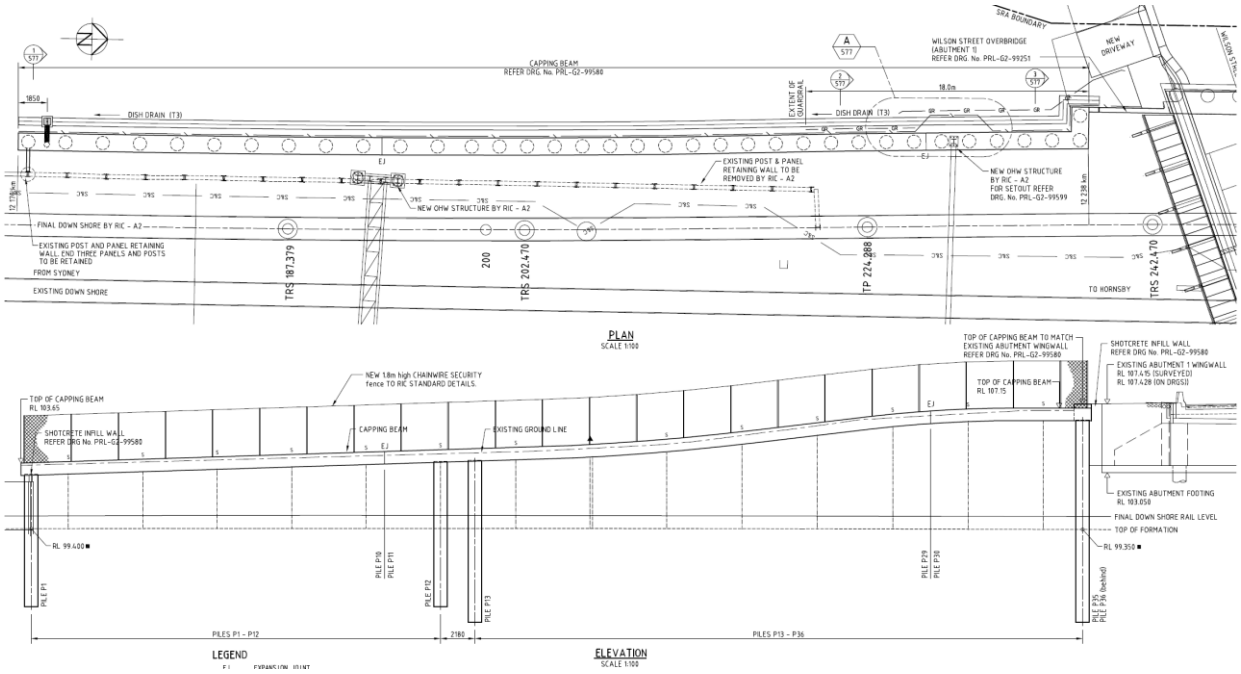


Figure 4.1: Longitudinal section of the rail retaining wall

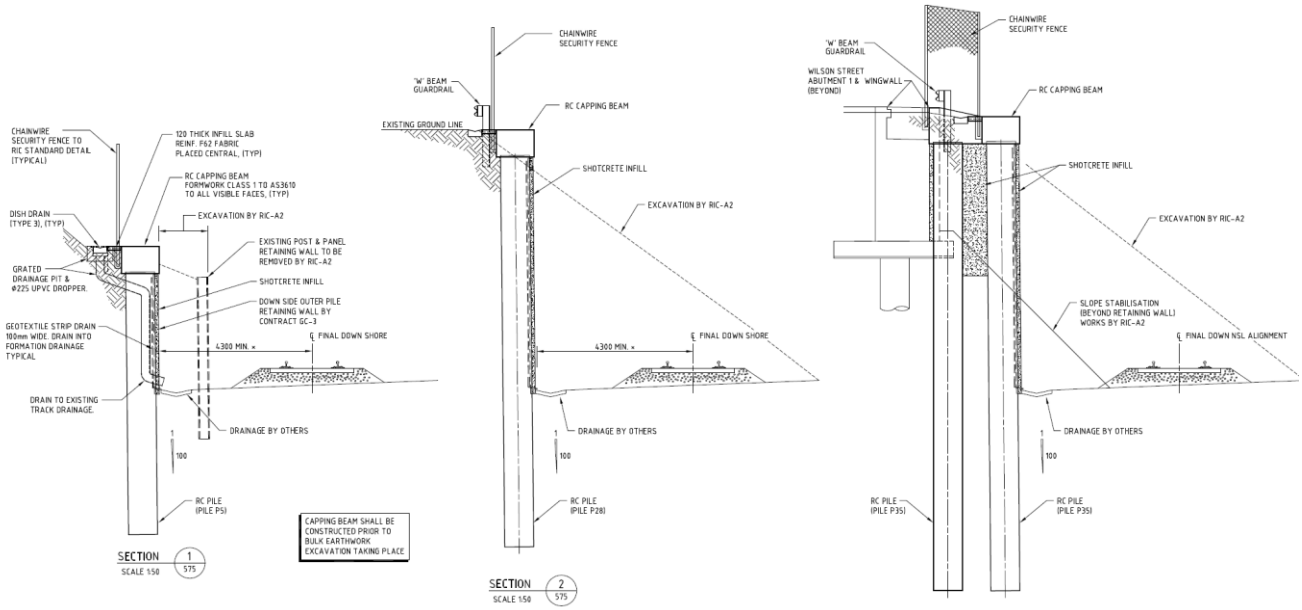


Figure 4.2: Sections extracted from the retaining wall

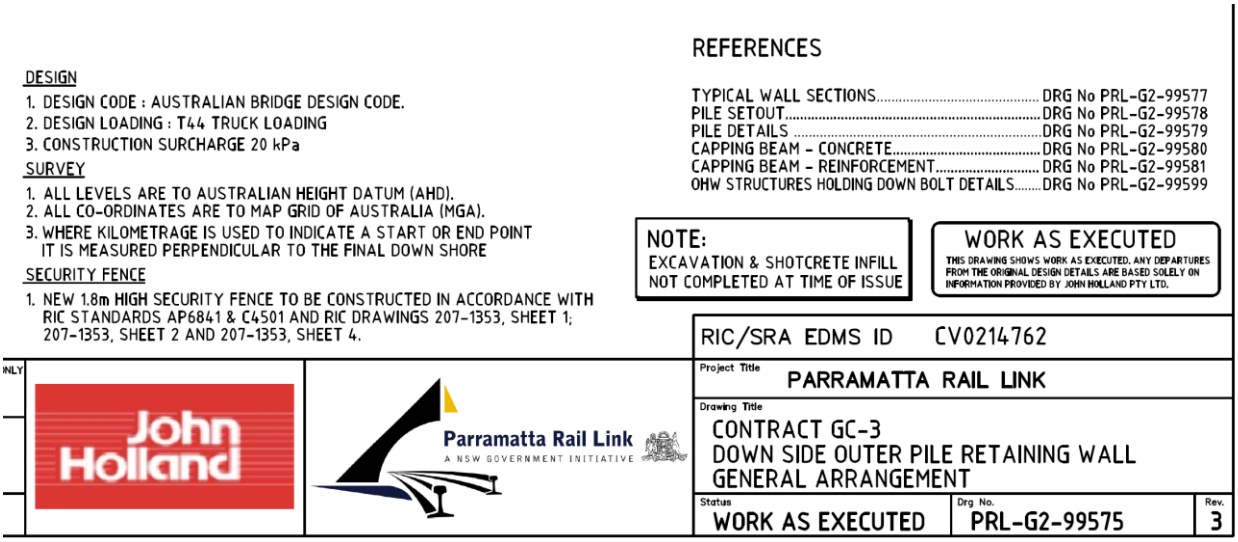


Figure 4.3: Snippet from the drawing indicating the references and loading conditions considered

4.5.2 EXISTING WILSON STREET OVERBRIDGE

The overbridge is a TfNSW asset which has a piled abutment close to the North east corner of the proposed development transfers the loads to a stiffer foundation stratum below. The L shape retaining walls have been designed to support the earth pressures acting on the wingwall and the abutment.

Figure 4.5- Figure 4.7 indicate some extracts from the as-built drawings.

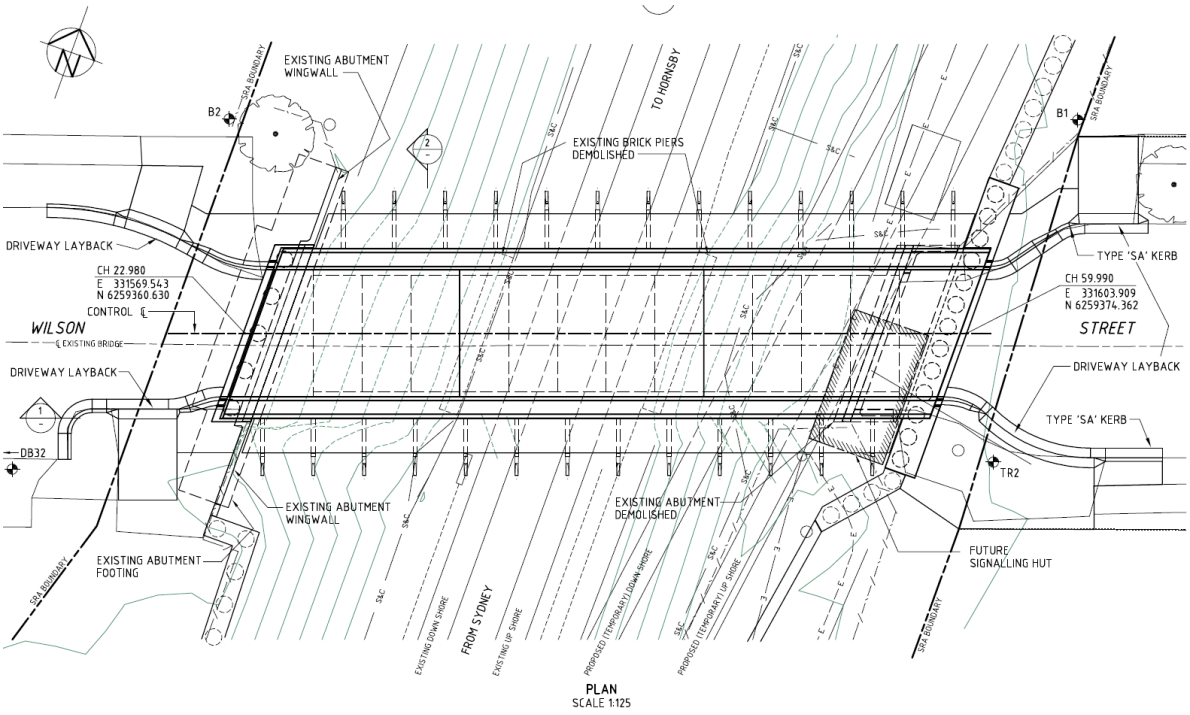


Figure 4.4: Plan view of the Wilson Street Pedestrian Bridge

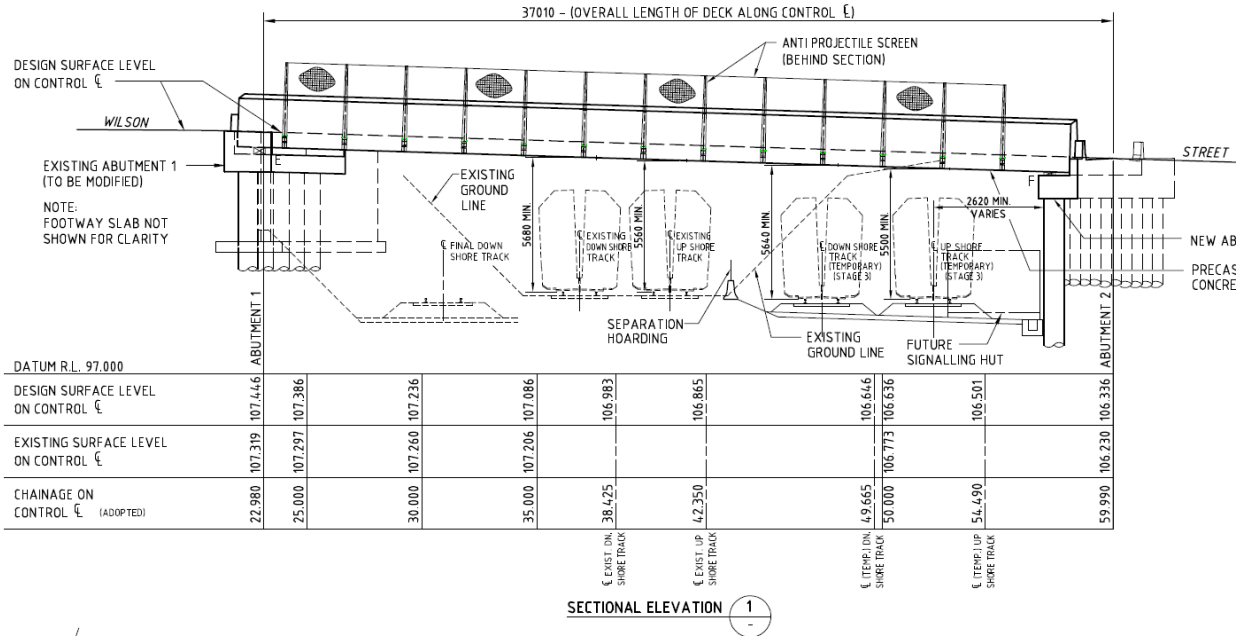


Figure 4.5: Sectional elevation of the bridge

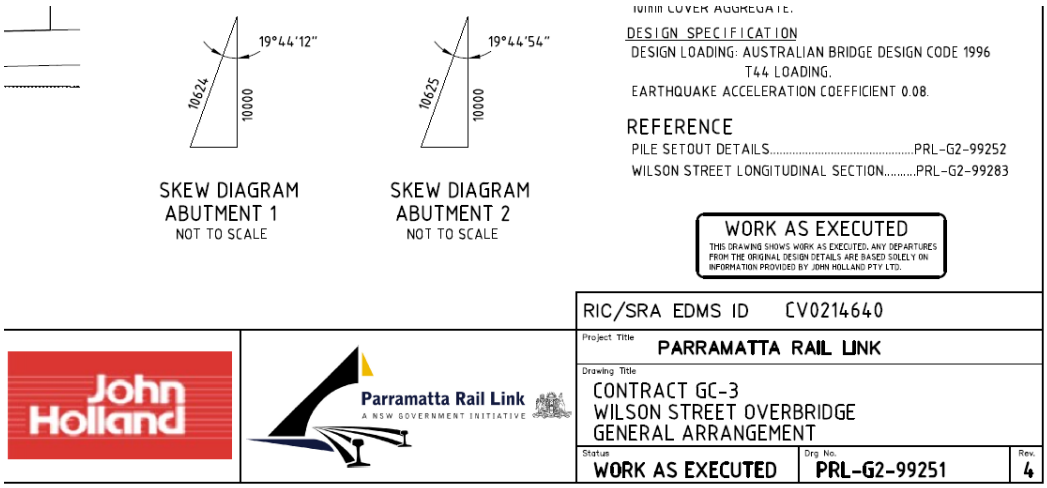


Figure 4.6: Snippet from the drawing with indication of references and loading arrangements

4.5.3 EXISTING O'BRIEN ST PEDESTRIAN BRIDGE

O'Brien St pedestrian bridge is in the Southeast of the site. As per the drawings it could be noted that the abutment in the western side is supported by two set of piles. The rear pile is of 900mm in diameter and the front pile is 400mm in diameter. The embedment length has not been indicated in the drawings. During the assessment it has been considered that the piles have been terminated at XW shale (Extremely weathered shale) with 0.4m embedment length for the 400mm diameter pile and 0.9m for the 900mm diameter pile. Figure 4.8 to figure 4.120 indicate the structural arrangement of the bridge extracted from the as built drawings.

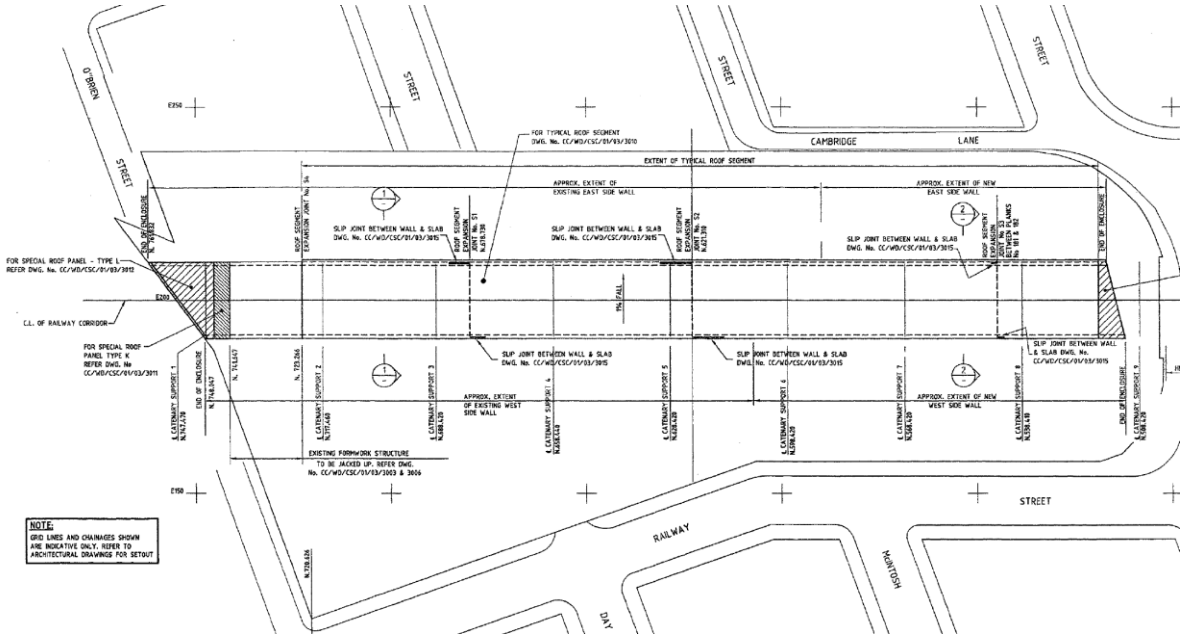


Figure 4.7: Plan view of the pedestrian bridge

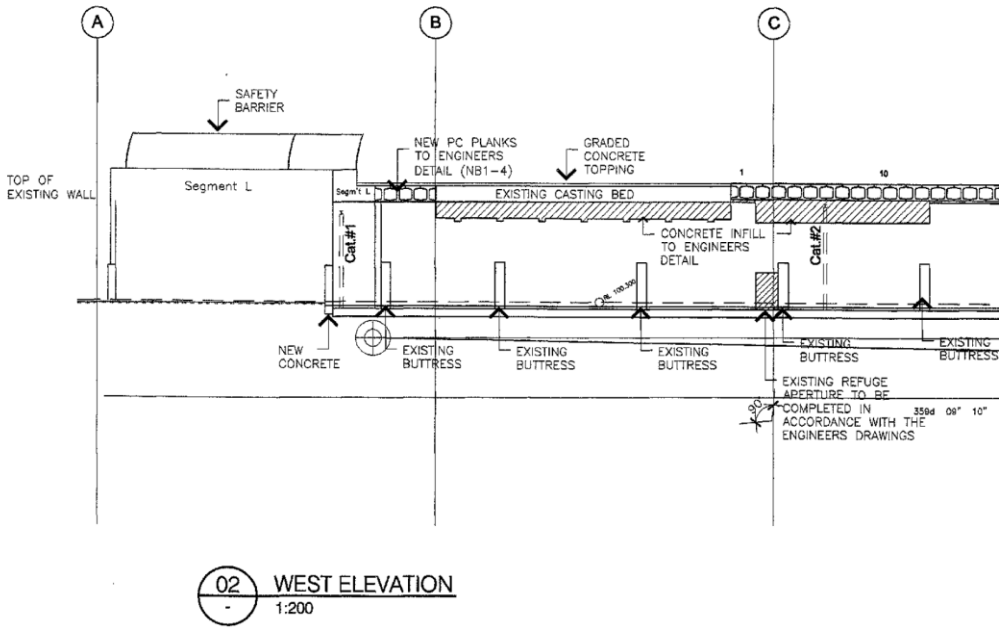


Figure 4.8: West elevation view extracted from drawings

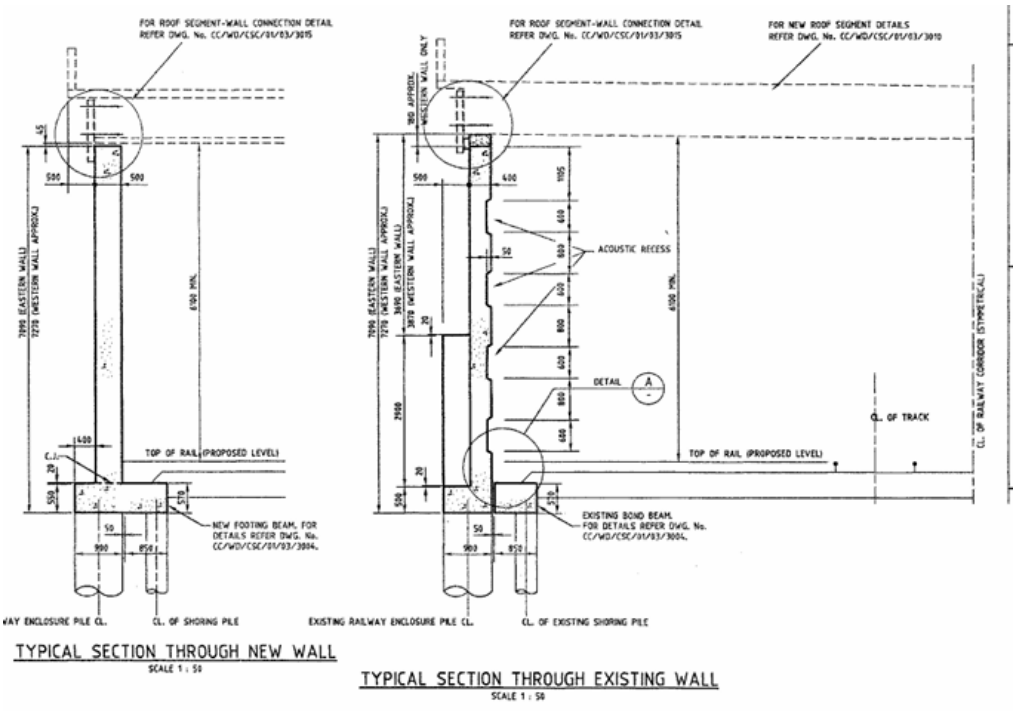


Figure 4.9: Cross section of the western abutment

4.6 GEOTECHNICAL DESIGN PARAMETERS

According to the borehole date the following parameters relevant to the soil and underlaying rock have been taken into consideration when modelling the temporary retention arrangement for the project. Figure 4.11 illustrates the parameters used in the PLAXIS software.

Add onto this, the following parameter of the ultimate skin friction stresses have been adopted in the assignment to assess the ground anchor capacities.

Table 4.2: Allowable unit stresses in tension loads according different rock types

Unit	Allowable unit stresses for tension loads (kPa)
Unit 3a: XW Shale Bedrock	40
Unit 3b: HW Shale Bedrock (Class IV)	75
Unit 3c: HW /MW Shale Bedrock (Class III)	100-225
Unit 3d: MW Shale Bedrock (Class II/III)	250-400
Unit 3e: SW Shael Bedrock (Class II or better)	>400

Unit	Typical description	Bulk Density γ_b (kN/m^3)	Effective Cohesion c' (kPa)	Friction Angle φ' (°)	Undrained Shear Strength s_u (kPa)	Design UCS (MPa)	Drained Young's Modulus E' (MPa)	Poisson Ratio ν	Horizontal K_0
Unit 1: Fill	Fine to coarse-grained Sandy GRAVEL and Gravelly SAND	18	0	30	N/A	N/A	10	0.3	0.53
Unit 2: Residual Soil	Sandy Silty CLAY, stiff to hard	19	5	28	120	N/A	30	0.3	0.53
Unit 3a: XW Shale Bedrock		22	10	21	N/R	1	65	0.25	0.50
Unit 3b: HW Shale Bedrock **(Class IV)**		23	50	23	N/R	3	130	0.25	3.50
Unit 3c: HW/MW Shale Bedrock **(Class III / IV)**		23	100	28	N/R	7	300	0.2	3.50
Unit 3d: MW Shale Bedrock **(Class II / III)**		23	150	30	N/R	15	600	0.2	3.50
Unit 3e: SW Shale Bedrock **(Class II or better)**		24	400	32	N/R	20	700	0.2	3.50
Unit 4a: Class II Sandstone		24	500	40	N/R	25	900	0.2	3.50

N/A – Not applicable N/R – Not relevant

Figure 4.10: Excerpts from the Geotechnical Railway Impact Assessment prepared by Fortify Geotech

4.7 PARAMETERS FOR STRUCTURAL ELEMENTS

During the initial simulation on PLAXIS the soldier piles have been considered as of 900mm diameter running with a spacing of 2m centre to centre and 600mm diameter piles at the rock berm retention with 3m centre to centre. The excerpt taken from the geotechnical simulation provides the parameters considered in the analysis. (Refer Figure 4.12). The bending moments, shear forces imposed on piles based on the structural and geotechnical parameters were later adopted by Cadigal Group for the design of the structural elements.

It also has to be noted that that the short term and the long-term deflection values had also been obtained from the PLAXIS simulation by modifying the EI (Stiffness factor of piles) by 90% and 60% respectively.

Property	Section 1		Section 2	Section 3
Pile diameter and spacing	0.9 m @ 2.0 m crs (inner piles)	0.6 m @ 2.4 m crs (outer piles)	0.9 m @ 2.0 m crs	
E (GPa)	32.8			
EA (kN/m)	10.43E+06	3.86E+06	10.43E+06	
EI, short term / long term (kNm^2/m)[1]	475.0E+03 / 317.0E+03	78.2E+03 / 52.2E+03	475.0E+03 / 317.0E+03	
Existing surface level (m AHD)	104.0		105	107.5
Final surface level (m AHD)	104.0		105	106.3
Bulk excavation level (m AHD)	84.9			
Over-excavation level (m AHD)	84.4			
Pile toe level (m AHD)	83.7 (inner piles)	95.0 (outer piles)	83.7	83.7
Rock berm pile diameter and spacing	0.6 m @ 2.4 m crs		0.6 m @ 3.0 m crs	
Rock berm pile toe level (m AHD)	88.1			
Ground anchors embedment	HW Shale (inner piles)	HW Shale (outer piles)	MW Shale	MW to SW Shale
Ground anchors hole diameter (mm)	130	150		
Temporary strut [2] EA (kN)	N/A		30E3 (1st level) 120E3 (2nd & 3rd level)	240E3

Figure 4.11: Excerpt from the Geotechnical Railway Impact Assessment report produced by Fortify Geotech

4.8 CONSTRUCTION AND SIMULATION SEQUENCE

The PLAXIS software simulation follows the actual construction sequence of the temporary retaining wall construction.

1. Installation of soldier piles.
2. Casting of capping beam.
3. First stage excavation up to approximately 1.5 m height
4. Casting the shotcrete wall between piles.
5. Installation of temporary steel beam struts at above excavation with calibrated stiffness support for the strut.
6. Second stage excavation up to 4.5m height.
7. Installation of temporary steel beams at above excavation level with calibrated stiffness support for the strut.
8. Third stage excavation up to 7.5m height.
9. Placing the shotcrete wall between piles and placing the first tie back anchor maintaining the effective bond length.
10. Installation of temporary steel beams at above excavation level with calibrated stiffness support for the strut.
11. Fourth stage excavation up to basement 10.5m height
12. Placing the shotcrete wall between piles and placing the second tie back anchor maintaining the effective bond length
13. Installation of temporary steel beams at above excavation level with calibrated stiffness support for the strut.
14. Fifth stage excavation up to basement 13.5m height.
15. Placing the shotcrete wall between piles and placing the third tie back anchor maintaining the effective bond length
16. Installation of temporary steel beams at above excavation level with calibrated stiffness support for the strut.
17. Sixth stage excavation up to basement 16.5m height.
18. Placing the shotcrete wall between piles.
19. Installation of temporary steel beams at above excavation level with calibrated stiffness support for the strut.
20. During the entire period dewatering should be carried out once the ground water level intersects with the RL level of the excavation
21. Sequential casting of basement floors
22. Provision of permanent horizontal support to shoring wall from each slab level
23. Releasing of stress of temporary anchors and removing them sequentially

During the finite element analysis an additional 0.5m has been over excavated and the bending stiffness of the reinforced concrete pile has been reduced from 90% to 60% to accommodate for long term effects as well.

The stiffness for the support condition provided by the internal strut was obtained through an iteration process of modelling in structural concepts which were later adopted to the geotechnical model. The geotechnical model was calibrated as per the results obtained from the structural model. The simulation of the structural model and the calibration process used is described below in section 5.

4.9 CRITICAL LOCATIONS SELECTED FOR THE ANALYSIS

As per the analysis carried out by Fortify Geotech, three critical locations have been highlighted in the design. The shoring wall arrangement finalized by Cadigal Group also considered the same locations as of high importance and conducted the design accordingly. Figure 4.13 indicates the locations in which the stresses and the constricted spaces were identified to be critical. These locations tally with the placement of Sydney railway assets that are under consideration. Details of the assets have been elaborated in "Section 4.4: Details of existing structures"

Design Section 1: At the South eastern corner of the premises

Design Section 2: At the Eastern side of the premises

Design Section 3: At the North eastern corner of the premises

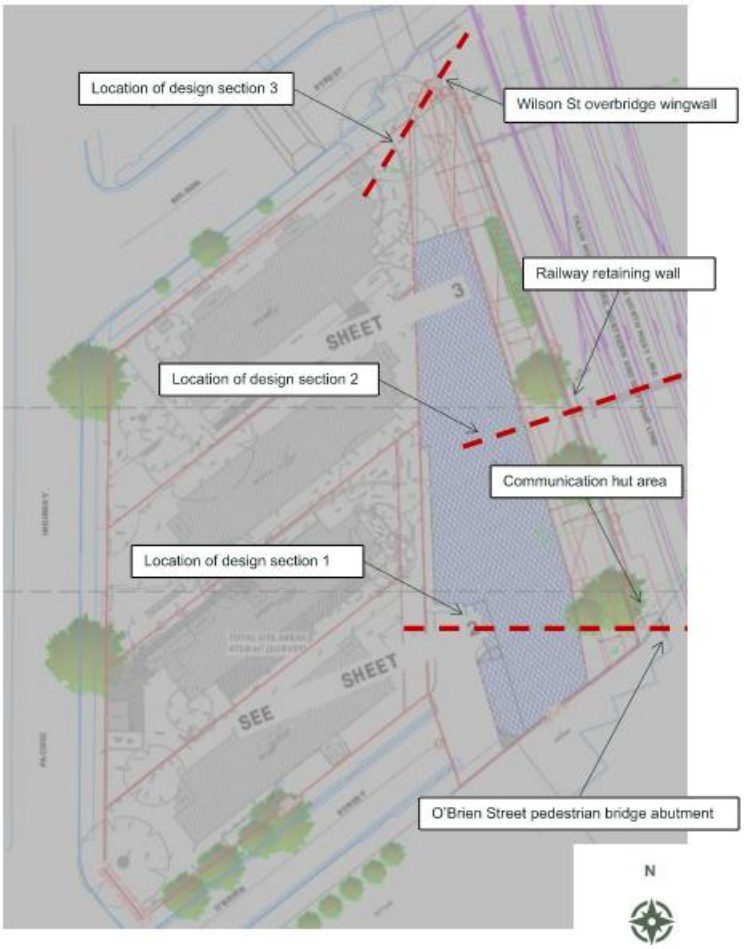


Figure 4.12: Critical design sections considered in the FEM analysis

The bending moments, shear forces and the deflections obtained at the soldier piles in these three critical locations have been tabulated in the following section. The deflection and stresses depict the impact on the Sydney railway assets due to the project under discussion.

5. STRUCTURAL APPROACH TO THE SHORING WALL DESIGN

As per the analysis results presented by the Geotechnical engineer following values were taken into consideration when the reinforcement for the piles were considered.

Table 5.1: Extracts of design stresses from the risk assessment analysis report

Design Section	Unfactored maximum bending moment (kNm/m)	Lateral deflection (mm)
Section 1	200	15.6
Section 2	120	8.8
Section 3	220	13.5

The maximum vertical defection (settlement) due to the excavation has been presented in figure 5.1 It has been obtained as 4.4mm.

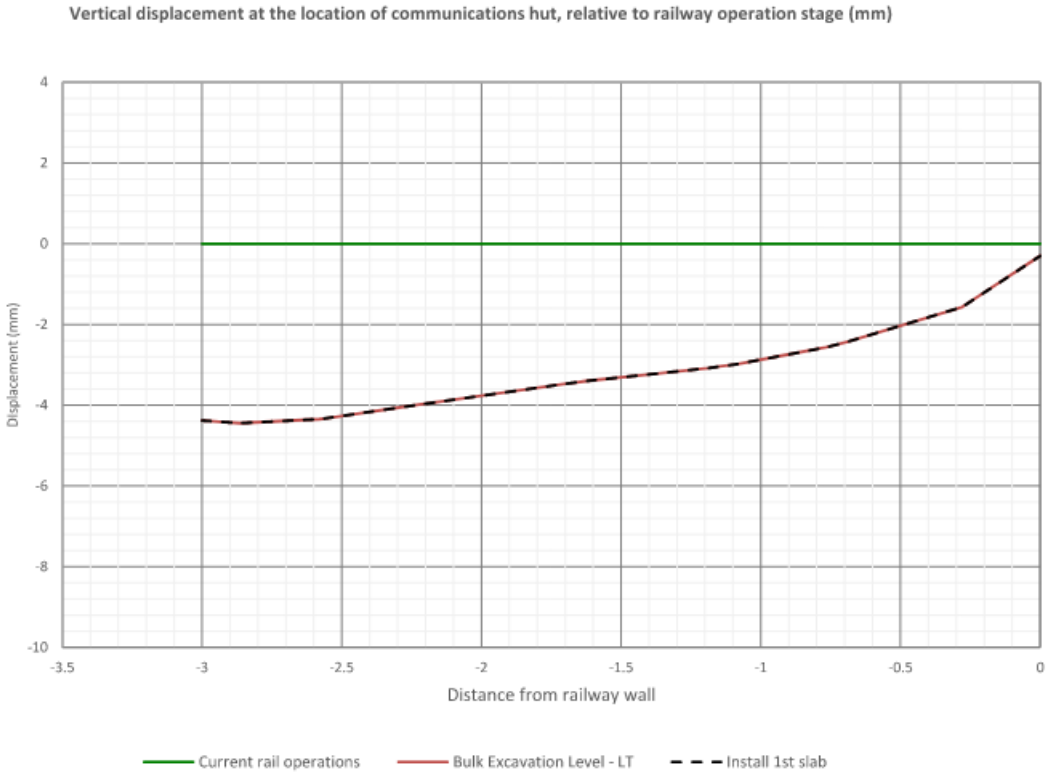


Figure 5.1: Vertical deflection due to the excavation

5.1 CLASSIFICATION OF SHORING WALLS

The entire shoring arrangement has been classified into 9 types. SW1 to SW9. Of the nine types, SW3 and SW4 has been considered in the geotechnical analysis and the structural approach has also been focused on the two shoring walls. Refer Annexure C: Shoring wall drawings issued by Cadigal Group.

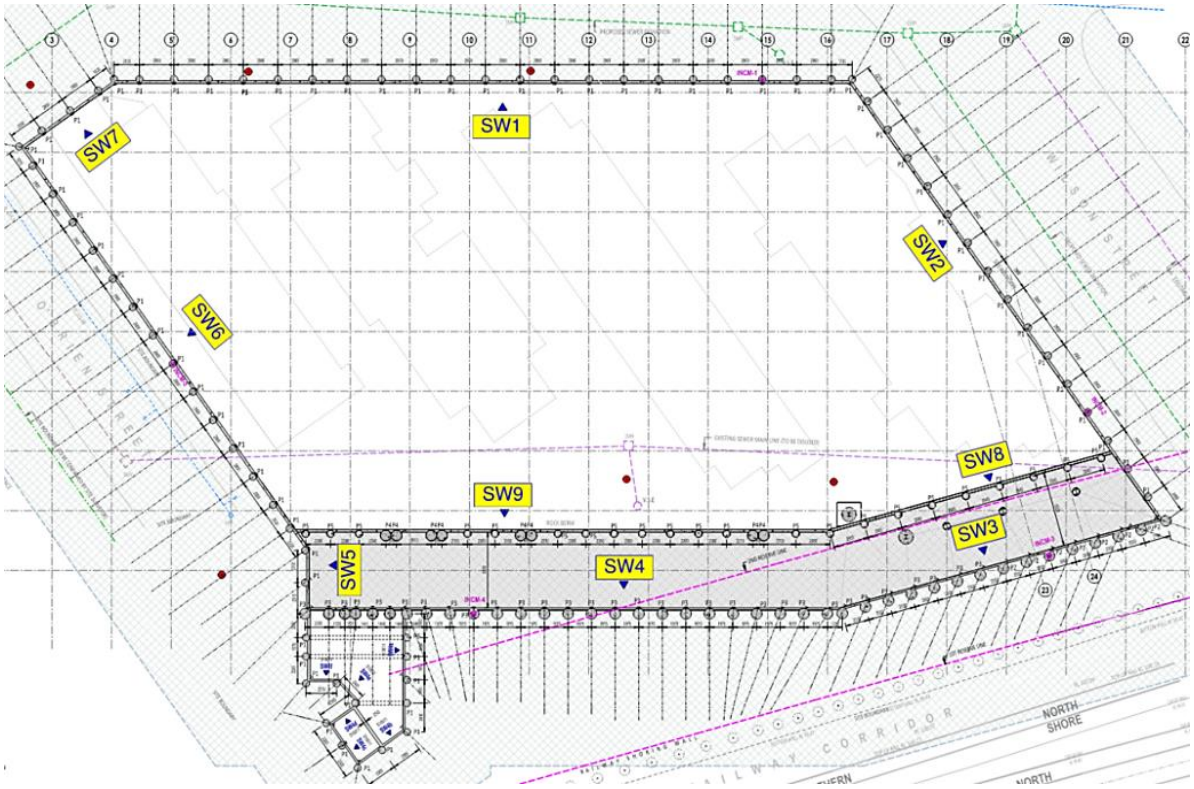


Figure 5.2: Classification of shoring walls

5.2 DESIGN OF PILES

Both SW3 and SW4 shoring walls have been designed using 900 mm diameter bored piles, embedded 1200 mm into slightly weathered shale. This embedment length was recommended by the geotechnical engineer and is measured from the general bulk excavation level, which is located below Basement 6. Consequently, the termination point for these piles is 1200 mm below Basement 6, despite the presence of a rock berm intersecting at Basement 5 in these areas.

Refer to Annexure C for shoring wall elevation drawings provided by Cadigal Group.

The 900 mm diameter piles are classified into three types based on their reinforcement arrangement:

- P2 and P3 Piles:
  These piles have been designed primarily to resist lateral earth pressures, as governed by bending moments supplied by the geotechnical engineer. The reinforcement for these piles is determined based on the calculated lateral pressures.
- P4 Piles:
  These piles function as load-bearing elements, supporting both lateral and vertical loads. They are designed to act as retaining structures and also as column supports for the superstructure above. Although the flexural demands on P4 piles are similar to those on P3 piles—resulting in similar reinforcement arrangements—their socket length into the shale has been increased to accommodate additional gravity loads.

Importantly, based on geotechnical advice, skin friction above Basement 6 is to be neglected in the axial capacity calculations for these piles, due to the presence of the rock berm in this zone.

600 mm diameter piles at the rock berm were designed as cantilevered piles based on the bending moments received from the geotechnical engineer. A separate set of piles as P5 was introduce to cater to the requirement at the rock berm.

Structural analysis of the soldier piles has been conducted on "RAPT" software, in which the circular piles have been simulated as square piles with the same bending stiffness due to the limitation the circular piles cannot be modelled in the RAPT. The bending stiffness of the 900mm diameter circular piles have been made equivalent to a 788mm square pile and then subjected to the bending moments tabulated in "Table 5.1: Extracts of design stresses from the risk assessment analysis report"

600mm diameter circular piles have been made equivalent to 525mm square piles based on their bending stiffness analysed for the cantilevered bending moments provided by the geotechnical engineer.

Of the three design sections specified by the geotechnical assessment along SW3 and SW4, it was observed that the most critical bending moments and design stresses are imposed towards the O'Brien Street side of the premises (Design Section 1). Design section 2, which is located in SW3 also showcases similar values, yet with slightly deferred to section 1. Thus, SW4 and half of SW3 piles have been designed based on the output results of Design Section 1 in the analysis to account for more conservativeness. The other half of SW3 piles has been designed based on the design stresses obtained at Design Section 3. Henceforth P2 pile has been designed with less vertical reinforcement and P3 with more congested vertical reinforcement to cater to the bending moments. Refer Annexure D: Analysis of P2 and P3 structural element extracted from RAPT software.

Table 5.2: Structural arrangement of soldier piles

Pile type	Diameter (mm)	Vertical reinforcement	Concrete grade (MPa)	Cover to the reinforcement (mm)	Socket length (Termination below BEL)
P2	900	8N32	50	60	1200mm
P3	900	8N36 + 4N24 from capping beam to Basement 3 level 8N32+4N24 after Basement 3 to Basement 6 level	50	60	1200mm
P4	900	8N36 + 4N24 from capping beam to Basement 3 level 8N32+4N24 after Basement 3 to Basement 6 level	50	60	6000mm
P5	600	8N24	50	60	900mm

5.3 DESIGN OF GROUND ANCHORS

The tension forces of the tie back anchors of the shoring wall were extracted from the geotechnical analysis. Following are the results obtained.

Table 5.3: Tensile capacity of tie back ground anchors

Design Section	Anchor level	Anchor pre-stress load (kN)	Maximum anchor load (kN)	Minimum bond length (m)	Bond material
1	1	80	120	4	HW Shale
	2	200	240	4	HW/MW Shale
	3	200	270	4	HW/MW Shale
	4	200	260	3	MW Shale
2	Strut	-	245		-
	Strut	-	715		-
	1	250	275	3	MW shale
	2	250	280	3	MW shale
	Strut	-	505	-	-
	3	250	275	3	MW shale
3	Strut	-	200	-	-
	Strut	-	400	-	-
	1	230	270	3	MW shale
	2	275	325	3	MW shale
	Strut	-	350	-	-
	3	275	350	3	SW Shale

Respective bond lengths have been adopted in the shoring design. Please refer Annexure C: Shoring drawings provided by Cadigal group to classify the anchor lengths specified.

5.4 LAYING OF GROUND ANCHORS

The minimum distance from the shoring wall to the rail retaining wall is approximately 7.0m at the North eastern side of the plot. As explained under section 4.1: Design Intent, if 3m bond length to be maintained on the first top most layer of anchor it will be intrusive within the TfNSW existing retaining wall therefore, few alternate approaches were accommodated. Figure 4.1 shows the clashing of the termination length of the first top most anchor to the pile of the retaining wall and the precautions used by the designers to omit the clash.

Apart from the rock berm that was introduced, the engineers also proposed an internal bracing system. The design and the modelling of the internal bracing system is described below for further understanding.

5.5 UTILISATION OF INTERNAL SUPPORTS FOR SHORING

A temporary internal steel bracing system has been implemented along the SW3 wall, located at the elevation corresponding to the first layer of tie-back anchors. As previously noted, the use of tie-back anchors at this level was eliminated due to the insufficient construction tolerance between the edge of the piles forming the railway retaining wall and the anticipated location of the anchor. Given this spatial constraint, the first row of anchors was replaced with internal steel bracing to ensure stability during excavation and construction.

The remainder of the SW3 wall height is supported by conventional tie-back anchors. It is important to highlight that the internal bracing system has been designed to resist ultimate loading conditions with 1.5 factored service condition loading.

The bracing system supports only the upper portion of the wall, while the lower sections continue to rely on tie-back anchors. Given the minimal soil mass present between the new shoring wall and the existing TfNSW railway retaining wall, the load imparted to the internal bracing is limited. Consequently, the risk of failure of the bracing arrangement is considered to be extremely low.

The following modelling strategy was used for the internal steel bracing arrangement. Plunger columns will be used for the bracing system. The modeling was done in a FEM software, in which the steel columns, horizontal and diagonal struts were simulated as line elements. After the analysis was conducted, the results were provided to the geotechnical engineer's input for his model and subsequent calibration.

5.5.1 DESIGN OF TEMPORARY BRACING ARRANGEMENT

The internal bracing arrangement has been simulated as a 3D finite element model on SPACE GAS software to analyse the behaviour of the struts and column arrangement. The model also reflects the behaviour of the bracing arrangement during its construction phases through sequential modelling.

This analysis process has been an iterative process between the structural modelling and geotechnical modelling as the loads and deflection results obtained from structural modelling needed to be verified by the geotechnical assessment.

5.5.1.1 Modelling methodology

The internal bracing arrangement has been simulated as a 3D finite element model on SPACE GAS software to analyse the behaviour of the struts and columns the arrangement. The model also reflects the behaviour of the bracing arrangement during its construction phases through sequential modelling.

This analysis process has been an iterative process between the structural modelling and geotechnical modelling as the loads and deflection results obtained from structural modelling needs to be verified by the geotechnical assessment.

1. Soldier piles in the shoring wall along SW3 were simulated as concrete line elements with 900mm diameter spaced at 2m centre to centre spacing.

2. Another line element of 1250mm x1000 mm dimension was modelled as the caping beam to connect the 900mm diameter piles in cluster at the pile top.

3. Steel columns which are behaving as king posts of the bracing arrangement were modelled as line elements at the locations where permanent columns will be constructed within the building. (Please refer to Figure 5.3)

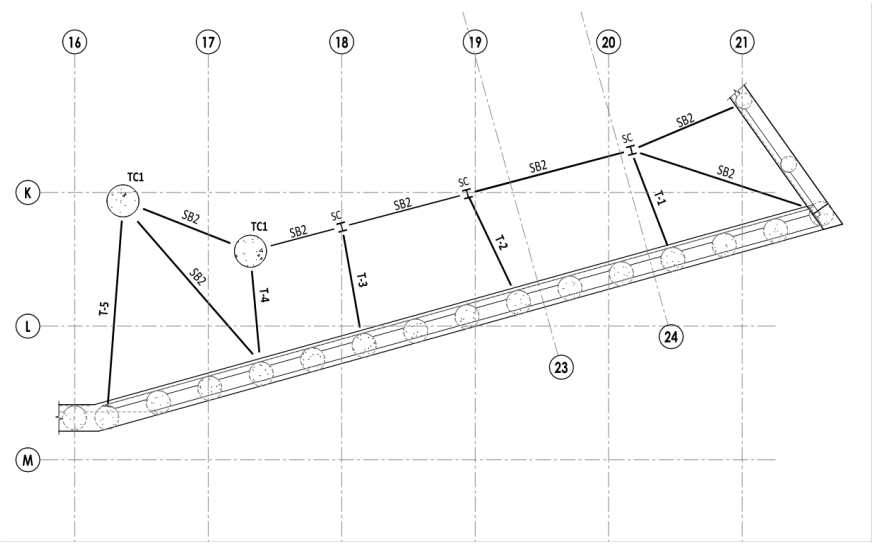


Figure 5.3: Placement of king posts of the internal bracing arrangement

4. Of the five steel columns, TC1 columns shown above are concrete columns. These concrete columns reduce the shoring wall deflection due to presence of higher axial and bending stiffness than the proposed steel columns. The bracings are then connected to each column diagonally and horizontally.

5. An initial value provided by the geotechnical engineer (230kN imposed on each pile at 45-degree inclination to the horizontal plane at the first anchor level) was considered. This load has been supplied by the geotechnical engineer when no bracing is used, and tie back anchors are used to fully retain the shoring wall along SW3.

6. It was conservatively assumed that approximately 3 pile reaction loads will be imposed on one horizontal bracing strut and at locations each strut is connected to the capping beam 490kN load was applied.

7. The supports of the columns were considered pinned to simulate the most conservative approach and the nodes in the soldier piles were restrained only in the direction of the shotcrete. The tie back anchors in the lower levels were not adopted in the model to create more conservative conditions in the analysis. It is worth to note that pile footing is placed under the steel column which may result in partial fixity to the steel/ concrete columns. The modelling assumption of pin support will result in conservative design of the shoring and the deflection; therefore, pin support was considered

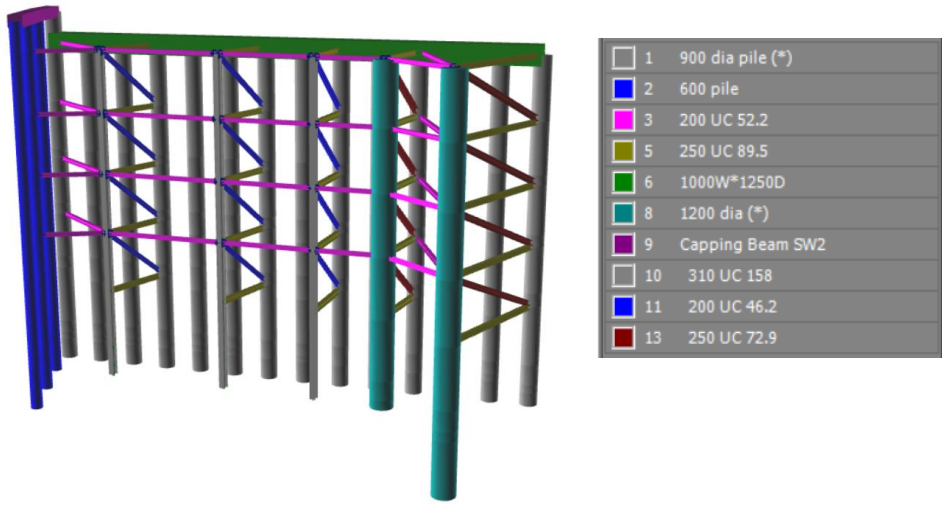


Figure 5.4: 3D view of the FEM model developed on SPACEGAS

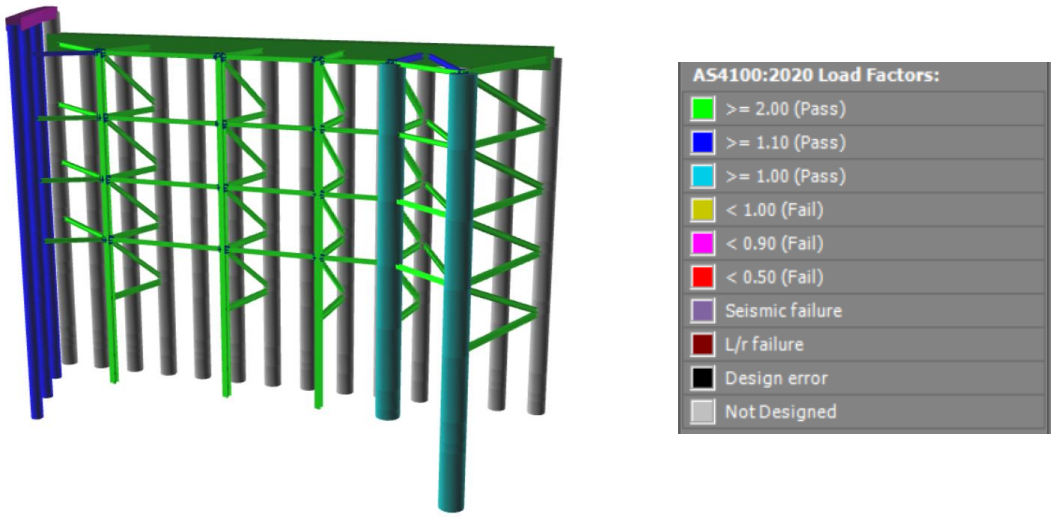


Figure 5.6: Member capacity verification for the first analysis

8. Based on these assumptions, the analysis was conducted. The steel section sizes were designated based on this first row of the iterative analysis process.

9. Once the steel sections were finalized, a displacement control phenomenon function was utilised to calibrate the geotechnical 2D model. Every horizontal node was pushed by 10mm and the corresponding member reaction forces and the other nodal displacements were submitted to the geotechnical engineer to provide spring stiffness in the geotechnical 2D model. Initially, this displacement value was applied on the node where the first layer of bracings was installed on the shoring wall. Reactions were obtained for the given displacement.

10. The same displacement control was applied on the second, third, fourth and fifth layers of bracing nodes respectively one at a time. Reaction loads were obtained for each analysis.

11. The reaction loads were applied on the geotechnical finite element analysis model and that model was calibrated with appropriate stiffness modifiers to induce 10mm deflection in the geotechnical model.

12. The equivalent calculated spring stiffness was then used in the geotechnical model that simulated actual condition of the shoring wall with the bracing arrangement. The geotechnical engineer used the provided parameters and calibrated their model with appropriate stiffness. Then applied soil pressure and other parameters to the idealised model. The output results of the geotechnical model were received and verified against structural model. It was ensured structural model loads are conservative for the structural design of the elements.

13. The structural model was also modelled and checked under construction sequence staging to identify if any critical stresses or excessive deflections were obtained during the construction phase. (Refer Figure 5.7 for the construction sequence)

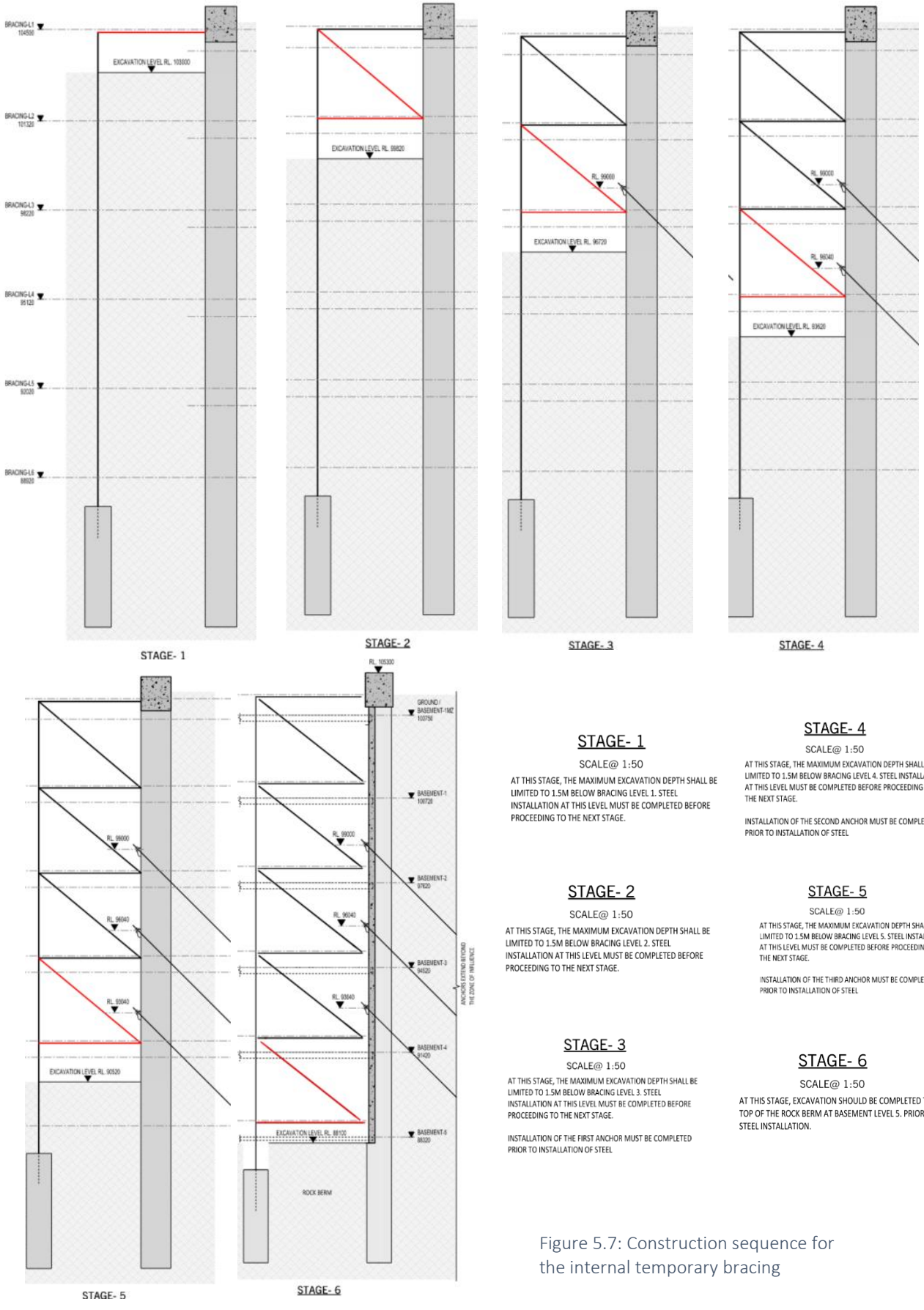


Figure 5.7: Construction sequence for the internal temporary bracing

6. INTERPRETATION AND ADOPTION OF RESULTS OBTAINED FROM THE GEOTECHNICAL IMPACT ASSESSMENT

Ground displacement in both lateral and vertical directions, stress changes induced in the rock masses and other vital parameters obtained from the risk impact assessment will be illustrated in this chapter to emphasize on the structural importance of the parameters for the overall stability and robustness of the both the temporary retaining structure and the permanent basement structure.

6.1 GROUND INDUCED DISPLACEMENTS

According to the results obtained from the final analysis of the geotechnical modelling, all lateral displacements (at the final excavation and removal of last level of ground anchor) were found to approximately 10mm along the railway line. Near the Wilson Street vehicle overbridge (Design Section 1). Those values obtained were also found to be exaggerated since the analysis did not consider the contribution of the bridge piles and any passive soil resistance in front of the wing wall has also not been included in it. Henceforth all lateral defection values expected during the temporary shoring construction is within the accepted limits.

It has also been stated in the geotechnical impact assessment report that even at a sensitivity analysis with 25% reduction of the Youngs Modulus of soil and rock layers, no significant changes to the lateral defections could be noted. Thus, it could be concluded that the basement excavation and the temporary shoring wall arrangement will not yield any adverse impacts or induced deformations in the existing Sydney railway assets.

6.2 STRESS CHANGE TO SURROUNDING SOIL/ROCK MASSES

As per the final observation of analysed data, it was identified that the proposed excavation and temporary works do not incur excessive or unacceptable stresses in the surrounding soil/rock masses. Henceforth the impact to the existing Sydney railway assets is minimal.

All foundations of the building will also be founded below the foundation level of the railway assets thus, the existing footings of the railway assets will not be disturbed with new zone of influences. It should also be noted that the basement piles or any foundation piles in proximity to the railway corridor, will not be subject to tension loading on any load cases.

On the other hand, it has also been confirmed in the risk assessment report that no significant changed occurred at the reduction of the Young's modulus of all rock and soil types by 25% during the sensitivity analysis.

7. VERIFICATION OF CONDITIONS IMPOSED BY TFNSW

Below have been presented the clauses imposed by TfNSW for Ground penetrations, approved ground anchors, footings and basement that should be verified via both geotechnical and structural perspectives.

7.1 GROUND PENETRATIONS

Figure 7.1 below showcases the conditions imposed by TfNSW for Ground penetrations happening within 25m vicinity of the railway assets.

14.4. Ground penetrations

Excavations, retaining works and other ground penetration and disturbance works associated with a proposed development shall not affect rail safety and operational integrity or cause the destabilisation of rail infrastructure facilities.

The design of development shall ensure the following:

- the stability and integrity of rail infrastructure facilities through loading from the development and ground deformation shall not be affected
- no excavation shall be made within 25 m of rail infrastructures facilities without prior analysis of structure stability with respect to the effects of the excavation, and temporary supports, where necessary, are installed
- no excavation shall be made below the base of the footings of any rail infrastructure facilities (for example bridges, station concourses, retaining walls and station platform walls) without prior analysis of structure stability with respect to the effects of the excavation, and temporary supports, where necessary, are installed
- ground vibrations that can result during any excavation works shall be assessed to ensure that the rail infrastructure facilities do not have adverse effects
- temporary structures and batters shall not infringe the railway corridor, except where approved, and temporary structures or batters in the railway corridor shall be easily removed and the corridor returned to its previous condition
- fill, spoil or any other material shall not be stored in the railway corridor at any stage of construction
- no adverse effects on the rail corridor from fill placed adjacent to the rail corridor rail corridor shall
- retaining structures necessary to stabilise any excavations for an external development shall be located outside the railway corridor cadastral boundary

Figure 7.1: Excerpts from the TfNSW related to ground penetrations

Of these above conditions the analysis related to ground deformations and stresses have been fulfilled. Ground vibrations induced by the excavation should be maintained at site as a main priority. Using heavy vibrating machinery for breaking and hammering bedrock in its natural position requires careful attention to prevent any damage or impact on nearby structures due to vibrations. Excavation activities are expected to occur within 10 meters of some adjacent structures. Given the shale bedrock in the area, there is a heightened concern because vibrations can easily travel through solid bedrock, potentially causing damage to foundations of existing railway assets resting on the bedrock.

It is essential that ground vibrations near the foundations of adjacent structures do not exceed 10mm/s. To ensure compliance with this limit, it has been decided to employ specialized vibration sensors for continuous monitoring. These monitoring devices must be operational before any excavation begins. If vibrations exceed the critical threshold of 10mm/s, all excavation activities must halt immediately. A qualified geotechnical engineer should then reassess the site to ensure stability and modify excavation methods to reduce vibrations below the critical level moving forward. Although the maximum allowable ground vibration is set at 10mm/s, it is prudent to design excavation methods with a target of not exceeding 5mm/s considering the vitality of the railway assets in the vicinity.

Alternative techniques such as rock sawing may be employed in specific situations where the use of rock hammers is expected to generate vibrations exceeding 10mm/s, or if such vibrations have already occurred. While saw cutting is less efficient, it can mitigate the risk of property damage caused by ground-transmitted vibrations. Prior to hammering, it is advisable to conduct saw cutting in segments of at least 1 meter depth to minimize vibrations propagating through the rock face.

Additionally, it is recommended that hammering around the perimeter of the excavation near adjacent structures (within approximately 10 meters) should be supervised by a geotechnical expert. All excavation equipment must be operated by experienced personnel who must remain vigilant to minimize excavation-induced vibrations and ensure ongoing stability and safety of the site. If any safety concerns arise during operations, the site supervisor and a geotechnical engineer should be promptly notified, and work in the affected area should cease until safety clearance is given by authorized personnel.

It should also be noted that no batters infringing the rail corridor or filling up of materials, soil or any other materials stored in the railway corridor will not occur under any given circumstance during construction.

7.2 APPROVED GROUND ANCHORS

Conditions related to ground anchors are mentioned below. This section is provided as a brief summary of TfNSW requirements which we do not need to meet these specific requirements given no anchors are protruding to TfNSW asset boundaries.

14.5. Approved ground anchors

Where they have been approved by TfNSW, requirements for ground anchors that extend into the railway corridor are as follows:

- anchors shall be temporary
- permanently stressed anchors shall not be used
- all anchors shall be designed so that they do not interfere with existing and planned railway infrastructure facilities
- the design life of temporary anchors left permanently in place shall not be less than 10 years
- temporary anchors left permanently in place shall be de-stressed and anchor heads removed following construction

- as-built drawings with anchor locations and details shall be submitted to TfNSW at completion of construction
- anchors used to retain excavations adjacent to the rail corridor shall be designed for applicable wind and earthquake loads based on an importance level of 3 and an AEP of 1/500 in accordance with AS 1170.0

The design of anchors shall be supported by a geotechnical and structural engineering report prepared by an AEO that confirms the works will not de-stabilise railway infrastructure facilities or place any unnecessary risk on the railway corridor. See Section 14.3 for report requirements.

Figure 7.2: Extracted from TfNSW related to Ground anchors

The anchors have been specified as temporary. No anchor will be stressed permanently. All anchors have been designed meticulously based on the geotechnical parameters. The design for wind and earthquake, has been disregarded since the shoring wall will later be supported by the basement slabs and ground floor level slab of the main structure and accommodated inside the main permanent structure. Thus, all structural simulations for the main building will be applicable to the shoring wall below the Ground floor level.

In case of placing the anchors in the shoring wall, especially in SW3 and SW4 the anchors have been placed with a skewed angle to the shoring wall. The main objective of maintaining an inclination to the shoring wall was to avoid protruding to the TfNSW asset boundary lines and clashes with the existing retaining wall at the railway corridor. It has to be noted that usually the anchor loads are defined as perpendicular forces acting on the shoring walls. Nevertheless, when anchors are not perpendicular, the anchor forces have been reduced based on the geometry and an equivalent perpendicular anchor force has been considered during the analysis.

The anchors have been placed accordingly, so that no anchors will be encroaching the TfNSW boundary or railway corridor. Therefore, no approval is required from the TfNSW and relevant authorities for the execution of splaying anchors.

7.3 FOOTINGS

Extractions for the footings are listed below.

15.1. Footings

Requirements for footings are as follows:

- footings shall not physically intrude into the rail corridor, except for station concourses and where located on platforms, or otherwise approved by TfNSW
- footings shall not rely upon passive earth pressure from rail corridor land
- for footings located within 5 m of the centreline of an existing or proposed track, the top of the footings shall be no less than 1 m below ground level, in order to facilitate cess drainage and maintenance activities such as ballast cleaning and track reconditioning
- footings located beyond 5 m of the centreline of an existing or proposed track, shall have the top of the footing located no less than half a metre below finished ground level, or as advised by the RIM
- footings located at a platform shall be located with the top of footing no higher than the lowest track formation level at the platform wall
- platforms shall not be relied upon to provide lateral support to footings

Figure 7.3: Extracts from TfNSW related to the ground anchors

It should be noted that no footing will intrude the rail corridor (Refer Annexure C) and the design will also not be based on the passive pressure. No footing for the given project will be placed either within 5m of the centreline of the existing track lines or at the plat from locations.

7.4 BASEMENTS

Quoted conditions for the basement from the TfNSW are shown in Figure 7.4.

15.2. Basements

Basements that are within 25 m of the rail corridor, or within the zone of influence from the rail corridor using a 45 degree angle measured from the ground level at the rail boundary to the basement excavation level, shall not have any adverse effect on existing or proposed rail infrastructure facilities.

Additional requirements for permanent retention systems for basements including floors, walls and columns up to ground level, that provides support to the rail corridor, are as follows:

- shall be designed for the earthquake AEP in Section 13.5 for the ATW
- surcharge from rail traffic shall be in accordance with AS 5100.2:2017
- the durability requirements for basements shall be in accordance with Section 13.2
- the design life for basements shall be in accordance with Section 13.3

Figure 7.4: Extracts from the TfNSW for basement constructions

All criteria of the above conditions have been accomplished within the structural engineering simulation of the building. The basements will also be designed in par with the criteria used in the designing of the super structure of the building.

Following criteria will be used in the designing of the buildings inclusive of the four basements. Related design parameters are mentioned below.

Seismic:

To Australian code AS 1170.4-2007:

Subsoil class= Be

Importance Level = 3
Design working life=50 years

kp=1.0

Z=0.08

Sp=0.77

μ= 2

kt=0.05

Wind loads:

Preliminary code wind loads:

Australian code AS 1170.2:

Parameters

Cp	0.8 Windward	0.5 Leeward
Ka	1	
Kc	1	
Kl	1	
Kp	1	

Wind Coefficients

Vr	$46ms^{-1}$ (Ultimate)
	$37ms^{-1}$ (Service)
T.C.	2.5
Md	1
Ms	1
Mt	1
Cdyn	1

7.5 OVERALL RISK ASSESSMENT

As per the conditions lined out in Section 5.3 of T HR CI 12090 ST: Airspace and External Developments it is noted that an overall risk assessment should be conducted regarding the risk factors of general, structural, track, security, electrical and human related considerations. Of these, the structural factors covering the damage to the building or adjacent structures due to unexpected accidents, derailments, potential for a development to collapse onto the rail corridor, disproportionate collapse of parts of the development if a support or supports are removed in the event of a train derailment, positioning of supports to avoid 'domino' effect in the event of derailment collision and etc have been majorly highlighted.

7.5.1 DERAILEMENT AND COLLISION EFFECT

Regarding the risks imposed, the report "Rail Corridor Interface - Preliminary Engineering Advice Report" prepared by Kellogg Brown & Root Pty Ltd states that the location of the development features four tracks, with Sydney Trains operating the outer two and Sydney Metro running the inner two. The line speed in this area is 80 km/h, and passenger trains run frequently. The track here is relatively straight with no turnouts or special trackwork, meaning there are no sharp curves or rail discontinuities that might increase the risk of derailment due to overspeed or track failure. It also states that it is important to note that at the northern end of the Chatswood Rail Enclosure Structure, the track changes from a concrete slab to a ballasted track form. This transition alters the track stiffness, which is typically managed by using a transition or approach slab beneath the ballasted track. This approach helps prevent sudden changes in stiffness, thereby reducing the stresses that could potentially cause rail breaks and derailments.

As per their observations, at this point, the vertical grade between the Sydney Trains and Metro Trains tracks changes, with the Metro tracks beginning their descent into the tunnel. Due to this height difference, the T1 Down Shore track has been equipped with guardrails within the track's 4ft width to prevent derailed trains from falling onto the lower-level Metro tracks. These guardrails also serve to mitigate the risk of trains hitting the retaining wall of the cutting. Should a derailment occur, the retaining wall and the depth of the cutting would act as barriers, preventing the trains from colliding with any nearby development buildings. Considering these safety measures, the likelihood of a train derailment at this location is deemed very low. Therefore; all structural risks associated could be interpreted of low risk and negligible considering the statement of the above-mentioned report.

Impact of a collision of the train could also be considered negligible due to the presence of the railway retaining wall and also the buffer space of 7.3m width which stays in between the building foot print and the site boundary. This space could be further embellished with passive landscape attributes to mitigate any transfer of collision loads to the building.

7.5.2 FAILURE OF ANCHORS OR SUPPORTS

In case of tie back anchor failure or internal strut failure, the stresses imposed on the shoring walls would be increased and have an adverse impact on the excavation for the development. Since the railway retaining wall and other related Sydney railway assets have already been founded on pile foundations, it could be stated that any potential movement of the new shoring area might release stresses in the underlain strata of the adjoining property but will not create any detrimental impacts to TfNSW structures as the existing retaining wall in the rail corridor retain all the soil.

7.5.3 STRAY CURRENT HAZARD

In order to mitigate the risks related to stray current hazard following precautions will be adopted during the design stage.

On grade slab: A moisture barrier will be used on the lower floor and basement on-ground slab. The moisture barrier acts as an electrical insulator to the conduction of stray traction current.

Footing: Pad and strip footings will be provided at load-bearing areas. Concrete with a minimum strength of 40 MPa combined with a minimum of 60 mm clear concrete cover will be considered to have sufficient electrical resistance to reduce the conduction of a stray traction current

Piles: All piles will be designed similar to footings with a concrete strength of Min 40 MPa with 60 mm of clear concrete cover.

Rock and Ground anchors: In case of the use of anchors, it is recommended that from a stray current mitigation point of view that the anchors will be isolated to the slab-reinforcing steel.

The service and other related engineers are also recommended to use mitigative proposals to ensure the stray current hazard does not impede the successful execution of the project.

8. CONCLUSION

According to the risk impact assessment results obtained through the 3D simulation of the assignment and through the interpretation and adoption of these results in the actual project it could be notified that there are no adverse or considerable impacts induced at the railway corridor of the Sydney railway assets. All deformations, stresses incurred have been identified to be within the acceptable limits. Vibrations that can occur during excavation requires to be maintained at the desired level and monitored throughout the phase.

A point of main emphasis should be that the entire process of excavation, temporary retaining arrangement and conversion of the temporary arrangement into permanent retaining structure should be meticulously monitored and documented. The monitoring and instrumentation plan should be equipped with survey monitoring prisms installed along the capping beam and on selected vertical arrays. In addition to these, inclinometers should also be installed in selected locations behind the proposed basement wall so that the ground displacements can also be assessed. A stringent monitoring arrangement will enhance the credibility of the construction process and inhibit any unexpected catastrophic events during all execution phases of the project.

Appendices

Annexure A: Summary of soil-structure analysis for design sections 1 to 3 prepared by Fortify Geotech

Annexure B: As-built drawing of railway assets of railway retaining wall, overbridge at Wilson Street and O'Brien Street provided by the client
- Parramatta Rail Link plans: Drawings 99575 to 99581
- Wilson St Overbridge 99251 to 99285
- Pacific Place Railway Enclosure Structure works as executed Oct 2001

Annexure C: Shoring design drawings issued by Cadigal Group

Annexure D: Analysis of P2 and P3 structural elements extracted from RAPT software. (Version 7.1.20 dated 8 July 2024)

Annexure A: Summary of soil- structure analysis for design section 1 to 3 prepared by Fortify Geotech

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Geotechnical Railway Impact Assessment - 849, 853 & 859 Pacific Highway, Chatswood

CLIENT

BB Wilson Property Pty Ltd

ADDRESS

Locked Bag 1400,
Meadowbank,
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DATE

June 2025



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02 June 2025
Our ref: S2207_GIA_01_Rev1

BB Wilson Property Pty Ltd

Via email: oscar.brady@billbergia.com.au

Attention: Mr Oscar Brady

849, 853 & 859 Pacific Highway, Chatswood, NSW

Geotechnical Railway Impact Assessment

We are pleased to present this report summarising our geotechnical railway impact assessment, in accordance with T HR CI 12090 ST – Airspace and External Developments, for the Sydney Trains (TfNSW) assets, as well as the Sydney Metro At Grade and Elevated Sections Corridor Protection Guidelines, in proximity to the proposed development at 849, 853 & 859 Pacific Highway, Chatswood, NSW.

The report outlines the assumptions, methodology and outcomes of our assessment and it has been reviewed by a TfNSW AEO/TAO.

Should you require any further information regarding this report, please do not hesitate to contact our office.

Yours faithfully
Fortify Geotech

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About us

We work with our clients to provide practical advice and solutions tailored to each project. Our professional services are reliable, responsive and efficient.

Our highly capable Geotechnical Engineers and Geologists have a comprehensive understanding of the industry. We provide the best engineering solution for complicated geotechnical engineering issues. This has earned us a solid reputation with our Construction Industry, Municipal and Government clients.

INDUSTRIES WE WORK IN

- Residential
- Commercial
- Transport Infrastructure
- Industrial Developments of all sizes.

SERVICES

- Geotechnical Site Investigations and Reporting;
- Engineering Geology;
- Mining/Rock Geotechnics;
- Foundation Engineering;
- Dam Engineering; Embankment Design and Specification;
- Geotechnical Design Recommendations;
- Pavement Engineering and Design;
- Pavement Condition Surveys;
- Slope Stability and Risk Assessments;
- Geotechnical and Hydrological Instrumentation and Monitoring;
- Footing and Excavation Supervision and Certifications;
- Excavated soil/rock assessments and VENM assessments;
- Supervision and Certification of Earthworks and Controlled Fill, including Level 1 supervision;
- Geotechnical Construction Specifications;
- Deep Excavation Support; and
- Slope/Retaining Structure Analysis and Design

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Appendix B: 2023 Fortify Geotech's Geotechnical Investigation Report
Appendix C: Summary of soil-structure analysis for design sections 1 to 3
Appendix D: TAO/AEO review certificate
Appendix E: Limitations in the use and interpretation of this geotechnical report

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Geotechnical Railway Impact Assessment

849, 853 & 859 Pacific Highway, Chatswood, NSW

QUALITY INFORMATION

Revision history

Reference/ Revision	Description	Date	Author	Reviewer
S2207_GIA_01_Rev0	First issue	11/04/2025	MN	JM
S2207_GIA_01_Rev1	Revision following update of structural layout	02/06/2025	MN	JM

BB Wilson Property Pty Ltd

849, 853 & 859 Pacific Highway, Chatswood, NSW

Geotechnical Railway Impact Assessment

1 INTRODUCTION

BB Wilson Property Pty Ltd (the Client) has engaged Fortify Geotech Pty Ltd (Fortify) to carry out a geotechnical railway impact assessment for the proposed multi-storey development at 849, 853 & 859 Pacific Highway, Chatswood, NSW. The requirement for this assessment has been triggered by TfNSW Standard T HR CI 12090 ST – Airspace and External Developments (Reference 1) requirements, in particular Clause 14.2.

> *"Where ground penetration is greater than 2 m within 25 m of the rail corridor, unless otherwise directed by TfNSW, the developer shall carry out an engineering analysis and impact assessment to demonstrate that the effects of the proposed development on the existing rail infrastructure facilities will not cause any adverse effect. This assessment shall be presented in an engineering assessment report. (…)*
>
> *The numerical modelling shall be based on the realistic geological model derived from the subsurface information gathered through the geotechnical investigation. It shall include critical geological features such as bedding planes, weak layers, joints and other discontinuities.*

In addition to the above TfNSW guideline, this impact assessment has also considered the requirements of Sydney Metro At Grade and Elevated Sections Corridor Protection Guidelines, in particular the geotechnical component described in Clauses 5.2 and 6.

> *"The main aim of these assessments (…) is to demonstrate that there will be no adverse effects arising from the proposed development within the defined protection reserves. The acceptability of the effects predicted (as determined through investigation and assessment) must be viewed against the performance requirements described in Section 6 of this guideline document, as well as compliance with relevant standards and codes.*

The project involves the construction of a multi-storey building, comprising a two-storey podium with a mix of commercial uses, two split residential towers of up to 36 storeys, and a 6-level basement extending to circa 20 m depth (the proposed bulk excavation level is at circa RL 84.9 m AHD, whereas existing ground surface across the site varies between RL103.5 and RL107 m AHD (and between 103.5 and 105 m AHD in proximity to the railway assets in analysis).

The aims of this assessment were to:

1. Undertake a numerical modelling assessment of the proposed works and its impacts on the adjacent Sydney Trains / Sydney Metro assets:
    a. Rail retaining wall along railway corridor (eastern boundary of the site)
    b. Wilson Street vehicle overbridge (at north-eastern corner of the site)
    c. O'Brien St pedestrian bridge (at south-eastern corner of the site)

2. Estimate the induced ground displacements at the location of the above railway assets, as well as stress changes to the surrounding soil/rock mass.

3. Estimate displacements on rail corridor land adjacent to the development (less than 10mm vertical and +/- 10mm horizontal)

4. Estimate track distortion (vertical dip of under 5mm)

2 INPUT INFORMATION

To assist with this assessment the following information was provided by the Client/Client's Design Consultants:

- Level survey *"Detail and Level Survey of Lot 1 in DP1189541, SP1496, SP60178, SP10110 and part of SP52947 – 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street"*, produced by SGD Pty Ltd, reference 9062, issue C, dated 20-03-24

- Proposed Ground Floor and Site Plans, produced PBD Architects, Project 2308, Drawings DA004 & DA105, Issue 2, dated 22-04-24

- Dewatering Management Plan for "*849, 853 & 859 Pacific Highway and 2 and 8 Wilson Street, Chatswood NSW 2067*", produced by Reditus, Project No. 23210, version 1, dated 01-05-24

- Sydney Trains / Sydney Metro as-built records:

    - *"Down Side Outer Pile Retaining Wall"*, GC-3 Works Contract, unknown author, unknown date

    - *"Pacific Place Railway Street Chatswood"*, unknown author, dated October 2001

    - *"Wilson Street Overbridge"*, GC-3 Works Contract, unknown author, unknown date

- Shoring (Soldier Pile System) for *"849-859 Pacific Highway & 2-8 Wilson Street, Chatswood*", produced by Cadigal Group, Project Ref. 01-100084, Revision H, dated 09-05-25

- Internal shoring system drawing set, produced by Cadigal Group, Project Ref. 01-1000084, Revision A, dated 18-03-25

Relevant extracts of the above documentation are provided in Appendix A of this report.

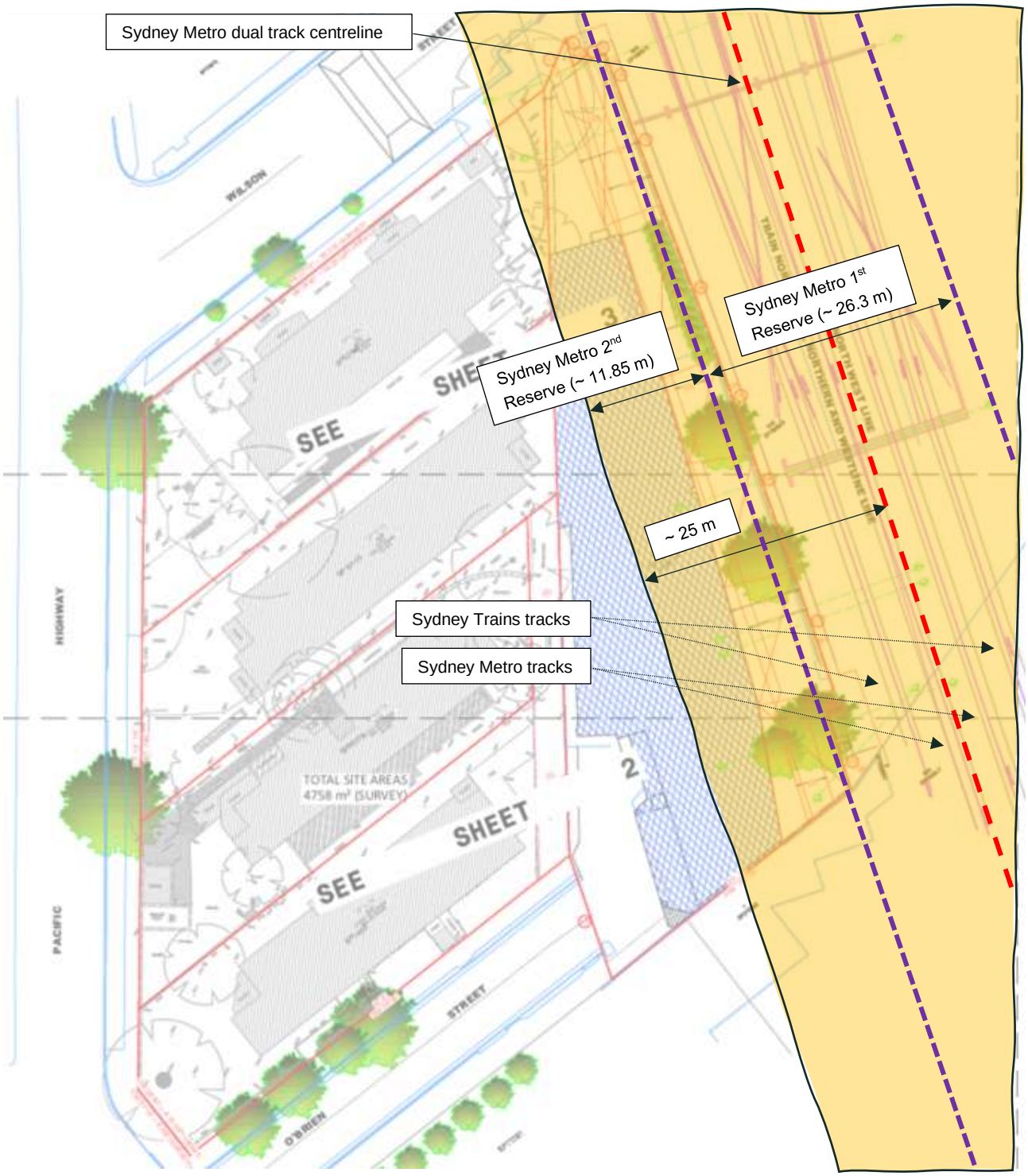
3 SITE CONDITIONS

3.1 SITE LOCATION AND DESCRIPTION

The site has a combined area of approximately ~4,660m2, and is irregular in shape. The site is bounded by Wilson Street to the north, Pacific Highway to the west, O'Brien Street to the south and a railway corridor to the east. The site is presently

occupied by existing residential unit buildings on the western portion of the site, and an existing warehouse structure on the eastern portion of the site. The ground surface is mostly concrete covered where not developed and is relatively flat, with a vertical cut at the eastern boundary of the site adjacent to the railway lines. Figure 1 shows the site locality and Plate 3-1 show the extent of the Sydney Metro protection zone in accordance with Clause 3.3 of Sydney Metro At Grade and Elevated Sections Corridor Protection Guidelines.

Plate 3-1: Site plan illustrating extent of Sydney Metro protection zone (highlighted in yellow)



3.2 REGIONAL GEOLOGY

The geological information provided by the Department of Regional NSW (Reference 2) indicates the area to be underlain by Middle Triassic age Ashfield Shale. Ashfield Shale consists of black to light grey marine shale and mudstone unit with minor siltstone and sandstone that outcrops in eastern Australia. Residual soils are expected above the shale bedrock.

Fortify has previously carried out a geotechnical investigation to investigate the subsurface conditions at the site, which comprised six (6) boreholes to a target depth of circa 20m with laboratory geotechnical testing of selected samples. Figure 2 shows the location of Fortify's 2023 boreholes, designed BH1 to BH6. The findings of the investigation are summarised in our report JS/S1998 Rev 2, dated 14 December 2023 (Reference 3) and the investigation's methods of description and classification of soils were based on the AS 1726-2017.

A supplementary investigation was conducted by Fortify and comprising of three (3) boreholes to a target depth of circa 27.5 m to inform the design of the additional basement levels and designated BH7 to BH9. The findings of the supplementary investigation are summarised in our report S2207_SGI_01_Rev2, dated 6 November 2024 (Reference 4). As part of the supplementary investigation three (3) dual groundwater monitoring wells were installed in boreholes BH7-BH9, with Reditus Consulting responsible for the installation and ongoing monitoring of data loggers. We understand that monitoring is still underway and that a revised Dewatering Management Plan will be prepared at a later date.

The findings of the site investigation broadly confirmed the information from the geological maps, with fill materials reported near surface, likely due to the existing residential/industrial developments at the site, overlying the natural soil.

3.3 SUBSURFACE CONDITIONS

For the purpose of this geotechnical assessment the ground conditions summarised in Table 3-1 have been adopted in our numerical analysis. These have been based on the initial and supplementary geotechnical investigation reports (References 3 and 4), which are included in Appendix B of this report. The inferred rock classification has been based on a new critical review of all available information with the team responsible for the Geotechnical Investigation team, which has considered rock weathering, point load test results, defect spacing and reported loss of material during coring. This has resulted in adjustments to the RLs (top and bottom) of some of the reported geological units, as well Unit 3c being re-classified as Class III / IV shale rock.

Table 3-1: Borehole Summary with Approximate RL's

Bore hole ID.	Approximate ground surface RL [1]	Top of Residual soils (Unit 2) (RL) [2]	Top of Shale Bedrock (RL) [2]					Top of Sandstone Bedrock (RL) [2]
			Class V Shale [Unit 3a]	Class IV Shale [Unit 3b]	Class III Shale [Unit 3c]	Class III/II Shale [Unit 3d]	Class II Shale [Unit 3e]	Class II Sandstone [Unit 4a]
BH1	103.6	103.3	98.8	95.8	94.1	88.6	86.6	N.E.
BH2	104.9	104.3	100.4	97.3	95.5	94.0	88.4	N.E.
BH3	105.8	105.3	101.3	98.3	97.7	96.7	90.7	N.E.
BH4	105.9	105.7	103.1	99.5	98.4	97.0	91.7	N.E.

Bore hole ID.	Approximate ground surface RL [1]	Top of Residual soils (Unit 2) (RL) [2]	Top of Shale Bedrock (RL) [2]					Top of Sandstone Bedrock (RL) [2]
			Class V Shale [Unit 3a]	Class IV Shale [Unit 3b]	Class III Shale [Unit 3c]	Class III/II Shale [Unit 3d]	Class II Shale [Unit 3e]	Class II Sandstone [Unit 4a]
BH5	105.7	105.1	102.5	99.7	97.3	96.2	89.7	N.E.
BH6	105.0	104.6	102.0	98.5	97.0	95.8	90.7	N.E.
BH7	104.8	103.8	99.3	99.0	91.8	N.C	87.8	N.E.
BH8	105.8	105.6	98.9	98.5	95.2	N.C	84.8	78.8
BH9	105.7	105.2	100.2	100.0	96.7	N.C	84.7	78.7

N.E. – Not encountered, N.C – Not considered

[1] RL's have been interpolated between survey points off the site survey.

[2] RL's have been calculated based on the interpolated RL at the top of each borehole.

3.4 GEOTECHNICAL DESIGN PARAMETERS

Table 3-2 summarises the key relevant geotechnical parameters of the soil/rock units used as part of this assessment. These have been discussed and agreed with the team responsible for the 2023 site investigation at the site and complement/supersede the original parameters derived in the geotechnical investigation report (Reference 3). These parameters have been based on the log description of the materials, previous experience in the area, as well as in-situ (SPT testing) and laboratory testing (e.g. Point Load Index – PLT testing). A summary of the PLT testing results is provided in Plate 3-1. The horizontal coefficient of earth pressures for Units 3b to 3e listed in Table 3-2 have been defined to replicate the range of likely horizontal stresses in the shale bedrock as defined in Bertuzzi (2014 – Reference 5) of $\sigma_H \approx 0.5 + 2.0 \times \sigma_V$.

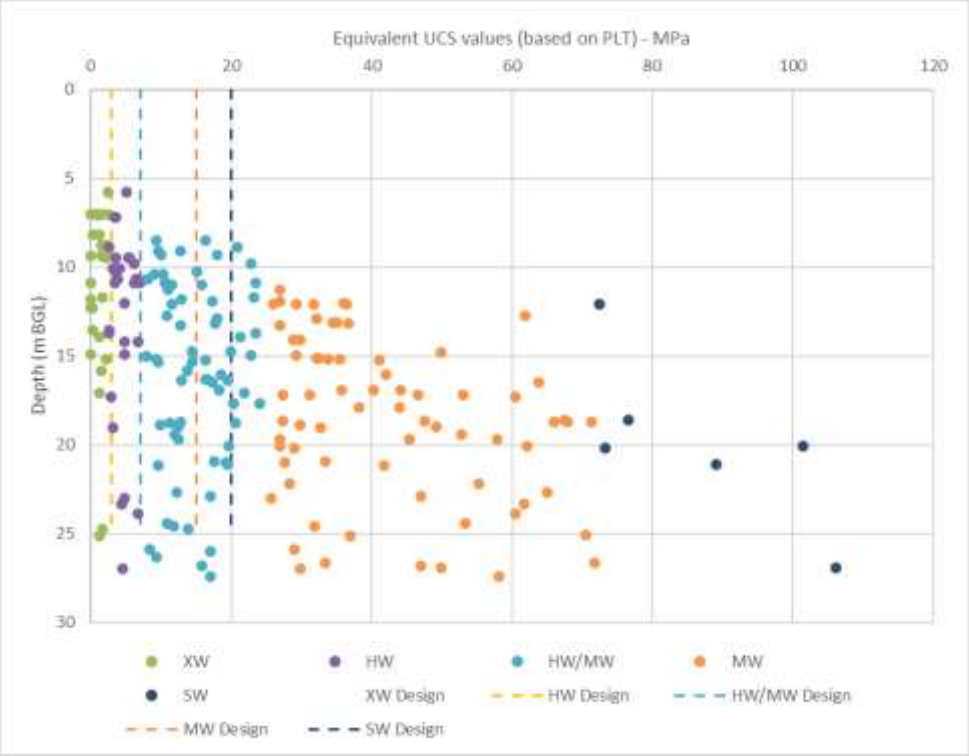
Table 3-2: Key Geotechnical Parameters

Unit	Typical description	Bulk Density γ_b (kN/m^3)	Effective Cohesion c' (kPa)	Friction Angle φ' (°)	Undrained Shear Strength s_u (kPa)	Design UCS (MPa)	Drained Young's Modulus E' (MPa)	Poisson Ratio ν	Horizontal K_0
Unit 1: Fill	Fine to coarse-grained Sandy GRAVEL and Gravelly SAND	18	0	30	N/A	N/A	10	0.3	0.53

Unit	Typical description	Bulk Density γ_b (kN/m^3)	Effective Cohesion c' (kPa)	Friction Angle φ' (°)	Undrained Shear Strength s_u (kPa)	Design UCS (MPa)	Drained Young's Modulus E' (MPa)	Poisson Ratio ν	Horizontal K_0
Unit 2: Residual Soil	Sandy Silty CLAY, stiff to hard	19	5	28	120	N/A	30	0.3	0.53
Unit 3a: XW Shale Bedrock		22	10	21	N/R	1	65	0.25	0.50
Unit 3b: HW Shale Bedrock **(Class IV)**		23	50	23	N/R	3	130	0.25	3.50
Unit 3c: HW/MW Shale Bedrock **(Class III / IV)**		23	100	28	N/R	7	300	0.2	3.50
Unit 3d: MW Shale Bedrock **(Class II / III)**		23	150	30	N/R	15	600	0.2	3.50
Unit 3e: SW Shale Bedrock **(Class II or better)**		24	400	32	N/R	20	700	0.2	3.50
Unit 4a: Class II Sandstone		24	500	40	N/R	25	900	0.2	3.50

N/A – Not applicable N/R – Not relevant

Plate 3-2: Equivalent UCS values for the different weathering profile of shale based on PLT testing



For the design of temporary ground anchors, the ultimate skin friction stresses provided in Table 3-3 have been adopted in this assessment. The have been based on the PLT results, as well as guidance from Pells et al. (2019 – Reference 6).

Table 3-3: Unit stresses adopted for ground anchors

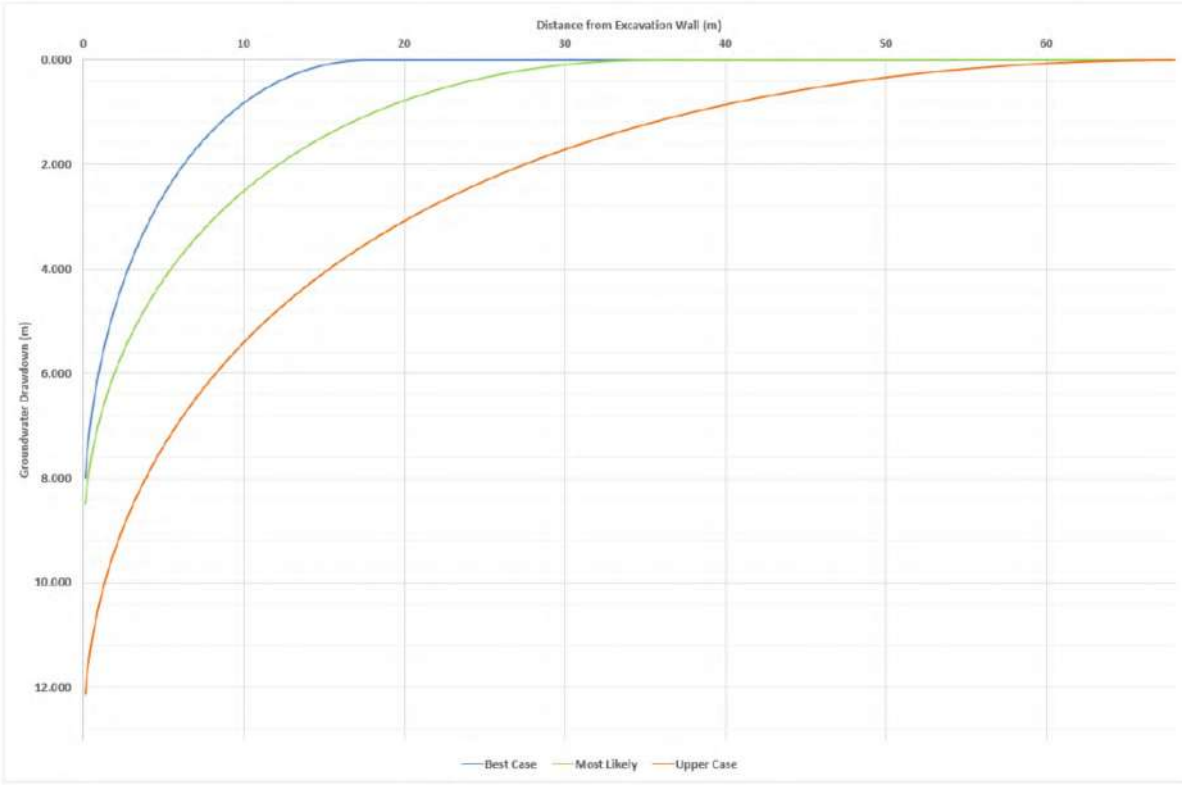
Unit	Allowable unit stresses for tension loads (kPa)
Unit 3a: XW Shale Bedrock	40
Unit 3b: HW Shale Bedrock **(Class IV)**	75
Unit 3c: HW/MW Shale Bedrock **(Class III / IV)**	100 - 225
Unit 3d: MW Shale Bedrock **(Class II / III)**	250 - 400
Unit 3e: SW Shale Bedrock **(Class II or better)**	> 400

3.5 DESIGN GROUNDWATER LEVELS

Groundwater levels (GWL) adopted in the analysis have been estimated based on the Dewatering Management Plan (DMP) for the site prepared by others. A 3-month monitoring campaign of GWL at the site, has reported GWL in proximity to the railway line to have a maximum standing water level of 97 m AHD, which has been adopted in this assessment.

As the proposed bulk excavation level for the development is RL 84.9 m AHD, it will intersect GWL. Given the proposals for a drained basement construction, long-term drawdown effects are expected in the area. The DMP has estimated the drawdown effect to extend to distances between 17.75 m to 67.50 m from the proposed excavation (Plate 3-1). However, note that this has been estimated for a 4-level basement excavation. An ongoing monitoring campaign is currently underway to inform the likely drawdown curves for a 6-level basement excavation.

Plate 3-3: Extent of drawdown from excavation [extract from Reditus' DWP]



A similar drawdown, albeit extending deeper into the ground profile and further away from the Site, has been adopted in this assessment. Note that these assumptions will have to be confirmed once a revised DMP for the Site is available and the analysis updated, if required.

4 METHODOLOGY AND KEY ASSUMPTIONS

The basement of the proposed development has been designed as a drained structure. As such, and as mentioned in Section 3.5, dewatering is assumed to occur progressively during construction, as the excavation intersects existing GWLs.

Based on the inputs provided by the Structural Engineer, the temporary lateral support for the excavation will be provided by multi-strand temporary ground anchors. These are expected to be sequentially de-activated as the permanent basement slabs are cast and connected to the retention piles.

As the design of the retention system is not part of the scope of this report, the following sub-sections provide details on the methodology and assumptions adopted for this assessment to infer the impact of the proposed works on the Sydney Trains / Sydney Metro assets listed in Section 1

The outcomes of the analyses are discussed in Section 7. Note that a sensitivity analysis has been carried out on all Design Sections considering a reduction in Young's Modulus values for all sol/rock layers of 25%, to capture the eventuality of more onerous ground conditions than anticipated.

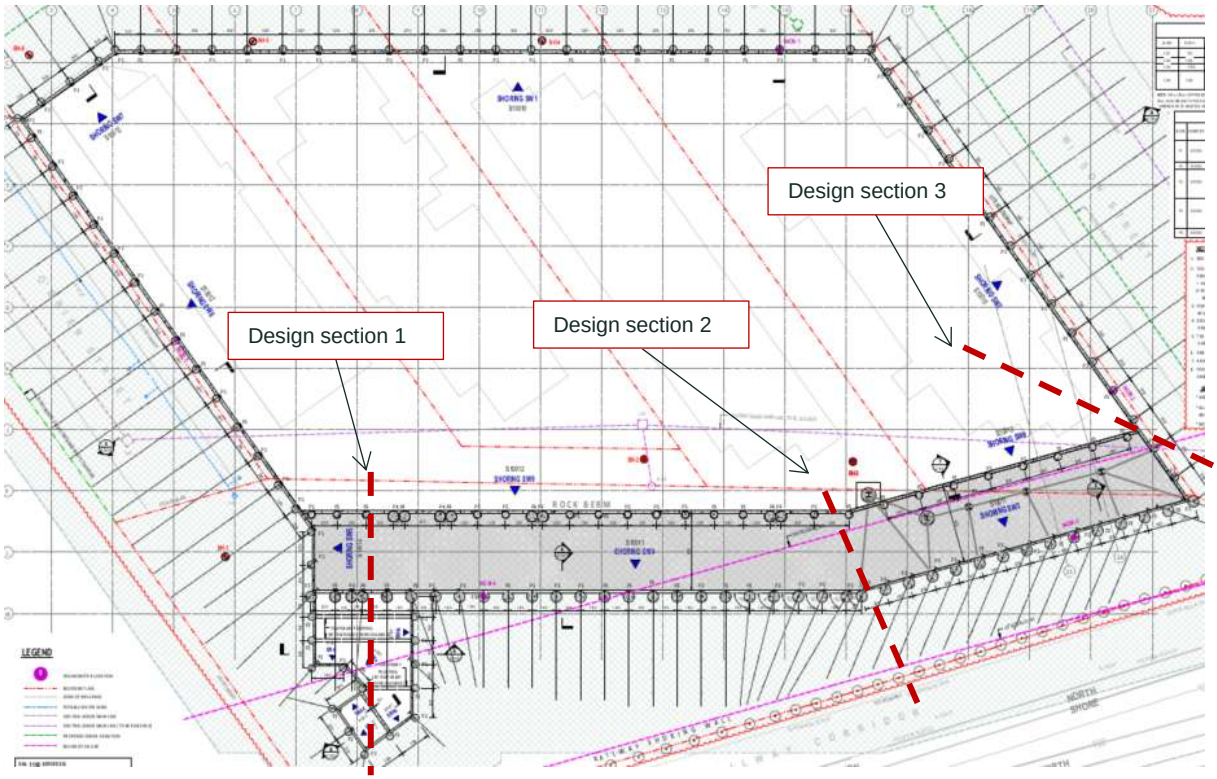
4.1 METHODOLOGY

The numerical analyses carried out as part of this assessment have made use of the commercially available finite element software PLAXIS-2D (V2024.1), which has accounted for the proposed construction sequence provided by the Structural Engineer.

The geometry and structural properties of the relevant railway assets have been based on the as-built records provided by the Client (refer to Section 4.4) and on past-experience.

The impact assessment was carried out by analysing three (3) design sections, designated as Sections 1 to 3 at the locations shown in Plate 4-1.

Plate 4-1: Location of design sections covered as part of this assessment



4.2 DESIGN LOADING

The following design loads have been adopted for the purpose of this assessment:

- Pedestrian traffic loading = 5 kPa
- Existing dwelling loading = 10 kPa / floor
- Communications hut loading = 10 kPa
- Train surcharge loading (300LA train) = 131 kPa, applied at the underside of the rail sleepers as per AS5100.2:2017 (Reference 7)
- 20 kPa surcharge at surface level between the basement walls and the railway corridor to allow for any future railway work (Clause 6.3 of Sydney Metro guideline – Reference 8), to be applied after construction is complete.

4.3 KEY ASSUMPTIONS

The following key assumptions have been considered in this geotechnical assessment:

- Geometry input provided by the Client and their Structural Engineer and largely based on the as-built records for the existing railway assets and the proposed Shoring System drawing set.
- Rock/soil relevant geotechnical design parameters used in the analyses based on Fortify's geotechnical investigation report for the site (report ref. S2207_SGI_01_Rev2, dated 6 November 2024) and summarised in Table 3-2.
- Clause 8.3.1 of AS5100.3 (Reference 8) requires that for a retaining wall stability assessment, the ground level in front of the wall to be lowered (i.e. passive resistance ignored) by 10% of the height of the wall beneath the lowest support, with a minimum value of 0.5 m. Based on the proposed levels for the lowest level of ground anchors (vary between approximately RL 93.1 m AHD and RL 90.3 m AHD), 10% of the remaining retained height corresponds to up to 0.8 m. However, as the excavation will be carried out in rock, we have assumed a 0.5 m over excavation sufficiently caters for this risk, as the likelihood of an over excavation extending past 0.5 m below BEL is very low.
- Except where stated otherwise, all results presented herein are based on unfactored loads and unfactored soil/rock parameters.
- Construction sequence and adopted RLs as advised by the Structural Engineer and summarised in Section 5. The assessment has only considered the impact of the proposed works until excavation to bulk excavation level (BEL) is reached, as well as the event of an accidental over-excavation, deemed as the most critical design scenario.
- Design GWLs considered as mentioned in Section 3.5 and presented in the outputs in Appendix C. Dewatering is assumed to occur progressively during construction, as the excavation intersects existing GWLs. The zone of influence of the GWL drawdown has been inferred based on the DMP for the site, yet considering the influence of a 6-level basement excavation, instead of 4-level.

- Given that only temporary conditions have been considered, the impacts of earthquake loading have not been included.

- Material proprieties for all structural elements have been agreed with the Structural Engineer and are listed in Section 6. In relation to the existing Sydney Trains / Sydney Metro assets, a reduction in their flexural rigidity (EI) to account for concrete cracking has been adopted throughout the entire analysis (EI = 0.6 x uncracked EI).

- The design of the temporary internal shoring system and its corresponding foundation piles is not part of the scope of this assessment and we assume that this will be designed by others at a subsequent stage of the design process. At this stage, we have assumed that the pile embedment below BEL will be sufficient to ensure adequate bearing capacity for any vertical and horizontal loads transferred through the internal bracing system. Overall, the geotechnical assessment has only considered a simplified approach to the modelling of this internal support structure, which should only be used for design validation. Results have been passed on to the Structural Engineer for verification against their structural model.

4.4 EXISTING SYDNEY TRAINS / SYDNEY METRO ASSETS

For the purpose of this assessment, three distinct existing Sydney Trains / Sydney Metro assets have been considered, which are described in the following subsections. A reinforced concrete Young's Modulus of 30 GPa has been assumed for all assets, albeit a reduction in EI to 60% of the uncracked value has been adopted in this assessment.

4.4.1 Rail retaining wall along railway corridor

An existing retaining wall runs along the railway corridor at the eastern boundary of the site. The wall comprises of a soldier pile wall with a continuous reinforced concrete capping beam at the top. The piles are 850 mm in diameter and have been installed at a 2.5 m spacing. Pile toe levels have been extracted from the as-built records (Plate 4-2).

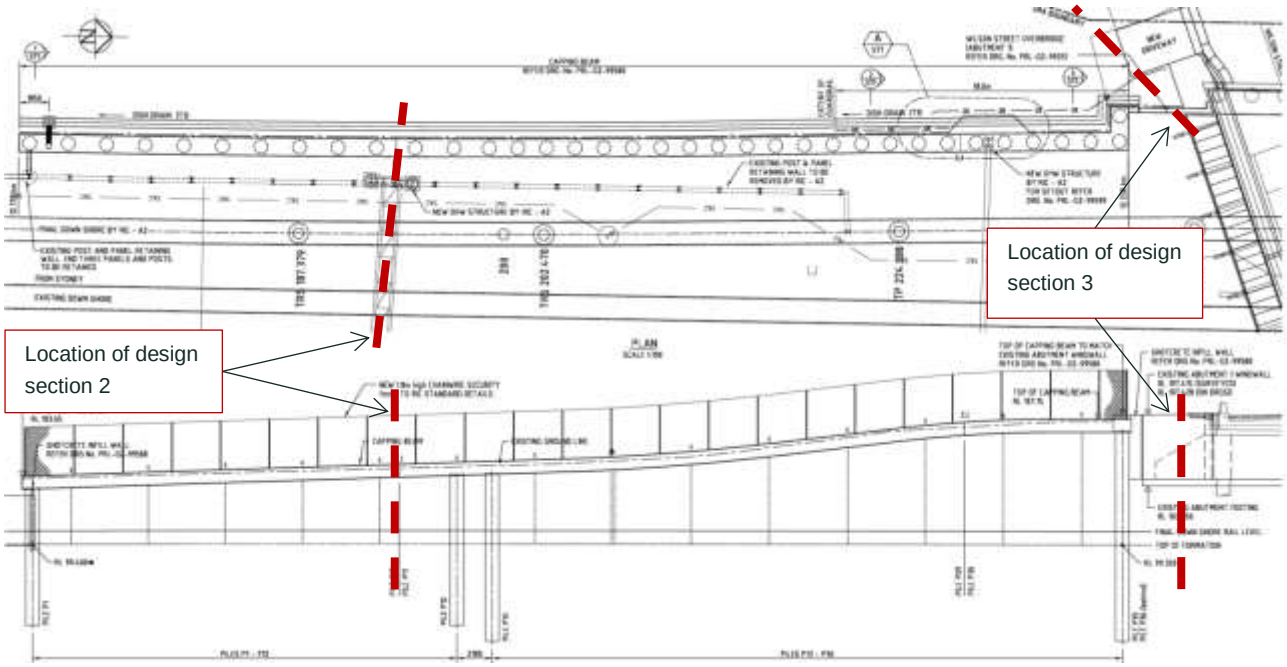
Plate 4-2: As-built extracts with pile toe levels

TABLE 1

PILE No	EASTING	NORTHING	DIAMETER	CUT OFF LEVEL	CONTRACT LEVEL	* ACTUAL FOUNDING LEVEL
P1	331 577.167	6 259 284.036	850	102.920	94.50	94.50
P2	331 577.085	6 259 286.405	850	102.995	94.50	94.50
P3	331 577.002	6 259 288.773	850	103.070	94.50	94.50
P4	331 576.917	6 259 291.142	850	103.145	94.50	94.50
P5	331 576.830	6 259 293.510	850	103.225	94.50	94.50
P6	331 576.739	6 259 295.879	850	103.300	94.50	94.50
P7	331 576.645	6 259 298.247	850	103.375	94.50	94.50
P8	331 576.548	6 259 300.615	850	103.450	94.50	94.50
P9	331 576.446	6 259 302.982	850	103.525	94.50	94.50
P10	331 576.339	6 259 305.350	850	103.600	94.50	94.50
P11	331 576.228	6 259 307.717	850	103.675	94.50	94.50
P12	331 576.112	6 259 310.085	850	103.750	94.50	94.50
P13	331 576.002	6 259 312.262	850	103.820	93.50	93.50
P14	331 575.910	6 259 314.020	850	103.875	93.50	93.50
P15	331 575.816	6 259 315.777	850	103.930	93.50	93.50
P16	331 575.719	6 259 317.535	850	103.990	93.50	93.50
P17	331 575.620	6 259 319.292	850	104.060	93.50	93.50
P18	331 575.519	6 259 321.049	850	104.185	93.50	93.50
P19	331 575.416	6 259 322.806	850	104.310	93.50	93.50

A design section aligned with the existing overhead wiring/signalling structure in the area has been selected, as show in Plate 4-3 against the as-built plan and elevation for the wall.

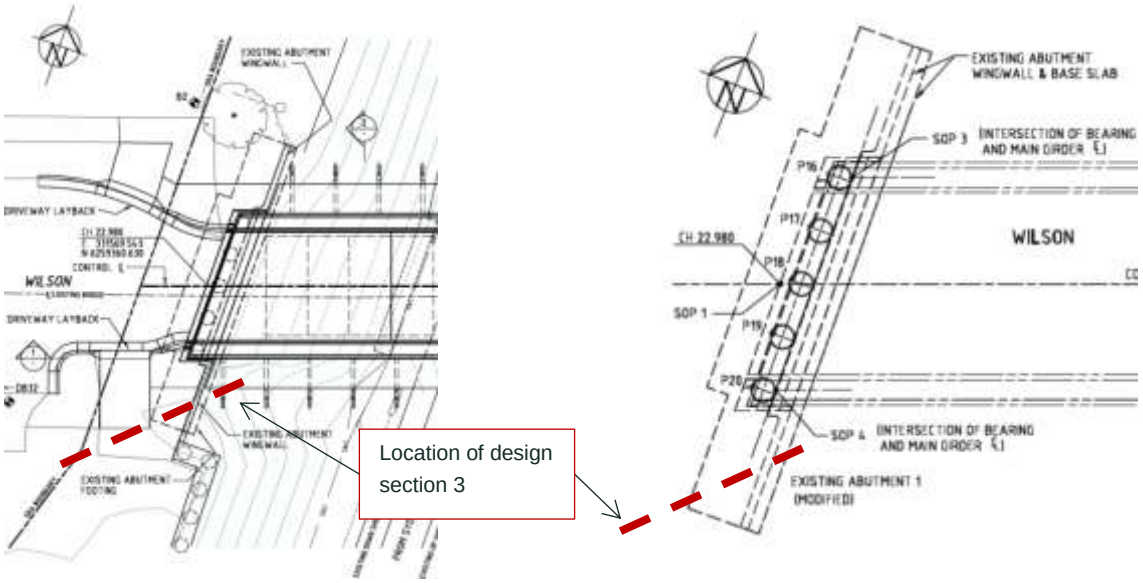
Plate 4-3: As-built extracts with indicative location of design section 2 (and design section 3)



4.4.2 Wilson Street overbridge

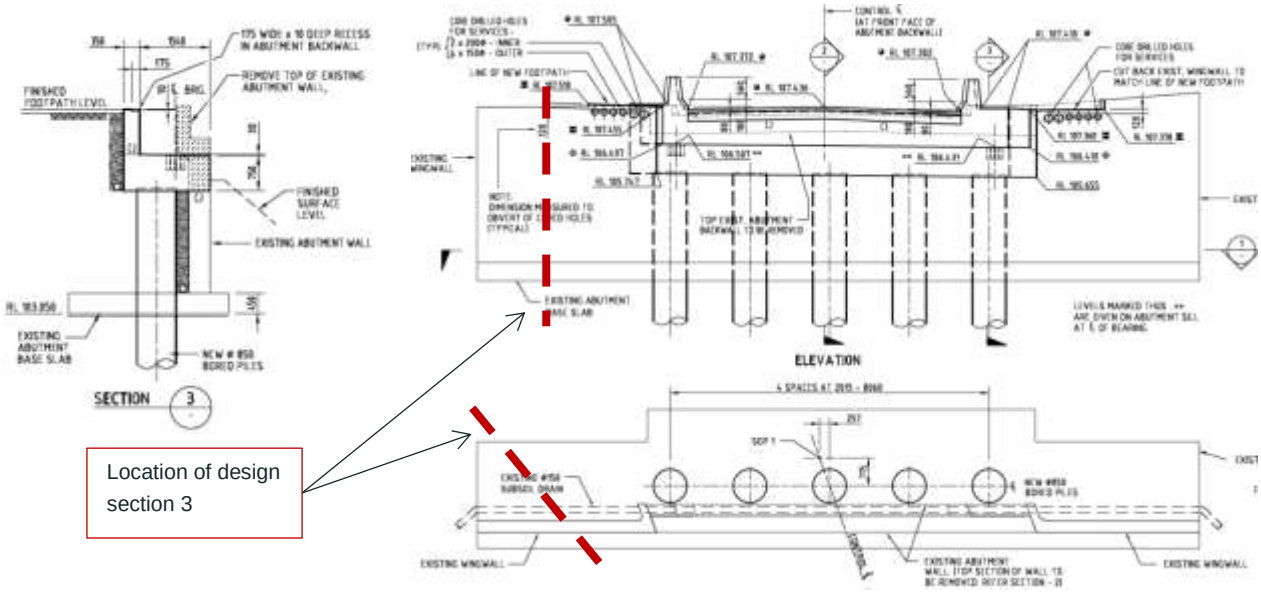
Wilson St overbridge is located to the northeast of the site. As-built records show the bridge to have the western abutment supported by piles that carry the bridge loads to a suitable foundation stratum, with L-shape retaining walls supporting the earth pressures acting on the abutment and wingwalls (Plate 4-4).

Plate 4-4: As-built extracts with indicative location of design section 3.



For the purpose of this assessment, the contribution of the foundation piles was ignored and the nearest wingwall to the excavation was considered as a standalone L-shape wall (Plate 4-5).

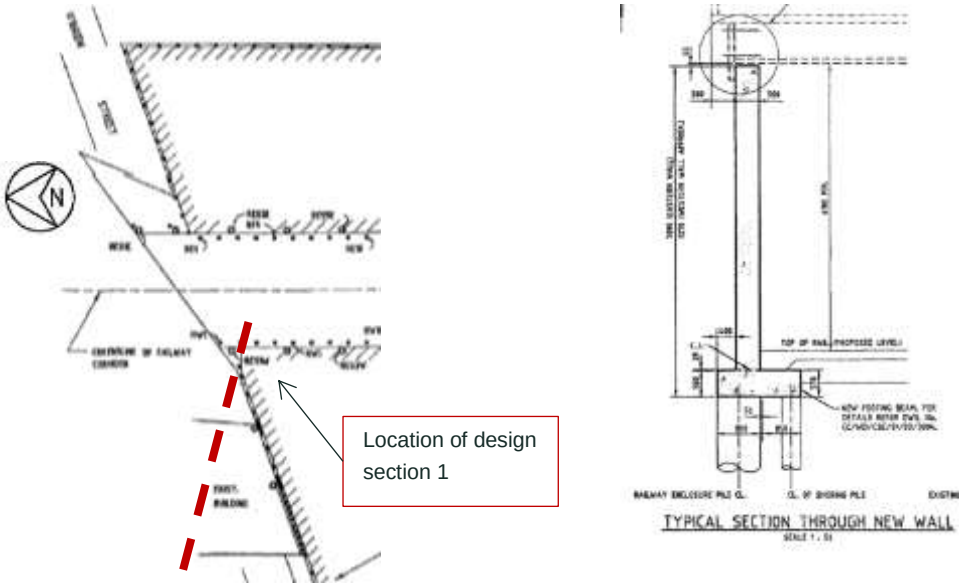
Plate 4-5: As-built extracts with indicative location of design section 3.



4.4.3 O'Brien St pedestrian bridge

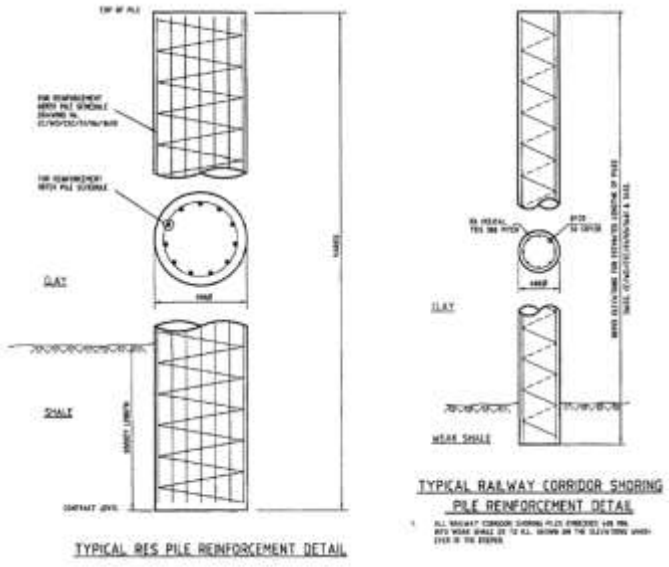
O'Brien St pedestrian bridge is located to the southeast of the site. As-built records show the bridge to have the western abutment supported by two sets of piles as shown in Plate 4-6.

Plate 4-6: As-built extracts with indicative location of design section 1.



The rear piles have 900 mm diameter and are spaced circa 7.5 m in plan. As-built toe levels have not been provided and an embedment of 2 diameters (1.8 m) into the underlying XW shale have been assumed based on the information shown in Plate 4-6. The front piles have 400 mm diameter and are spaced closer together at 2.5 m centres. Once again, no information about as-built pile toe levels has been provided, so for the purpose of this assessment an embedment of 1 diameter (0.4 m) into the underlying XW shale has been assumed based on the information shown in Plate 4-7.

Plate 4-7: As-built extracts about front and rear foundation piles of O'Brien St pedestrian bridge



As part of the numerical analysis a sensitivity assessment has been carried out by reducing the embedment of the rear piles from 2 diameters (1.8 m) to only 1 diameter (0.9 m). Given the distance between asset and the proposed excavation, this change has not impacted on the overall assessment results.

As the embedment of the existing piles is a function of the inferred ground model in the area, the updates and RL adjustments to inferred geological units following a review of all available information (refer to Section 3.3) have led to shorter foundation piles than previously assumed.

5 CONSTRUCTION SEQUENCE

The following construction sequences (staging) has been considered in this design geotechnical assessment:

Section 1

1) Establish initial site conditions;

2) Apply surcharge loading equivalent to current housing development;

3) Model railway trench excavation and associated retaining wall(s);

4) Apply train surcharge and reset deformation **(CURRENT CONDITION)**;

5) Demolition of current housing development;

6) Installation of outer soldier pile wall to the proposed toe level (RL 95.0 m AHD);

7) 1st level of excavation to RL 101.0 m AHD;

8) Installation of 1st level of ground anchors at RL 101.5 m AHD;

9) 2nd level of excavation to RL 97.6 m AHD;

10) Installation of inner soldier pile wall to the proposed toe level (RL 83.7 m AHD) and portion of basement slab connecting the outer and inner retaining walls;

11) 3rd level of excavation to RL 95.7 m AHD. **GWL lowered (dewatering)**;

12) Installation of 2nd level of ground anchors at RL 96.2 m AHD. **GWL lowered (dewatering)**;

13) 4th level of excavation to RL 92.7 m AHD. **GWL lowered (dewatering)**;

14) Installation of 3rd level of ground anchors at RL 93.2 m AHD. **GWL lowered (dewatering)**;

15) 5th level of excavation to RL 89.8 m AHD. **GWL lowered (dewatering)**;

16) Installation of 4th level of ground anchors at RL 90.3 m AHD. **GWL lowered (dewatering)**;

17) 6th level of excavation to RL 88.1 m AHD. **GWL lowered (dewatering)**;

18) Installation of rock berm shoring wall to the proposed toe level (RL 84.1 m AHD);

19) Excavation to BEL (RL 84.9 m AHD) with rock berm. **GWL lowered (dewatering)**;

- Undertake ‘phi-c’ strength reduction FoS check

19 a) Allow for an additional 0.5 m over-excavation;

- Undertake ‘phi-c’ strength reduction FoS check

20) Reduce bending stiffness of reinforced concrete elements to account for long-term effects. **GWL lowered (dewatering)**;

21) to 29) Sequentially install floor slabs and remove temporary ground anchors/struts. **Inferred Permanent GWL profile adopted.**

30) Apply 20 kPa surcharge between basement walls and railway corridor to allow for any future railway work (Clause 6.3 of Sydney Metro guideline – Reference 8). **Inferred permanent GWL profile adopted.**

Section 2

1) Establish initial site conditions;
2) Apply surcharge loading equivalent to current housing development;
3) Model railway trench excavation and associated retaining wall(s);
4) Apply train surcharge and reset deformation **(CURRENT CONDITION)**;
5) Demolition of current housing development;
6) Installation soldier pile wall to the proposed toe level (RL 83.7 m AHD);
7) 1st level of excavation to RL 103.8 m AHD;
8) Installation of 1st frame level support at RL 104.3 m AHD;
9) 2nd level of excavation to RL 101.7 m AHD;
10) 3rd level of excavation to RL 98.6 m AHD;
11) Installation of 2nd frame level at RL 99.6 m AHD and 1st level of ground anchors at RL 99.1 m AHD;
12) 4th level of excavation to RL 95.7 m AHD. **GWL lowered (dewatering)**;
13) Installation of 2nd level of ground anchors at RL 96.2 m AHD. **GWL lowered (dewatering)**;
14) 5th level of excavation to RL 92.2 m AHD. **GWL lowered (dewatering)**;
15) Installation of 3rd frame level at RL 93.6 m AHD and 3rd level of ground anchors at RL 92.7 m AHD;
16) 6th level of excavation to RL 88.1 m AHD. **GWL lowered (dewatering)**;
17) Installation of rock berm shoring wall to proposed toe level (RL 84.1 m AHD);
18) Excavation to BEL (RL 84.9 m AHD) with rock berm. **GWL lowered (dewatering)**;
    - Undertake ‘phi-c’ strength reduction FoS check

    18 a) Allow for an additional 0.5 m over-excavation;
    - Undertake ‘phi-c’ strength reduction FoS check
19) Reduce bending stiffness of reinforced concrete elements to account for long-term effects. **GWL lowered (dewatering)**;

20) to 28) Sequentially install floor slabs and remove temporary ground anchors/struts. **Inferred Permanent GWL profile adopted.**

29) Apply 20 kPa surcharge between basement walls and railway corridor to allow for any future railway work (Clause 6.3 of Sydney Metro guideline – Reference 8). **Inferred permanent GWL profile adopted.**

Section 3

1) Establish initial site conditions;

2) Apply surcharge loading equivalent to current housing development;

3) Model railway trench excavation and associated retaining wall(s);

4) Apply train surcharge and reset deformation **(CURRENT CONDITION)**;

5) Demolition of current housing development;

6) Installation soldier pile wall to the proposed toe level (RL 83.7 m AHD);

7) 1st level of excavation to RL 103.8 m AHD;

8) Installation of 1st frame level support at RL 104.3 m AHD;

9) 2nd level of excavation to RL 101.7 m AHD;

10) 3rd level of excavation to RL 98.6 m AHD;

11) Installation of 2nd frame level at RL 99.6 m AHD and 1st level of ground anchors at RL 99.1 m AHD;

12) 4th level of excavation to RL 95.7 m AHD. **GWL lowered (dewatering)**;

13) Installation of 2nd level of ground anchors at RL 96.2 m AHD. **GWL lowered (dewatering)**;

14) 5th level of excavation to RL 92.2 m AHD. **GWL lowered (dewatering)**;

15) Installation of 3rd frame level at RL 93.6 m AHD and 3rd level of ground anchors at RL 93.1 m AHD;

16) 6th level of excavation to RL 88.1 m AHD. **GWL lowered (dewatering)**;

17) Installation of rock berm shoring wall to proposed toe level (RL 84.1 m AHD);

18) Excavation to BEL (RL 84.9 m AHD) with rock berm. **GWL lowered (dewatering)**;

- Undertake ‘phi-c’ strength reduction FoS check

18 a) Allow for an additional 0.5 m over-excavation;

- Undertake ‘phi-c’ strength reduction FoS check

19) Reduce bending stiffness of reinforced concrete elements to account for long-term effects. **GWL lowered (dewatering)**;

20) to 29) Sequentially install floor slabs and remove temporary ground anchors/struts. **Inferred Permanent GWL profile adopted.**

30) Apply 20 kPa surcharge between basement walls and railway corridor to allow for any future railway work (Clause 6.3 of Sydney Metro guideline – Reference 8). **Inferred permanent GWL profile adopted.**

6 GEOMETRY AND STRUCTURAL INPUTS

Three cross sections have been selected as part of this geotechnical assessment, one for each asset in analysis and illustrated in Plates 6-1 to 6-3. Ground conditions at each design cross section have been interpolated based on the site investigation records and overall geometry has been based on the site survey provided by the Client.

Plate 6-1: Design cross section 1 (based on structural section 4 but considering two retaining walls – inner and outer, as depicted in the shoring set)

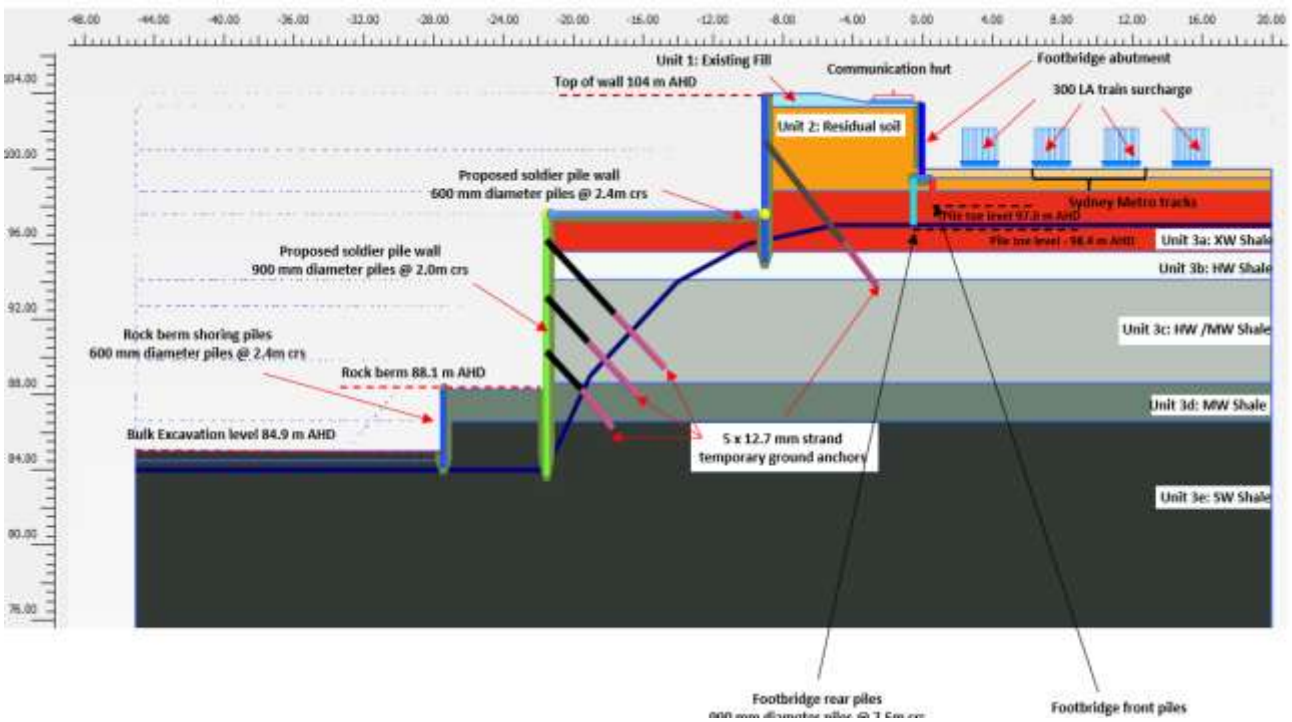


Plate 6-2: Design cross section 2 (based on structural section 3 but considering the top of wall and anchor levels shown on the elevation drawing, as well as the proposed internal shoring bracing system)

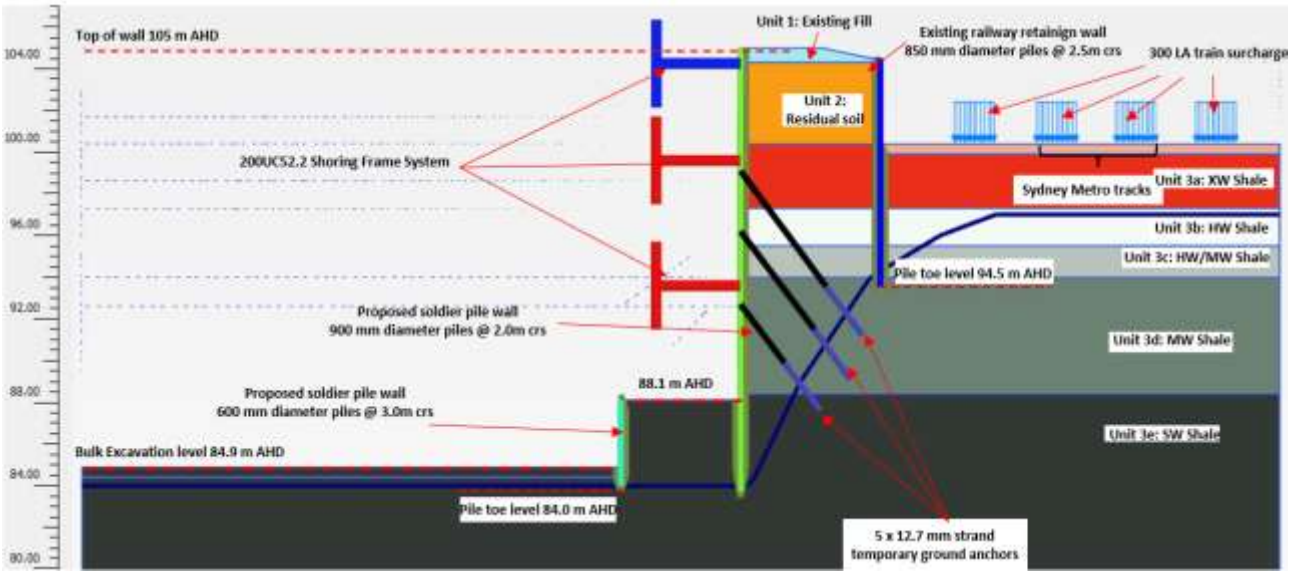
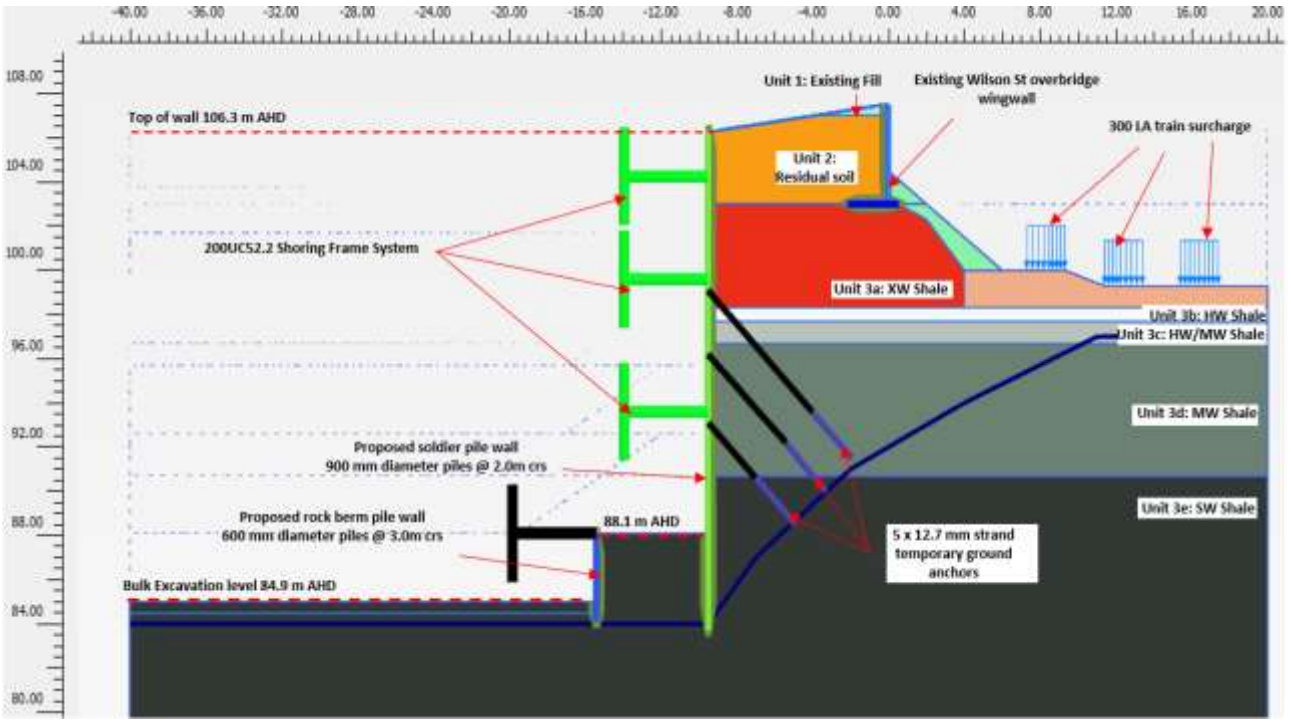


Plate 6-3: Design cross section 3 (based on structural section 3, as well as the proposed internal shoring bracing system)



The structural properties and dimensions adopted in this assessment are presented in Tables 6-1 and 6-2. Please note that the proposed shotcrete infill panels between soldier piles have been ignored for the purpose of the modelling.

Table 6-1: Basement soldier pile wall

Property	Section 1		Section 2	Section 3
Pile diameter and spacing	0.9 m @ 2.0 m crs (inner piles)	0.6 m @ 2.4 m crs (outer piles)	0.9 m @ 2.0 m crs	
E (GPa)	32.8			
EA (kN/m)	10.43E+06	3.86E+06	10.43E+06	
EI, short term / long term (kNm^2/m)[1]	475.0E+03 / 317.0E+03	78.2E+03 / 52.2E+03	475.0E+03 / 317.0E+03	
Existing surface level (m AHD)	104.0		105	107.5
Final surface level (m AHD)	104.0		105	106.3
Bulk excavation level (m AHD)	84.9			
Over-excavation level (m AHD)	84.4			
Pile toe level (m AHD)	83.7 (inner piles)	95.0 (outer piles)	83.7	83.7
Rock berm pile diameter and spacing	0.6 m @ 2.4 m crs		0.6 m @ 3.0 m crs	
Rock berm pile toe level (m AHD)	88.1			
Ground anchors embedment	HW Shale (inner piles)	HW Shale (outer piles)	MW Shale	MW to SW Shale
Ground anchors hole diameter (mm)	130	150		
Temporary strut [2] EA (kN)	N/A		30E3 (1st level) 120E3 (2nd & 3rd level)	240E3

[1] Short and long-term values of EI of 90% and 60%, respectively, of the uncracked stiffness values have been adopted in the assessment, following advice from the Structural Engineer.

[2] EA values for struts agreed with the Structural Engineer.

Table 6-2: – Ground anchors loading, ground anchor bond materials and strut loading

Design Section	Anchor / Strut Level	Anchors pre-stress load (kN)	Max anchor / strut load (kN)	Min bond length (m)	Bond material
1	GA 1	80	120	4	HW Shale
	GA 2	200	240	4	HW/MW Shale
	GA 3	200	270	4	HW/MW Shale
	GA 4	200	260	3	MW Shale
2	Strut 1	-	245	-	-
	Strut 2	-	715	-	-
	GA 1	250	275	3	MW Shale
	GA 2	250	280	3	MW Shale
	Strut 3	-	505	-	-
	GA 3	250	275	3	MW Shale
3	Strut 1	-	200	-	-
	Strut 2	-	400	-	-
	GA 1	230	270	3	MW Shale
	GA 2	275	325	3	MW Shale
	Strut 3	-	350	-	-
	GA 3	275	350	3	SW Shale

We recommend that the pre-stressing loads listed above are specified as part of the design, subject to confirmation/optimisation as part of the subsequent design stage (detailed design).

7 GEOTECHNICAL ASSESSMENT RESULTS

As described in Section 4, the numerical analysis carried out as part of this geotechnical assessment has been completed using the commercially available software PLAXIS-2D. The following subsections summarise the results of the geotechnical assessment. Further details on the soil-structure analysis can be found in Appendix C.

Although not part of the remit of this report, the 'phi-c' strength reduction analyses carried out in PLAXIS-2D have reported factors of safety higher than 1.5 against overall / global failure.

7.1.1 Induced ground displacements

Table 7-1 summarises the induced ground at the location of the relevant Sydney Trains /Sydney Metro assets.

Table 7-1: Sydney Trains / Sydney Metro assets lateral displacements due to the proposed works

Sydney Trains /Sydney Metro asset	Before 2nd Level of Strut / Excavation to Basement 3 Level (Stage 10/11)	End of excavation (Stage 18/19)	Removal of last level of ground anchors (Stage 28/29)	Largest differential to current conditions (Stage 4)
Rail retaining wall along railway corridor	< 5 mm	< 10 mm	< 10 mm	< 10 mm
Wilson Street vehicle overbridge	< 5 mm [1]	< 10 mm [1]	< 10 mm [1]	< 10 mm [1]
O'Brien St pedestrian bridge	< 5 mm	< 5 mm	< 5 mm	< 5 mm

[1] The estimates for the Wilson Street Overbridge wingwall are deemed as overestimate as they ignore the contribution of the bridge piles, as discussed in Section 4.4.2.

From an induced displacements point of view, the proposed works have minimum impacts on the existing Sydney Trains / Sydney Metro assets. No significant changes to the results shown above have been noted when a sensitivity analysis was carried out at each section with a reduction in Young Modulus values for all soils and rock layers of 25%.

On all design sections covered by this geotechnical assessment, the estimate of induced displacements on rail corridor land due to the proposed works are less than 10 mm.

7.1.2 Stress changes to surrounding soil/rock mass

Table 7-2 summarises the soil/rock stresses at the location of the relevant Sydney Trains /Sydney Metro assets prior to, during and post excavation works.

Table 7-2: Stresses in surrounding soil/rock mass of Sydney Trains / Sydney Metro assets

Sydney Trains / Sydney Metro asset		Current condition (Stage 4)	Before 2nd Level of Strut / Excavation to Basement-3 Level (Stage 10/11)	End of excavation (Stage 18/19)	Removal of last level of ground anchors (Stage 28/29)	Largest differential to Stage 4
XX (horizontal) direction [1]						
Rail retaining wall along railway corridor		0 to < 80 kPa (Units 1 to 3a) ~470 to < 730 kPa (Below Unit 3a)	0 to < 60 kPa (Units 1 to 3a) ~450 to < 710 kPa (Below Unit 3a)	0 to < 55 kPa (Units 1 to 3a) ~220 to < 370 kPa (Below Unit 3a)	0 to < 50 kPa (Units 1 to 3a) ~215 to < 365 kPa (Below Unit 3a)	< 30 kPa (Units 1 to 3a) < 390 kPa (Below Unit 3a)
Wilson Street vehicle	Stem	0 to < 60 kPa	0 to < 55 kPa	0 to < 65 kPa	0 to < 65kPa	< 10 kPa
Sydney Trains / Sydney Metro asset		**Current condition (Stage 4)**	**Before 2nd Level of Strut / Excavation to Basement-3 Level (Stage 10/11)**	**End of excavation (Stage 18/19)**	**Removal of last level of ground anchors (Stage 28/29)**	**Largest differential to Stage 4**
YY (vertical) direction [1]						
Rail retaining wall along railway corridor		0 to < 260 kPa	0 to < 200 kPa	0 to < 220 kPa	0 to < 200 kPa	< 70 kPa
Wilson Street vehicle overbridge	Stem	5 to < 90 kPa	5 to < 85 kPa	5 to < 90 kPa	to < 95 kPa	< 15 kPa
	Base	~50 to < 210 kPa	~55 to < 205 kPa	~40 to < 240 kPa	~40 to < 235 kPa	< 25 kPa
O'Brien St pedestrian bridge		0 to < 75 kPa	0 to < 70 kPa	0 to < 70 kPa	0 to < 70 kPa	< 5 kPa

[1] Total stresses measured behind the retaining walls and beneath the base of the wingwall at Wilson St overbridge

With regards to changes to surrounding soil/rock mass, the proposed works have minimum impacts on the existing Sydney Trains /Syndey Metro assets. Furthermore, the foundations for the proposed building will all be constructed below the founding level of all Sydney Trains / Sydney Metro assets and away from their influence zone. The Structural Engineer has also confirmed that the basement piles, or any foundation pile in proximity to the railway corridor, will not be subject to tension loading on any load cases.

No significant changes to the results shown above have been noted when a sensitivity analysis was carried out at each section with a reduction in Young Modulus values for all soils and rock layers of 25%.

7.1.3 Induced track movement

On all design sections covered by this geotechnical assessment, the estimate of induced displacements at the location of the existing Sydney Trains/Sydney Metro railway tracks is not greater than 5 mm, as summarised in Table 7-3.

Table 7-3: Induced track movement on Sydney Trains / Sydney Metro lines

Sydney Trains / Sydney Metro lines / Design Section	Sydney Trains (West Line)	Sydney Metro (West Line)	Sydney Metro (East Line)	Sydney Trains (East Line)
Horizontal Displacement (mm)				
Rail retaining wall along railway corridor	< 5 mm	< 4 mm	< 3 mm	< 1 mm
Wilson Street vehicle overbridge	< 4 mm	< 3 mm	< 2 mm	Not covered in analysis
O'Brien St pedestrian bridge	< 3 mm	< 2 mm	< 1 mm	< 1 mm
Vertical Displacement (mm)				
Rail retaining wall along railway corridor	< 2 mm	< 2 mm	< 1 mm	1 mm
Wilson Street vehicle overbridge	< 1 mm	< 1 mm	< 1 mm	Not covered in analysis
O'Brien St pedestrian bridge	< 1 mm	< 1 mm	< 1 mm	< 1 mm

In light of the above, and considering the requirements of TfNSW Technical Note – TN 004:2015 and TfNSW Engineering Specification SPC 207, as the risk of track displacement is rack displacement equal to, or greater than 4 mm, track monitoring will be required during the works.

8 INSTRUMENTATION AND MONITORING

At this point of the design development the instrumentation and monitoring plan is yet to be developed and may be developed by others. Nonetheless, we recommend that active monitoring of the proposed basement wall is carried out through the works, as its behaviour will be critical to the performance of the existing Sydney Trains / Sydney Metro assets as construction progresses.

We envisage that the instrumentation and monitoring plan will comprise of survey monitoring prisms/points are installed along the caping beam and on selected vertical arrays. In conjunction with the survey monitoring prisms/points, we

consider it would be prudent to install borehole inclinometers at selected locations behind the proposed basement wall, so that the ground displacement profile with depth can also be assessed.

Monitoring points should also be installed at the location of the existing Sydney Trains / Sydney Metro assets and it will be important to have that carried ahead of the works to establish baseline readings. The proposed monitoring should also adhere to the requirements set out by TfNSW Technical Note – TN 004:2015 and TfNSW Engineering Specification SPC 207 regarding track monitoring.

9 KEY RISKS AND CONSIDERATIONS

Some of the key risks and considerations associated with the assessment presented in this report include:

- Impacts on and underground services in the vicinity, if any, have not been considered within this technical memorandum. Any temporary works stability associated with these works are also outside of the scope of this report.

- The inferred ground conditions are based on the existing geotechnical investigation, which was carried put in excess of 20 m away from the Sydney Trains / Sydney Metro assets in analysis. Actual ground conditions may vary for those presented in this report.

- Any soil consolidation settlement has not been considered as part of this assessment and may be dependent on the extent of groundwater drawdown in the area. However, given that the existing railway lines/assets are founded on XW shale rock or better, no long-term settlement (primary consolidation or creep) are anticipated.

- As no site-specific information is available about the locked-in stresses within the shale rock mass in the area, published literature (References 5 & 6) has been used to calibrate the numerical modelling.

- The global stability check carried out using the c-phi reduction method in PLAXIS 2D has limitations and may be influenced by the stiffness of the structural elements in the model and assumed groundwater profiles.

- This impact assessment has been carried out based on the preliminary design for the shoring system for the site. Should the design proposal be updated, this assessment may need to be revisited.

- Based on the overall ground conditions, distance to the proposed works and their construction sequence, the overall impact of the works on the existing railway assets is considered minor to negligeable.

Fortify Geotech Pty Ltd

REFERENCES

Transport for NSW – Asset Standards Authority, “T HR CI 12090 ST – Airspace and External Developments”, version 1.0, issue date 01 June 2021

MinView – geological map - https://minview.geoscience.nsw.gov.au - Accessed 6/05/2024

Fortify Geotech, “Geotechnical Investigation Report”, report reference JS/S1998 Rev 2, dated 14 December 2023

Fortify Geotech, “Geotechnical Investigation Report”, report reference S2207_SGI_01_Rev2, dated 6 November 2024

Bertuzzi, Robert, “Sydney Sandstone and Shale Parameters for Tunnel Design”, Australian Geomechanics Vol 49 No 1, March 2014.

Pells, P.J.N., Mostyn, G., Bertuzzi, R. and Wong, P. K., “Classification of Sandstones and Shales in the Sydney Region: A Forty Year Review”, Australian Geomechanics, Vol 54 No 2, June 2019.

Standards Australia, “AS5100.2-2017 - Bridge design Part 2: Design loads”

Standards Australia, “AS5100.3-2017 - Bridge design Part 3: Foundations and soil-supporting structures”

Transport for NSW – Sydney Metro Authority, “Sydney Metro At Grade and Elevated Sections Corridor Protection Guidelines”, Project No 657578, Revision 0, September 2018

Transport for NSW – Technical Note - TN 004: 2015 - “Buried services at turnouts and special trackwork”, issued 03 September 2015

Transport for NSW – Engineering Specification – SPC 207 “Track Monitoring Requirements for Undertrack Excavation”, version 1.5, issued April 2013

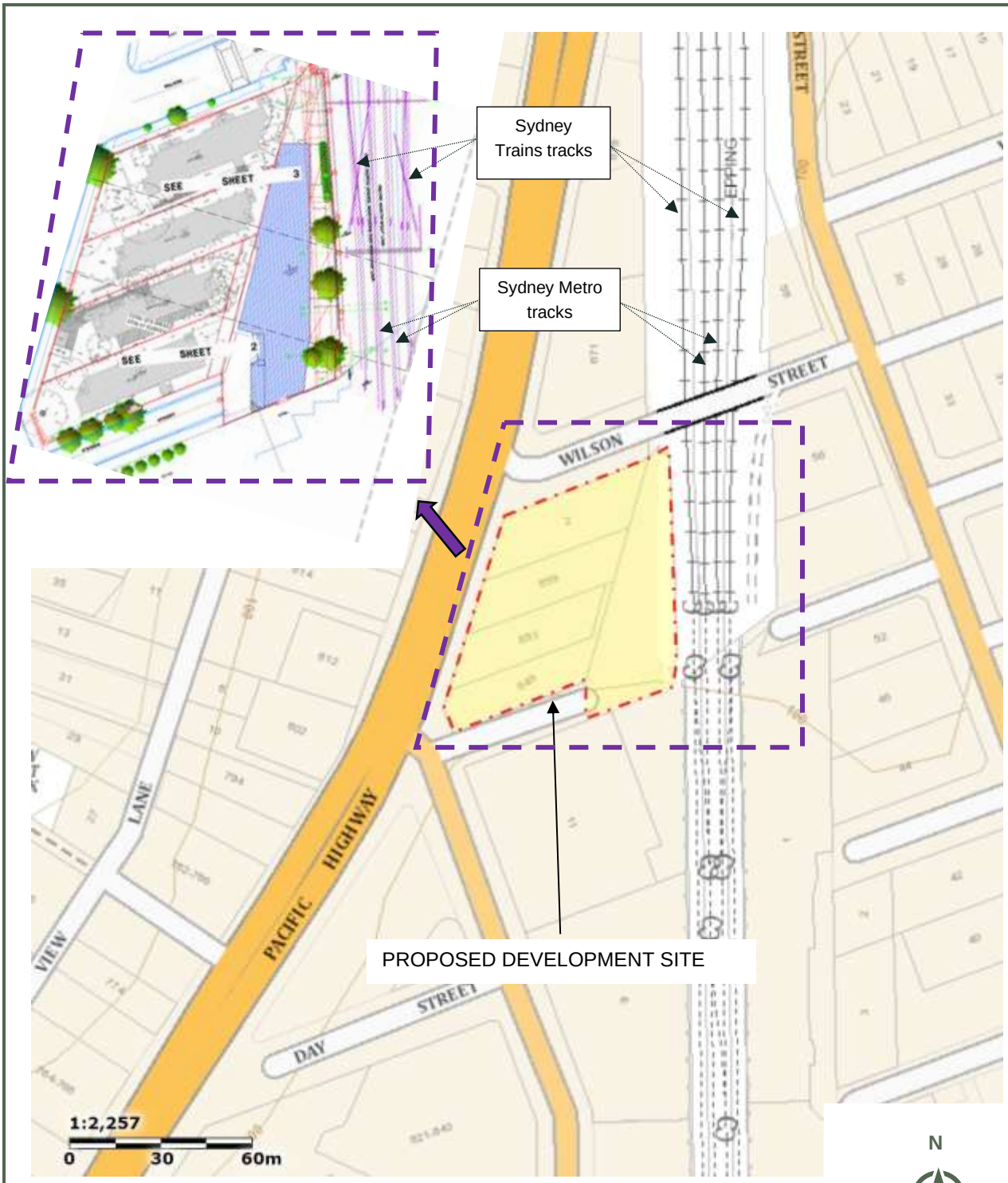


FIGURE 1: SITE LOCALITY | S2207



FIGURE 2: AERIAL PHOTOGRAPH AND 2023 FORTIFY BOREHOLE LOCATIONS

S2207

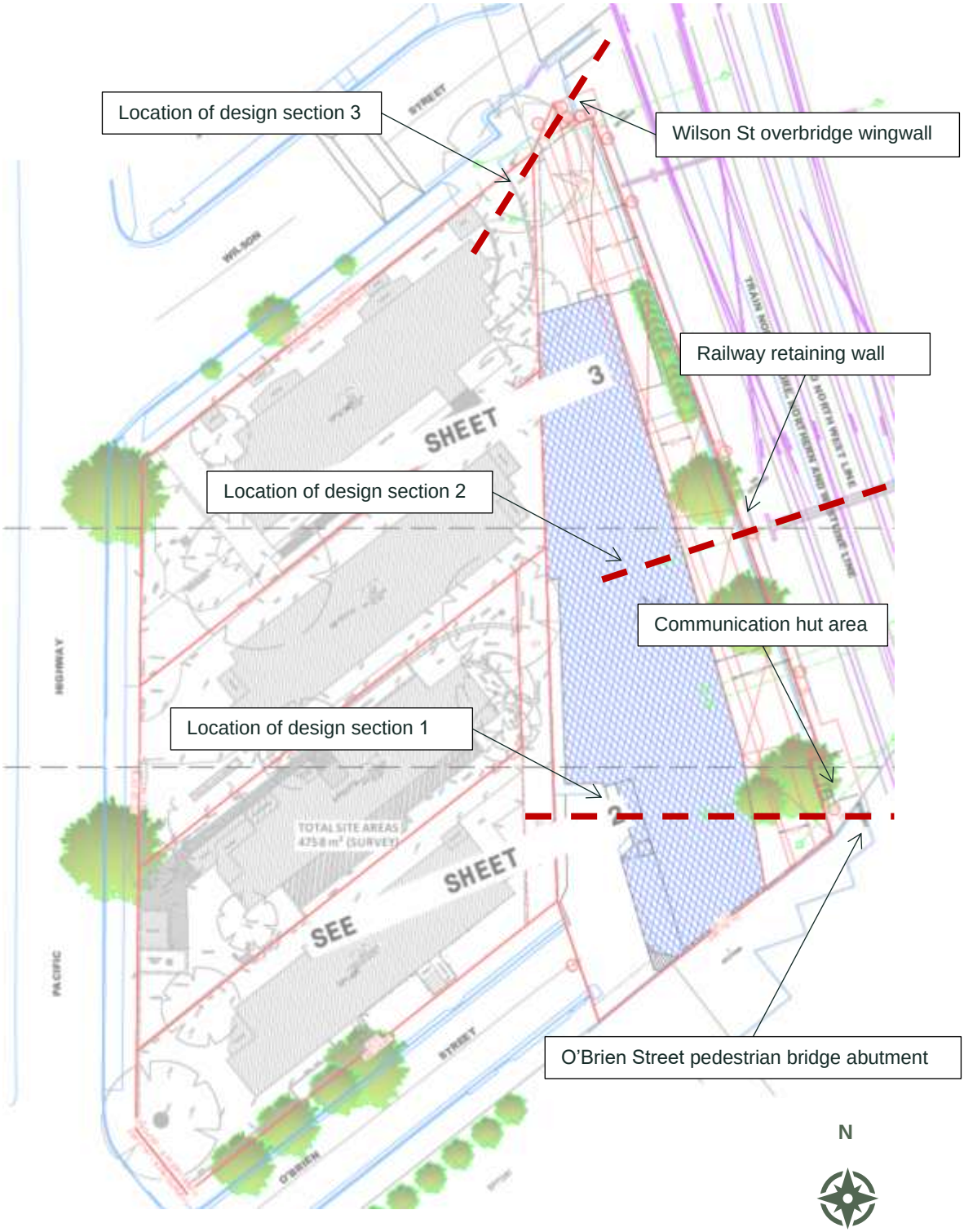


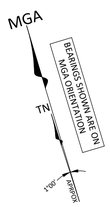
FIGURE 3: LOCATION OF DESIGN SECTIONS | S2207

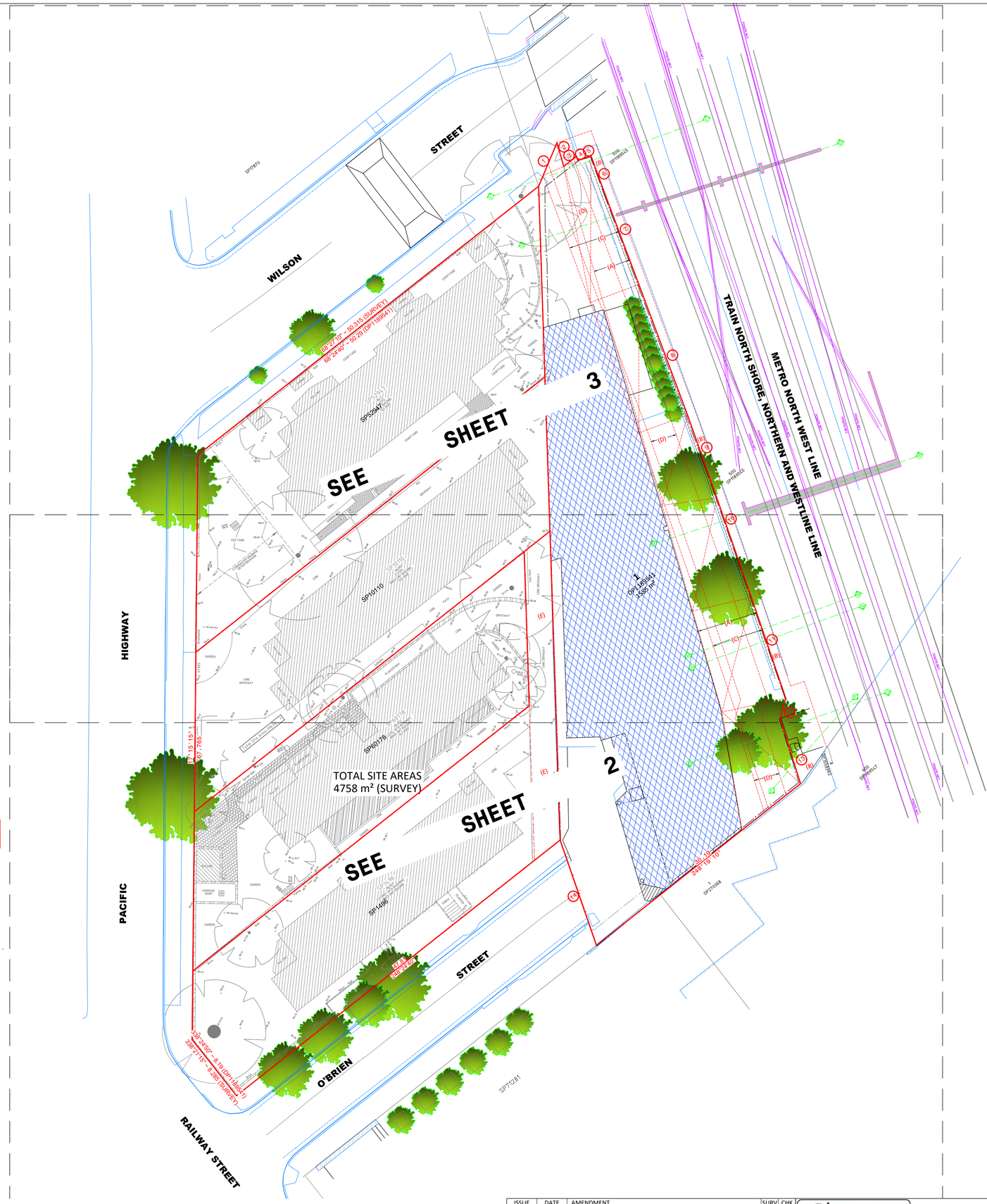
FORTIFY
GEOTECH

Appendix A

Relevant extracts of reference documents and input information

A1





SEE SHEETS 2 & 3 FOR UNDERGROUND SERVICE LINES, TREE INFORMATION & EASEMENT DETAILS

SEE SHEET 4 FOR UNDERGROUND SERVICE TABLES

SEE SHEETS 5-9 FOR RAIL SECTIONS AND PROPOSED DESIGN LOCATION

SCHEDULE OF SHORT LINES

No.	BEARING	DISTANCE
1	39°37'10"	5.455
2	180°30'50"	2.835
3	68°25'10"	1.88
4	178°31'50"	0.485
5	87°13'30"	1.62
6	176°43'10"	4.93
7	176°06'	11
8	176°15'10"	16.155
9	177°13'40"	10.205
10	177°31'40"	12.19
11	177°55'	12.365
12	212°50'20"	2.39
13	179°18'50"	7.955
14	357°41'50"	12.91

2 4 6 8 10 20 25
1:250

Schedule of Easements & Restrictions

No	Description
(A)	EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(B)	EASEMENT FOR SUPPORT 1 WIDE & VARIABLE WIDTH (DP1189541)
(C)	EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 WIDE & VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(D)	EASEMENT FOR ACCESS 3 WIDE (AR288094)
(E)	RIGHT OF WAY 3.05 WIDE (550481)

NOTE:

UL 107.3 DENOTES UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (4) AND (C)

WARNING

THE SURVEY INFORMATION RELATING TO SP52947, SP10110, SP60178 & SP1496 (SHOWN GREY) WAS TAKEN FROM THE DETAIL AND LEVEL PLAN PREPARED BY BURTON & FIELD DRAWING REF. E5380-78240 DATED 08/10/2020. THIS SURVEY HAS NOT BEEN VERIFIED SDG TAKES NO RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION TAKEN FROM THIS PLAN.

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BOUNDARY NOTES

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BOUNDARIES HAVE NOT BEEN MARKED.

SURVEY INFORMATION NOTES

THE ORIGIN OF COORDINATES COMES FROM PM290 E331528.198 N6259353.120 CLASS B POSITIONAL UNCERTAINTY (PU) 0.02 (MGA2020) ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIENTATION OF THIS PLAN IS MGA NORTH WHICH HAS BEEN DETERMINED BY DP1189451.

CERTIFICATE OF TITLE NOTES

THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOTS:

- LOT 1 IN DP1189541
  (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
    - EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE AND VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (C) (DP1189541)
    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP60178)
    - POSITIVE COVENANT (SP60178)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP10110
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP52947
  (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - POSITIVE COVENANT (SP52947)
    - RESTRICTION(S) ON THE USE OF LAND (SP52947)

COVENANTS AND RESTRICTIONS NOTED ON THE TITLE HAVE NOT BEEN INVESTIGATED. THESE SHOULD BE INVESTIGATED PRIOR TO DESIGN TO ENSURE ANY FUTURE DEVELOPMENT COMPLIES.

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PROJECT:
DETAIL AND LEVEL SURVEY OF
LOT 1 IN DP1189541, SP1496,
SP60178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET & LOT 1 O'BRIEN STREET
CHATSWOOD

CLIENT: BB WILSON PROPERTY PTY LTD

FILE: 9062 - Detail & Level - Rev C - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood

LGA: WILLOUGHBY

REF: 9062	CONTOURS: 0.5m
ISSUE: C	DATUM: AHD
SURVEY DATE: 20/03/2024	AZIMUTH: MGA2020
SCALE: 1:250	SHEET 1 OF 9 SHEETS

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT
B	29/01/24	RIDGES AND GUTTERS OF ADJOINING LOTS ADDED	SY	MT
C	20/03/24	RAILWAY SECTION VIEWS ADDED	AZ	MT

BEFORE YOU DIG www.byda.com.au

GDA2020

Global-Mark.com.au

MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

SDG Pty Ltd
abn 85 213 523 621
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t: (02) 9630 7955 w: sdg.net.au
Liability limited by a scheme approved under Professional Standards Legislation

A1

SEE SHEET 3

MGA

TN

BEARINGS SHOWN ARE ON MGA ORIENTATION

1.700° EMPIRE

SPOT LEVELS SHOWN RED HAVE BEEN OBTAINED AS APART OF THIS SURVEY

1 DP1189541

SP10110

SP60178

SP1496

SP71281

TWO STOREY BRICK & METAL SHEET COMMERCIAL BUILDING
LOT 1 IN DP1189541
ACCESS FROM O'BRIEN STREET & WILSON STREET

STORMWATER PIT
Grate RL:103.61
Invert RL:102.87

HIGHWAY

PACIFIC

STREET

O'BRIEN

RAILWAY

MEDIAN STRIP

BACK OF KERB

CONCRETE FOOTPATH

PAVEMENT

GRASS

CONCRETE

BITUMEN

GRAVEL

GLASS FACADE

LANDING

RAMP

CONCRETE DRIVEWAY

STORMWATER PIT
Grate RL:103.25
Invert RL:101.68

STORMWATER PIT
Grate RL:103.16
Invert RL:101.93

STORMWATER PIT
Grate RL:103.04
Invert RL:102.09

STORMWATER PIT
Grate RL:103.26
Invert RL:102.35

STORMWATER PIT
Grate RL:103.40
Invert RL:101.88

STORMWATER PIT
Grate RL:103.27
Invert RL:N/A

LEVEL 1 CONCRETE SLAB
(NON-TRAFFICABLE ROOF)

GROUND FLOOR OUTLINE

RENDERED WALL

CONC WALL

LINTEL

GUARD

RAIL PLATFORM

DISH DRAIN

FACE OF CB

EDGE OF CONCRETE

CONCRETE TUNNEL ENTRY TOP RL:108.65

CONCRETE TUNNEL ENTRY BOTTOM RL:106.65

POWERLINES

SMH INVERT NOT SURVEYED

BENCHMARK
DRILL HOLE AND WING IN KERB

MAGENTA AND GREEN LINEWORK AND LEVELS SHOWN HAVE BEEN OBTAINED AS PART OF REVISION B

WARNING

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2 4 6 8 10 15
1:150

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT
B	29/01/24	RIDGES AND GUTTERS OF ADJOINING LOTS ADDED	SY	MT
C	20/03/24	RAILWAY SECTION VIEWS ADDED	AZ	MT

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    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP60178)
    - POSITIVE COVENANT (SP60178)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP10110
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP52947
  (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
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LEGEND

TAG	DESCRIPTION	TAG	DESCRIPTION	TAG	DESCRIPTION
B	BOLLARD	LP	LIGHT POLE	WM	WATER METER
BOK	BACK OF KERB	MC	METAL COVER		
CB	CAPPING BEAM	PC	PRAM CROSSING		
CL	CENTRELINE OF ROAD	PP	POWER POLE		
COL	COLUMN	SC	STOP COCK		
COM	COMMUNICATIONS PIT	SGR	SEALED GRATE		
CONC	CONCRETE	SIP	SEWER INSPECTION PIT		
EP	ELECTRICITY PIT	SMH	SEWER MANHOLE		
GAS	GAS LID	SS	STREET SIGN		
GDN	GARDEN	ST	STAIRS		
GR	GRATE	SV	STOP VALVE		
GUARD	GUARD RAIL	TK	TOP OF KERB		
GUT	GUTTER OF KERB	TS	TRAFFIC SIGNAL		
HYD	HYDRANT	TSP	TRAFFIC SIGNAL PIT		
LIP	LIP OF KERB	VC	VEHICLE CROSSING		

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UNDERGROUND SERVICES LEGEND
QUALITY LEVEL B (AS 5488.1:2019)

W	POTABLE WATER MAIN
D	STORMWATER PIPE
S	SEWER MAIN
C	COMMUNICATIONS CABLES
E	ELECTRICITY CABLES
G	GAS MAIN
U	UNIDENTIFIED SERVICES

CAUTION: FIBRE OPTIC CABLES ARE PRESENT IN THIS AREA

SERVICES NOTES:-

1. ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND IF SHOWN AS "+ 89.67" ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019. LEVELS SHOWN ARE SURFACE LEVELS UNLESS NOTED OTHERWISE.
2. UNDERGROUND SERVICES HAVE BEEN LOCATED FOR POSITION AND DEPTH AND HAVE BEEN DETERMINED FROM USING EQUIPMENT ON REPORT PROVIDED BY ONPOINT LOCATING ON 30/10/23 - 31/10/23. ALL RELEVANT AUTHORITIES MUST BE CONTRACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

Schedule of Easements & Restrictions

No	Description
(A)	EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(B)	EASEMENT FOR SUPPORT 1 WIDE & VARIABLE WIDTH (DP1189541)
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(D)	EASEMENT FOR ACCESS 3 WIDE (AR288094)
(E)	RIGHT OF WAY 3.05 WIDE (550481)

NOTE:

UL 107.3 DENOTES UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (A) AND (C)

Schedule of Trees

No	Diam	Spread	Height
1	0.1	2	5
2	0.2	5	5
3	0.2	2	5
4	1.0	10	11
5	1.0	10	11
6	0.2	3	3
7	0.2	3	3
8	0.2	3	3
9	0.2	3	3
10	0.2	3	3
11	0.2	3	3
12	0.5	8	8
13	0.3	5	6
14	0.4	6	7
15	0.4	6	7
17	0.2	2	2
18	0.4	7	7
19	0.4	8	8
20	0.2	5	5
21	0.4	8	8
22	0.2	2	2
23	0.2	2	2
24	0.2	2	2
25	0.2	2	2
26	0.2	2	2
27	0.2	2	2
28	0.2	2	2
29	0.2	2	2
30	0.2	2	2
31	0.2	2	2
32	0.2	2	2
33	0.2	2	2

SCHEDULE OF SHORT LINES

No.	BEARING	DISTANCE
1	39°37'10"	5.455
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4	178°31'50"	0.485
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LOT 1 IN DP1189541, SP1496,
SP60178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET
& LOT 1 O'BRIEN STREET
CHATSWOOD

CLIENT: BB WILSON PROPERTY PTY LTD

FILE: 9062 - Detail & Level - Rev C - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood

LGA: WILLOUGHBY

REF: 9062	CONTOURS: 0.5m
ISSUE: C	DATUM: AHD
SURVEY DATE: 20/03/2024	AZIMUTH: MGA2020
SCALE: 1:150	SHEET 2 OF 9 SHEETS

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Liability limited by a scheme approved under Professional Standards Legislation

MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

A1

UNDERGROUND SERVICES LEGEND
QUALITY LEVEL B (AS 5488.1:2019)

- W — POTABLE WATER MAIN
- D — STORMWATER PIPE
- S — SEWER MAIN
- C — COMMUNICATIONS CABLES
- E — ELECTRICITY CABLES
- G — GAS MAIN
- U — UNIDENTIFIED SERVICES

CAUTION: FIBRE OPTIC CABLES ARE PRESENT IN THIS AREA

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UL 107.3 DENOTES UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (A) AND (C)

WARNING

THE SURVEY INFORMATION RELATING TO SP52947, SP10110, SP60178 & SP1496 (SHOWN GREY) WAS TAKEN FROM THE DETAIL AND LEVEL PLAN PREPARED BY BURTON & FIELD DRAWING REF. E5380-78240 DATED 08/10/2020. THIS SURVEY HAS NOT BEEN VERIFIED SDG TAKES NO RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION TAKEN FROM THIS PLAN.

SCHEDULE OF SHORT LINES

No.	BEARING	DISTANCE
1	39°37'10"	5.455
2	180°30'50"	2.835
3	68°25'10"	1.88
4	178°31'50"	0.485
5	87°13'30"	1.62
6	176°43'10"	4.93
7	176°06'	11
8	176°15'10"	16.155
9	177°13'40"	10.205
10	177°31'40"	12.19
11	177°55'	12.365
12	212°50'20"	2.39
13	179°18'50"	7.955
14	357°41'50"	12.91

Schedule of Trees

No	Diam	Spread	Height
1	0.1	2	5
2	0.2	5	5
3	0.2	2	5
4	1.0	10	11
5	1.0	10	11
6	0.2	3	3
7	0.2	3	3
8	0.2	3	3
9	0.2	3	3
10	0.2	3	3
11	0.2	3	3
12	0.5	8	8
13	0.3	5	6
14	0.4	6	7
15	0.4	6	7
17	0.2	2	2
18	0.4	7	7
19	0.4	8	8
20	0.2	5	5
21	0.4	8	8
22	0.2	2	2
23	0.2	2	2
24	0.2	2	2
25	0.2	2	2
26	0.2	2	2
27	0.2	2	2
28	0.2	2	2
29	0.2	2	2
30	0.2	2	2
31	0.2	2	2
32	0.2	2	2
33	0.2	2	2
34	0.2	2	2

LEGEND

TAG	DESCRIPTION	TAG	DESCRIPTION	TAG	DESCRIPTION
B	BOLLARD	LP	LIGHT POLE	WM	WATER METER
BOK	BACK OF KERB	MC	METAL COVER		
CB	CAPPING BEAM	PC	PRAM CROSSING		
CL	CENTRELINE OF ROAD	PP	POWER POLE		
COL	COLUMN	SC	STOP COCK		
COM	COMMUNICATIONS PIT	SGR	SEALED GRATE		
CONC	CONCRETE	SIP	SEWER INSPECTION PIT		
EP	ELECTRICITY PIT	SMH	SEWER MANHOLE		
GAS	GAS LID	SS	STREET SIGN		
GDN	GARDEN	ST	STAIRS		
GR	GRATE	SV	STOP VALVE		
GUARD	GUARD RAIL	TK	TOP OF KERB		
GUT	GUTTER OF KERB	TS	TRAFFIC SIGNAL		
HYD	HYDRANT	TSP	TRAFFIC SIGNAL PIT		
LIP	LIP OF KERB	VC	VEHICLE CROSSING		

GENERAL NOTES

ONLY TREES GREATER THAN 2 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS ARE DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN.

CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.

LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (AHD).

ALL SETOUT LEVELS MUST BE REFERRED TO THE BENCH MARK SHOWN ON THIS PLAN.

BOUNDARY NOTES

A BASIC BOUNDARY SURVEY HAS BEEN DONE SUITABLE FOR DA LODGEMENT PURPOSES.

BOUNDARIES HAVE NOT BEEN MARKED.

SURVEY INFORMATION NOTES

THE ORIGIN OF COORDINATES COMES FROM PM290 E331528.198 N6259353.120 CLASS B POSITIONAL UNCERTAINTY (PU) 0.02 (MGA2020) ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIENTATION OF THIS PLAN IS MGA NORTH WHICH HAS BEEN DETERMINED BY DP1189451.

CERTIFICATE OF TITLE NOTES

THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOTS:

- LOT 1 IN DP1189541
  (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
    - EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE AND VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (C) (DP1189541)
    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP60178)
    - POSITIVE COVENANT (SP60178)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP10110
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP52947
  (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - POSITIVE COVENANT (SP52947)
    - RESTRICTION(S) ON THE USE OF LAND (SP52947)

COVENANTS AND RESTRICTIONS NOTED ON THE TITLE HAVE NOT BEEN INVESTIGATED. THESE SHOULD BE INVESTIGATED PRIOR TO DESIGN TO ENSURE ANY FUTURE DEVELOPMENT COMPLIES.

BY LAWS RELATING TO EACH OF THE SCHEMES HAVE NOT BEEN INVESTIGATED.

SERVICES NOTES

ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019.

UNDERGROUND SERVICES HAVE BEEN LOCATED FOR BY 'ON POINT LOCATING' ON 31/10/2023 AND 01/11/2023 USING EQUIPMENT AS NOTED ON REPORT PROVIDED DATED 31/10/2023 AND 01/11/2023. THE SERVICE POSITION IS SHOWN ON THE PLAN AND THEIR RESPECTIVE DEPTH AND QUALITY ARE AS STATED IN THE TABLE.

UNDERGROUND SERVICES HAVE BEEN PLOTTED FROM 'DIAL-BEFORE'YOU-DIG' PLANS, ARE QUALITY LEVEL D AS DEFINED BY AS 5488.1:2019 AND ARE ONLY CURRENT AT THE DATE OF SEARCH.

ALL RELEVANT AUTHORITIES MUST BE CONTACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

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PROJECT:
DETAIL AND LEVEL SURVEY OF
LOT 1 IN DP1189541, SP1496,
SP60178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET
& LOT 1 O'BRIEN STREET
CHATSWOOD

CLIENT: BB WILSON PROPERTY PTY LTD	
FILE: 9062 - Detail & Level - Rev C - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood	
LGA: WILLOUGHBY	
REF: 9062	CONTOURS: 0.5m
ISSUE: C	DATUM: AHD
SURVEY DATE: 20/03/2024	AZIMUTH: MGA2020
SCALE: 1:150	SHEET 3 OF 9 SHEETS

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT
B	29/01/24	RIDGES AND GUTTERS OF ADJOINING LOTS ADDED	SY	MT
C	20/03/24	RAILWAY SECTION VIEWS ADDED	AZ	MT

BEFORE YOU DIG www.byda.com.au

GDA2020

MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

SDG Pty Ltd
abn 85 213 523 621
Suite 1, 3 Railway Street, Baulkham Hills NSW 2153
t: (02) 9630 7955 w: sdg.net.au
Liability limited by a scheme approved
under Professional Standards Legislation

2 4 6 8 10 15
1:150

A1

SERVICES-COMMUNICATIONS			
No	Surface RL	Approx Depth	Service RL
1	104.30	0.90	103.40
2	104.54	0.90	103.64
3	105.04	0.70	104.34
4	105.15	0.60	104.55
5	105.85	0.50	105.35
6	106.01	0.40	105.61
7	106.07	0.40	105.67
8	106.26	0.50	105.76
9	106.42	0.30	106.12
10	106.48	0.60	105.88
11	106.61	0.60	106.01
12	106.56	0.30	106.26
13	106.86	0.40	106.46
14	106.86	0.60	106.26
15	107.48	0.80	106.68
16	107.53	0.80	106.73
17	107.46	0.30	107.16
18	107.53	0.30	107.23
19	107.55	0.60	106.95
20	107.52	0.50	107.02
21	107.56	0.60	106.96
22	107.61	0.80	106.81
23	107.64	0.80	106.84
24	107.62	0.30	107.32
25	107.70	0.20	107.50
26	107.66	0.70	106.96
27	107.62	0.60	107.02
28	107.55	0.50	107.05
29	107.44	0.60	106.84
30	105.90	0.40	105.50
31	105.64	0.30	105.34
32	105.34	0.40	104.94
33	105.06	0.40	104.66
34	104.84	0.40	104.44
35	104.74	0.30	104.44
36	104.44	0.40	104.04
37	104.10	0.40	103.70
38	103.74	0.40	103.34
39	103.51	0.40	103.11
40	103.42	0.60	102.82

SERVICES-SEWER			
No	Surface RL	Approx Depth	Service RL
41	105.14	2.80	102.34
42	107.38	4.10	103.28
43	103.23	2.61	100.62
44	105.13	2.90	102.23
45	103.21	2.63	100.58
46	103.33	1.50	101.83
47	103.65	1.90	101.75
138	107.38	0.98	106.40
139	107.37	3.94	103.43
140	107.36	3.83	103.53

SERVICES-GAS			
No	Surface RL	Approx Depth	Service RL
121	105.90	0.50	105.40
122	106.07	0.50	105.57
123	106.72	0.50	106.22
124	106.84	0.70	106.14
125	107.02	0.50	106.52

SERVICES-POTABLE WATER			
No	Surface RL	Approx Depth	Service RL
48	103.41	0.50	102.91
49	103.36	0.70	102.66
50	103.32	0.70	102.62
51	103.31	0.60	102.71
52	103.58	0.70	102.88
53	103.86	0.70	103.16
54	104.07	0.70	103.37
55	104.33	0.70	103.63
56	105.50	0.30	105.20
57	105.46	0.60	104.86
58	105.60	0.70	104.90
59	105.89	0.70	105.19
60	105.90	0.40	105.50
61	105.98	0.30	105.68
62	105.99	0.70	105.29
63	106.01	0.60	105.41
64	106.23	0.60	105.63
65	106.39	0.60	105.79
66	106.52	0.30	106.22
67	106.52	0.60	105.92
68	106.74	0.40	106.34
69	106.84	0.60	106.24
70	106.74	0.80	105.94
71	107.22	0.80	106.42
72	107.45	0.80	106.65

SERVICES-TRAFFIC			
No	Surface RL	Approx Depth	Service RL
73	104.32	0.60	103.72
74	104.17	0.50	103.67
75	104.40	0.50	103.90
76	104.58	0.40	104.18
77	104.59	0.30	104.29
78	104.84	0.30	104.54
79	104.99	0.50	104.49
80	105.19	0.60	104.59
81	105.31	0.50	104.81
82	105.36	0.45	104.91
83	105.31	0.45	104.86

SERVICES-UNIDENTIFIED			
No	Surface RL	Approx Depth	Service RL
126	107.29	0.60	106.69
127	107.34	0.60	106.74
128	107.23	0.60	106.63
129	107.30	0.60	106.70
130	106.57	0.50	106.07
131	106.61	0.50	106.11
132	106.50	0.50	106.00
133	106.53	0.50	106.03
134	106.15	0.40	105.75
135	106.07	0.40	105.67
136	106.12	0.30	105.82
137	106.09	0.30	105.79

SERVICES-ELECTRICTY			
No	Surface RL	Approx Depth	Service RL
84	103.23	0.80	102.43
85	103.37	0.40	102.97
86	103.37	0.50	102.87
87	103.80	0.70	103.10
88	104.03	0.50	103.53
89	104.34	0.45	103.89
90	104.33		
91	104.31	1.00	103.31
92	104.20	1.10	103.10
93	104.47	1.00	103.47
94	104.65	0.55	104.10
95	104.81	0.60	104.21
96	104.77	0.65	104.12
97	104.90	1.40	103.50
98	105.13	1.10	104.03
99	105.23	1.10	104.13
100	105.34	1.30	104.04
101	105.41	1.20	104.21
102	105.45	1.20	104.25
103	105.40	1.30	104.10
104	105.58	1.20	104.38
105	105.64	1.00	104.64
106	105.90	0.80	105.10
107	106.09	1.00	105.09
108	106.32	1.00	105.32
109	106.51	1.10	105.41
110	106.62	1.10	105.52
111	106.87	0.90	105.97
112	106.99	0.80	106.19
113	107.20	0.75	106.45
114	107.33	0.70	106.63
115	107.40	0.80	106.60
116	107.48	1.10	106.38
117	107.44	1.10	106.34
118	107.44	1.10	106.34
119	107.45	0.90	106.55
120	107.39	1.20	106.19

WARNING

ALL SERVICES LEVELS ARE OBVERT LEVELS WITH THE EXCEPTION OF SEWER AND DRAINGAGE

FOR PIPE SIZES REFER TO BYDA PLANS AND WHERE PIPE SIZING AND LEVELS ARE CRITICAL TO DESIGN, POTHOLING SHOULD BE UNDETAKEN

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT
B	29/01/24	RIDGES AND GUTTERS OF ADJOINING LOTS ADDED	SY	MT
C	20/03/24	RAILWAY SECTION VIEWS ADDED	AZ	MT

BEFORE YOU DIG www.byda.com.au

GDA2020

MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

GENERAL NOTES

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SURVEY INFORMATION NOTES

THE ORIGIN OF COORDINATES COMES FROM PM290 E331528.198 N6259353.120 CLASS B POSITIONAL UNCERTAINTY (PU) 0.02 (MGA2020) ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.

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CERTIFICATE OF TITLE NOTES

THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOTS:

- LOT 1 IN DP1189541
  (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
    - EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE AND VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (C) (DP1189541)
    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP60178)
    - POSITIVE COVENANT (SP60178)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP10110
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP52947
  (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - POSITIVE COVENANT (SP52947)
    - RESTRICTION(S) ON THE USE OF LAND (SP52947)

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PROJECT:

DETAIL AND LEVEL SURVEY OF
LOT 1 IN DP1189541, SP1496,
SP60178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET
& LOT 1 O'BRIEN STREET
CHATSWOOD

CLIENT: BB WILSON PROPERTY PTY LTD

FILE: 9062 - Detail & Level - Rev C - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood

LGA: WILLOUGHBY

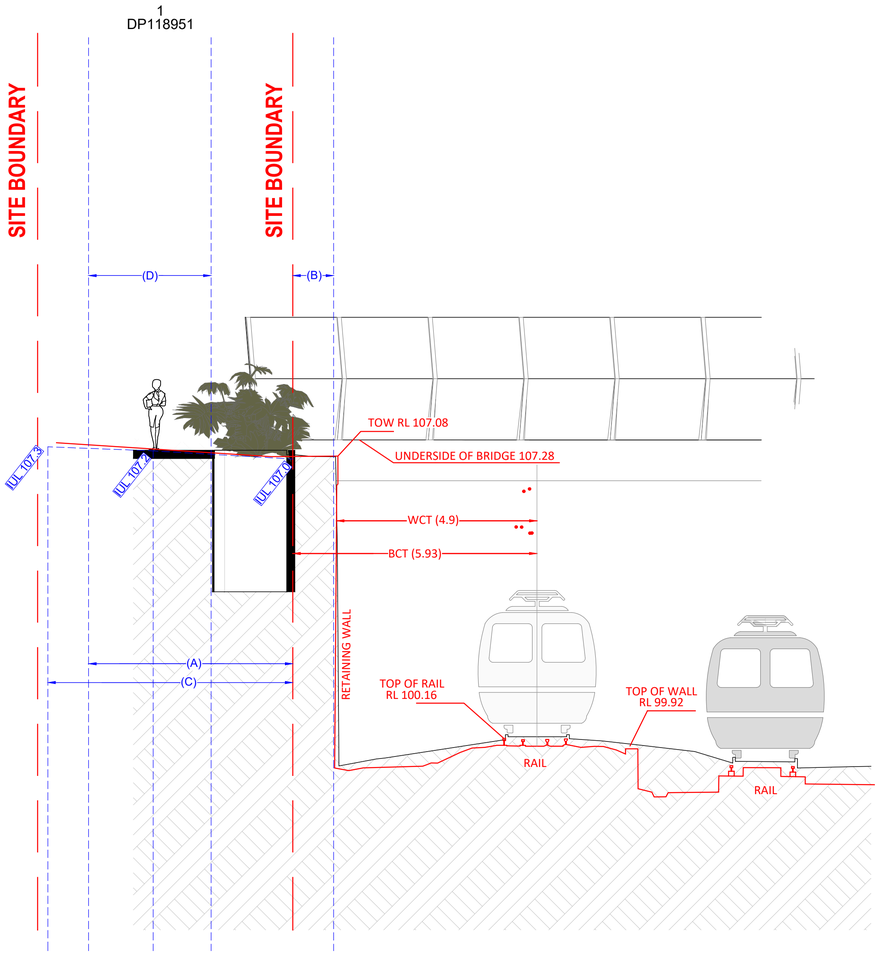
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ISSUE: C	DATUM: AHD
SURVEY DATE: 20/03/2024	AZIMUTH: MGA2020
SCALE: N/A	SHEET 4 OF 9 SHEETS

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abn 85 213 523 621
Suite 1, 3 Railway Street, Baulkham Hills NSW 2153
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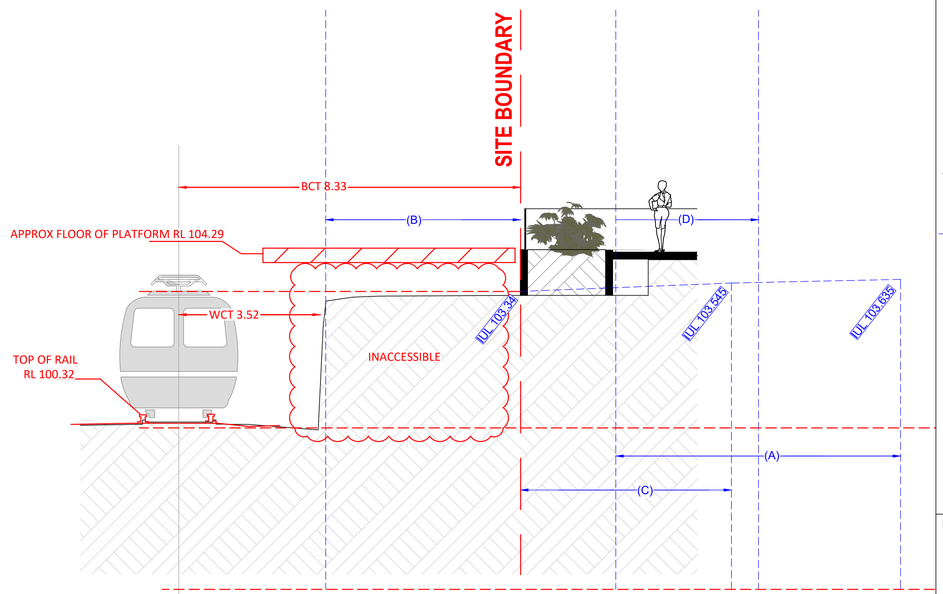
A1

• Denotes ELECTRICITY WIRES

1
DP118951



SECTION VIEW Ⓛ-Ⓛ



SECTION VIEW Ⓟ-Ⓟ

Schedule of Easements & Restrictions	
No	Description
(A)	EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(B)	EASEMENT FOR SUPPORT 1 WIDE & VARIABLE WIDTH (DP1189541)
(C)	EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 WIDE & VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(D)	EASEMENT FOR ACCESS 3 WIDE (AR288094)
NOTE:	
IUL 107.3	DENOTES INTERPOLATED UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (A) AND (C)

GENERAL NOTES

ONLY TREES GREATER THAN 2 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS ARE DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN.

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BOUNDARIES HAVE NOT BEEN MARKED.

SURVEY INFORMATION NOTES

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THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.

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  (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)
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    - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
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    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP60178)
    - POSITIVE COVENANT (SP60178)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP10110
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP52947
  (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - POSITIVE COVENANT (SP52947)
    - RESTRICTION(S) ON THE USE OF LAND (SP52947)

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BY LAWS RELATING TO EACH OF THE SCHEMES HAVE NOT BEEN INVESTIGATED.

LEGEND

BCT denotes BOUNDARY TO CENTERLINE OF TRACK
WCT denotes WALL TO CENTERLINE OF TRACK
TOW denotes TOP OF WALL
IUL denotes INTERPOLATED UPPER LIMIT
– – – denotes APPROXIMATE EASEMENT POSITION

NOTE:
DESIGN ELEVATIONS PROVIDED DIGITALLY BY PBD ARCHITECTS DRAWING NUMBER DA801 ISSUE 1 DATED 6/3/2024

THE BOUNDARY LINE WAS ADOPTED FOR THE POSITIONING OF THE SECTION

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PROJECT:
DETAIL AND LEVEL SURVEY OF
LOT 1 IN DP1189541, SP1496,
SP60178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET
& LOT 1 O'BRIEN STREET
CHATSWOOD

CLIENT: BB WILSON PROPERTY PTY LTD

FILE: 9062 - Detail & Level - Rev C - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood

LGA: WILLOUGHBY

REF: 9062	CONTOURS: 0.5m
ISSUE: C	DATUM: AHD
SURVEY DATE: 20/03/2024	AZIMUTH: MGA2020
SCALE: 1:75	SHEET 5 OF 9 SHEETS

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT
B	29/01/24	RIDGES AND GUTTERS OF ADJOINING LOTS ADDED	SY	MT
C	20/03/24	RAILWAY SECTION VIEWS ADDED	AZ	MT

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MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

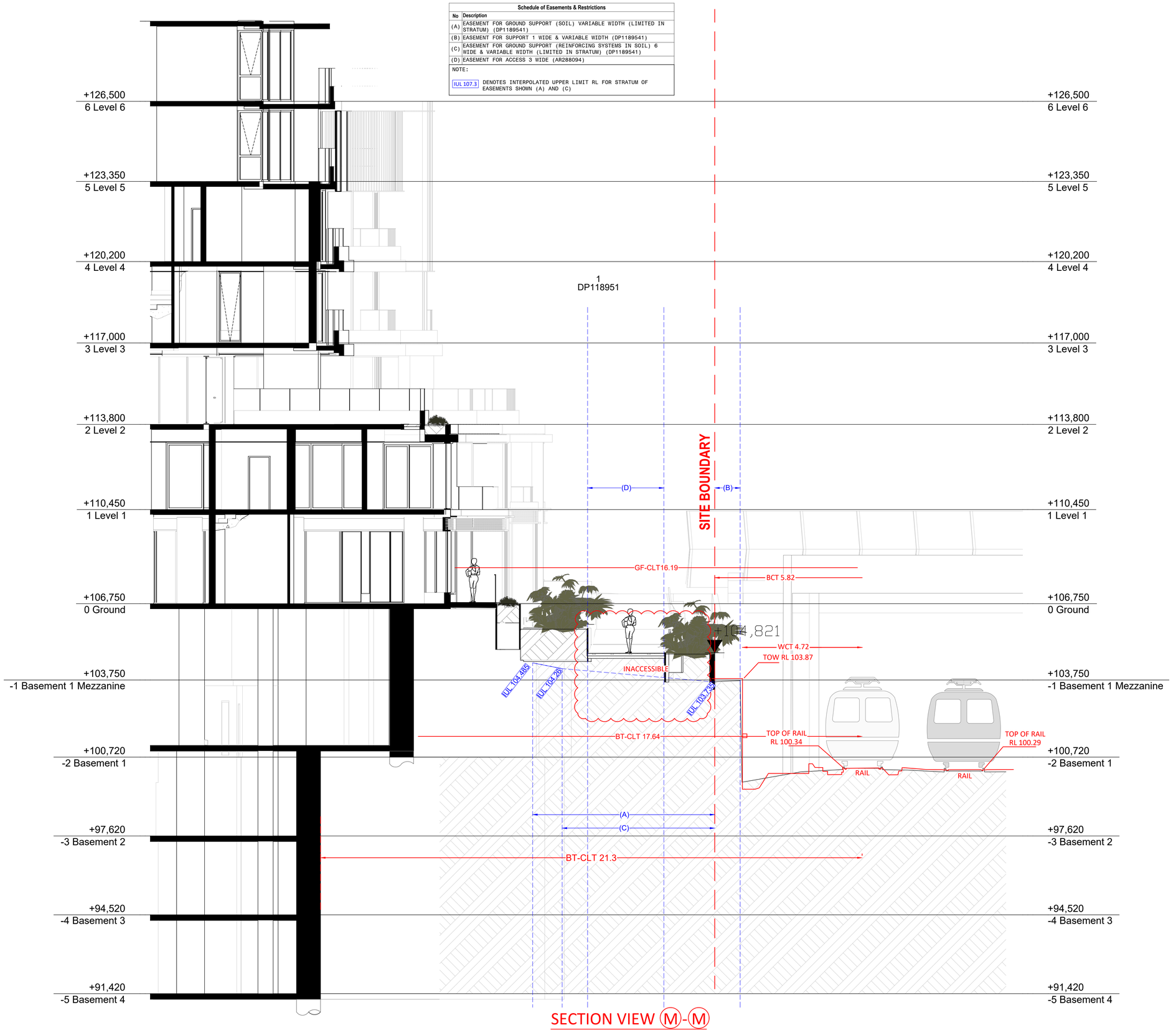
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Schedule of Easements & Restrictions	
No	Description
(A)	EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(B)	EASEMENT FOR SUPPORT 1 WIDE & VARIABLE WIDTH (DP1189541)
(C)	EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 WIDE & VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
(D)	EASEMENT FOR ACCESS 3 WIDE (AR288094)

NOTE:

IUL 107.3 DENOTES INTERPOLATED UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (A) AND (C)



SECTION VIEW Ⓜ-Ⓜ

GENERAL NOTES

ONLY TREES GREATER THAN 2 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS ARE DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN.

CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.

LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (AHD).

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BOUNDARY NOTES

A BASIC BOUNDARY SURVEY HAS BEEN DONE SUITABLE FOR DA LODGEMENT PURPOSES.

BOUNDARIES HAVE NOT BEEN MARKED.

SURVEY INFORMATION NOTES

THE ORIGIN OF COORDINATES COMES FROM PM290 E331528.198 N6259353.120 CLASS B POSITIONAL UNCERTAINTY (PU) 0.02 (MGA2020) ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIGIN OF LEVELS COMES FROM PM290 RL107.323 CLASS LA POSITIONAL UNCERTAINTY (PU) 0.02 ADOPTED FROM SCIMS DATED 02/11/2023.

THE ORIENTATION OF THIS PLAN IS MGA NORTH WHICH HAS BEEN DETERMINED BY DP1189451.

CERTIFICATE OF TITLE NOTES

THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOTS:

- LOT 1 IN DP1189541
  (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
    - EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE AND VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (C) (DP1189541)
    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
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    - RESTRICTION(S) ON THE USE OF LAND (SP52947)

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- - -	denotes APPROXIMATE EASEMENT POSITION

NOTE:
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THE BOUNDARY LINE WAS ADPOPTED FOR THE POSITIONING OF THE SECTION

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PROJECT:

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849-859 PACIFIC HIGHWAY, 2 WILSON STREET
& LOT 1 O'BRIEN STREET
CHATSWOOD

CLIENT: BB WILSON PROPERTY PTY LTD	
FILE: 9062 - Detail & Level - Rev C - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood	
LGA: WILLOUGHBY	
REF: 9062	CONTOURS: 0.5m
ISSUE: C	DATUM: AHD
SURVEY DATE: 20/03/2024	AZIMUTH: MGA2020
SCALE: 1:75	SHEET 6 OF 9 SHEETS

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT
B	29/01/24	RIDGES AND GUTTERS OF ADJOINING LOTS ADDED	SY	MT
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Quality Management ISO 9001 Global-Mark.com.au®
Environmental Management ISO 14001 Global-Mark.com.au®

MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

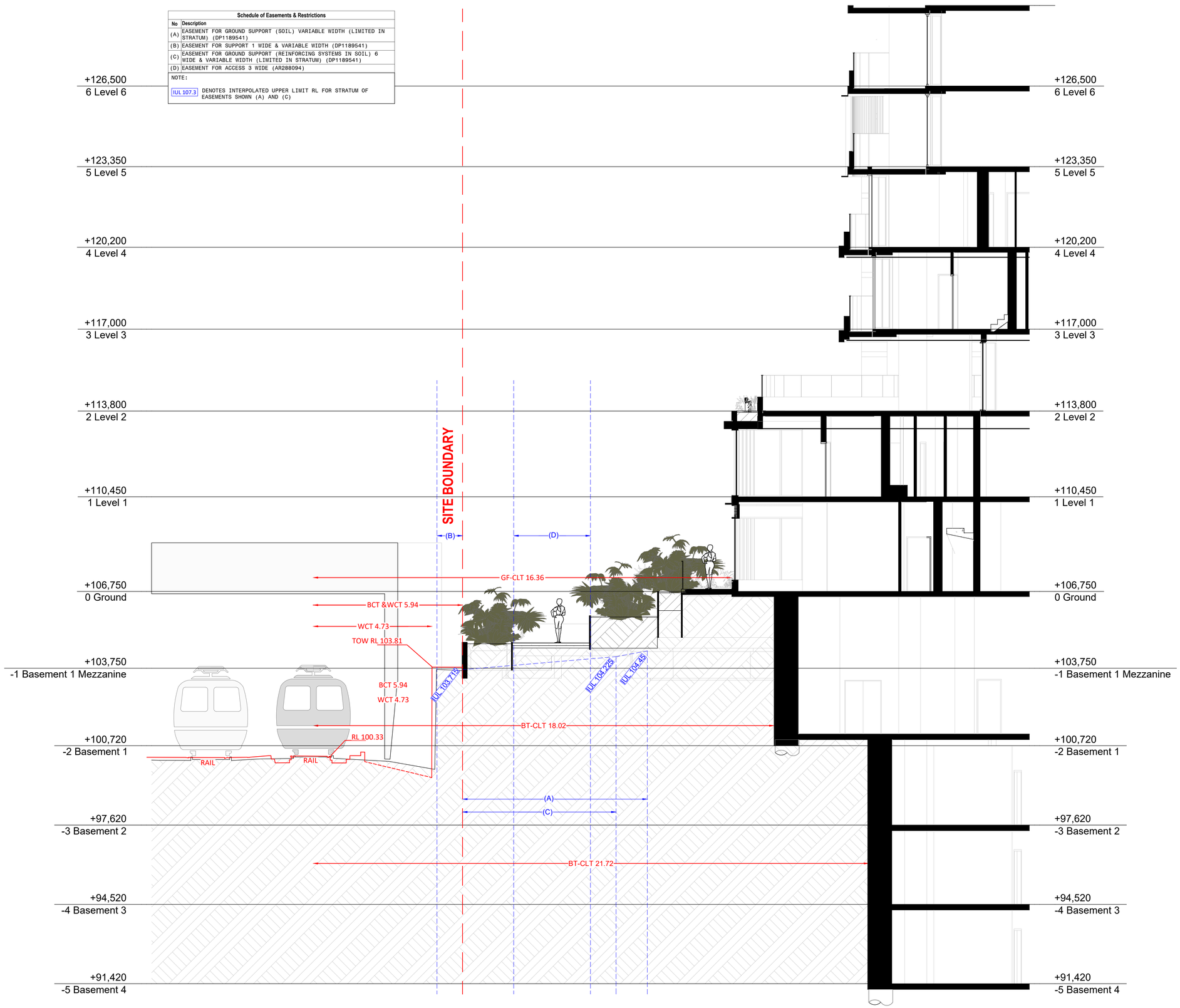
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NOTE:

IUL 107.3 DENOTES INTERPOLATED UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (A) AND (C)



SECTION VIEW Ⓝ-Ⓝ

ISSUE	DATE	AMENDMENT	SURV	CHK
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MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

GENERAL NOTES

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  - BENEFITED BY:
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- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP60178)
    - POSITIVE COVENANT (SP60178)
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  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
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  (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
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PROJECT:
DETAIL AND LEVEL SURVEY OF
LOT 1 IN DP1189541, SP1496,
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849-859 PACIFIC HIGHWAY, 2 WILSON STREET & LOT 1 O'BRIEN STREET
CHATSWOOD

CLIENT: BB WILSON PROPERTY PTY LTD

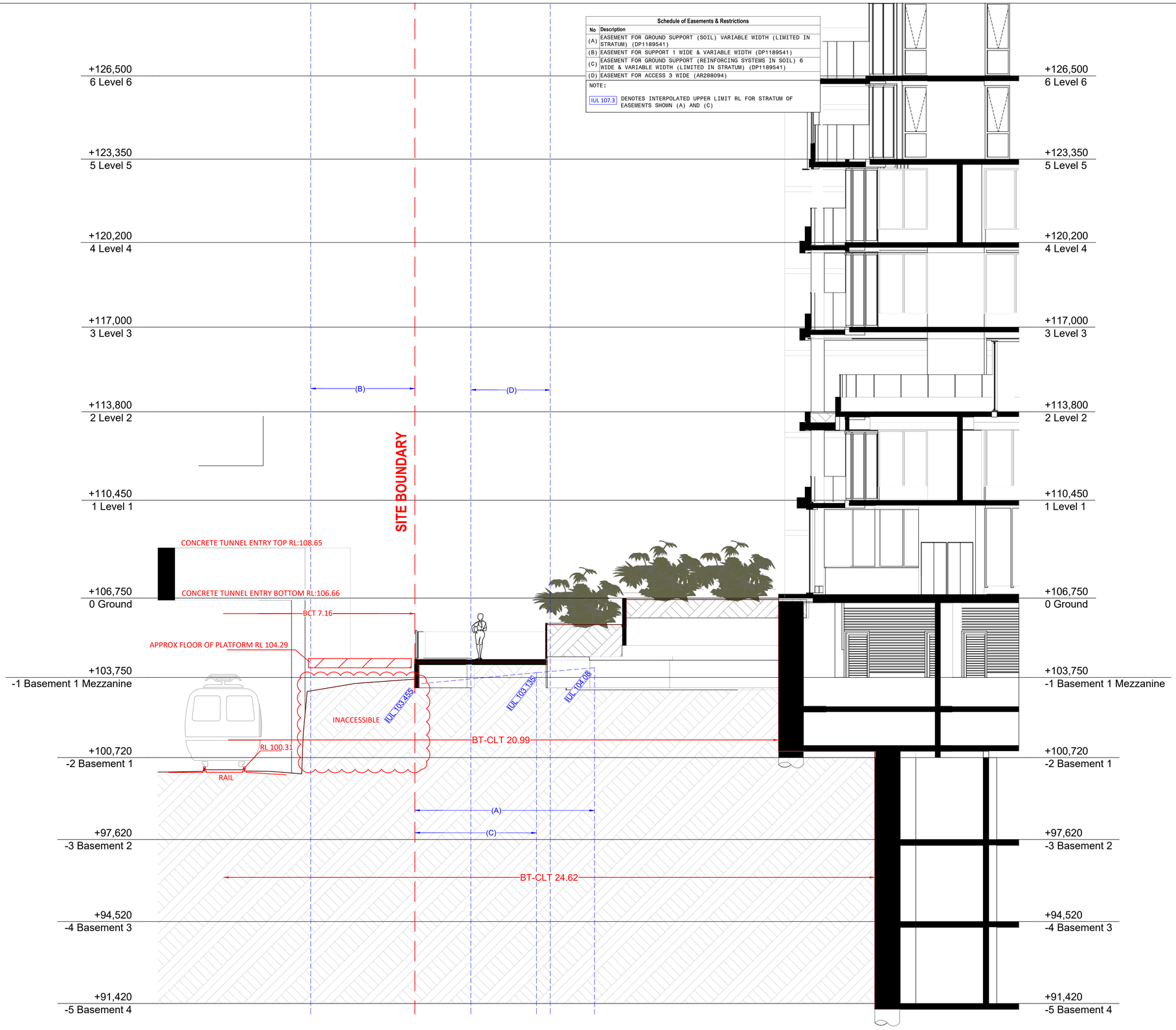
FILE: 9062 - Detail & Level - Rev C - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood

LGA: WILLOUGHBY

REF: 9062	CONTOURS: 0.5m
ISSUE: C	DATUM: AHD
SURVEY DATE: 20/03/2024	AZIMUTH: MGA2020
SCALE: 1:75	SHEET 7 OF 9 SHEETS

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Schedule of Easements & Restrictions

No	Description
(A)	EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) (DP1189541)
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NOTE:

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SECTION VIEW Ⓞ-Ⓞ

GENERAL NOTES

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  (CT EDITION 7 DATED 16/10/2023 SEARCH DATE 07/11/2023)
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    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
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CLIENT: BB WILSON PROPERTY PTY LTD

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B	29/01/24	RIDGES AND GUTTERS OF ADJOINING LOTS ADDED	SY	MT
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MICHAEL TRIFIRO ID: SU008624
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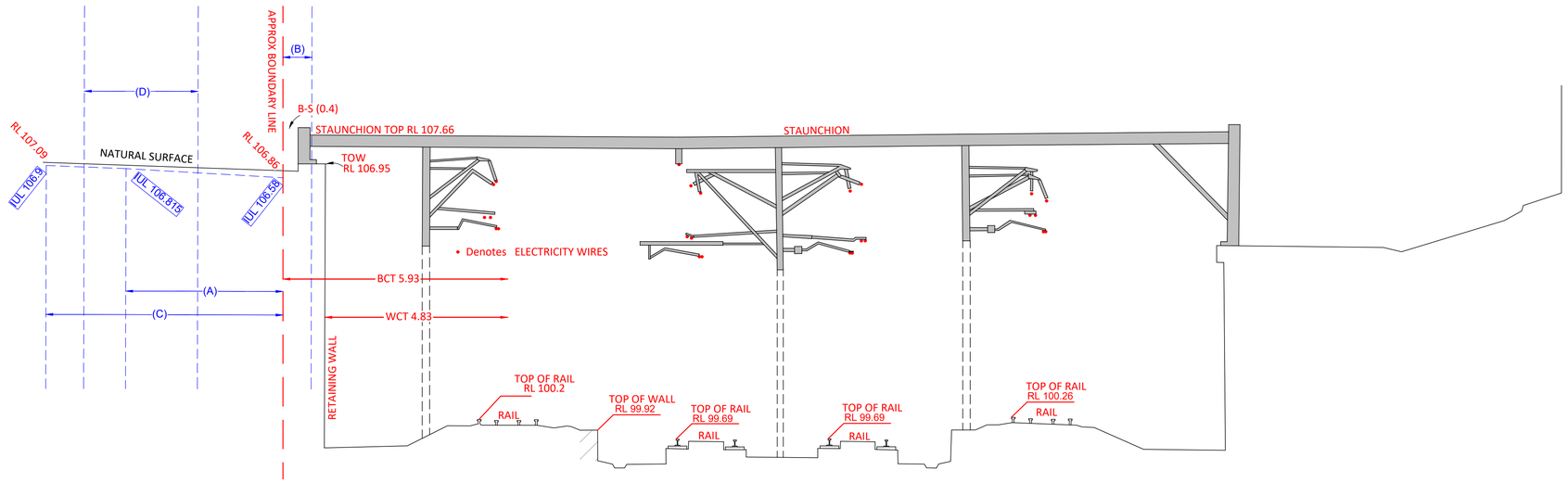
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Schedule of Easements & Restrictions	
No	Description
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NOTE:

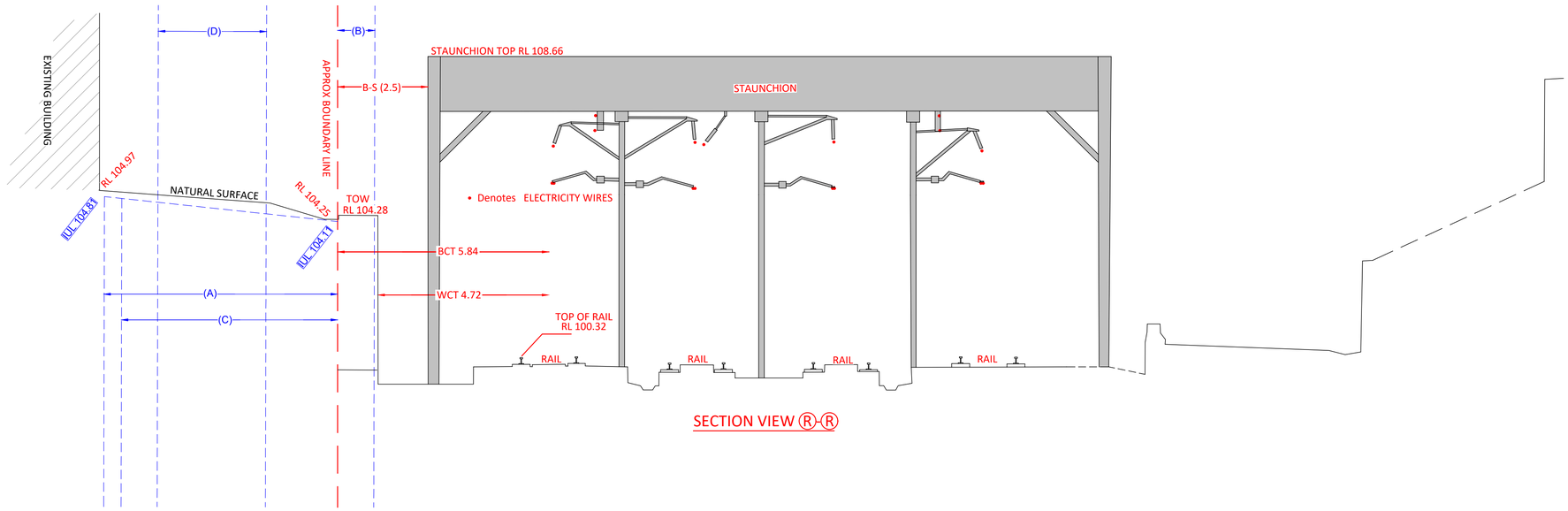
IUL 107.3 DENOTES INTERPOLATED UPPER LIMIT RL FOR STRATUM OF EASEMENTS SHOWN (A) AND (C)

1
DP118951



SECTION VIEW Ⓠ-Ⓠ

1
DP118951



SECTION VIEW Ⓡ-Ⓡ

GENERAL NOTES

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    - EASEMENT FOR GROUND SUPPORT (SOIL) VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (A) (DP1189541)
    - EASEMENT FOR GROUND SUPPORT (REINFORCING SYSTEMS IN SOIL) 6 METRES WIDE AND VARIABLE WIDTH (LIMITED IN STRATUM) SHOWN AS (C) (DP1189541)
    - EASEMENT FOR ACCESS 3 WIDE SHOWN AS (D) (AR288094)
  - BENEFITED BY:
    - EASEMENT FOR SUPPORT 1 METRE WIDE AND VARIABLE WIDTH SHOWN AS (B) (DP1189541)
- CP/SP1496
  (CT EDITION 4 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP60178
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - RESTRICTION(S) ON THE USE OF LAND (SP60178)
    - POSITIVE COVENANT (SP60178)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP10110
  (CT EDITION 6 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - BENEFITED BY:
    - RIGHT OF WAY 3.05 WIDE SHOWN AS (E) (550481)
- CP/SP52947
  (CT EDITION 10 DATED 17/10/2023 SEARCH DATE 07/11/2023)
  - AFFECTED BY:
    - POSITIVE COVENANT (SP52947)
    - RESTRICTION(S) ON THE USE OF LAND (SP52947)

COVENANTS AND RESTRICTIONS NOTED ON THE TITLE HAVE NOT BEEN INVESTIGATED. THESE SHOULD BE INVESTIGATED PRIOR TO DESIGN TO ENSURE ANY FUTURE DEVELOPMENT COMPLIES.

BY LAWS RELATING TO EACH OF THE SCHEMES HAVE NOT BEEN INVESTIGATED.

LEGEND

BCT denotes BOUNDARY TO CENTERLINE OF TRACK
WCT denotes WALL TO CENTERLINE OF TRACK
TOW denotes TOP OF WALL
B-S denotes BOUNDARY TO STAUNCHION
IUL denotes INTERPOLATED UPPER LIMIT
– – – – denotes APPROXIMATE EASEMENT POSITION

NOTE:
DESIGN ELEVATIONS PROVIDED DIGITALLY BY PBD ARCHITECTS DRAWING NUMBER DA801 ISSUE 1 DATED 6/3/2024

THE BOUNDARY LINE WAS ADPOPTED FOR THE POSITIONING OF THE SECTION

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PROJECT:

DETAIL AND LEVEL SURVEY OF
LOT 1 IN DP1189541, SP1496,
SP60178, SP10110 AND PART OF SP52947

849-859 PACIFIC HIGHWAY, 2 WILSON STREET
& LOT 1 O'BRIEN STREET
CHATSWOOD

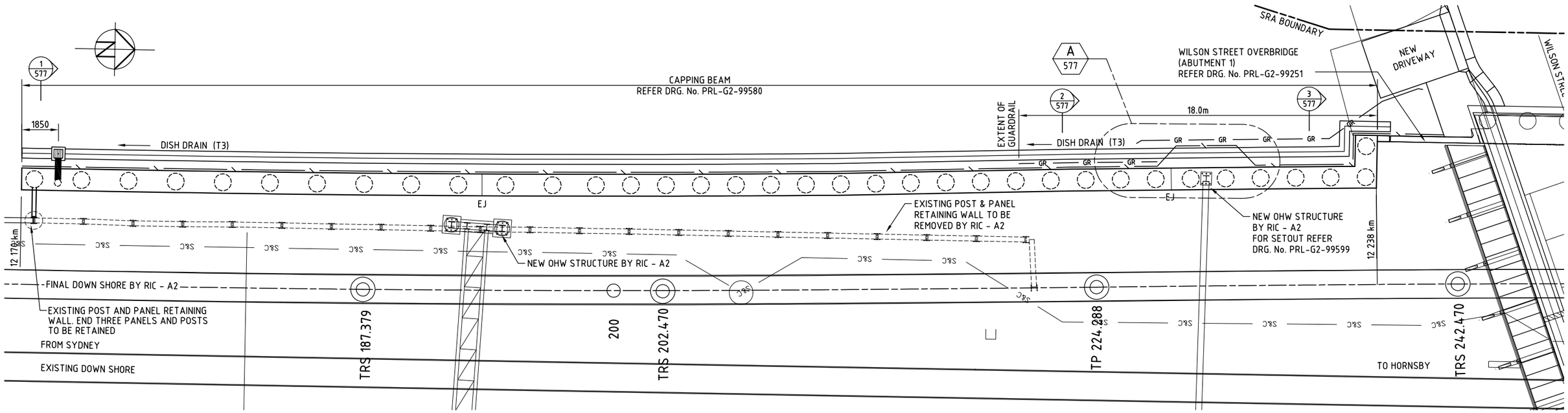
CLIENT: BB WILSON PROPERTY PTY LTD	
FILE: 9062 - Detail & Level - Rev C - 849-859 Pacific Highway, 2 Wilson Street & Lot 1 O'Brien Street Chatswood	
LGA: WILLOUGHBY	
REF: 9062	CONTOURS: 0.5m
ISSUE: C	DATUM: AHD
SURVEY DATE: 20/03/2024	AZIMUTH: MGA2020
SCALE: 1:75	SHEET 9 OF 9 SHEETS

ISSUE	DATE	AMENDMENT	SURV	CHK
A	01/11/23	ORIGINAL ISSUE	PQ	MT
B	29/01/24	RIDGES AND GUTTERS OF ADJOINING LOTS ADDED	SY	MT
C	20/03/24	RAILWAY SECTION VIEWS ADDED	AZ	MT

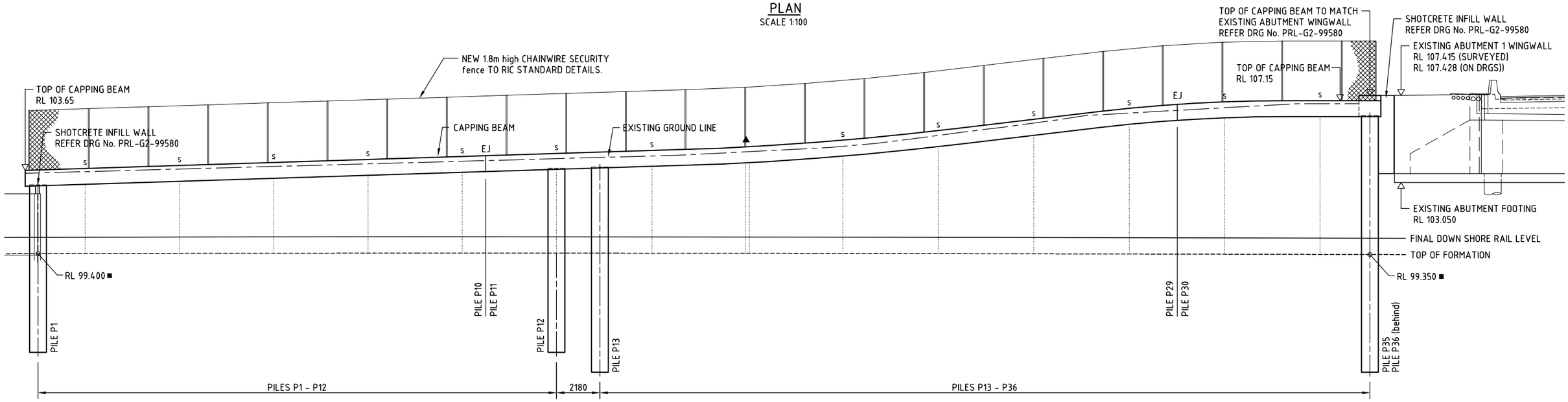
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MICHAEL TRIFIRO ID: SU008624
REGISTERED LAND SURVEYOR

SDG Pty Ltd
abn 85 213 523 621
Suite 1, 3 Railway Street, Baulkham Hills NSW 2153
t: (02) 9630 7955 w: sdg.net.au
Liability limited by a scheme approved
under Professional Standards Legislation



PLAN
SCALE 1:100



ELEVATION
SCALE 1:100

LEGEND

- EJ ....EXPANSION JOINT
- ▲ ....PRIMARY CALIBRATION-URBAN DESIGN
- S ....SECONDARY CALIBRATION-URBAN DESIGN
- —S&C— ....SIGNAL & COMMUNICATIONS CABLING (TO BE RELOCATED BY RIC)
- —\—\— ....NEW CHAINWIRE FENCE (TO RIC STANDARD)
- —GR— ....NEW 'W' BEAM GUARDRAIL (TO RTA MODEL DRAWING Nos. MD.R132.A01.A1 & MD.R132.B01.A1)
- DISH DRAIN ....NEW DISH DRAIN (TYPE 3) (REFER DRAWING No. PRL-G2-99715 FOR DETAIL)
- ▣ ....NEW, (450x450x600 DEEP) PRECAST CONC. PIT WITH HEAVY DUTY 'V' GRATE INLET.
- o ....Ø225 UPVC PIPE & DROPPER

Scales
0 2 4
2 1
(1:100 BEFORE REDUCTION)
SCALE IN METRES
(AT A1 SHEET SIZE)

NOTES

GENERAL

1. DIMENSIONS ARE NOT BE SCALED FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE CHAINAGES & REDUCED LEVELS ARE IN METRES
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING THE LOCATION OF ALL SERVICES AFFECTED BY THE WORKS PRIOR TO COMMENCEMENT OF ANY EXCAVATION.
4. LOCATION OF SERVICES SHOWN ON DRAWINGS IS INDICATIVE AND SHALL BE VERIFIED BY THE CONTRACTOR.
5. TOP OF FORMATION LEVEL AT BASE OF RETAINING WALL TO BE NOT LOWER THAN THE RL SHOWN ■ ON ELEVATION.
6. EXCAVATION IN FRONT OF PILE WALL NOT TO EXCEED 500mm BELOW FORMATION LEVELS.
7. SAFETY SCREENS TO FUTURE DETAIL.

DESIGN

1. DESIGN CODE : AUSTRALIAN BRIDGE DESIGN CODE.
2. DESIGN LOADING : T44 TRUCK LOADING
3. CONSTRUCTION SURCHARGE 20 kPa

SURVEY

1. ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
2. ALL CO-ORDINATES ARE TO MAP GRID OF AUSTRALIA (MGA).
3. WHERE KILOMETRAGE IS USED TO INDICATE A START OR END POINT IT IS MEASURED PERPENDICULAR TO THE FINAL DOWN SHORE

SECURITY FENCE

1. NEW 1.8m HIGH SECURITY FENCE TO BE CONSTRUCTED IN ACCORDANCE WITH RIC STANDARDS AP6841 & C4501 AND RIC DRAWINGS 207-1353, SHEET 1; 207-1353, SHEET 2 AND 207-1353, SHEET 4.

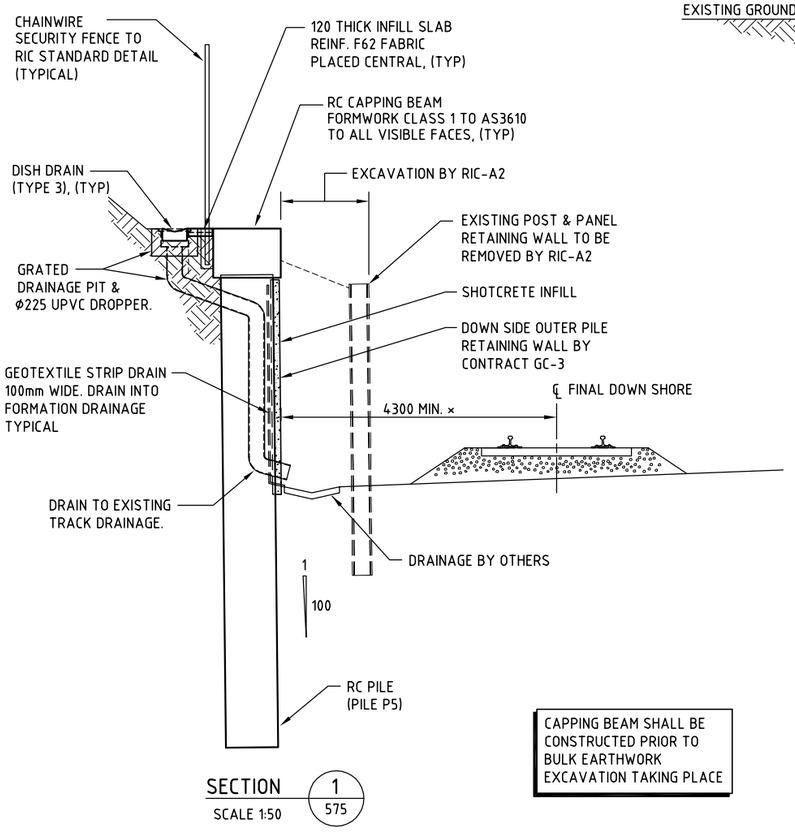
REFERENCES

TYPICAL WALL SECTIONS	DRG No PRL-G2-99577
PILE SETOUT	DRG No PRL-G2-99578
PILE DETAILS	DRG No PRL-G2-99579
CAPPING BEAM - CONCRETE	DRG No PRL-G2-99580
CAPPING BEAM - REINFORCEMENT	DRG No PRL-G2-99581
OHW STRUCTURES HOLDING DOWN BOLT DETAILS	DRG No PRL-G2-99599

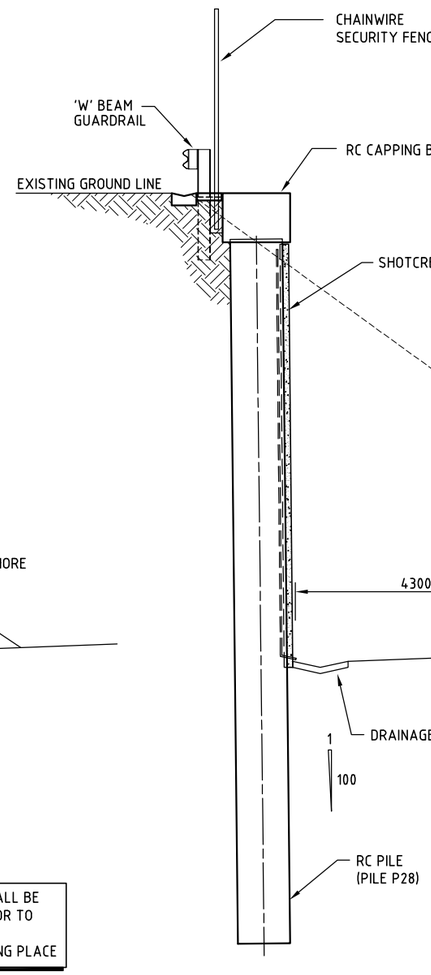
NOTE:
EXCAVATION & SHOTCRETE INFILL NOT COMPLETED AT TIME OF ISSUE

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214762

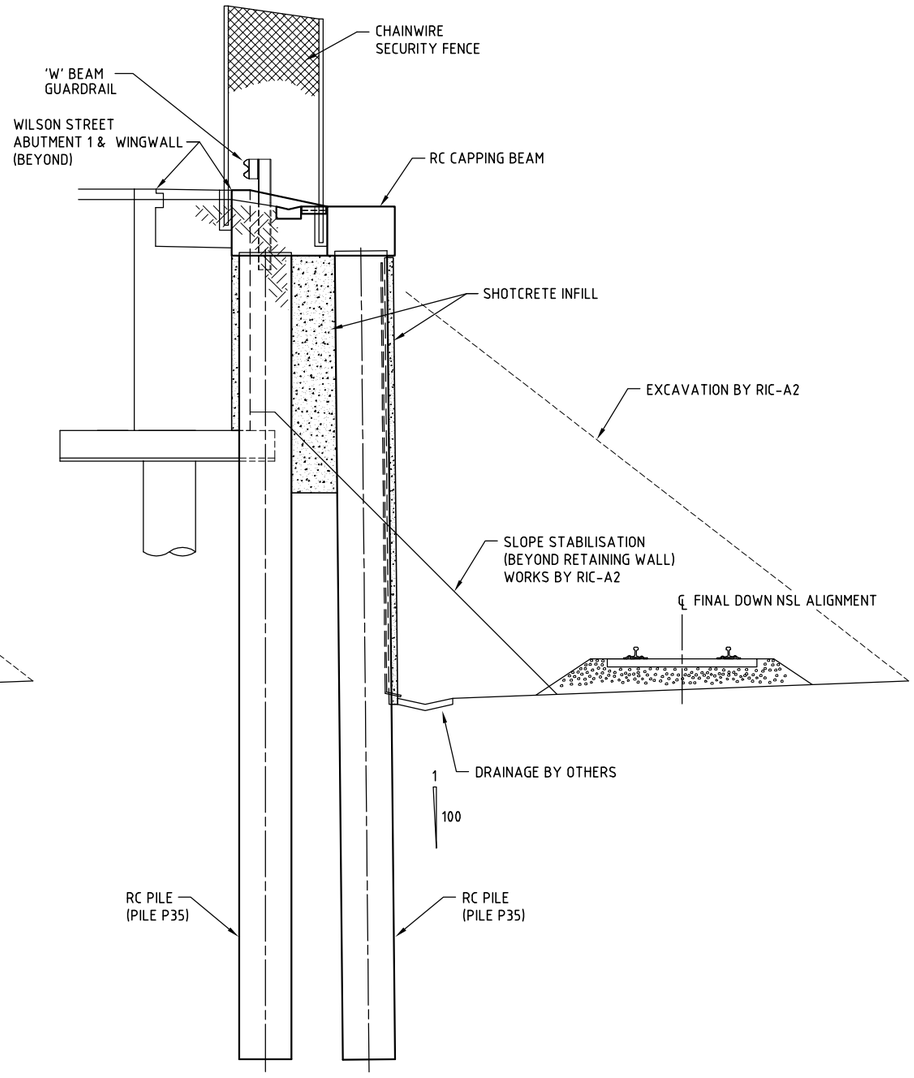


SECTION 1 / 575
SCALE 1:50

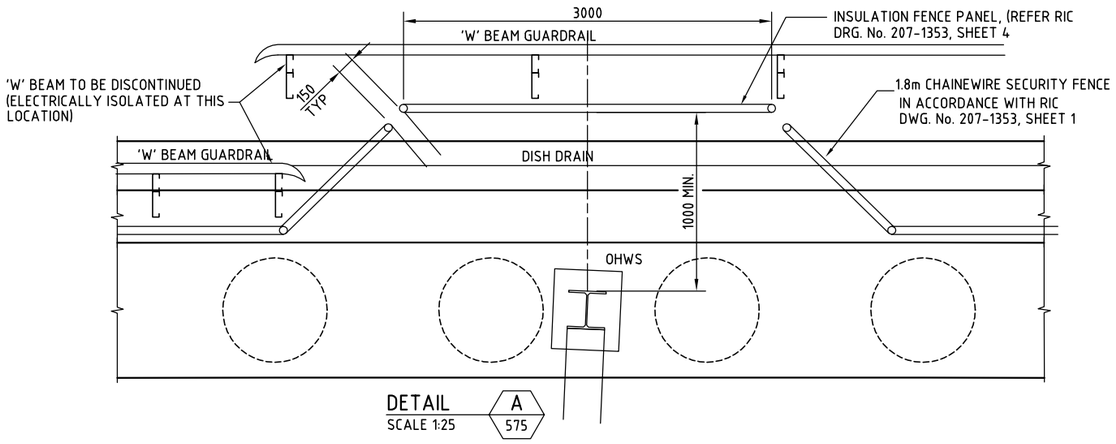


CAPPING BEAM SHALL BE CONSTRUCTED PRIOR TO BULK EARTHWORK EXCAVATION TAKING PLACE

SECTION 2 / 575
SCALE 1:50



SECTION 3 / 575
SCALE 1:50



DETAIL A / 575
SCALE 1:25

Scales
0 1000 2000
1000 500
(1:50 BEFORE REDUCTION)
SCALE IN MILLIMETRES (AT A1 SHEET SIZE)

NOTES

GENERAL
REFER TO DRG No PRL-G2-99575

× DIMENSION NOT TO BE USED FOR SETOUT

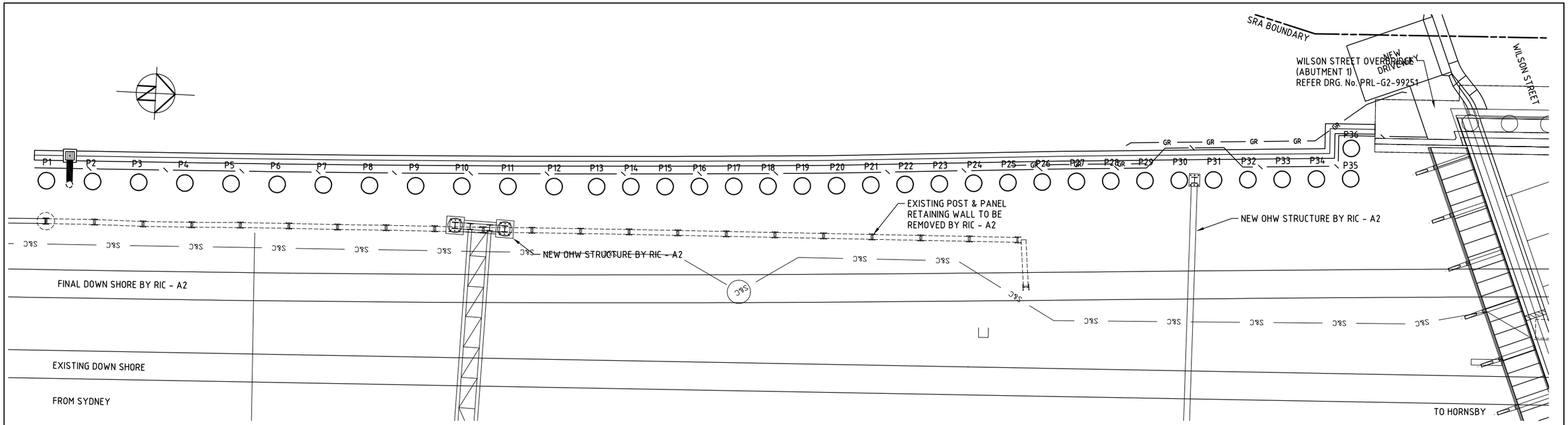
REFERENCES

GENERAL ARRANGEMENT	DRG No PRL-G2-99575
PILE SET OUT	DRG No PRL-G2-99578
PILE DETAILS	DRG No PRL-G2-99579
CAPPING BEAM - CONCRETE	DRG No PRL-G2-99580
CAPPING BEAM - REINFORCEMENT	DRG No PRL-G2-99581

NOTE:
EXCAVATION & SHOTCRETE INFILL NOT COMPLETED AT TIME OF ISSUE

WORK AS EXECUTED
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RIC/SRA EDMS ID CV0214763



PILE SETOUT

SCALE 1:100

TABLE 1

PILE No	EASTING	NORTHING	DIAMETER	CUT OFF LEVEL	CONTRACT LEVEL	× ACTUAL FOUNDING LEVEL
P1	331 577.167	6 259 284.036	850	102.920	94.50	94.50
P2	331 577.085	6 259 286.405	850	102.995	94.50	94.50
P3	331 577.002	6 259 288.773	850	103.070	94.50	94.50
P4	331 576.917	6 259 291.142	850	103.145	94.50	94.50
P5	331 576.830	6 259 293.510	850	103.225	94.50	94.50
P6	331 576.739	6 259 295.879	850	103.300	94.50	94.50
P7	331 576.645	6 259 298.247	850	103.375	94.50	94.50
P8	331 576.548	6 259 300.615	850	103.450	94.50	94.50
P9	331 576.446	6 259 302.982	850	103.525	94.50	94.50
P10	331 576.339	6 259 305.350	850	103.600	94.50	94.50
P11	331 576.228	6 259 307.717	850	103.675	94.50	94.50
P12	331 576.112	6 259 310.085	850	103.750	94.50	94.50
P13	331 576.002	6 259 312.262	850	103.820	93.50	93.50
P14	331 575.910	6 259 314.020	850	103.875	93.50	93.50
P15	331 575.816	6 259 315.777	850	103.930	93.50	93.50
P16	331 575.719	6 259 317.535	850	103.990	93.50	93.50
P17	331 575.620	6 259 319.292	850	104.060	93.50	93.50
P18	331 575.519	6 259 321.049	850	104.185	93.50	93.50
P19	331 575.416	6 259 322.806	850	104.310	93.50	93.50
P20	331 575.308	6 259 324.563	850	104.450	93.50	93.50
P21	331 575.186	6 259 326.318	850	104.610	93.50	93.50
P22	331 575.063	6 259 328.074	850	104.790	93.50	93.50
P23	331 574.940	6 259 329.830	850	104.985	93.50	93.50
P24	331 574.818	6 259 331.585	850	105.195	93.50	93.50
P25	331 574.695	6 259 333.341	850	105.405	93.50	93.50
P26	331 574.572	6 259 335.097	850	105.615	93.50	93.50
P27	331 574.450	6 259 336.853	850	105.820	93.50	93.50
P28	331 574.339	6 259 338.609	850	106.015	93.50	93.50
P29	331 574.228	6 259 340.366	850	106.175	93.50	93.50
P30	331 574.118	6 259 342.122	850	106.270	93.50	93.50
P31	331 574.008	6 259 343.879	850	106.350	93.50	93.50
P32	331 573.899	6 259 345.635	850	106.400	93.50	93.50
P33	331 573.791	6 259 347.392	850	106.400	93.50	93.50
P34	331 573.684	6 259 349.149	850	106.400	93.50	93.50
P35	331 573.578	6 259 350.906	850	106.400	93.50	93.50
P36	331572.021	6 259 350.853	850	106.400	93.50	93.50

Scales

0 2000 4000

2000 1000

(1:100 BEFORE REDUCTION)
SCALE IN MILLIMETERS
(AT A1 SHEET SIZE)

NOTES

GENERAL

1. DIMENSIONS ARE NOT TO BE SCALE FROM THE DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE CHAINAGES & REDUCED LEVELS ARE IN METRES
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING THE LOCATION OF ALL SERVICES AFFECTED BY THE WORKS PRIOR TO COMMENCEMENT OF ANY EXCAVATION.
4. LOCATION OF SERVICES SHOWN ON DRAWINGS IS INDICATIVE AND SHALL BE VERIFIED BY THE CONTRACTOR.

DESIGN

1. DESIGN CODE : AUSTRALIAN BRIDGE DESIGN CODE-1996.
2. DESIGN LOADING : CONSTRUCTION SURCHARGE 20 kPa, T44 TRUCK

SURVEY

1. ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
2. ALL CO-ORDINATES ARE TO MAP GRID OF AUSTRALIA (MGA).
3. SETOUT POINT IS CENTRE OF PILE AT CUT OFF LEVEL.
4. PILES SHALL BE SURVEYED AFTER INSTALLATION TO DETERMINE DEVIATIONS FORM DESIGN SETOUT.

REFERENCES

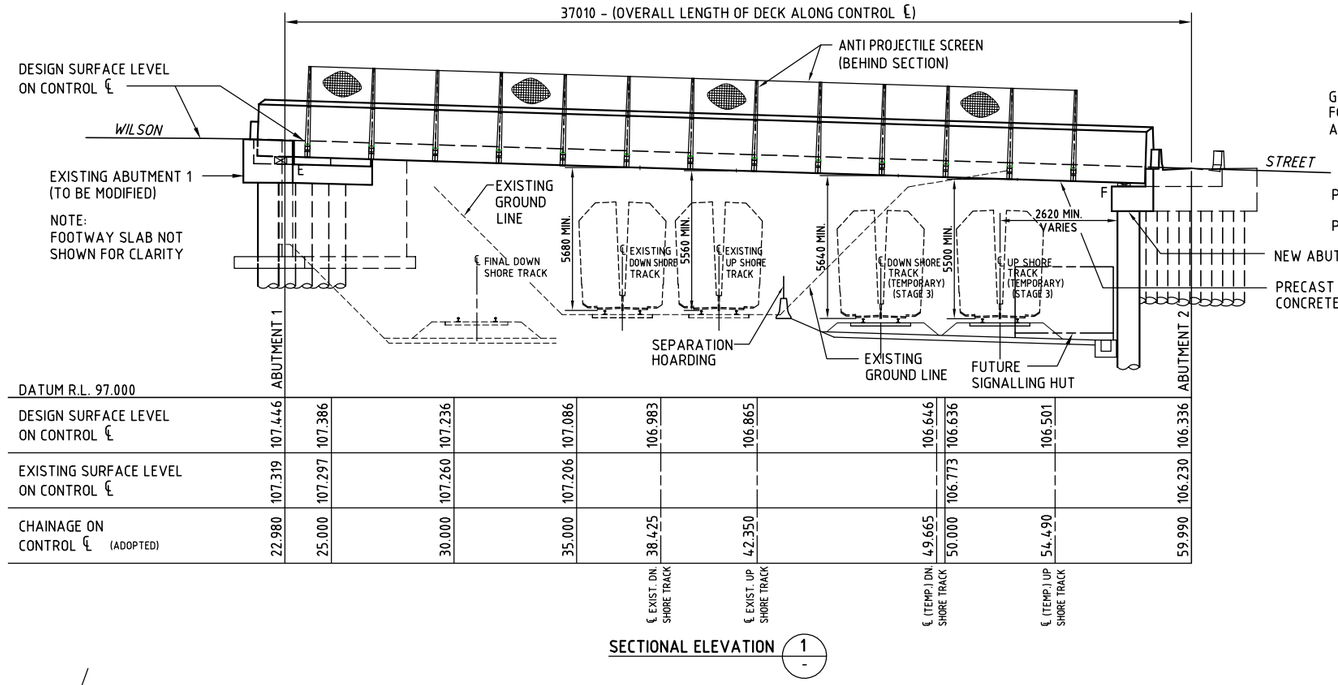
GENERAL ARRANGEMENT..... DRG No. PRL-G2-99575
PILE DETAILS..... DRG No. PRL-G2-99579

× COLUMNS FOR "ACTUAL FOUNDING LEVELS" AND "NATURE OF FOUNDING MATERIAL" TO BE COMPLETED BY THE CONTRACTOR (INCLUDING ANY VARIATION IN CONTRACT LEVEL SHOWN) AND SUBMITTED AS AN "AS BUILT" DRAWING

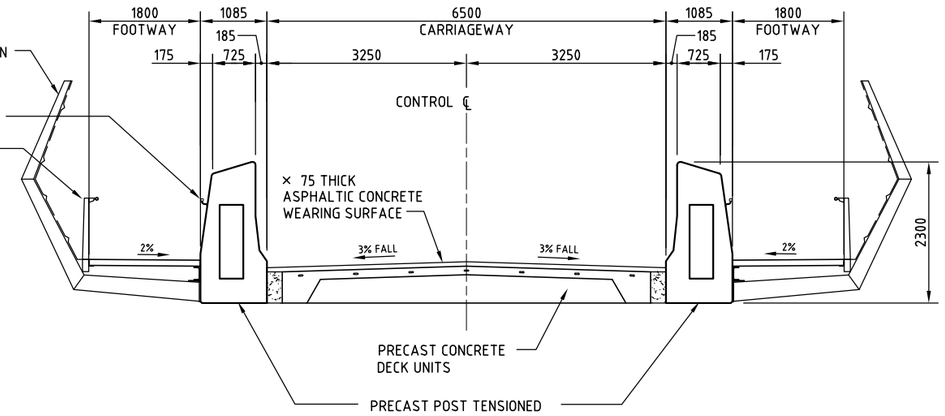
NOTE:
EXCAVATION & SHOTCRETE INFILL NOT COMPLETED AT TIME OF ISSUE

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

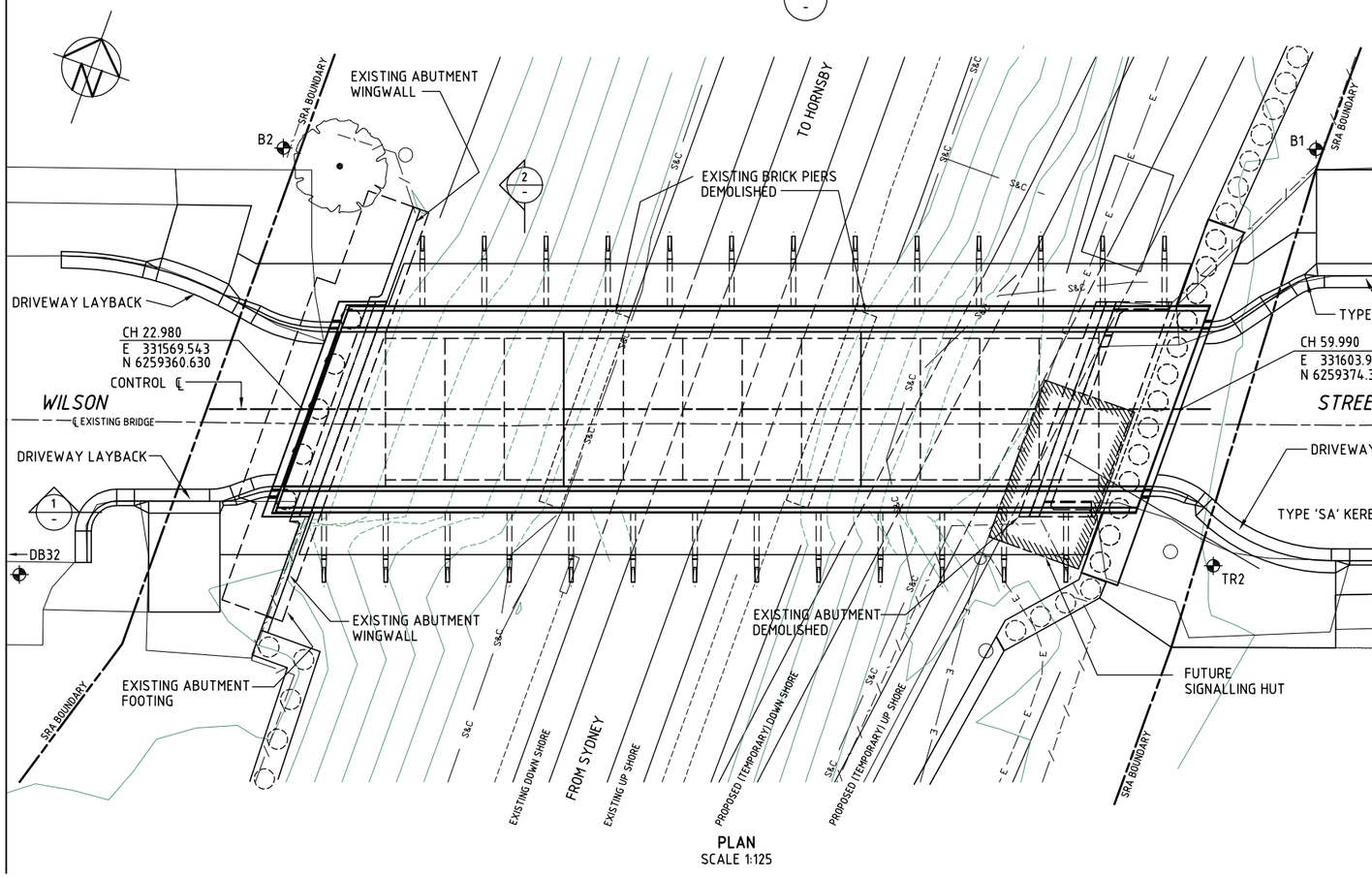
RIC/SRA EDMS ID CV0214764



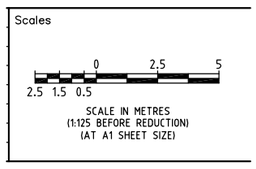
SECTIONAL ELEVATION 1 -

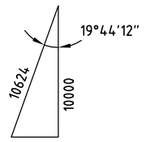


SECTION 2 -
SCALE 1:50

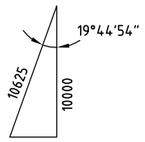


PLAN
SCALE 1:125





SKEW DIAGRAM ABUTMENT 1
NOT TO SCALE



SKEW DIAGRAM ABUTMENT 2
NOT TO SCALE

LEGEND

EXISTING UTILITIES

- E ——.....OVERHEAD/UNDERGROUND ELECTRICITY (TO BE RELOCATED BY RIC)
- S&C ——.....SIGNAL & COMMUNICATION CABLING (TO BE RELOCATED BY RIC)
- ——/——.....EXISTING FENCE LINE
- B1 ⊕ .....DENOTES APPROXIMATE BORE HOLE LOCATIONS

NOTES

GENERAL

SCALE 1:125 UNLESS NOTED OTHERWISE.
DIMENSIONS ARE NOT TO BE SCALED FROM THE DRAWINGS.
DIMENSIONS ARE IN MILLIMETRES,
REDUCED LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD)
CHAINAGES AND REDUCED LEVELS ARE IN METRES.
E DENOTES EXPANSION END
F DENOTES FIXED END

× DENOTES THICKNESS INCLUDES 70mm NOM. THICKNESS AC AND SPRAYED BITUMINOUS WATERPROOF MEMBRANE WITH 10mm COVER AGGREGATE.

DESIGN SPECIFICATION

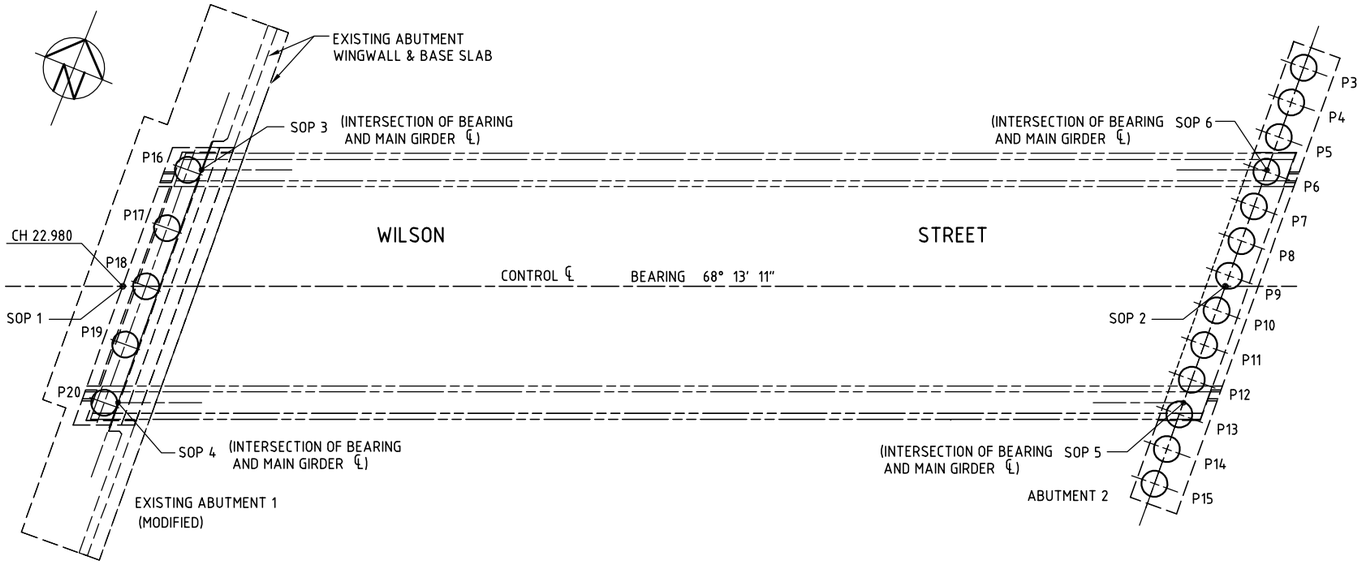
DESIGN LOADING: AUSTRALIAN BRIDGE DESIGN CODE 1996 T44 LOADING.
EARTHQUAKE ACCELERATION COEFFICIENT 0.08.

REFERENCE

PILE SETOUT DETAILS.....PRL-G2-99252
WILSON STREET LONGITUDINAL SECTION.....PRL-G2-99283

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214640

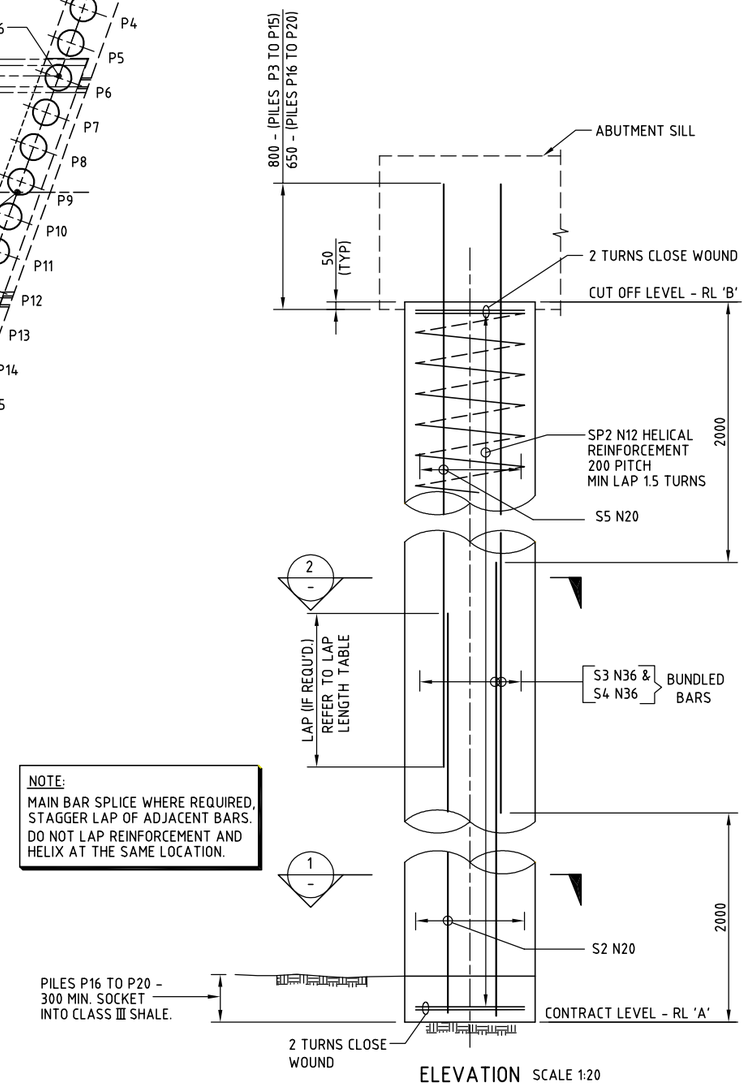


PLAN
SCALE 1:100

PILE SCHEDULE & DECK SET-OUT							
LOCATION	PILE No.	POINT	CO-ORDINATES		CUT OFF LEVEL RL 'B' (m)	CONTRACT LEVEL - RL 'A' (m)	
			EASTING	NORTHING		CONTRACT	ACTUAL
DECK SETOUT		SOP 1	331569.543	6259360.630	-	-	-
		SOP 2	331602.913	6259373.964	-	-	-
		SOP 3	331570.519	6259365.105	-	-	-
		SOP 4	331570.805	6259357.050	-	-	-
		SOP 5	331603.056	6259369.937	-	-	-
		SOP 6	331602.770	6259377.991	-	-	-
EXISTING ABUTMENT 1 (MODIFIED)	P1		NOT USED				
	P2		NOT USED				
	P16		331570.105	6259364.939	105.715	96.300	96.300
	P17		331570.177	6259362.926	105.735	96.300	96.300
	P18		331570.248	6259360.912	105.755	96.300	96.300
	P19		331570.320	6259358.899	105.775	96.300	96.300
	P20		331570.391	6259356.885	105.795	96.300	96.300
ABUTMENT 2	P 3		331602.644	6259381.526	104.375	94.500	94.500
	P 4		331602.686	6259380.327	104.395	94.500	94.500
	P 5		331602.729	6259379.127	104.410	94.500	94.500
	P 6		331602.772	6259377.928	104.425	94.500	94.500
	P 7		331602.814	6259376.729	104.440	94.500	94.500
	P 8		331602.857	6259375.530	104.460	94.500	94.500
	P 9		331602.899	6259374.330	104.475	94.500	94.500
	P10		331602.942	6259373.131	104.490	94.500	94.500
	P11		331602.984	6259371.932	104.510	94.500	94.500
	P12		331603.027	6259370.733	104.525	94.500	94.500
	P13		331603.069	6259369.533	104.540	94.500	94.500
	P14		331603.112	6259368.334	104.555	94.500	94.500
	P15		331603.154	6259367.135	104.575	94.500	94.500

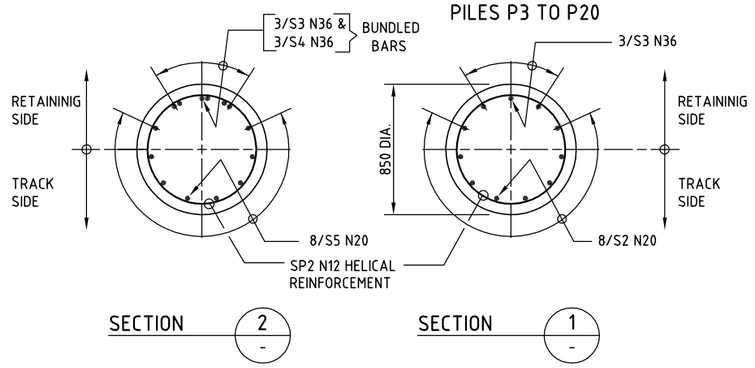
NOTE:
PILES TO BE CONSTRUCTED WITH A MAXIMUM OUT OF VERTICALITY TOLERANCE OF 1%

Scales
0 2 4
2 1 (1:100 BEFORE REDUCTION)
SCALE IN METRES
0 400 800mm
400 200 (1:20 BEFORE REDUCTION)
SCALE IN MILLIMETRES
(AT A1 SHEET SIZE)



NOTE:
MAIN BAR SPLICE WHERE REQUIRED, STAGGER LAP OF ADJACENT BARS. DO NOT LAP REINFORCEMENT AND HELIX AT THE SAME LOCATION.

ELEVATION SCALE 1:20
PILES P3 TO P20



NOTES

GENERAL
REFER DRG. No. PRL-G2-99251

PILES
1. PILES ARE DESIGNED IN ACCORDANCE WITH AS 2159-1995 AND THE AUSTRALIAN BRIDGE DESIGN CODE-1996.
2. THE PILES SHALL BE BORED CAST-IN-PLACE REINFORCED CONCRETE PILES (WITHOUT PERMANENT CASING), DERIVING LOAD CAPACITY FROM END BEARING, LATERAL RESISTANCE AND SHAFT FRICTION.
3. GEOTECHNICAL INFORMATION REFERRED TO IN THE SPECIFICATION MUST BE STUDIED BY THE CONTRACTOR TO APPRECIATE POTENTIAL CONSTRUCTION DIFFICULTIES.
4. FOUNDING MATERIAL DESIGN PARAMETERS ARE IN ACCORDANCE WITH THE INTERPETIVE GEOTECHNICAL REPORT BY GOLDER ASSOCIATES PTY LTD FROM MARCH 2003.
5. CONTRACT LEVELS SHALL BE CONFIRMED ON SITE BY A GEOTECHNICAL ENGINEER.
6. THE CONTRACTOR SHALL SUBMIT ALL THE RELEVANT PILING DETAILS TO THE PRINCIPAL IN ACCORDANCE WITH THE SPECIFICATIONS.

PILE CONSTRUCTION
1. PILES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATION.
2. SOCKET ROUGHNESS CATEGORY TO BE R2 OR BETTER CORRESPONDING TO GROOVES OF DEPTH 1 - 4mm AND WIDTH GREATER THAN 2mm AT SPACING OF 50mm TO 200mm.
3. MINIMUM CLEARANCE TO PILE RIG SHALL BE 3.7m HORIZONTALLY FROM CENTRELINE OF ADJACENT TRACK. CONTRACTOR MUST SUBMIT WITH TENDER A LETTER INDICATING WHETHER PILES CAN BE CONSTRUCTED WITHOUT INFRINGING THIS DISTANCE. THE CONTRACTOR SHALL REFER TO SPECIAL CONDITIONS OF CONTRACT AND OBTAIN ALL NECESSARY APPROVALS FROM THE PRINCIPAL'S REPRESENTATIVE.
4. THE CONTRACTOR MUST SUBMIT COMPLETE DETAILS OF PILING RIG AND CLEARANCES TO THE PRINCIPAL TWO (2) WEEKS PRIOR TO COMMENCEMENT OF THE PILING SO THAT THE PRINCIPAL CAN DETERMINE THE TYPE OF TRACK PROTECTION NECESSARY FOR THIS WORK.

TESTING OF PILE
1. TESTING OF PILES SHALL BE IN ACCORDANCE WITH THE SPECIFICATION.

CONCRETE
1. ALL CONCRETE WORK SHALL COMPLY WITH THE SPECIFICATION.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH f'c = 40 MPa.
3. EXPOSURE CLASSIFICATION = B1.
4. SHOTCRETE LINING SHALL BE APPLIED TO THE EXPOSED FACE OF THE PILES REFER UPSIDE OUTER PILE RETAINING WALL DRAWINGS FOR TYPICAL DETAILS.

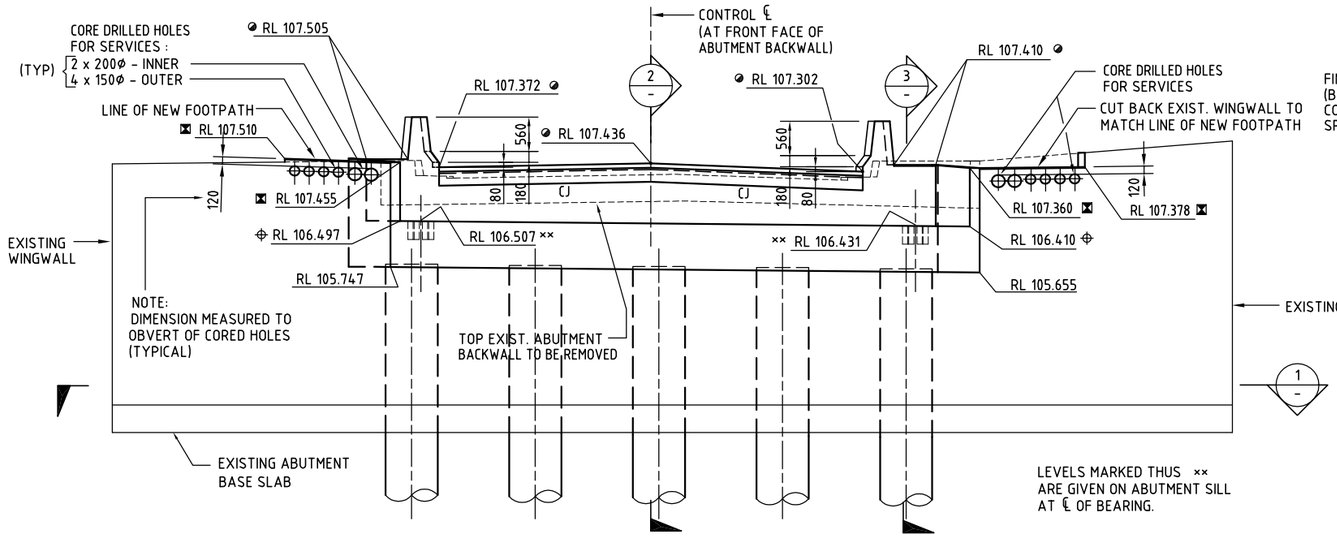
REINFORCEMENT
1. ALL REINFORCEMENT BARS SHALL BE IN ACCORDANCE WITH AS/NZS 4671:2001 WHERE ALL BARS ARE GRADE 500 DEFORMED RIBBED BAR UNO.
2. DESIGNATION OF REINFORCING BARS : 10/S1 N24-200 EF
   - No. OF BARS
   - BAR SHAPE NOTATION
   - DUCTILITY CLASS AND DIA
   - SPACING OF BARS
   - LOCATION COMMENT
3. CLEAR COVER TO PILE REINFORCEMENT SHALL BE 75mm
4. COGS AND HOOKS SHALL BE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE 1996.
5. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR AS APPROVED IN WRITING BY THE PRINCIPAL'S REPRESENTATIVE.
6. BAR SHAPES SHALL BE IN ACCORDANCE WITH AS/NZS 1100.501:2002.
7. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT :
   - EW - EACH WAY
   - EF - EACH FACE
   - NF - NEAR FACE
   - FF - FAR FACE
   - T - TOP FACE
   - B - BOTTOM FACE
   - C - CENTRALLY PLACED
8. BAR LAPS SHALL BE AS FOLLOWS UNO;

BAR SIZE	LAPS (mm)	BAR SIZE	LAPS (mm)
N12	400	N28	1000
N16	500	N32	1300
N20	650	N36	1500
N24	750	N40	1700

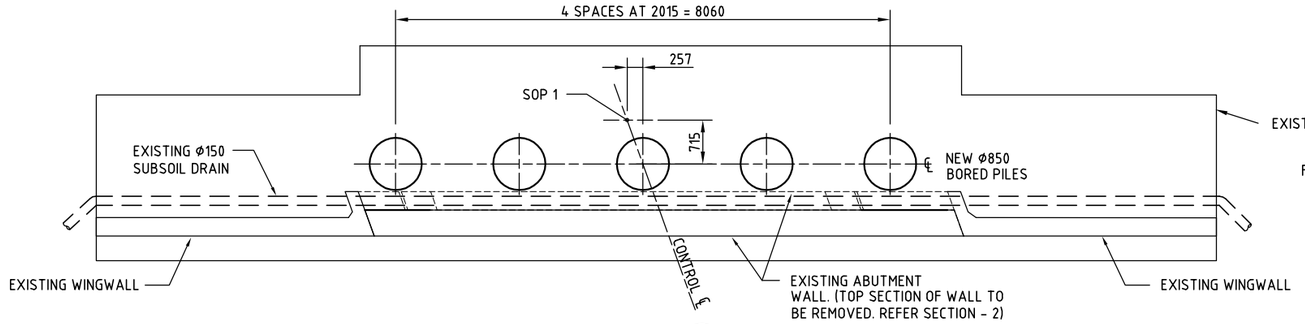
REFERENCE
GENERAL ARRANGEMENT . . . PRL-G2-99251

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

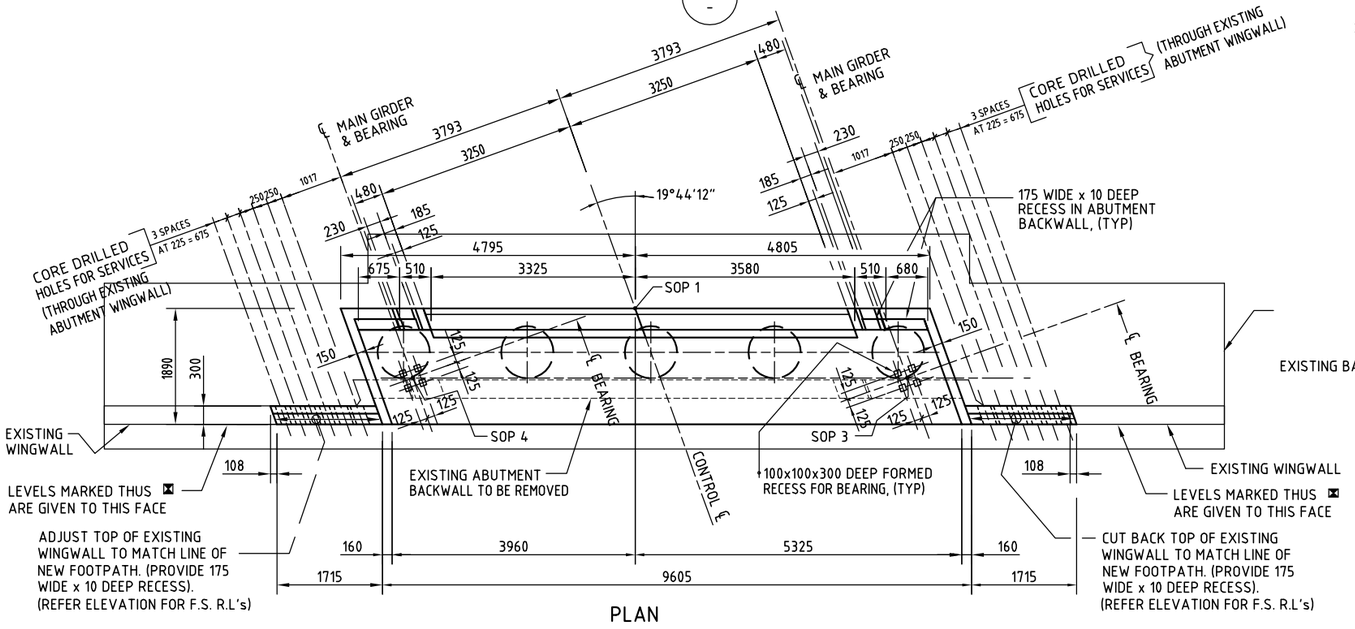
RIC/SRA EDMS ID CV0214641



ELEVATION

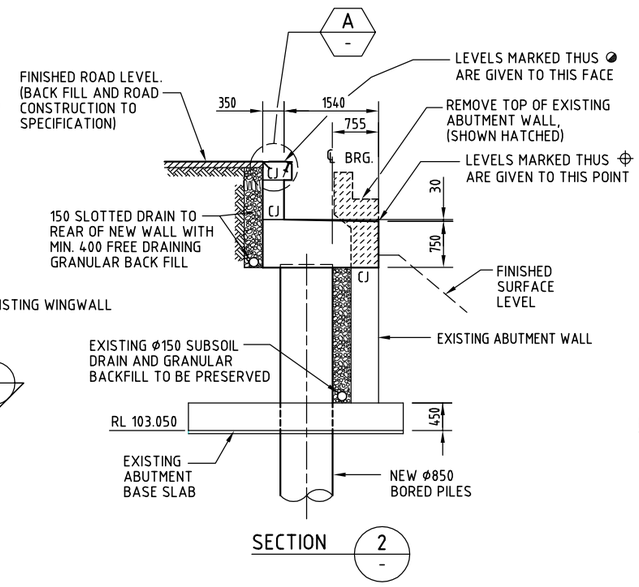


PLAN SECTION 1

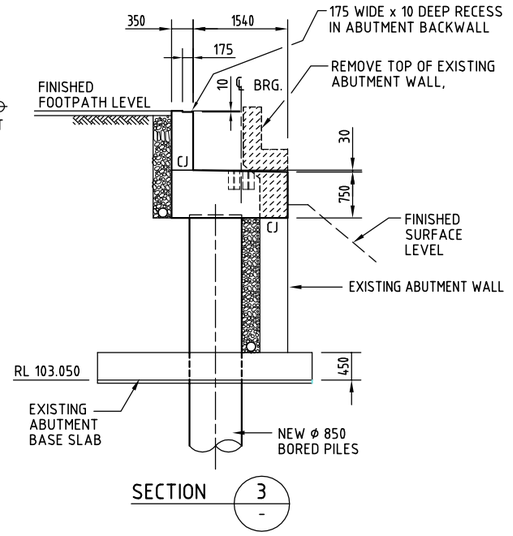


PLAN

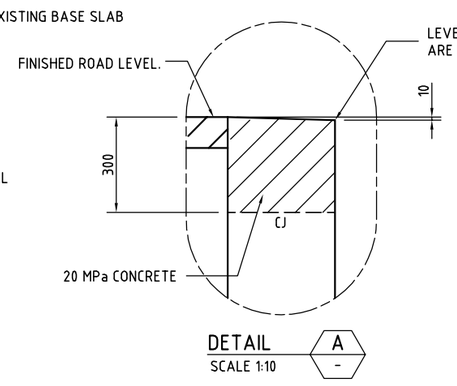
Scales
0 200 400mm
200 (1:10 BEFORE REDUCTION)
0 1 2
1 (1:50 BEFORE REDUCTION)
SCALE IN METRES (U.N.O.)
(AT A1 SHEET SIZE)



SECTION 2



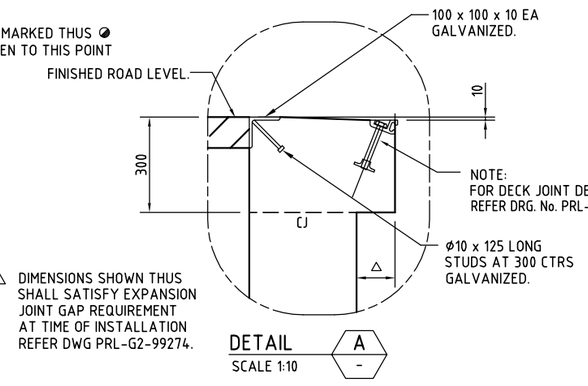
SECTION 3



DETAIL A
SCALE 1:10

(SHOWING TEMPORARY ABUTMENT BACKWALL OUTLINE)

NOTE: PRIOR TO INSTALLATION OF EXPANSION JOINT DEMOLISH PART OF BACKWALL ABOVE C.J. AND REBUILD TO SUIT EXPANSION REQUIREMENTS.



DETAIL A
SCALE 1:10

(SHOWING FINAL ABUTMENT BACKWALL OUTLINE)

NOTE: PLAN AND ELEVATION DRAWN FOR FINAL ABUTMENT BACKWALL OUTLINE)

NOTE:
WHERE NEW CONCRETE IS PLACED IN CONTACT WITH EXISTING CONCRETE SURFACES SHALL BE SCABBLED FREE OF DIRT AND DUST AND TREATED AS CJ

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

NOTES

GENERAL

SCALE 1:50 UNLESS NOTED OTHERWISE.
DIMENSIONS ARE NOT TO BE SCALED FROM THE DRAWINGS.
DIMENSIONS ARE IN MILLIMETRES,
CHAINAGES AND REDUCED LEVELS ARE IN METRES.
CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF ALL CONCRETE SHALL BE 40MPa.
EDGES SHALL BE CHAMFERED 20x20 AND RE-ENTRANT ANGLES FILLETED 20x20 UNLESS SPECIFIED OTHERWISE.

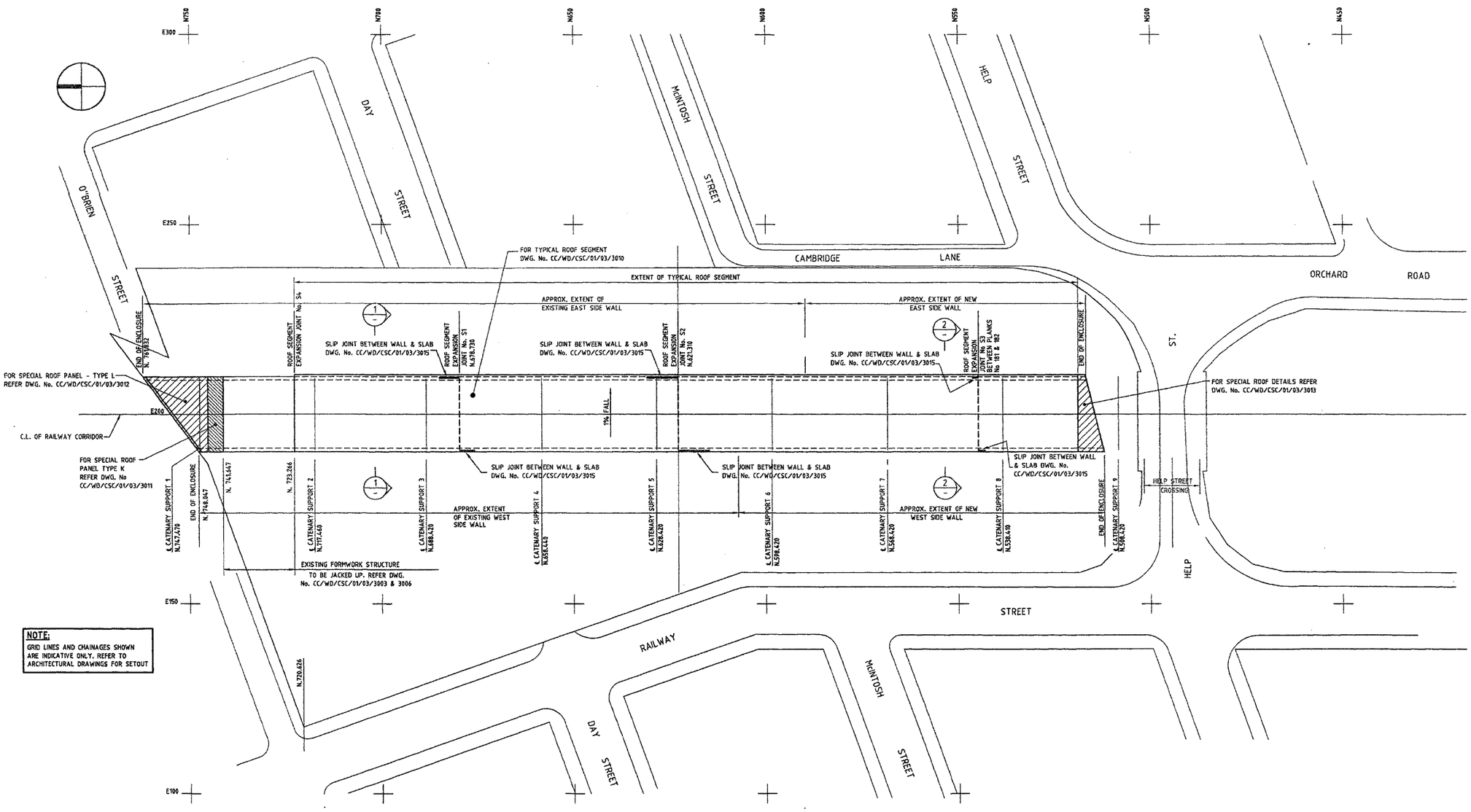
REFERENCE

GENERAL ARRANGEMENT.....PRL-G2-99251
PILE SETOUT AND DETAILS...PRL-G2-99252
ABUTMENT 1-REINFORCEMENT..PRL-G2-99256
DECK JOINT DETAILS.....PRL-G2-99274

RIC/SRA EDMS ID CV0214642

NOTES:

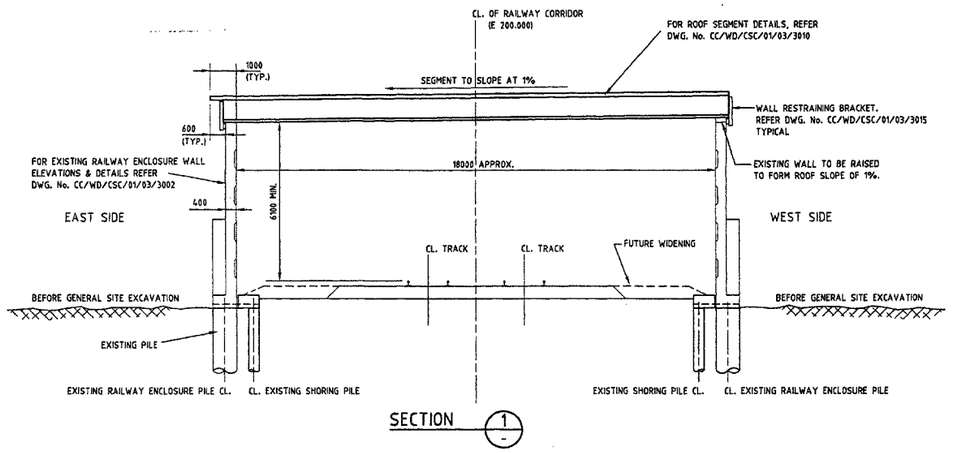
1. SCALES AS SHOWN.
2. DIMENSIONS ARE IN MILLIMETRES, CHAINAGES AND REDUCED LEVELS ARE IN METRES.
3. REDUCED LEVELS ARE TO AUSTRALIAN HEIGHT DATUM.
4. ENCLOSURE ROOF STRUCTURE SHALL BE GENERALLY CONSTRUCTED IN SEGMENTS USING 1000 DEEP x 970 WIDE PRETENSIONED CONCRETE 'I' SECTIONS CRANED INTO POSITION ON TOP OF EXISTING & NEW IN-SITU REINFORCED CONCRETE WALLS. SEGMENTS SHALL BE PLACED SIDE BY SIDE WITH 20mm NOM. GAP AND CONNECTED WITH SITE WELDED REINFORCEMENT IN REBATES LOCATED AT THE TOP OF FLANGES.
5. FOR STRUCTURAL NOTES REFER TO DRAWING NUMBER CC/WD/CSC/01/03/3045



NOTE:
GRID LINES AND CHAINAGES SHOWN ARE INDICATIVE ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR SETOUT

RAILWAY ENCLOSURE PLAN

SCALE 1 ; 500

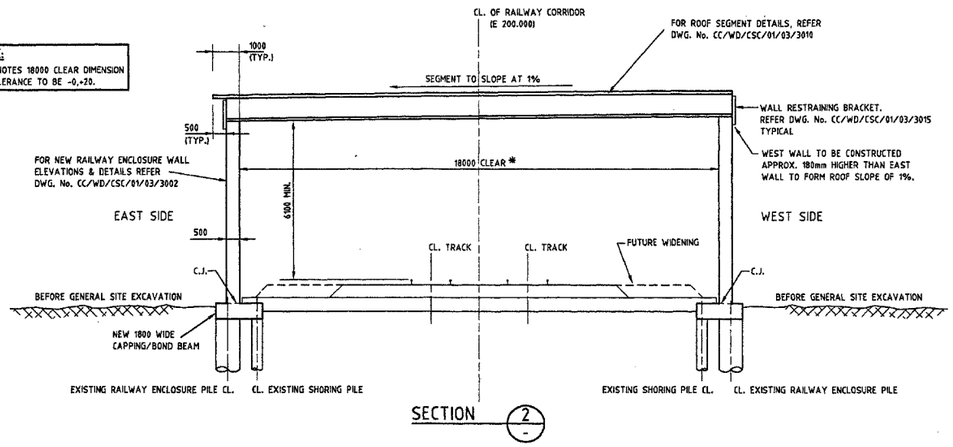


SECTION 1 / -

TYPICAL RAILWAY ENCLOSURE SECTION AT EXISTING WALLS

SCALE 1 : 100

NOTE:
* DENOTES 18000 CLEAR DIMENSION TOLERANCE TO BE -0,+20.



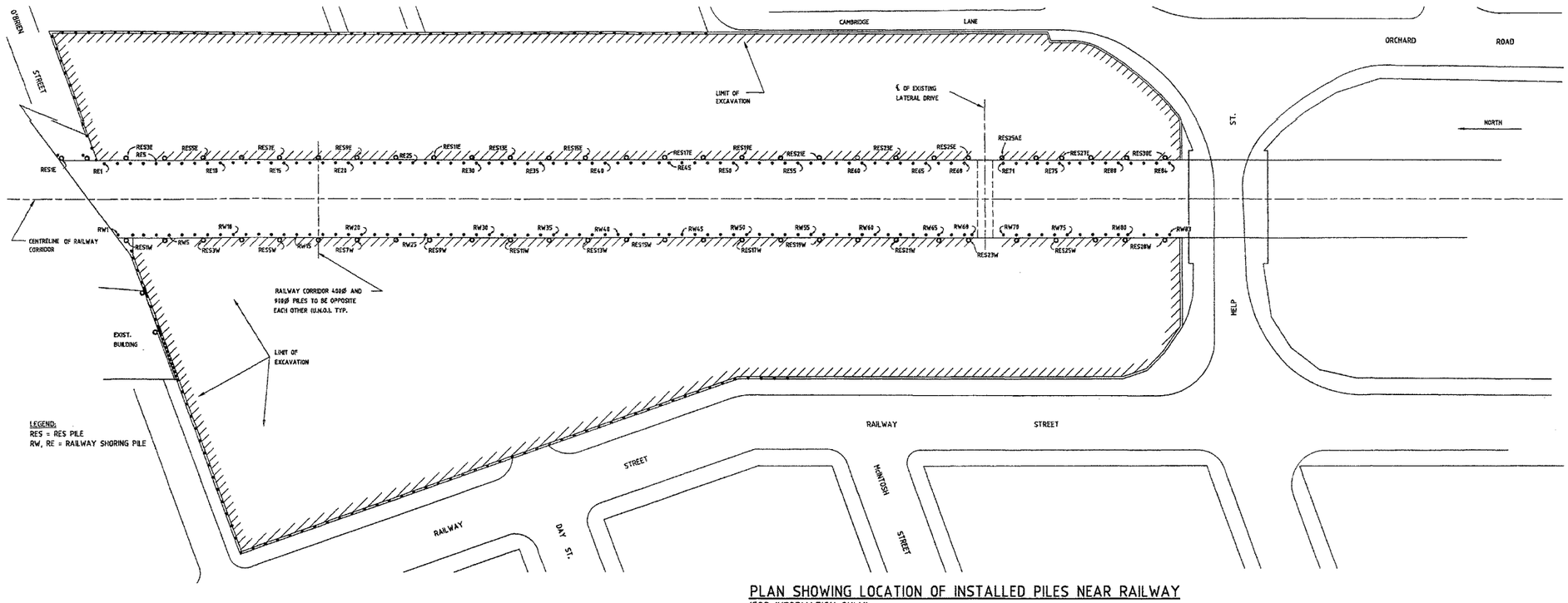
SECTION 2 / -

TYPICAL RAILWAY ENCLOSURE SECTION AT NEW WALLS

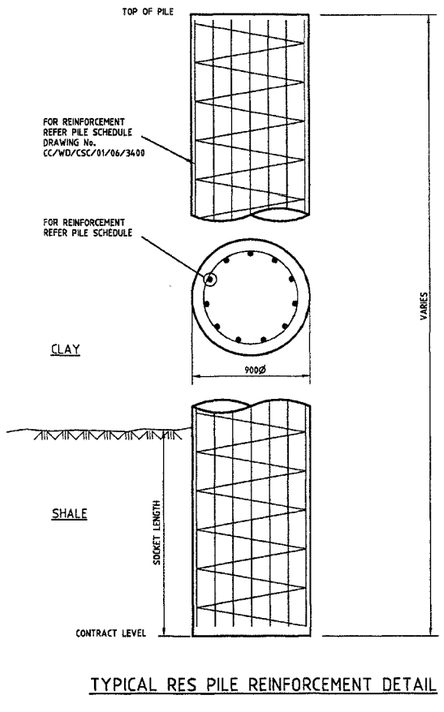
SCALE 1 : 100

EDMS CV0278720 WARNING SCANNED IMAGE

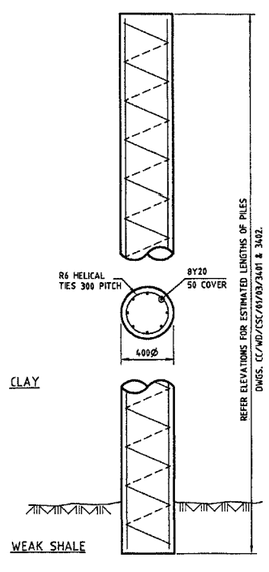
WORK AS EXECUTED



PLAN SHOWING LOCATION OF INSTALLED PILES NEAR RAILWAY
(FOR INFORMATION ONLY)



TYPICAL RES PILE REINFORCEMENT DETAIL

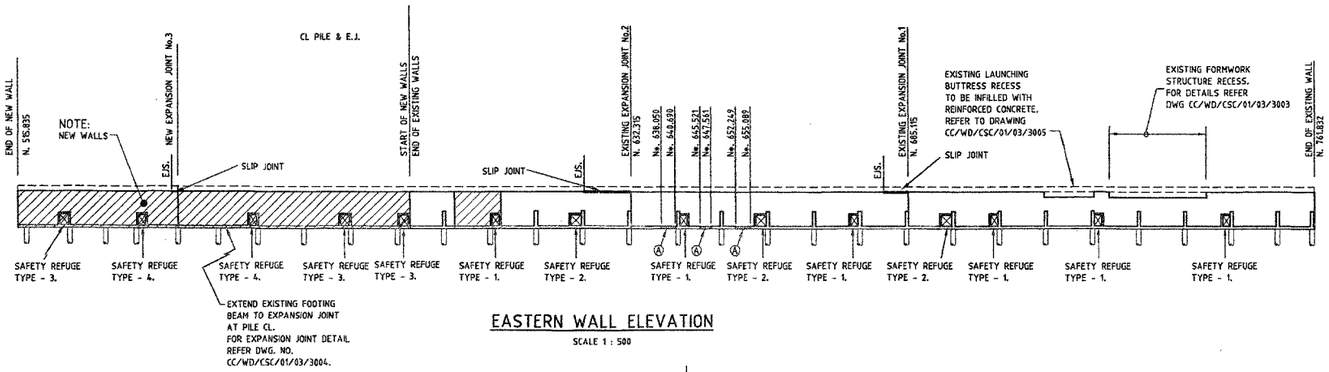


TYPICAL RAILWAY CORRIDOR SHORING PILE REINFORCEMENT DETAIL

1. ALL RAILWAY CORRIDOR SHORING PILES EMBEDDED 600 MIN. INTO WEAK SHALE OR TO R.L. SHOWN ON THE ELEVATIONS WHICH EVER IS THE DEEPER.

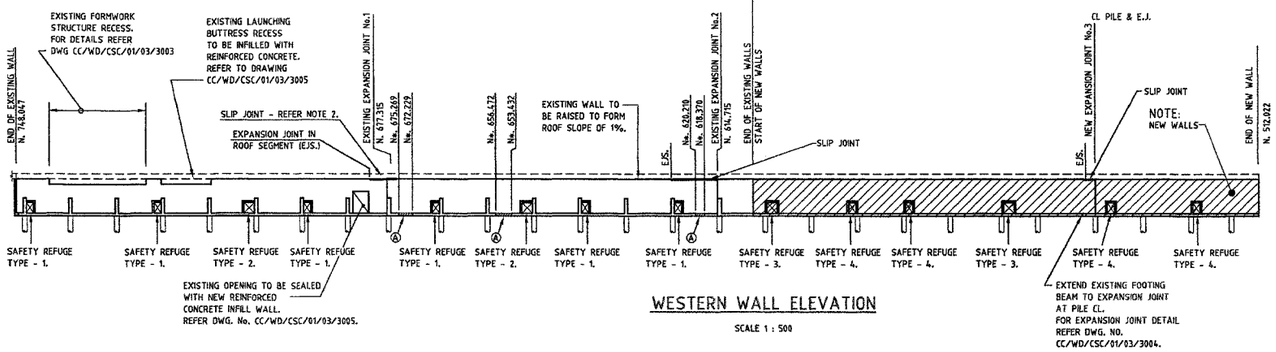
EDMS CV0278721 WARNING SCANNED IMAGE

WORK AS EXECUTED



EASTERN WALL ELEVATION

SCALE 1 : 500



WESTERN WALL ELEVATION

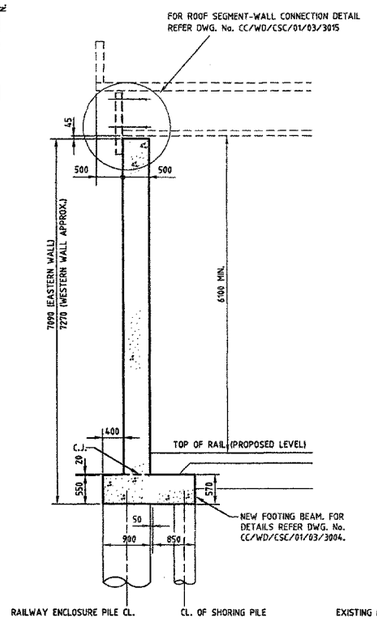
SCALE 1 : 500

NOTES:

1. No CO-ORDINATES OF RECESS IN WALL FLANGE TO ACCOMMODATE PREVIOUSLY PROPOSED TOWER COLUMNS.
2. FOR DETAILS OF SLIP JOINT BETWEEN WALL AND ROOF SEGMENT REFER TO DRAWING No. CC/WD/CSC/01/03/3015.
3. Ⓐ - DENOTES EXISTING FLANGE RECESS TO BE FILLED WITH REINFORCED CONCRETE LINK BEAM .

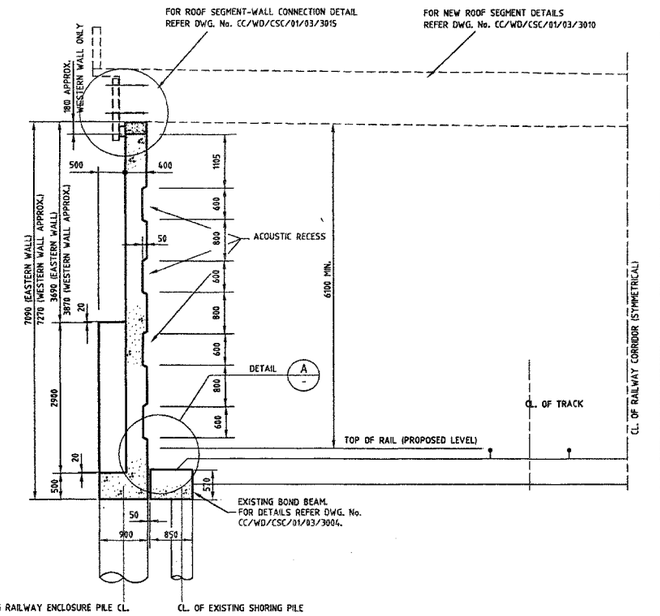
NOTES:

1. MINIMUM 28 DAY COMPRESSIVE STRENGTH OF EXISTING CONCRETE 32 MPa, & NEW CONCRETE SHALL BE 40 MPa. MAXIMUM SIZE AGGREGATE OF 20. MAXIMUM SLUMP 80.
2. HORIZONTAL CONSTRUCTION JOINT MAY BE PROVIDED IF REQUIRED - REFER SPECIFICATION.
3. CO-ORDINATES OF WALLS EXPANSION JOINTS ARE GIVEN FOR THE TOP OF WALL.
4. FOR STRUCTURAL NOTES REFER TO DWG. No. CC/WD/CSC/01/03/3045.



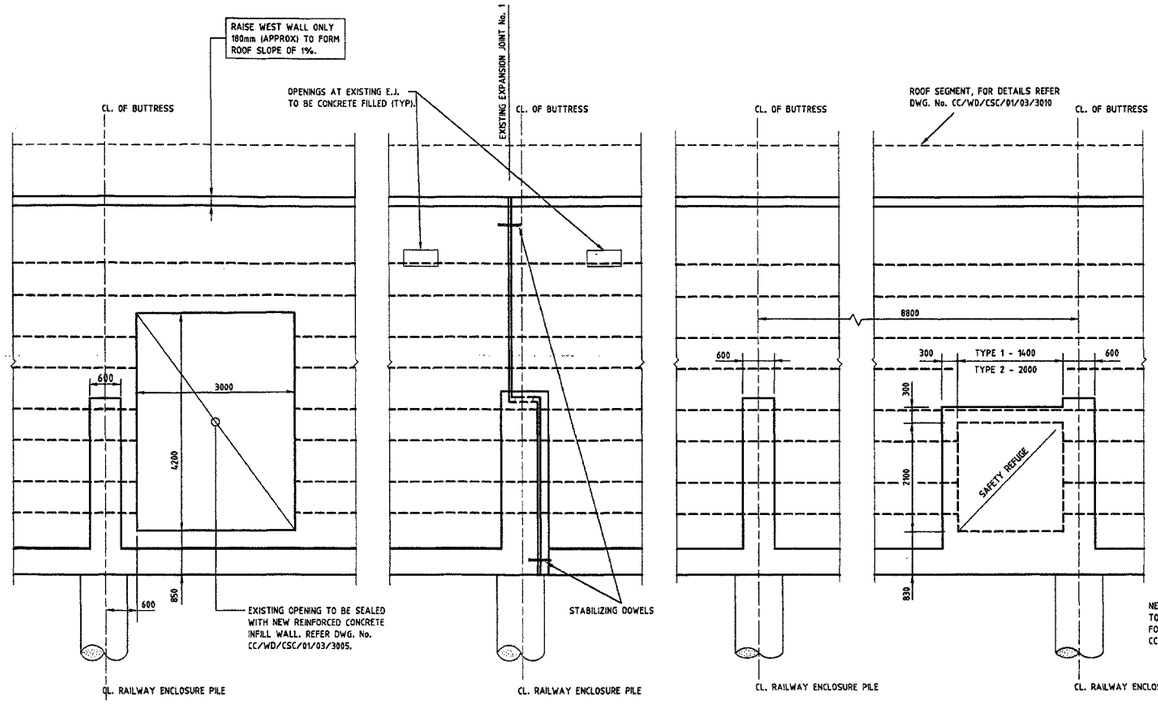
TYPICAL SECTION THROUGH NEW WALL

SCALE 1 : 50



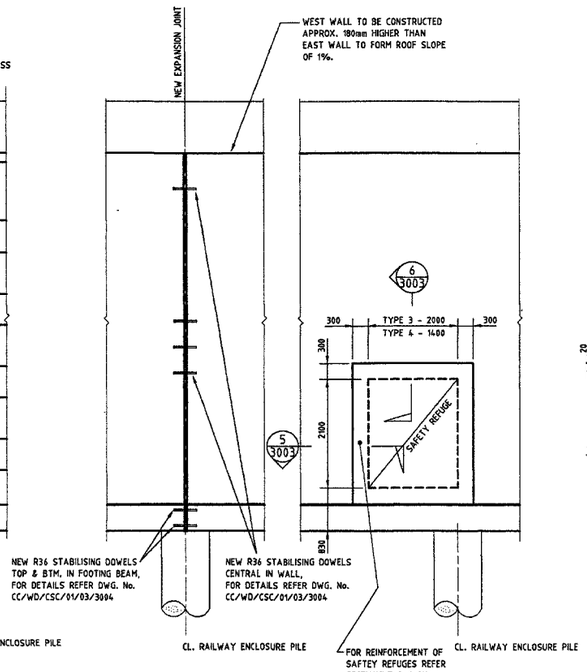
TYPICAL SECTION THROUGH EXISTING WALL

SCALE 1 : 50



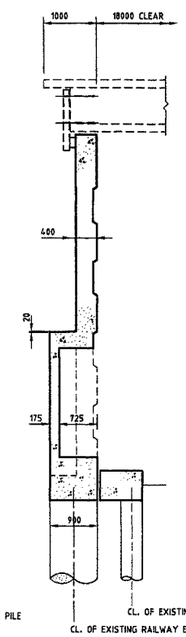
TYPICAL PART ELEVATION EXISTING WALL

SCALE 1:50



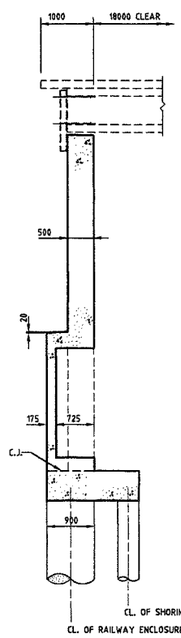
TYPICAL PART ELEVATION NEW WALL

SCALE 1:50



TYPICAL SECTION THROUGH EXISTING SAFETY REFUGES TYPES 1 & 2

SCALE 1 : 50

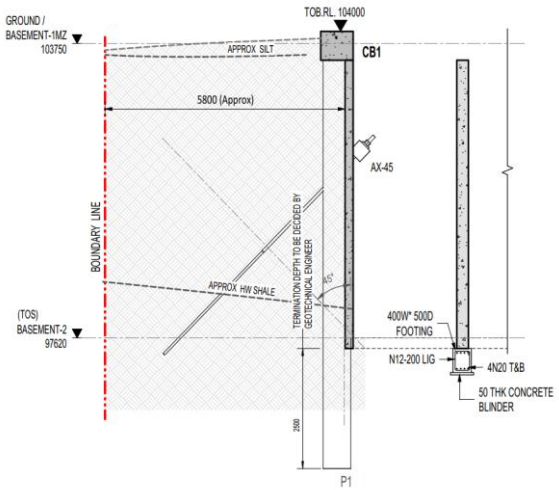


TYPICAL SECTION THROUGH NEW SAFETY REFUGES TYPES 3 & 4

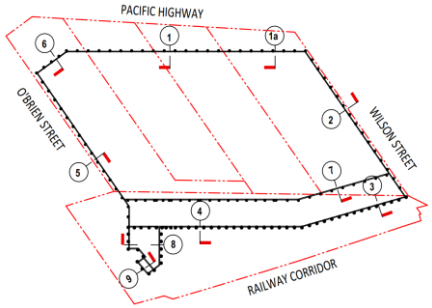
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EDMS CV0278722 WARNING SCANNED IMAGE

WORK AS EXECUTED

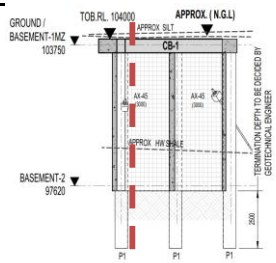


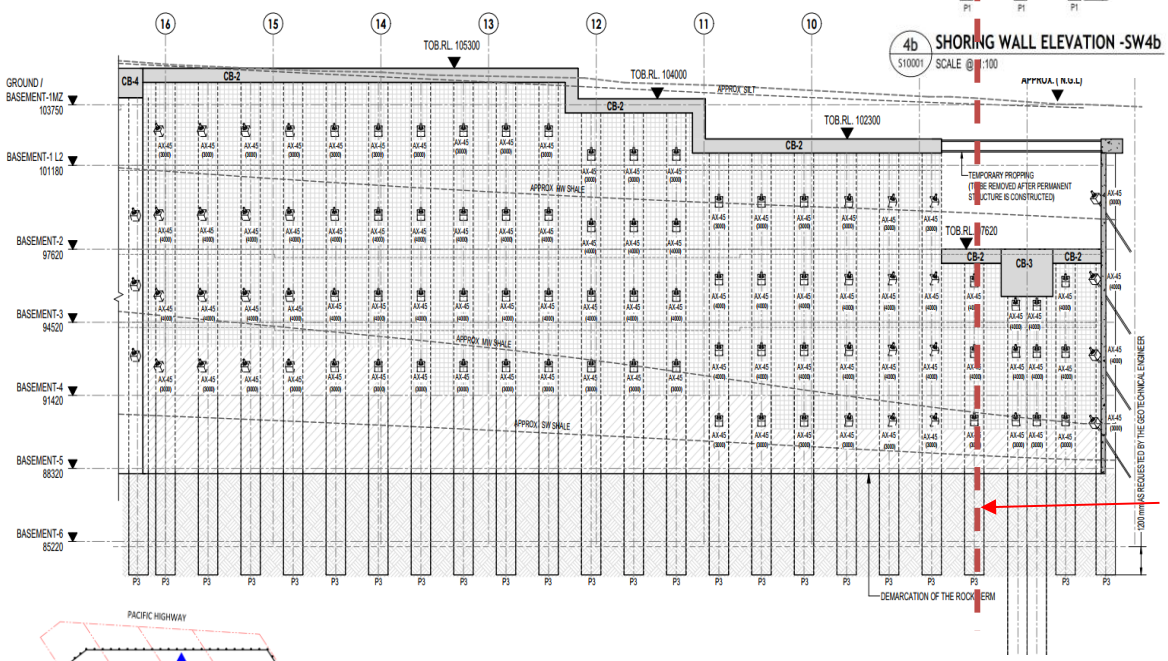
09 S10001 **SECTION-9** SCALE @ 1:50



Typical cross-section view of upper shoring wall

(extract of Cardigal Group Drawing S10020 Rev H, dated 09/05/25, Project Ref. 01-100084)

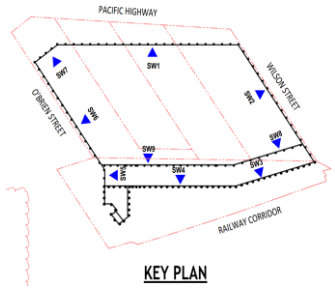




4b S10001 **SHORING WALL ELEVATION -SW4b** SCALE @ 1:100

Location of design cross section

DESIGN SECTION 1



KEY PLAN

04 S10001 **SHORING WALL ELEVATION -SW4** SCALE @ 1:100

Elevation view showing indicative location of design cross-section

(extract of Cardigal Group Drawing S10011 Rev H, dated 09/05/25, Project Ref. 01-100084)

CLIENT
BB Wilson

PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

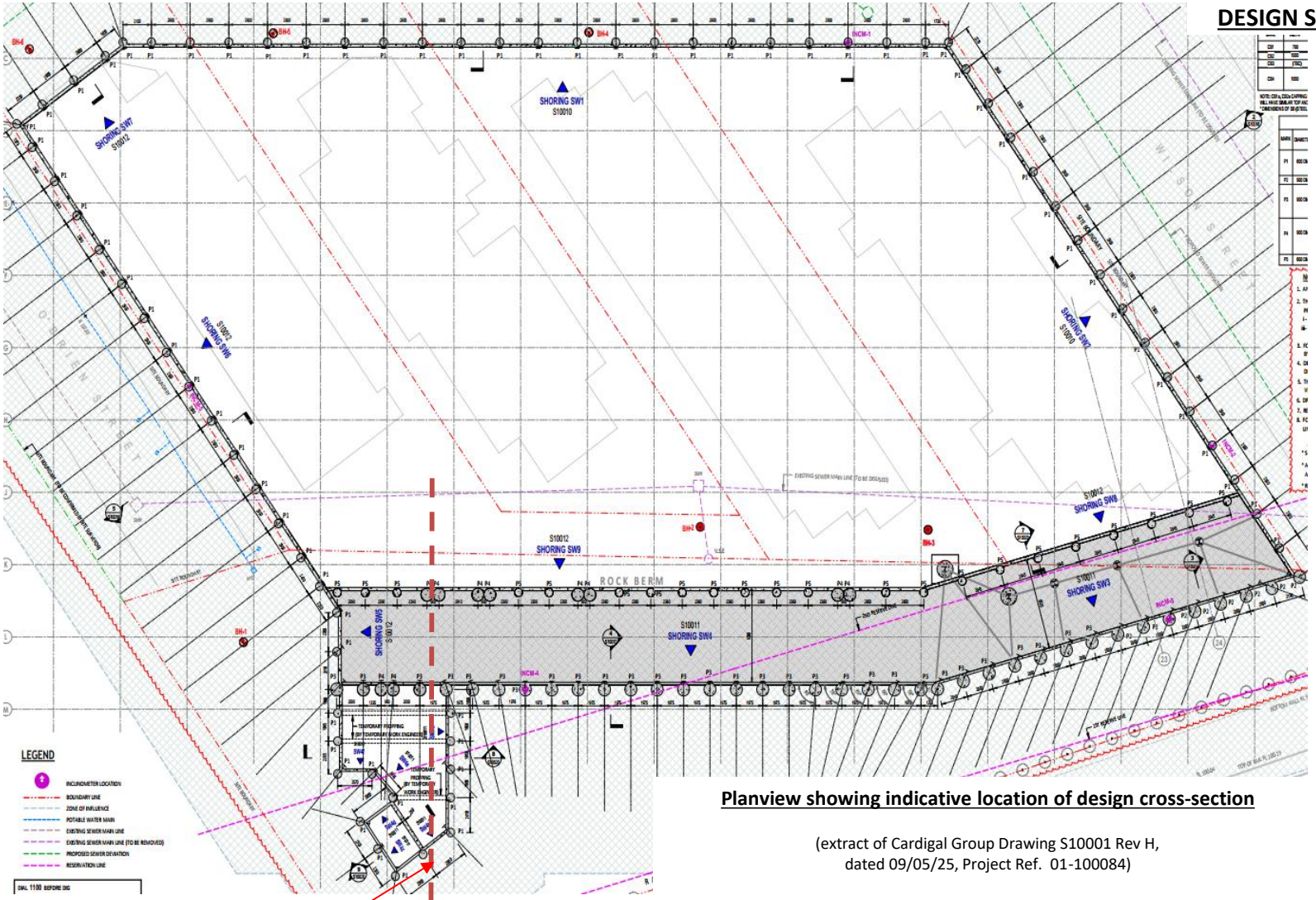
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PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
Proposed shoring system - structural input

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-1

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsw

DESIGN SECTION 1



Planview showing indicative location of design cross-section

(extract of Cardigal Group Drawing S10001 Rev H, dated 09/05/25, Project Ref. 01-100084)

Location of design cross section

CLIENT
BB Wilson

PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

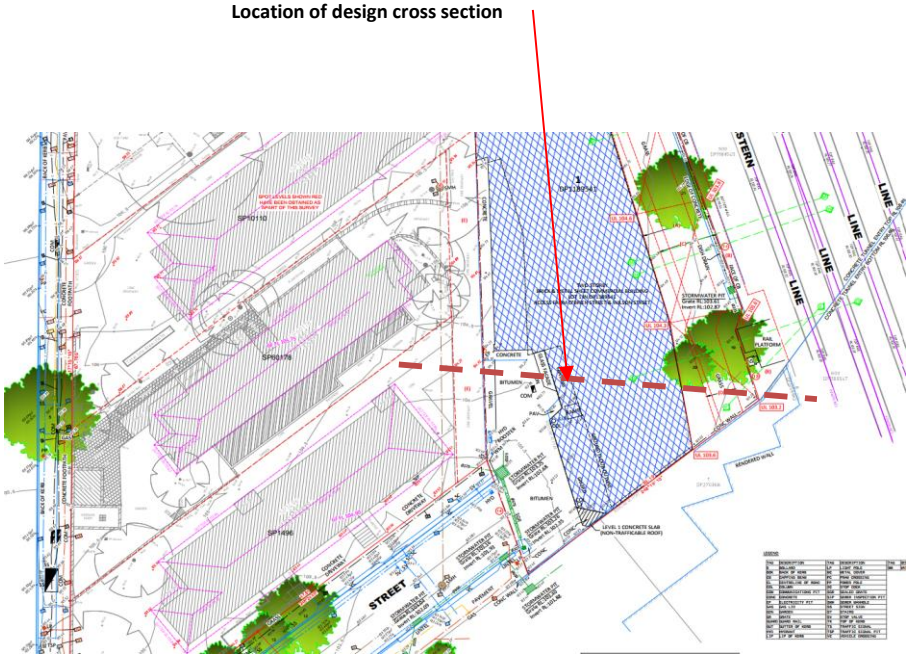
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PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
Proposed shoring system - plan view

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-2

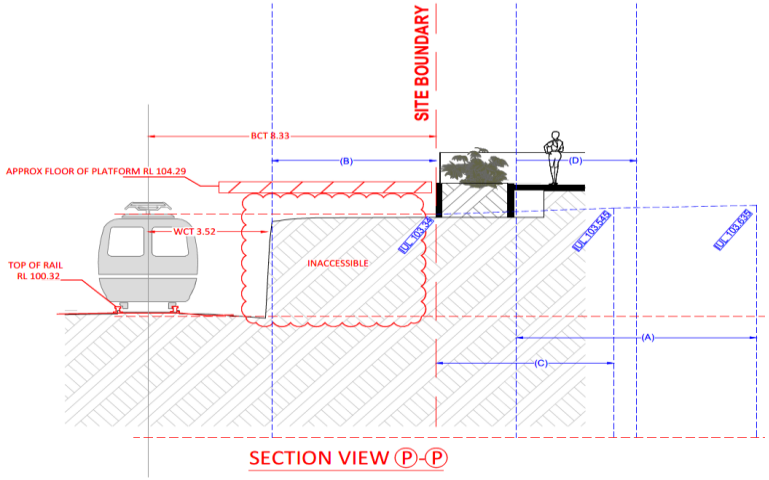
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DESIGN SECTION 1



Survey plan of the site and surroudings, showing location of design cross-section

(extract of SDS Pty Ltd Drawing 6 of 9, REF: 9062 Rev C, dated 20/03/24)



Cross-section P-P showing proposed development in relation to railway assets

(extract of SDS Pty Ltd Drawing 5 of 9, REF: 9062 Rev C, dated 20/03/24)

CLIENT
BB Wilson

PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

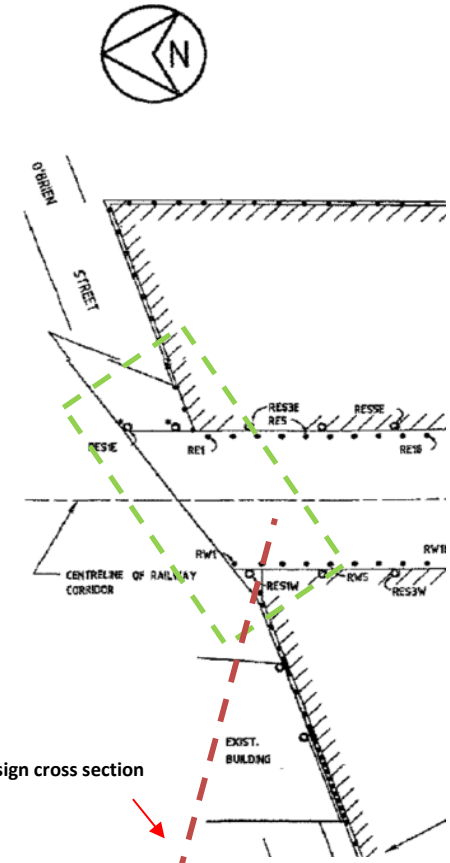
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DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
Survey/architectural drawings - geometric input

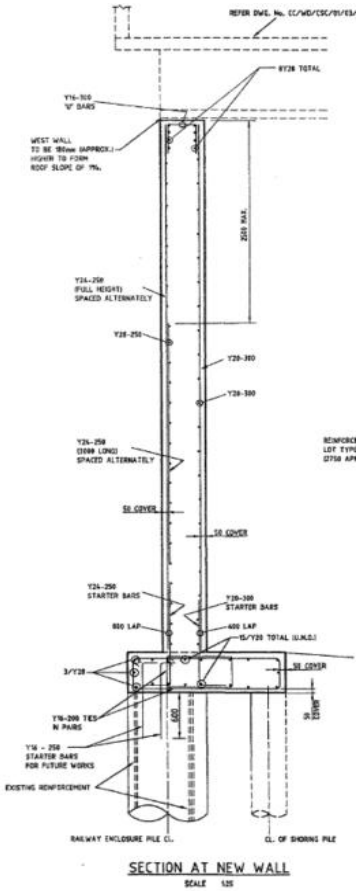
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-3

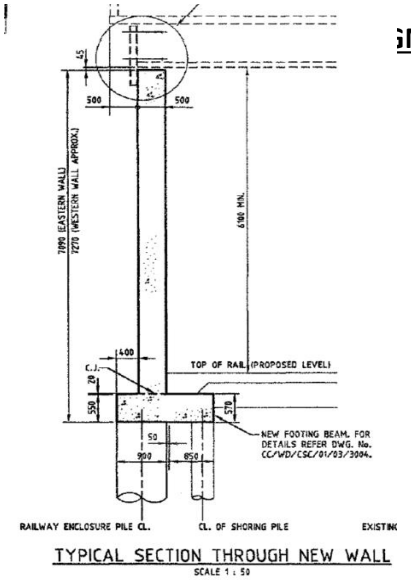
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GN SECTION 1

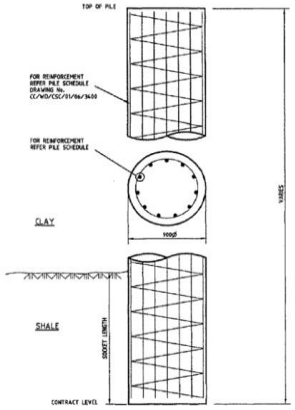


Location of design cross section

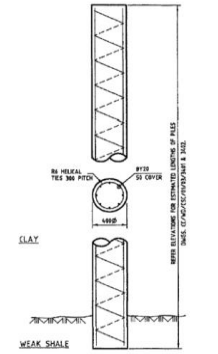




TYPICAL SECTION THROUGH NEW WALL
SCALE 1 : 50



TYPICAL RES PILE REINFORCEMENT DETAIL



TYPICAL RAILWAY CORRIDOR SHORING PILE REINFORCEMENT DETAIL

As-built records

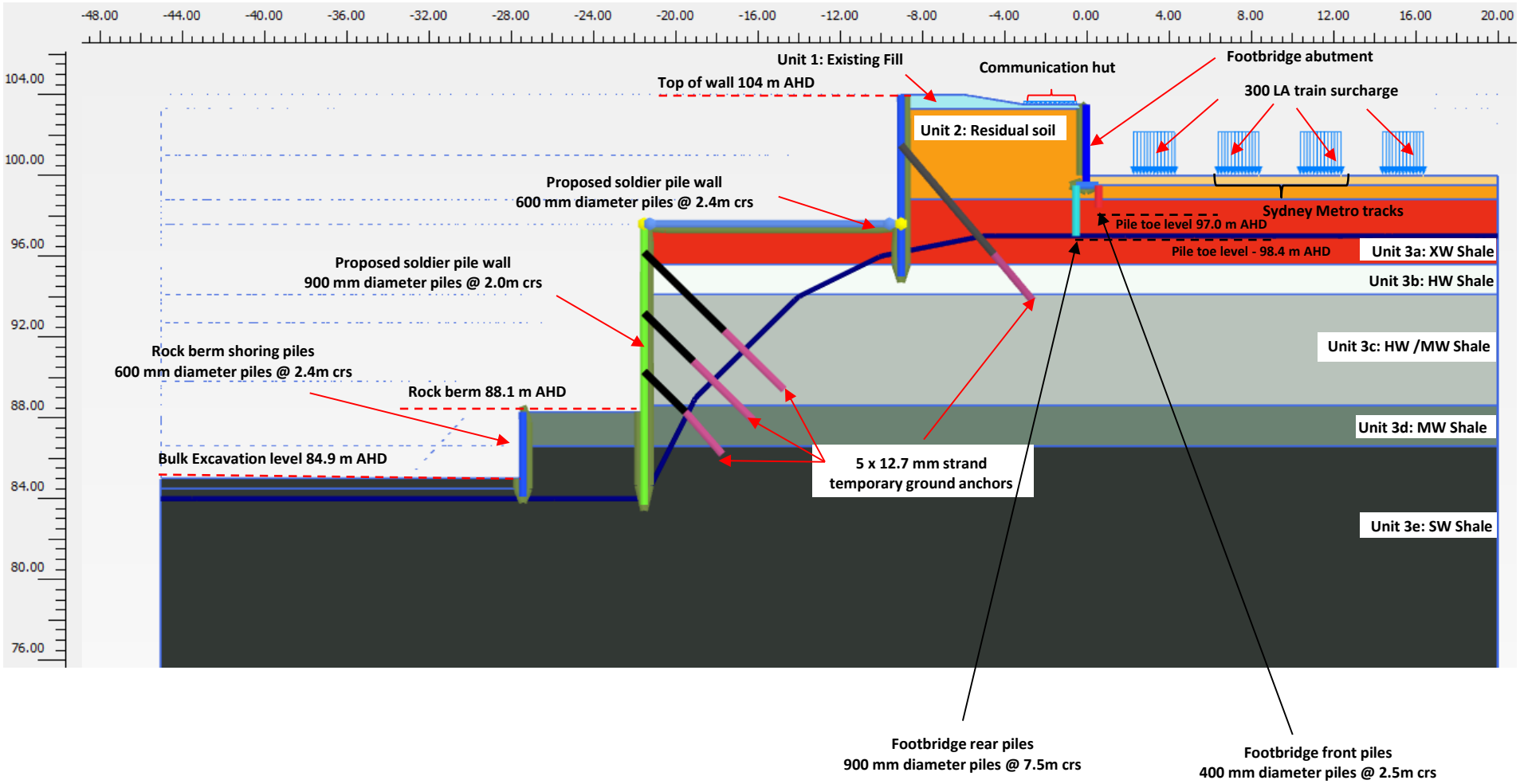
(extracts of Railway Enclosure Structure - Pacific Place, Railway Street Chastwood C, dated October 2001)

CLIENT	BB Wilson
PROJECT	849, 853 & 859 Pacific Highway, Chatswood
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM
TITLE	**Existing railway assets as-builts**

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-4

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 1



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PROJECT
849, 853 & 859 Pacific Highway, Chatswood

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DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
PLAXIS 2D - Model overview

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-5

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 1

Stage no:		Construction stage	Surcharge/Loading	Structural EI stiffness of new piled wall
1		Establish initial conditions	/	N/A
2		Current housing development	Dwelling (20 kPa) & pedestrian (5 kPa) surcharge	
3		Railway trench excavation	As above	
4		Railway operation	Dwelling (20 kPa), pedestrian (5 kPa) surcharges & LA300 train surcharge	
5		Demolition of current housing development	LA300 train surcharge	
6		Install outer soldier pile wall	As above	0.9 EI
7		1st level of excavation	As above	
8		Installation of 1st level of ground anchors	As above	
9		2nd level of excavation	As above	
10		Install inner solder pile wall	As above	
11		3rd level of excavation	As above	
12		Installation of 2nd level of ground anchors	As above	
13		4th level of excavation	As above	
14		Installation of 3rd level of ground anchors	As above	
15		5th level of excavation	As above	
16		Installation of 4th level of ground anchors	As above	
17		6th level of excavation (Top of rock berm)	As above	
18		Install rock berm shoring wall	As above	
19		Excavation to bulk excavation level	As above	
	19.1	Over-excavation scenario	As above	
20		Change to long-term structural properties	As above	0.6 EI
21		Install Basement -5 slab	As above	
22		Install Basement -4 slab	As above	
23		Deactivate 4th level of ground anchors	As above	
24		Install Basement -3 slab	As above	
25		Deactivate 3rd level of ground anchors	As above	
26		Install Basement -2 slab	As above	
27		Deactivate 2nd level of ground anchors	As above	
28		Install Basement -1MZ slab	As above	
29		Deactivate 1st level of ground anchors	As above	
30		Application of 20kPa surcharge for future railway operations	Railway (20 kPa) surcharge & LA300 train surcharge	

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DATE	30/05/2025
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DESIGN	MN
REVIEW	JM
APPROVED	JM

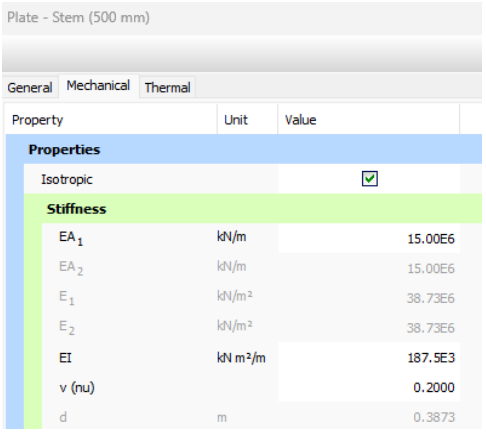
TITLE
PLAXIS 2D - Construction staging

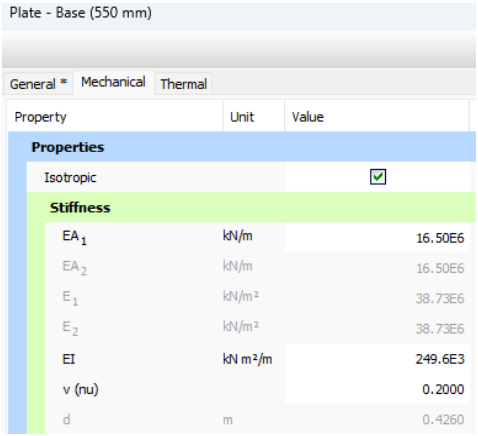
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-6

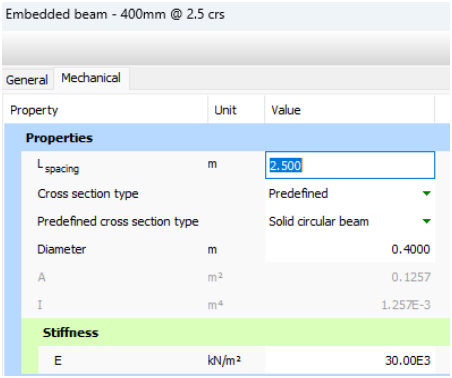
https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

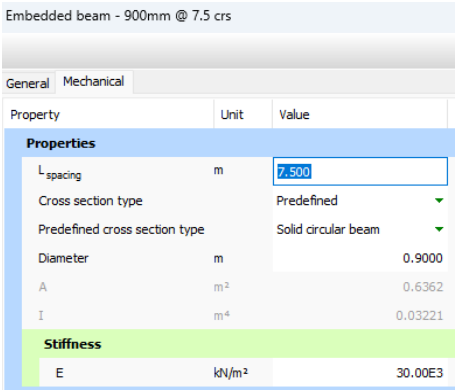
Existing railway asset

DESIGN SECTION 1

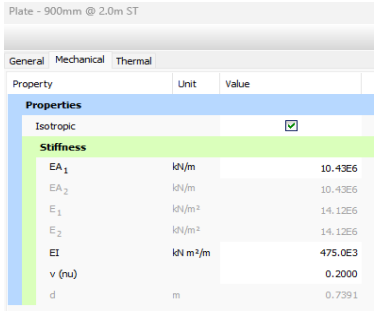


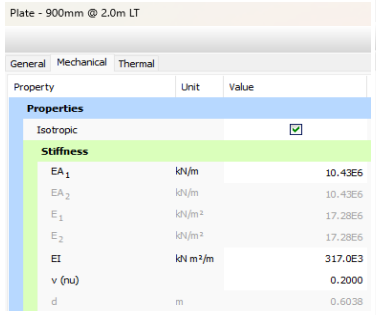


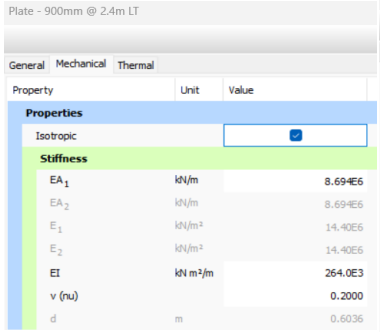


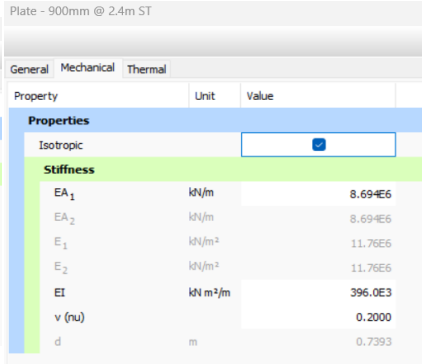


Proposed shoring system









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849, 853 & 859 Pacific Highway, Chatswood

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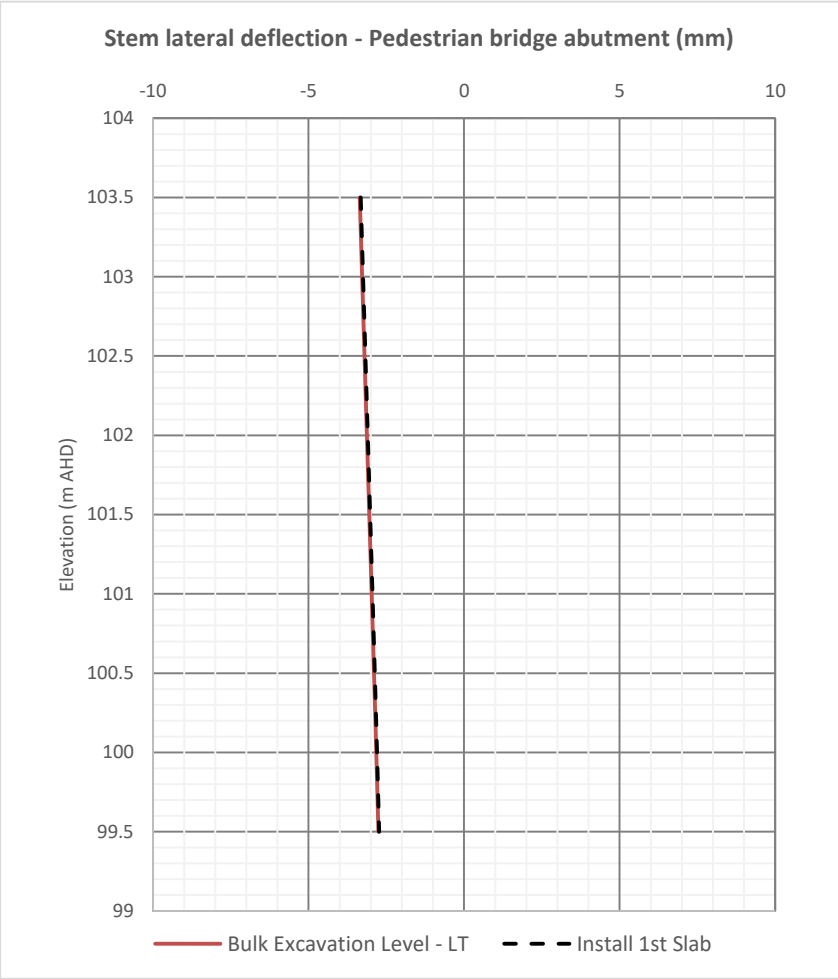
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

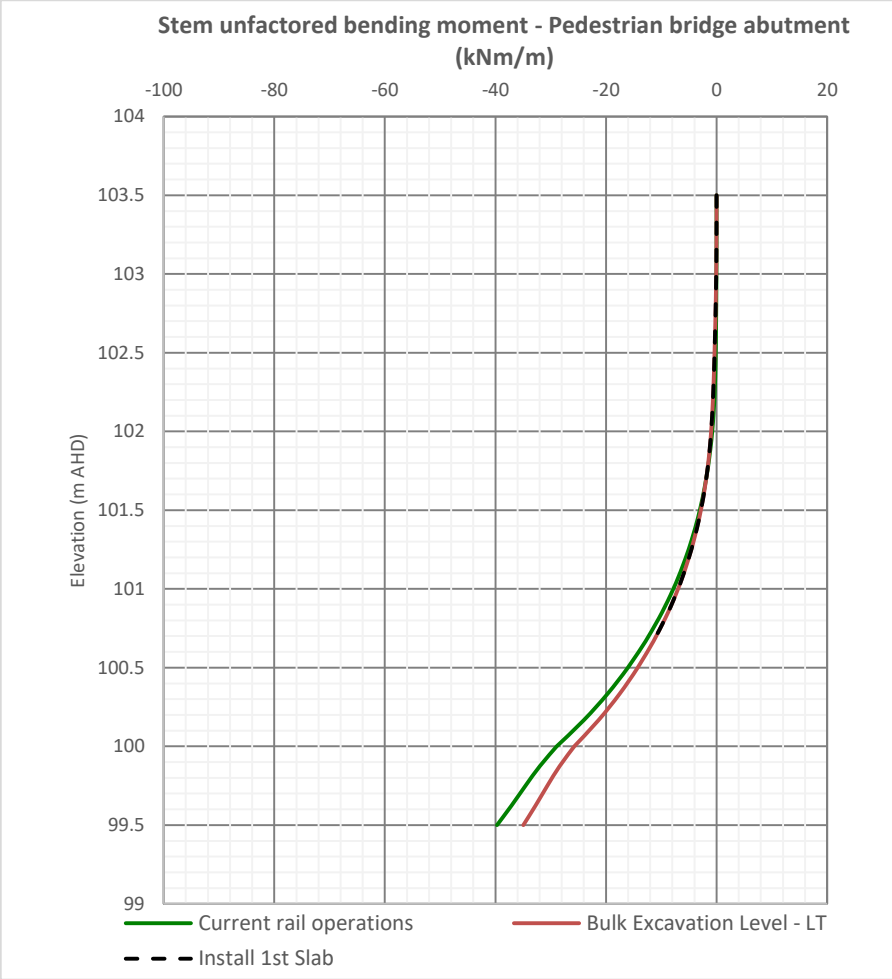
TITLE
PLAXIS 2D - Structural elements properties

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-7

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 1





Notes:
1. Structural actions are per pile and unfactored

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PROJECT
849, 853 & 859 Pacific Highway, Chatswood

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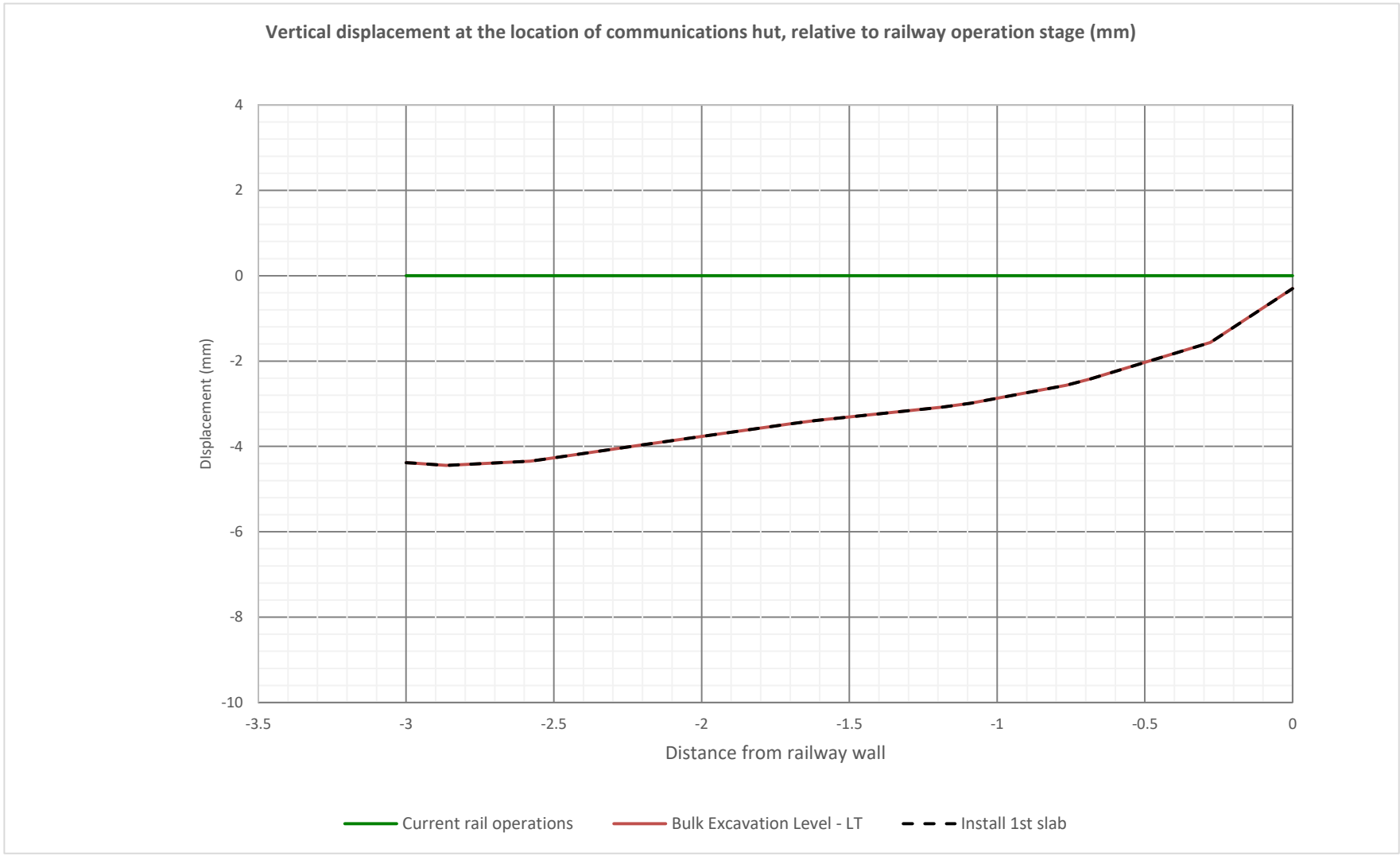
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
PLAXIS 2D - Existing railway wall outputs

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-8

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsw

DESIGN SECTION 1



Notes:
1. Structural actions are per pile and unfactored

CLIENT
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PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

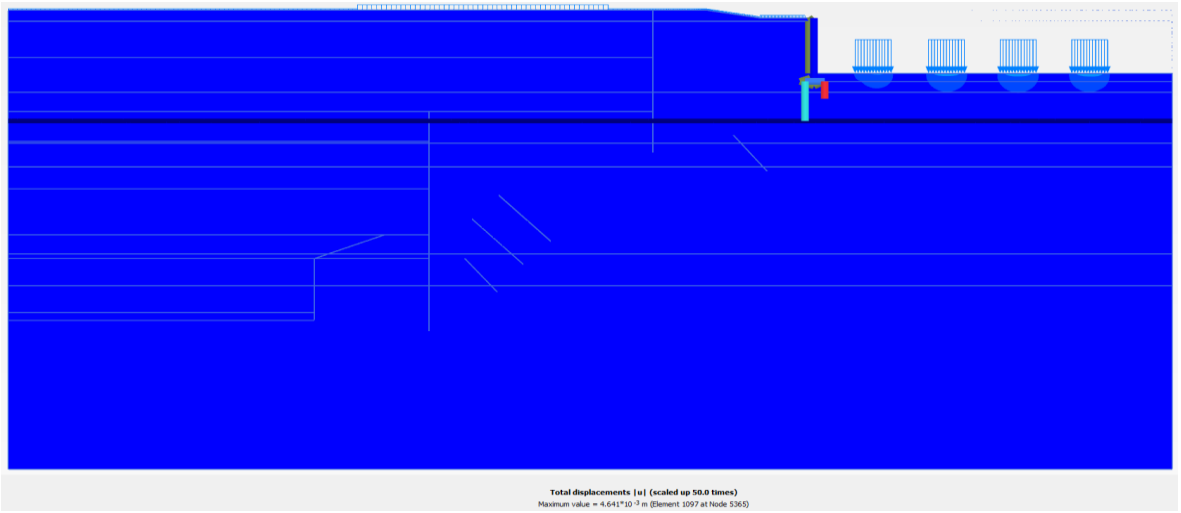
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

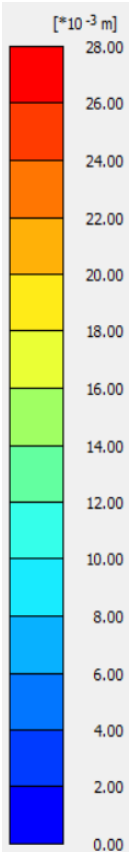
TITLE
PLAXIS 2D - Settlement at existing Sydney Trains communication hut location

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS1-9

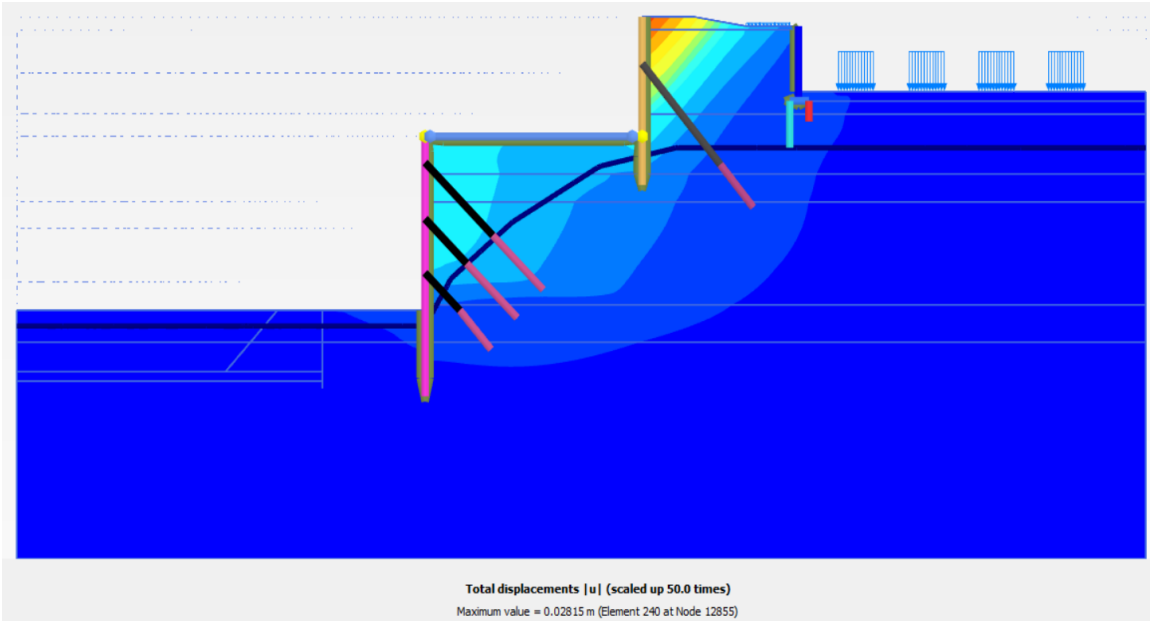
https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 1





Railway operation stage (current)



Impact of proposed works (6th level of excavation)

File Name: #

CLIENT
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PROJECT
849, 853 & 859 Pacific Highway, Chatswood

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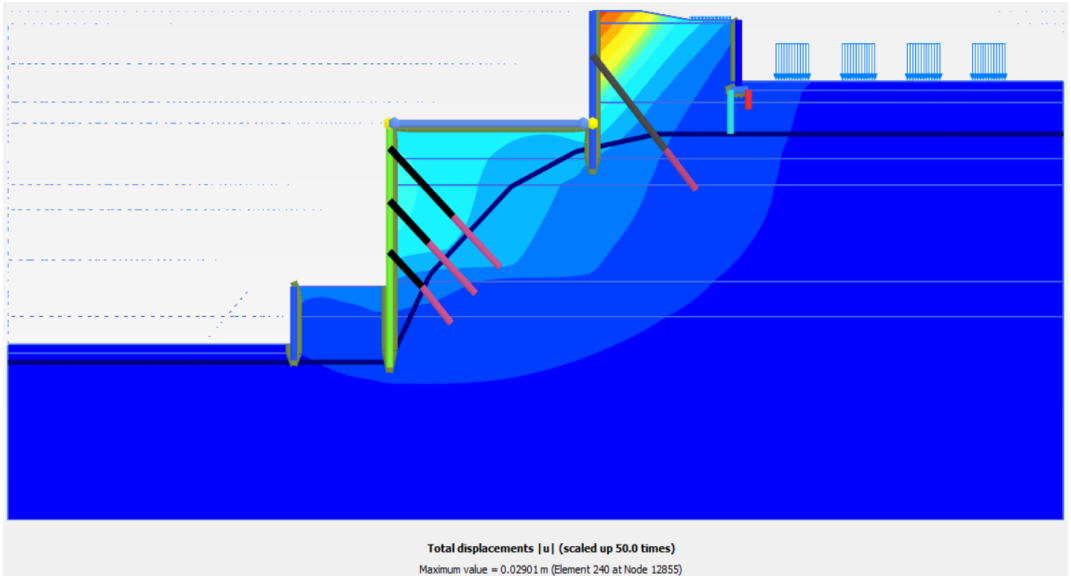
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

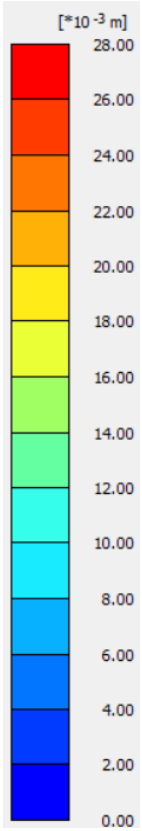
TITLE
PLAXIS 2D - Displacement field XY 1/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S1-10

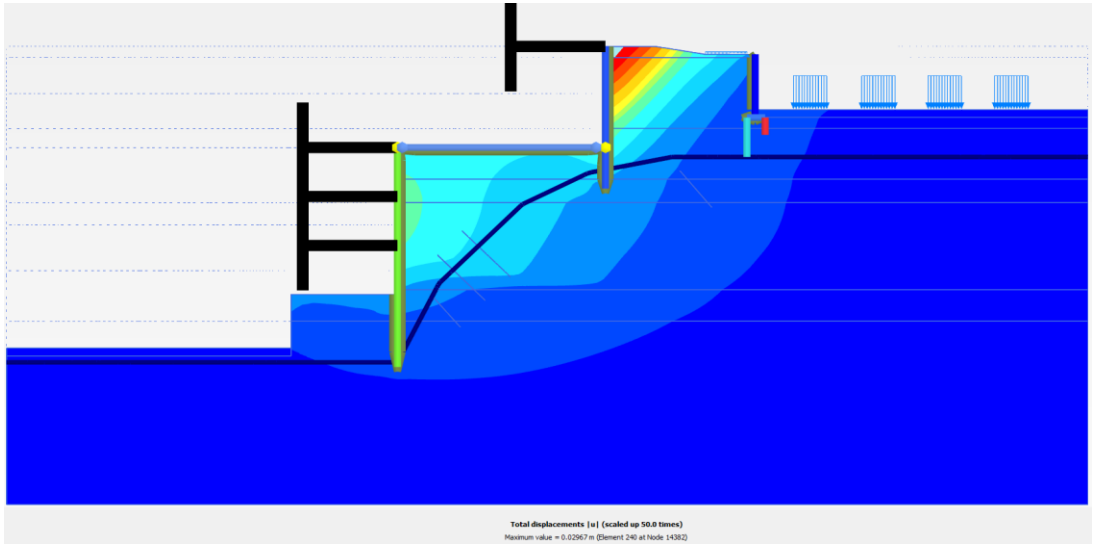
https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 1





Impact of proposed works (end of excavation)



Impact of proposed works (removal of last ground anchor level)

File Name: #

CLIENT
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PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

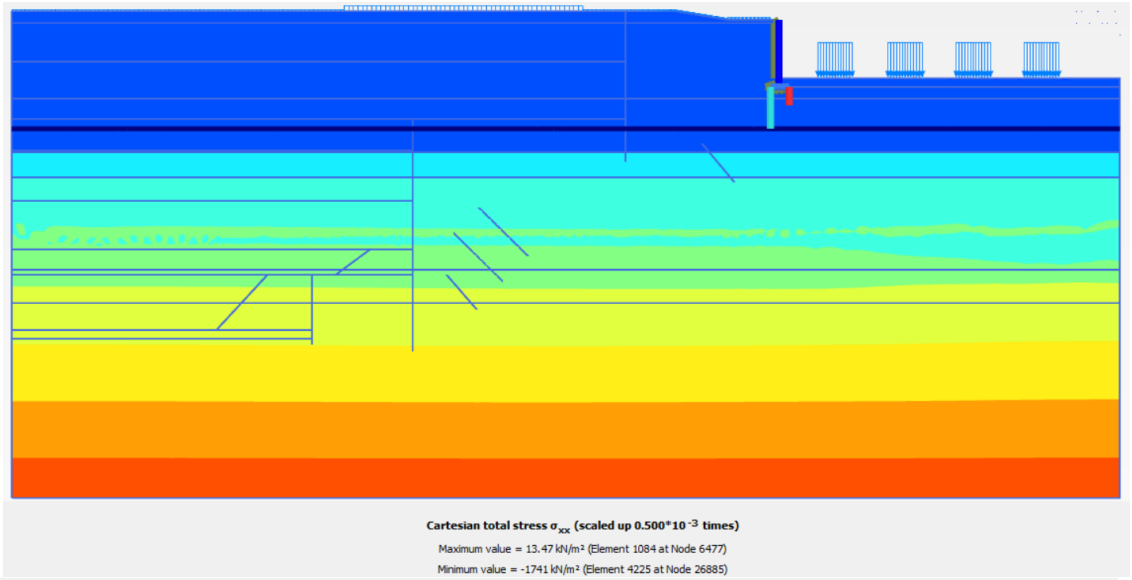
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
PLAXIS 2D - Displacement field XY 2/2

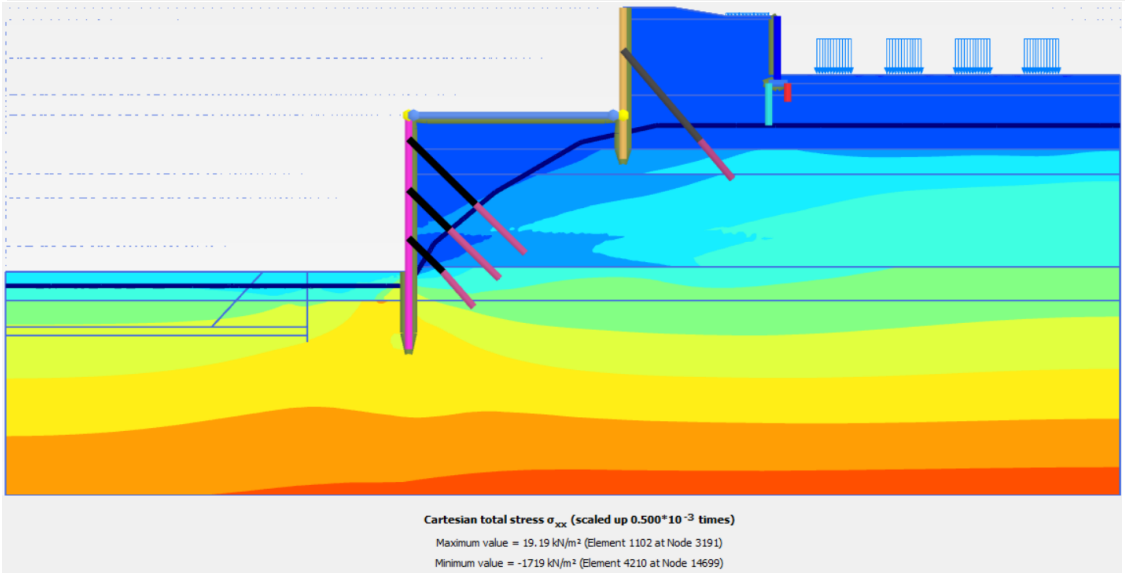
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S1-11

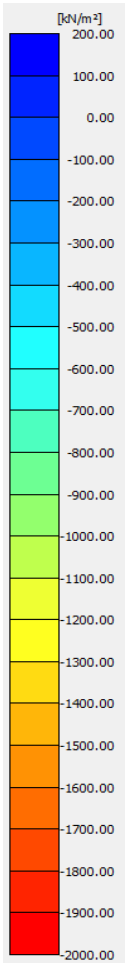
https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 1



Railway operation stage (current)





Impact of proposed works (6th of excavation)

File Name: #

CLIENT
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PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

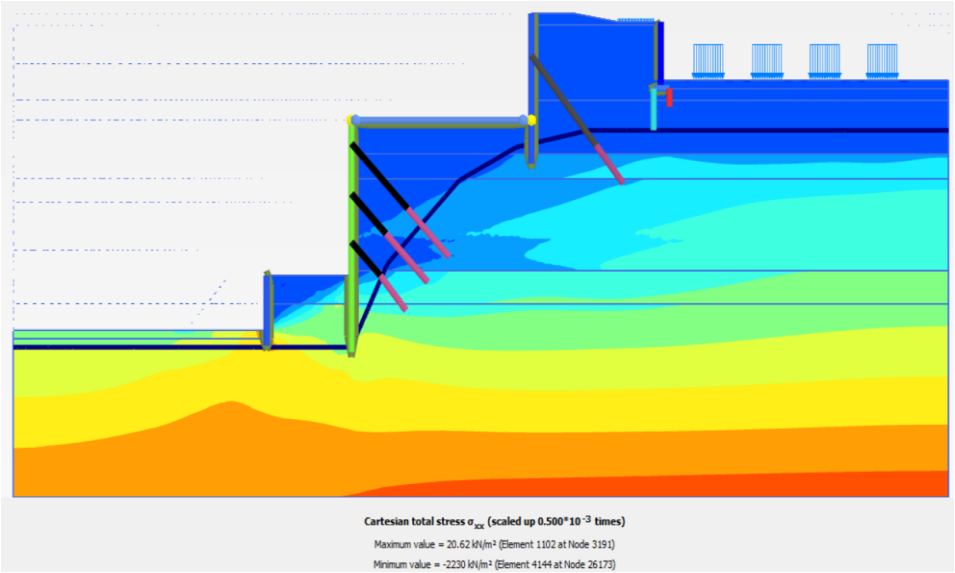
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
PLAXIS 2D - Stress field XX 1/2

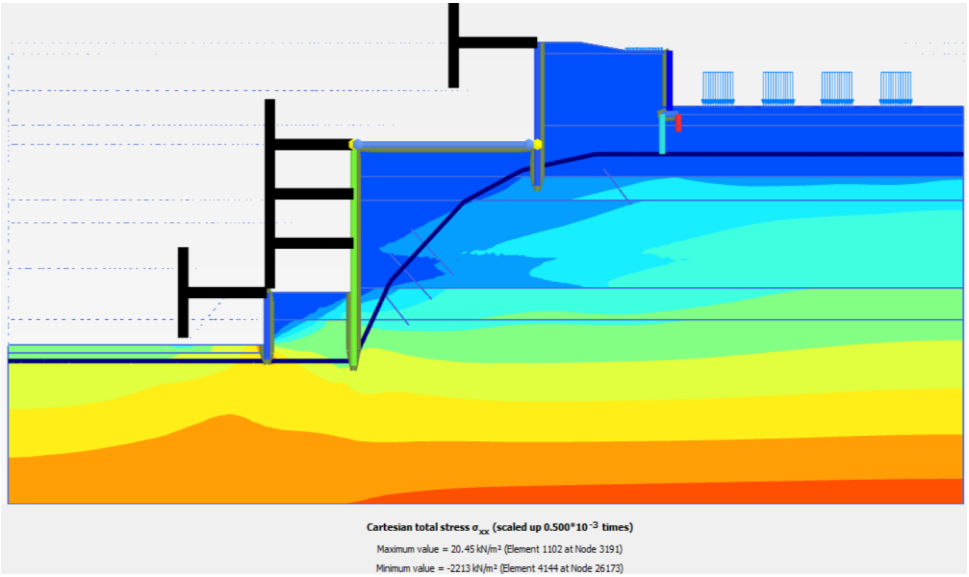
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S1-12

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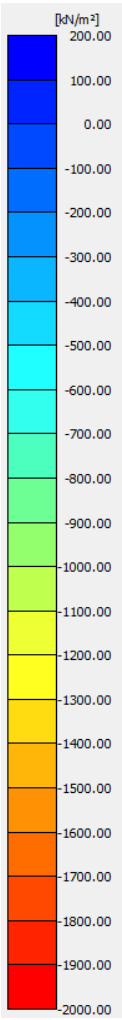
DESIGN SECTION 1



Impact of proposed works (end of excavation)



Impact of proposed works (removal of last level of anchors)



File Name: #

CLIENT
BB Wilson

PROJECT
849, 853 & 859 Pacific Highway, Chatswood

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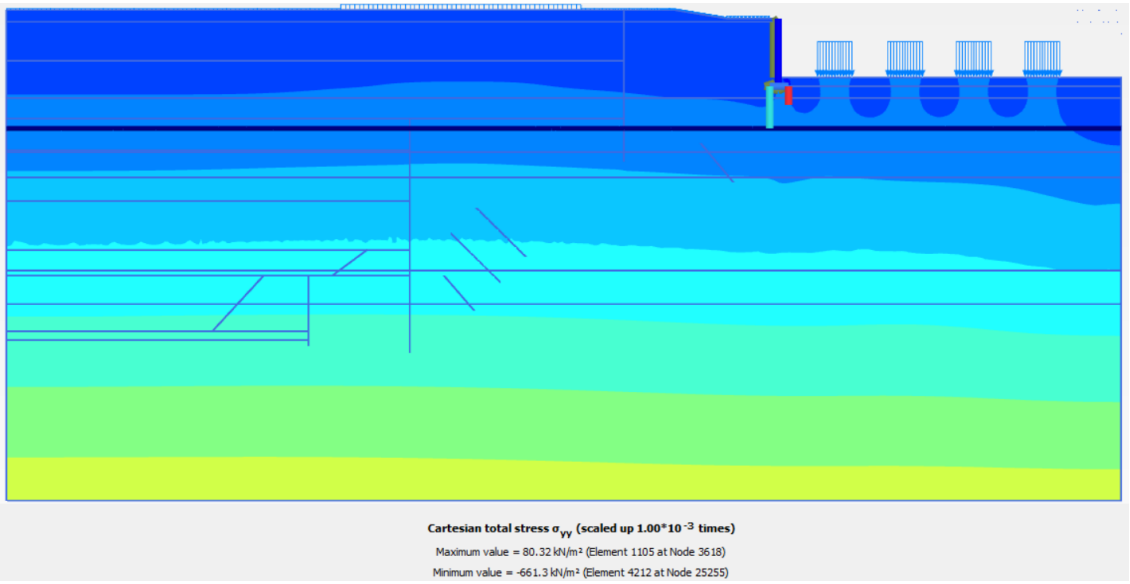
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DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
PLAXIS 2D - Stress field XX 2/2

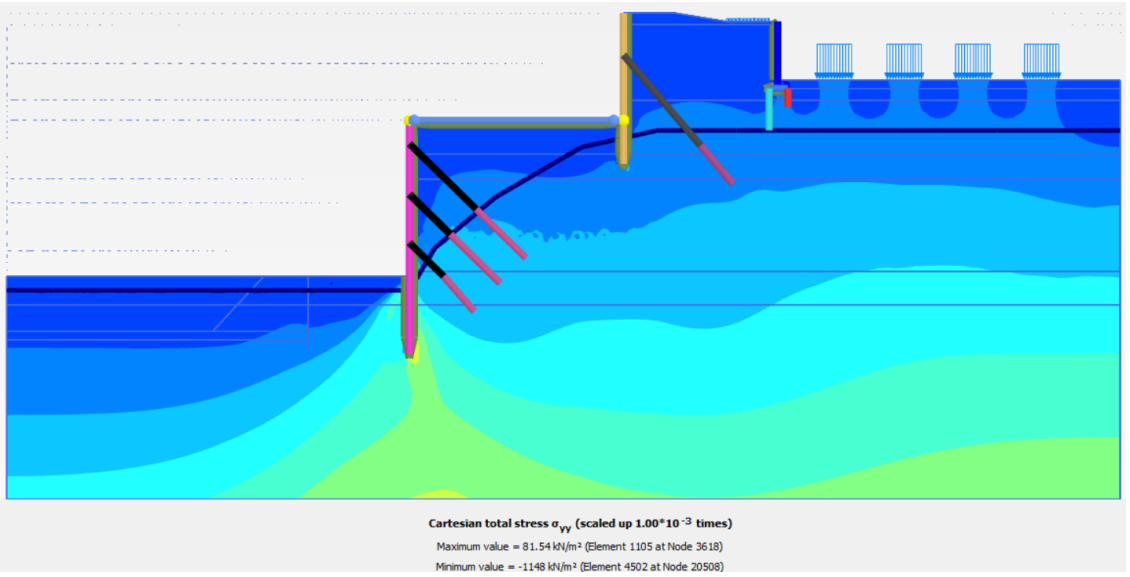
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S1-13

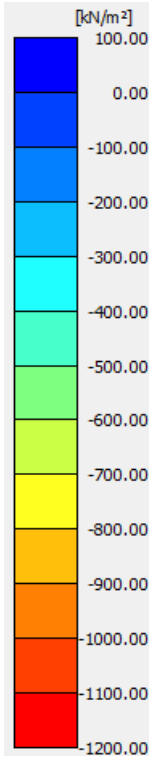
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DESIGN SECTION 1



Railway operation stage (current)





Impact of proposed works (6th of excavation)

File Name: #

CLIENT
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PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

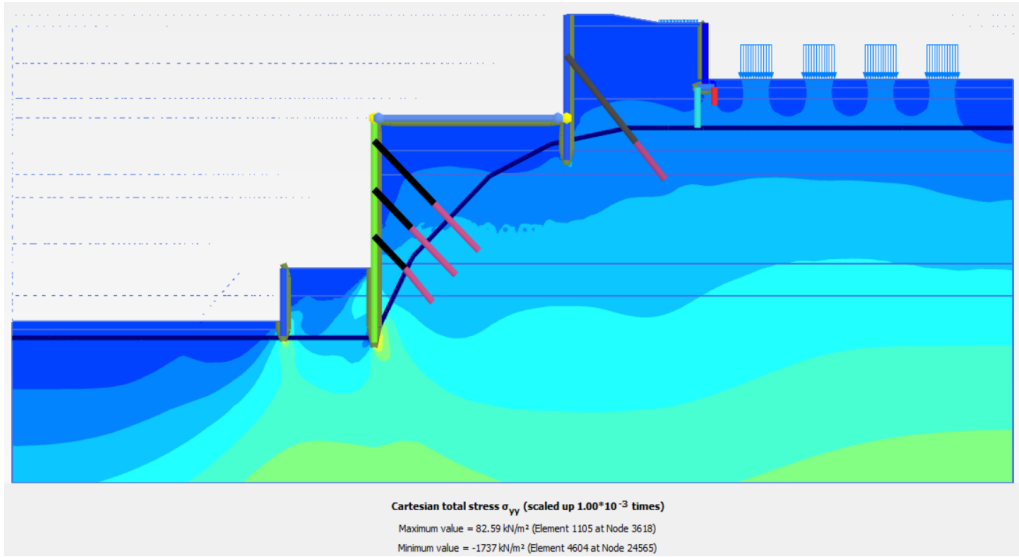
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APPROVED	JM

TITLE
PLAXIS 2D - Stress field YY 1/2

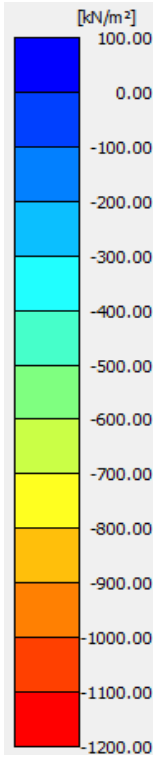
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S1-14

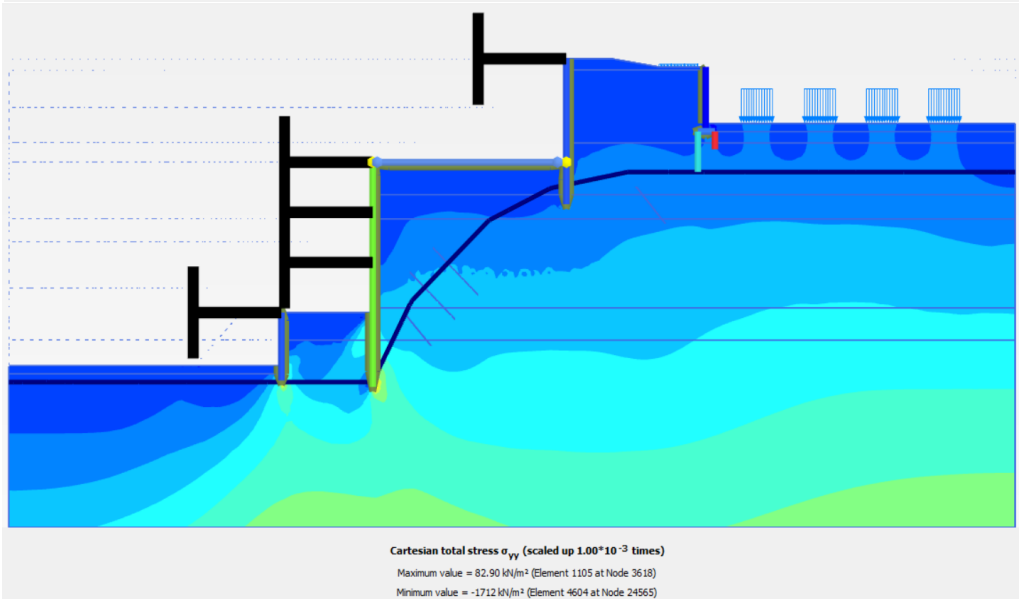
https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 1



Impact of proposed works (end of excavation)





Impact of proposed works (removal of last level of anchors)

File Name: #

CLIENT
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PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

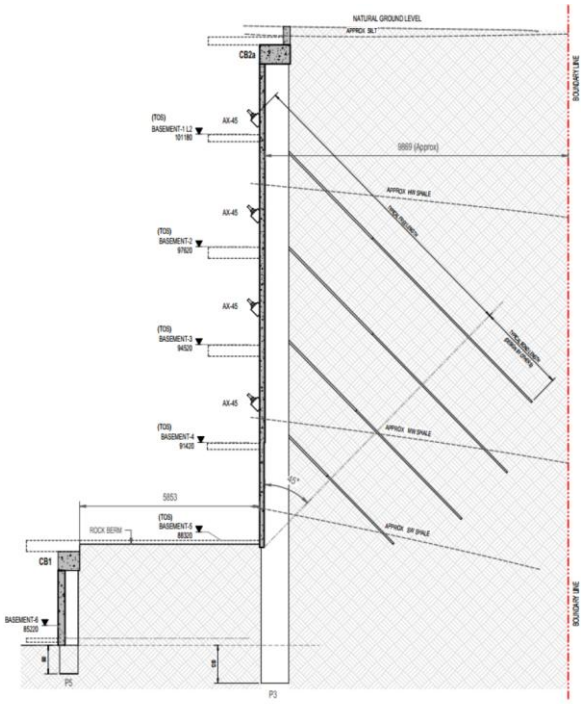
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APPROVED	00/01/1900

TITLE
PLAXIS 2D - Stress field YY 2/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S1-15

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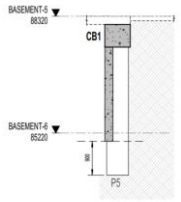
DESIGN SECTION 2



04 SECTION-4 SCALE @ 1:50

Typical cross-section view

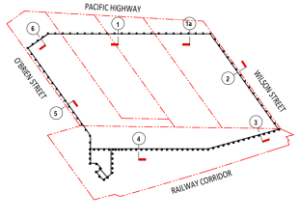
(extract of Cardigal Group Drawing S 10017 Rev H, dated 09/05/25, Project Ref. 01-100084)



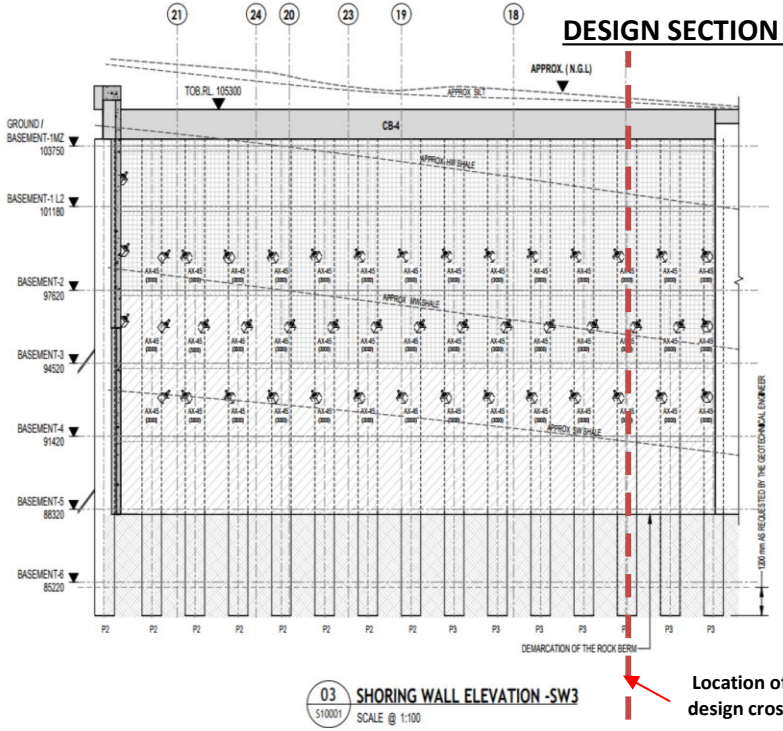
07 SECTION -7 SCALE @ 1:50

Rock berm cross-section view

(extract of Cardigal Group Drawing S 10020 Rev H, dated 09/05/25, Project Ref. 01-100084)

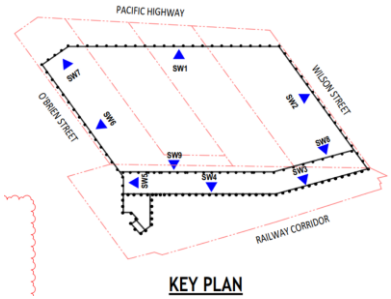


KEY PLAN



03 SHORING WALL ELEVATION -SW3 SCALE @ 1:100

Location of design cross



KEY PLAN

Elevation view showing indicative location of design cross-section

(extract of Cardigal Group Drawing S 10011 Rev H, dated 09/05/25, Project Ref. 01-100084)

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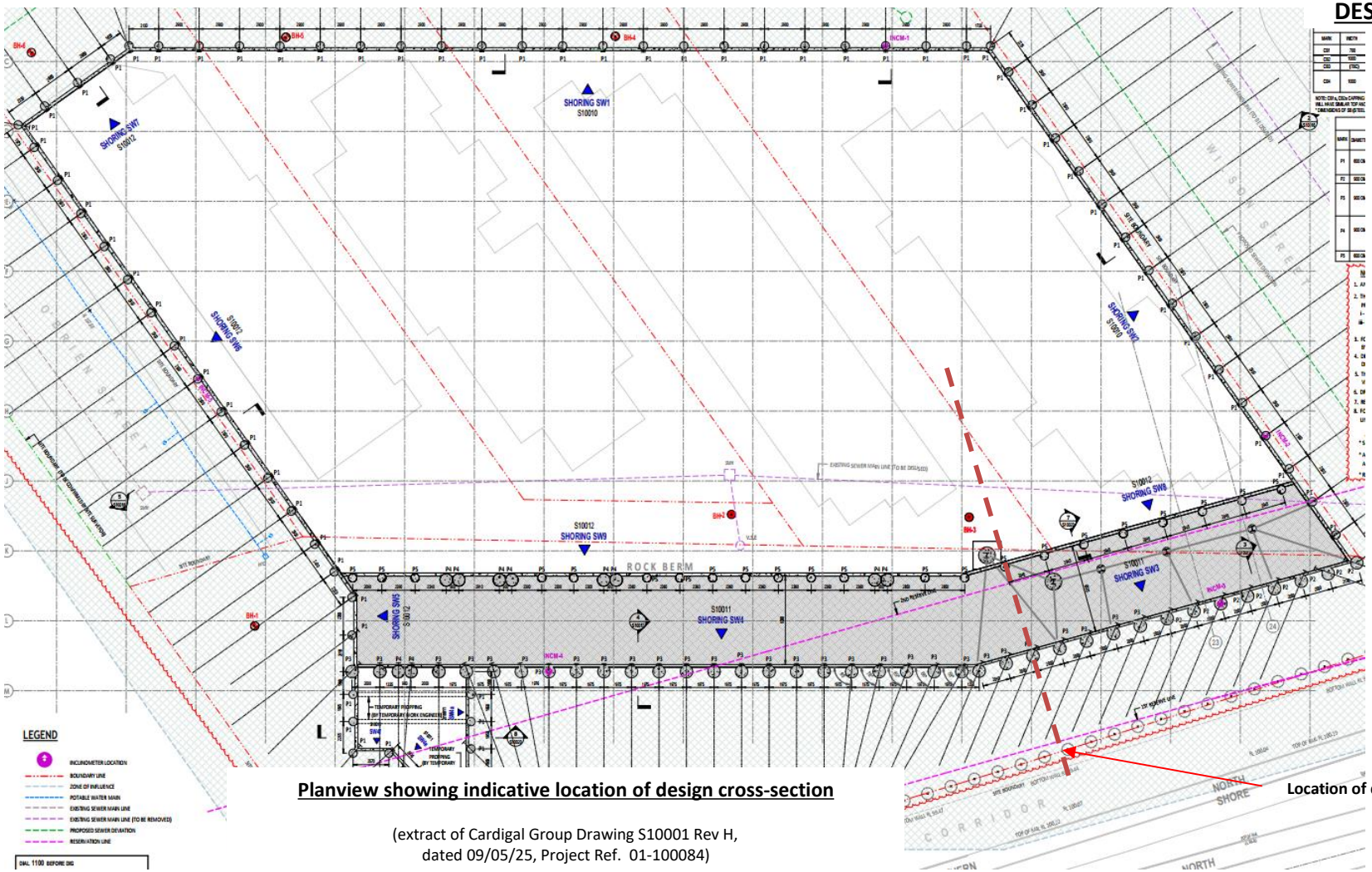
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
Proposed shoring system - structural input 1/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-1

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DESIGN SECTION 2



Planview showing indicative location of design cross-section

(extract of Cardigal Group Drawing S10001 Rev H,
dated 09/05/25, Project Ref. 01-100084)

Location of design cross section

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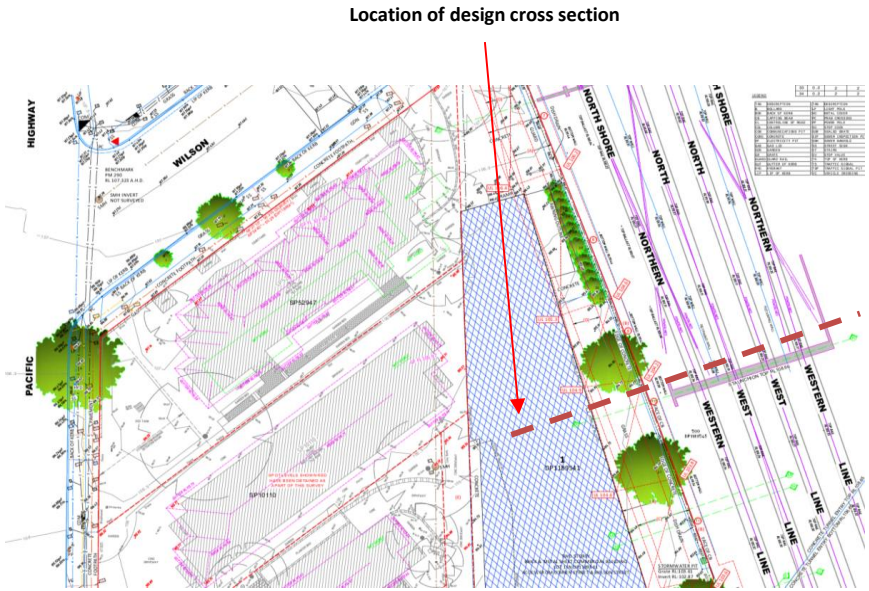
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
Proposed shoring system - structural input 2/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-2

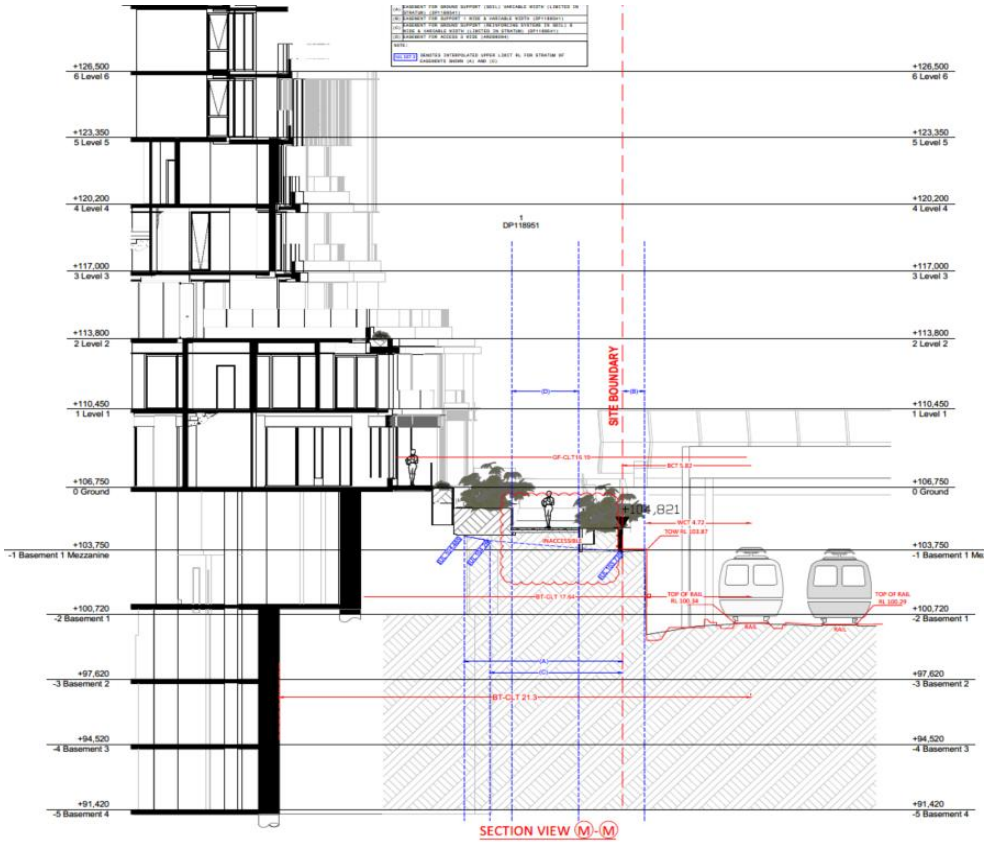
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DESIGN SECTION 2



Survey plan of the site and surroudings, showing location of design cross-section

(extract of SDS Pty Ltd Drawing 6 of 9, REF: 9062 Rev C, dated 20/03/24)



Cross-section M-M showing proposed development in relation to railway assets

(extract of SDS Pty Ltd Drawing 6 of 9, REF: 9062 Rev C, dated 20/03/24)

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TITLE
Survey/architectural drawings - geometric input

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-3

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DESIGN SECTION 2

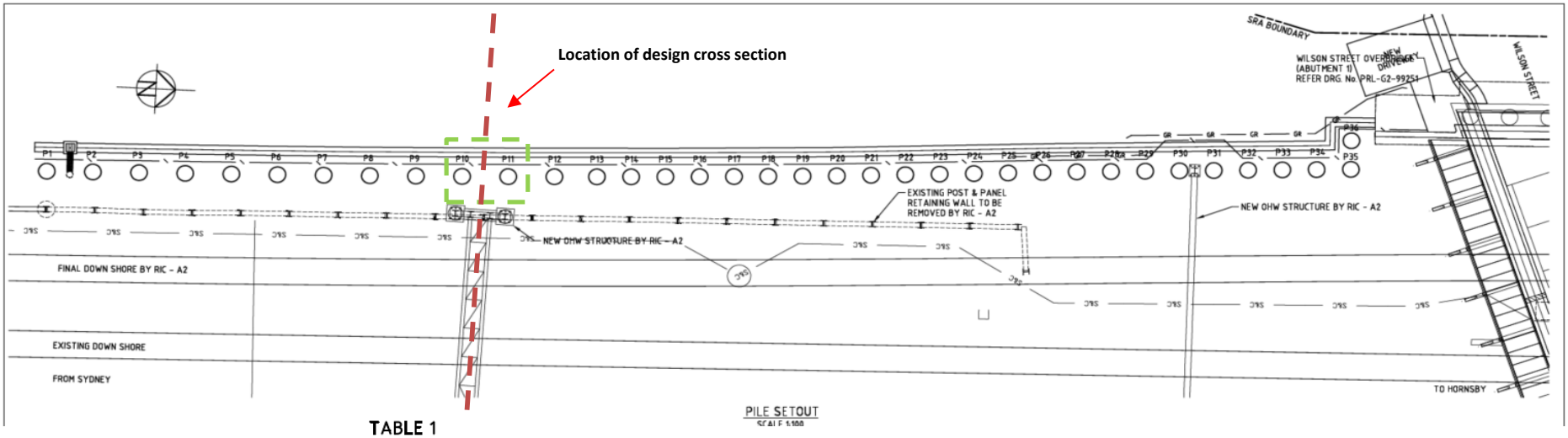


TABLE 1

PILE No	EASTING	NORTHING	DIAMETER	CUT OFF LEVEL	CONTRACT LEVEL	× ACTUAL FOUNDING LEVEL
P1	331 577.167	6 259 284.036	850	102.920	94.50	94.50
P2	331 577.085	6 259 286.405	850	102.995	94.50	94.50
P3	331 577.002	6 259 288.773	850	103.070	94.50	94.50
P4	331 576.917	6 259 291.142	850	103.145	94.50	94.50
P5	331 576.830	6 259 293.510	850	103.225	94.50	94.50
P6	331 576.739	6 259 295.879	850	103.300	94.50	94.50
P7	331 576.645	6 259 298.247	850	103.375	94.50	94.50
P8	331 576.548	6 259 300.615	850	103.450	94.50	94.50
P9	331 576.446	6 259 302.982	850	103.525	94.50	94.50
P10	331 576.339	6 259 305.350	850	103.600	94.50	94.50
P11	331 576.228	6 259 307.717	850	103.675	94.50	94.50
P12	331 576.112	6 259 310.085	850	103.750	94.50	94.50
P13	331 576.002	6 259 312.262	850	103.820	93.50	93.50
P14	331 575.910	6 259 314.020	850	103.875	93.50	93.50
P15	331 575.816	6 259 315.777	850	103.930	93.50	93.50
P16	331 575.719	6 259 317.535	850	103.990	93.50	93.50
P17	331 575.620	6 259 319.292	850	104.060	93.50	93.50
P18	331 575.519	6 259 321.049	850	104.185	93.50	93.50
P19	331 575.416	6 259 322.806	850	104.310	93.50	93.50

As-built pile setout plan & Pile shedule

(extracts of Down Side Outer Pile Retaining Wall GC-3 Works Drawing set, Contract SDS Pty Ltd Drawing 6 of 9, REF: 9062 Rev C, dated 20/03/24)

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PROJECT: 849, 853 & 859 Pacific Highway, Chatswood

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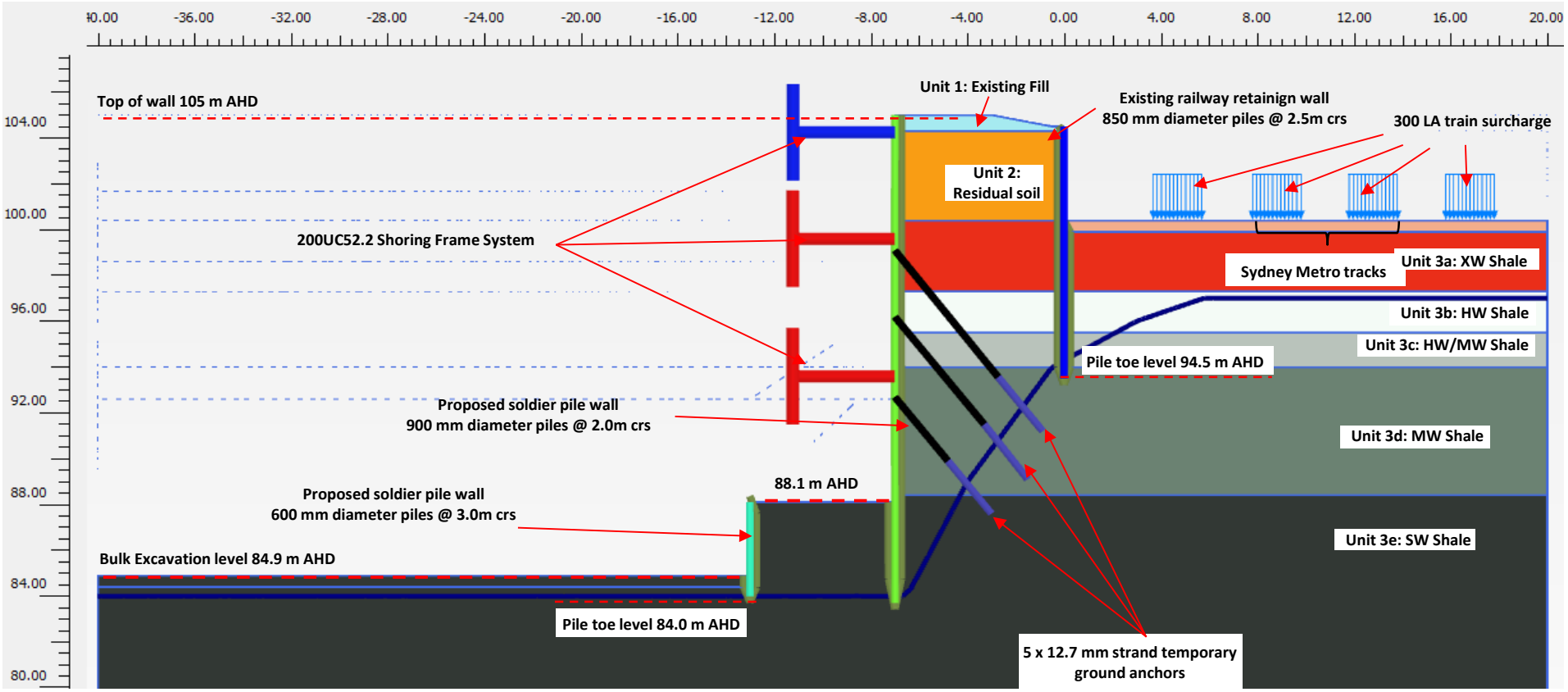
DATE	30/05/2025
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DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE: **Existing railway assets as-builts**

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-4

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DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
PLAXIS 2D - Model overview

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-5

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DESIGN SECTION 2

Stage no:		Construction stage	Surcharge/Loading	Structural EI stiffness of new piled wall
1		Establish initial conditions	/	N/A
2		Current housing development	Dwelling (20 kPa) & pedestrian (5 kPa) surcharge	
3		Railway trench excavation	As above	
4		Railway operation	Dwelling (20 kPa), pedestrian (5 kPa) surcharges & LA300 train surcharge	
5		Demolition of current housing development	LA300 train surcharge	
6		Install soldier pile wall	As above	0.9 EI
7		1st level of excavation	As above	
8		Installation of 1st level of shoring frame	As above	
9		2nd level of excavation	As above	
10		3rd level of excavation	As above	
11		Installation of 1st level of ground anchors and 2nd level of shoring frame	As above	
12		4th level of excavation	As above	
13		Installation of 2nd level of ground anchors and 3rd level of shoring frame	As above	
14		5th level of excavation	As above	
15		Installation of 3rd level of ground anchors	As above	
16		6th level of excavation	As above	
17		Install rock berm shoring wall		
18		Excavation to bulk excavation level	As above	
	18.1	Over-excavation scenario	As above	
19		Change to long-term structural properties	As above	0.6 EI
20		Install Basement -4 slab	As above	
21		Install Basement -3 slab	As above	
22		Deactivate 4th level of ground anchors and 3rd level of shoring frame	As above	
23		Install Basement -2 slab	As above	
24		Deactivate 3rd level of ground anchors	As above	
25		Install Basemend -1 L2	As above	
26		Deactivate 2nd level of ground anchors and 2nd level of shoring frame	As above	
27		Install Basement -1MZ slab	As above	
28		Deactivate 1st level of ground anchors and 1st level of shoring frame	As above	
29		Application of 20kPa surcharge for future railway operations	Railway (20 kPa) surcharge & LA300 train surcharge	

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TITLE
PLAXIS 2D - Construction staging

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-6

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DESIGN SECTION 2

Existing railway asset

Plate - Rail retaining wall

General | Mechanical | Thermal

Property	Unit	Value
Properties		
Isotropic		☑
Stiffness		
EA_1	kN/m	7.445E6
EA_2	kN/m	7.445E6
E_1	kN/m²	13.05E6
E_2	kN/m²	13.05E6
EI	kN m²/m	202.0E3
v (nu)		0.2000
d	m	0.5706

Proposed shoring frame

Anchor - Mid / Bottom

General | Mechanical | Thermal

Property	Unit	Value
Properties		
$L_{spacing}$	m	4.800
Stiffness		
EA	kN	120.0E3

Anchor - Top

General | Mechanical | Thermal

Property	Unit	Value
Properties		
$L_{spacing}$	m	4.800
Stiffness		
EA	kN	30.00E3

Proposed shoring wall

Plate - 900mm @ 2.0m ST

General | Mechanical | Thermal

Property	Unit	Value
Properties		
Isotropic		☑
Stiffness		
EA_1	kN/m	10.43E6
EA_2	kN/m	10.43E6
E_1	kN/m²	14.12E6
E_2	kN/m²	14.12E6
EI	kN m²/m	475.0E3
v (nu)		0.2000
d	m	0.7391

Plate - 900mm @ 2.0m LT

General | Mechanical | Thermal

Property	Unit	Value
Properties		
Isotropic		☑
Stiffness		
EA_1	kN/m	10.43E6
EA_2	kN/m	10.43E6
E_1	kN/m²	17.28E6
E_2	kN/m²	17.28E6
EI	kN m²/m	317.0E3
v (nu)		0.2000
d	m	0.6038

Proposed rock berm shoring wall

Plate - 600mm @3m ST

General | Mechanical | Thermal

Property	Unit	Value
Properties		
Isotropic		☑
Stiffness		
EA_1	kN/m	3.091E6
EA_2	kN/m	3.091E6
E_1	kN/m²	6.271E6
E_2	kN/m²	6.271E6
EI	kN m²/m	62.60E3
v (nu)		0.2000
d	m	0.4930

Plate - 600mm @3m LT

General | Mechanical | Thermal

Property	Unit	Value
Properties		
Isotropic		☑
Stiffness		
EA_1	kN/m	3.091E6
EA_2	kN/m	3.091E6
E_1	kN/m²	7.683E6
E_2	kN/m²	7.683E6
EI	kN m²/m	41.70E3
v (nu)		0.2000
d	m	0.4023

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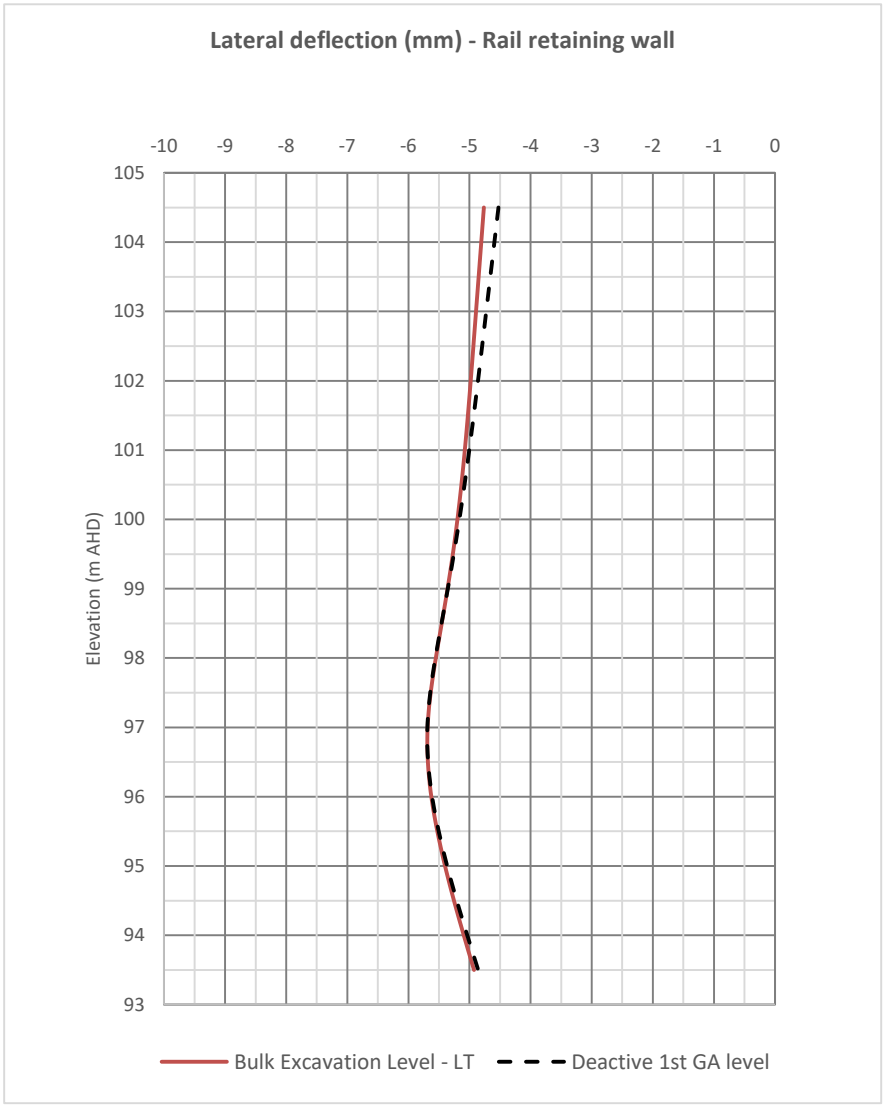
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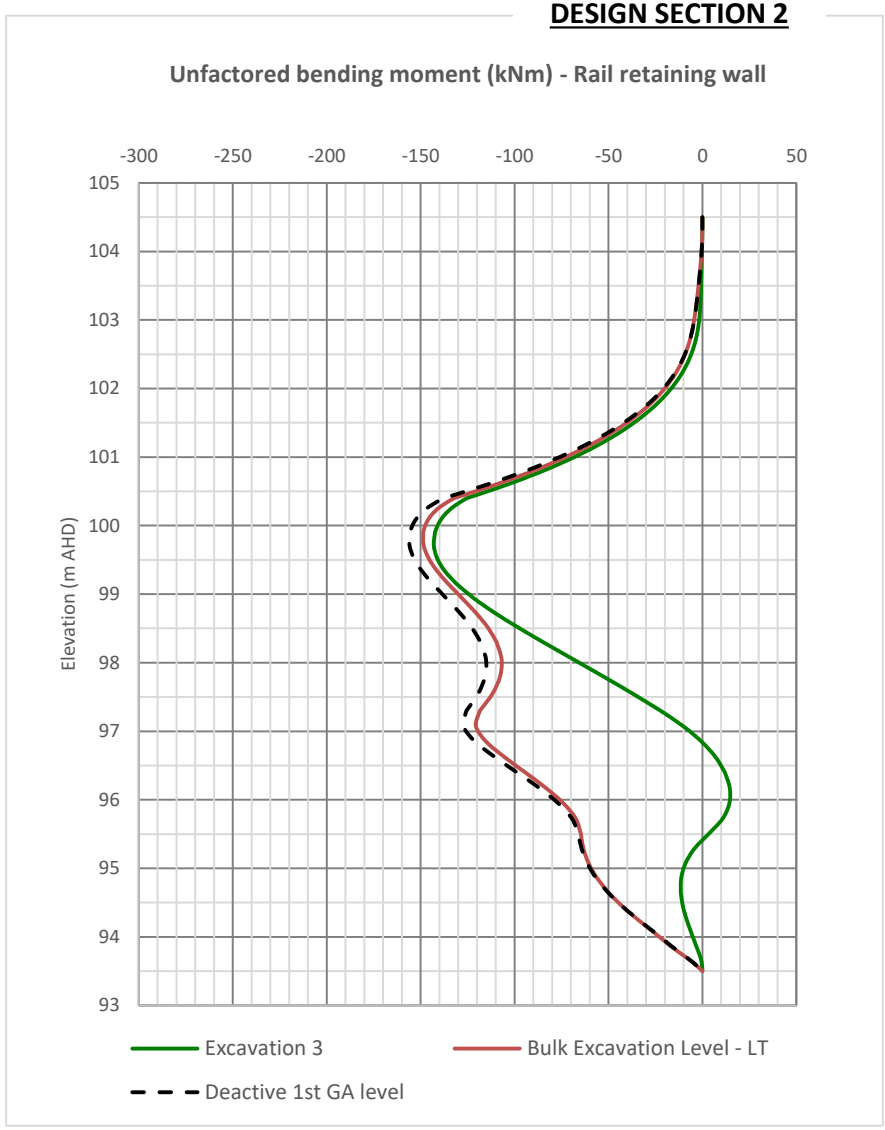
TITLE
PLAXIS 2D - Structural elements properties

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-7

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DESIGN SECTION 2





Notes:
1. Structural actions are per pile and unfactored

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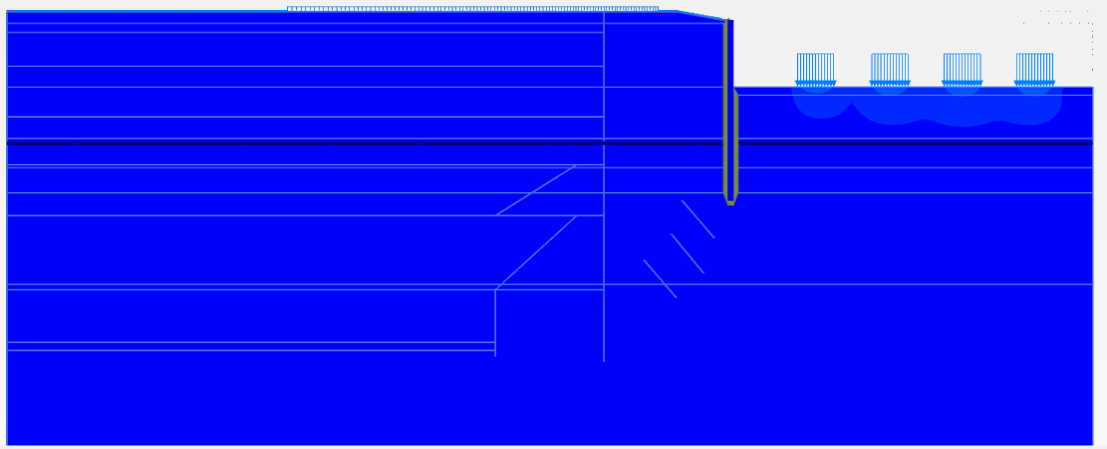
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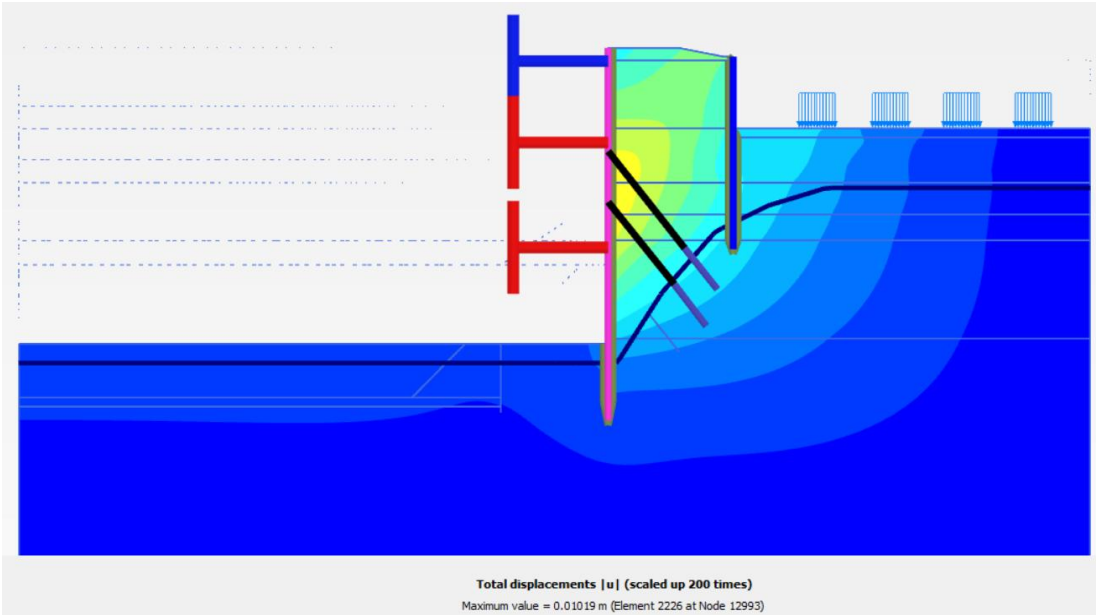
TITLE
PLAXIS 2D - Existing railway wall outputs

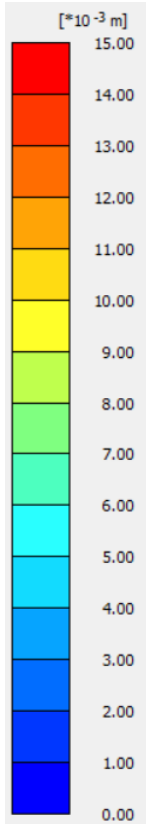
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-8

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DESIGN SECTION 2







Railway operation stage (current)

Impact of proposed works (6th level of excavation)

File Name: #

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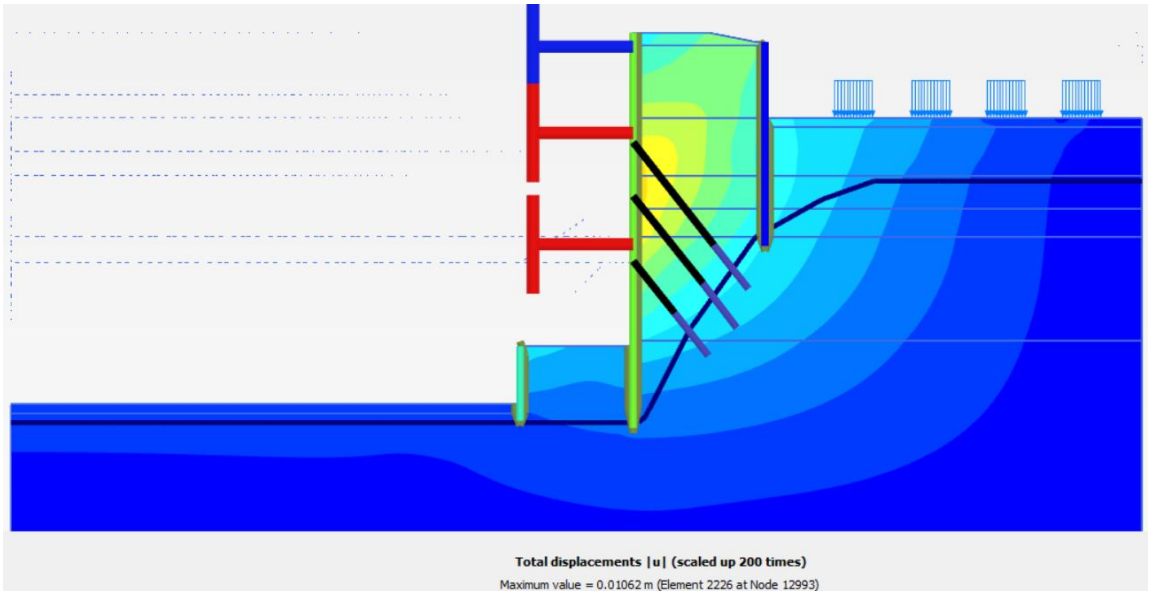
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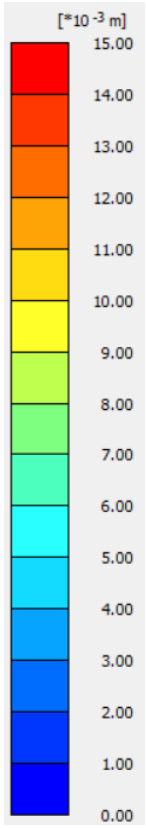
TITLE
PLAXIS 2D - Displacement field XY 1/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS2-9

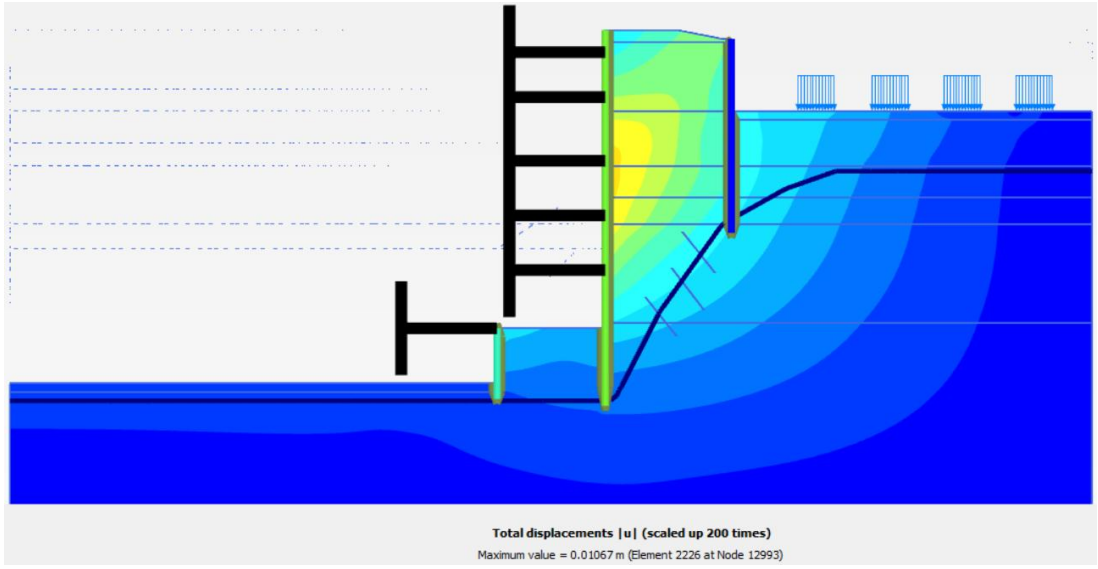
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DESIGN SECTION 2





Impact of proposed works (end of excavation)



Impact of proposed works (removal of last ground anchor level)

File Name: #

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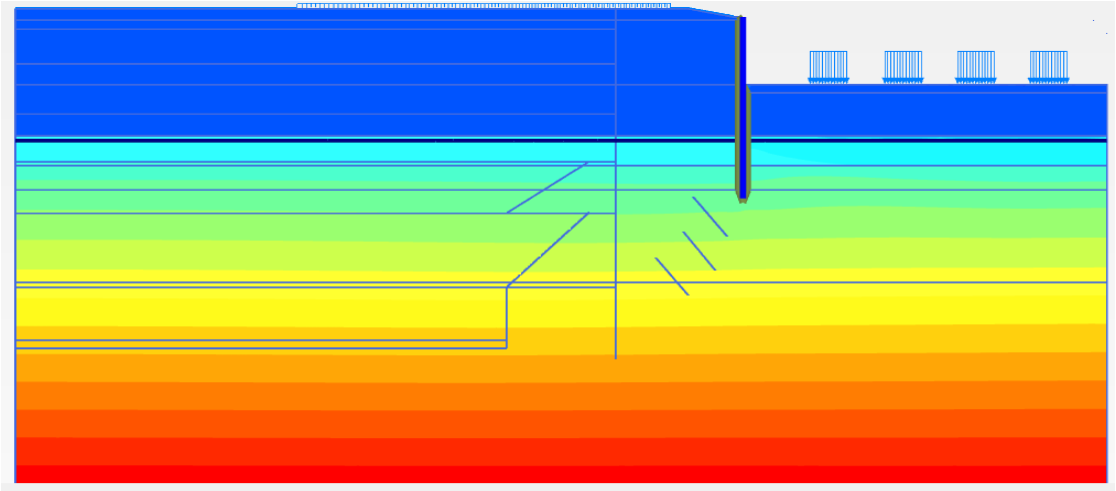
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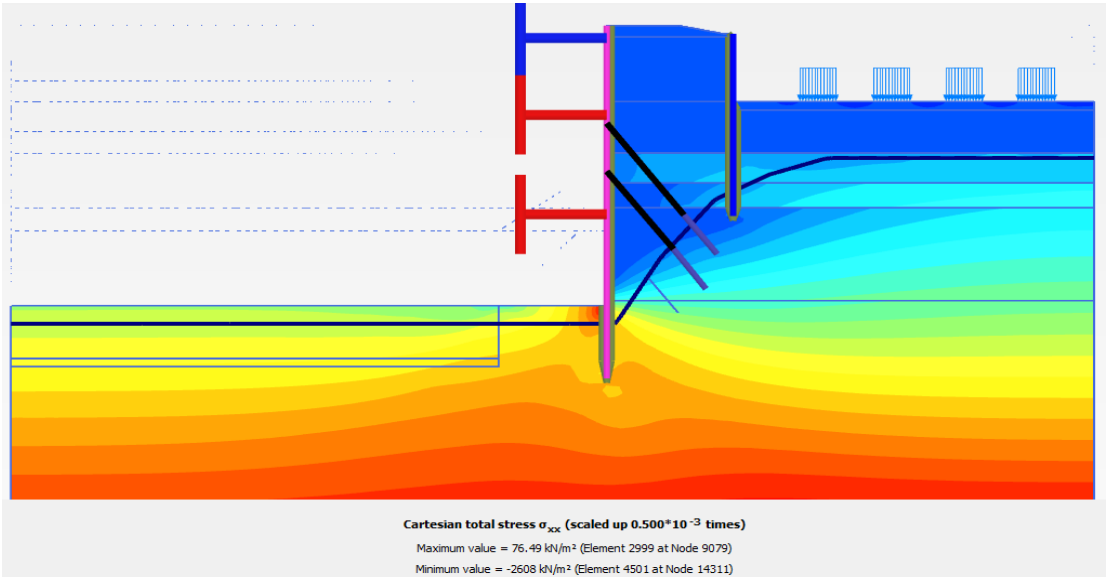
TITLE
PLAXIS 2D - Displacement field XY 2/2

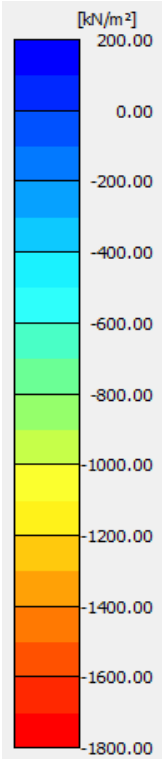
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S2-10

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DESIGN SECTION 2







Railway operation stage (current)

Impact of proposed works (6th of excavation)

File Name: #

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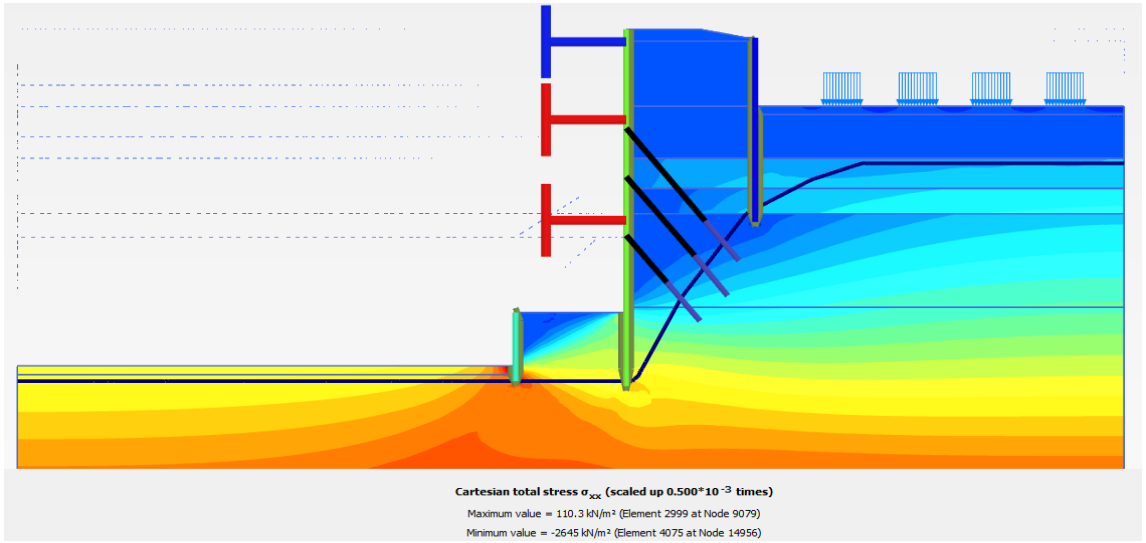
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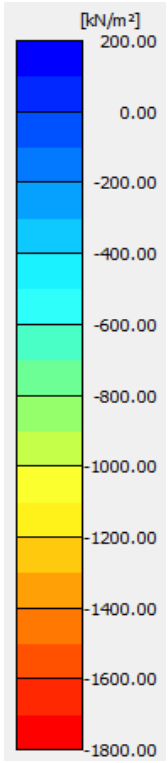
TITLE
PLAXIS 2D - Stress field XX 1/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S2-11

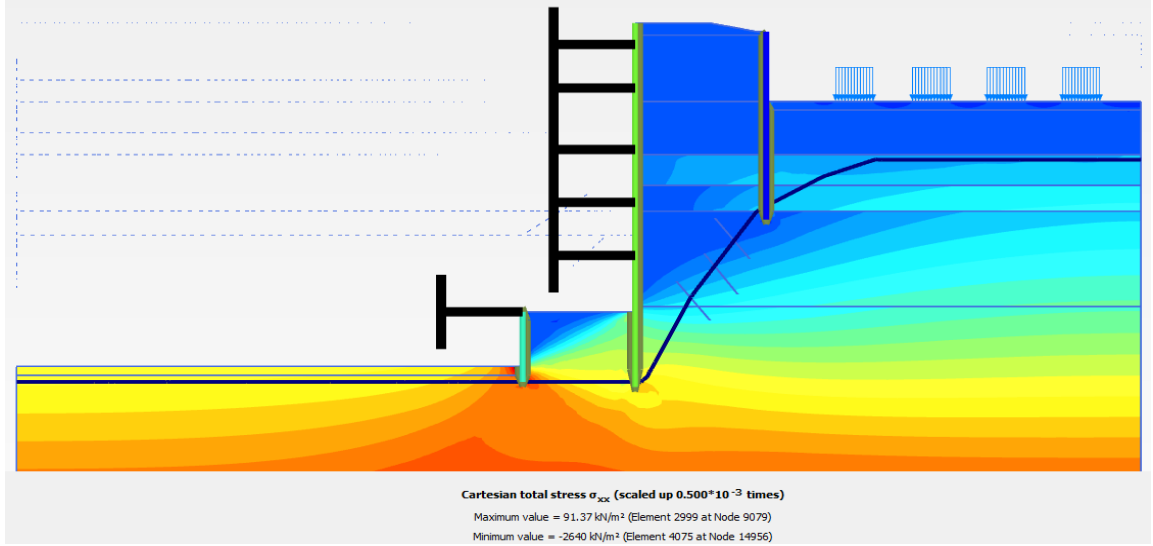
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DESIGN SECTION 2





Impact of proposed works (end of excavation)



Impact of proposed works (removal of last level of anchors)

File Name: #

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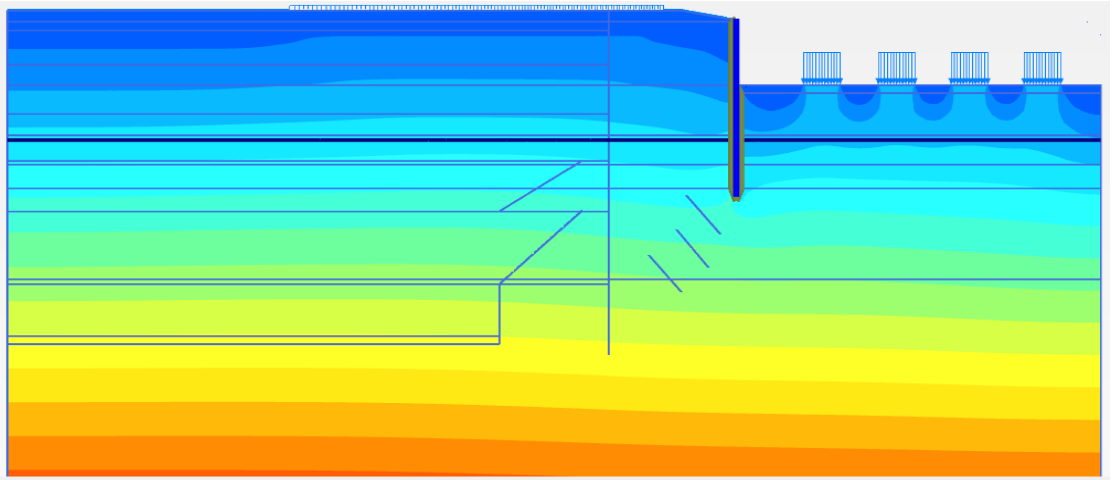
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TITLE
PLAXIS 2D - Stress field XX 2/2

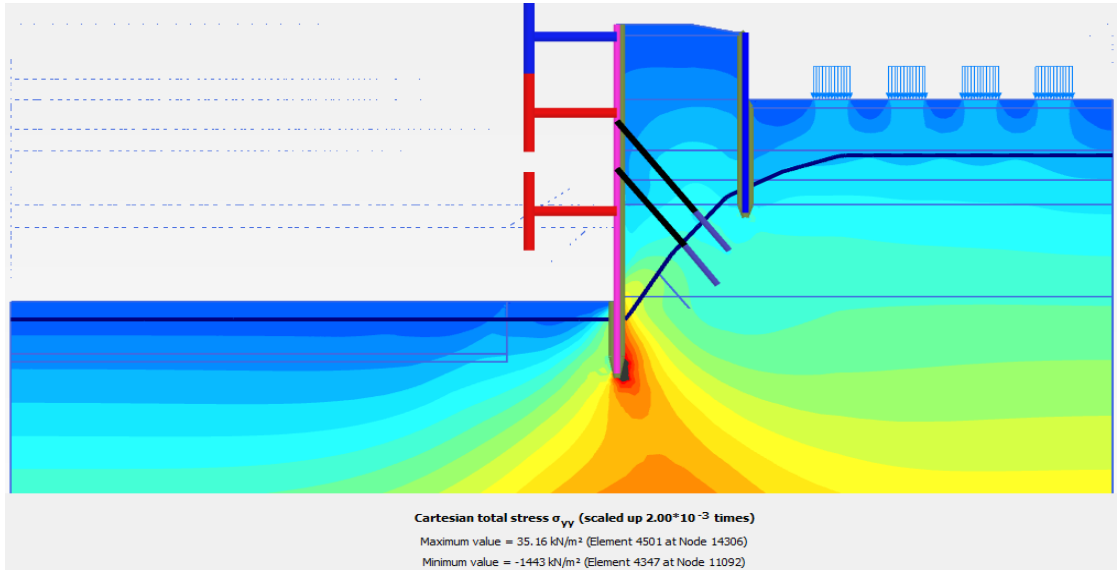
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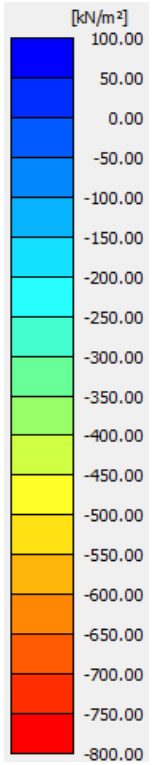
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DESIGN SECTION 2



Railway operation stage (current)





Impact of proposed works (6th of excavation)

File Name: #

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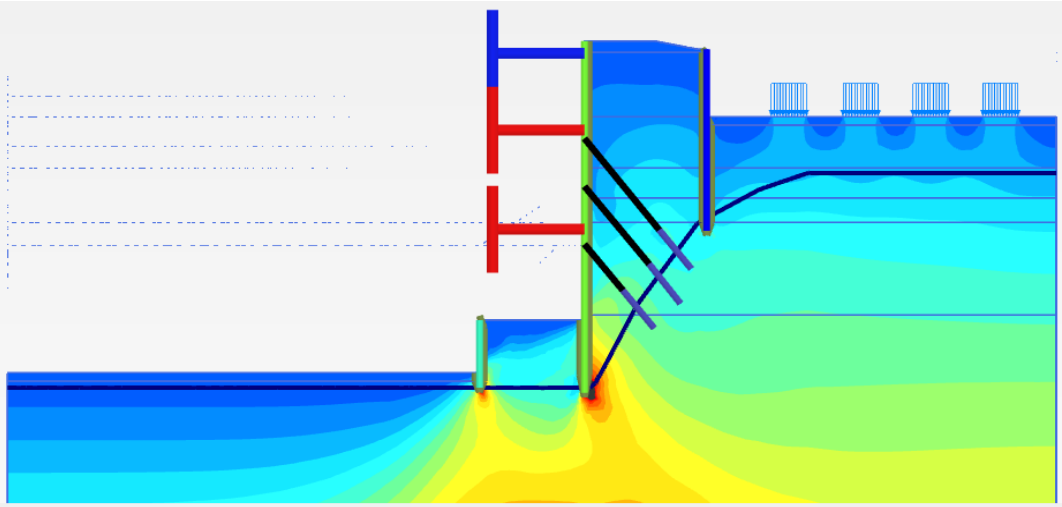
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REVIEW	JM
APPROVED	JM

TITLE
PLAXIS 2D - Stress field YY 1/2

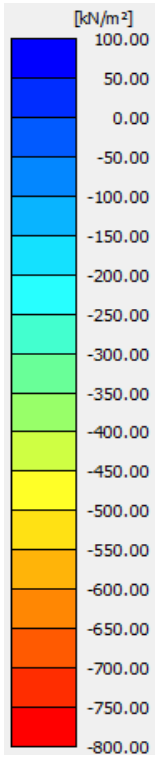
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S2-13

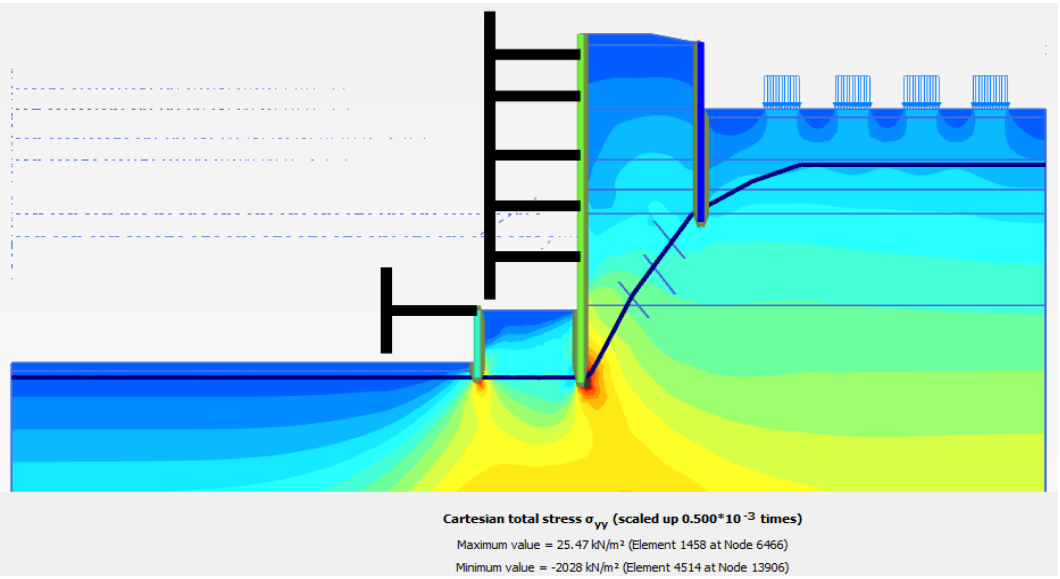
https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 2



Impact of proposed works (end of excavation)





Impact of proposed works (removal of last level of anchors)

File Name: #

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FORTIFY GEOTECH

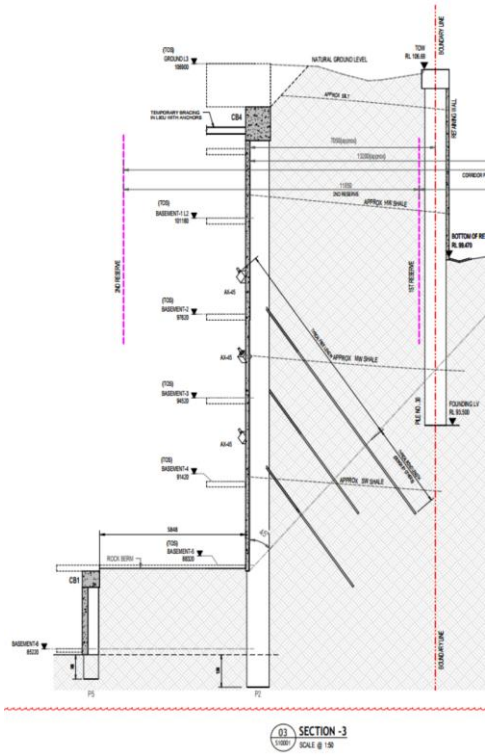
DATE	30/05/2025
PREPARED	MN
DESIGN	MN
REVIEW	JM
APPROVED	JM

TITLE
PLAXIS 2D - Stress field YY 2/2

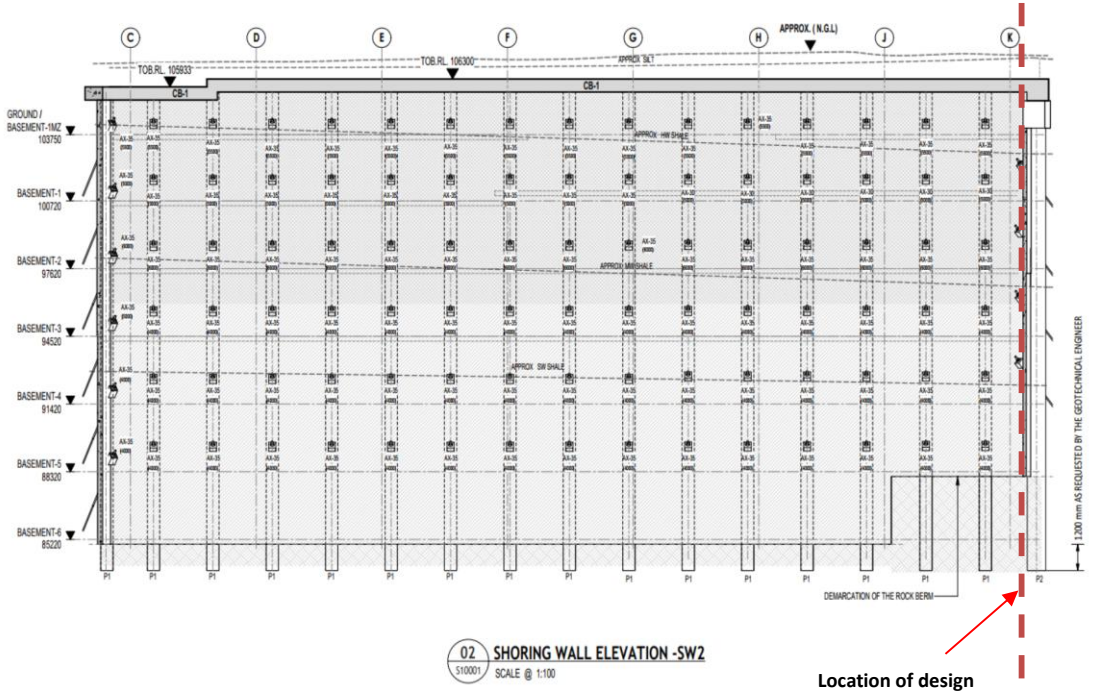
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S2-14

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 3



03 SECTION -3
SCALE @ 1:50

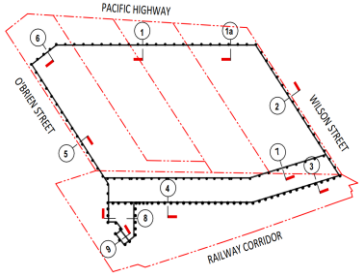


02 SHORING WALL ELEVATION -SW2
510001 SCALE @ 1:100

Location of design cross section

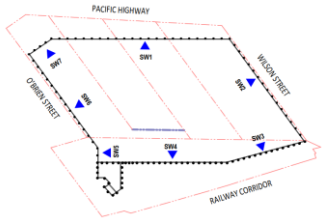
Elevation view showing indicative location of design cross-section

(extract of Cardigal Group Drawing S 10010 Rev H, dated 09/05/25, Project Ref. 01-100084)



Typical cross-section view

(extract of Cardigal Group Drawing S 10020 Rev H, dated 09/05/25, Project Ref. 01-100084)



KEY PLAN

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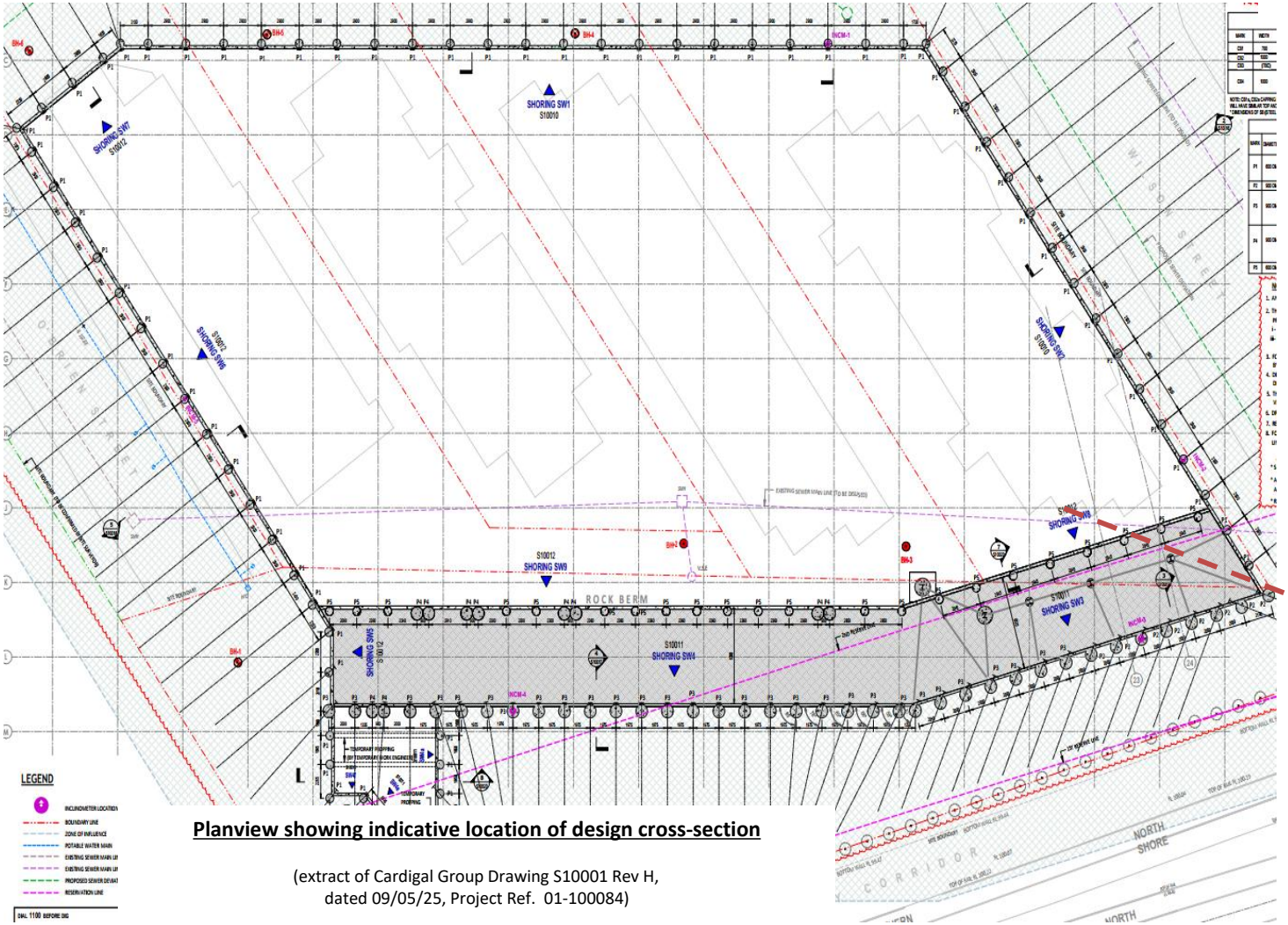
DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE
Proposed shoring system - structural input 1/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-1

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DESIGN SECTION 3



Planview showing indicative location of design cross-section

(extract of Cardigal Group Drawing S10001 Rev H, dated 09/05/25, Project Ref. 01-100084)

Location of design cross section

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DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE

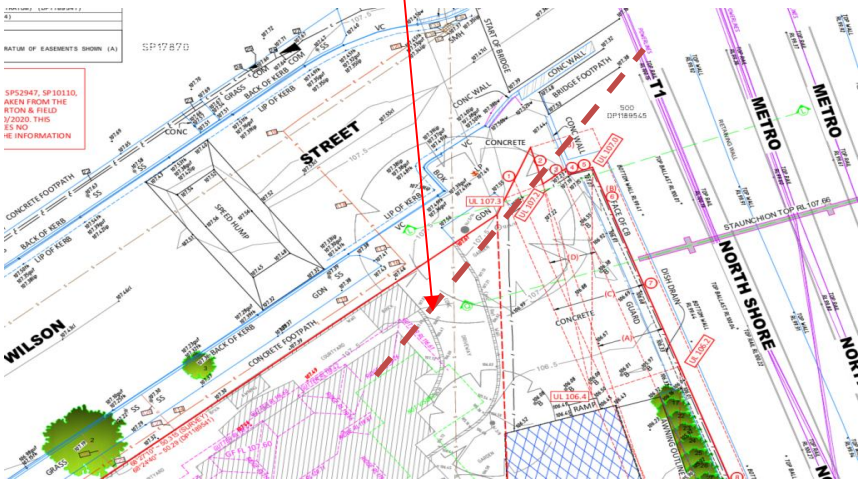
Proposed shoring system - structural input 2/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-2

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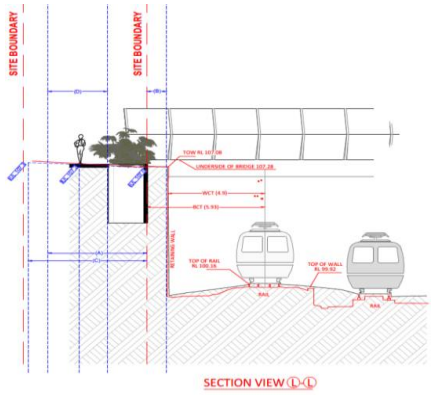
DESIGN SECTION 3

Location of design cross section



Survey plan of the site and surroudings, showing location of design cross-section

(extract of SDS Pty Ltd Drawing 6 of 9, REF: 9062 Rev C, dated 20/03/24)



Cross-section L-L showing proposed development in relation to railway assets

(extract of SDS Pty Ltd Drawing 5 of 9, REF: 9062 Rev C, dated 20/03/24)

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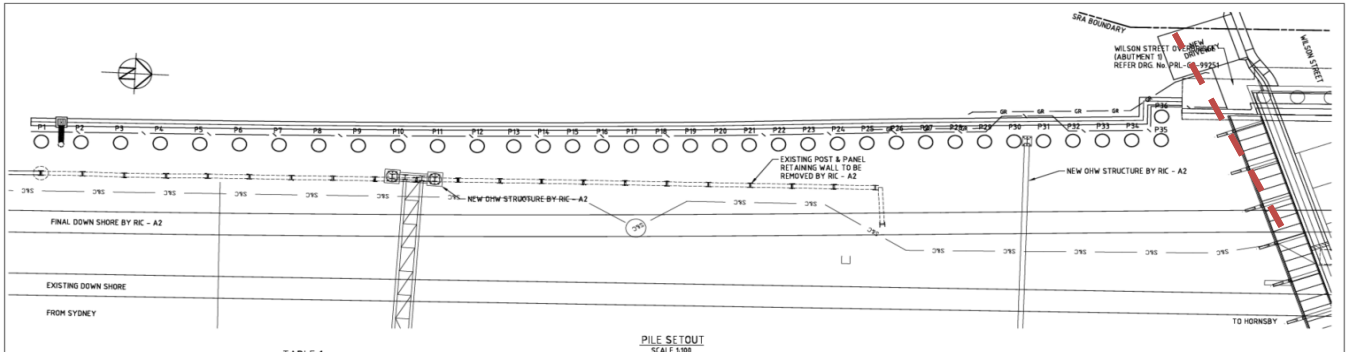
DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE
Survey/architectural drawings - geometric input

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-3

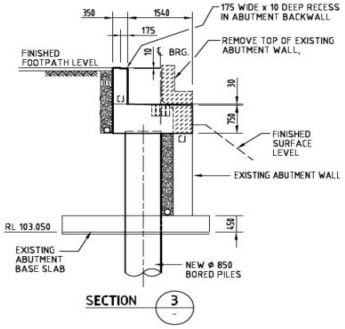
https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsw

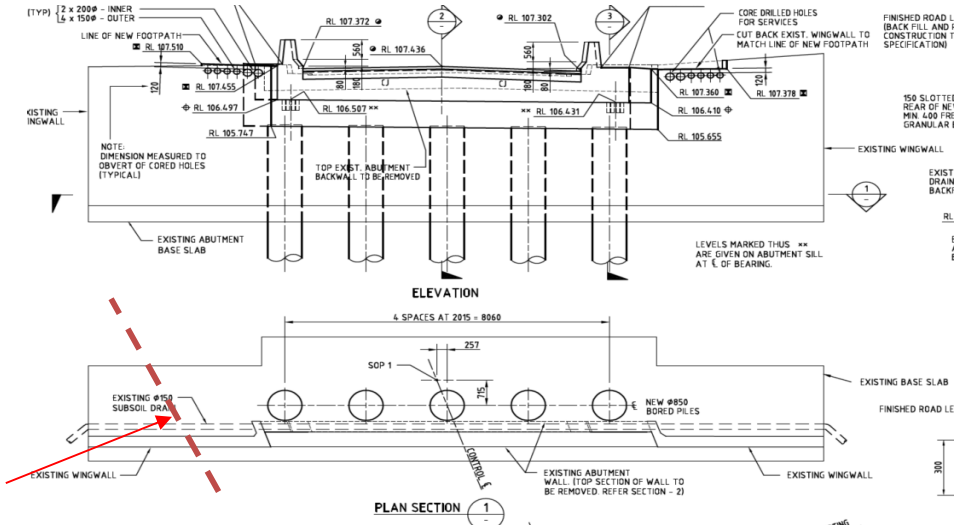
DESIGN SECTION 3



As-built pile setout plan & Pile shedule

(extract of Down Side Outer Pile Retaining Wall GC-3 Works Drawing set, Contract SDS Pty Ltd Drawing 6 of 9, REF: 9062 Rev C, dated 20/03/24)





Location of design cross section

As-built pile setout plan & Pile shedule

(extract of Will Street Overbirgde GC-3 Works Contract Drawing set, unknown date)

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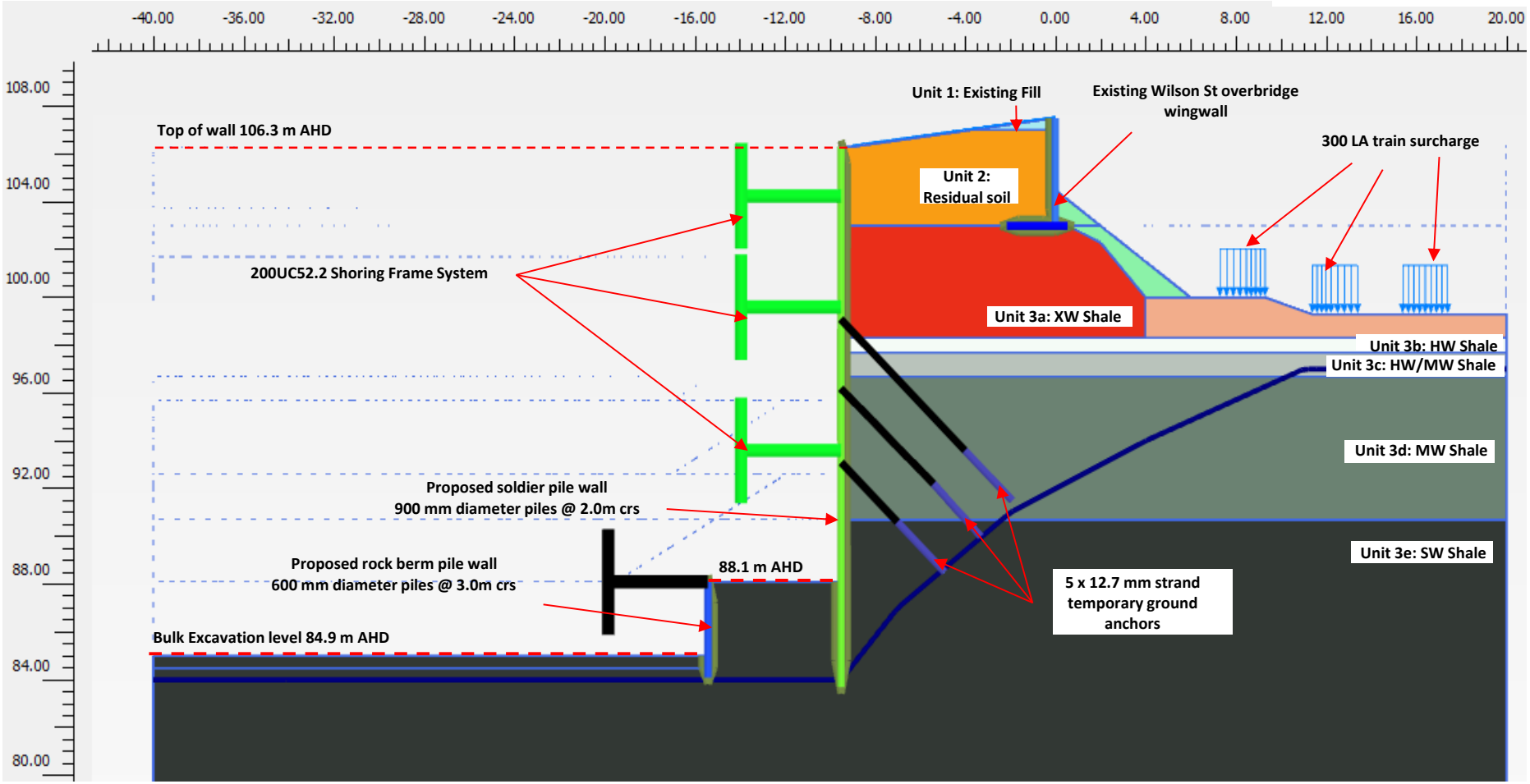
DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE
Existing railway assets as-builts

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-4

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DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE
PLAXIS 2D - Model overview

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-5

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 3

Stage no:		Construction stage	Surcharge/Loading	Structural EI stiffness of new piled wall
1		Establish initial conditions	/	N/A
2		Current housing development	Dwelling (20 kPa) & pedestrian (5 kPa) surcharge	
3		Railway trench excavation	As above	
4		Railway operation	Dwelling (20 kPa), pedestrian (5 kPa) surcharges & LA300 train surcharge	
5		Demolition of current housing development	LA300 train surcharge	
6		Install soldier pile wall	As above	0.9 EI
7		1st level of excavation	As above	
8		Installation of 1st level of shoring frame	As above	
9		2nd level of excavation	As above	
10		3rd level of excavation	As above	
11		Installation of 1st level of ground anchors and 2nd level of shoring frame	As above	
12		4th level of excavation	As above	
13		Installation of 2nd level of ground anchors and 3rd level of shoring frame	As above	
14		5th level of excavation	As above	
15		Installation of 3rd level of ground anchors	As above	
16		6th level of excavation	As above	
17		Installation of rock berm retaining wall	As above	
18		Excavation to bulk excavation level	As above	
	18.1	Over-excavation scenario	As above	
19		Change to long-term structural properties	As above	0.6 EI
20		Install Basement -5 slab		
21		Install Basement -4 slab	As above	
22		Install Basement -3 slab	As above	
23		Deactivate 4th level of ground anchors and 3rd level of shoring frame	As above	
24		Install Basement -2 slab	As above	
25		Deactivate 3rd level of ground anchors	As above	
26		Install Basemend -1 L2	As above	
27		Deactivate 2nd level of ground anchors and 2nd level of shoring frame	As above	
28		Install Basement -1MZ slab	As above	
29		Deactivate 1st level of ground anchors and 1st level of shoring frame	As above	
30		Application of 20kPa surcharge for future railway operations	Railway (20 kPa) surcharge & LA300 train surcharge	

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DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE
PLAXIS 2D - Construction staging

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-6

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DESIGN SECTION 3

Existing railway asset

Plate - Stem (300 mm)

General | Mechanical | Thermal

Property		Unit	Value
Properties			
Isotropic			☑
Stiffness			
EA_1		kN/m	9.000E6
EA_2		kN/m	9.000E6
E_1		kN/m²	38.73E6
E_2		kN/m²	38.73E6
EI		kN m²/m	40.50E3
ν (nu)			0.2000
d		m	0.2324

Plate - Base (450 mm)

General | Mechanical | Thermal

Property		Unit	Value
Properties			
Isotropic			☑
Stiffness			
EA_1		kN/m	13.50E6
EA_2		kN/m	13.50E6
E_1		kN/m²	38.73E6
E_2		kN/m²	38.73E6
EI		kN m²/m	136.7E3
ν (nu)			0.2000
d		m	0.3486

Proposed shoring frame

Anchor - Mid / Bottom

General | Mechanical | Thermal

Property		Unit	Value
Properties			
$L_{spacing}$		m	4.800
Stiffness			
EA		kN	120.0E3

Anchor - Top

General | Mechanical | Thermal

Property		Unit	Value
Properties			
$L_{spacing}$		m	4.800
Stiffness			
EA		kN	30.00E3

Proposed shoring wall

Plate - 900mm @ 2.0m ST

General | Mechanical | Thermal

Property		Unit	Value
Properties			
Isotropic			☑
Stiffness			
EA_1		kN/m	10.43E6
EA_2		kN/m	10.43E6
E_1		kN/m²	14.12E6
E_2		kN/m²	14.12E6
EI		kN m²/m	475.0E3
ν (nu)			0.2000
d		m	0.7391

Plate - 900mm @ 2.0m LT

General | Mechanical | Thermal

Property		Unit	Value
Properties			
Isotropic			☑
Stiffness			
EA_1		kN/m	10.43E6
EA_2		kN/m	10.43E6
E_1		kN/m²	17.28E6
E_2		kN/m²	17.28E6
EI		kN m²/m	317.0E3
ν (nu)			0.2000
d		m	0.6038

Proposed rock berm shoring wall

Plate - 600mm @ 2.4m ST

General | Mechanical | Thermal

Property		Unit	Value
Properties			
Isotropic			☑
Stiffness			
EA_1		kN/m	3.864E6
EA_2		kN/m	3.864E6
E_1		kN/m²	7.841E6
E_2		kN/m²	7.841E6
EI		kN m²/m	78.20E3
ν (nu)			0.2000
d		m	0.4928

Plate - 600mm @ 2.4m LT

General | Mechanical | Thermal

Property		Unit	Value
Properties			
Isotropic			☑
Stiffness			
EA_1		kN/m	3.864E6
EA_2		kN/m	3.864E6
E_1		kN/m²	9.597E6
E_2		kN/m²	9.597E6
EI		kN m²/m	52.20E3
ν (nu)			0.2000
d		m	0.4026

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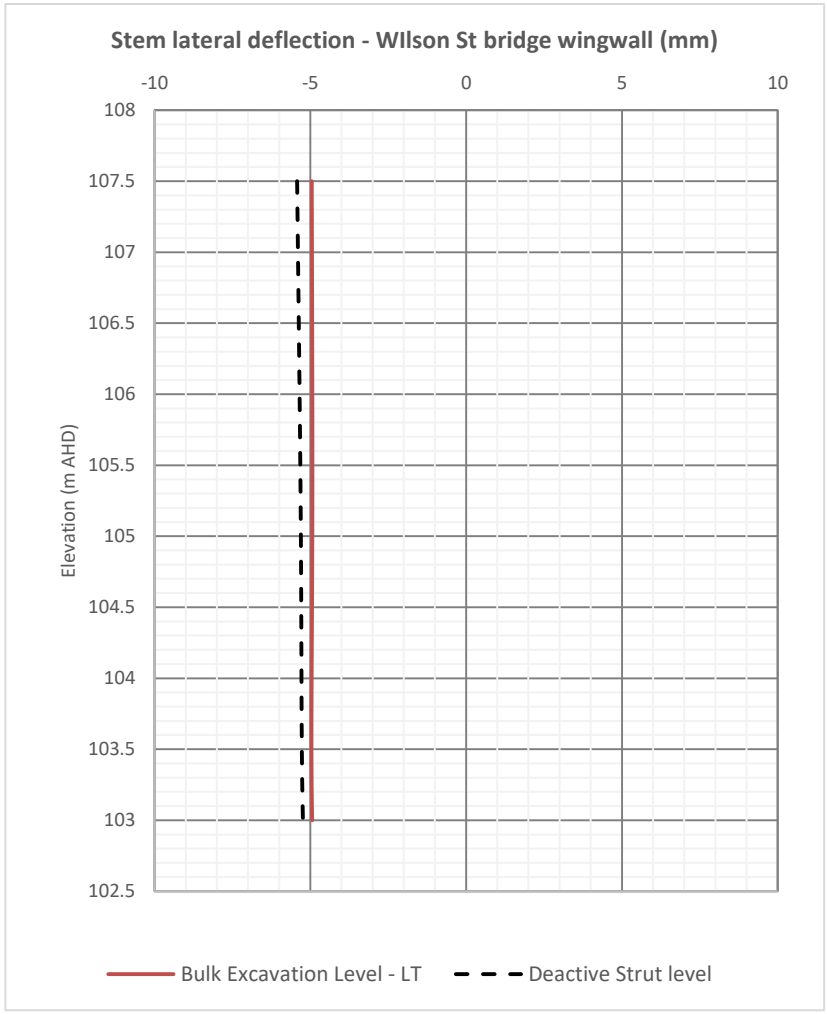
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DESIGN	JOE
REVIEW	MN
APPROVED	MN

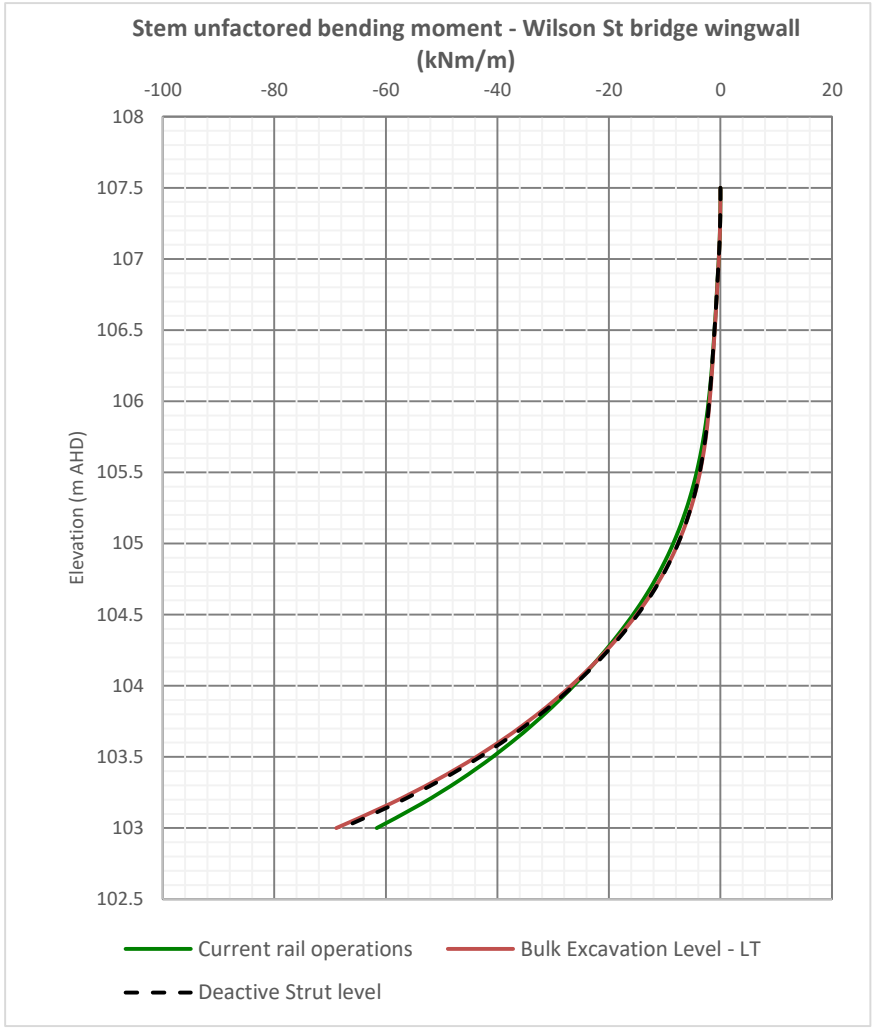
TITLE
PLAXIS 2D - Structural elements properties

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-7

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DESIGN SECTION 3





Notes:
1. Structural actions are per pile and unfactored

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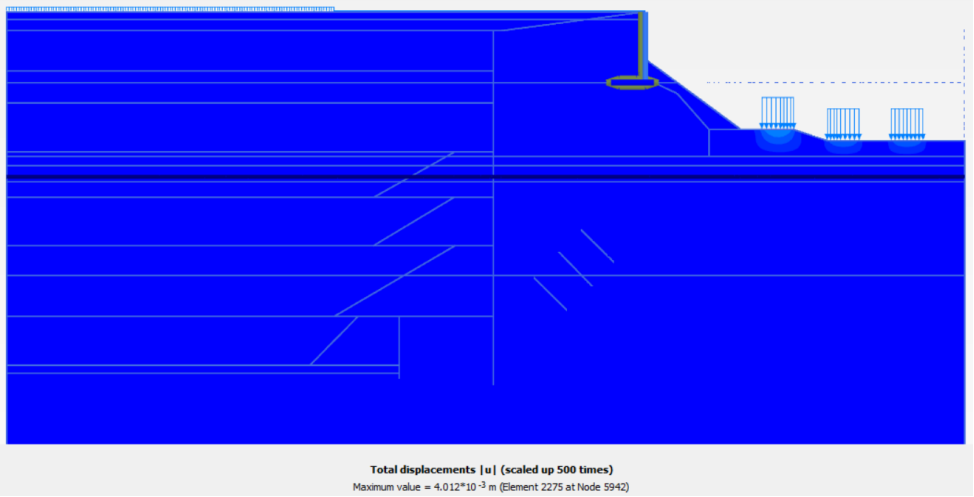
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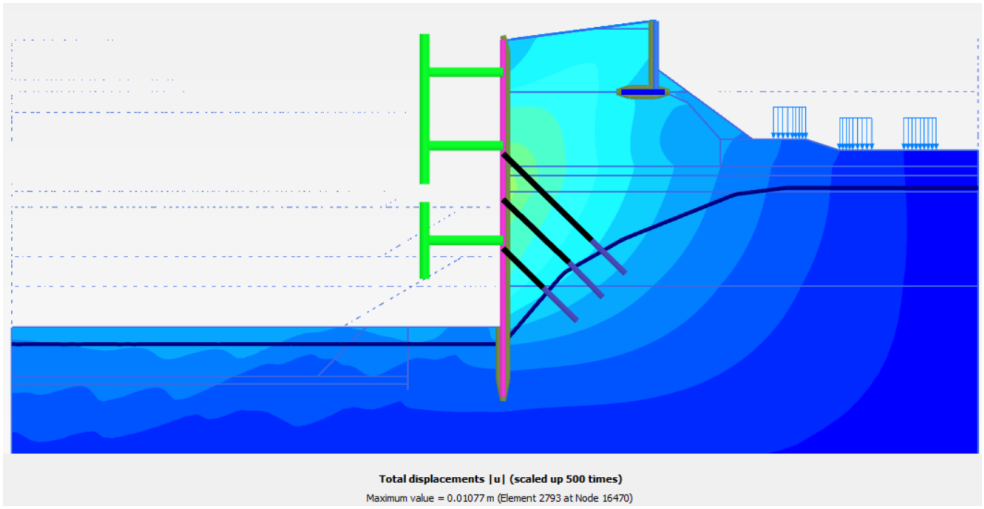
TITLE
PLAXIS 2D - Existing railway wall outputs

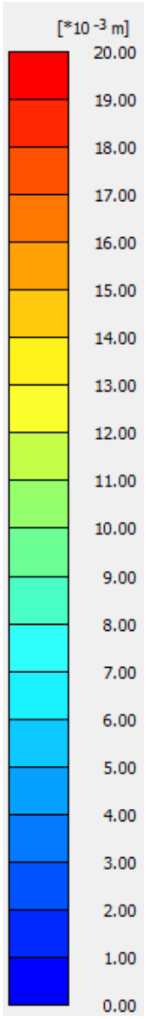
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-8

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 3







Railway operation stage (current)

Impact of proposed works (6th level of excavation)

File Name: #

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849, 853 & 859 Pacific Highway, Chatswood

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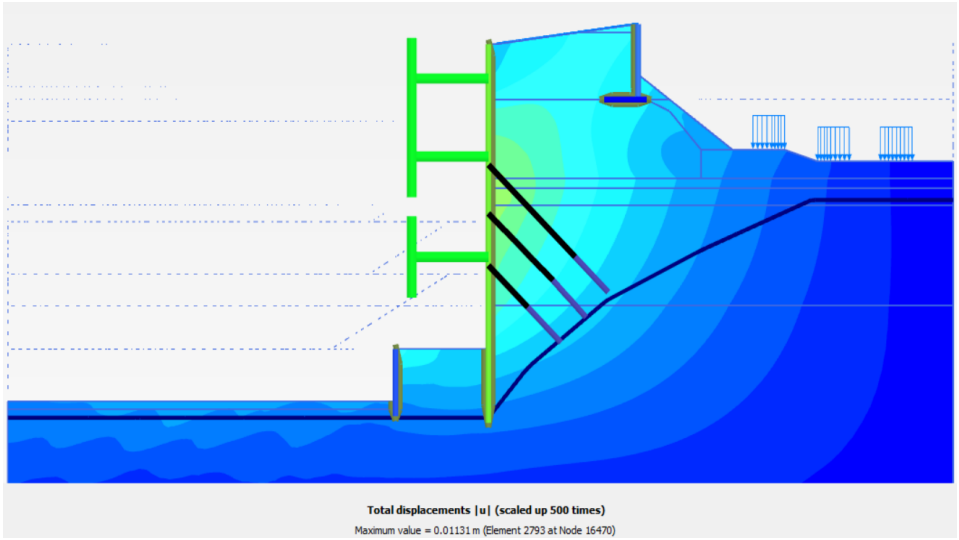
DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE
PLAXIS 2D - Displacement field XY 1/2

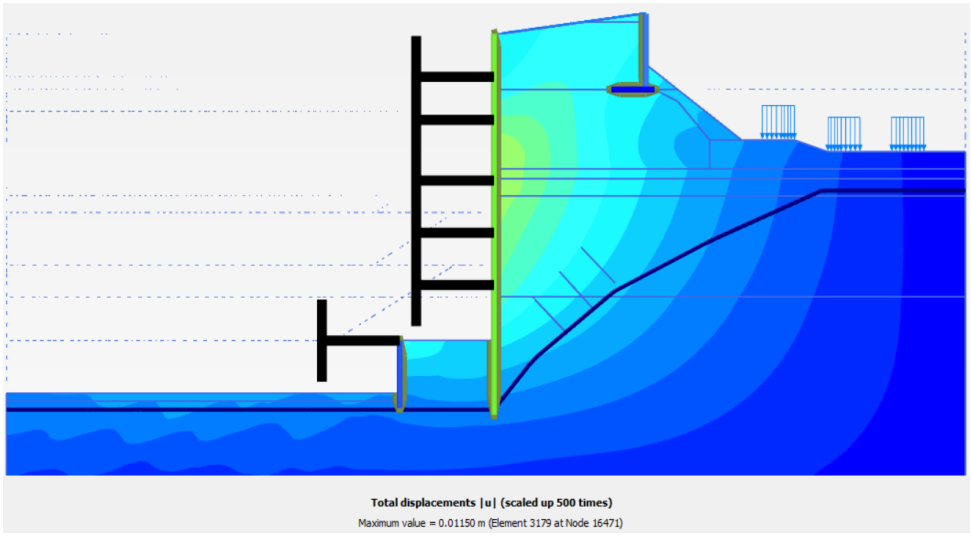
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	XS3-9

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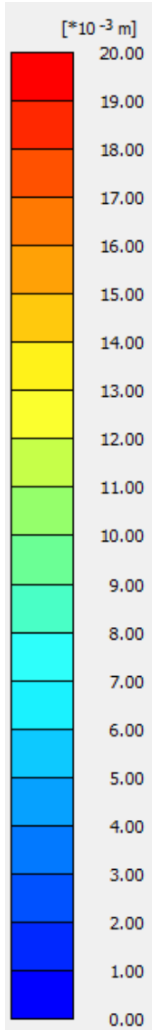
DESIGN SECTION 3



Impact of proposed works
(end of excavation)



Impact of proposed works
(removal of last ground anchor level)



File Name: #

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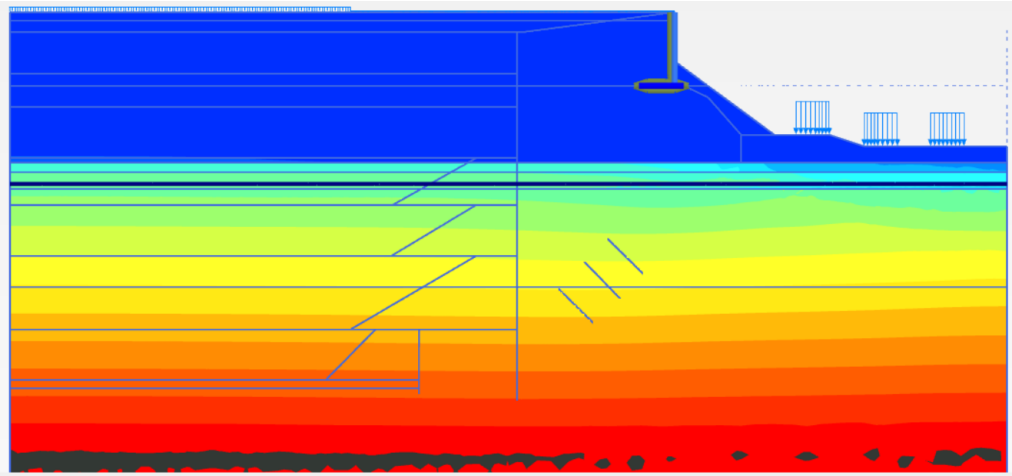
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PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

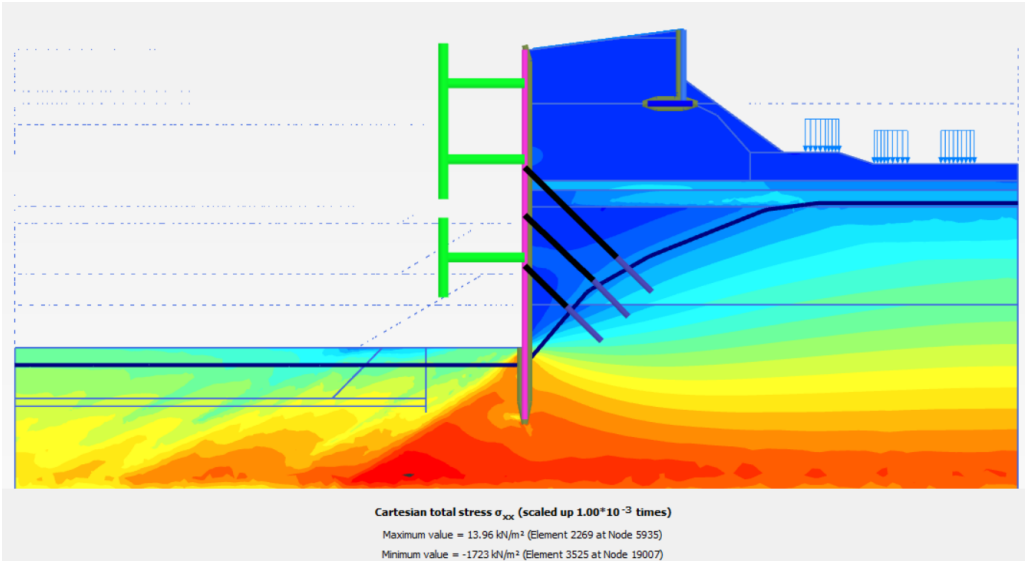
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PLAXIS 2D - Displacement field XY 2/2

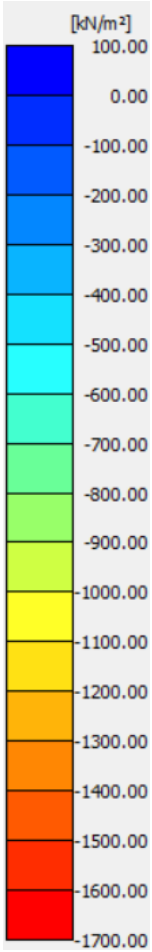
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S3-10

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 3







Railway operation stage (current)

Impact of proposed works (6th of excavation)

File Name: #

CLIENT
BB Wilson

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849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

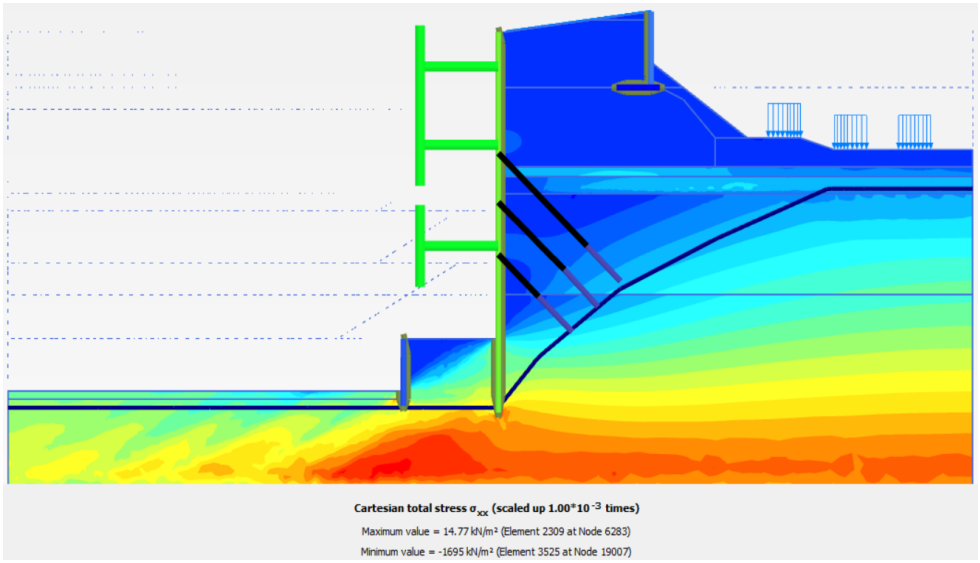
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PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

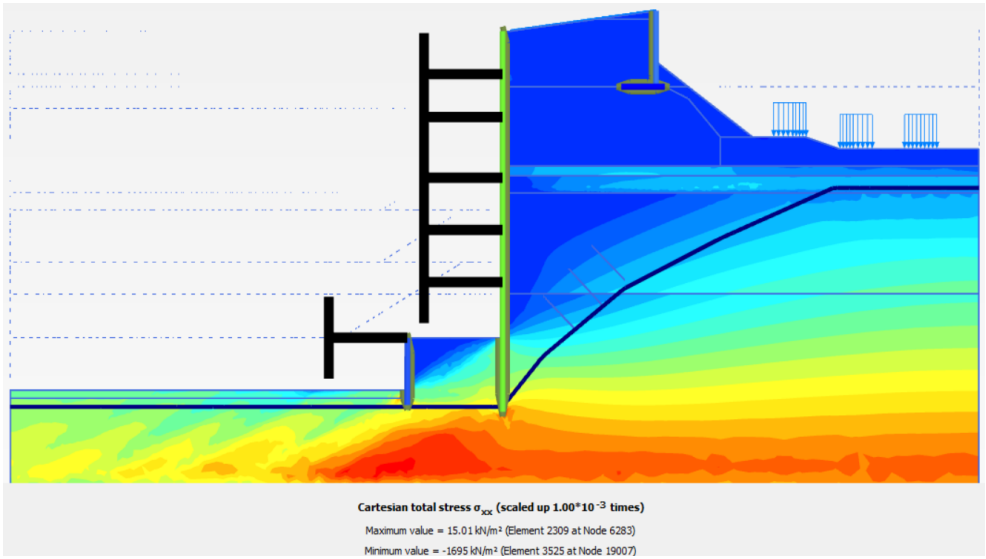
TITLE
PLAXIS 2D - Stress field XX 1/2

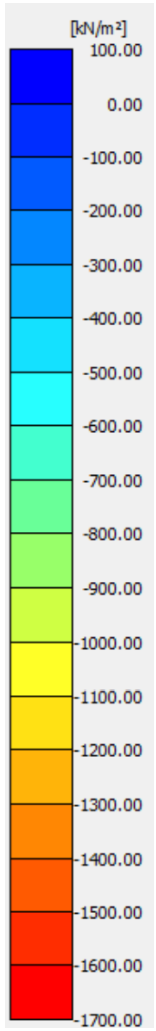
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S3-11

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 3







Impact of proposed works (end of excavation)

Impact of proposed works (removal of last level of anchors)

File Name: #

CLIENT
BB Wilson

PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

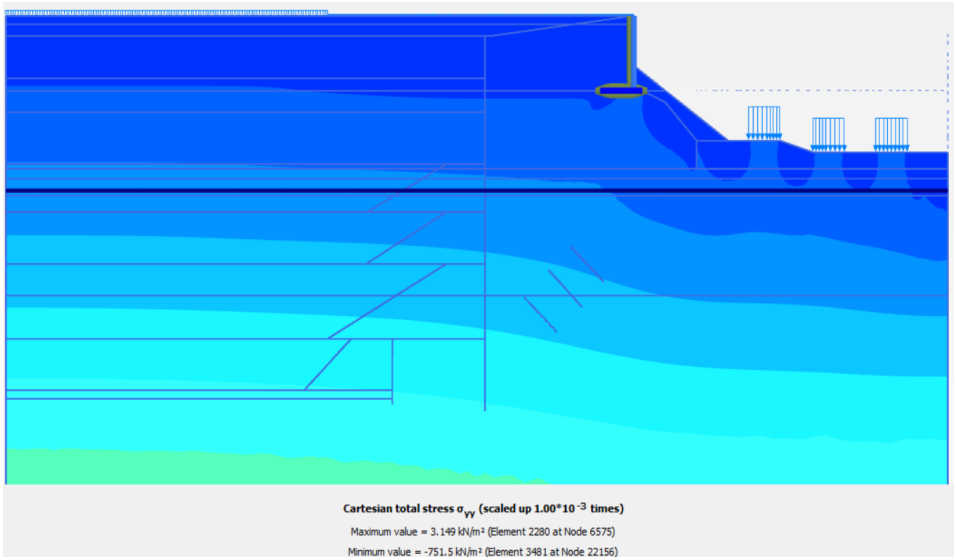
DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

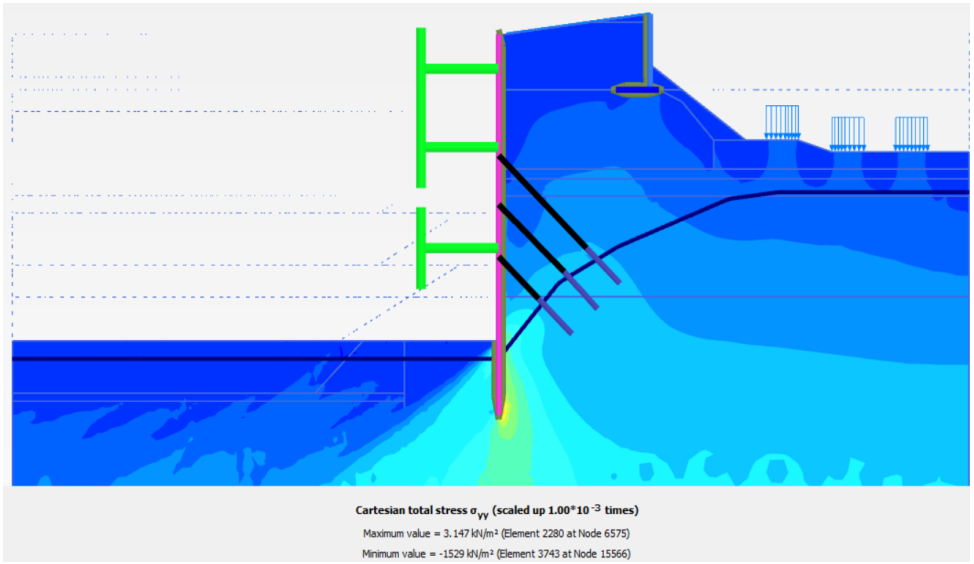
TITLE
PLAXIS 2D - Stress field XX 2/2

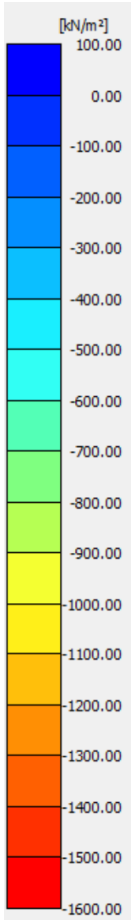
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S3-12

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 3







Railway operation stage (current)

Impact of proposed works (6th of excavation)

File Name: #

CLIENT
BB Wilson

PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

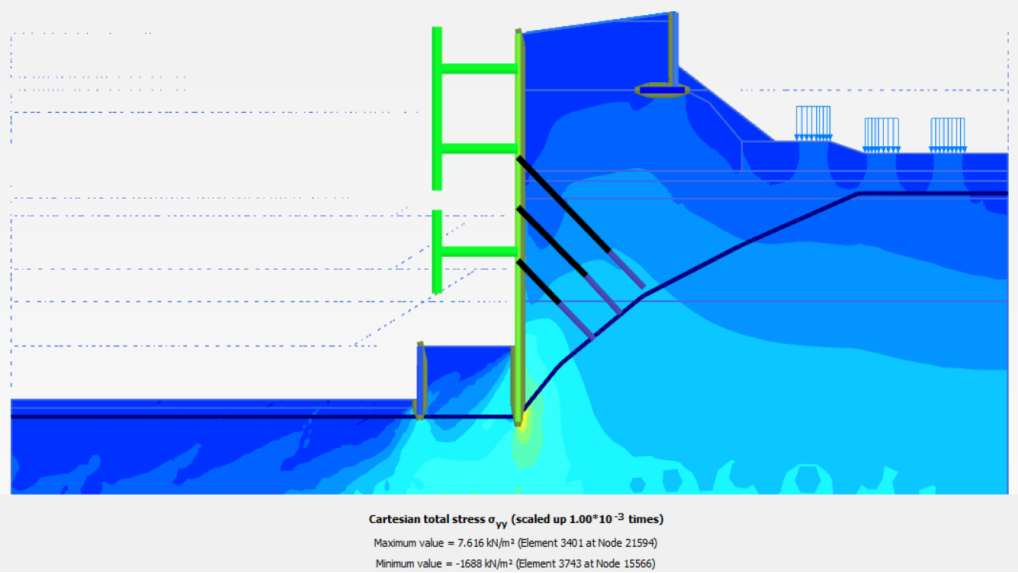
DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE
PLAXIS 2D - Stress field YY 1/2

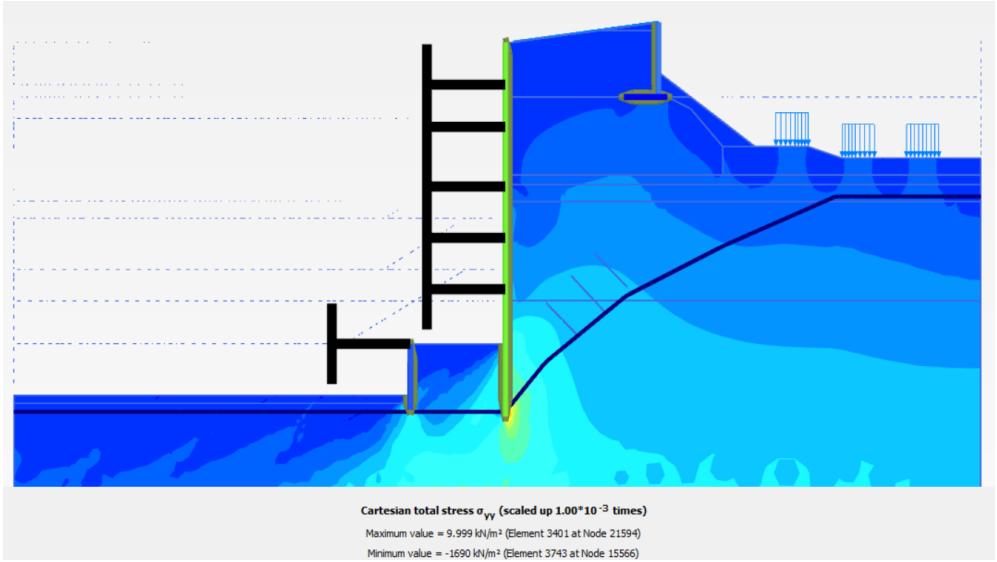
PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S3-13

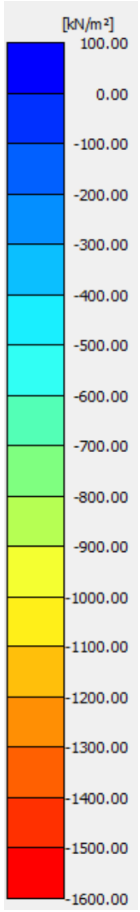
https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

DESIGN SECTION 3



Impact of proposed works (end of excavation)





Impact of proposed works (removal of last level of anchors)

File Name: #

CLIENT
BB Wilson

PROJECT
849, 853 & 859 Pacific Highway, Chatswood

FORTIFY GEOTECH

DATE	30/05/2025
PREPARED	JOE
DESIGN	JOE
REVIEW	MN
APPROVED	MN

TITLE
PLAXIS 2D - Stress field YY 2/2

PROJECT No.	DOC. No	Rev.	FIG. No
S2207	S2207_GIA_01	1	S3-14

https://fortifygeotech.sharepoint.com/sites/FortifyGeotech2/Shared Documents/01. Jobs/S2207 - 849, 853 & 859 Pacific Highway, Chatsv

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Appendix D

TAO/AEO review certificate

Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001

Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
www.wsp.com

Our ref: PS214804-JP-SYD-GEO-LTR-00007 RevA

Your ref: PS214804

By email
manuel@fortifygeotech.com.au

2 June 2025

Public

Manuel Neves
Operations Manager
Fortify Geotech
39 Sydenham Road
Marrickville NSW 2204

Dear Manuel,

849, 853 & 859 Pacific Highway, Chatswood, NSW - Review of Rail Impact Assessment (Sydney Trains & Sydney Metro)

I, Jiping Pan, certify that I have undertaken a TAO review in relation to the geotechnical impact assessment report reference S2207_GIA_01_ Rev1, dated on 2 June 2025, provided by Fortify Geotech in line with Clause 14.3.2 “Impact Assessment Report” (Geotechnical) of Transport for NSW standard “TS 02404– Airspace and External Developments (previous T HR CI 12090 ST)”, issue date 01 June 2021 and in line with the requirements of Sydney Metro At Grade and Elevated Sections Corridor Protection Guidelines, in particular geotechnical requirements of Clauses 5.2 and 6.

In performing the function of reviewer, I have used due skill, care and diligence and from my review and in my opinion as a professional engineer I consider that all relevant requirements within Clause 14.3.2 of TS 02404 and the geotechnical requirements of Sydney Metro At Grade and Elevated Sections Corridor Protection Guidelines (Clauses 5.2 and 6) have been addressed by this geotechnical impact assessment report.

Yours sincerely,



Dr. Jiping Pan
Technical Director
CPEng, IntPE, APEC Engineer, RPEV, FIEAust, NER

WSP | Calibre acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

WSP Australia Pty Limited ABN 80 078 004 798

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GEOTECH

Appendix E

Limitations in the use and interpretation of this geotechnical report

39 Sydenham Rd, Marrickville NSW 2204
PO Box 9225, Deakin ACT 2600

(02) 9188 4033
FortifyGeotech.com.au

Limitations in the Use and Interpretation of this Geotechnical Report

Our Professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

This Document has been prepared for the particular purpose outlined in Fortify Geotech's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose. The scope and the period of Fortify Geotech's Services are as described in Fortify's proposal and are subject to restrictions and limitations. Fortify Geotech did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the Document. If a service is not expressly indicated, do not assume it has been provided.

Conditions may exist which were undetectable given the limited nature of the enquiry Fortify Geotech was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required. Unanticipated soil conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking soil samples, borings or test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. It is recommended that the Owner consider providing a contingency fund to accommodate such potential extra costs.

In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Fortify Geotech's opinions are based upon information that existed at the time of the production of the Document. It is understood that the Services provided allowed Fortify Geotech to form no more than an opinion of the actual conditions of the site at the time the site was visited and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

Any assessments made in this Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this Document. Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Fortify Geotech for incomplete or inaccurate data supplied by others.

Fortify may have retained subconsultants affiliated with Fortify Geotech to provide Services for the benefit of Fortify. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any direct legal recourse to, and waives any claim, demand, or cause of action against, Fortify Geotech's affiliated companies, and their employees, officers and directors.

This Document is provided for sole use by the Client and is confidential to it and its professional advisers. No responsibility whatsoever for the contents of this Document will be accepted to any person other than the Client. Any use which a third party makes of this Document, or any reliance on or decisions to be made based on it, is the responsibility of such third parties. Fortify Geotech accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this Document.

By date, or revision, the Report supersedes any prior report or other document issued by Fortify Geotech in dealing with any matter that is in the Report.

Any uncertainty as to the extent to which this Report can be used or relied upon in any respect should be referred to Fortify Geotech for clarification.

Annexure B: As built drawing of railway assets of railway retaining wall, over bridge at Wilson Street and O'Brien Street provided by the client

Parramatta Rail Link
A NSW GOVERNMENT INITIATIVE

DOWN SIDE OUTER PILE RETAINING WALL

GC-3 WORKS CONTRACT

DRAWINGS SCHEDULE

DRAWING No.	TITLE
PRL-G2-99575	GENERAL ARRANGEMENT
PRL-G2-99576	NOT USED
PRL-G2-99577	TYPICAL WALL SECTIONS
PRL-G2-99578	PILE SETOUT
PRL-G2-99579	PILE DETAILS
PRL-G2-99580	CAPPING BEAM - CONCRETE
PRL-G2-99581	CAPPING BEAM - REINFORCEMENT

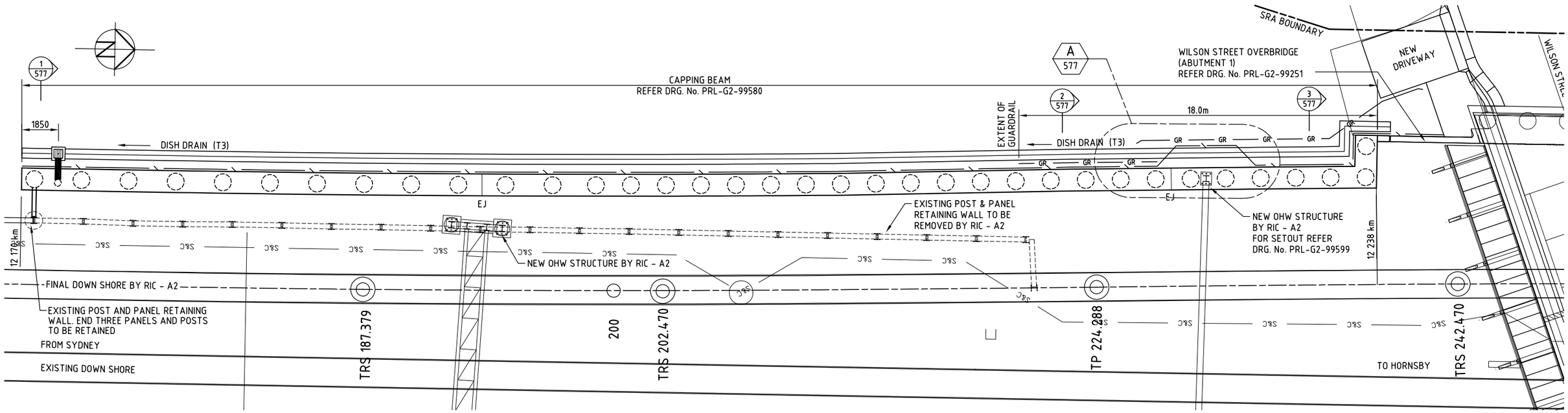
LOCALITY PLAN

NOT TO SCALE

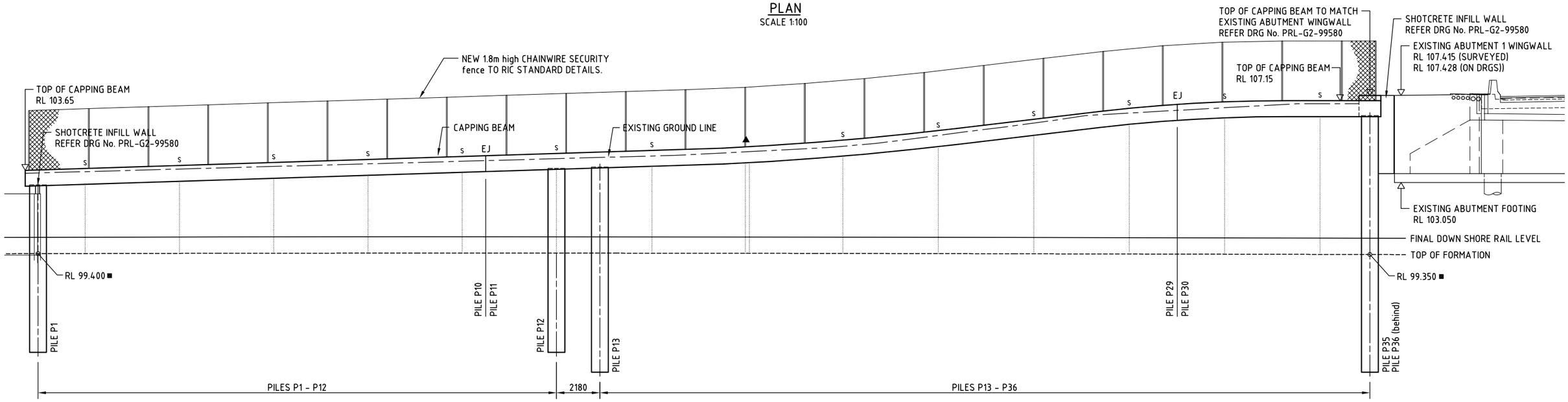
CV0214761

WORK AS EXECUTED

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PLAN
SCALE 1:100



ELEVATION
SCALE 1:100

LEGEND

- EJ ....EXPANSION JOINT
- ▲ ....PRIMARY CALIBRATION-URBAN DESIGN
- S ....SECONDARY CALIBRATION-URBAN DESIGN
- —S&C— ....SIGNAL & COMMUNICATIONS CABLING (TO BE RELOCATED BY RIC)
- —\—\— ....NEW CHAINWIRE FENCE (TO RIC STANDARD)
- —GR— ....NEW 'W' BEAM GUARDRAIL (TO RTA MODEL DRAWING Nos. MD.R132.A01.A1 & MD.R132.B01.A1)
- DISH DRAIN ....NEW DISH DRAIN (TYPE 3) (REFER DRAWING No. PRL-G2-99715 FOR DETAIL)
- ▣ ....NEW, (450x450x600 DEEP) PRECAST CONC. PIT WITH HEAVY DUTY 'V' GRATE INLET.
- o ....Ø225 UPVC PIPE & DROPPER

Scales
0 2 4
2 1
(1:100 BEFORE REDUCTION)
SCALE IN METRES
(AT A1 SHEET SIZE)

NOTES

GENERAL

1. DIMENSIONS ARE NOT BE SCALED FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE CHAINAGES & REDUCED LEVELS ARE IN METRES
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING THE LOCATION OF ALL SERVICES AFFECTED BY THE WORKS PRIOR TO COMMENCEMENT OF ANY EXCAVATION.
4. LOCATION OF SERVICES SHOWN ON DRAWINGS IS INDICATIVE AND SHALL BE VERIFIED BY THE CONTRACTOR.
5. TOP OF FORMATION LEVEL AT BASE OF RETAINING WALL TO BE NOT LOWER THAN THE RL SHOWN ■ ON ELEVATION.
6. EXCAVATION IN FRONT OF PILE WALL NOT TO EXCEED 500mm BELOW FORMATION LEVELS.
7. SAFETY SCREENS TO FUTURE DETAIL.

DESIGN

1. DESIGN CODE : AUSTRALIAN BRIDGE DESIGN CODE.
2. DESIGN LOADING : T44 TRUCK LOADING
3. CONSTRUCTION SURCHARGE 20 kPa

SURVEY

1. ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
2. ALL CO-ORDINATES ARE TO MAP GRID OF AUSTRALIA (MGA).
3. WHERE KILOMETRAGE IS USED TO INDICATE A START OR END POINT IT IS MEASURED PERPENDICULAR TO THE FINAL DOWN SHORE

SECURITY FENCE

1. NEW 1.8m HIGH SECURITY FENCE TO BE CONSTRUCTED IN ACCORDANCE WITH RIC STANDARDS AP6841 & C4501 AND RIC DRAWINGS 207-1353, SHEET 1; 207-1353, SHEET 2 AND 207-1353, SHEET 4.

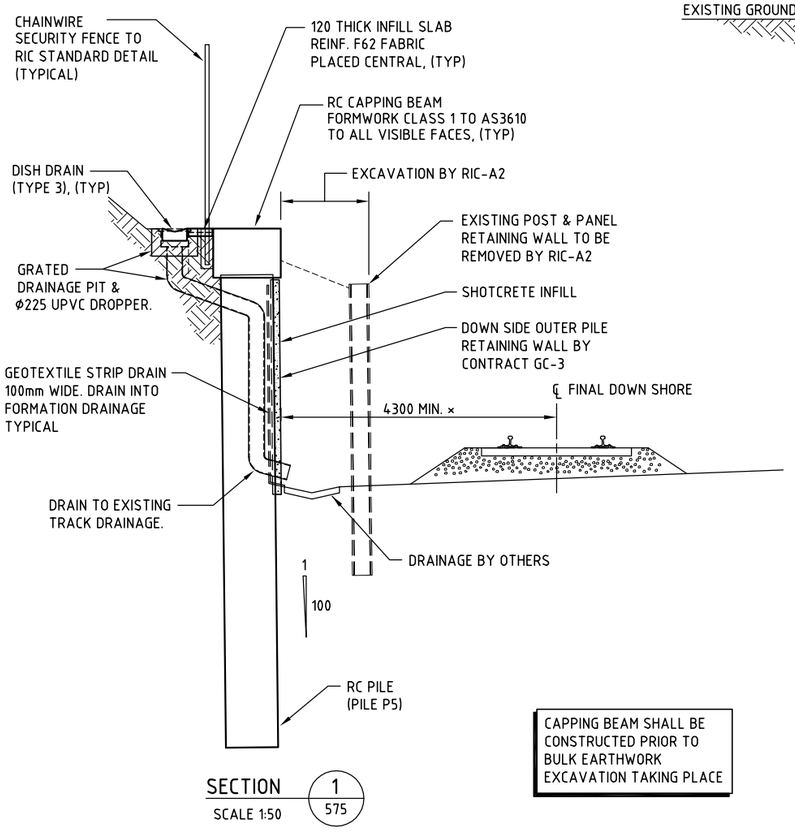
REFERENCES

TYPICAL WALL SECTIONS	DRG No PRL-G2-99577
PILE SETOUT	DRG No PRL-G2-99578
PILE DETAILS	DRG No PRL-G2-99579
CAPPING BEAM - CONCRETE	DRG No PRL-G2-99580
CAPPING BEAM - REINFORCEMENT	DRG No PRL-G2-99581
OHW STRUCTURES HOLDING DOWN BOLT DETAILS	DRG No PRL-G2-99599

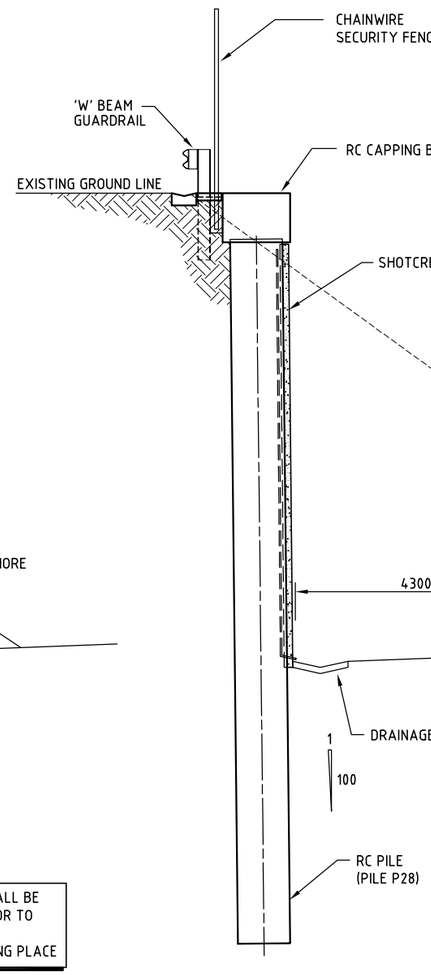
NOTE:
EXCAVATION & SHOTCRETE INFILL NOT COMPLETED AT TIME OF ISSUE

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214762

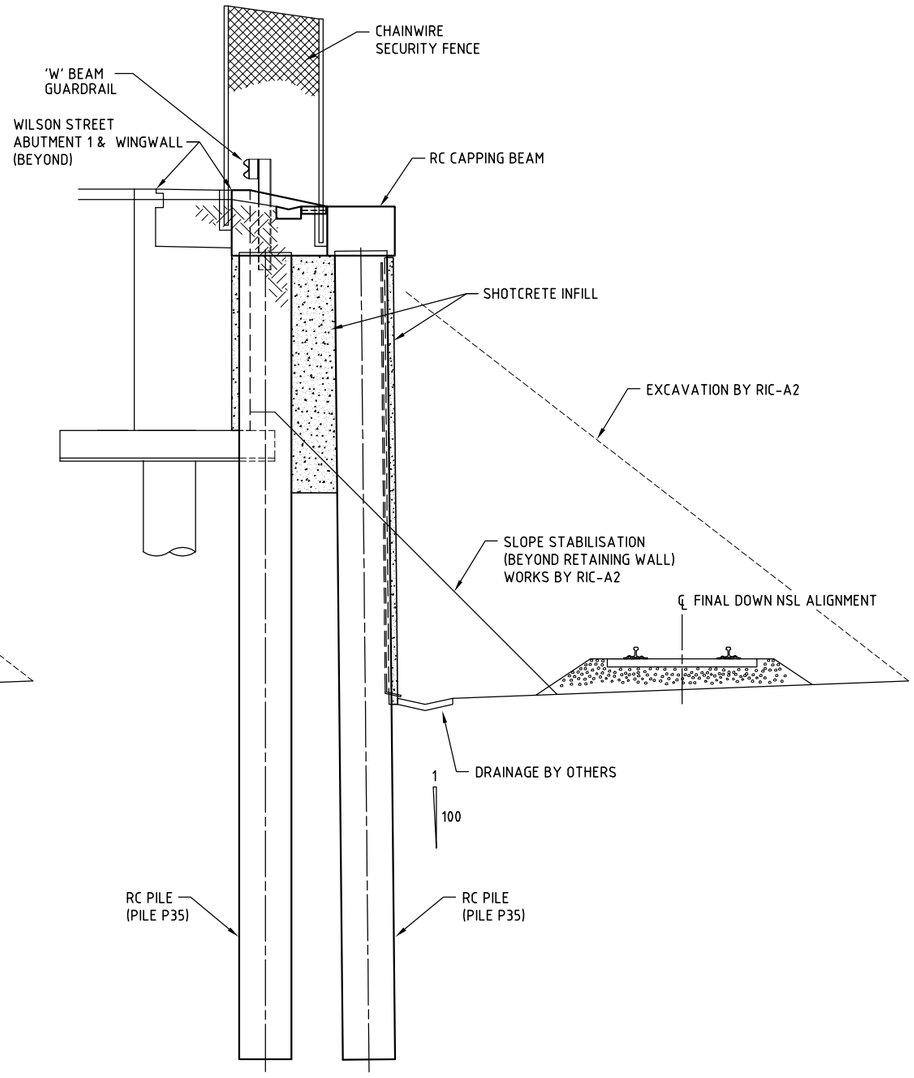


SECTION 1 / 575
SCALE 1:50

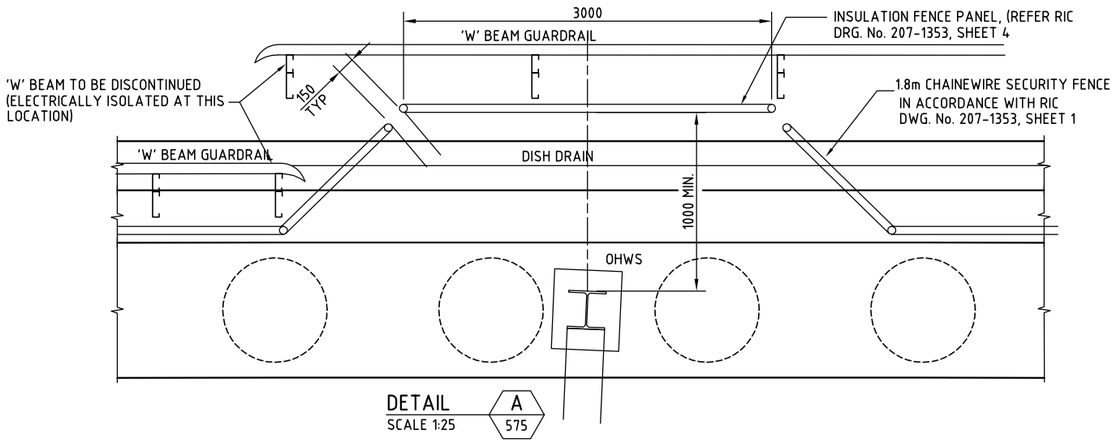


CAPPING BEAM SHALL BE CONSTRUCTED PRIOR TO BULK EARTHWORK EXCAVATION TAKING PLACE

SECTION 2 / 575
SCALE 1:50



SECTION 3 / 575
SCALE 1:50



DETAIL A / 575
SCALE 1:25

Scales
0 1000 2000
1000 500
(1:50 BEFORE REDUCTION)
SCALE IN MILLIMETRES (AT A1 SHEET SIZE)

NOTES

GENERAL
REFER TO DRG No PRL-G2-99575

× DIMENSION NOT TO BE USED FOR SETOUT

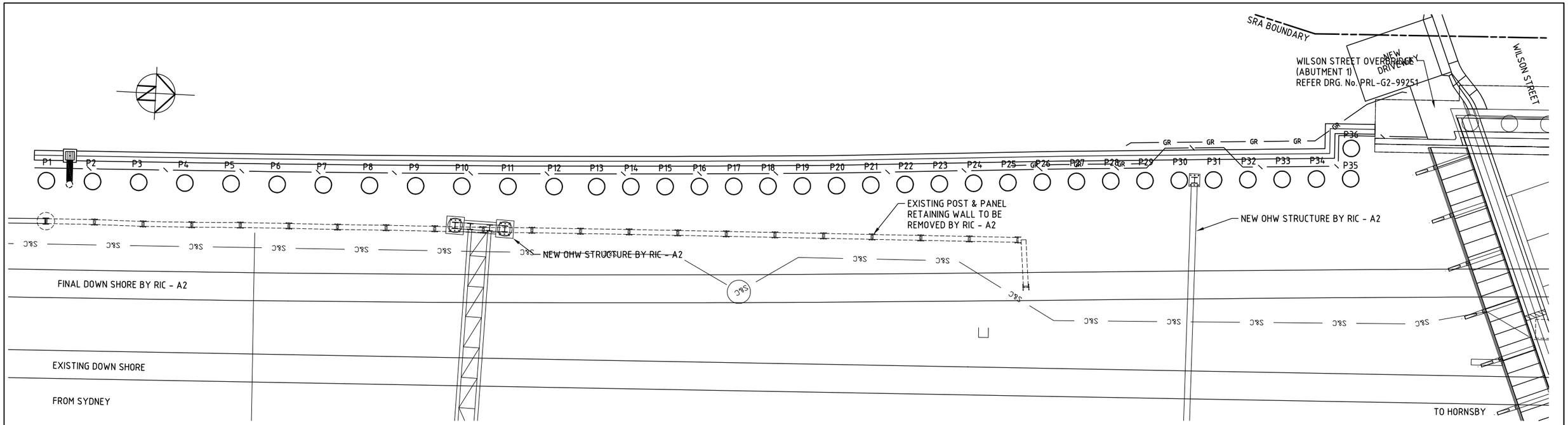
REFERENCES

GENERAL ARRANGEMENT	DRG No PRL-G2-99575
PILE SET OUT	DRG No PRL-G2-99578
PILE DETAILS	DRG No PRL-G2-99579
CAPPING BEAM - CONCRETE	DRG No PRL-G2-99580
CAPPING BEAM - REINFORCEMENT	DRG No PRL-G2-99581

NOTE:
EXCAVATION & SHOTCRETE INFILL NOT COMPLETED AT TIME OF ISSUE

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214763



PILE SETOUT

SCALE 1:100

TABLE 1

PILE No	EASTING	NORTHING	DIAMETER	CUT OFF LEVEL	CONTRACT LEVEL	× ACTUAL FOUNDING LEVEL
P1	331 577.167	6 259 284.036	850	102.920	94.50	94.50
P2	331 577.085	6 259 286.405	850	102.995	94.50	94.50
P3	331 577.002	6 259 288.773	850	103.070	94.50	94.50
P4	331 576.917	6 259 291.142	850	103.145	94.50	94.50
P5	331 576.830	6 259 293.510	850	103.225	94.50	94.50
P6	331 576.739	6 259 295.879	850	103.300	94.50	94.50
P7	331 576.645	6 259 298.247	850	103.375	94.50	94.50
P8	331 576.548	6 259 300.615	850	103.450	94.50	94.50
P9	331 576.446	6 259 302.982	850	103.525	94.50	94.50
P10	331 576.339	6 259 305.350	850	103.600	94.50	94.50
P11	331 576.228	6 259 307.717	850	103.675	94.50	94.50
P12	331 576.112	6 259 310.085	850	103.750	94.50	94.50
P13	331 576.002	6 259 312.262	850	103.820	93.50	93.50
P14	331 575.910	6 259 314.020	850	103.875	93.50	93.50
P15	331 575.816	6 259 315.777	850	103.930	93.50	93.50
P16	331 575.719	6 259 317.535	850	103.990	93.50	93.50
P17	331 575.620	6 259 319.292	850	104.060	93.50	93.50
P18	331 575.519	6 259 321.049	850	104.185	93.50	93.50
P19	331 575.416	6 259 322.806	850	104.310	93.50	93.50
P20	331 575.308	6 259 324.563	850	104.450	93.50	93.50
P21	331 575.186	6 259 326.318	850	104.610	93.50	93.50
P22	331 575.063	6 259 328.074	850	104.790	93.50	93.50
P23	331 574.940	6 259 329.830	850	104.985	93.50	93.50
P24	331 574.818	6 259 331.585	850	105.195	93.50	93.50
P25	331 574.695	6 259 333.341	850	105.405	93.50	93.50
P26	331 574.572	6 259 335.097	850	105.615	93.50	93.50
P27	331 574.450	6 259 336.853	850	105.820	93.50	93.50
P28	331 574.339	6 259 338.609	850	106.015	93.50	93.50
P29	331 574.228	6 259 340.366	850	106.175	93.50	93.50
P30	331 574.118	6 259 342.122	850	106.270	93.50	93.50
P31	331 574.008	6 259 343.879	850	106.350	93.50	93.50
P32	331 573.899	6 259 345.635	850	106.400	93.50	93.50
P33	331 573.791	6 259 347.392	850	106.400	93.50	93.50
P34	331 573.684	6 259 349.149	850	106.400	93.50	93.50
P35	331 573.578	6 259 350.906	850	106.400	93.50	93.50
P36	331572.021	6 259 350.853	850	106.400	93.50	93.50

Scales

0 2000 4000

2000 1000

(1:100 BEFORE REDUCTION)
SCALE IN MILLIMETERS
(AT A1 SHEET SIZE)

NOTES

GENERAL

1. DIMENSIONS ARE NOT TO BE SCALE FROM THE DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE CHAINAGES & REDUCED LEVELS ARE IN METRES
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING THE LOCATION OF ALL SERVICES AFFECTED BY THE WORKS PRIOR TO COMMENCEMENT OF ANY EXCAVATION.
4. LOCATION OF SERVICES SHOWN ON DRAWINGS IS INDICATIVE AND SHALL BE VERIFIED BY THE CONTRACTOR.

DESIGN

1. DESIGN CODE : AUSTRALIAN BRIDGE DESIGN CODE-1996.
2. DESIGN LOADING : CONSTRUCTION SURCHARGE 20 kPa, T44 TRUCK

SURVEY

1. ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
2. ALL CO-ORDINATES ARE TO MAP GRID OF AUSTRALIA (MGA).
3. SETOUT POINT IS CENTRE OF PILE AT CUT OFF LEVEL.
4. PILES SHALL BE SURVEYED AFTER INSTALLATION TO DETERMINE DEVIATIONS FORM DESIGN SETOUT.

REFERENCES

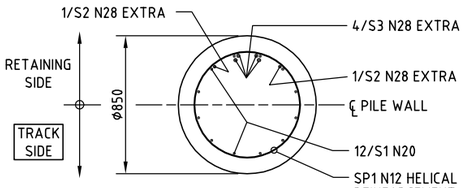
GENERAL ARRANGEMENT..... DRG No. PRL-G2-99575
PILE DETAILS..... DRG No. PRL-G2-99579

× COLUMNS FOR "ACTUAL FOUNDING LEVELS" AND "NATURE OF FOUNDING MATERIAL" TO BE COMPLETED BY THE CONTRACTOR (INCLUDING ANY VARIATION IN CONTRACT LEVEL SHOWN) AND SUBMITTED AS AN "AS BUILT" DRAWING

NOTE:
EXCAVATION & SHOTCRETE INFILL NOT COMPLETED AT TIME OF ISSUE

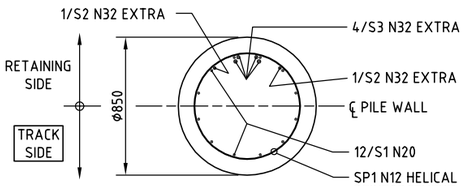
WORK AS EXECUTED
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RIC/SRA EDMS ID CV0214764



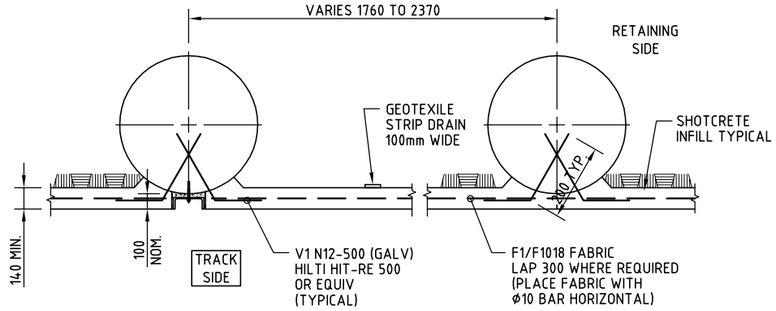
ø850 PILE TYPE 1
PILES P1 TO P12

SECTION 1 / SCALE 1:20

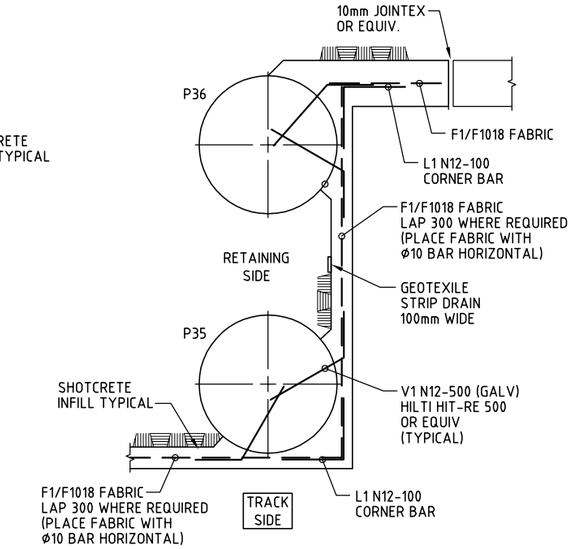


ø850 PILE TYPE 2
PILES P13 TO P36

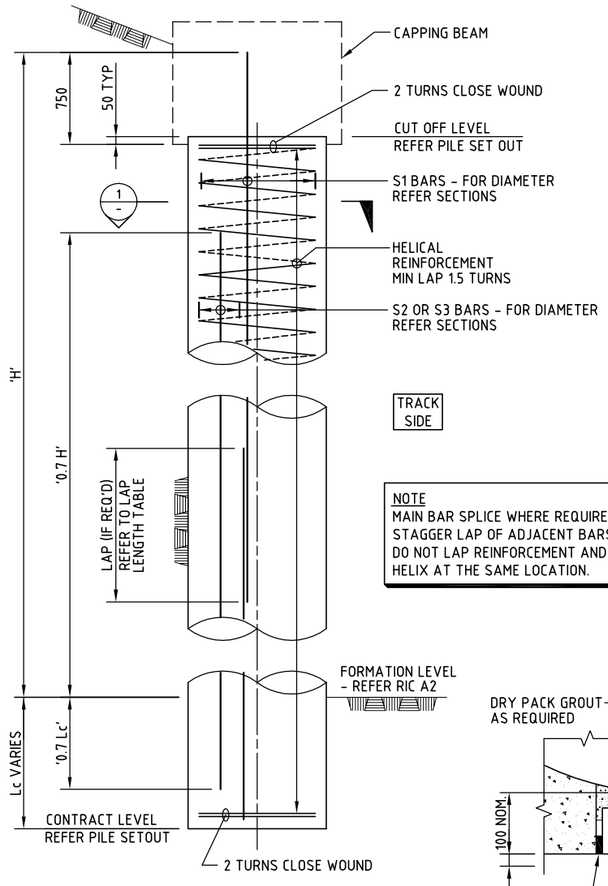
SECTION 1 / SCALE 1:20



TYPICAL WALL DETAIL
SCALE 1:20

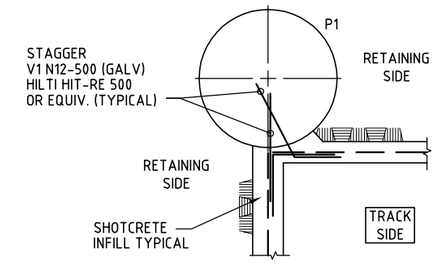


WALL CORNER DETAIL AT PILES P35 & P36
SCALE 1:20

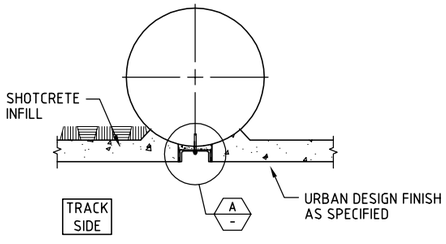


ELEVATION
SCALE 1:20

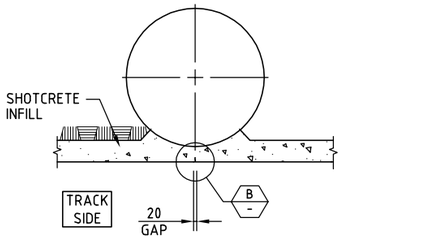
NOTE
MAIN BAR SPLICE WHERE REQUIRED, STAGGER LAP OF ADJACENT BARS. DO NOT LAP REINFORCEMENT AND HELIX AT THE SAME LOCATION.



WALL CORNER DETAIL AT PILE P1
SCALE 1:20

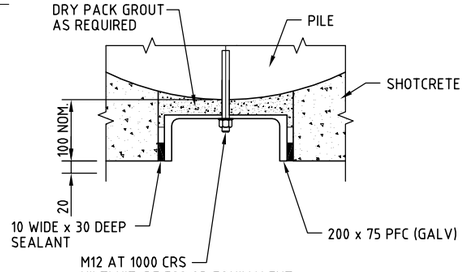


PRIMARY CALIBRATION - URBAN DESIGN (▲)
(AT 48.0 m CENTRES NOMINAL)
FOR SETOUT REFER URBAN DESIGN DRAWINGS
SCALE 1:20

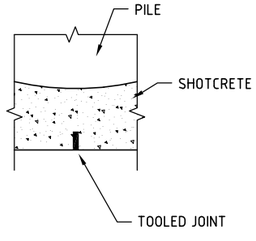


SECONDARY CALIBRATION - URBAN DESIGN (s)
(AT 4.80 m CENTRES NOMINAL)
FOR SETOUT REFER URBAN DESIGN DRAWINGS
SCALE 1:20

NOTE
DESIGN ORIENTATION OF BARS : ±10° MAX. DEVIATION (TYPICAL)



DETAIL A / SCALE 1:5



DETAIL B / SCALE 1:5

Scales
0 400 800
400 200
(1:20 BEFORE REDUCTION)
SCALE IN MILLIMETRES
(AT A1 SHEET SIZE)

NOTES

GENERAL

NOTES REFER TO DRG No. PRL-G2-99575

PILES

1. PILES ARE DESIGNED IN ACCORDANCE WITH AUSTRALIAN 'PILING CODE' AS2159-1995 AND THE AUSTRALIAN BRIDGE DESIGN CODE-1996.
2. THE PILES SHALL BE BORED CAST-IN-PLACE REINFORCED CONCRETE PILES (WITHOUT PERMANENT CASING), DERIVING LOAD CAPACITY FROM END BEARING, LATERAL RESISTANCE AND SHAFT FRICTION.
3. GEOTECHNICAL INFORMATION CONTAINED IN THE SPECIFICATION MUST BE STUDIED BY THE CONTRACTOR TO APPRECIATE POTENTIAL CONSTRUCTION DIFFICULTIES.
4. THE CONTRACTOR SHALL SUBMIT ALL THE RELEVANT PILING DETAILS TO THE PRINCIPAL IN ACCORDANCE WITH THE SPECIFICATIONS.
5. A GEOTECHNICAL ENGINEER SHALL INSPECT EXCAVATED FACE OF WALL TO DETERMINE EXTENT OF ROCK BOLTING REQUIRED IF ANY.

PILE CONSTRUCTION

1. PILES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATION.
2. SOCKET ROUGHNESS CATEGORY TO BE R2 OR BETTER.
3. MINIMUM CLEARANCE TO PILE RIG SHALL BE 3.7m HORIZONTALLY FROM CENTRELINE OF ADJACENT TRACK. THE CONTRACTOR SHALL REFER TO SPECIAL CONDITIONS OF CONTRACT AND OBTAIN ALL NECESSARY APPROVALS FROM THE PRINCIPAL'S REPRESENTATIVE.
4. THE CONTRACTOR MUST SUBMIT COMPLETE DETAILS OF PILING RIG AND CLEARANCES TO THE PRINCIPAL TWO (2) WEEKS PRIOR TO COMMENCEMENT OF THE PILING.

TESTING OF PILE

1. TESTING OF PILES SHALL BE IN ACCORDANCE WITH THE SPECIFICATION.

CONCRETE

1. ALL CONCRETE WORK SHALL COMPLY WITH THE SPECIFICATION.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH:
   PILES.....f'c = 40 MPa.
   CAPPING BEAM.....f'c = 40 MPa.
   SHOTCRETE.....f'c = 32 MPa.
3. EXPOSURE CLASSIFICATION = B1.
4. 25mm CHAMFERS & FILLETS SHALL BE PROVIDED TO ALL EXPOSED EDGES AND CORNERS UNO.

REINFORCEMENT

1. ALL REINFORCEMENT BARS SHALL COMPLY WITH THE SPECIFICATION. ALL BARS ARE GRADE 500N DEFORMED RIBBED BAR (NORMAL DUCTILITY) RIBBED BAR UNO.
2. DESIGNATION OF REINFORCING BARS : 10/S1 N24-200 EF
   - No. OF BARS
   - BAR SHAPE NOTATION
   - DUCTILITY CLASS AND DIA
   - SPACING OF BARS
   - LOCATION COMMENT
3. CLEAR COVER TO REINFORCEMENT SHALL BE :
   PILE - 75mm
   PILE CAP - 50mm TOP, BOTTOM & EXPOSED FACE
   - 75mm FACE IN CONTACT WITH GROUND
   SHOTCRETE - 75mm AGAINST EARTH
   - 50mm TRACK SIDE
4. COGS AND HOOKS SHALL BE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE 1996.
5. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR AS APPROVED IN WRITING BY THE ENGINEER
6. BAR SHAPES SHALL BE IN ACCORDANCE WITH AS/NZS 1100.501:2002.
7. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT :
   EW - EACH WAY T - TOP FACE
   EF - EACH FACE B - BOTTOM FACE
   NF - NEAR FACE C - CENTRALLY PLACED
   FF - FAR FACE NSOP - NOT SHOWN ON PLAN
8. BAR LAPS SHALL BE AS FOLLOWS UNO;

BAR SIZE	LAPS (mm)	BAR SIZE	LAPS (mm)
N12	400	N28	1000
N16	500	N32	1300
N20	650	N36	1500
N24	750	N40	1700

NOTE: MINIMUM SPACING OF BARS 150mm

FORMWORK

CAPPING BEAM FORMWORK - CLASS 2

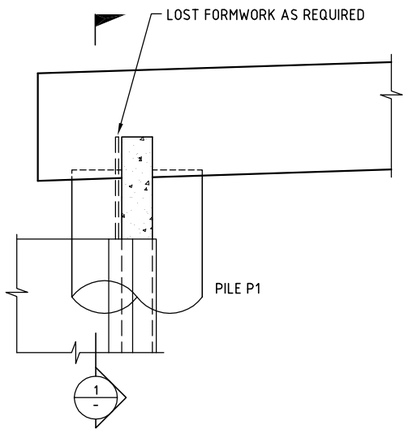
NOTE:
EXCAVATION & SHOTCRETE INFILL COMPLETED BY RIC-A2

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

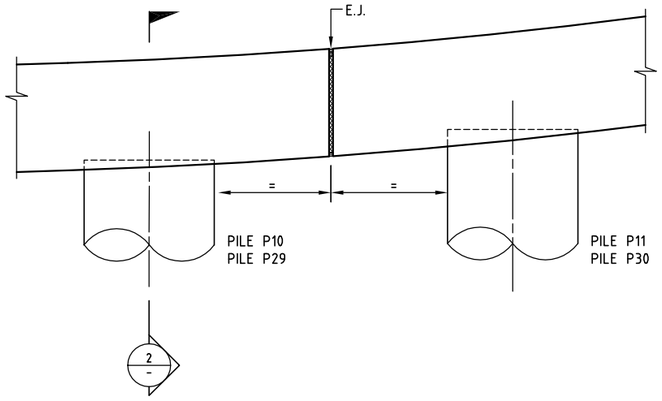
REFERENCES

GENERAL ARRANGEMENT..... DRG No PRL-G2-99575
PILE SETOUT..... DRG No PRL-G2-99578
CAPPING BEAM - CONCRETE..... DRG No PRL-G2-99580
CAPPING BEAM - REINFORCEMENT..... DRG No PRL-G2-99581

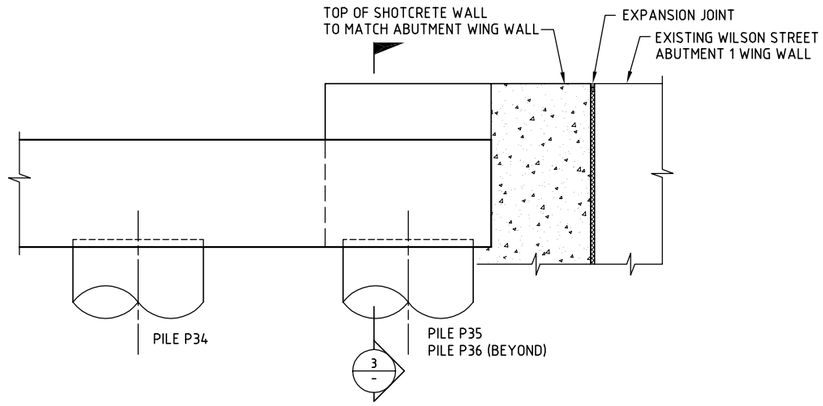
RIC/SRA EDMS ID CV0214765



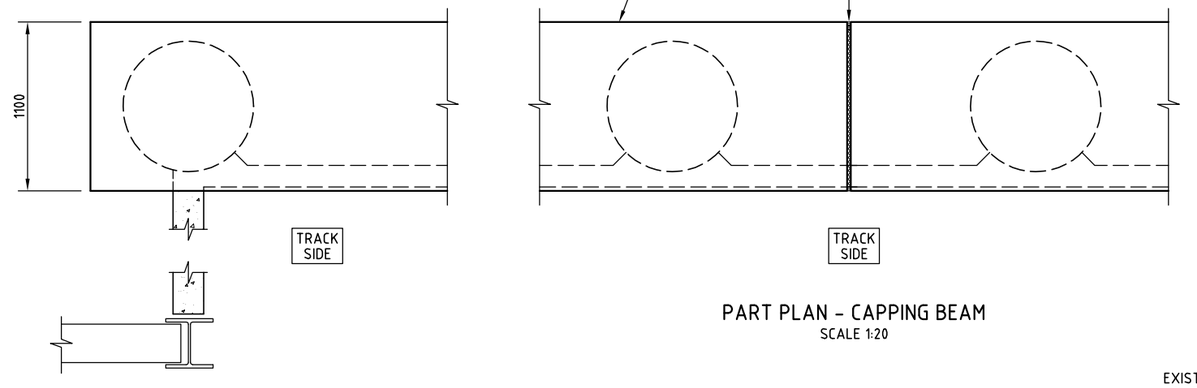
PART ELEVATION - PILE P1
SCALE 1:20

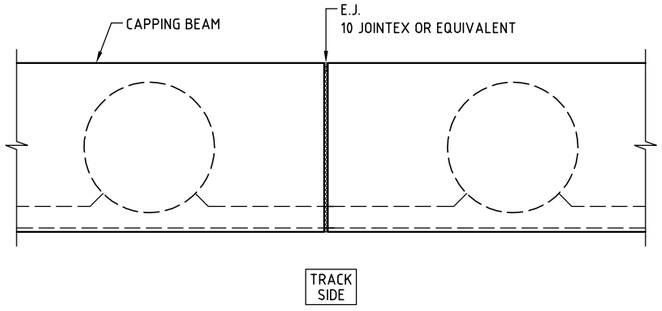


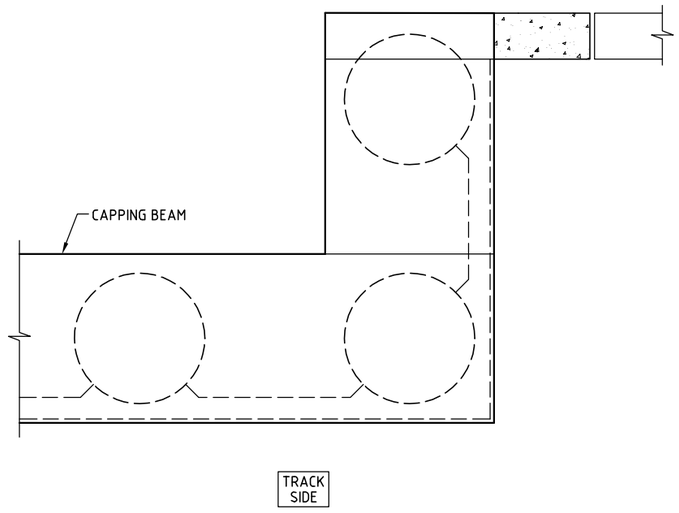
PART ELEVATION -
AT EXPANSION JOINT (EJ) (TYP.)
SCALE 1:20



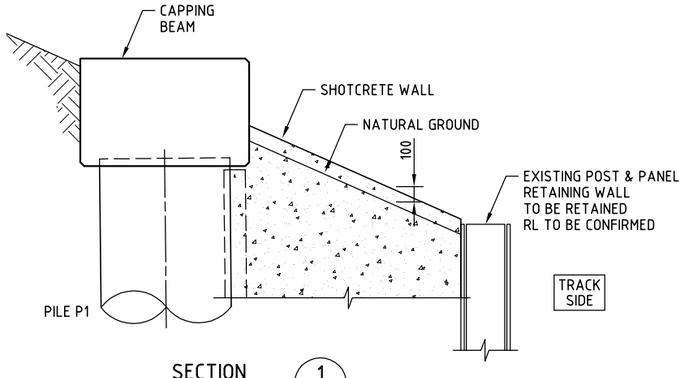
PART ELEVATION - PILES P34 - P36
SCALE 1:20



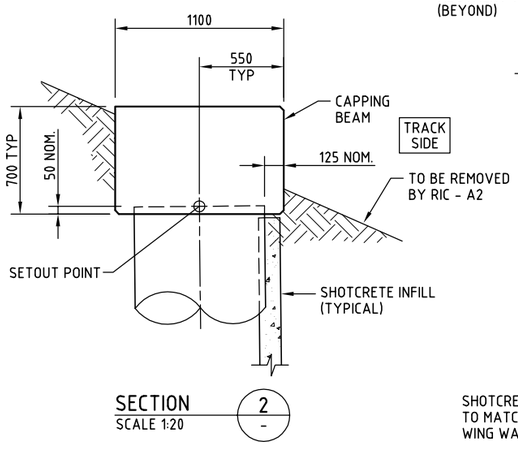




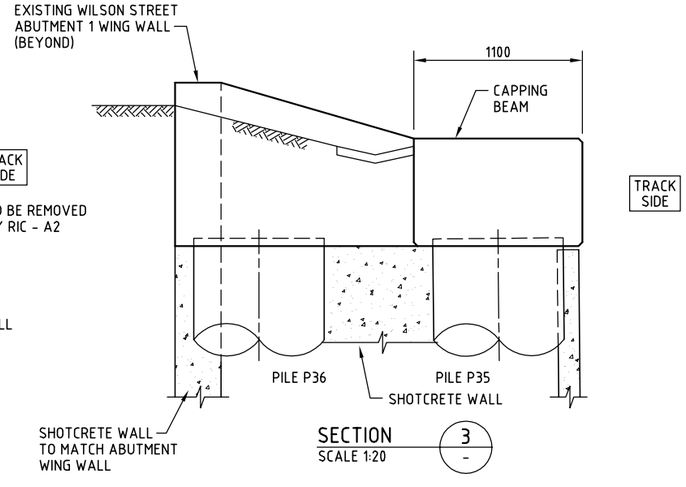
PART PLAN - CAPPING BEAM
SCALE 1:20



SECTION 1
SCALE 1:20



SECTION 2
SCALE 1:20



SECTION 3
SCALE 1:20

Scales
0 400 800
400 200
(1:20 BEFORE REDUCTION)
SCALE IN MILLIMETERS
(AT A1 SHEET SIZE)

NOTES

GENERAL
REFER TO DRG No PRL-G2-99575
CONCRETE
REFER TO DRG No PRL-G2-99579

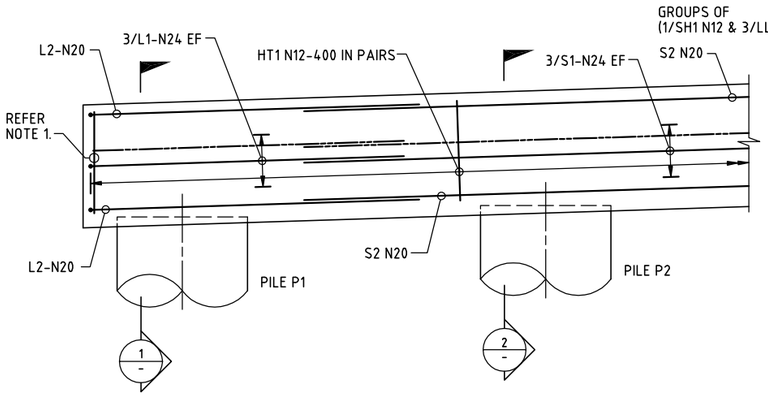
REFERENCES

GENERAL ARRANGEMENT	DRG No PRL-G2-99575
TYPICAL WALL SECTIONS	DRG No PRL-G2-99577
PILE SETOUT	DRG No PRL-G2-99578
PILE DETAILS	DRG No PRL-G2-99579
CAPPING BEAM - REINFORCEMENT	DRG No PRL-G2-99581

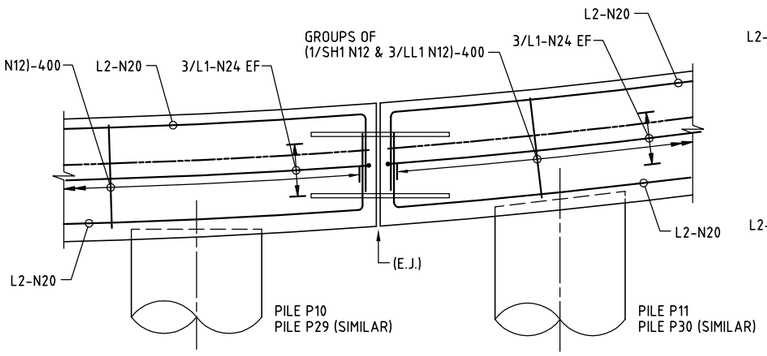
NOTE:
EXCAVATION & SHOTCRETE INFILL
NOT COMPLETED AT TIME OF ISSUE

WORK AS EXECUTED
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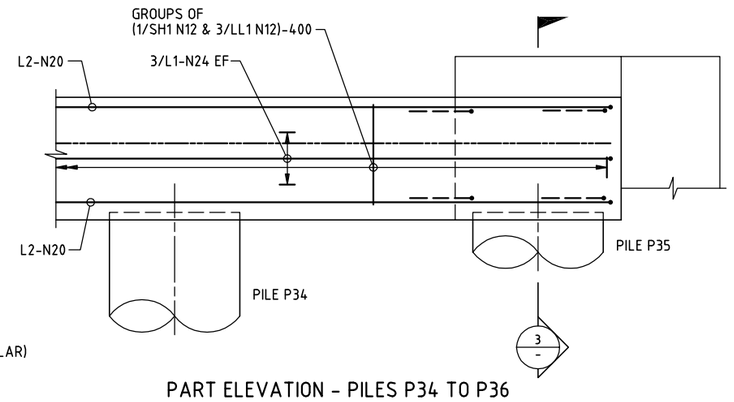
RIC/SRA EDMS ID CV0214766



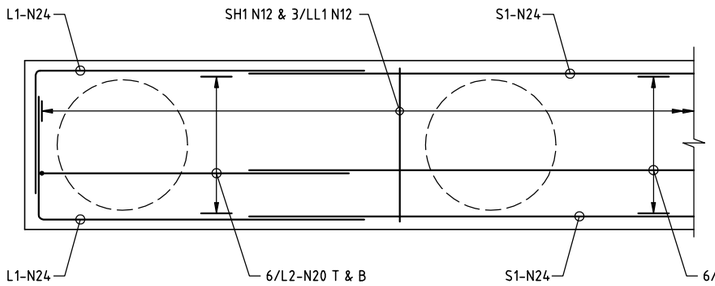
PART ELEVATION - PILES P1 & P2
SCALE 1:20



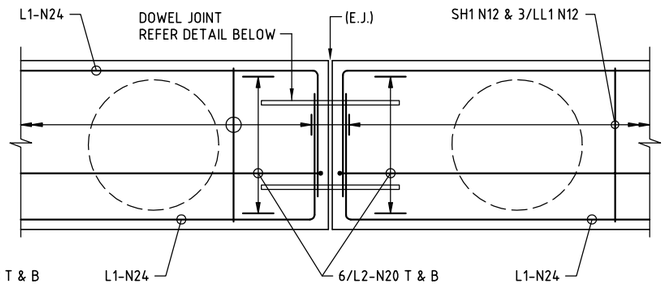
PART ELEVATION -
AT EXPANSION JOINT (EJ) (TYP)
SCALE 1:20



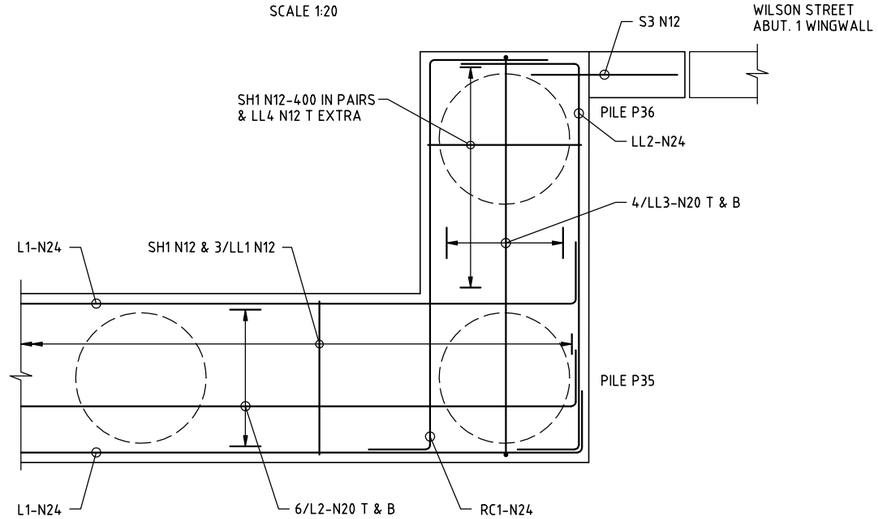
PART ELEVATION - PILES P34 TO P36
SCALE 1:20



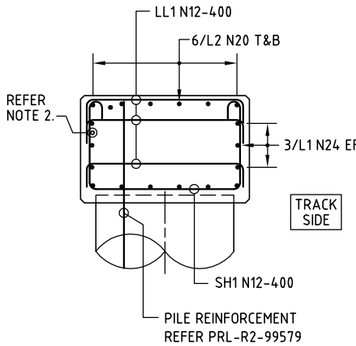
PART PLAN - CAPPING BEAM
SCALE 1:20



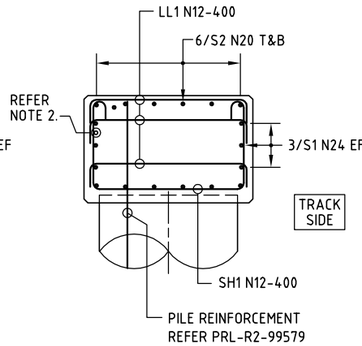
PART PLAN - CAPPING BEAM
SCALE 1:20



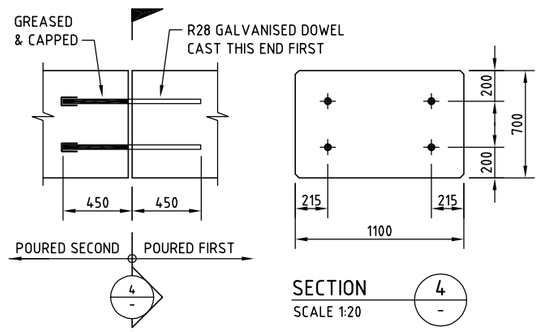
PART PLAN - CAPPING BEAM
SCALE 1:20



SECTION 1
SCALE 1:20

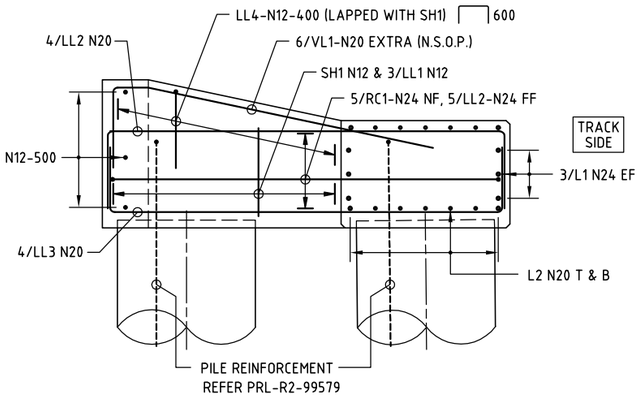


SECTION 2
SCALE 1:20



DOWEL JOINT DETAIL
SCALE 1:20

SECTION 4
SCALE 1:20



SECTION 3
SCALE 1:20

NOTES

GENERAL
REFER TO DRG No PRL-G2-99575
CONCRETE
REFER TO DRG No PRL-G2-99579
REINFORCEMENT
REFER TO DRG No PRL-G2-99579

1. WELD ALL LONGITUDINAL REBAR TO LAST LIGATURE AT ENDS & EXPANSION JOINTS. REPEAT WELDING IF LAPS REQUIRED IN LONGITUDINAL REBAR TYPICAL.
   FIT PROPRIETORY CATHODIC DRAINAGE BONDS TO THIS LIGATURE AS APPROVED BY SUPERINTENDENT.
2. ELECTRICAL ISOLATION BAR N12 WELD TO ALL LIGATURES. WELDED LAP AS REQUIRED. FULL LENGTH OF CAPPING BEAM.

REFERENCES

GENERAL ARRANGEMENT	DRG No PRL-G2-99575
TYPICAL WALL SECTIONS	DRG No PRL-G2-99577
PILE SETOUT	DRG No PRL-G2-99578
PILE DETAILS	DRG No PRL-G2-99579
CAPPING BEAM - CONCRETE	DRG No PRL-G2-99580

NOTE:
EXCAVATION & SHOTCRETE INFILL NOT COMPLETED AT TIME OF ISSUE

WORK AS EXECUTED
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RIC/SRA EDMS ID CV0214767

Scales
0 400 800
400 200
(1:20 BEFORE REDUCTION)
SCALE IN MILLIMETERS
(AT A1 SHEET SIZE)

Parramatta Rail Link

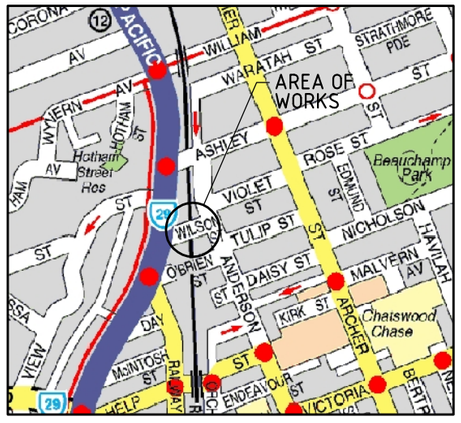
A NSW GOVERNMENT INITIATIVE

WILSON STREET OVERBRIDGE

GC-3 WORKS CONTRACT

DRAWINGS SCHEDULE

DRAWING No.	TITLE
PRL-G2-99251	GENERAL ARRANGEMENT
PRL-G2-99252	PILE SETOUT AND DETAILS
PRL-G2-99253	NOT USED
PRL-G2-99254	NOT USED
PRL-G2-99255	ABUTMENT 1 - CONCRETE
PRL-G2-99256	ABUTMENT 1 - REINFORCEMENT
PRL-G2-99257	ABUTMENT 2 - CONCRETE
PRL-G2-99258	ABUTMENT 2 - REINFORCEMENT
PRL-G2-99259	NOT USED
PRL-G2-99260	NOT USED
PRL-G2-99261	BEARING PLAN AND DETAILS
PRL-G2-99262	PRECAST POST TENSIONED GIRDERS - SHEET 1 OF 6
PRL-G2-99263	PRECAST POST TENSIONED GIRDERS - SHEET 2 OF 6
PRL-G2-99264	PRECAST POST TENSIONED GIRDERS - SHEET 3 OF 6
PRL-G2-99265	PRECAST POST TENSIONED GIRDERS - SHEET 4 OF 6
PRL-G2-99266	PRECAST POST TENSIONED GIRDERS - SHEET 5 OF 6
PRL-G2-99267	PRECAST POST TENSIONED GIRDERS - SHEET 6 OF 6
PRL-G2-99268	PRECAST DECK UNITS - CONCRETE
PRL-G2-99269	PRECAST DECK UNITS - REINFORCEMENT
PRL-G2-99270	PERMANENT COVER PLATE DETAILS
PRL-G2-99271	TEMPORARY COVER PLATE DETAILS
PRL-G2-99272	IN-SITU DECK - PLAN AND DETAILS
PRL-G2-99273	PRECAST AND IN-SITU DECK - DETAILS
PRL-G2-99274	DECK JOINT DETAILS
PRL-G2-99275	FOOTWAY GIRDERS PLAN & DETAILS
PRL-G2-99276	ANTI PROJECTILE SCREEN DETAILS
PRL-G2-99277	PEDESTRIAN RAILING
PRL-G2-99278	PRECAST FOOTWAY SLABS - SHEET 1 OF 2
PRL-G2-99279	PRECAST FOOTWAY SLABS - SHEET 2 OF 2
PRL-G2-99280	FOOTWAY SUPPORT STEELWORK DETAILS SHEET 1 OF 2
PRL-G2-99281	FOOTWAY SUPPORT STEELWORK DETAILS SHEET 2 OF 2
PRL-G2-99282	ANTI PROJECTILE ACRYLIC PANEL SUPPORT FRAME
PRL-G2-99283	WILSON STREET LONGITUDINAL SECTION
PRL-G2-99284	TEMPORARY STEELWORK - SHEET 1 OF 2
PRL-G2-99285	SUGGESTED CONSTRUCTION STAGING
PRL-G2-99286	TEMPORARY STEELWORK - SHEET 2 OF 2



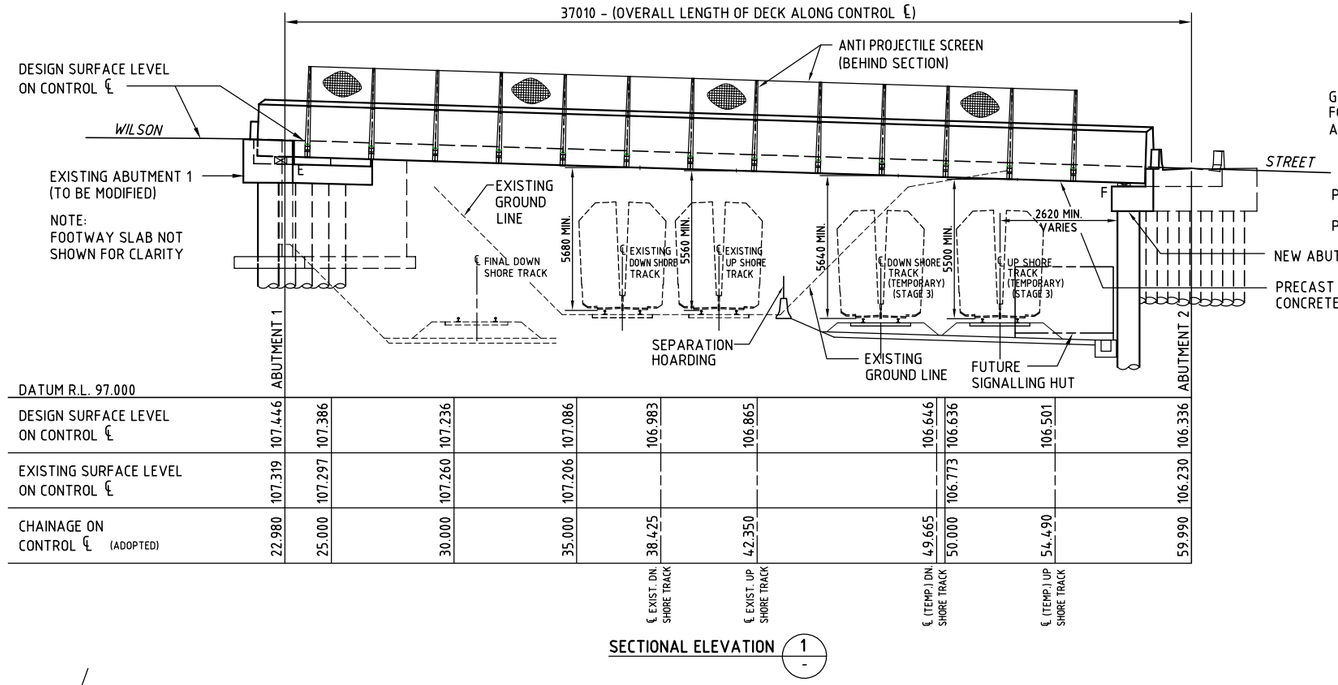
LOCALITY PLAN

NOT TO SCALE

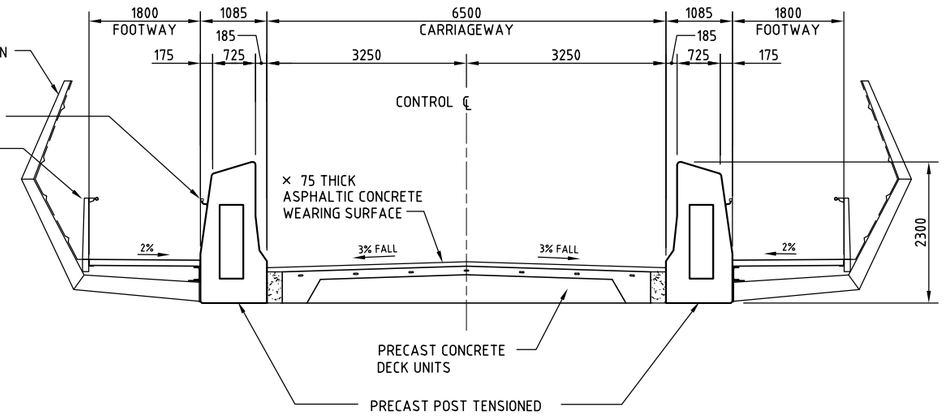
CV0214639

WORK AS EXECUTED

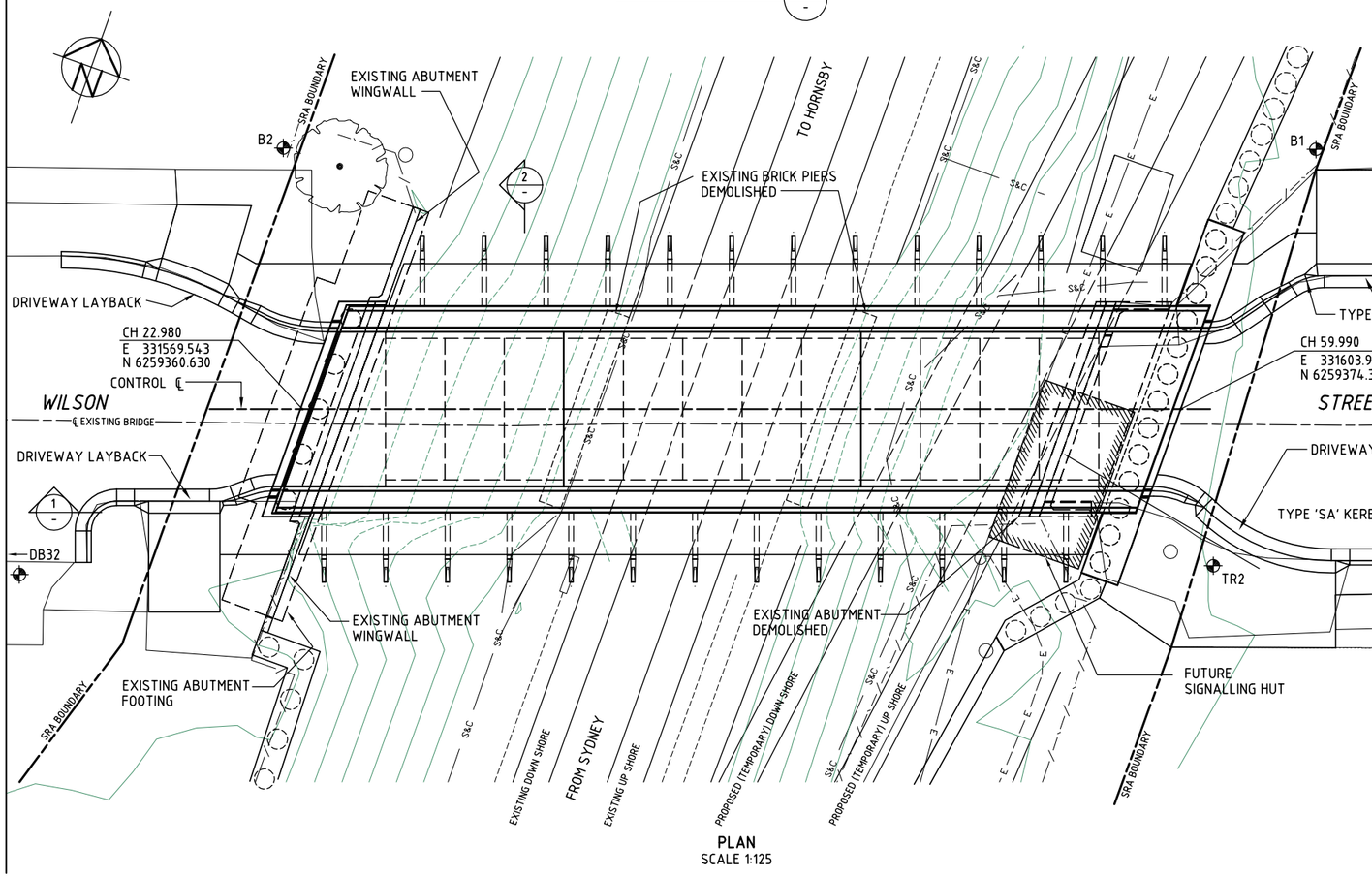
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.



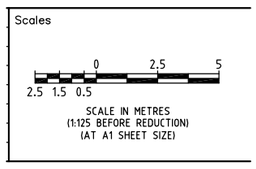
SECTIONAL ELEVATION 1 -

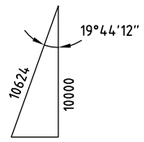


SECTION 2 -
SCALE 1:50

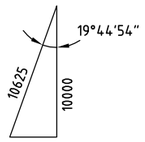


PLAN
SCALE 1:125





SKEW DIAGRAM ABUTMENT 1
NOT TO SCALE



SKEW DIAGRAM ABUTMENT 2
NOT TO SCALE

LEGEND

EXISTING UTILITIES

- E ——.....OVERHEAD/UNDERGROUND ELECTRICITY (TO BE RELOCATED BY RIC)
- S&C ——.....SIGNAL & COMMUNICATION CABLING (TO BE RELOCATED BY RIC)
- ——/——.....EXISTING FENCE LINE
- B1 ⊕ .....DENOTES APPROXIMATE BORE HOLE LOCATIONS

NOTES

GENERAL

SCALE 1:125 UNLESS NOTED OTHERWISE.
DIMENSIONS ARE NOT TO BE SCALED FROM THE DRAWINGS.
DIMENSIONS ARE IN MILLIMETRES,
REDUCED LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD)
CHAINAGES AND REDUCED LEVELS ARE IN METRES.
E DENOTES EXPANSION END
F DENOTES FIXED END

× DENOTES THICKNESS INCLUDES 70mm NOM. THICKNESS AC AND SPRAYED BITUMINOUS WATERPROOF MEMBRANE WITH 10mm COVER AGGREGATE.

DESIGN SPECIFICATION

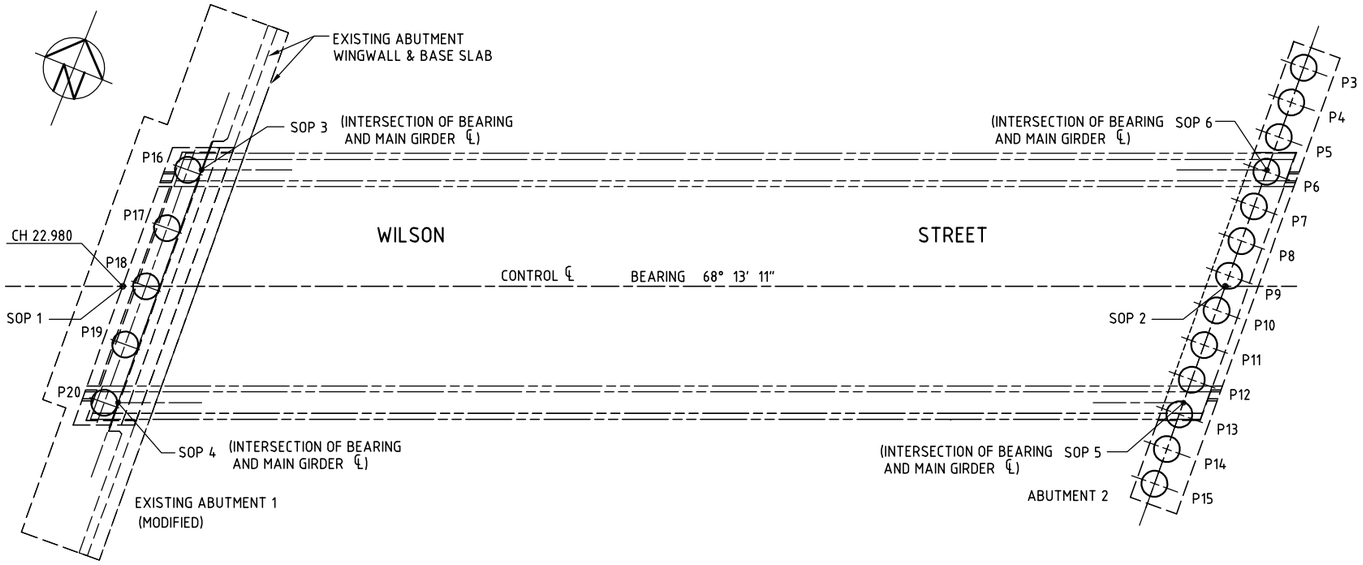
DESIGN LOADING: AUSTRALIAN BRIDGE DESIGN CODE 1996 T44 LOADING.
EARTHQUAKE ACCELERATION COEFFICIENT 0.08.

REFERENCE

PILE SETOUT DETAILS.....PRL-G2-99252
WILSON STREET LONGITUDINAL SECTION.....PRL-G2-99283

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214640

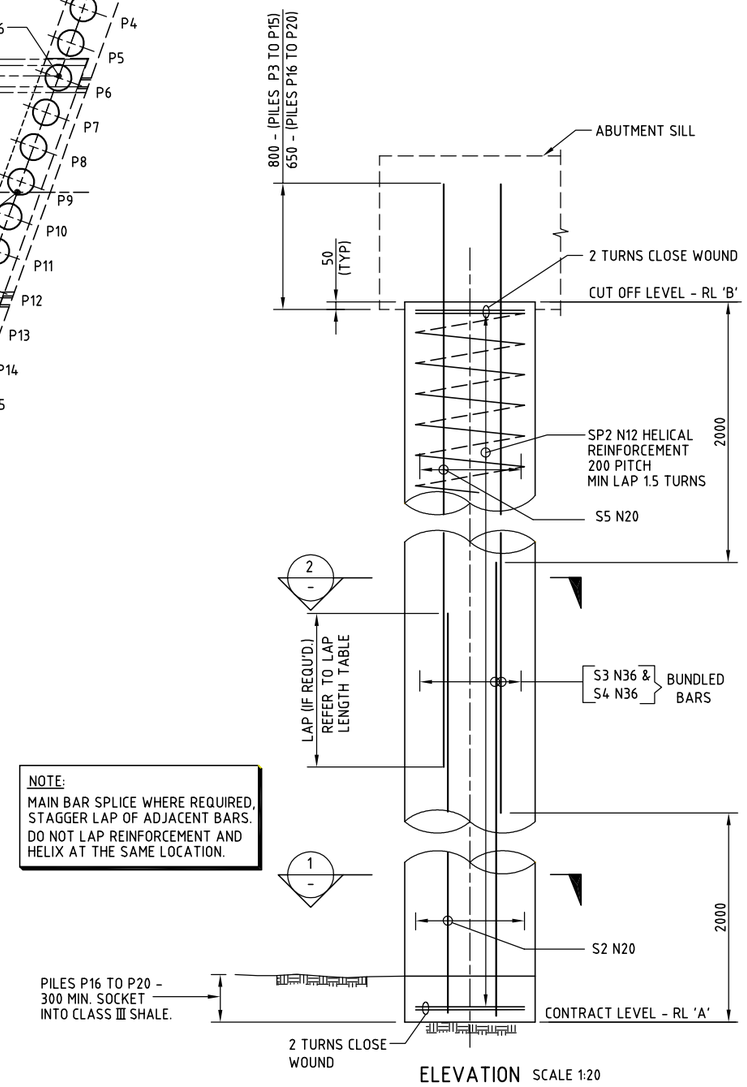


PLAN
SCALE 1:100

PILE SCHEDULE & DECK SET-OUT							
LOCATION	PILE No.	POINT	CO-ORDINATES		CUT OFF LEVEL RL 'B' (m)	CONTRACT LEVEL - RL 'A' (m)	
			EASTING	NORTHING		CONTRACT	ACTUAL
DECK SETOUT		SOP 1	331569.543	6259360.630	-	-	-
		SOP 2	331602.913	6259373.964	-	-	-
		SOP 3	331570.519	6259365.105	-	-	-
		SOP 4	331570.805	6259357.050	-	-	-
		SOP 5	331603.056	6259369.937	-	-	-
		SOP 6	331602.770	6259377.991	-	-	-
EXISTING ABUTMENT 1 (MODIFIED)	P1		NOT USED				
	P2		NOT USED				
	P16		331570.105	6259364.939	105.715	96.300	96.300
	P17		331570.177	6259362.926	105.735	96.300	96.300
	P18		331570.248	6259360.912	105.755	96.300	96.300
	P19		331570.320	6259358.899	105.775	96.300	96.300
	P20		331570.391	6259356.885	105.795	96.300	96.300
ABUTMENT 2	P 3		331602.644	6259381.526	104.375	94.500	94.500
	P 4		331602.686	6259380.327	104.395	94.500	94.500
	P 5		331602.729	6259379.127	104.410	94.500	94.500
	P 6		331602.772	6259377.928	104.425	94.500	94.500
	P 7		331602.814	6259376.729	104.440	94.500	94.500
	P 8		331602.857	6259375.530	104.460	94.500	94.500
	P 9		331602.899	6259374.330	104.475	94.500	94.500
	P10		331602.942	6259373.131	104.490	94.500	94.500
	P11		331602.984	6259371.932	104.510	94.500	94.500
	P12		331603.027	6259370.733	104.525	94.500	94.500
	P13		331603.069	6259369.533	104.540	94.500	94.500
	P14		331603.112	6259368.334	104.555	94.500	94.500
	P15		331603.154	6259367.135	104.575	94.500	94.500

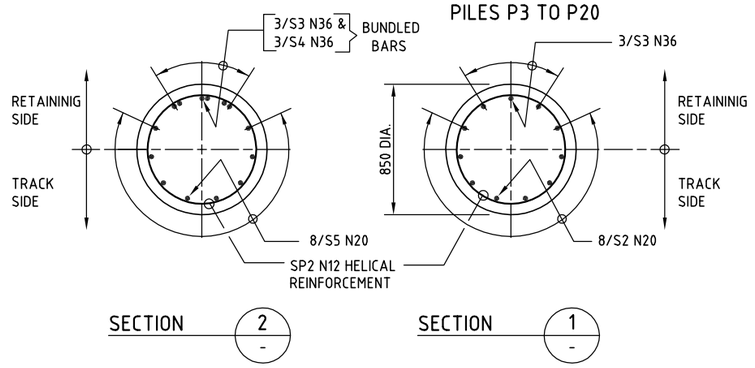
NOTE:
PILES TO BE CONSTRUCTED WITH A MAXIMUM OUT OF VERTICALITY TOLERANCE OF 1%

Scales
0 2 4
2 1 (1:100 BEFORE REDUCTION)
SCALE IN METRES
0 400 800mm
400 200 (1:20 BEFORE REDUCTION)
SCALE IN MILLIMETRES
(AT A1 SHEET SIZE)



NOTE:
MAIN BAR SPLICE WHERE REQUIRED, STAGGER LAP OF ADJACENT BARS. DO NOT LAP REINFORCEMENT AND HELIX AT THE SAME LOCATION.

ELEVATION SCALE 1:20
PILES P3 TO P20



NOTES

GENERAL
REFER DRG. No. PRL-G2-99251

PILES
1. PILES ARE DESIGNED IN ACCORDANCE WITH AS 2159-1995 AND THE AUSTRALIAN BRIDGE DESIGN CODE-1996.
2. THE PILES SHALL BE BORED CAST-IN-PLACE REINFORCED CONCRETE PILES (WITHOUT PERMANENT CASING), DERIVING LOAD CAPACITY FROM END BEARING, LATERAL RESISTANCE AND SHAFT FRICTION.
3. GEOTECHNICAL INFORMATION REFERRED TO IN THE SPECIFICATION MUST BE STUDIED BY THE CONTRACTOR TO APPRECIATE POTENTIAL CONSTRUCTION DIFFICULTIES.
4. FOUNDING MATERIAL DESIGN PARAMETERS ARE IN ACCORDANCE WITH THE INTERPETIVE GEOTECHNICAL REPORT BY GOLDER ASSOCIATES PTY LTD FROM MARCH 2003.
5. CONTRACT LEVELS SHALL BE CONFIRMED ON SITE BY A GEOTECHNICAL ENGINEER.
6. THE CONTRACTOR SHALL SUBMIT ALL THE RELEVANT PILING DETAILS TO THE PRINCIPAL IN ACCORDANCE WITH THE SPECIFICATIONS.

PILE CONSTRUCTION
1. PILES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATION.
2. SOCKET ROUGHNESS CATEGORY TO BE R2 OR BETTER CORRESPONDING TO GROOVES OF DEPTH 1 - 4mm AND WIDTH GREATER THAN 2mm AT SPACING OF 50mm TO 200mm.
3. MINIMUM CLEARANCE TO PILE RIG SHALL BE 3.7m HORIZONTALLY FROM CENTRELINE OF ADJACENT TRACK. CONTRACTOR MUST SUBMIT WITH TENDER A LETTER INDICATING WHETHER PILES CAN BE CONSTRUCTED WITHOUT INFRINGING THIS DISTANCE. THE CONTRACTOR SHALL REFER TO SPECIAL CONDITIONS OF CONTRACT AND OBTAIN ALL NECESSARY APPROVALS FROM THE PRINCIPAL'S REPRESENTATIVE.
4. THE CONTRACTOR MUST SUBMIT COMPLETE DETAILS OF PILING RIG AND CLEARANCES TO THE PRINCIPAL TWO (2) WEEKS PRIOR TO COMMENCEMENT OF THE PILING SO THAT THE PRINCIPAL CAN DETERMINE THE TYPE OF TRACK PROTECTION NECESSARY FOR THIS WORK.

TESTING OF PILE
1. TESTING OF PILES SHALL BE IN ACCORDANCE WITH THE SPECIFICATION.

CONCRETE
1. ALL CONCRETE WORK SHALL COMPLY WITH THE SPECIFICATION.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH f'c = 40 MPa.
3. EXPOSURE CLASSIFICATION = B1.
4. SHOTCRETE LINING SHALL BE APPLIED TO THE EXPOSED FACE OF THE PILES REFER UPSIDE OUTER PILE RETAINING WALL DRAWINGS FOR TYPICAL DETAILS.

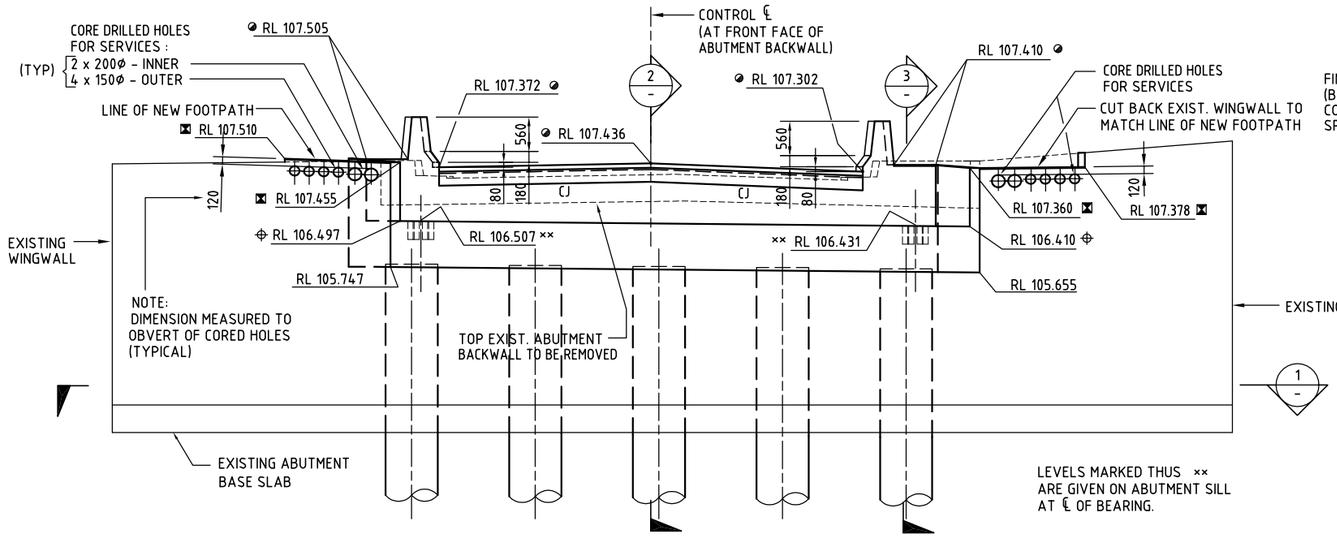
REINFORCEMENT
1. ALL REINFORCEMENT BARS SHALL BE IN ACCORDANCE WITH AS/NZS 4671:2001 WHERE ALL BARS ARE GRADE 500 DEFORMED RIBBED BAR UNO.
2. DESIGNATION OF REINFORCING BARS : 10/S1 N24-200 EF
   - No. OF BARS
   - BAR SHAPE NOTATION
   - DUCTILITY CLASS AND DIA
   - SPACING OF BARS
   - LOCATION COMMENT
3. CLEAR COVER TO PILE REINFORCEMENT SHALL BE 75mm
4. COGS AND HOOKS SHALL BE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE 1996.
5. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR AS APPROVED IN WRITING BY THE PRINCIPAL'S REPRESENTATIVE.
6. BAR SHAPES SHALL BE IN ACCORDANCE WITH AS/NZS 1100.501:2002.
7. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT :
   - EW - EACH WAY
   - EF - EACH FACE
   - NF - NEAR FACE
   - FF - FAR FACE
   - T - TOP FACE
   - B - BOTTOM FACE
   - C - CENTRALLY PLACED
8. BAR LAPS SHALL BE AS FOLLOWS UNO;

BAR SIZE	LAPS (mm)	BAR SIZE	LAPS (mm)
N12	400	N28	1000
N16	500	N32	1300
N20	650	N36	1500
N24	750	N40	1700

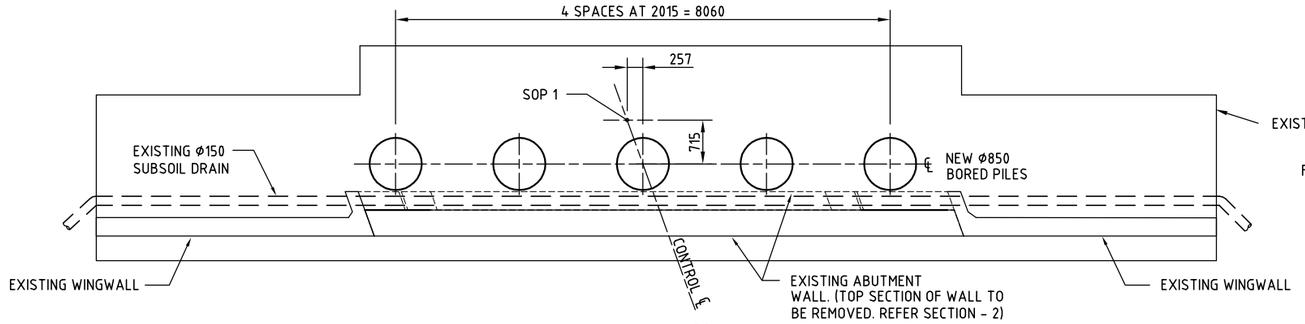
REFERENCE
GENERAL ARRANGEMENT . . . PRL-G2-99251

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

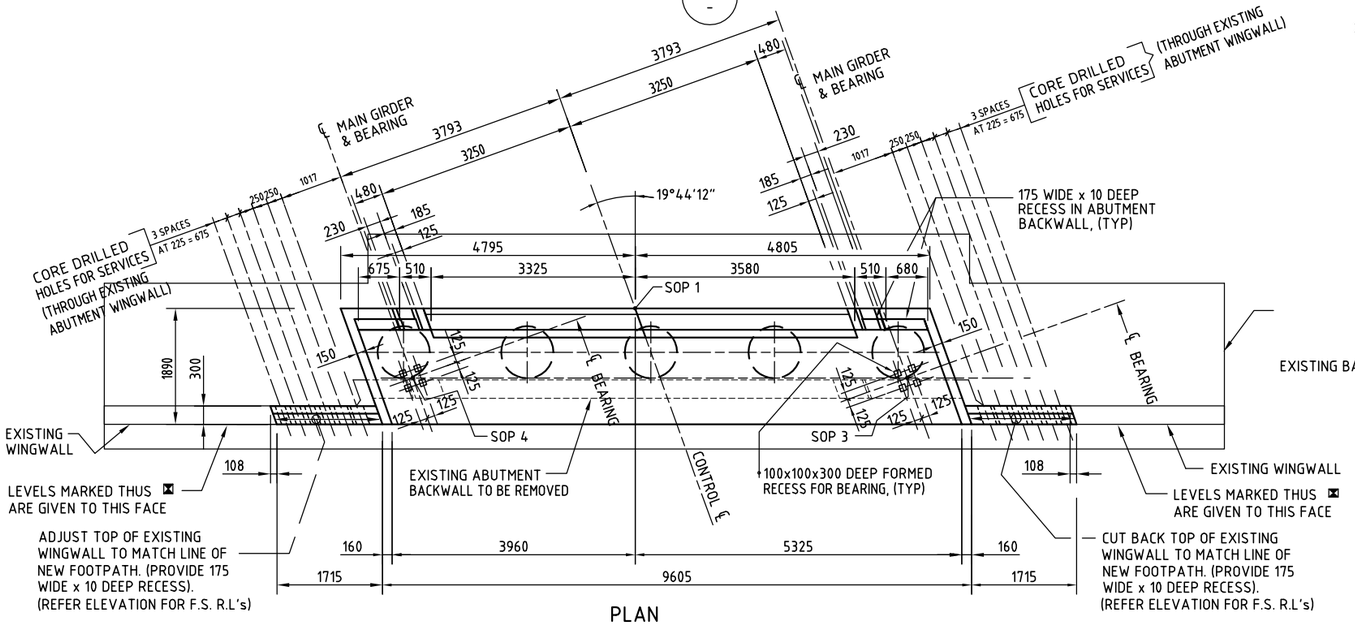
RIC/SRA EDMS ID CV0214641



ELEVATION

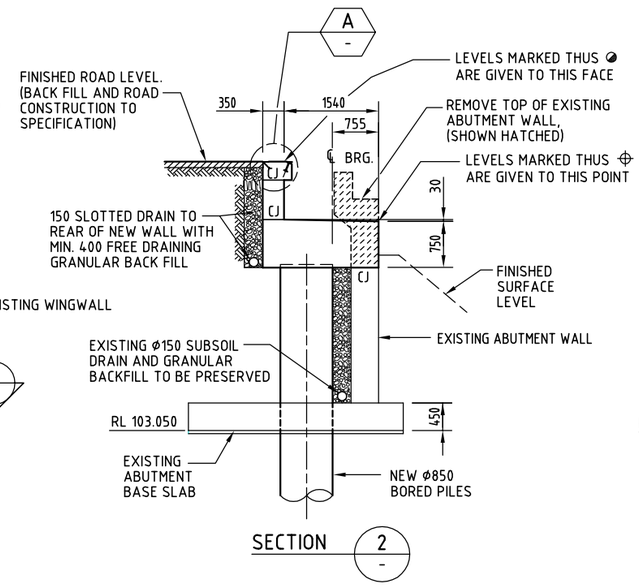


PLAN SECTION 1

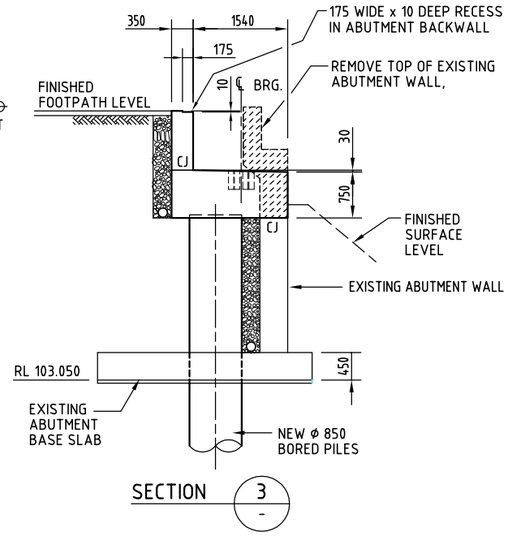


PLAN

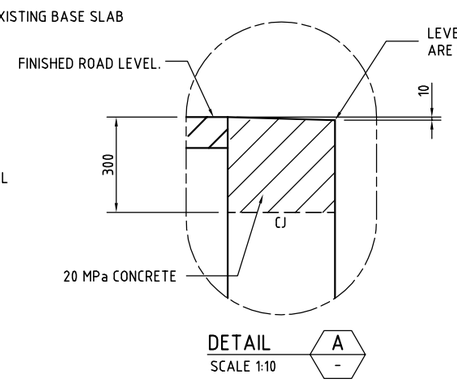
Scales
0 200 400mm
200 (1:10 BEFORE REDUCTION)
0 1 2
1 (1:50 BEFORE REDUCTION)
SCALE IN METRES (U.N.O.)
(AT A1 SHEET SIZE)



SECTION 2



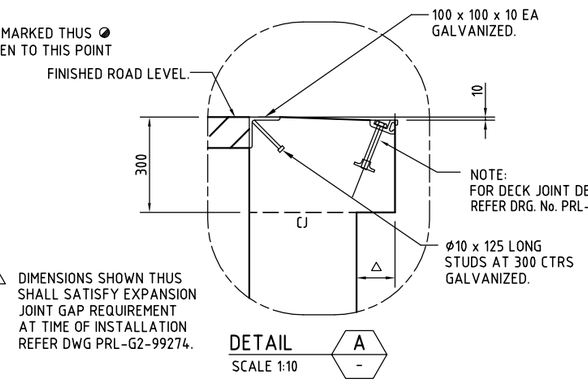
SECTION 3



DETAIL A
SCALE 1:10

(SHOWING TEMPORARY ABUTMENT BACKWALL OUTLINE)

NOTE: PRIOR TO INSTALLATION OF EXPANSION JOINT DEMOLISH PART OF BACKWALL ABOVE C.J. AND REBUILD TO SUIT EXPANSION REQUIREMENTS.



DETAIL A
SCALE 1:10

(SHOWING FINAL ABUTMENT BACKWALL OUTLINE)

NOTE: PLAN AND ELEVATION DRAWN FOR FINAL ABUTMENT BACKWALL OUTLINE)

NOTE:
WHERE NEW CONCRETE IS PLACED IN CONTACT WITH EXISTING CONCRETE SURFACES SHALL BE SCABBLED FREE OF DIRT AND DUST AND TREATED AS CJ

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

NOTES

GENERAL

SCALE 1:50 UNLESS NOTED OTHERWISE.
DIMENSIONS ARE NOT TO BE SCALED FROM THE DRAWINGS.
DIMENSIONS ARE IN MILLIMETRES,
CHAINAGES AND REDUCED LEVELS ARE IN METRES.
CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF ALL CONCRETE SHALL BE 40MPa.
EDGES SHALL BE CHAMFERED 20x20 AND RE-ENTRANT ANGLES FILLETED 20x20 UNLESS SPECIFIED OTHERWISE.

REFERENCE

GENERAL ARRANGEMENT.....PRL-G2-99251
PILE SETOUT AND DETAILS...PRL-G2-99252
ABUTMENT 1-REINFORCEMENT..PRL-G2-99256
DECK JOINT DETAILS.....PRL-G2-99274

RIC/SRA EDMS ID CV0214642

NOTES

GENERAL

REFER DRAWING No. PRL-G2-99255

REINFORCEMENT

REFER DRAWING No. PRL-G2-99258

N.S.O.E. DENOTES REINFORCEMENT NOT SHOWN ON ELEVATION FOR CLARITY.

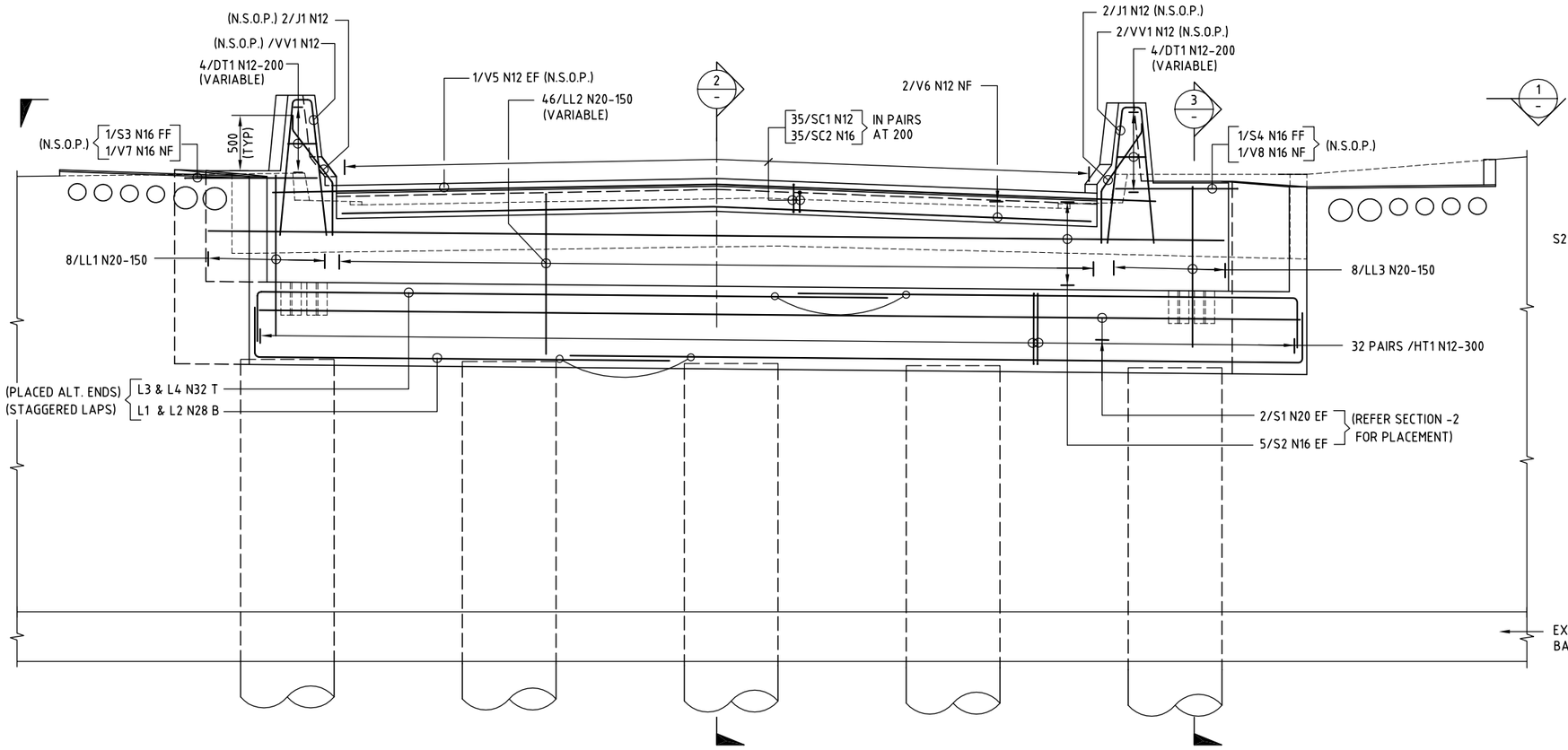
N.S.O.P. DENOTES REINFORCEMENT NOT SHOWN ON PLAN FOR CLARITY.

REFERENCE

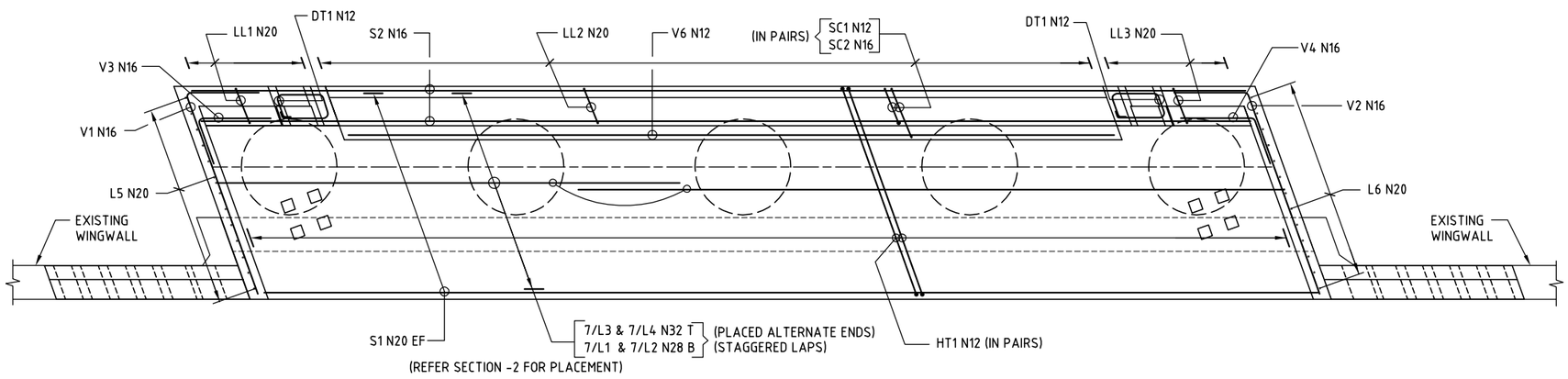
GENERAL ARRANGEMENT.....PRL-G2-99251

PILE SETOUT AND DETAILS...PRL-G2-99252

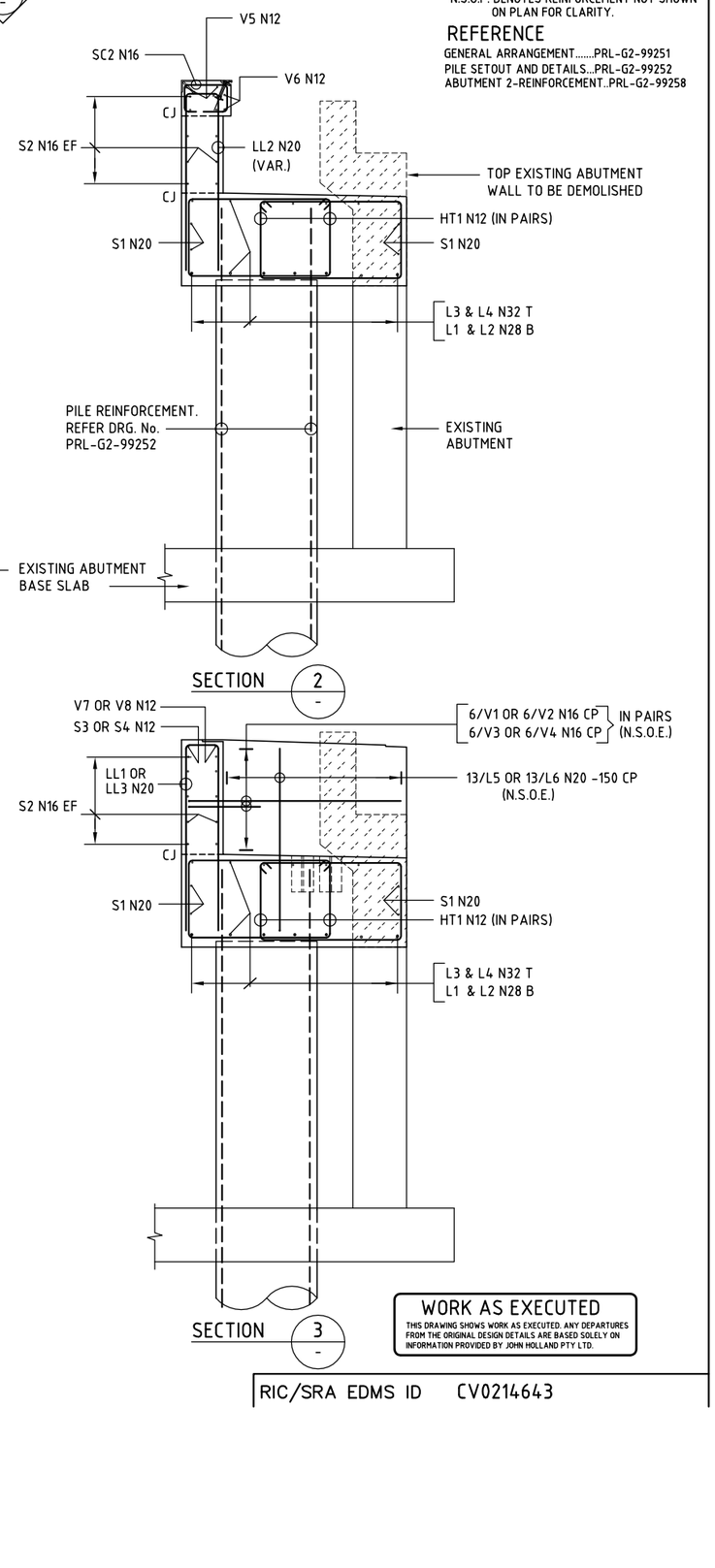
ABUTMENT 2-REINFORCEMENT..PRL-G2-99258



ELEVATION



PLAN SECTION 1 -



SECTION 2 -

SECTION 3 -

Scales

0 0.5 1

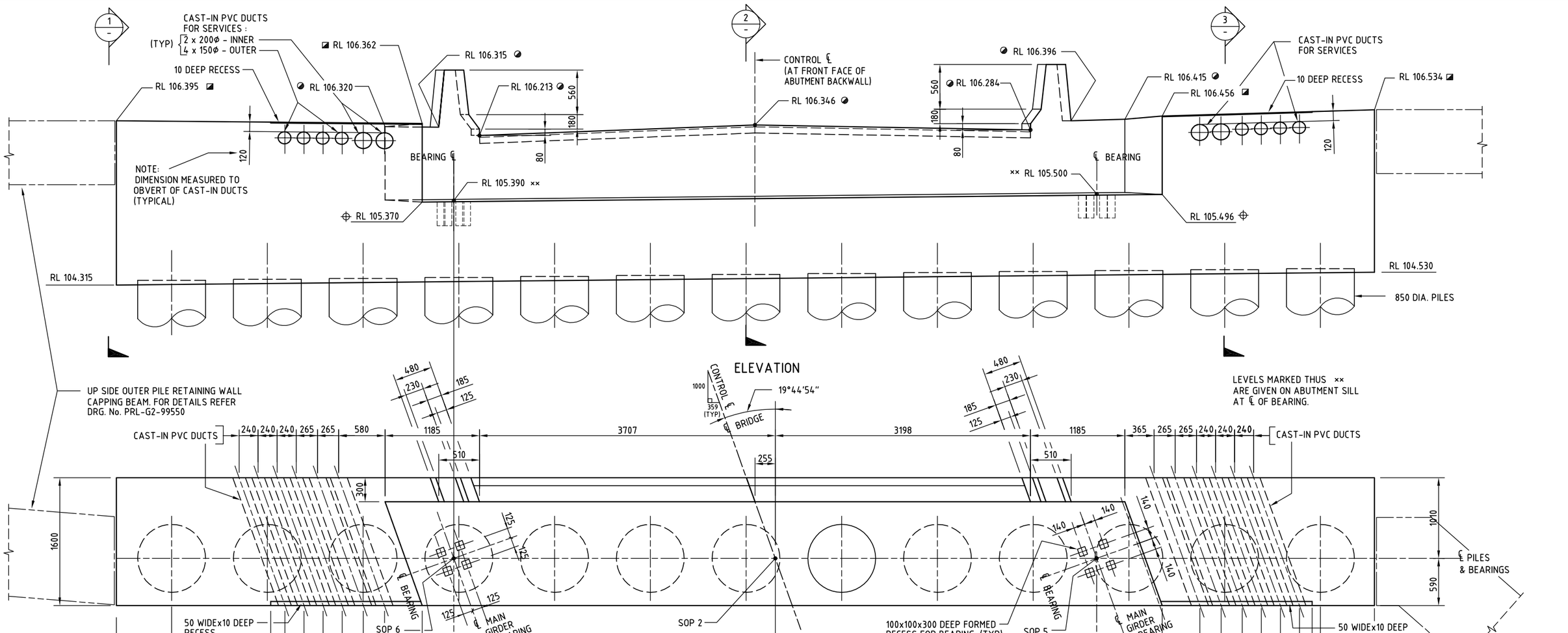
0.5

SCALE IN METRES (1:25 BEFORE REDUCTION) (AT A1 SHEET SIZE)

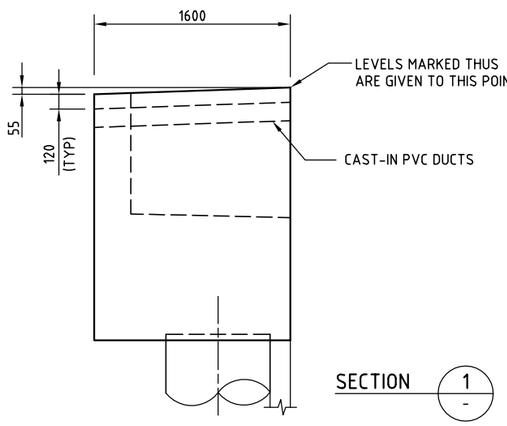
WORK AS EXECUTED

THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

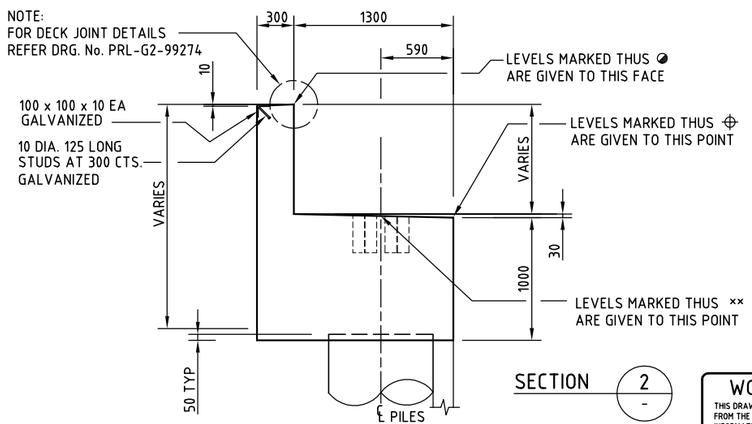
RIC/SRA EDMS ID CV0214643



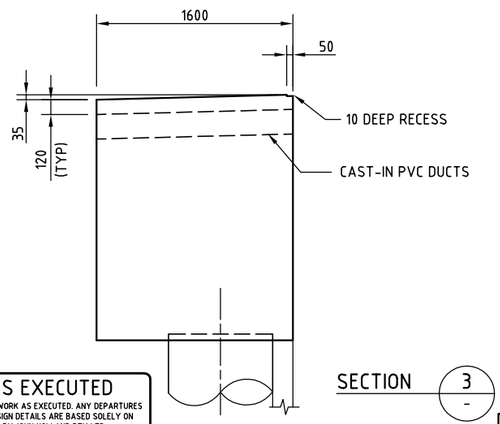
PLAN



SECTION 1 -



SECTION 2 -



SECTION 3 -

NOTES

GENERAL

SCALE 1:25 UNLESS NOTED OTHERWISE.
DIMENSIONS ARE NOT TO BE SCALED FROM THE DRAWINGS.
DIMENSIONS ARE IN MILLIMETRES,
CHAINAGES AND REDUCED LEVELS ARE IN METRES.
CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF ALL CONCRETE SHALL BE 40MPa.
EDGES SHALL BE CHAMFERED 20x20 AND RE-ENTRANT ANGLES FILLETED 20x20 UNLESS SPECIFIED OTHERWISE.

REFERENCE

GENERAL ARRANGEMENT.....PRL-G2-99251
PILE SETOUT AND DETAILS...PRL-G2-99252
ABUTMENT 2-REINFORCEMENT..PRL-G2-99258

WORK AS EXECUTED

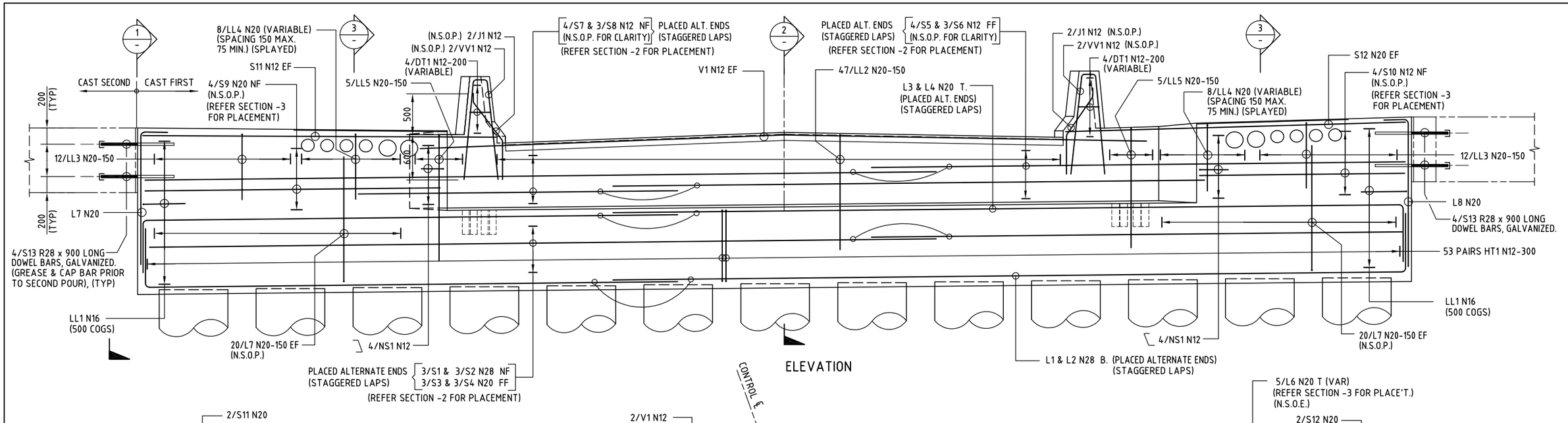
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

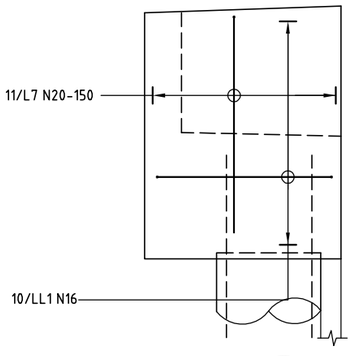
Scales

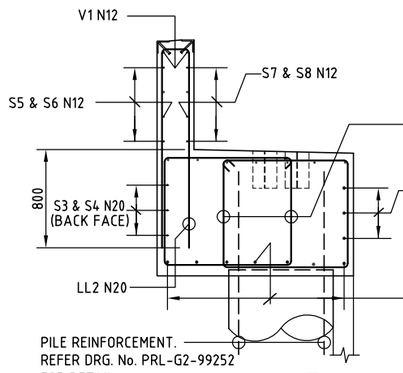
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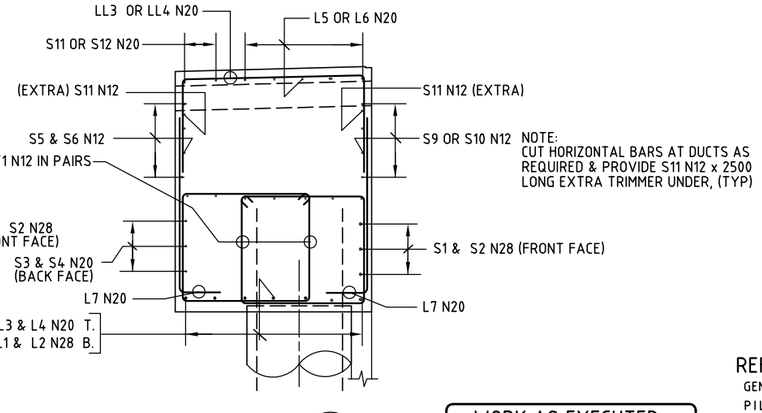
SCALE IN METRES
(1:25 BEFORE REDUCTION)
(AT A1 SHEET SIZE)

RIC/SRA EDMS ID CV0214644









NOTE:
REINFORCEMENT TO BE LOCALLY DISPLACED TO AVOID FORMED HOLES & CAST-IN DUCTS.

NOTE:
PILE REINFORCEMENT NOT SHOWN IN PLAN FOR CLARITY

REFERENCE

GENERAL ARRANGEMENT.....PRL-G2-99251
PILE SETOUT AND DETAILS...PRL-G2-99252
ABUTMENT 2-CONCRETET.....PRL-G2-99257

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

Scales
0 0.5 1
0.5
SCALE IN METRES
(1:25 BEFORE REDUCTION)
(AT A1 SHEET SIZE)

NOTES

GENERAL

REFER DRG. No. PRL-G2-99257

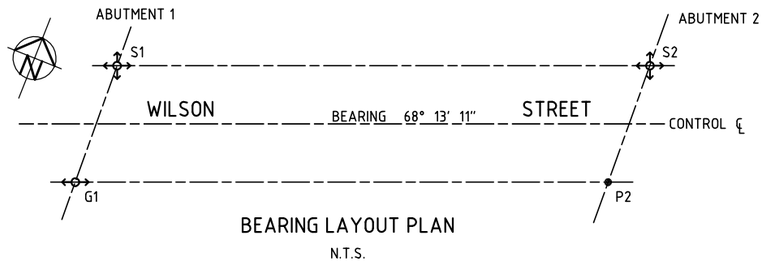
REINFORCEMENT

1. ALL REINFORCEMENT BARS SHALL BE IN ACCORDANCE WITH AS/NZS 4671:2001 WHERE ALL BARS ARE GRADE 500 DEFORMED RIBBED BARS UNO.
2. DESIGNATION OF REINFORCING BARS : 10/S1 N24-200 EF
   - No OF BARS
   - BAR SHAPE NOTATION
   - DUCTILITY CLASS AND DIA
   - SPACING OF BARS
   - LOCATION COMMENT
3. CLEAR COVER TO REINFORCEMENT SHALL BE 40mm.
4. COGS AND HOOKS SHALL BE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE 1996.
5. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR AS APPROVED IN WRITING BY THE PRINCIPAL.
6. BAR SHAPES SHALL BE IN ACCORDANCE WITH AS 1100.501-2002.
7. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT :
   EW - EACH WAY; EF - EACH FACE; NF - NEAR FACE; FF - FAR FACE; T - TOP; B - BOTTOM; CP - CENTRALLY PLACED; N.S.O.P. - DENOTES NOT SHOWN ON PLAN; N.S.O.E. - DENOTES NOT SHOWN ON ELEVATION
8. BAR LAPS SHALL BE AS FOLLOWS :

BAR SIZE	LAPS (mm)	BAR SIZE	LAPS (mm)
N12	400	N20	650
N16	500	N24	750

VALUES IN THE TABLE TO BE MULTIPLIED BY 1.25 FOR HORIZONTAL BARS WITH MORE THAN 300mm OF CONCRETE CAST BELOW THE BAR.

RIC/SRA EDMS ID CV0214645



BEARING LAYOUT PLAN

N.T.S.

NOTE:
GRANOR RUBBER & ENG P/L SUPPLIED THE BEARINGS PERFORMANCE:
S1 - GPFF (10) - 2500 -20/75 (OFF SET)
S2 - GPFF (10) - 2500 -25/25 (OFF SET)
G1 - GPFF (10) - 2500 - 0/75 (OFF SET)
P2 - GPFX (25) - 2500 - 0/0 (OFF SET)

NOTES

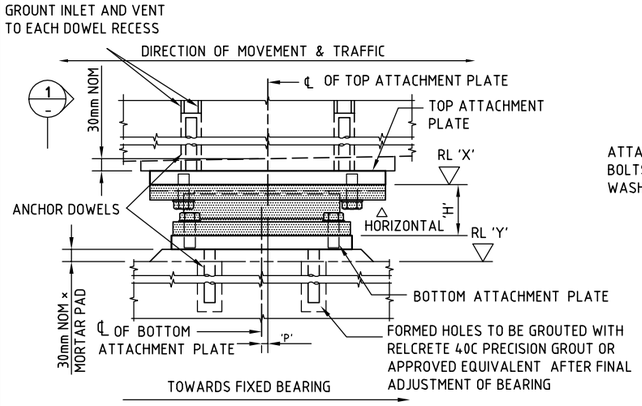
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF MORTAR AND GROUT SHALL BE 50 MPa.
MORTAR SHALL BE DRY PACKED

DENOTES PROPRIETARY BEARING.

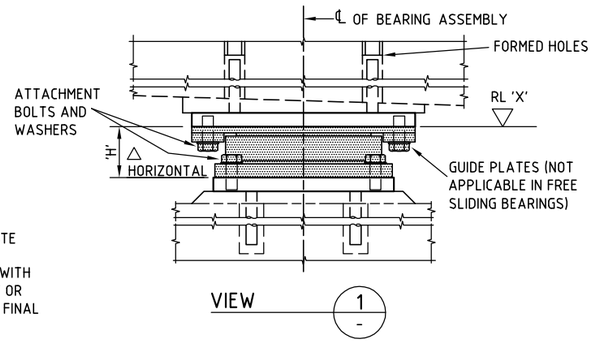
BEARING NOTES
TYPICAL POT-TYPE BEARING AND ASSOCIATED ATTACHMENT PLATES ARE DETAILED ON THE BEARING DRAWINGS.
POT-TYPE BEARINGS OF ANY MANUFACTURER WILL BE CONSIDERED PROVIDED:
a) THE PERFORMANCE REQUIREMENTS IN TABLE ARE SATISFIED.
b) ANY VARIATIONS OF THE PHYSICAL DIMENSIONS OF THE BEARINGS AND ATTACHMENT PLATES FROM THOSE SHOWN ON THE DRAWINGS CAN BE ACCOMMODATED WITHIN THE STRUCTURE.

THE ACTUAL HEIGHT OF THE BEARINGS SHALL BE ASCERTAINED FROM THE BEARING MANUFACTURER BEFORE CONSTRUCTION OF THE ABUTMENTS
THE REDUCED LEVEL AT THE TOP OF THE ABUTMENTS SHALL BE ADJUSTED TO SUIT THE ACTUAL BEARING HEIGHTS WHERE REQUIRED
ALL SURFACES (EXCEPT STAINLESS STEEL SLIDING SURFACES) OF THE BEARINGS SHALL BE GIVEN A PROTECTIVE TREATMENT OF AN INORGANIC ZINC SILICATE PRIMER AND TWO COATS OF CHLORINATED RUBBER FINISHING PAINT
THE TOP SLIDING PLATE SHALL BE OFFSET FROM THE BEARING BASE BY THE VALUES FOR PRESET "P" GIVEN IN TABLE 1 FOR A BRIDGE TEMPERATURE OF 20°C. THE DIRECTION OF PRESET IS SHOWN IN ELEVATION. "P" IS +VE TOWARDS THE FIXED BEARING (P2)
BEARING ASSEMBLIES SHALL BE HELD TOGETHER WITH TRANSIT BOLTS TO PREVENT MISALIGNMENT AND DAMAGE TO THE COMPONENT DURING TRANSIT AND ERECTION. THE TRANSIT BOLTS SHOULD BE REMOVED UNTIL AFTER INSTALLATION.
THE PTFE/STAINLESS STEEL INTERFACE OF ALL BEARINGS SHALL BE PERMANENTLY LUBRICATED AFTER TESTING.
STEEL PLATE GRADE 350 TO AS3678
DOWELS GRADE 350 TO AS367
WELDING SP TO AS1554 PT 1.
WELDING SYMBOLS TO AS 1101 PT3.

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.



ELEVATION

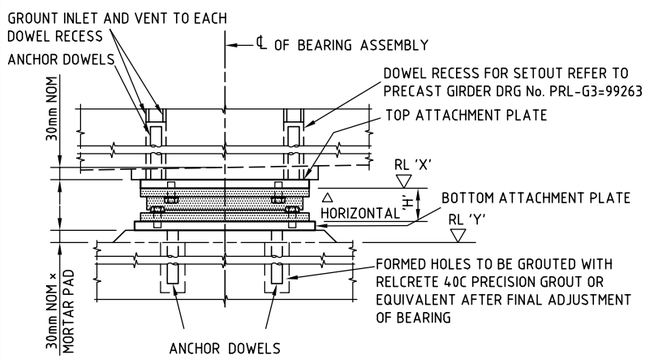


VIEW 1/-

FREE SLIDING & GUIDED SLIDING BEARINGS

GUIDED SLIDING BEARING SHOWN, FREE SLIDING BEARING SIMILAR (AS NOTED)

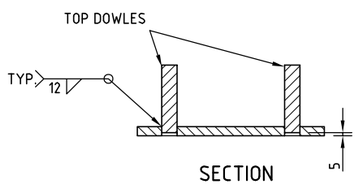
N.T.S.



ELEVATION
FIXED BEARING

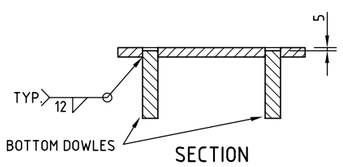
N.T.S.

× THICKNESS OF TOP AND BOTTOM MORTAT GROUT PADS MAY BE VARIED BETWEEN 10mm AND 50mm TO SUIT ACTUAL BEARING HEIGHT

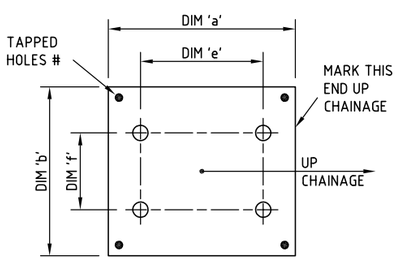


SECTION

POSITION OF TAPPED HOLES FOR ATTACHMENT OF PLATE TO BEARING TO BE DETERMINED BY THE BEARING MANAFACTURER

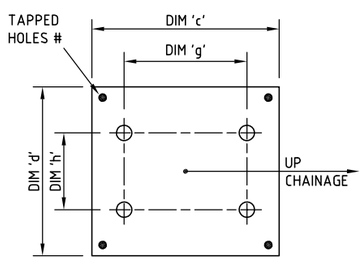


SECTION



PLAN
TOP ATTACHMENT PLATE

SCALE 1:10



PLAN
BOTTOM ATTACHMENT PLATE

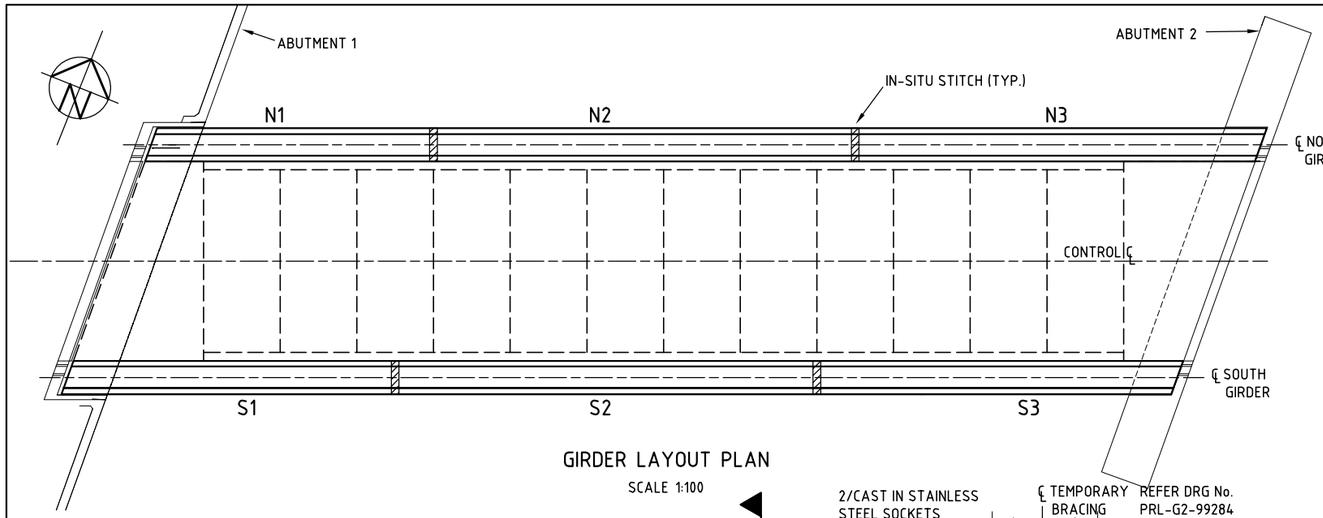
SCALE 1:10

TABLE 1 - BEARING SCHEDULE

Bearing Identification mark				G1	S1	P2	S2
Type (Refer to Granor Pot-Type Bearing Catalogue)				GPGS-2500	GPFF-2500	GPFX-3500	GPFF-2500
Number off				1	1	1	1
Design Load effects (kN)	SLS	Vertical	max	2500	2500	2500	2500
			permanent	1700	1700	1700	1700
			min	1500	1500	1500	1500
		Transverse		250	-	250	-
		Longitudinal		-	-	570	-
	ULS	Vertical		3500	3500	3500	3500
		Transverse		380	-	380	-
		Longitudinal		-	-	830	-
Translation (mm)	ULS	Preset P	Transverse	0	0	0	0
			Long	+25	+25	0	0
		Movement	Transverse	0	10	0	10
			Longitudinal	±75	±75	0	10
Rotation (rad)	SLS			0.005	0.005	0.005	0.005
	Nominal Bearing Height 'H' (mm)			151	148	118	148
Top Attachment Plate		Thickness (mm)		28	25	28	25
		dim 'a' (mm)		610	580	610	530
		dim 'b' (mm)		550	530	450	530
	Dowels	dim 'e' (mm)		400	370	400	320
		dim 'f' (mm)		250	320	330	320
		Dowel Size (mm)		50	50	50	50
		Dowel Length (mm)		220	220	220	220
Bottom Attachment Plate		Thickness (mm)		28	28	28	28
		dim 'c' (mm)		460	460	490	460
		dim 'd' (mm)		460	460	490	460
	Dowels	dim 'g' (mm)		250	250	280	250
		dim 'h' (mm)		250	250	280	250
		Dowel Size (mm)		50	50	50	50
		Dowel Length (mm)		220	220	220	220
RL 'X'				106.716	106.639	105.676	105.596
RL 'Y'				106.507	106.433	105.500	105.390

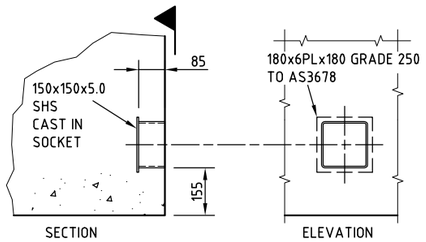
RIC/SRA EDMS ID CV0214646

Scales
0 200 400mm
200 100
(1:10 BEFORE REDUCTION)
SCALE IN METRES U.N.O. (AT A1 SHEET SIZE)



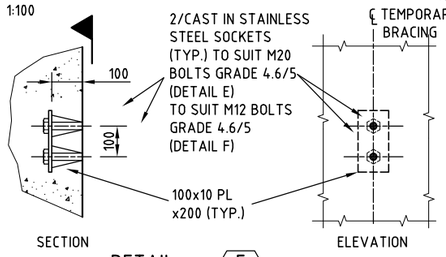
GIRDER LAYOUT PLAN

SCALE 1:100



DETAIL A (-)
SCALE 1:10

(SHOWING CAST-IN SOCKET FOR DECK PLANK SUPPORT)



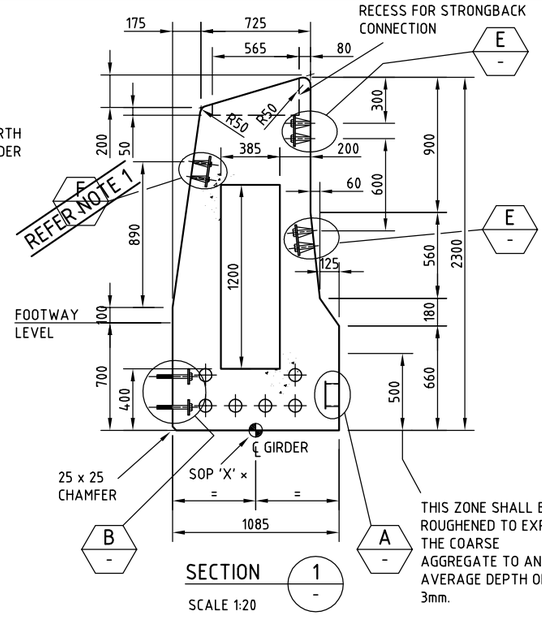
DETAIL E (-)
SCALE 1:10

(SHOWING TEMPORARY BRACING ATTACHMENT ARRANGEMENT)

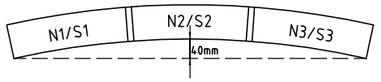
DETAIL F (-)
SCALE 1:10

REFER NOTE 1

(SHOWING CAST-IN SOCKETS FOR HANDRAIL CONNECTION)



SECTION 1 (-)
SCALE 1:20



PRECAMBER DIAGRAM

N.T.S.

GIRDER SEGMENTS TO BE CAST SUCH THAT PRECAMBER OF 40mm IS ACHIEVED. THE SOFFIT OF THE GIRDER SHOULD BE PARABOLIC

NOTES

POST TENSIONING

REFER DRG. No. PRL-G2-99264

CONCRETE

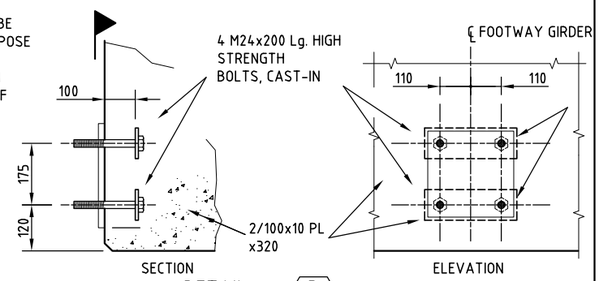
CONCRETE EXPOSURE CLASSIFICATION B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF PRECAST CONCRETE GIRDERS SEGMENTS SHALL BE 50 MPa.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF IN-SITU CONCRETE STITCH SHALL BE 50 MPa.

STEELWORK

HIGH TENSILE BARS SHALL BE VSL CT STRESSBARS OR EQUIVALENT IN ACCORDANCE WITH AS1313 & AS1314 INCLUDING NUTS, WASHERS, DUCTS AND OTHER FITTINGS PROVIDED BY THE HT BAR SUPPLIER. FITTINGS SHALL BE GALVANISED.
STEEL PLATE SHALL BE GRADE 350 TO AS3678 UNLESS NOTED OTHERWISE
SHS SECTIONS SHALL BE GRADE C250 TO AS1163
THE WELD CATERGORY SHALL BE GP IN ACCORDANCE WITH AS1554 PT 1.
WELDING SYMBOLS ARE TO AS1101 PT 3.
EDGES TO BE PROTECTIVE TREATED SHALL BE ROUNDED TO A RADIUS OF 1.5mm
ALL STEEL COMPONENTS, EXCEPT HIGH TENSILE BARS SHALL BE GALVANISED AFTER FABRICATION.
HIGH STRENGTH BOLTS, NUTS, WASHERS SHALL BE TO AS1252 & GALVANISED IN ACCORDANCE WITH AS 1214

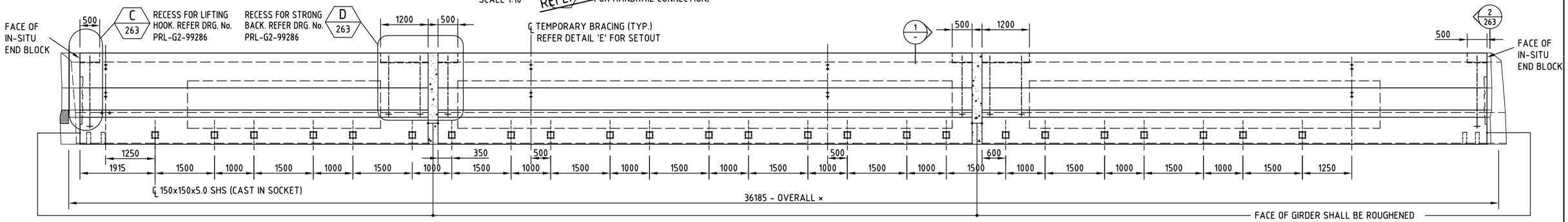
REFERENCE

GENERAL ARRANGEMENT	PRL-G2-99251
PRECAST POST-TENSIONED GIRDER SHT. 2 TO SHT. 6	PRL-G2-99263 TO 99267
TEMPORARY STEELWORK - SHEET 1 OF 2	PRL-G2-99284
TEMPORARY STEELWORK - SHEET 2 OF 2	PRL-G2-99286



DETAIL B (-)
SCALE 1:10

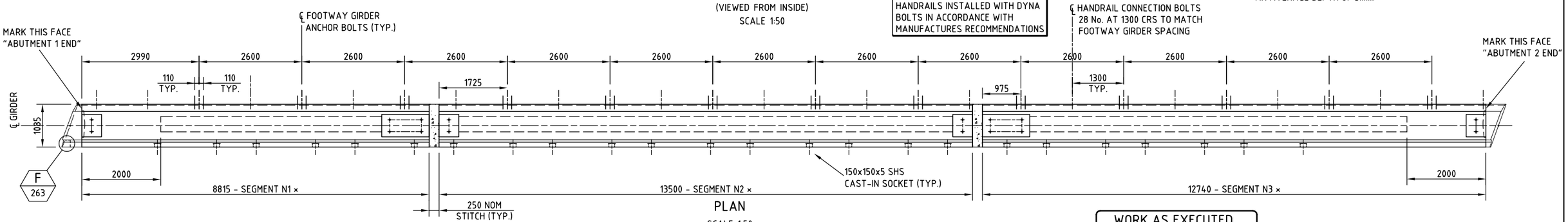
(SHOWING FOOTWAY GIRDER BOLT ARRANGEMENT)



ELEVATION

(VIEWED FROM INSIDE)
SCALE 1:50

NOTE 1:
HANDRAILS INSTALLED WITH DYNA BOLTS IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS



PLAN

SCALE 1:50

NORTH GIRDER

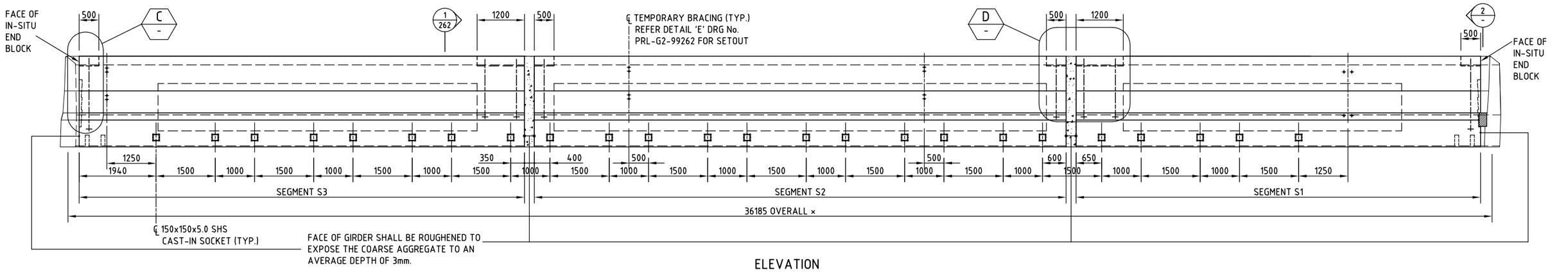
x DENOTES DIMENSIONS MEASURED ALONG ℄ OF GIRDER SOFFIT - REFER TO SECTION 1 (SOP 'X')

WORK AS EXECUTED

THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

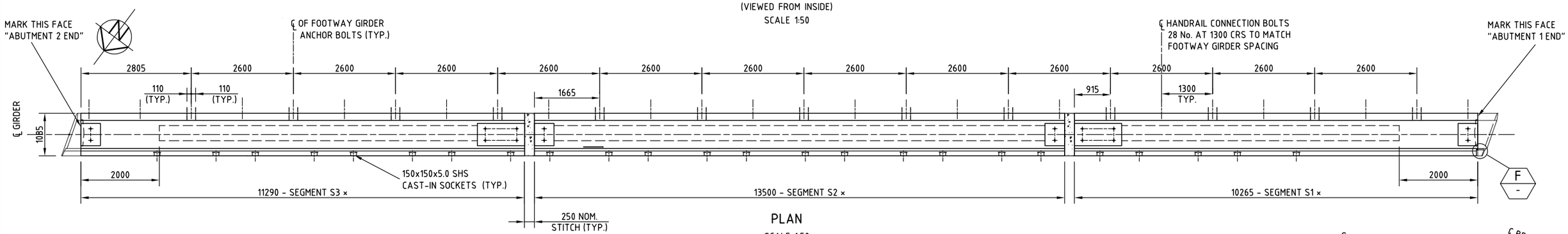
RIC/SRA EDMS ID CV0214647

Scales
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200 100 (1:20 BEFORE REDUCTION)
0 1 2
1 (1:50 BEFORE REDUCTION)
0 2 4
2 1 (1:100 BEFORE REDUCTION)
SCALE IN METRES(U.N.O.) (AT A1 SHEET SIZE)



ELEVATION

(VIEWED FROM INSIDE)
SCALE 1:50



PLAN

SCALE 1:50

SOUTH GIRDER

NOTES

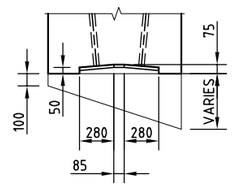
FOR NOTES REFER TO DRG PRL-G2-99262

REFERENCE

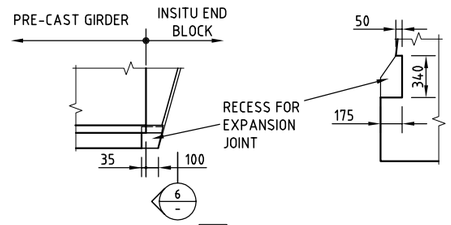
GENERAL ARRANGEMENT	PRL-G2-99251
PRECAST POST TENSIONED GIRDERS - SHT 1	PRL-G2-99262
PRECAST POST TENSIONED GIRDERS - SHT 4	PRL-G2-99265
PRECAST POST TENSIONED GIRDERS - SHT 6	PRL-G2-99267
TEMPORARY STEELWORK - SHEET 1 OF 2	PRL-G2-99284
TEMPORARY STEELWORK - SHEET 2 OF 2	PRL-G2-99286

× DENOTES DIMENSIONS MEASURED ALONG ℄ L OF GIRDER SOFFIT - REFER TO SECTION 1 (SOP 'X')

×× 100x100x300 RECESSES ARE FOR ATTACHING BEARING TOP PLATE TO U/SIDE OF GIRDER, (TOP PLATE DOWEL BARS TO BE GROUTED INTO RECESSSES & PROVIDE GROUT INLET AND VENT). ALTERNATIVELY THE TOP ATTACHMENT PLATE MAY BE CAST WITH THE GIRDER

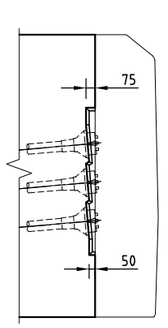


SECTION 3
SCALE 1:25

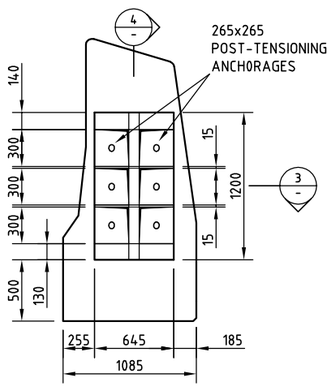


DETAIL F
SCALE 1:10

SECTION 6
SCALE 1:10



SECTION 4
SCALE 1:25

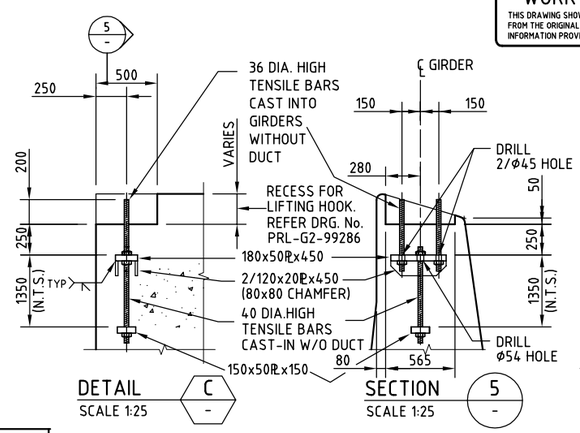


SECTION 2
SCALE 1:25

(SHOWING END BLOCK DETAIL)

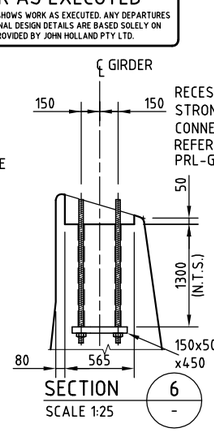
WORK AS EXECUTED

THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

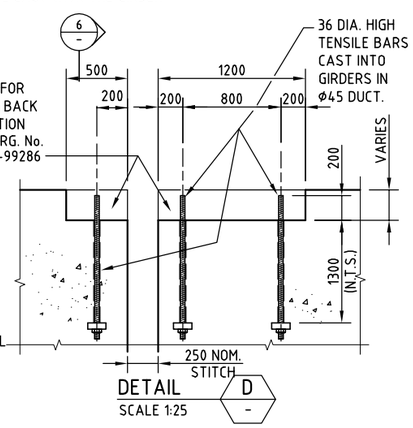


DETAIL C
SCALE 1:25

SECTION 5
SCALE 1:25

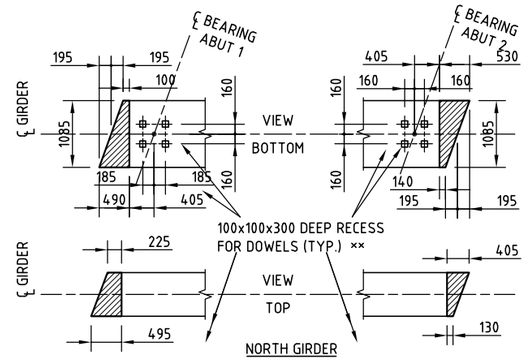


SECTION 6
SCALE 1:25



DETAIL D
SCALE 1:25

NOTE:
IN-SITU CONCRETE SHOWN HATCHED

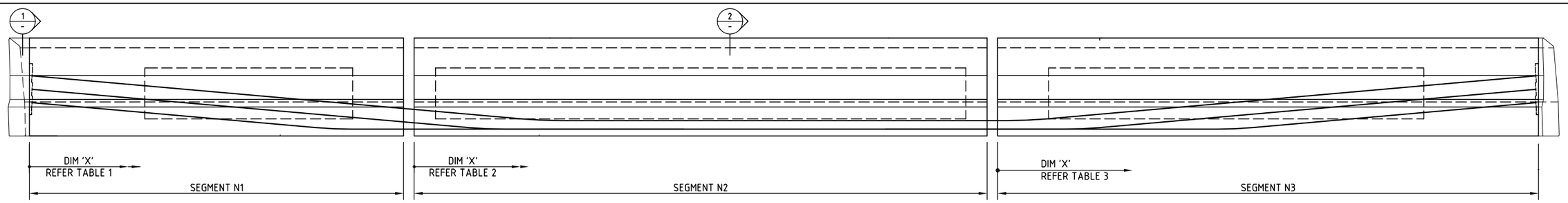


INSITU END BLOCK DIMENSIONS

SCALE 1:50

RIC/SRA EDMS ID CV0214648

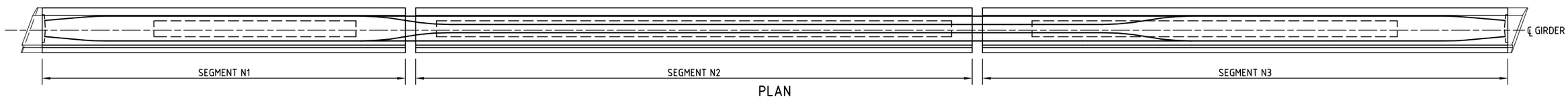
Scales
0 500 1000mm
500
(1:25 BEFORE REDUCTION)
0 1 2
1
(1:50 BEFORE REDUCTION)
SCALE IN METRES (U.N.O.)
(AT A1 SHEET SIZE)



ELEVATION

(VIEWED FROM INSIDE)

SCALE 1:50



PLAN

SCALE 1:50

SEGMENT N1		OVERALL LENGTH = 8815							
	'X'	0	650	1500	3000	4500	6000	7500	8815
T1	'Y'	395	338	308	285	285	285	285	285
	'Z'	1410	1353	1279	1149	1018	887	756	642
T2	'Y'	395	338	308	285	285	285	285	285
	'Z'	1095	1038	964	834	703	572	441	327
T3	'Y'	395	338	308	285	285	285	285	285
	'Z'	780	723	649	519	388	257	196	160
T4	'Y'	760	817	847	870	870	870	870	870
	'Z'	1410	1353	1279	1149	1018	887	756	642
T5	'Y'	760	817	847	870	870	870	870	870
	'Z'	1095	1038	964	834	703	572	441	327
T6	'Y'	760	817	847	870	870	870	870	870
	'Z'	780	723	649	519	388	257	196	160

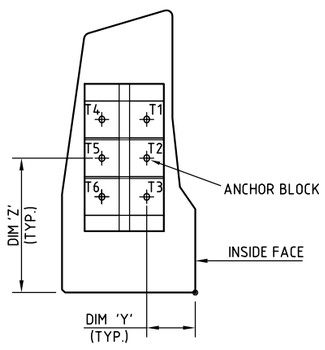
TENDON SETOUT TABLE 1

SEGMENT N2		OVERALL LENGTH = 13500					
	'X'	0	2700	5400	8100	10800	13500
T1	'Y'	285	285	285	285	285	285
	'Z'	620	394	360	360	360	360
T2	'Y'	285	285	285	285	285	285
	'Z'	305	160	160	160	160	160
T3	'Y'	285	480	480	480	480	480
	'Z'	160	160	160	160	160	160
T4	'Y'	870	870	870	870	870	870
	'Z'	620	394	360	360	360	360
T5	'Y'	870	870	870	870	870	870
	'Z'	305	160	160	160	160	160
T6	'Y'	870	675	675	675	675	675
	'Z'	160	160	160	160	160	160

TENDON SETOUT TABLE 2

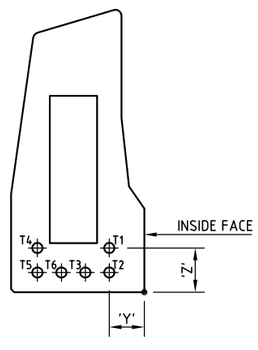
SEGMENT N3		OVERALL LENGTH = 12740							
	'X'	0	3500	5500	7500	9500	11240	12090	12740
T1	'Y'	285	285	285	285	285	308	338	395
	'Z'	360	605	779	953	1128	1279	1353	1410
T2	'Y'	285	285	285	285	285	308	338	395
	'Z'	160	290	464	638	813	964	1038	1095
T3	'Y'	480	285	285	285	285	308	338	395
	'Z'	160	160	196	323	498	649	723	780
T4	'Y'	870	870	870	870	870	847	817	760
	'Z'	360	605	779	953	1128	1279	1353	1410
T5	'Y'	870	870	870	870	870	847	817	760
	'Z'	160	290	464	638	813	964	1038	1095
T6	'Y'	675	870	870	870	870	847	817	760
	'Z'	160	160	196	323	498	649	723	780

TENDON SETOUT TABLE 3



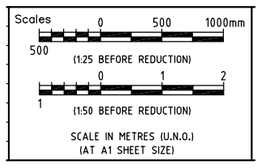
SECTION 1 / SCALE 1:25

(PRESTRESS TENDON SETOUT)



SECTION 2 / SCALE 1:25

(PRESTRESS TENDON SETOUT)



NORTH GIRDER

NOTES

POST TENSIONING

EACH PRESTRESSING TENDON SHALL CONSIST OF 19 No. 12.7mm STRESS RELIEVED SEVEN WIRE SUPER STRAND TO AS1311.
NOMINAL DIAMETER 12.7mm
NOMINAL STEEL AREA 100.0mm2
NOMINAL MASS 0.785 kg/m
NOMINAL ULTIMATE TENSILE STRENGTH 1840 N/mm2
GUARANTEED NOMINAL BREAKING LOAD 184.0 kN
LOAD AT 1% EXTENSION OR 0.2% PROOF LOAD 156.0 kN
YOUNGS MODULUS 195 kN/mm2
RELAXATION (1000 HRS/70% UTS) 2.5%
DUCTS SHALL BE COMPRISED OF CORRUGATED STEEL WITH A MINIMUM WALL THICKNESS OF 0.4mm AND AN INTERNAL DIAMETER OF 84mm.
PRESTRESS LOSS CALCULATIONS ARE BASED ON THE FOLLOWING:
WEDGE DRAW-IN 6mm
FRICTION M 0.2
WOBBLE FACTOR k 0.0012 rad/m
FRICTION IS CALCULATED FROM THE FOLLOWING FORMULA
Px = Po e-m (kx+f)
WHERE Po = JACKING PRESTRESS FORCE
Px = PRESTRESS FORCE AT x
x = DISTANCE FROM STRESSING ANCHOR (m)
M= CO-EFFICIENT OF FRICTION
k = WOBBLE FACTOR
ϕ = TOTAL ANGLE TURNED FROM STRESSING ANCHOR
EACH REEL OF STRAND SHALL BE TESTED IN ACCORDANCE WITH THE SPECIFICATION. IN ADDITON EACH REEL SHALL BE TESTED FOR NOMINAL CROSS-SECTIONED AREA AND YOUNG'S MODULUS.

INSTALLATION OF PERMANENT TENDONS

DUCTS SHALL BE STRAIGHT FOR A MINIMUM DISTANCE OF 100mm EACH SIDE OF THE JOINTS BETWEEN SEGMENTS.
DUCTS SHALL BE STRAIGHT PERPENDICULAR TO THE FACE OF THE ANCHOR FOR A MINIMUM DISTANCE OF 1000mm FROM ALL ANCHORAGE FACES.
THE RADIUS OF CURVATURE OF THE DUCT CENTRELINE SHALL NOT BE LESS THAN 5500mm.
THE DISTANCE FROM THE CENTRE OF THE DUCT TO ANY EXTERNAL CONCRETE FACE SHALL NOT BE LESS THAN 115mm.
DUCTS SHALL BE RIGIDLY SUPPORTED AT POINTS NO MORE 1000mm APART, OR CLOSER WHERE NECESSARY TO PROVIDE THE REQUIRED PROFILES. THE DUCTS SHALL BE HELD IN THEIR CORRECT POSITIONS AGAINST FLOTATION AND DISPLACEMENT DURING CONCRETING.

STRESSING OF PERMANENT TENDONS

THE TENDONS SHALL BE STRESSED TO 2450 kN IN THE FOLLOWING ORDER 2,5,1,4,3,6
THE SPECIFIED PRESTRESSING FORCE SHOULD BE INCREASED TO ALLOW FOR LOSSES IN ANCHOR AND JACK.
JACKING SHALL BE FROM ONE END ONLY
THE EXTENSIONS TABULATED IN THE TABLE BELOW CALCULATED ON THE BASIS OF THE NOMINAL STRAND AREA AND YOUNG'S MODULUS GIVEN ABOVE. THESE EXTENSIONS SHOULD BE CORRECTED FOR THE ACTUAL CERTIFIED VALUES.

TENDON NO.	JACKING FORCE (kN)	EXTENSION (mm)
T1	2620kN	236mm
T2	2620kN	242mm
T3	2620kN	242mm
T4	2620kN	236mm
T5	2620kN	242mm
T6	2620kN	242mm

THE TENDON PROFILES SHALL BE PLACED TO A SMOOTH PROFILE PASSING THROUGH THE SPECIFIED POINTS SHOWN ON THE DUCT PROFILE. GROUT POINTS SHALL BE PROVIDED AT ALL ANCHORAGES.
AIR BLEEDER TUBES SHALL BE PROVIDED AT ALL CROWN AND SAG POINTS OF EACH DUCT (SEE SPECIFICATION FOR DETAILED GROUTING REQUIREMENTS).
STRESSING OF TENDONS

THE TENDONS SHALL BE STRESSED AT A GRADUAL AND STEADY RATE WITH READINGS OF EXTENSIONS TAKEN AT 10% OF THE SPECIFIED PRESTRESSING FORCE AND AT MINIMUM OF THREE FURTHER, APPROXIMATELY EQUAL INCREMENTS TO ENABLE DETERMINATION OF THE TOTAL EXTENSION. THE INCREMENTS SHALL BE AGREED PRIOR TO STRESSING. STRESSING SHALL CONTINUE UNTIL THE SPECIFIED PRESTRESSING FORCE IS APPLIED, PROVIDED THAT THE EXTENSION, HAVING ALLOWED FOR THE DRAW-IN AT THE DEAD END DOES NOT EXCEED THE TABULATED EXTENSION BY MORE THAN 5%. IF THE EXTENSION OBTAINED AFTER APPLYING THE PRESTRESSING IS LESS THAN 95% OF THE TABULATED EXTENSION, THE PRESTRESSING FORCE SHALL BE INCREASED UNTIL 95% OF THE TABULTED EXTENSION IS ACHIEVED EXCEPT THAT THE PRESTRESSING FORCE SHALL NOT EXCEED 80% OF THE ULTIMATE TENSILE STRENGTH OF THE TENDON. IF THE ABOVE PROCEDURE FAILS TO PRODUCE THE SPECIFIED PRESTRESSING FORCE AND TABULTED EXTENSIONS WITIN A TOLERANCE OF 5% ALL STRESSING OPERATIONS SHALL CEASE AND THE SITUATION REPORTED TO THE ENGINEER.
GROUTING OF TENDONS
DUCTS SHALL BE FULLY GROUTED AFTER ALL STRESSING IS COMPLETED AND APPROVED. GROUTING SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE SPECIFICATION.

CONCRETE

REFER TO DRG No. PRL-G2-99262

REINFORCEMENT

REFER TO DRG No. PRL-G2-99266

REFERENCE

GENERAL ARRANGEMENT DRG No. PRL-G2-99251
PRECAST POST TENSIONED GIRDERS 1 OF 6 DRG No. PRL-G2-99262
PRECAST POST TENSIONED GIRDERS 5 OF 6 DRG No. PRL-G2-99266

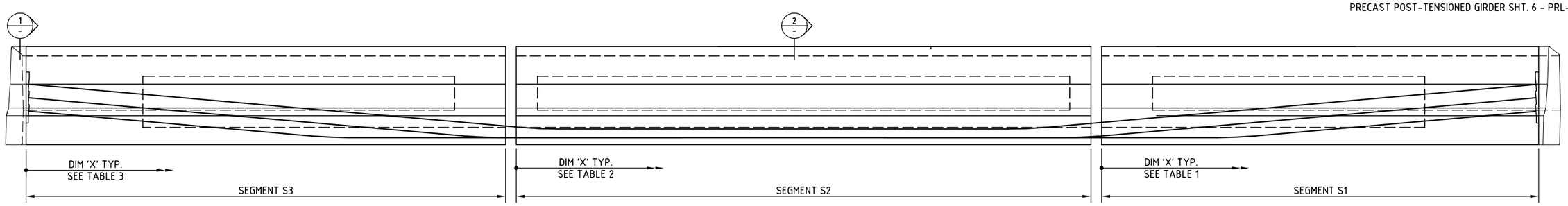
WORK AS EXECUTED

THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

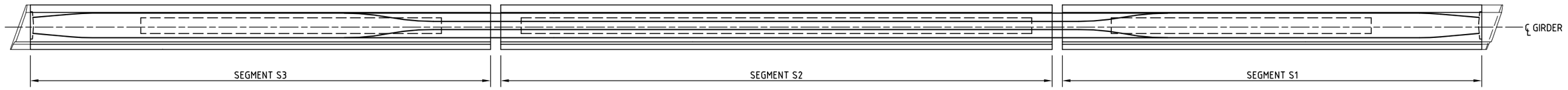
RIC/SRA EDMS ID CV0214649

NOTES

CONCRETE
REFER DRG. No. PRL-G2-99262
POST TENSIONING
REFER DRG. No. PRL-G2-99264
REINFORCEMENT
REFER DRG. No. PRL-G2-99266
REFERENCE
GENERAL ARRANGEMENT - PRL-G2-99251
PRECAST POST-TENSIONED GIRDER SHT. 2 - PRL-G2-99263
PRECAST POST-TENSIONED GIRDER SHT. 6 - PRL-G2-99267



ELEVATION
(VIEWED FROM INSIDE)
SCALE 1:50



PLAN
SCALE 1:50

SEGMENT S3		OVERALL LENGTH = 11290							
	'X'	0	650	1500	1790	3790	5790	7790	11290
T1	'Y'	395	338	308	285	285	285	285	285
	'Z'	1410	1353	1279	1254	1080	905	731	426
T2	'Y'	395	338	308	285	285	285	285	285
	'Z'	1095	1038	964	939	765	590	416	160
T3	'Y'	395	338	308	285	285	285	285	480
	'Z'	780	723	649	624	450	275	160	160
T4	'Y'	760	817	847	870	870	870	870	870
	'Z'	1410	1353	1279	1254	1080	905	731	426
T5	'Y'	760	817	847	870	870	870	870	870
	'Z'	1095	1038	964	939	765	590	416	160
T6	'Y'	760	817	847	870	870	870	870	675
	'Z'	780	723	649	624	450	275	160	160

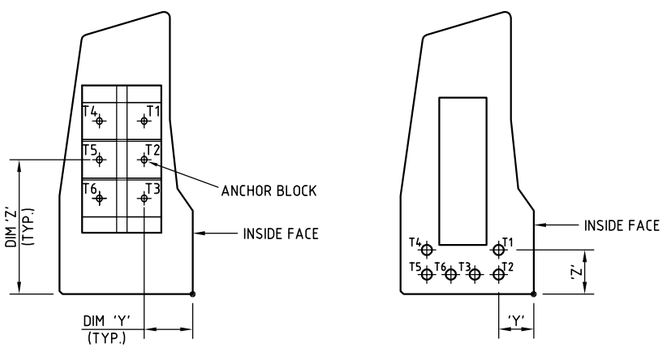
TENDON SETOUT - TABLE 3

SEGMENT S2		OVERALL LENGTH = 13500					
	'X'	0	2700	5400	8100	10800	13500
T1	'Y'	285	285	285	285	285	285
	'Z'	406	360	360	360	360	494
T2	'Y'	285	285	285	285	285	285
	'Z'	160	160	160	160	160	195
T3	'Y'	480	480	480	480	480	480
	'Z'	160	160	160	160	160	160
T4	'Y'	870	870	870	870	870	870
	'Z'	406	360	360	360	360	494
T5	'Y'	870	870	870	870	870	870
	'Z'	160	160	160	160	160	195
T6	'Y'	675	675	675	675	675	675
	'Z'	160	160	160	160	160	160

TENDON SETOUT - TABLE 2

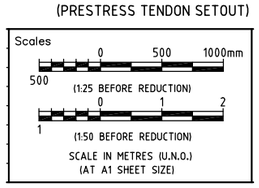
SEGMENT S1		OVERALL LENGTH = 10265							
	'X'	0	1765	3585	5265	7015	8765	9615	10265
T1	'Y'	285	285	285	285	285	308	338	395
	'Z'	515	669	822	974	1127	1279	1353	1410
T2	'Y'	285	285	285	285	285	308	338	395
	'Z'	200	354	507	659	812	964	1038	1095
T3	'Y'	480	383	285	285	285	308	338	395
	'Z'	160	160	196	344	497	649	723	780
T4	'Y'	870	870	870	870	870	847	817	760
	'Z'	515	669	822	974	1127	1279	1353	1410
T5	'Y'	870	870	870	870	870	847	817	760
	'Z'	200	354	507	659	812	964	1038	1095
T6	'Y'	675	773	870	870	870	847	817	760
	'Z'	160	160	196	344	497	649	723	780

TENDON SETOUT - TABLE 1



SECTION 1
SCALE 1:25
(PRESTRESS TENDON SETOUT)

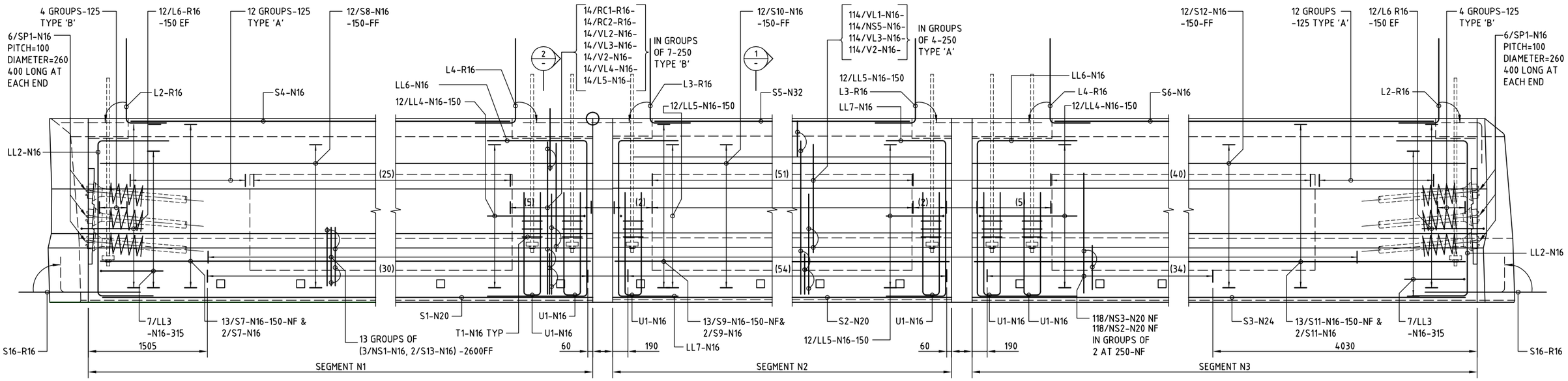
SECTION 2
SCALE 1:25
(PRESTRESS TENDON SETOUT)



SOUTH GIRDER

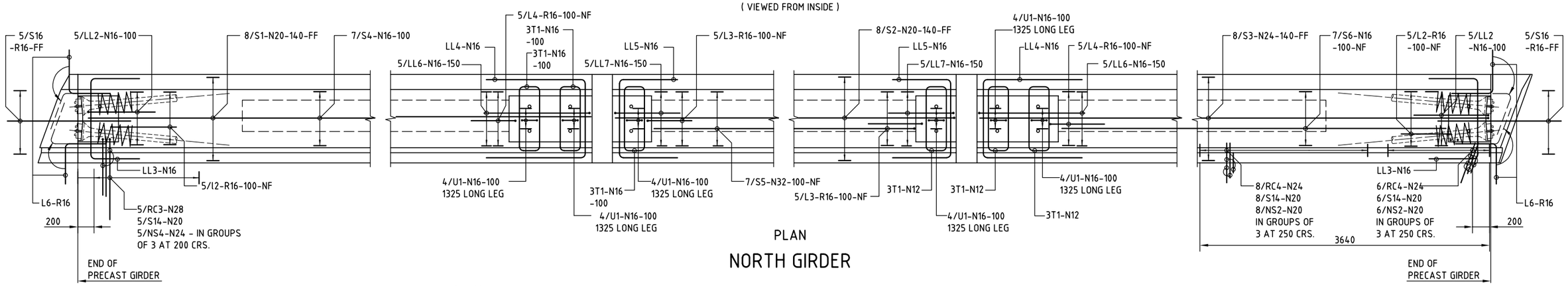
WORK AS EXECUTED
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RIC/SRA EDMS ID CV0214650



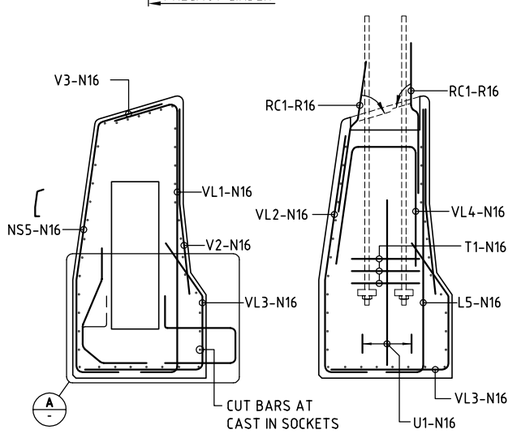
ELEVATION

(VIEWED FROM INSIDE)



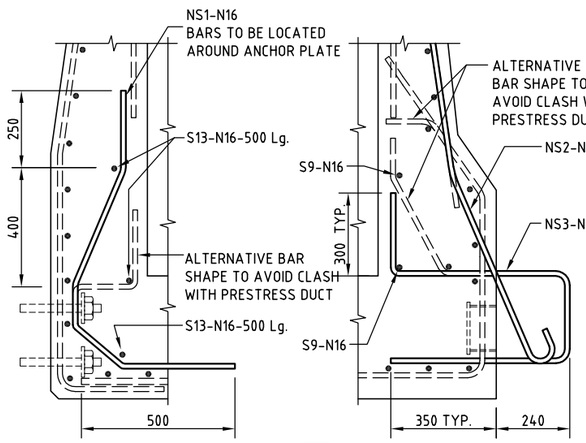
PLAN

NORTH GIRDER

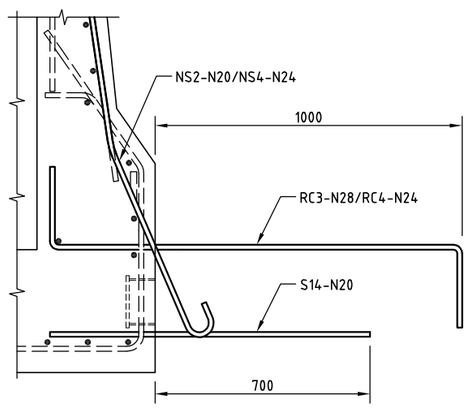


SECTION 1 - SCALE 1:25

SECTION 2 - SCALE 1:25



DETAIL A - SCALE 1:10



DETAIL A - SCALE 1:10

AT GIRDER END

NOTES

CONCRETE

REFER DRG No.PRL-G2-9962

REINFORCEMENT

1. ALL REINFORCEMENT BARS SHALL BE IN ACCORDANCE WITH AS/NZS 4671:2001 WHERE ALL BARS ARE GRADE 500 DEFORMED RIBBED BARS UNO.
2. DESIGNATION OF REINFORCING BARS : 10/S1 N24-200 EF
   - No OF BARS
   - BAR SHAPE NOTATION
   - DUCTILITY CLASS AND DIA
   - SPACING OF BARS
   - LOCATION COMMENT
3. CLEAR COVER TO REINFORCEMENT SHALL BE 30mm.
4. COGS AND HOOKS SHALL BE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE 1996.
5. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR AS APPROVED IN WRITING BY THE PRINCIPAL.
6. BAR SHAPES SHALL BE IN ACCORDANCE WITH AS 1100.501-2002.
7. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT :
   - EW - EACH WAY
   - EF - EACH FACE
   - NF - NEAR FACE
   - FF - FAR FACE
   - T - TOP
   - B - BOTTOM
   - CP - CENTRALLY PLACED
8. BAR LAPS SHALL BE AS FOLLOWS :

BAR SIZE	LAPS (mm)	BAR SIZE	LAPS (mm)
N12	400	N24	700
N16	500	N28	950
N20	600	N32	1200

VALUES IN THE TABLE TO BE MULTIPLIED BY 1.25 FOR HORIZONTAL BARS WITH MORE THAN 300mm OF CONCRETE CAST BELOW THE BAR

LAPS NOT SHOWN ON THE DRAWING SHALL BE STAGGERED SO THAT NO MORE THAN 50% OF BARS ARE LAPPED AT ANYONE CROSS SECTION.

REFERENCE

GENERAL ARRANGEMENT - PRL-G2-99251
PRECAST POST-TENSIONED GIRDER SHT 1 OF 6 - PRL-G2-99262
PRECAST POST-TENSIONED GIRDER SHT 3 OF 6 - PRL-G2-99264

WORK AS EXECUTED

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RIC/SRA EDMS ID CV0214651

Scales
0 200 400mm
200 100
(1:10 BEFORE REDUCTION)
0 500 1000mm
500
(1:25 BEFORE REDUCTION)
(AT A1 SHEET SIZE)

NOTES

CONCRETE

REFER DRG No. PRL-G2-99262

REINFORCEMENT

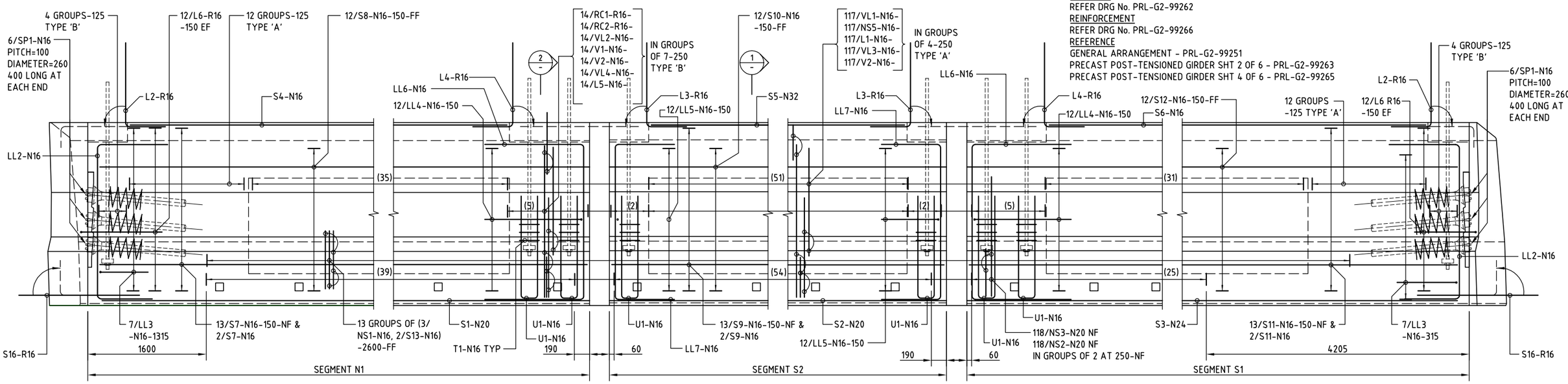
REFER DRG No. PRL-G2-99266

REFERENCE

GENERAL ARRANGEMENT - PRL-G2-99251

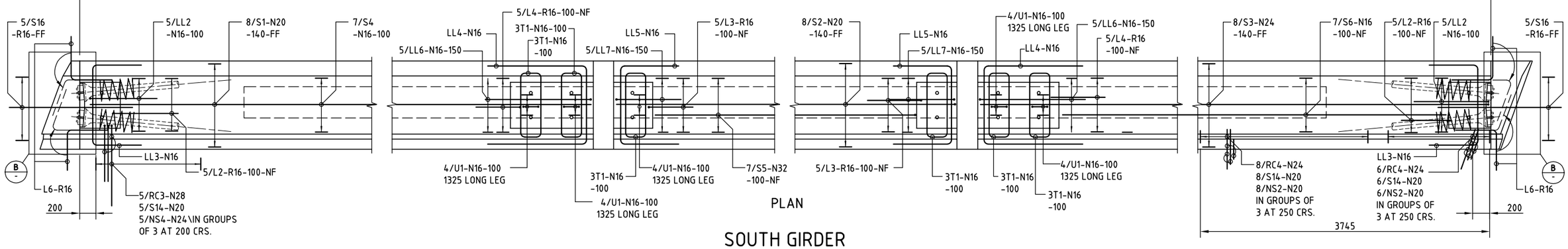
PRECAST POST-TENSIONED GIRDER SHT 2 OF 6 - PRL-G2-99263

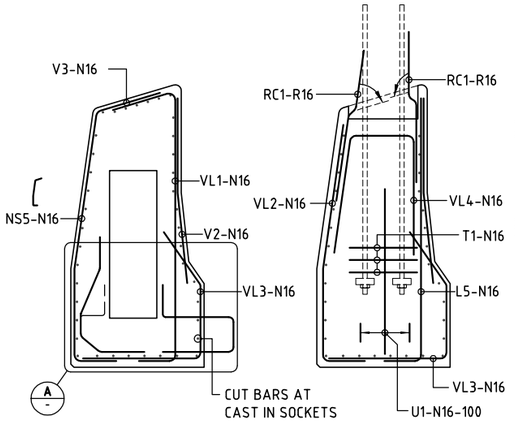
PRECAST POST-TENSIONED GIRDER SHT 4 OF 6 - PRL-G2-99265

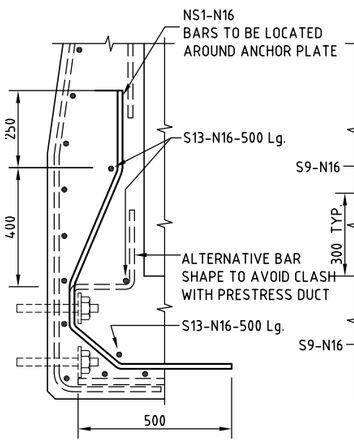


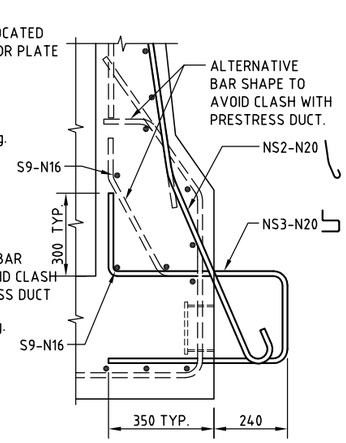
ELEVATION

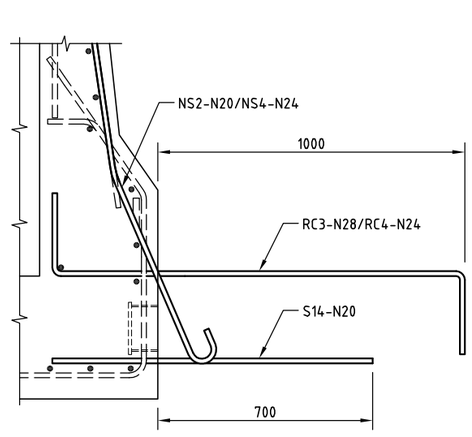
(VIEWED FROM INDIDE)





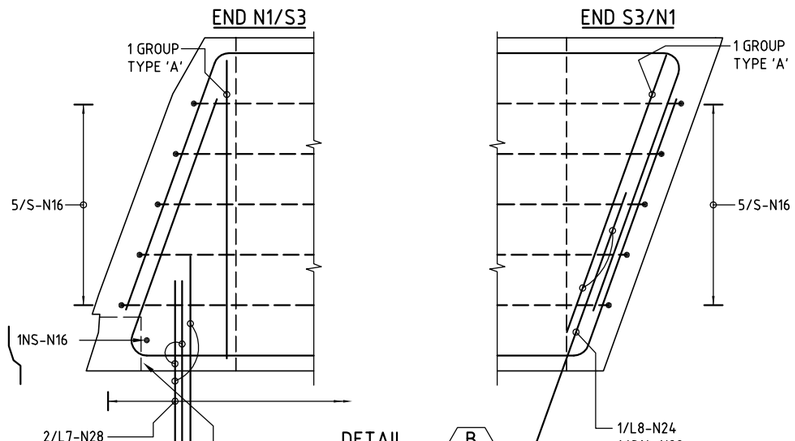


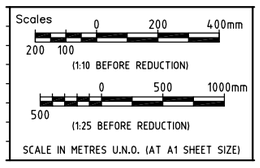




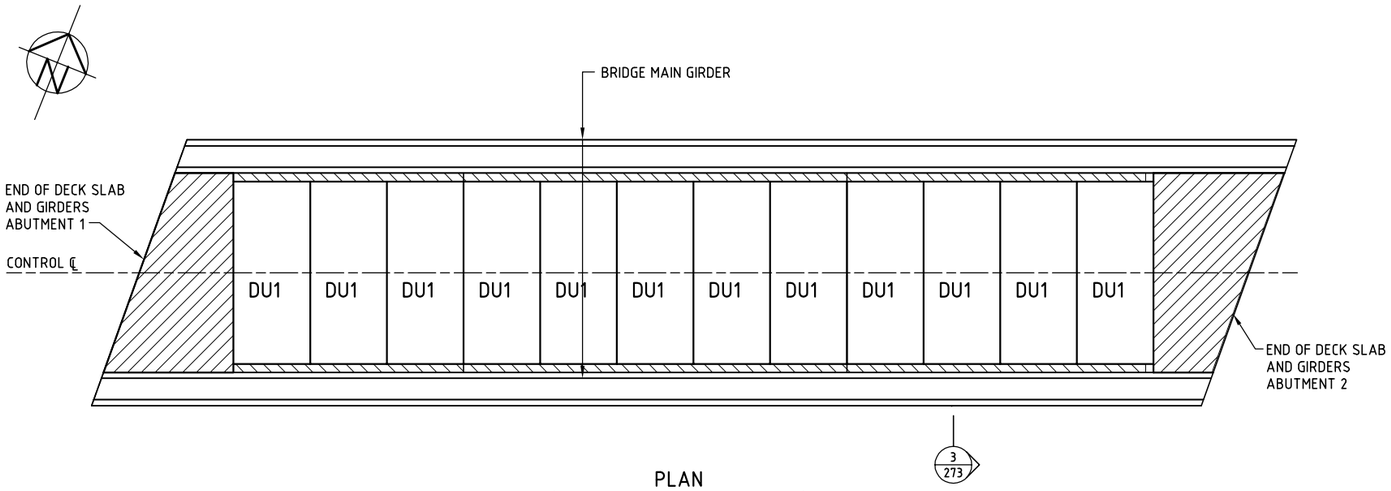
WORK AS EXECUTED

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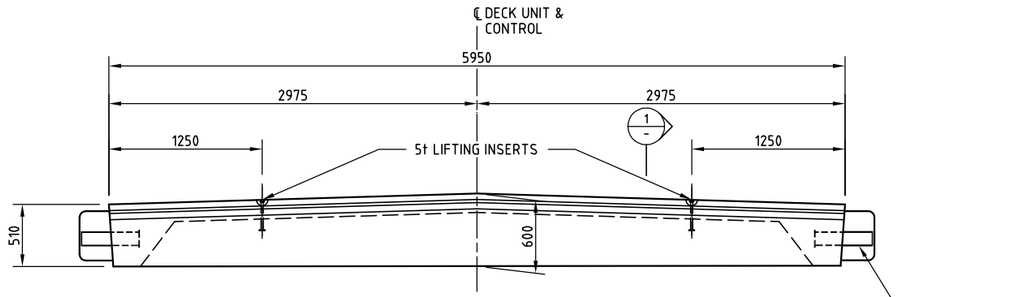


RIC/SRA EDMS ID CV0214652

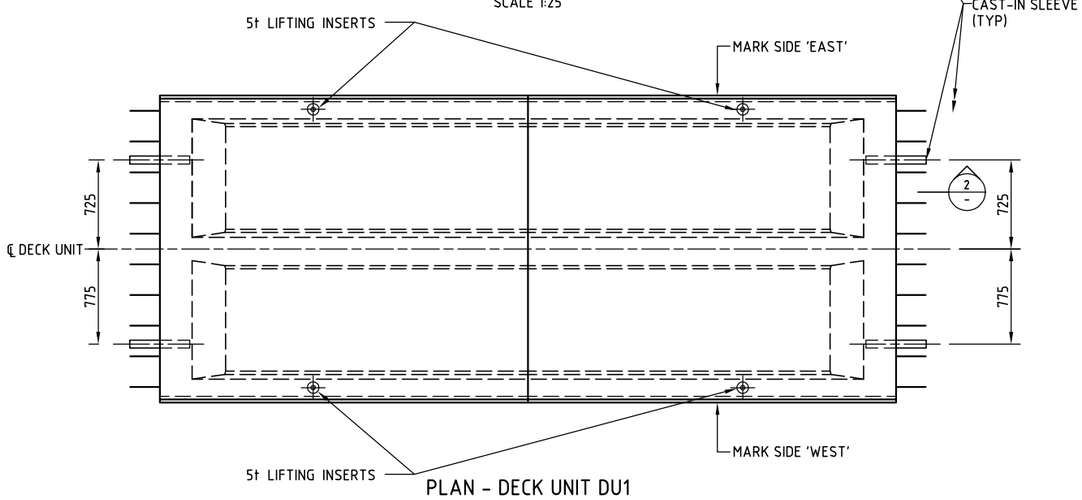


PLAN
(WALKWAYS NOT SHOWN FOR CLARITY)
SCALE 1:100

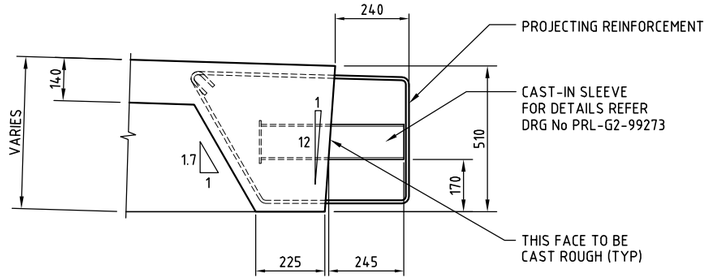
DENOTES CAST IN-SITU CONCRETE REFER DRG.No PRL-G2-99272



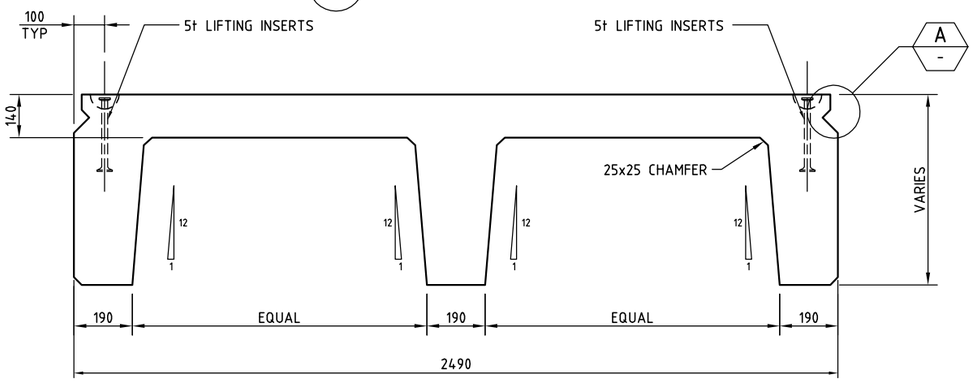
ELEVATION
SCALE 1:25



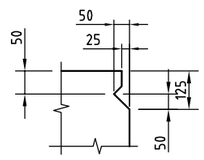
PLAN - DECK UNIT DU1
SCALE 1:25
(12 REQUIRED)



SECTION 2
-



SECTION 1
-



DETAIL A
-

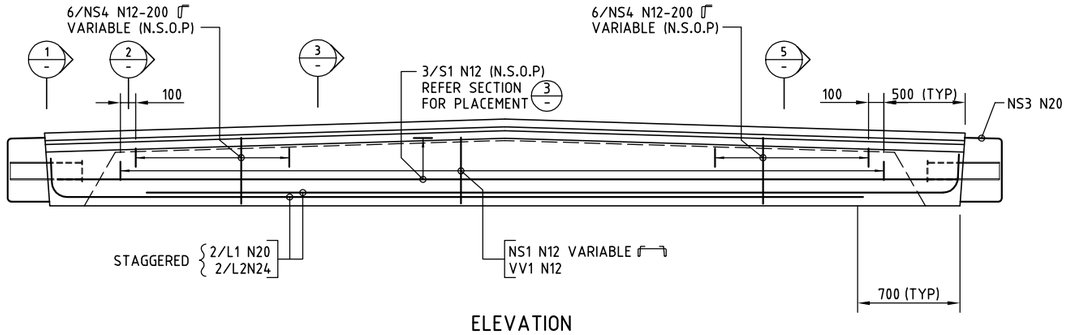
Scales
0 200 400mm
200 100
(1:10 BEFORE REDUCTION)
(AT A1 SHEET SIZE)

NOTES

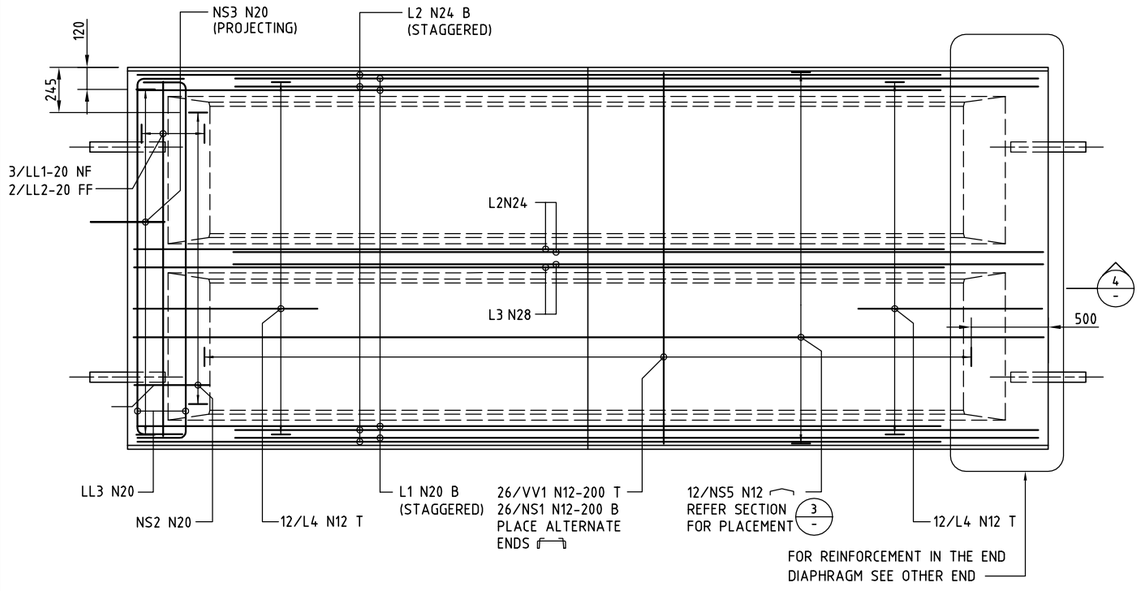
GENERAL
SCALE 1:10 UNLESS SPECIFIED OTHERWISE.
CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 40MPa.
EDGES SHALL BE CHAMFERED 25x25 AND RE-ENTRANT ANGLES SHALL BE FILLETED 25x25 UNLESS SPECIFIED OTHERWISE.
PLANKS SHALL ONLY BE LIFTED BY LIFTING INSERTS PROVIDED.
DURING STORAGE, TRANSPORT AND HANDLING, PLANKS SHALL BE IN AN UPRIGHT POSITION AND SUPPORTED AT NO MORE THAN 500mm FROM EACH END.
APPROX MASS OF PLANK IS 10.2t
(BASED ON A DENSITY OF 2480 kg/m^3.)
FOR IN-SITU DECK DETAILS REFER DRG No PRL-G2-99272

WORK AS EXECUTED
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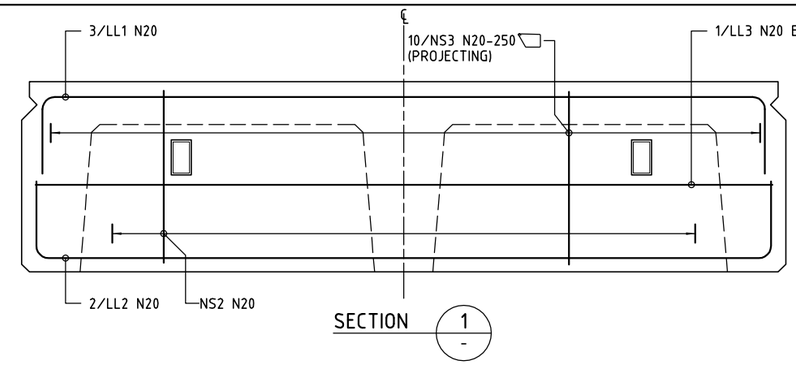
RIC/SRA EDMS ID CV0214653



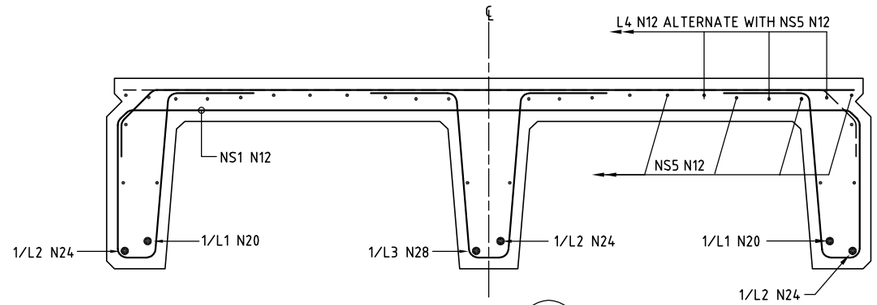
ELEVATION
SHOWING END WEB REINFORCEMENT
SCALE 1:20



PLAN
SCALE 1:20

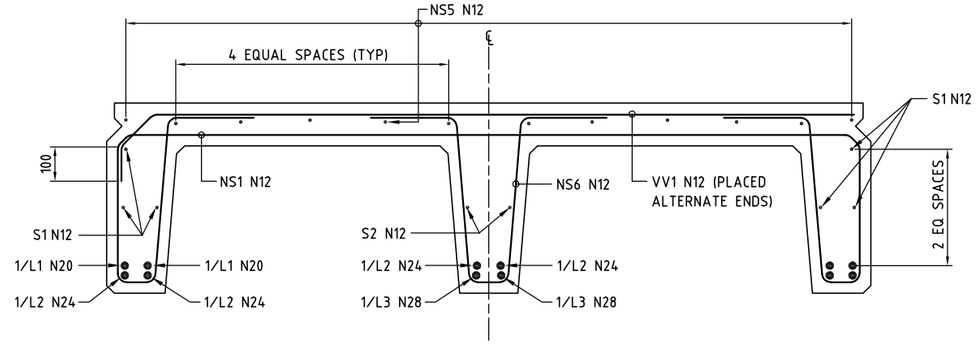


SECTION 1

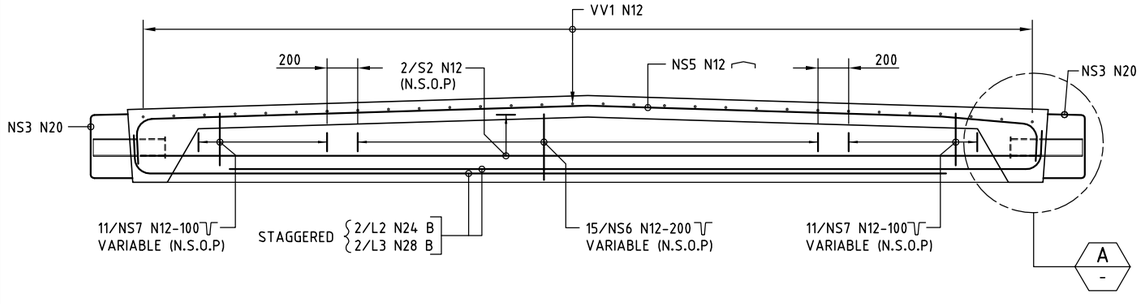


SECTION 2

UNMARKED REINFORCEMENT AS NOTES SECTION 3

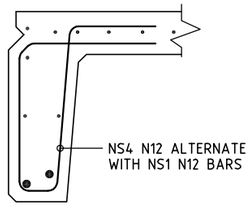


SECTION 3



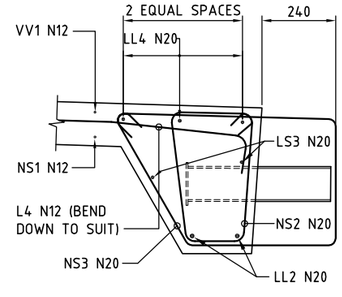
SECTION 4
SCALE 1:20

(SHOWING MIDDLE WEB REINFORCEMENT)
(END DIAPHRAGM RE-INFORCEMENT NOT SHOWN FOR CLARITY)



SECTION 5

(SHOWING NS4 BARS)



DETAIL A

NOTES

GENERAL

SCALE 1:10 UNLESS SPECIFIED OTHERWISE.

REINFORCEMENT

1. ALL REINFORCEMENT BARS SHALL BE IN ACCORDANCE WITH AS/NZS 4671:2001 WHERE ALL BARS ARE GRADE 500 DEFORMED RIBBED BARS UNO.
2. DESIGNATION OF REINFORCING BARS : 10/S1 N24-200 EF
   - No OF BARS
   - BAR SHAPE NOTATION
   - DUCTILITY CLASS AND DIA
   - SPACING OF BARS
   - LOCATION COMMENT
3. CLEAR COVER TO REINFORCEMENT SHALL BE 30mm.
4. COGS AND HOOKS SHALL BE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE 1996.
5. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR AS APPROVED IN WRITING BY THE PRINCIPAL.
6. BAR SHAPES SHALL BE IN ACCORDANCE WITH AS 1100.501-2002.
7. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT :

EW - EACH WAY	T - TOP
EF - EACH FACE	B - BOTTOM
NF - NEAR FACE	CP - CENTRALLY PLACED
FF - FAR FACE	N.S.O.P - NOT SHOWN ON PLAN

8. BAR LAPS SHALL BE AS FOLLOWS :

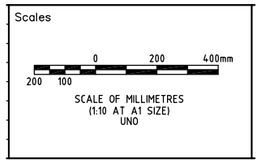
BAR SIZE	LAPS (mm)	BAR SIZE	LAPS (mm)
N12	400	N20	600
N16	500	N24	700

VALUES IN THE TABLE TO BE MULTIPLIED BY 1.25 FOR HORIZONTAL BARS WITH MORE THAN 300mm OF CONCRETE CAST BELOW THE BA

LAPS NOT SHOWN ON THE DRAWING SHALL BE STAGGERED SO THA NO MORE THAN 50% OF BARS ARE LAPPED AT ANYONE CROSS SECTION.
THE FOUR LONGITUDINAL BARS AT THE BOTTOM OF EACH LONGITUDINAL WEB SHALL BE CONTINUOUS BARS (NO LAPS)

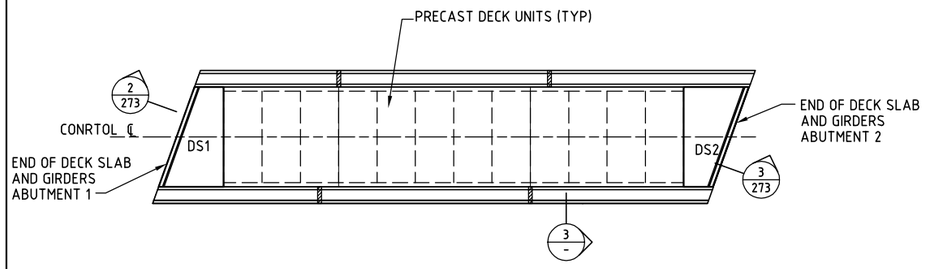
LOADING RESTRICTIONS:

THIS PLANK HAS BEEN DESIGNED TO THE AUSTRALIAN BRIDGE COD -1996 WITH NO ALLOWANCE FOR HEAVY LOAD PLATFORM LOADING

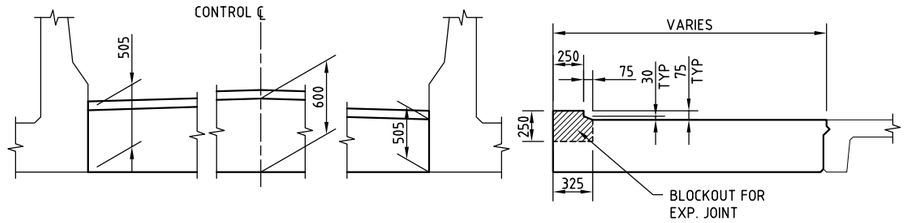


WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214654



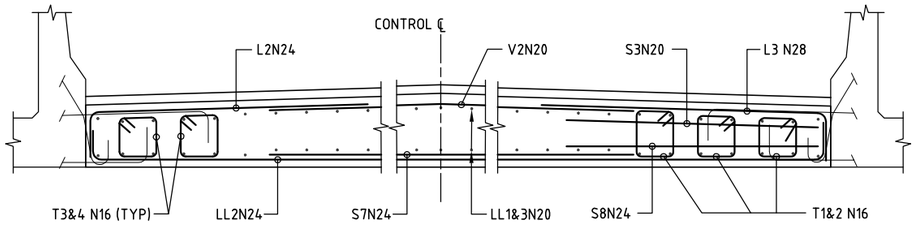
CAST IN-SITU PLAN
SCALE 1:200



SECTION 1 / SCALE 1:25

SECTION 2 / SCALE 1:25
(SECTION 3 SIMILAR)

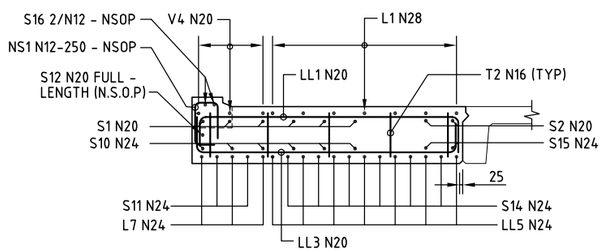
CONCRETE



SECTION 1 / SCALE 1:25

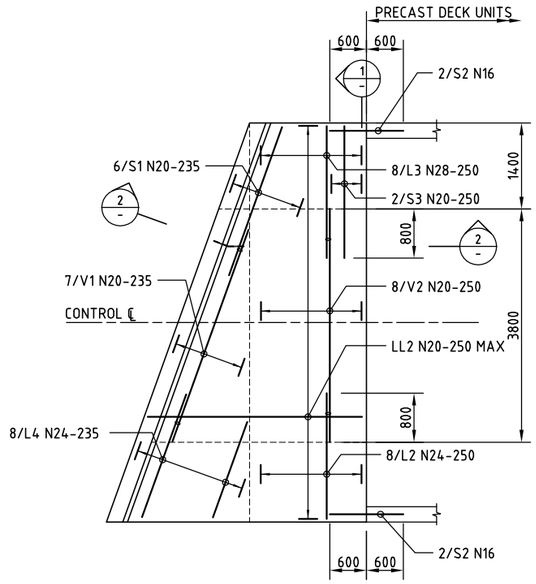
REINFORCEMENT

NOTE:
WESTERN SIDE (DS1) REINFORCEMENT SHOWN
EASTERN SIDE (DS2) SIMILAR EXCEPT WHERE
SPECIFIC VARIATION ARE SHOWN BRACKETED

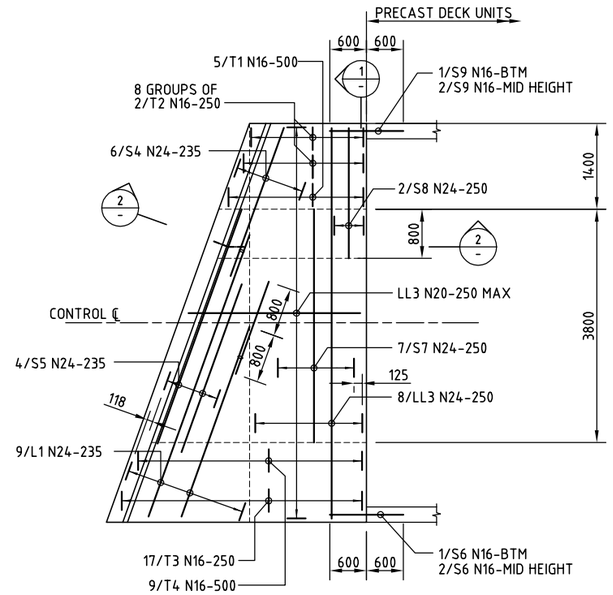


SECTION 2 / SCALE 1:25

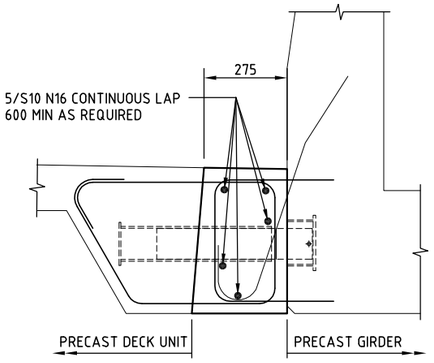
Scales
0 1000 2000mm
1000 600 200
SCALE OF MILLIMETRES
(1:50 AT A1 SIZE)
UNO



TOP REINFORCEMENT
(WESTERN SIDE SHOWN EAST SIDE SIMILAR)



BOTTOM REINFORCEMENT
(WESTERN SIDE SHOWN EAST SIDE SIMILAR)



SECTION 3 / SCALE 1:10
(SHOWING STITCH REINFORCMENT)

NOTES

GENERAL

SCALE 1:50 UNLESS SPECIFIED OTHERWISE.

REINFORCEMENT

1. ALL REINFORCEMENT BARS SHALL BE IN ACCORDANCE WITH AS/NZS 4671:2001 WHERE ALL BARS ARE GRADE 500 DEFORMED RIBBED BARS UNO.
2. DESIGNATION OF REINFORCING BARS : 10/S1 N24-200 EF
   - No OF BARS
   - BAR SHAPE NOTATION
   - DUCTILITY CLASS AND DIA
   - SPACING OF BARS
   - LOCATION COMMENT
3. CLEAR COVER TO REINFORCEMENT SHALL BE 40mm.
4. COGS AND HOOKS SHALL BE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE 1996.
5. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR AS APPROVED IN WRITING BY THE PRINCIPAL.
6. BAR SHAPES SHALL BE IN ACCORDANCE WITH AS 1100.501-2002.
7. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT :

EW	- EACH WAY	T	- TOP
EF	- EACH FACE	B	- BOTTOM
NF	- NEAR FACE	CP	- CENTRALLY PLACED
FF	- FAR FACE	N.S.O.P	- NOT SHOWN ON PLAN

8. BAR LAPS SHALL BE AS FOLLOWS :

BAR SIZE	LAPS (mm)	BAR SIZE	LAPS (mm)
N12	400	N20	600
N16	500	N24	700

VALUES IN THE TABLE TO BE MULTIPLIED BY 1.25 FOR HORIZONTAL BARS WITH MORE THAN 300mm OF CONCRETE CAST BELOW THE BAR.

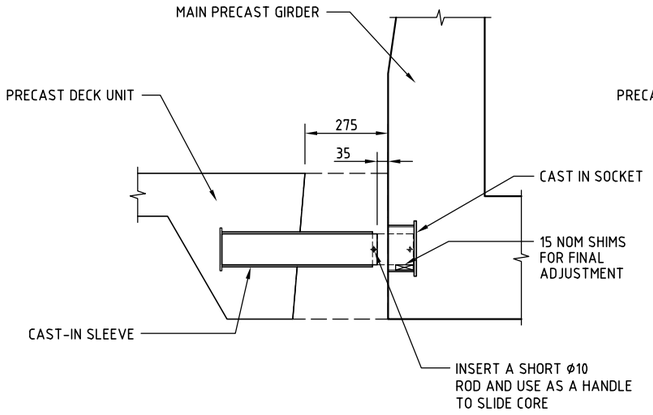
LAPS NOT SHOWN ON THE DRAWING SHALL BE STAGGERED SO THAT NO MORE THAN 50% OF BARS ARE LAPPED AT ANYONE CROSS SECTION.
THE FOUR LONGITUDINAL BARS AT THE BOTTOM OF EACH LONGITUDINAL WEB SHALL BE CONTINUOUS BARS (NO LAPS)

LEGEND

--------- DENOTES BOUNDARY OF REINFORCEMENT STRIPS WHERE DIRECTION OF REINFORCEMENT CHANGES OR BARS ARE TERMINATED (TYP)

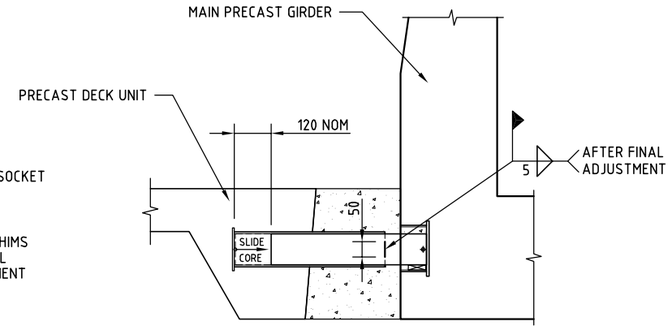
WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214656



SECTION 3/368

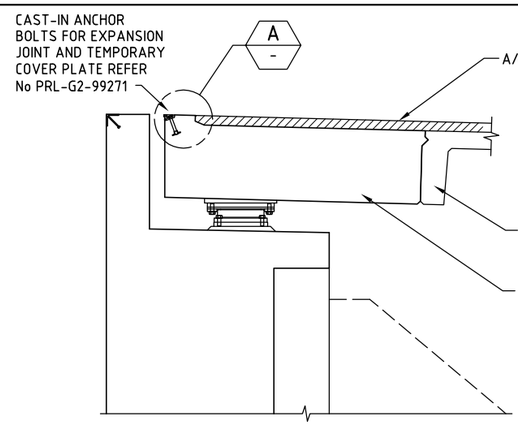
PRIOR AND DURING INSTALLATION
(REINFORCEMENT NOT SHOWN FOR CLARITY.)



NOTE:
DO NOT RELEASE LIFTING EQUIPMENT UNTIL FINAL ADJUSTMENT AND SITE WELDS ARE COMPLETED

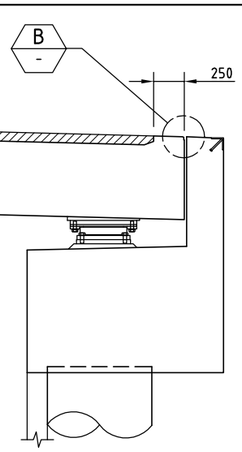
SECTION 3/368

FINAL POSITION AFTER INSTALLATION



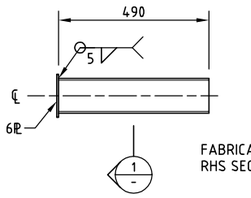
ABUTMENT 1

SECTION 2/272
SCALE 1:25

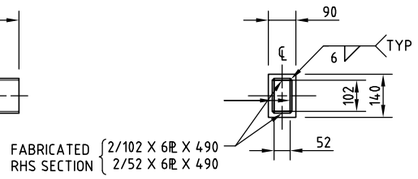


ABUTMENT 2

SECTION 3/272
SCALE 1:25

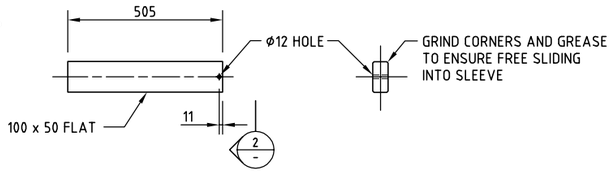


ELEVATION



SECTION 1/-

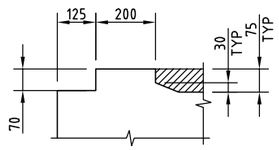
(CAST-IN SLEEVE)



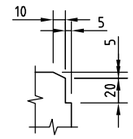
ELEVATION

SECTION 2/-

(SLIDING CORE)



DETAIL A/-
SCALE 1:10



DETAIL B/-
SCALE 1:2.5

PRECAST DECK UNITS - TEMPORARY SUPPORTING BRACKET ASSEMBLY

(DO NOT PROVIDE PROTECTIVE TREATMENT TO THIS ASSEMBLY ONLY)
(48 ASSEBLIES REQUIRED)

Scales

0 200 400mm
200 100

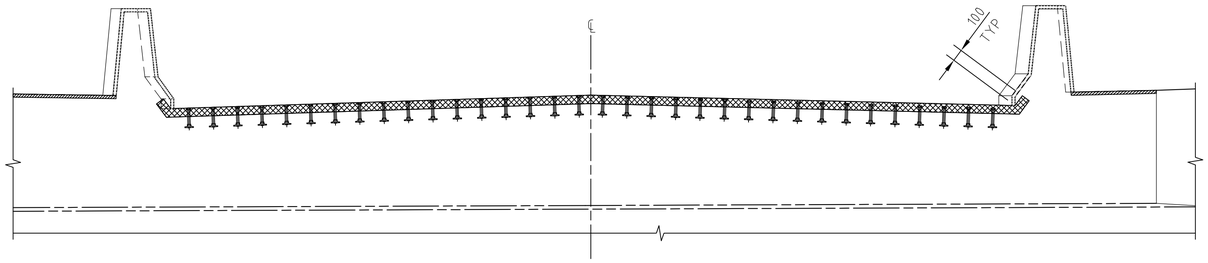
SCALE OF MILLIMETRES
(1:10 AT A1 SIZE)
UNO

NOTES

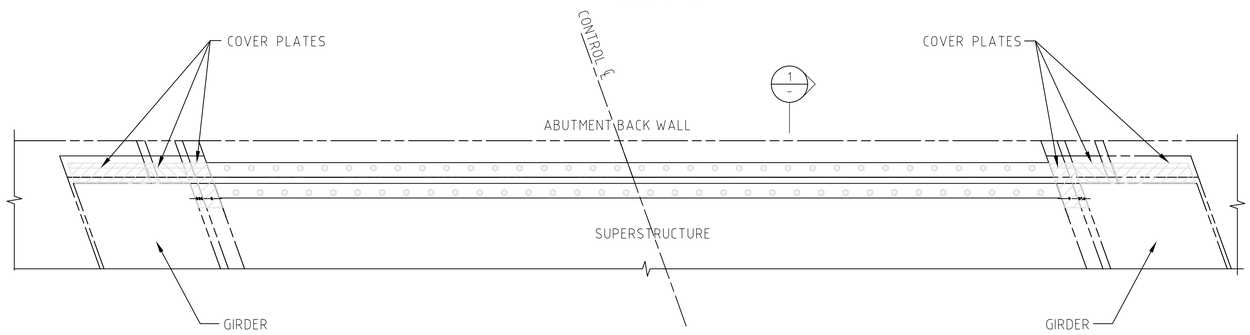
SCALE 1:10 UNLESS SPECIFIED OTHERWISE.
STEEL PLATE SHALL BE GRADE 300 TO AS 3678.
CIRCULAR HOLLOW SECTIONS SHALL BE GRADE C350 TO AS 1163.
THE WELD CATEGORY SHALL BE GP IN ACCORDANCE WITH AS 1554 PART 1.
WELDING SYMBOLS ARE TO AS 1101 PART 3.
EDGES TO BE PROTECTIVE TREATED SHALL BE ROUNDED TO
A RADIUS OF 1.5mm UNLESS SPECIFIED OTHERWISE.
ALL COMPONENTS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION
IN ACCORDANCE WITH THE SPECIFICATION - UNO.

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214657



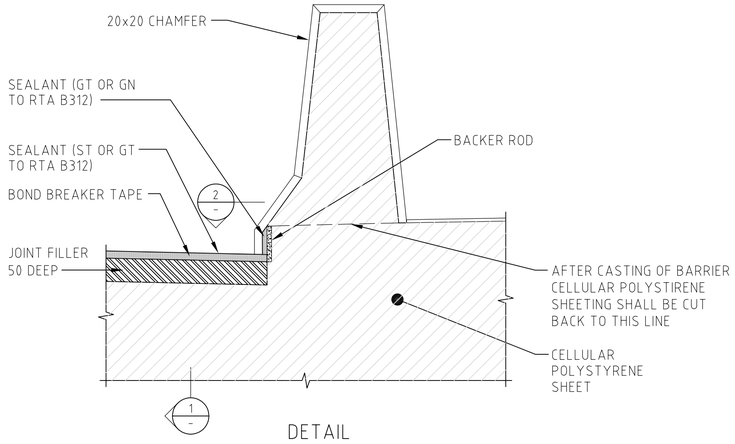
ELEVATION



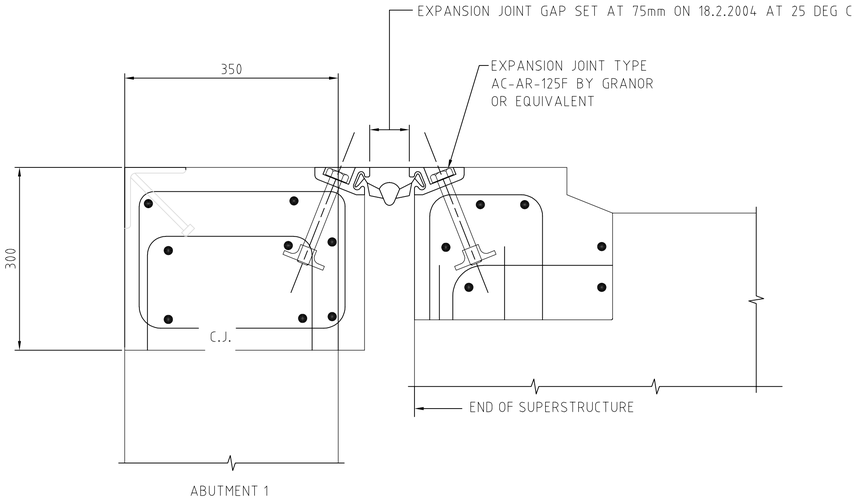
PLAN
SCALE 1:100

ABUTMENT 1 DECK - JOINT

NOTE:
JOINT INSTALLED 7 MONTHS AFTER THE EXCAVATION IN FRONT OF ABUTMENT 2
FOR TEMPORARY DECK COVER DETAILS REFER DRG No PRL-G2-99270

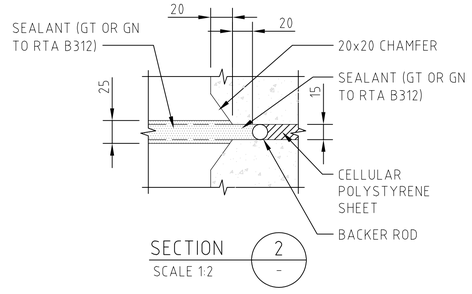


DETAIL
SCALE 1:10

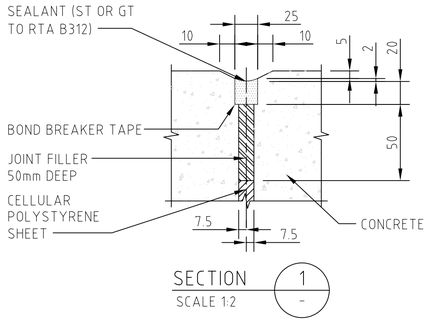


SECTION 1 / SCALE 1:5

NOTE:
GRANOR RUBBER & ENG P/L "AC-AR-125F" EXPANSION JOINT USED



SECTION 2 / SCALE 1:2



SECTION 1 / SCALE 1:2

(CONCRETE WEARING SURFACES FOOTWAYS & MEDIANS ON BRIDGES)

ABUTMENT 2 DECK & PARAPET JOINT

Scales
0 200 400mm
200 100
(1:10 BEFORE REDUCTION)
0 2 4
2 1
(1:100 BEFORE REDUCTION)
SCALE IN METRES (U.N.O)
(AT A1 SHEET SIZE)

NOTES

GENERAL
SCALE 1:25 UNLESS SPECIFIED OTHERWISE.

ABUTMENT 1
A TYPICAL STRIP SEAL TYPE DECK JOINT HAS BEEN DETAILED.
ACCEPTABLE STRIP SEAL TYPE DECK JOINTS INCLUDE:
- ICL ALNL SERIES, WITH TYPE I OR II EXTRUSION
- HERCULES – HONEL SERIES 13
- WABO SERIES S, WITH TYPE B OR ALU-STRIP EXTRUSION

ELASTOMERIC STRIP SEAL JOINT PERFORMANCE MINIMUM REQUIREMENT FOR MOVEMENT = +25mm (EXPANSION OF JOINT) / -35mm (CONTRACTION OF JOINT)

ANCHORAGE DETAILS INCLUDING REINFORCEMENT SURROUNDING THE ANCHOR BOLTS MAY BE VARIED TO SUIT THE PROPOSED JOINT, HOWEVER THE ANCHORAGE CAPACITY SHALL NOT BE LESS THAN DETAILED. DETAILS OF THE PROPOSED ANCHORAGE SYSTEM SHALL BE SUBMITTED TO THE SUPERINTENDENT PRIOR TO DECK AND ABUTMENT CONSTRUCTION.

△DENOTES DIMENSION IS NOMINAL AND MAY BE VARIED TO SUIT THE PROPOSED JOINT. ANCHORAGE BOLTS SHALL REMAIN INSIDE THE DETAILED REINFORCEMENT FOR ALL JOINTS.

STEEL PLATE SHALL BE GRADE 250 TO AS 3678.
HIGH-STRENGTH STEEL BOLTS SHALL BE PROPERTY CLASS 8.8 TO AS/NZS 1252.
HIGH-STRENGTH STEEL NUTS SHALL BE PROPERTY CLASS 8 TO AS/NZS 1252.
HIGH-STRENGTH STEEL WASHERS SHALL CONFORM TO AS/NZS 1252.
BOLTING CATEGORY FOR HIGH-STRENGTH STEEL BOLTS SHALL BE 8.8/S IN ACCORDANCE WITH AS 4100.

EDGES TO BE PROTECTIVE TREATED SHALL BE ROUNDED TO A RADIUS OF 1.5mm UNLESS SPECIFIED OTHERWISE.

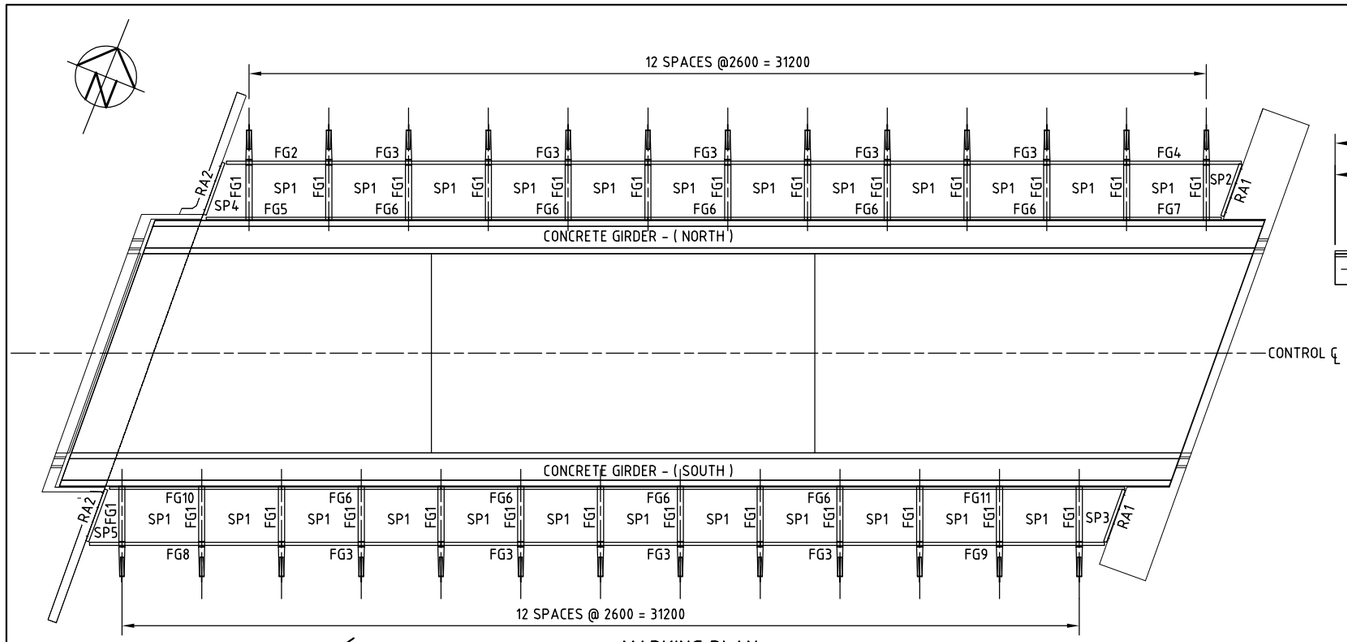
STEEL PLATES, BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.

* DENOTES DIMENSION AT 16°C. THE CALCULATED TEMPERATURE MOVEMENT IS APPROX ±2mm PER ±5°C AT ABUTMENT 1

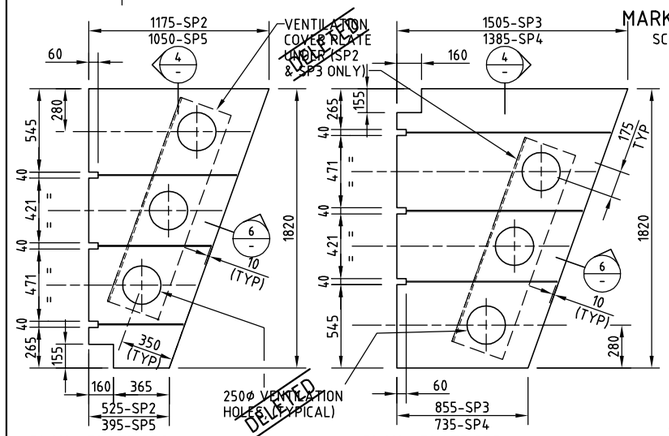
ABUTMENT 2
ALL SELANTS SHALL CONFORM TO RTA B312
COLOUR CODED, SELF ADHESIVE PRESSURE SENSITIVE TAPES MADE FROM NON-STICKING MATERIAL SUCH AS TEFLON OR POLYETHYLENE SHALL BE USED AS BOND BREAKERS.
BACKER RODS SHALL BE NON ABSORBENT, CLOSED CELL POLYETHYLENE OR NEOPRENE (PARBURY'S EXPANDAFOAM BACKER ROD OR APPROVED EQUIVALENT) INSTALLED WITH 25% COMPRESSION.
JOINT FILLER SHALL BE SEMI-RIGID, NON ABSORBENT, CLOSED CELL POLYETHYLENE (PARBURY'S HYDROCELL OR APPROVED EQUIVALENT WITH A DENSITY OF 1.2kg/m^3 INSTALLED WITH 25% COMPRESSION.
JOINT FILLERS SHALL BE INSERTED IN THE GAP AFTER REMOVAL OF THE PULL-OUT STRIP OF CELLULAR POLYSTYRENE SHEET WHICH SHALL BE CUT BEFORE INSTALLATION.
THE SEALANT SHALL BE APPLIED BETWEEN 7:00am AND 11:00 am, AT TEMPERATURES NOT LESS THAN 10 deg C OR NOT MORE THAN 35 deg C.
JOINT WIDTHS AT INSTALLATION SHALL NOT EXCEED THE SPECIFIED WIDTH± MOVEMENT RANGE SPECIFIED

WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214658

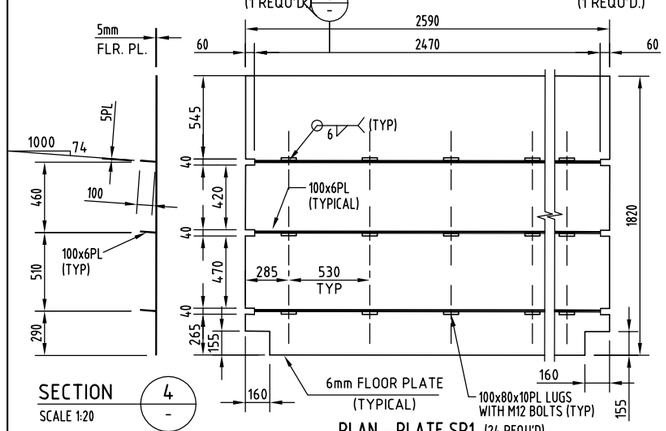


MARKING PLAN
SCALE 1:100



PLAN - PLATE SP2 - AS DRAWN, (1 REQU'D.)
PLATE SP5 - SIMILAR, AS NOTED, (1 REQU'D.)

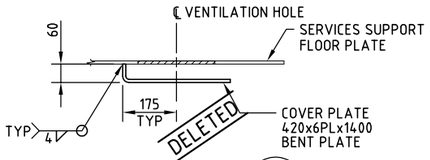
PLAN - PLATE SP3 - AS DRAWN, (1 REQU'D.)
PLATE SP4 - SIMILAR, AS NOTED, (1 REQU'D.)



PLAN - PLATE SP1 (24 REQU'D)

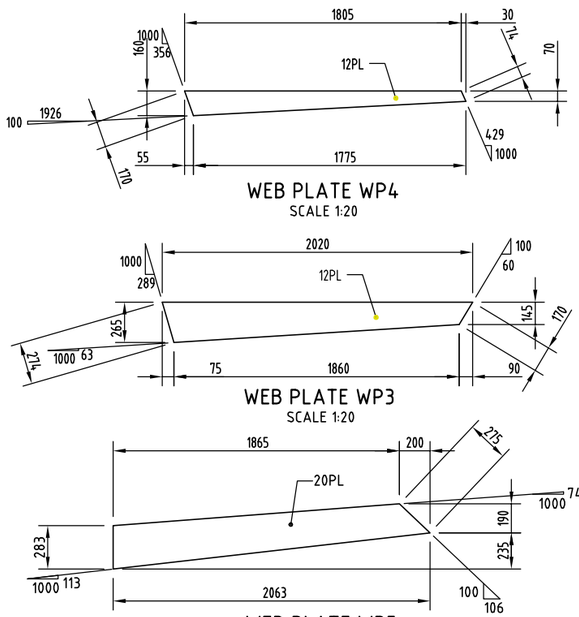
SECTION 4 SCALE 1:20

SERVICES SUPPORT FLOOR PLATES
NOTE: VENTILATION COVER PLATE - SP2 & SP3 NOT SHOWN FOR CLARITY



SECTION 6 SCALE 1:10

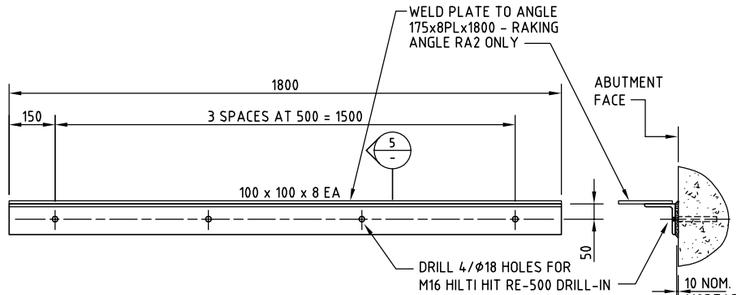
(SHOWING VENTILATION COVER PLATE) (SP2 AND SP3 ONLY)



WEB PLATE WP4 SCALE 1:20

WEB PLATE WP3 SCALE 1:20

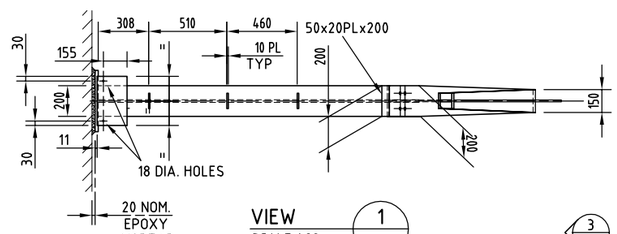
WEB PLATE WP5 SCALE 1:20



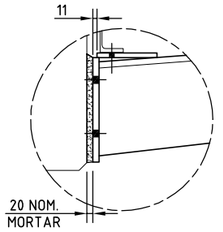
ELEVATION SCALE 1:10

SECTION 5 -

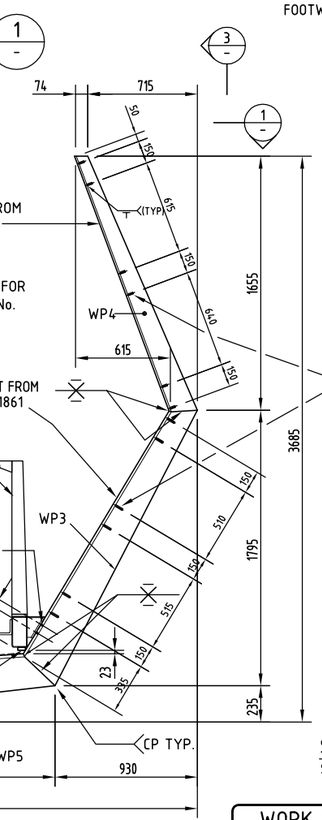
RAKING ANGLE - RA1 - AS DRAWN
RAKING ANGLE - RA2 - SIMILAR, AS NOTED
(2 OF EACH REQUIRED)



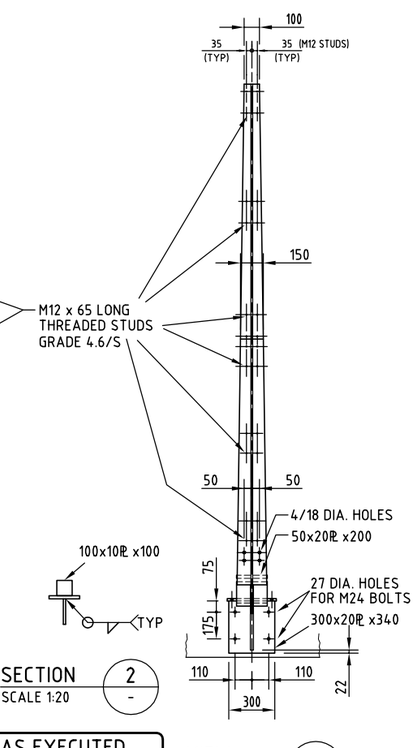
VIEW 1 - SCALE 1:20



DETAIL A - SCALE 1:10



GIRDER ELEVATION - FG1 SCALE 1:20
(26 REQUIRED)



SECTION 2 SCALE 1:20

VIEW 3 SCALE 1:20

NOTES

STEELWORK
1. ALL STRUCTURAL STEELWORK SHALL COMPLY WITH THE SPECIFICATIO
2. ROLLED SECTIONS SHALL BE GRADE 300PLUS AND SHALL COMPLY WITH AS 3679.
3. MINOR GUSSET PLATES SHALL BE GRADE 300 TO AS 3678.
4. PLATES SHALL BE ULTRASONICALLY TESTED IN ACCORDANCE WITH THE SPECIFICATIONS.

BOLTING
1. ALL HOLES TO BE DIA. 18 FOR M16 BOLTS U.N.O. AND DIA. 14 HOLES FOR M12 BOLTS U.N.O.
2. ALL BOLTS TO BE 8.8/TF NO THREAD ALLOWED IN SHEAR PLANE U.N.
3. ALL 8.8/TF BOLTED AREAS TO MAIN GIRDERS TO BE MASKED PRIOR TO PAINTING.

WELDING
1. ALL WELDS SHALL COMPLY WITH ANSI/AWS D1.1-96 AND AS 1554 PART 1 CATEGORY SP.
2. ALL WELDS SHALL BE GMAW U.N.O. ELECTRODE E48XX/W50X.

GALVANIZING
1. WALKWAY AND HANDRAIL ELEMENTS SHALL BE HOT DIP GALVANISED TO AS/NZS 4680-1999 AND IN ACCORDANCE WITH THE SPECIFICATIONS.
2. ALL VENT HOLES FOR GALVANIZING SHALL BE PUNCHED OR DRILLED.
3. UNLESS SHOWN ON DRAWING ALL VENT HOLES TO GALVANIZER
4. REQUIREMENTS TO AS/NZS 4680 SHALL BE FOLLOWED WHEN GALVANIZED TO AS 1214.

MORTAR
1. EPOXY MORTAR TO BE GRADE 40 MPa

ERECTION
1. DURING CONSTRUCTIONTHE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION ENSURING NO PART IS OVERSTRESSED.

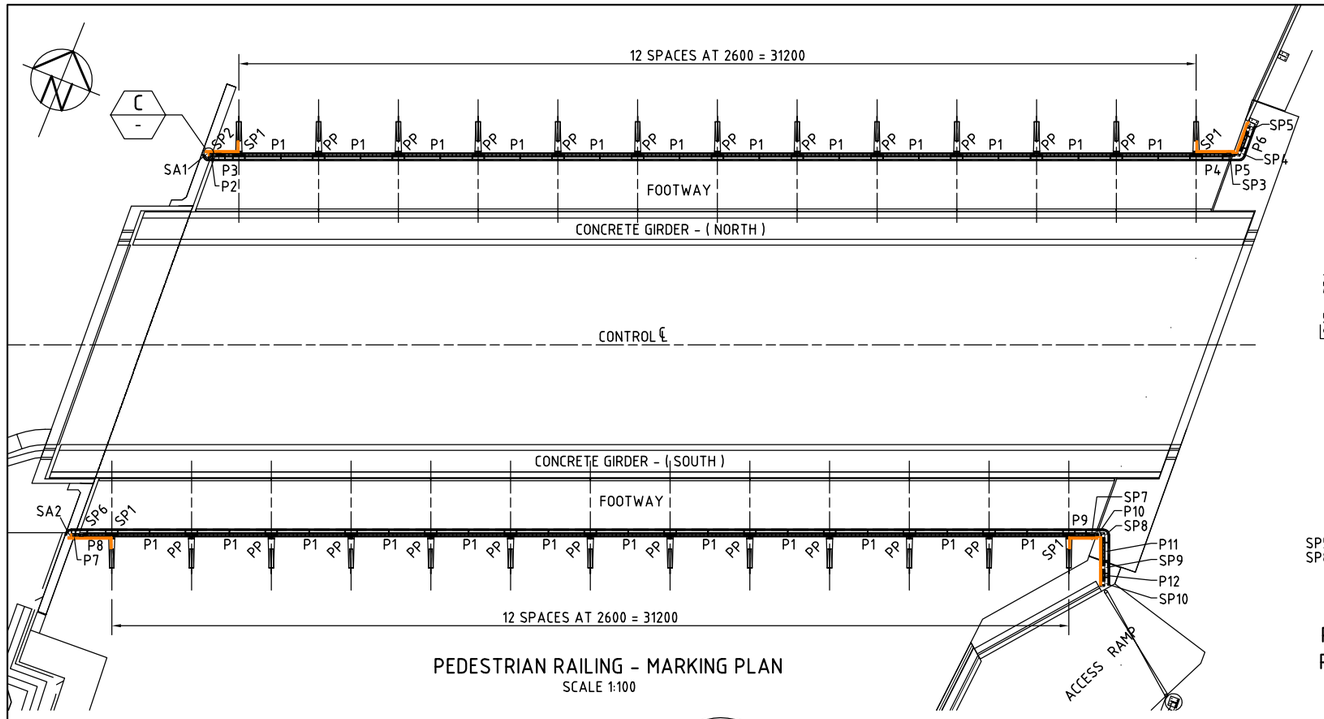
REFERENCE

GENERAL ARRANGEMENT.....PRL-G2-99251
PEDESTRIAN RAILING PRL-G2-99277
FOOTWAY SUPPORT STEELWORK DETAILS SHT 1 OF 2....PRL-G2-99280
FOOTWAY SUPPORT STEELWORK DETAILS SHT 2 OF 2....PRL-G2-99281

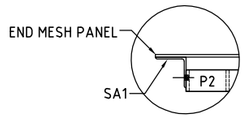
WORK AS EXECUTED
THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

Scales
(1:20 BEFORE REDUCTION)
(1:100 BEFORE REDUCTION)
SCALE IN METRES (U.N.O.) (AT A1 SHEET SIZE)

RIC/SRA EDMS ID CV0214659

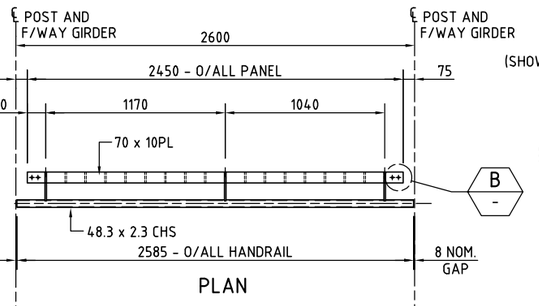


PEDESTRIAN RAILING - MARKING PLAN
SCALE 1:100

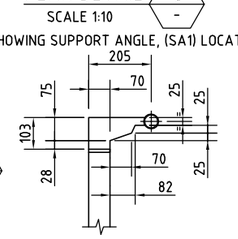


PLAN DETAIL C
SCALE 1:10

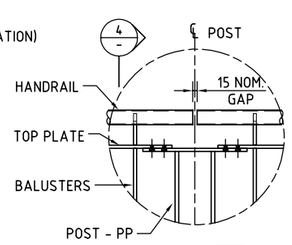
NOTE:
PROVIDE ϕ8 HOLES IN BACK PLATE OF POSTS SP1 TO SP10 FOR END MESH PANEL FIXING. REFER DRG. No. PRL-G2-99276.
PROVIDE ϕ14 HOLES IN BACK PLATE OF POSTS SP1 FOR TEMPORARY OHW PROTECTION SCREEN FIXING. REFER DRG. No. PRL-G2-99282



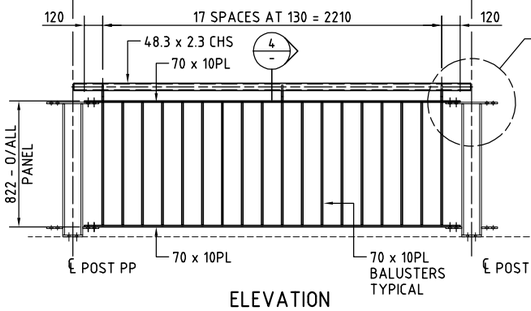
PLAN



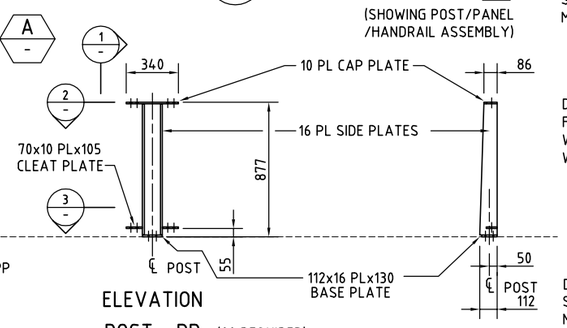
SECTION 4
SCALE 1:10
(SHOWING SUPPORT ANGLE, (SA1) LOCATION)



DETAIL A
SCALE 1:10
(SHOWING POST/PANEL /HANDRAIL ASSEMBLY)



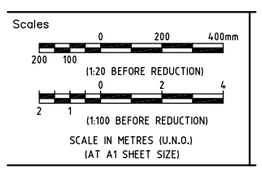
ELEVATION
PANEL - P1 (24 REQUIRED)

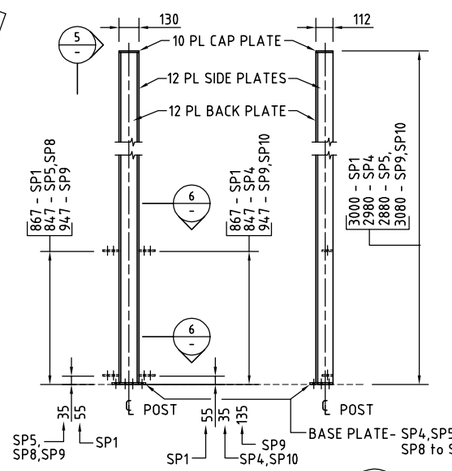


ELEVATION
POST - PP (22 REQUIRED)

SECTION 1
SCALE 1:10

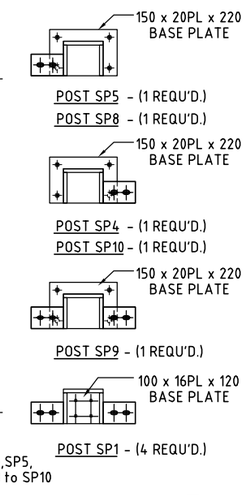
PEDESTRIAN RAILING
SCALE 1:20
(VIEWED FROM INSIDE TYPICAL)





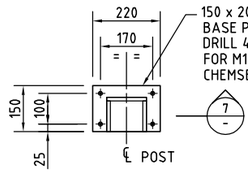
ELEVATION
SCALE 1:20

VIEW 5
SCALE 1:20

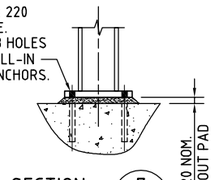


PLAN SECTION 6
SCALE 1:10
REFER SECTION 3 FOR DETAILS

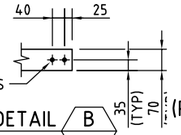
POST - SP1 - (AS DRAWN)
POST - SP4, SP5, SP8 to SP10 - (SIMILAR AS NOTED)



PLAN SCALE 1:10

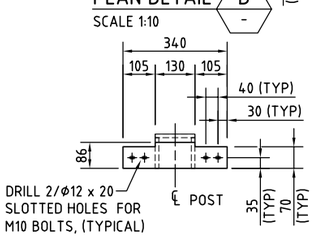


SECTION 7

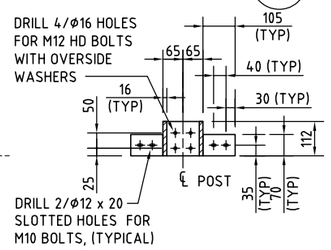


PLAN DETAIL B
SCALE 1:10

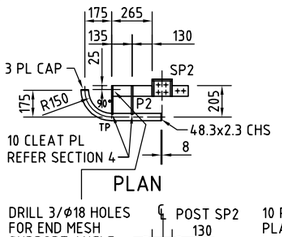
BASE PLATE DETAIL
(POST - SP4, SP5, SP8 to SP10)



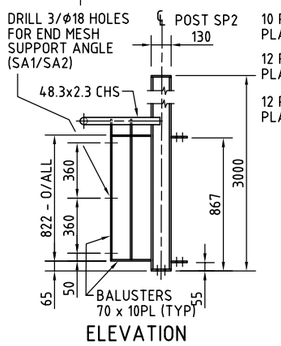
PLAN SECTION 2
SCALE 1:10



PLAN SECTION 3
SCALE 1:10

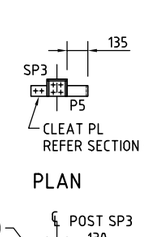


PLAN

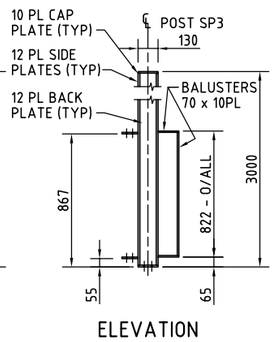


ELEVATION
POST - SP2/PANEL P2
(1 REQUIRED)

POST - SP6/PANEL P7
(1 REQUIRED - OPPOSITE HAND)



PLAN



ELEVATION
POST - SP3/PANEL P5
(1 REQUIRED)

POST - SP7/PANEL P10
(1 REQUIRED - OPPOSITE HAND)

NOTES
GENERAL

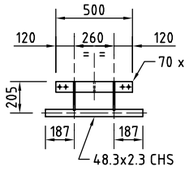
1. SCALE 1:20 UNLESS SPECIFIED OTHERWISE
2. DIMENSIONS NOT TO BE SCALED FROM THE DRAWINGS.
3. DIMENSIONS ARE IN MILLIMETRES.

STEELWORK

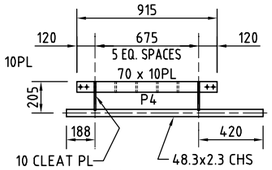
REFER DRAWING No. PRL-G2-99275

REFERENCE

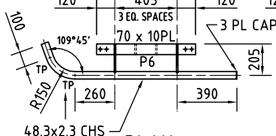
GENERAL ARRANGEMENT	PRL-G2-99251
FOOTWAY GIRDERS PLAN & DETAILS	PRL-G2-99275
FOOTWAY SUPPORT STEELWORK DETAILS SHT 1 OF 2	PRL-G2-99280
FOOTWAY SUPPORT STEELWORK DETAILS SHT 2 OF 2	PRL-G2-99281



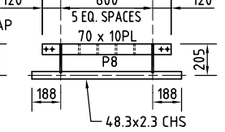
PLAN
PANEL - P3
(1 REQUIRED)



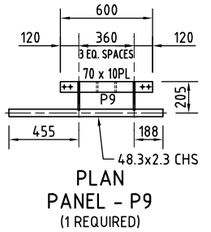
PLAN
PANEL - P4
(1 REQUIRED)



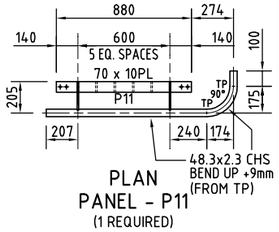
PLAN
PANEL - P6
(1 REQUIRED)



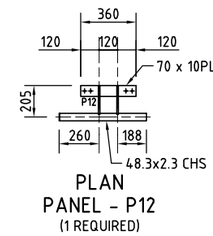
PLAN
PANEL - P8
(1 REQUIRED)



PLAN
PANEL - P9
(1 REQUIRED)



PLAN
PANEL - P11
(1 REQUIRED)

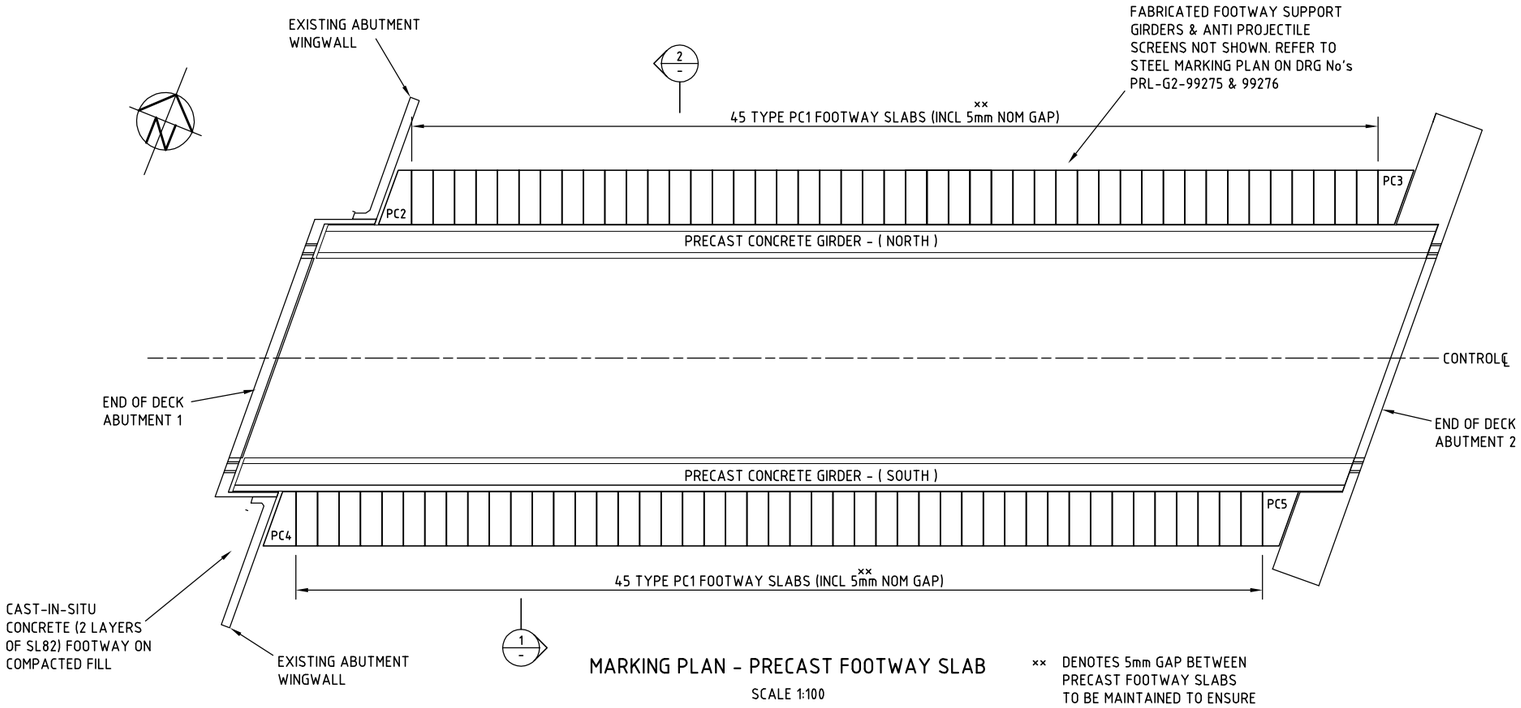


PLAN
PANEL - P12
(1 REQUIRED)

PANEL HEIGHT 'H'	
PANEL No.	'H' (mm)
P1	822
P2	822
P3	822
P4	822
P5	822
P6	822
P7	822
P8	822
P9	822
P10	822
P11	822
P12	922

WORK AS EXECUTED
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RIC/SRA EDMS ID CV0214661



MARKING PLAN - PRECAST FOOTWAY SLAB

SCALE 1:100

×× DENOTES 5mm GAP BETWEEN PRECAST FOOTWAY SLABS TO BE MAINTAINED TO ENSURE VENTILATION TO SERVICES.

NOTES

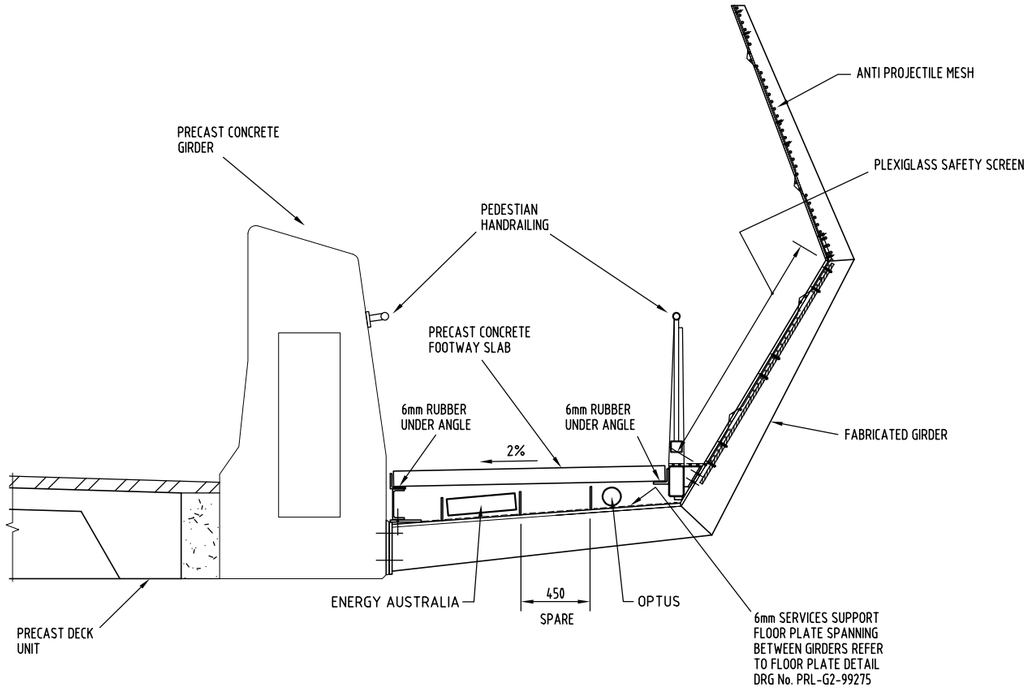
CONCRETE

REFER DRG. No. PRL-G2-99279.

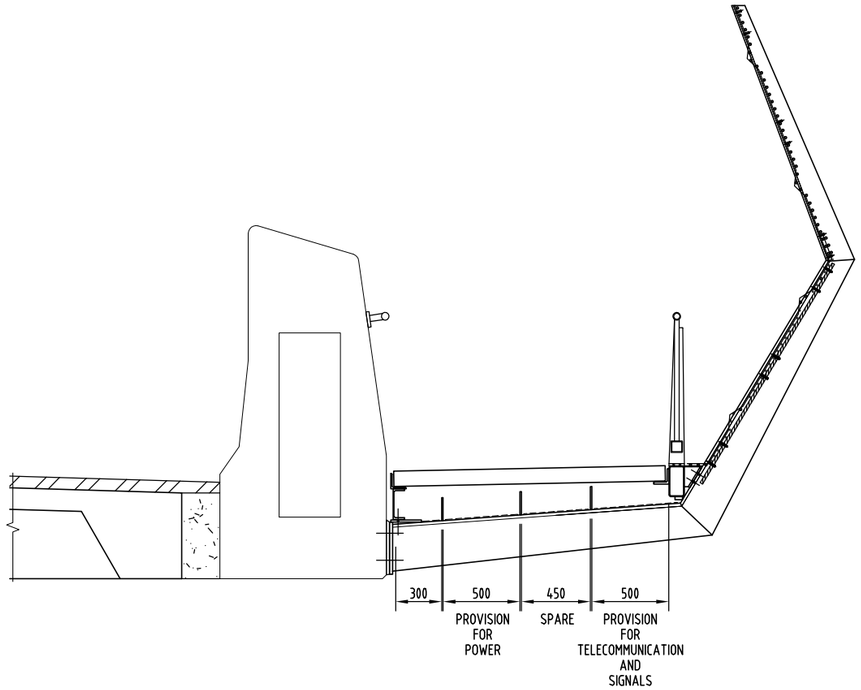
REFERENCE

GENERAL ARRANGEMENT PRL-G2-99251

PRECAST FOOTWAY SLABS SHEET 2 OF 2.....PRL-G2-99279



SECTION 1 / - SCALE 1:20



SECTION 2 / - SCALE 1:20

Scales

0 2 4

2 1

(1:100 BEFORE REDUCTION)

0 400 800mm

400 200

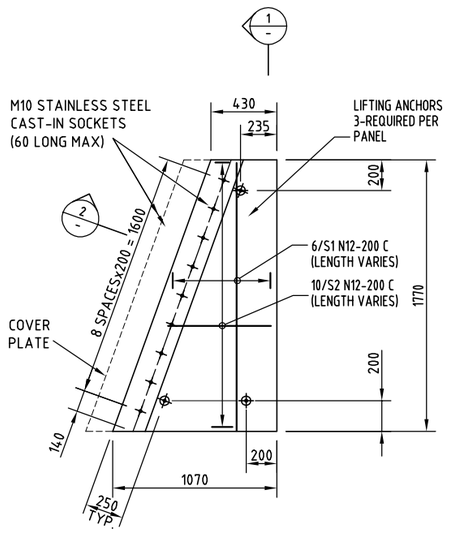
(1:20 BEFORE REDUCTION))

SCALE IN METRES U.N.O. (AT A1 SHEET SIZE)

WORK AS EXECUTED

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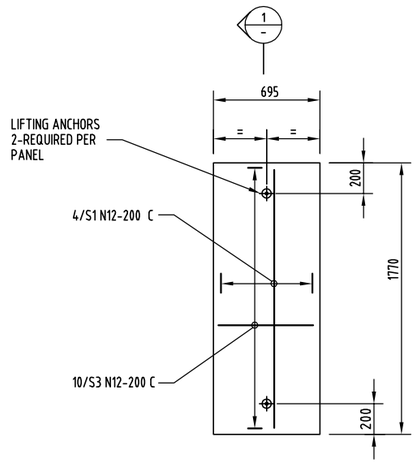
RIC/SRA EDMS ID CV0214662



TYPE PC2 - (1 REQUIRED)
TYPE PC4 - (1 REQUIRED)

SCALE 1:20

APPROX. MASS = 0.4 TONNES

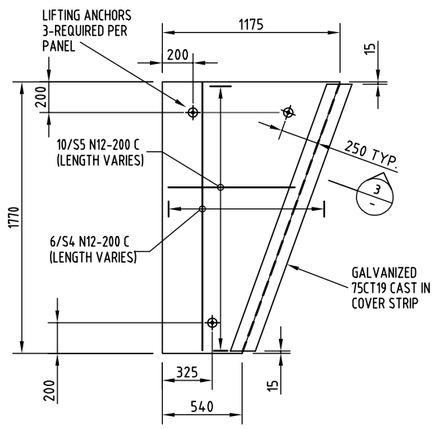


TYPE PC1 - (90 REQUIRED)

SCALE 1:20

APPROX. MASS = 0.3 TONNES

REINFORCEMENT MAY BE
LOCALLY DISPLACED TO
AVOID LIFTING ANCHORS



TYPE PC3 - (1 REQUIRED)
TYPE PC5 - (1 REQUIRED)

SCALE 1:20

APPROX. MASS = 0.4 TONNES

NOTES

CONCRETE

1. CONCRETE IN PRECAST SLAB SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 40MPa AT 28 DAYS.
2. MANUFACTURE OF PRECAST SLABS SHALL BE IN ACCORDANCE WITH R.T.A. FORM No's B80 & B110.
3. 25mm CHAMFERS & FILLETS SHALL BE PROVIDED TO ALL EXPOSED EDGES AND CORNERS UNO.
4. EXPOSURE CLASSIFICATION = B1.

REINFORCEMENT

1. ALL REINFORCEMENT BARS SHALL BE IN ACCORDANCE WITH AS/NZS 4671:2001 WHERE ALL BARS ARE GRADE 500 DEFORMED RIBBED BARS UNO.

   DESIGNATION OF REINFORCING BARS : 10/S1 N24-200 EF
   - No OF BARS
   - BAR SHAPE NOTATION
   - DUCTILITY CLASS AND DIA
   - SPACING OF BARS
   - LOCATION COMMENT
2. CLEAR COVER TO REINFORCEMENT SHALL BE 30mm.
3. COGS AND HOOKS SHALL BE IN ACCORDANCE WITH AUSTRALIAN BRIDGE DESIGN CODE 1996.
4. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR AS APPROVED IN WRITING BY THE PRINCIPAL.
5. BAR SHAPES SHALL BE IN ACCORDANCE WITH AS 1100.501-2002.
6. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT

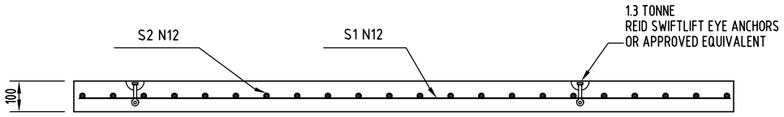
EW - EACHWAY	T - TOP FACE
EF - EACH FACE	B - BOTTOM FACE
NF - NEAR FACE	NF - NEAR FACE
FF - FARFACE	C - CENTRALLY PLACED

HANDLING

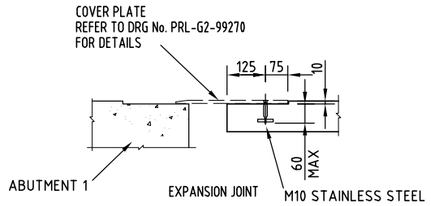
1. LIFTING ANCHORS TO BE "REID SWIFTLIFT" EYE ANCHORS OR APPROVED EQUIVALENT, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. SLABS SHALL BE LIFTED ONLY VIA LIFTING POINTS PROVIDED.
3. MAXIMUM ENCLOSED ANGLE BETWEEN LIFTING ROPES IS 90°
4. MANUFACTURER / CONTRACTOR TO ENSURE LIFTING CAPACITIES ARE NOT EXCEEDED DURING STRIPPING AND HANDLING.
5. STABILITY OF SLABS DURING LIFTING TO BE MAINTAINED.

REFERENCE

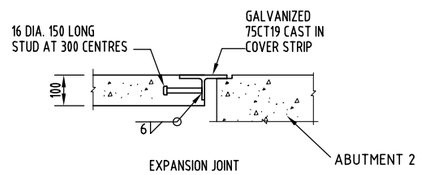
GENERAL ARRANGEMENT PRL-G2-99251
PRECAST FOOTWAY SLABS SHEET 1 OF 2.....PRL-G2-99278



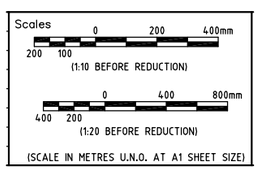
SECTION 1 / - / SCALE 1:10



SECTION 2 / - / SCALE 1:10

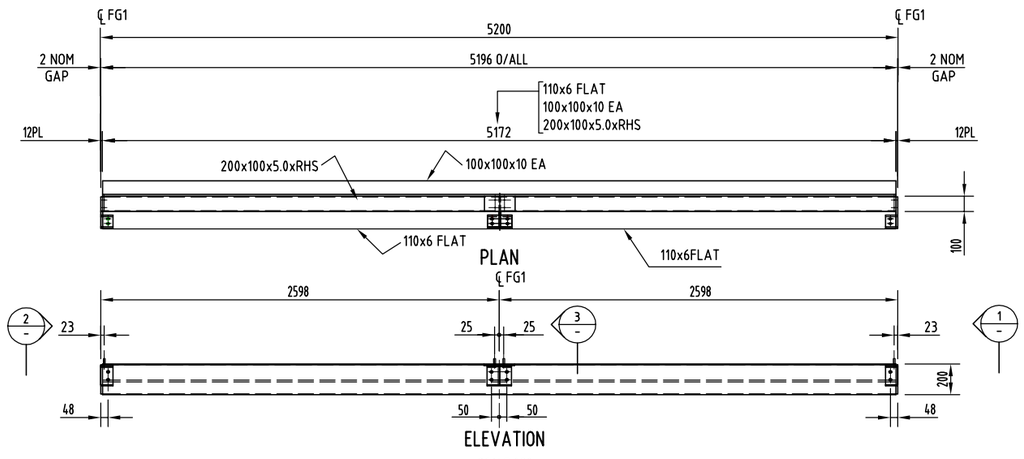


SECTION 3 / - / SCALE 1:10



WORK AS EXECUTED
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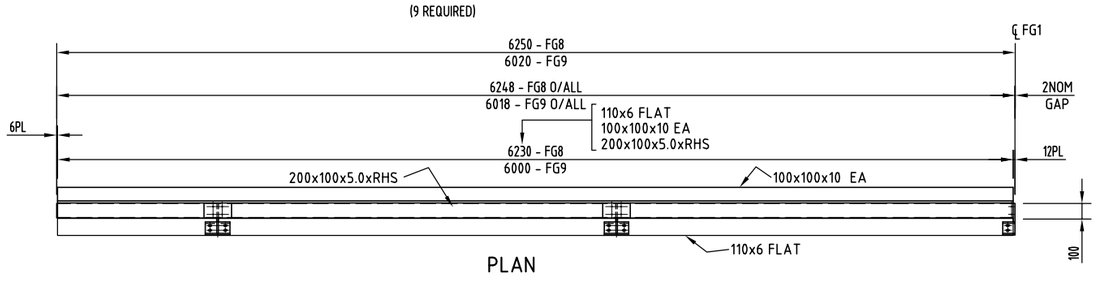
RIC/SRA EDMS ID CV0214663

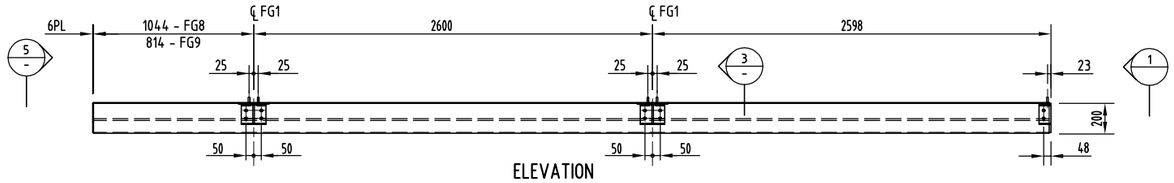


SCALE 1:20

FOOTPATH SUPPORT GIRDER - MARK FG3

(9 REQUIRED)

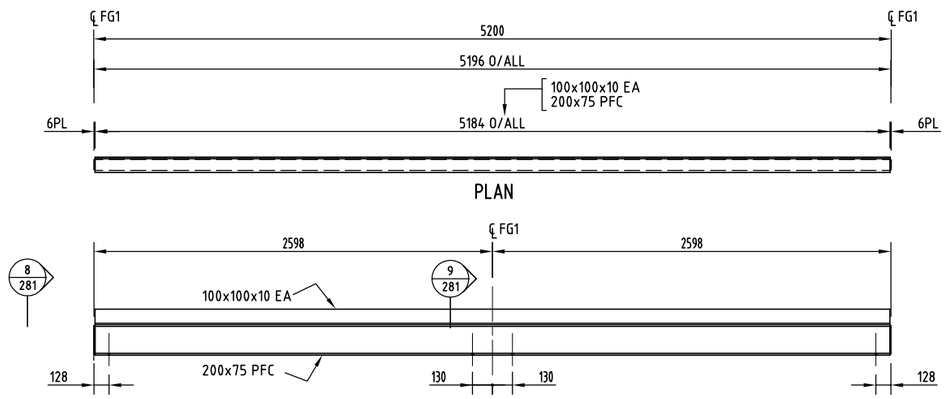




SCALE 1:20

FOOTPATH SUPPORT GIRDER - MARK FG8 - AS DRAWN (1 REQUIRED)

- MARK FG9 - OPPOSITE HAND, AS NOTED (1 REQUIRED)



SCALE 1:20

FOOTPATH SUPPORT GIRDER - MARK FG6

(9 REQUIRED)

Scales

0 100 200mm

100 50

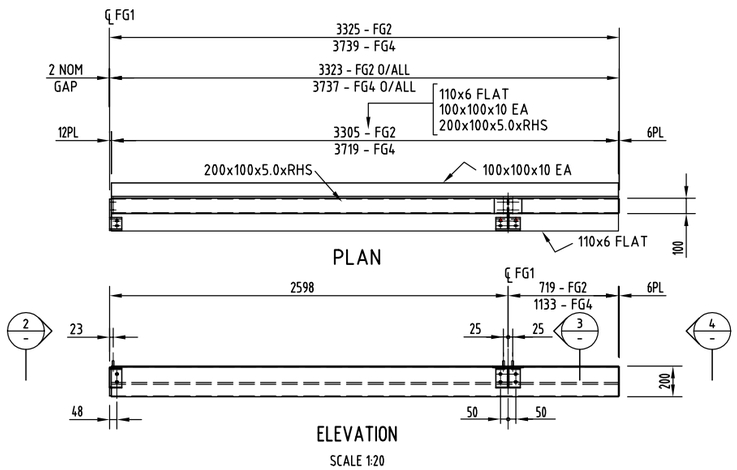
(1:5 AT A1 BEFORE REDUCTION)

0 400 800mm

400 200

(1:20 BEFORE REDUCTION)

(SCALE IN METRES U.N.O. AT A1 SHEET SIZE)



SCALE 1:20

FOOTPATH SUPPORT GIRDER - MARK FG2 - AS DRAWN (1 REQUIRED)

- MARK FG4 - OPPOSITE HAND, AS NOTED (1 REQUIRED)

NOTES

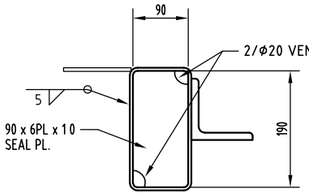
STEELWORK

REFER DRG No. PRL-G2-99275

REFERENCE

GENERAL ARRANGEMENT PRL-G2-99251

FOOTWAY GIRDER PLAN AND DETAILS.....PRL-G2-99275

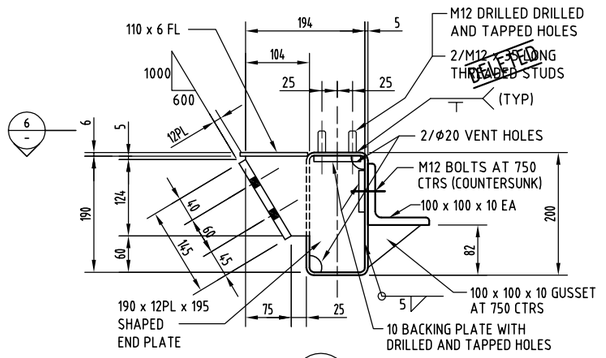


VIEW 4 - AS DRAWN

SCALE 1:5

VIEW 5 - OPPOSITE HAND

SCALE 1:5

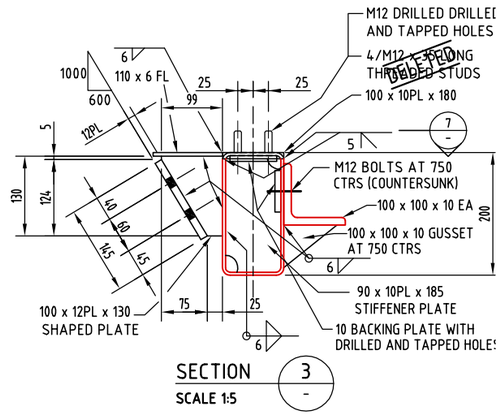


VIEW 1 - AS DRAWN

SCALE 1:5

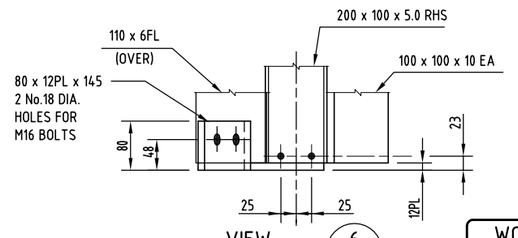
VIEW 2 - OPPOSITE HAND

SCALE 1:5



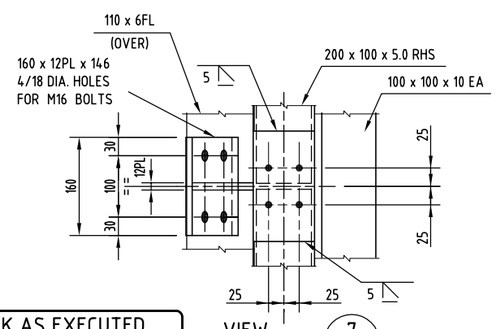
SECTION 3

SCALE 1:5



VIEW 6

SCALE 1:5



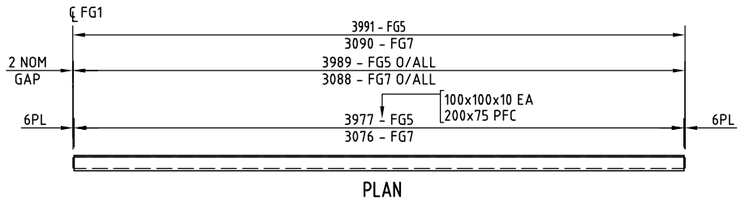
VIEW 7

SCALE 1:5

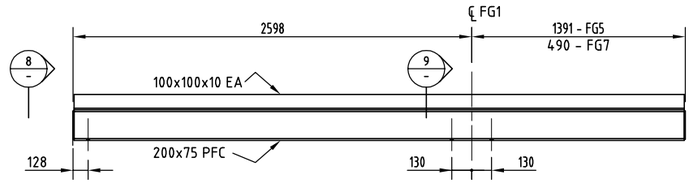
WORK AS EXECUTED

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RIC/SRA EDMS ID CV0214664



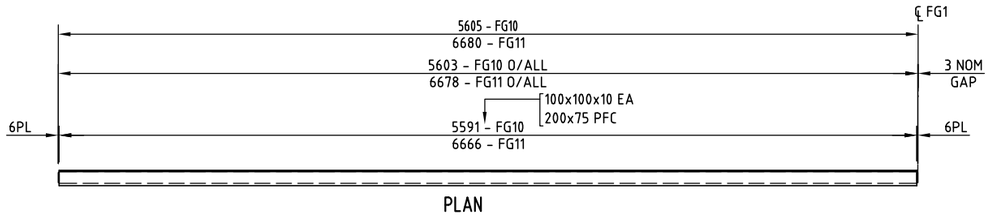
PLAN



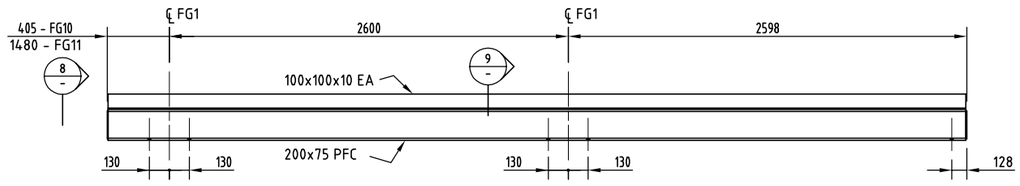
ELEVATION

SCALE 1:20

FOOTPATH SUPPORT GIRDER - MARK FG5 - AS DRAWN (1 REQUIRED)
- MARK FG7 - OPPOSITE HAND, AS NOTED (1 REQUIRED)



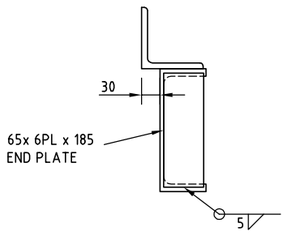
PLAN



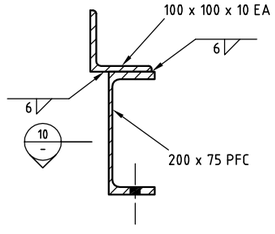
ELEVATION

SCALE 1:20

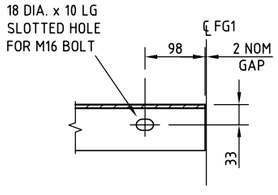
FOOTPATH SUPPORT GIRDER - MARK FG10 - AS DRAWN (1 REQUIRED)
- MARK FG11 - OPPPOSITE HAND, AS NOTED (1 REQUIRED)



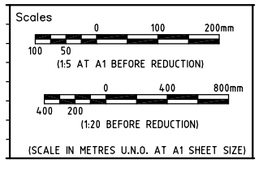
VIEW 8
SCALE 1:5



VIEW 9
SCALE 1:5



VIEW 10
SCALE 1:5



NOTES

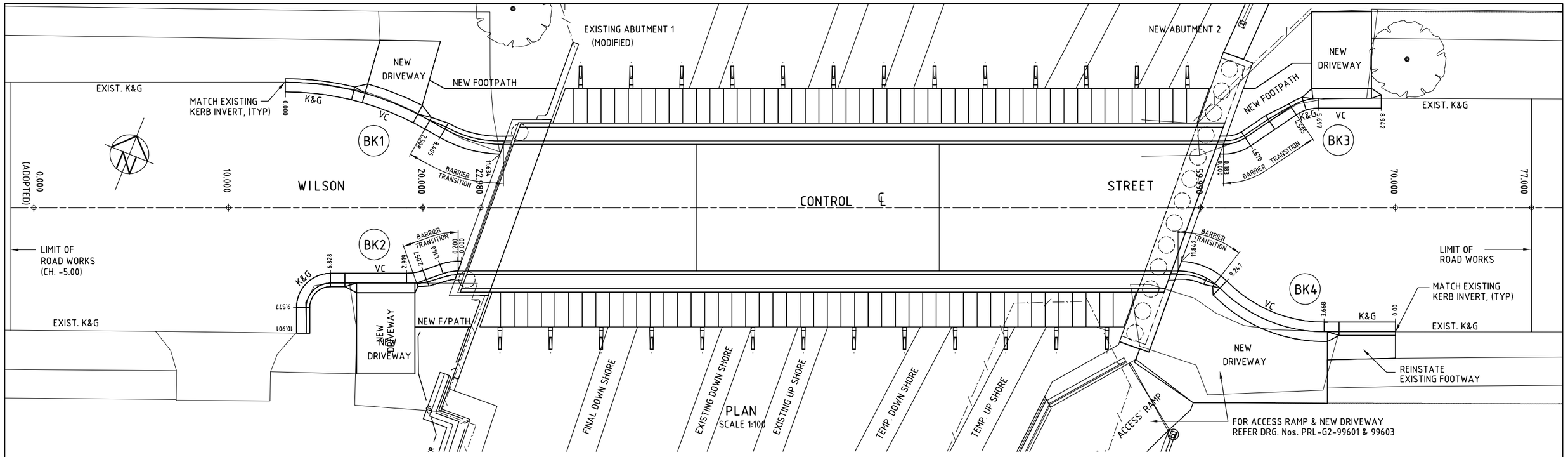
STEELWORK
REFER DRG No. PRL-G2-99275

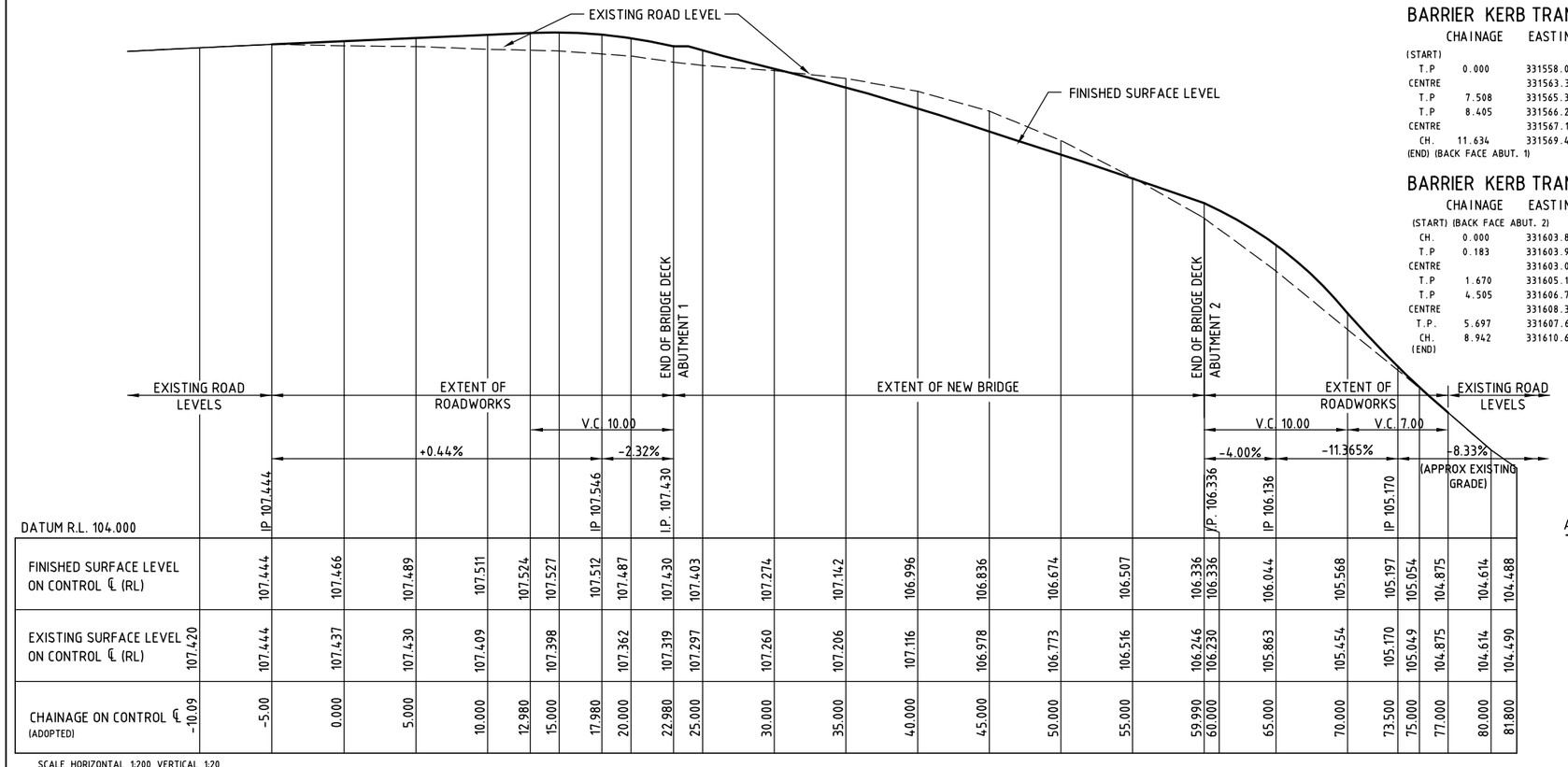
REFERENCE

GENERAL ARRANGEMENT PRL-G2-99251
FOOTWAY GIRDER PLAN AND DETAILS.....PRL-G2-99275

WORK AS EXECUTED
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RIC/SRA EDMS ID CV0214665

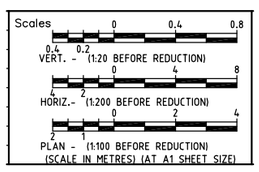




FINISHED SURFACE LEVEL ON CONTROL ℄ (RL)	107.444	107.444	107.466	107.489	107.511	107.524	107.527	107.512	107.487	107.430	107.403	107.274	107.142	106.996	106.836	106.674	106.507	106.336	106.336	106.044	105.568	105.197	105.054	104.875	104.614	104.488
EXISTING SURFACE LEVEL ON CONTROL ℄ (RL)	107.420	107.444	107.437	107.430	107.409		107.398	107.362	107.319	107.297	107.260	107.206	107.116	106.978	106.773	106.516	106.246	106.230	105.863	105.454	105.170	105.049	104.875	104.614	104.490	
CHAINAGE ON CONTROL ℄ (ADOPTED)	-10.09	-5.00	0.000	5.000	10.000	12.980	15.000	17.980	20.000	22.980	25.000	30.000	35.000	40.000	45.000	50.000	55.000	59.990	60.000	65.000	70.000	73.500	75.000	77.000	80.000	81.800

SCALE HORIZONTAL 1:200 VERTICAL 1:20

WILSON STREET - LONGITUDINAL SECTION



BARRIER KERB TRANSITION - BK1 (GUTTER LIP LINE)

	CHAINAGE	EASTING	NORTHING	BEARING	RADIUS
(START)					
T.P	0.000	331558.004	6259362.418	** 68°11'31"	
CENTRE		331563.391	6259348.956		14.500
T.P	7.508	331565.374	6259363.320	97°51'34"	
T.P	8.405	331566.263	6259363.197	97°51'34"	
CENTRE		331567.151	6259369.636		6.500
CH.	11.634	331569.439	6259363.552	69°23'40"	
(END) (BACK FACE ABUT. 1)					

BARRIER KERB TRANSITION - BK2 (GUTTER LIP LINE)

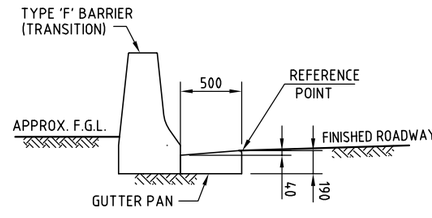
	CHAINAGE	EASTING	NORTHING	BEARING	RADIUS
(START) (BACK FACE ABUT. 1)					
CH.	0.000	331569.646	6259357.711	248°13'11"	
T.P.	0.200	331569.459	6259357.636	248°13'11"	
CENTRE		331570.488	6259355.085		2.750
T.P	1.140	331568.665	6259357.144	228°27'42"	
T.P	2.057	331567.978	6259356.536	228°27'42"	
CENTRE		331566.321	6259358.407		2.500
T.P	2.919	331567.248	6259356.086	248°13'11"	
T.P	6.828	331563.619	6259354.635	248°13'11"	
CENTRE		331564.268	6259353.010		1.750
T.P	9.577	331562.643	6259352.361	158°13'11"	
CH.	10.901	331563.134	6259351.133	** 158°13'11"	
(END)					

BARRIER KERB TRANSITION - BK3 (GUTTER LIP LINE)

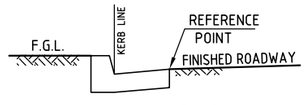
	CHAINAGE	EASTING	NORTHING	BEARING	RADIUS
(START) (BACK FACE ABUT. 2)					
CH.	0.000	331603.806	6259377.282	68°13'11"	
T.P	0.183	331603.975	6259377.350	68°13'11"	
CENTRE		331603.047	6259379.672		2.500
T.P	1.670	331605.117	6259378.269	34°06'51"	
T.P	4.505	331606.707	6259380.617	34°06'51"	
CENTRE		331608.363	6259379.495		2.000
T.P.	5.697	331607.621	6259381.352	68°13'11"	
CH.	8.942	331610.635	6259382.556	** 68°13'11"	
(END)					

BARRIER KERB TRANSITION - BK4 (GUTTER LIP LINE)

	CHAINAGE	EASTING	NORTHING	BEARING	RADIUS
(START)					
CH.	0.000	331615.386	6259372.622	** 248°14'05"	
T.P.	3.668	331611.980	6259371.262	248°14'05"	
CENTRE		331609.384	6259377.763		7.000
C.T.P	9.247	331606.547	6259371.362	292°58'37"	
CENTRE		331605.181	6259368.140		3.500
CH.	11.842	331604.013	6259371.439	250°30'06"	
(END)					



TYPE 'F' SAFETY BARRIER TRANSITION



'SA' KERB & GUTTER (K&G)

(VC) - DENOTES STANDARD VEHICULAR CROSSING.
REFER RTA MODEL DRG. No. MD.R15.A08.A

WORK AS EXECUTED

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NOTES

GENERAL

a). SCALE 1:100 UNLESS NOTED OTHERWISE.
b). LW DENOTES 'LIMIT OF WORKS' FOR APPROACH ROADS.

DIMENSIONS

a). DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING.
b). CO-ORDINATES, CHAINAGES & REDUCED LEVELS ARE IN METRES.
c). CO-ORDINATES SHOWN THUS ** TO BE CHECKED ON SITE. (TO MATCH WITH EXISTING KERB).

SURVEY

a). ALL CO-ORDINATES ARE TO MAP GRID OF AUSTRALIA (MGA)
b). ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD)

REFERENCE

GENERAL ARRANGEMENT.....PRL-G2-99251
ABUTMENT 1 - CONCRETE.....PRL-G2-99255
ABUTMENT 2 - CONCRETE.....PRL-G2-99257

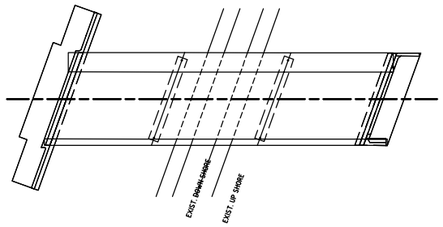
RIC/SRA EDMS ID CV0214667

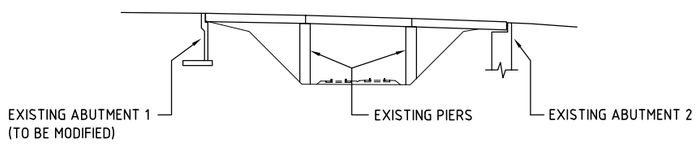
STAGE 1: DURING 1ST TRACK OCCUPATION

a). CLOSE WILSON STREET OVERBRIDGE TO ROAD TRAFFIC

a). INSTALL TEMPORARY GIRDER SUPPORT BRACKETS ON EXISTING PIERS.

b). CLOSE WILSON STREET OVERBRIDGE TO ROAD TRAFFIC.





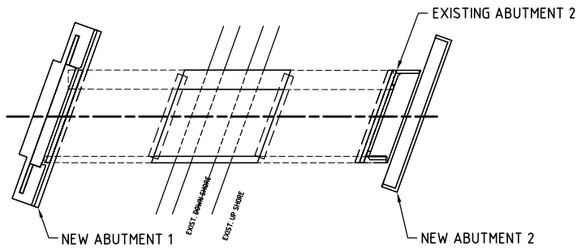
STAGE 2: PRIOR TO 2ND TRACK OCCUPATION

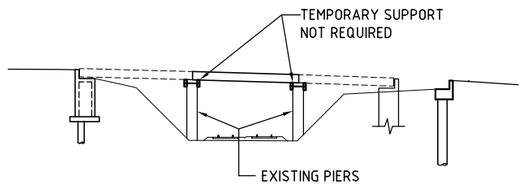
a). CONSTRUCT PRECAST CONCRETE MAIN GIRDER SEGMENTS AND PRECAST CONCRETE DECK UNITS.

b). CLOSE BRIDGE TO TRAFFIC, RELOCATE SERVICES AND REMOVE EXISTING BRIDGE END SPANS.

c). COMMENCE ABUTMENT CONSTRUCTION.

NOTE:
EXISTING UP AND DOWN NORTH SHORE LINE OPERATIONAL





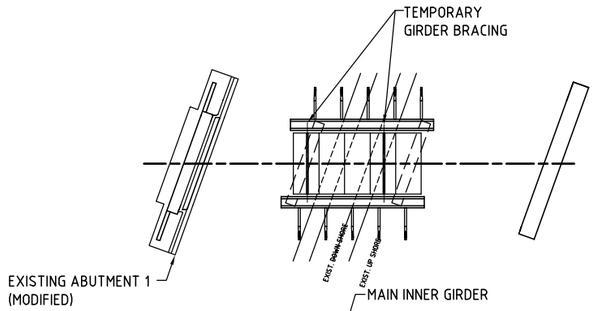
STAGE 3: DURING 2ND TRACK OCCUPATION

a). REMOVE EXISTING BRIDGE CENTRE SPAN.

b). ERECT MAIN GIRDER INNER SEGMENTS (INCLUDING PRE-ATTACHED WALKWAY FRAME)
INSTALL BRACING BETWEEN GIRDER SEGMENTS.

c). ERECT PRECAST DECK UNITS.

d). INSTALL FALSEWORK/FORMWORK FOR INSITU STITCH BETWEEN MAIN GIRDER AND DECK UNITS.



STAGE 4: PRIOR TO 3RD TRACK OCCUPATION

a). COMPLETE NEW ABUTMENTS.

b). ERECT MAIN GIRDER OUTER SEGMENTS (INCLUDING PRE-ATTACHED WALKWAY FRAMES AND INSTALL BRACING BETWEEN GIRDER SEGMENTS. GIRDERS ARE TO BE SUPPORTED ON TEMPORARY BEARINGS AT THE AND STRONGBACK STRESSED TO CENTRE OF GIRDER SEGMENT.

c). ERECT REMAINING PRECAST DECK UNITS.

d). INSTALL FORMWORK AND CAST INSITU STITCH BETWEEN MAIN GIRDER SEGMENTS. STITCH TO BE CAST AFTER 8.00 PM

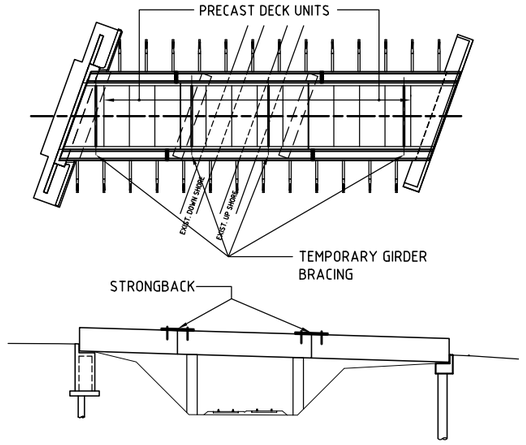
e). STRESS TENDONS T2 AND T5 WHEN STITCH CONCRETE HAS REACHED 15MPa AND BEFORE 10.00AM IN THE FOLLOWING MORNING AFTER CASTING THE STITCH.

f). STRESS TENDONS T1, T4, T3 AND T6 WHEN STITCH CONCRETE HAS REACHED 30MPa REMOVE STRONGBACKS CAST STRONGBACK RECESSES AND MAIN GIRDER END CAPS.

g). CAST INSITU CONCRETE DECK JOINT BETWEEN MAIN GIRDER AND DECK UNITS.

h). REMOVE TEMPORARY GIRDER BRACING.

NOTE:
EXISTING UP AND DOWN NORTH SHORE LINE OPERATIONAL



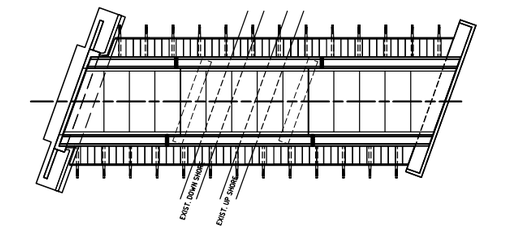
STAGE 5: DURING 3RD TRACK OCCUPATION

a). WHEN STITCH CONCRETE HAS REACHED 40MPa LIFT SPAN OFF INTERMEDIATE SUPPORTS BY JACKING AT ABUTMENTS.

b). DEMOLISH EXISTING PIERS AND REMOVE TEMPORARY SUPPORT BRACKETS AND SUPPORT FRAME.

c). REMOVE FALSEWORK/FORMWORK THE INSITU JOINT BETWEEN THE GIRDERS AND DECK UNITS.

d). COMPLETE WALKWAY ERECTION OVER RAILWAY.



STAGE 6: AFTER 3RD TRACK OCCUPATION

a). LOWER SPAN ONTO PERMANENT BEARINGS.

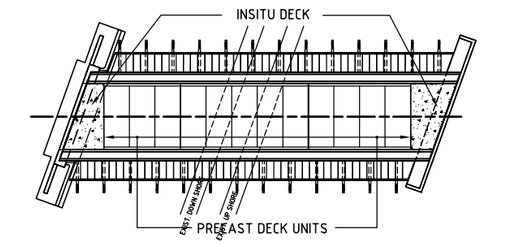
b). CAST INSITU END DECK SECTIONS.

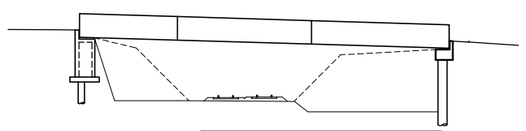
c). GROUT JOINTS BETWEEN PRECAST DECK UNITS.

d). COMPLETE BRIDGE WORKS INCLUDING SURFACING, TEMPORARY AND PERMANENT DECK JOINTS, SERVICE RELOCATION, LIGHTING ETC.

d). OPEN WILSON STREET OVERBRIDGE TO ROAD TRAFFIC.

NOTE:
EXISTING UP AND DOWN NORTH SHORE LINE OPERATIONAL





WORK AS EXECUTED

THIS DRAWING SHOWS WORK AS EXECUTED. ANY DEPARTURES FROM THE ORIGINAL DESIGN DETAILS ARE BASED SOLELY ON INFORMATION PROVIDED BY JOHN HOLLAND PTY LTD.

RIC/SRA EDMS ID CV0214668

Scales

NOT TO SCALE

PACIFIC PLACE

RAILWAY STREET CHATSWOOD

RAILWAY ENCLOSURE STRUCTURE - WORK AS EXECUTED

OCTOBER 2001

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1018.01	STAGE 2 - HELP STREET BRIDGE
1019.01	STAGE 2 - PRB1 BEAM INSERT LOCATIONS
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STRUCTURAL

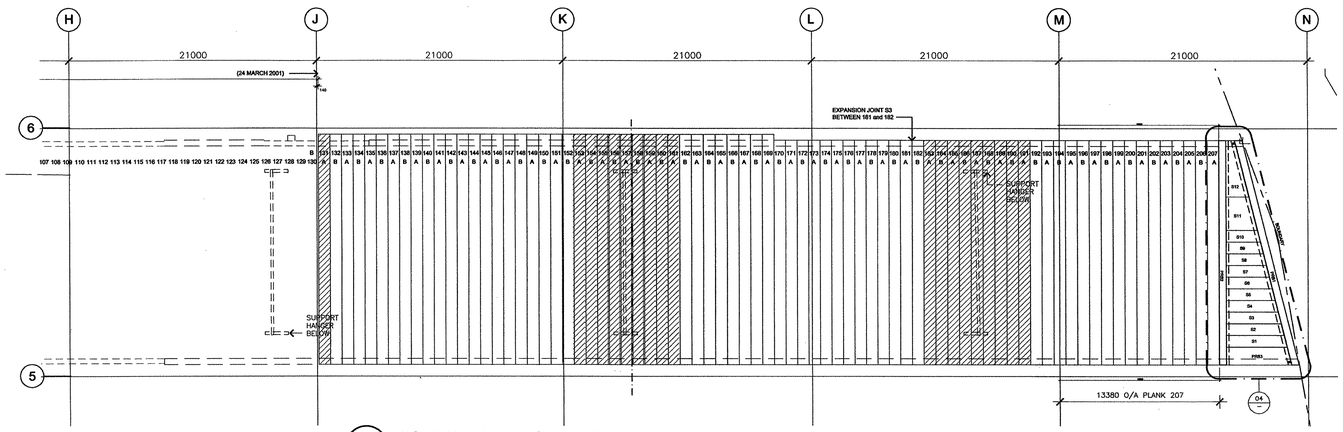
3000.D	GENERAL ARRANGEMENT
3001.B	PILES SETTING OUT PLAN
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3003.B	ENCLOSURE WALL CONCRETE SHEET 2
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3601.B	LATRAL DRIVE END WALL ELEVATIONS
3602.E	CATWALK SAFETY BARRIER SOUTHERN END

WARNING SCANNED IMAGE
EDMS CV0014045

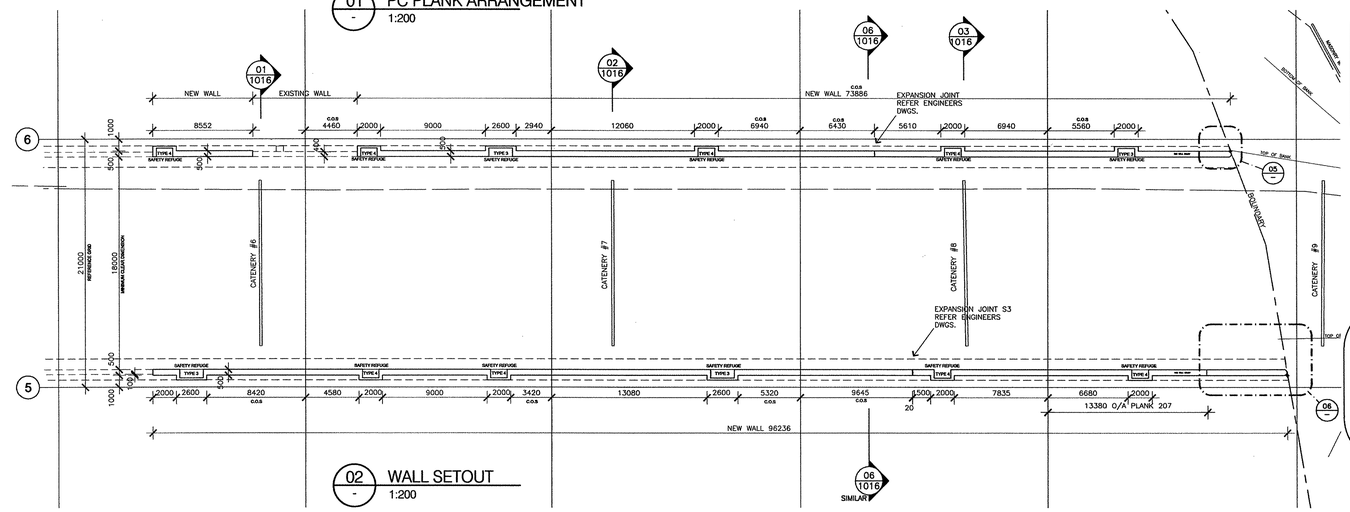
RAILWAY ENCLOSURE STRUCTURE

PACIFIC PLACE

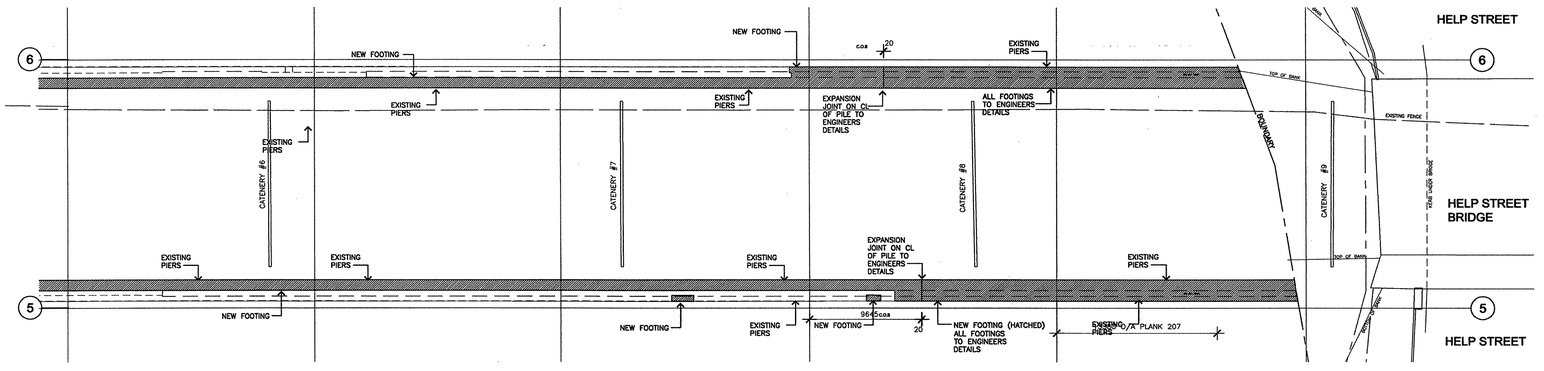
RAILWAY STREET- CHATSWOOD - NSW 2067



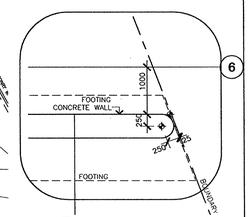
01 - PC PLANK ARRANGEMENT
1:200



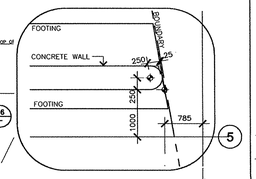
02 - WALL SETOUT
1:200



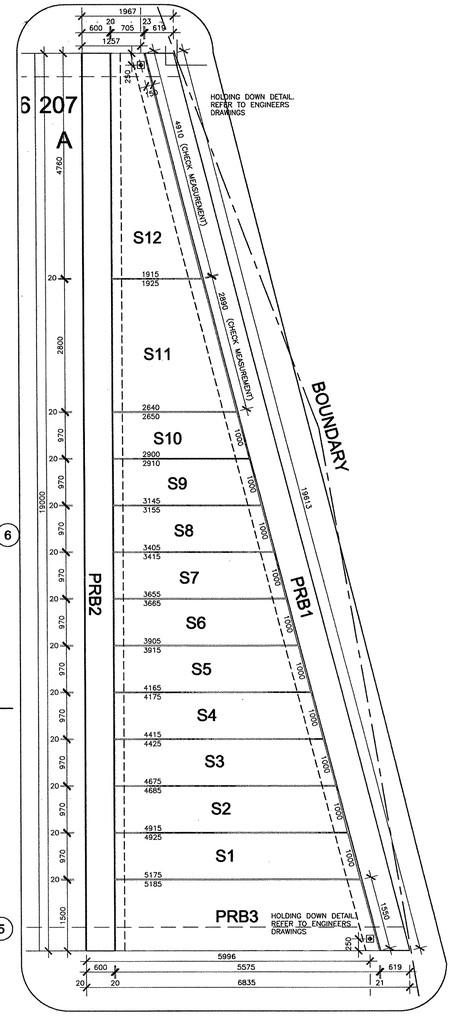
03 - FOOTING LAYOUT
1:200



05 - PLAN DETAIL
1:50



06 - PLAN DETAIL
1:50



04 - PLAN DETAIL
1:50

WARNING SCANNED IMAGE

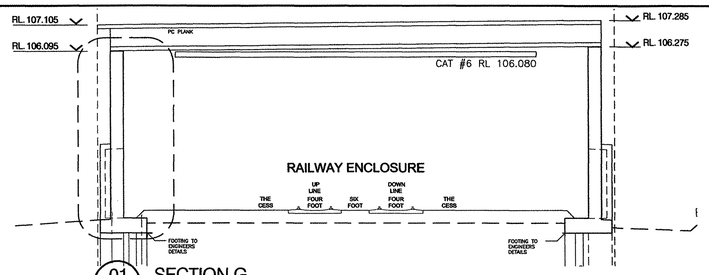
EDMS CV0014047

Table 2 - (Stage 2)

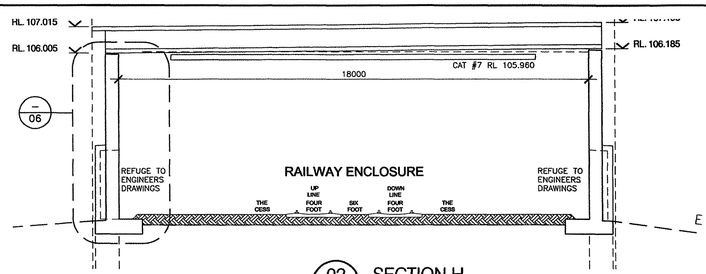
FERRULE SETS FOR CATENERY HANGERS ARE TO BE PROVIDED ON THE FOLLOWING PLANKS. (SHOWN SHADED)		
GANTRY #6	A	123,125,127,129,131
	B	124,126,128,130
GANTRY #7	A	153,155,157,159,161
	B	154,156,158,160
GANTRY #8	A	183,185,187,189,191
	B	184,186,188190
REFER TO ENGINEERS DRAWINGS		

NOTE:
REFER TO ENGINEERS DRAWINGS FOR REINFORCEMENT DETAILS, DIMENSIONS, CONCRETE STRENGTHS etc.

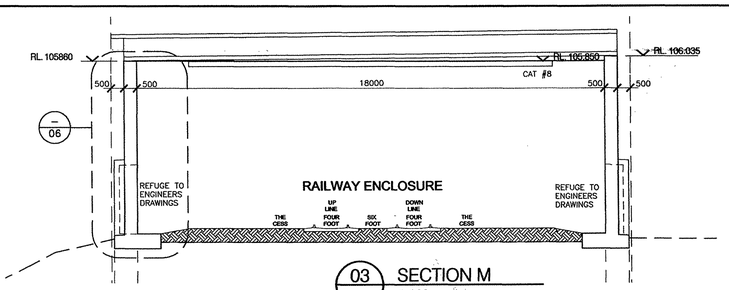
WORK AS EXECUTED



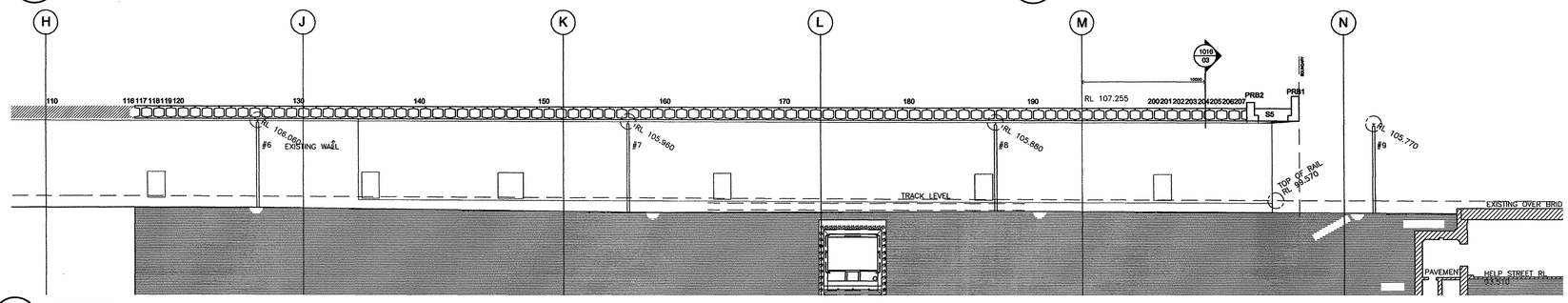
01 - SECTION G
1:100



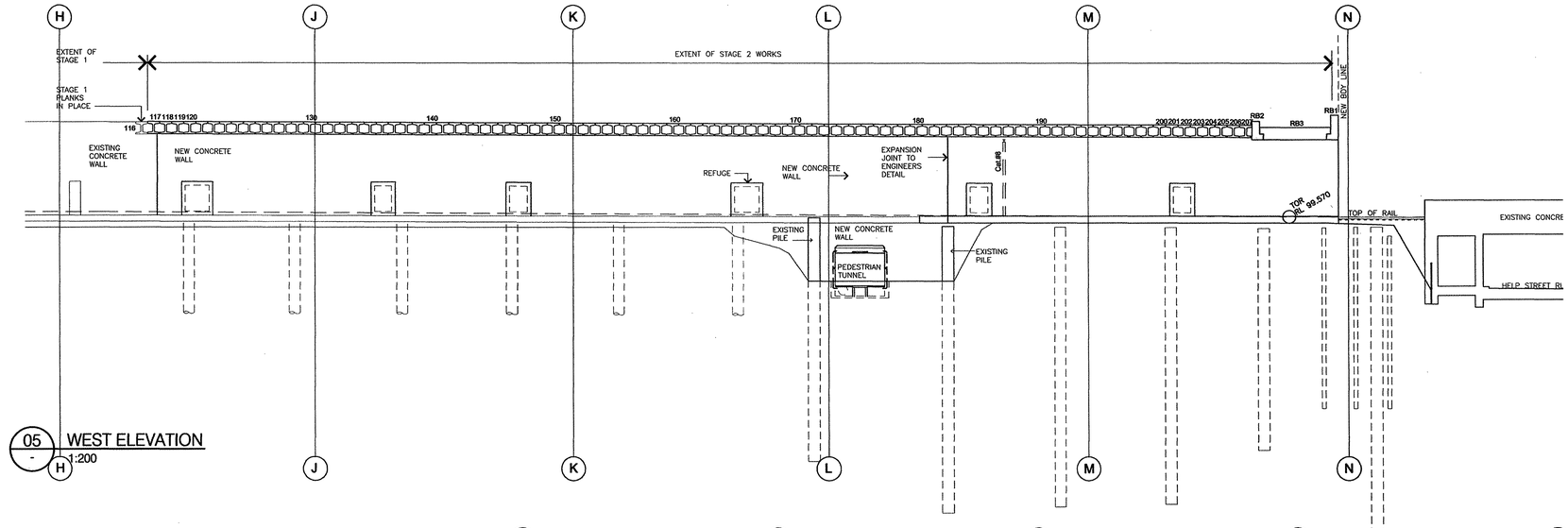
02 - SECTION H
1:100



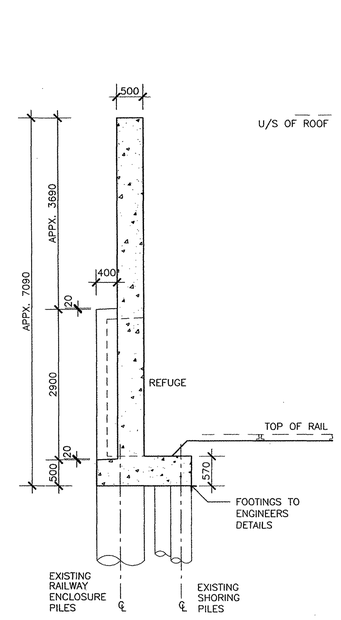
03 - SECTION M
1:100



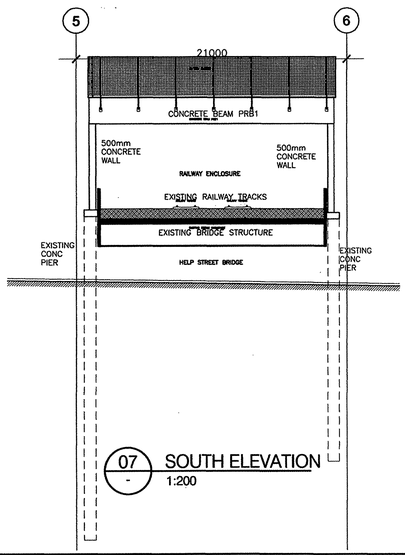
04 - SECTION A
1:200



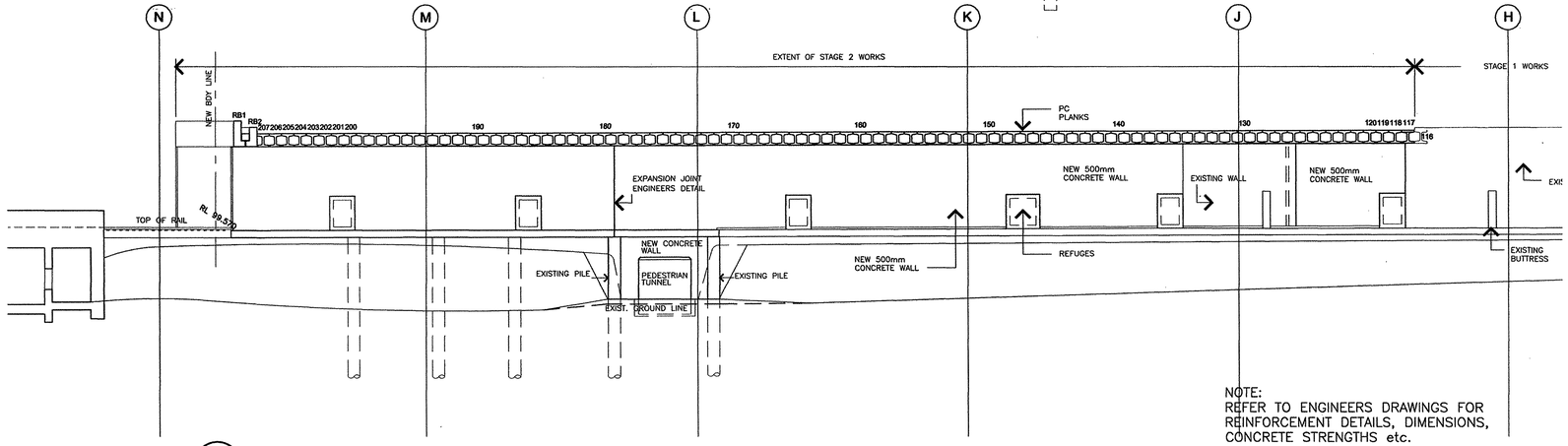
05 - WEST ELEVATION
1:200



06 - WALL SECTION
1:50



07 - SOUTH ELEVATION
1:200



08 - EAST ELEVATION
1:200

NOTE:
REFER TO ENGINEERS DRAWINGS FOR REINFORCEMENT DETAILS, DIMENSIONS, CONCRETE STRENGTHS etc.

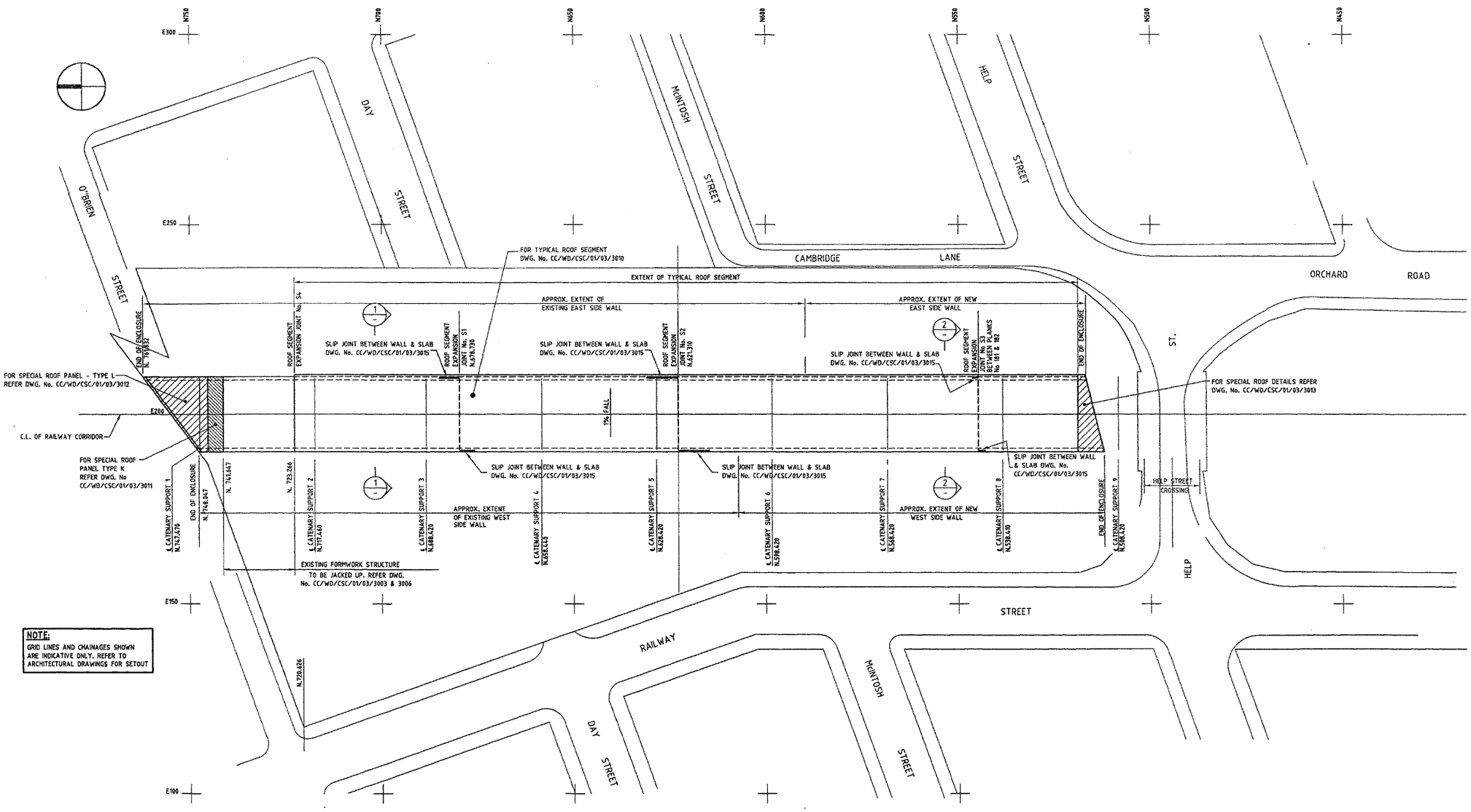
WORK AS EXECUTED

WARNING SCANNED IMAGE

EDMS CV0014052

NOTES:

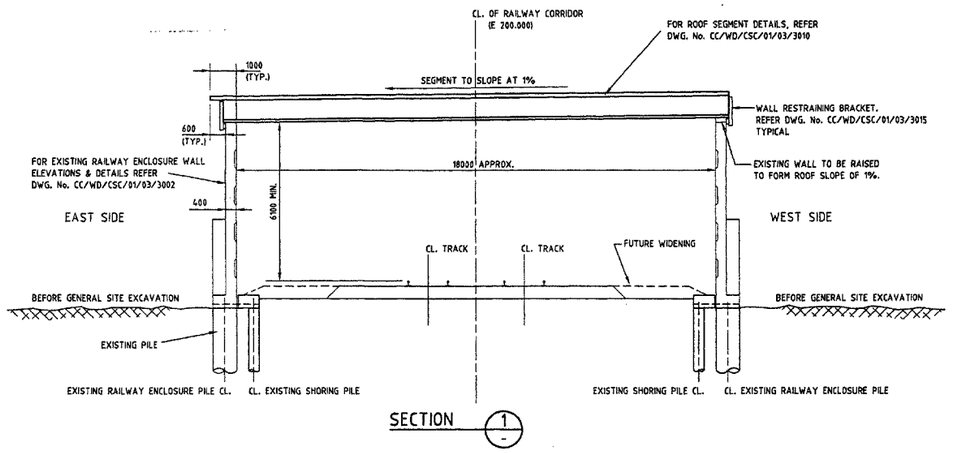
1. SCALES AS SHOWN.
2. DIMENSIONS ARE IN MILLIMETRES, CHAINAGES AND REDUCED LEVELS ARE IN METRES.
3. REDUCED LEVELS ARE TO AUSTRALIAN HEIGHT DATUM.
4. ENCLOSURE ROOF STRUCTURE SHALL BE GENERALLY CONSTRUCTED IN SEGMENTS USING 1000 DEEP x 970 WIDE PRETENSIONED CONCRETE 'I' SECTIONS CRANED INTO POSITION ON TOP OF EXISTING & NEW IN-SITU REINFORCED CONCRETE WALLS. SEGMENTS SHALL BE PLACED SIDE BY SIDE WITH 20mm NOM. GAP AND CONNECTED WITH SITE WELDED REINFORCEMENT IN REBATES LOCATED AT THE TOP OF FLANGES.
5. FOR STRUCTURAL NOTES REFER TO DRAWING NUMBER CC/WD/CSC/01/03/3045



NOTE:
GRID LINES AND CHAINAGES SHOWN ARE INDICATIVE ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR SETOUT

RAILWAY ENCLOSURE PLAN

SCALE 1 ; 500

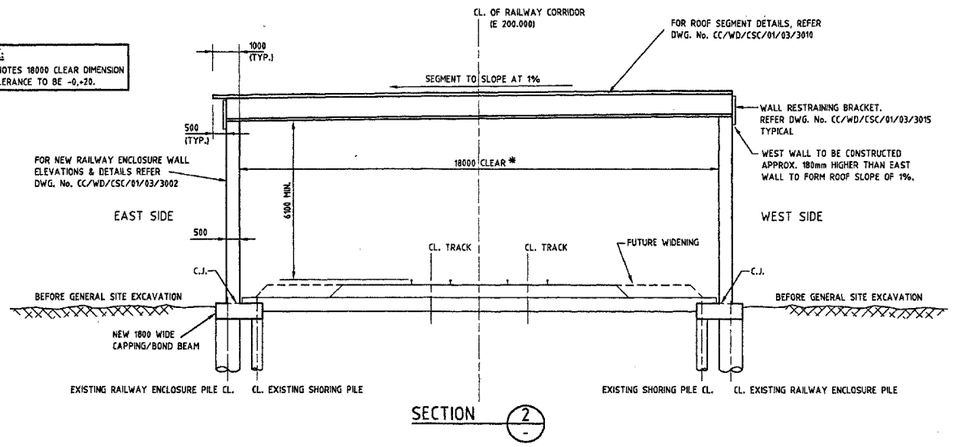


SECTION 1 / -

TYPICAL RAILWAY ENCLOSURE SECTION AT EXISTING WALLS

SCALE 1 : 100

NOTE:
* DENOTES 18000 CLEAR DIMENSION TOLERANCE TO BE -0,+20.



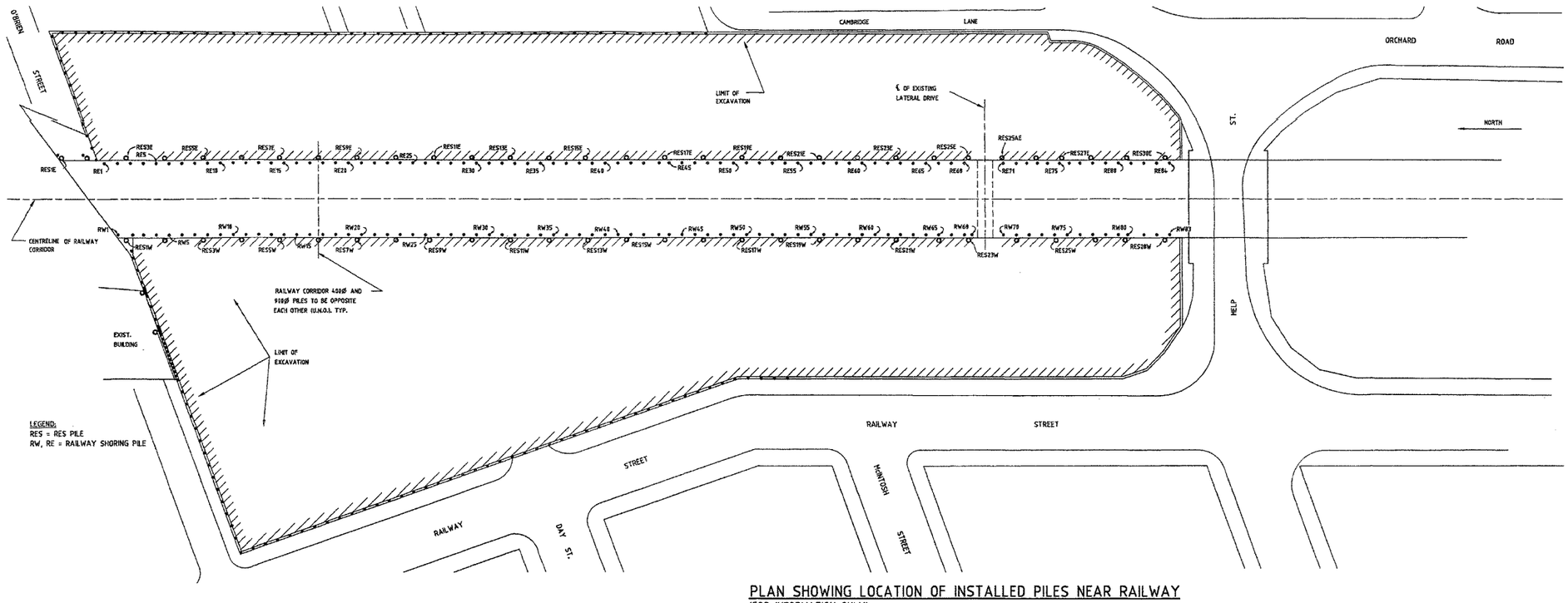
SECTION 2 / -

TYPICAL RAILWAY ENCLOSURE SECTION AT NEW WALLS

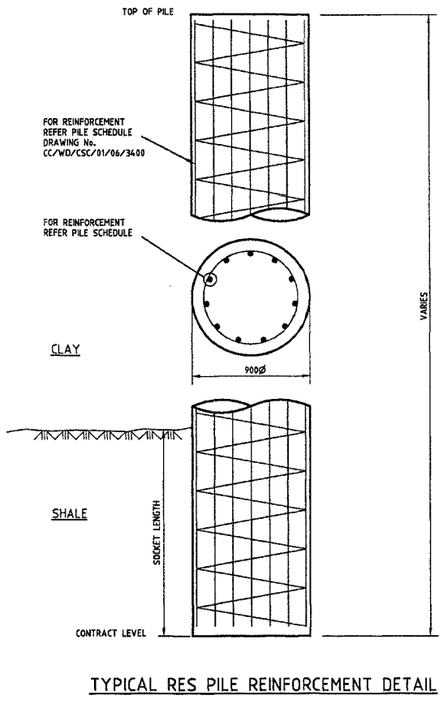
SCALE 1 : 100

EDMS CV0278720 WARNING SCANNED IMAGE

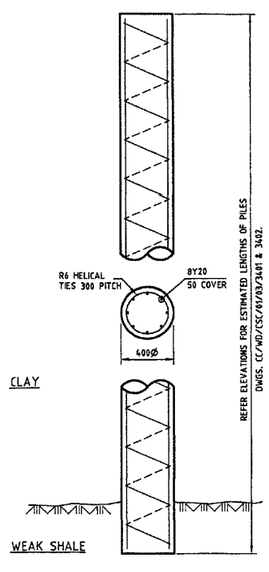
WORK AS EXECUTED



PLAN SHOWING LOCATION OF INSTALLED PILES NEAR RAILWAY
(FOR INFORMATION ONLY)



TYPICAL RES PILE REINFORCEMENT DETAIL

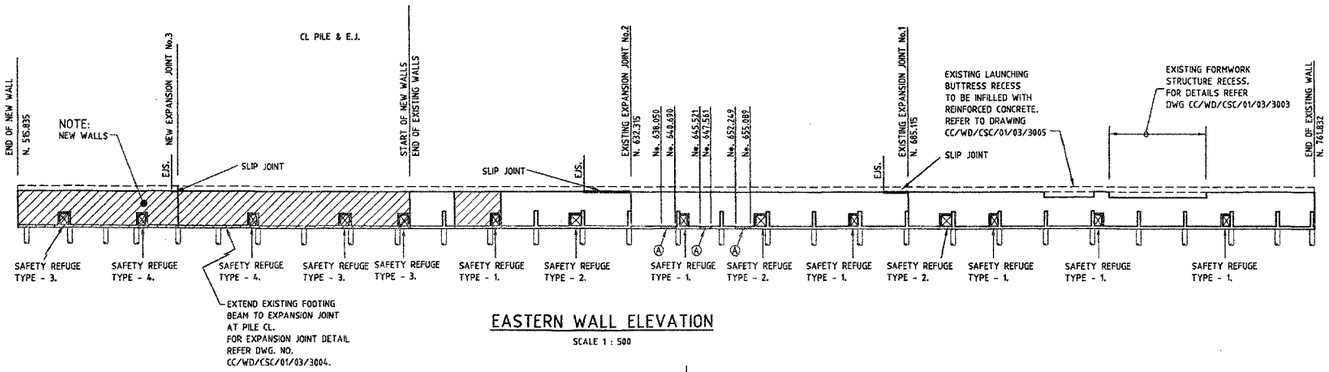


TYPICAL RAILWAY CORRIDOR SHORING PILE REINFORCEMENT DETAIL

1. ALL RAILWAY CORRIDOR SHORING PILES EMBEDDED 600 MIN. INTO WEAK SHALE OR TO R.L. SHOWN ON THE ELEVATIONS WHICH EVER IS THE DEEPER.

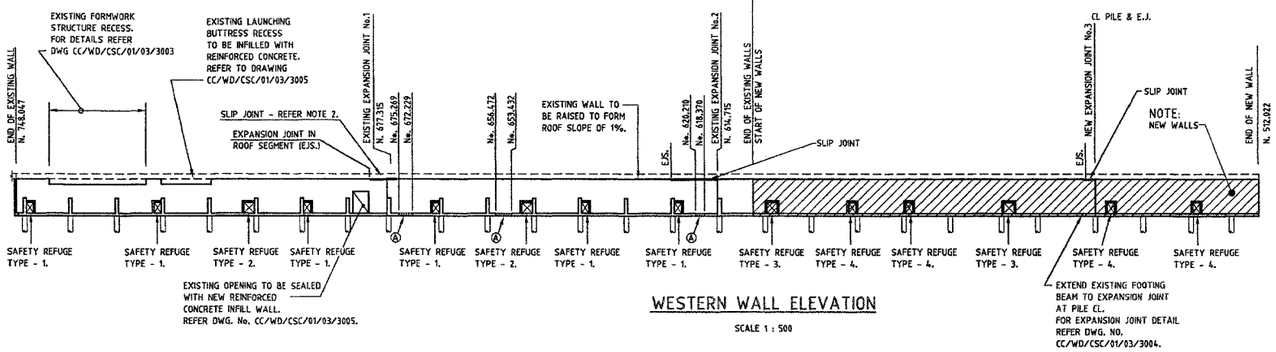
EDMS CV0278721 WARNING SCANNED IMAGE

WORK AS EXECUTED



EASTERN WALL ELEVATION

SCALE 1 : 500



WESTERN WALL ELEVATION

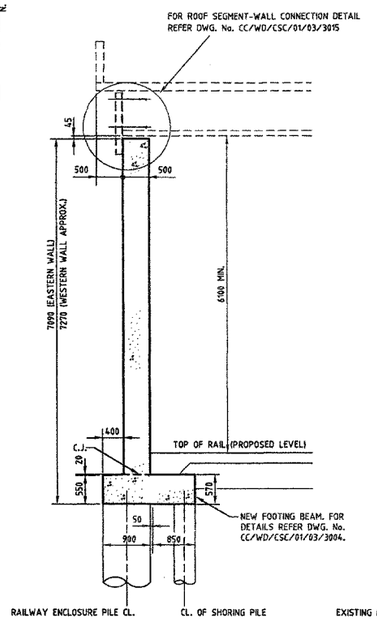
SCALE 1 : 500

NOTES:

1. No CO-ORDINATES OF RECESS IN WALL FLANGE TO ACCOMMODATE PREVIOUSLY PROPOSED TOWER COLUMNS.
2. FOR DETAILS OF SLIP JOINT BETWEEN WALL AND ROOF SEGMENT REFER TO DRAWING No. CC/WD/CSC/01/03/3015.
3. Ⓐ - DENOTES EXISTING FLANGE RECESS TO BE FILLED WITH REINFORCED CONCRETE LINK BEAM .

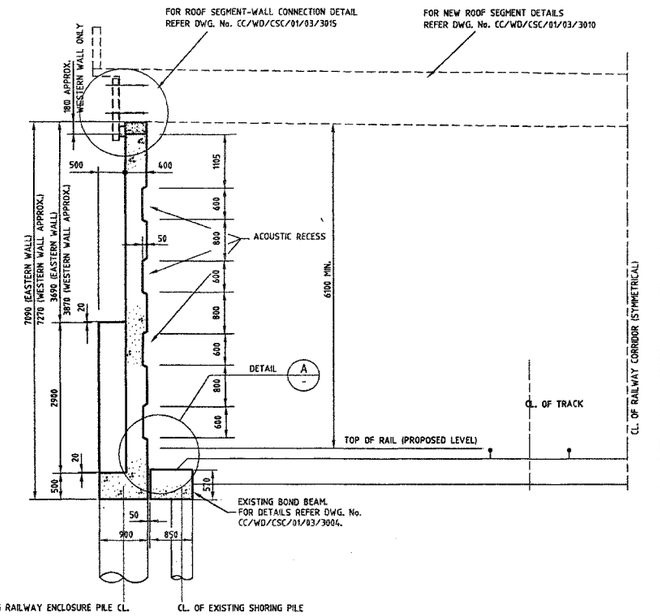
NOTES:

1. MINIMUM 28 DAY COMPRESSIVE STRENGTH OF EXISTING CONCRETE 32 MPa, & NEW CONCRETE SHALL BE 40 MPa. MAXIMUM SIZE AGGREGATE OF 20. MAXIMUM SLUMP 80.
2. HORIZONTAL CONSTRUCTION JOINT MAY BE PROVIDED IF REQUIRED - REFER SPECIFICATION.
3. CO-ORDINATES OF WALLS EXPANSION JOINTS ARE GIVEN FOR THE TOP OF WALL.
4. FOR STRUCTURAL NOTES REFER TO DWG. No. CC/WD/CSC/01/03/3045.



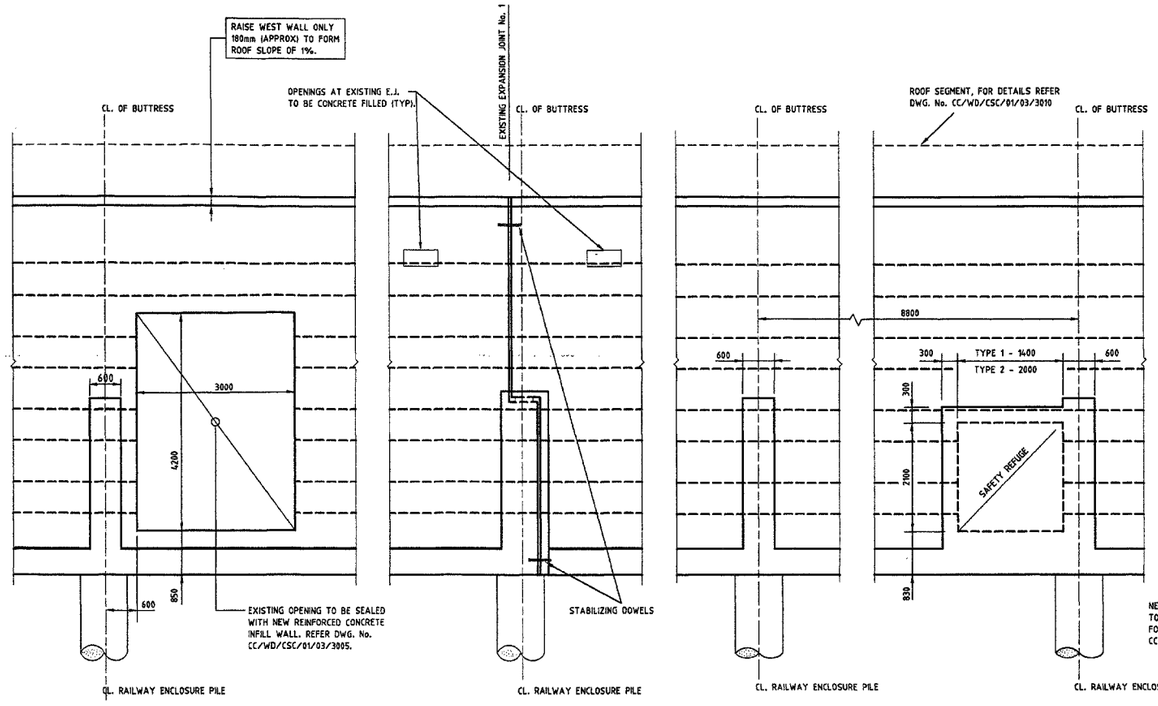
TYPICAL SECTION THROUGH NEW WALL

SCALE 1 : 50



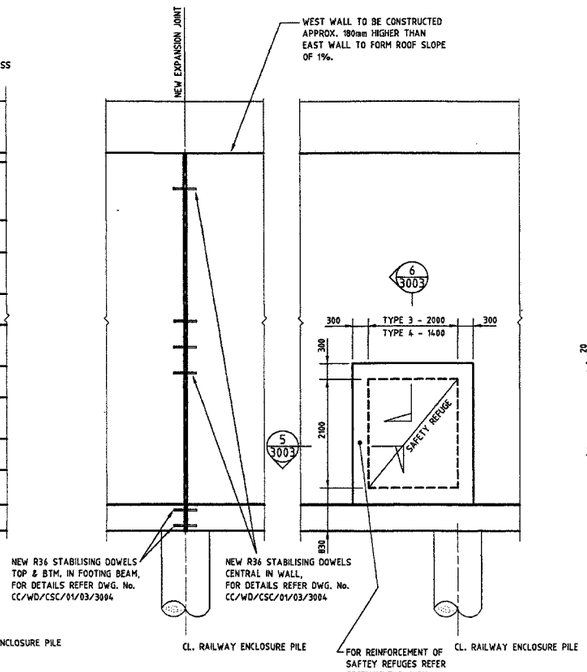
TYPICAL SECTION THROUGH EXISTING WALL

SCALE 1 : 50



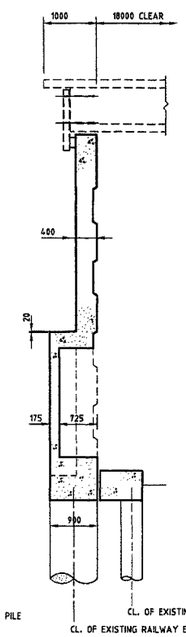
TYPICAL PART ELEVATION EXISTING WALL

SCALE 1:50



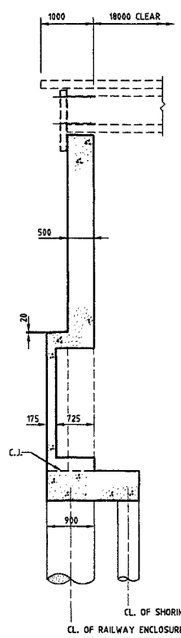
TYPICAL PART ELEVATION NEW WALL

SCALE 1:50



TYPICAL SECTION THROUGH EXISTING SAFETY REFUGES TYPES 1 & 2

SCALE 1 : 50



TYPICAL SECTION THROUGH NEW SAFETY REFUGES TYPES 3 & 4

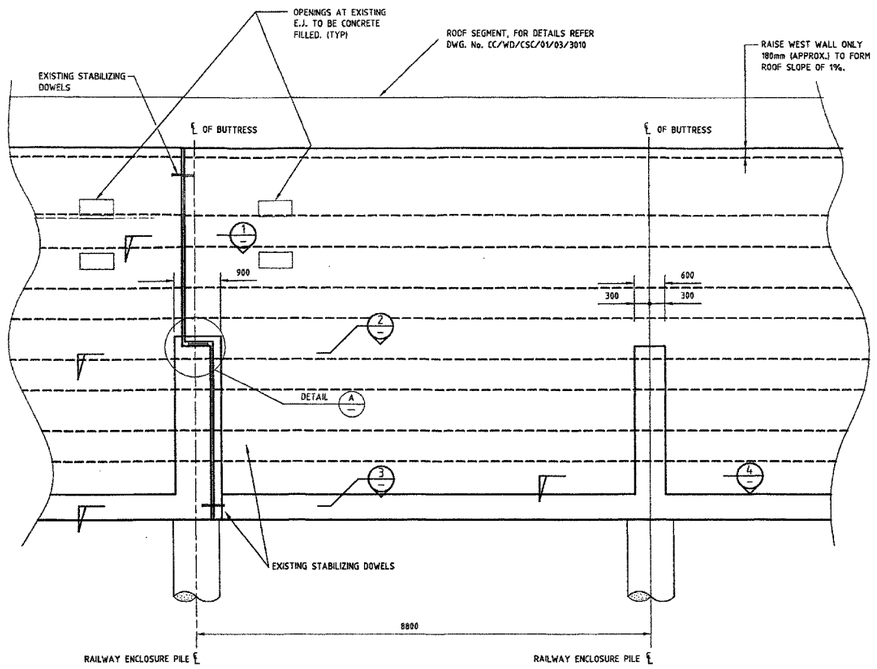
SCALE 1 : 50

EDMS CV0278722 WARNING SCANNED IMAGE

WORK AS EXECUTED

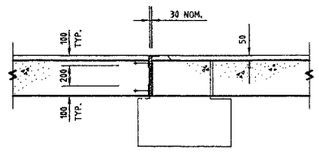
NOTES

1. FOR CONCRETE NOTES REFER DWG. No.- CC/WD/CSC/01/03/3002.

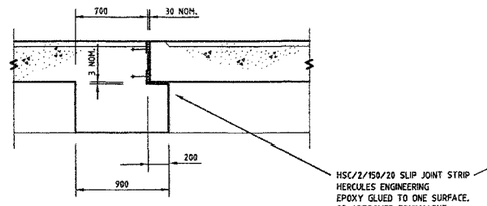


EXPANSION JOINT IN EXISTING WALL
PART ELEVATION

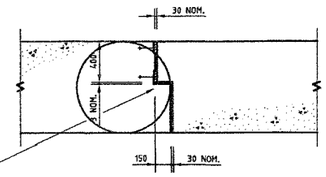
SCALE 1 : 50



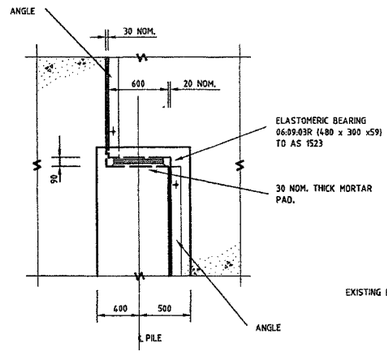
SECTION 1
SCALE 1 : 25

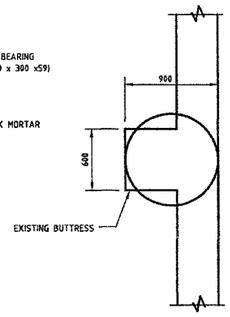


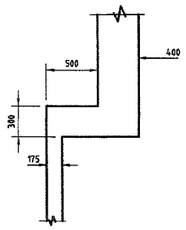
SECTION 2
SCALE 1 : 25



SECTION 3
SCALE 1 : 25







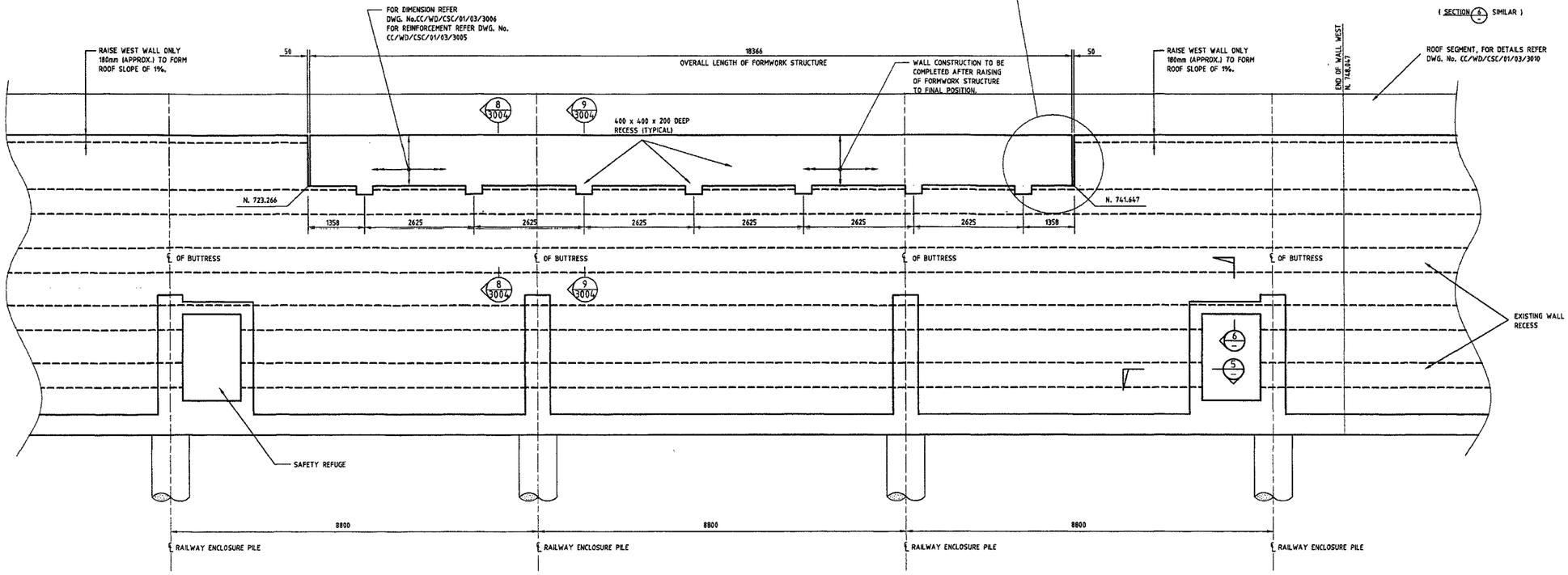
TYPES 1 & 2
AT SAFETY REFUGE
EXISTING WALL

NOTE:
THIS DRAWING REFERS TO COMPLETION WORKS IN EXISTING WALL. FOR NEW SECTION OF RAILWAY ENCLOSURE WALL DETAILS REFER DWG. No. CC/WD/CSC/01/03/3004.

DETAIL A
SCALE 1 : 25

SECTION 4
SCALE 1:25

SECTION 5
SCALE 1:25
(SECTION 4 SIMILAR)



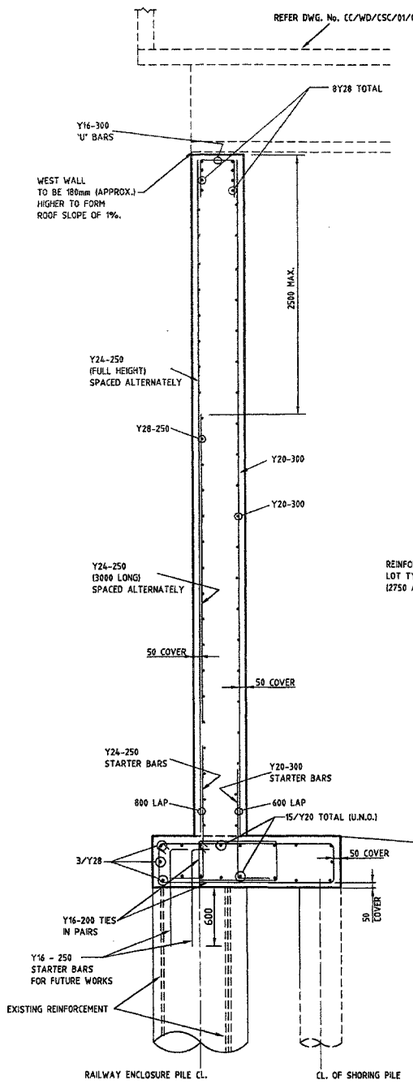
EXISTING FORMWORK STRUCTURE RECESS
EAST WALL PART ELEVATION

SCALE 1 : 50

WEST WALL SIMILAR OPPOSITE HAND

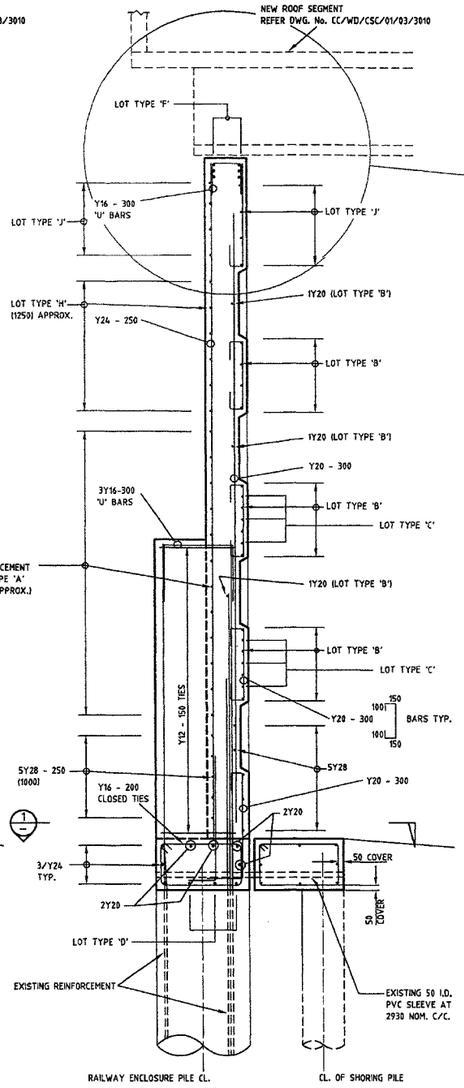
EDMS Nº CV0278723 WARNING SCANNED IMAGE

WORK AS EXECUTED



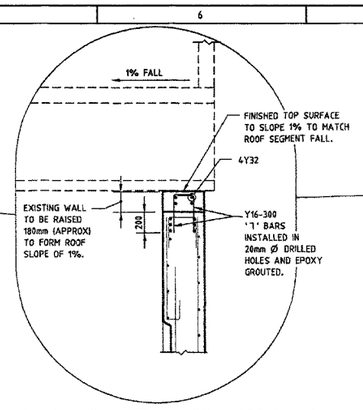
SECTION AT NEW WALL

SCALE 1:25

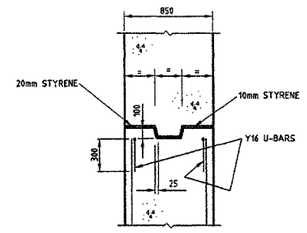


SECTION AT EXISTING BUTTRESS

SCALE 1:25

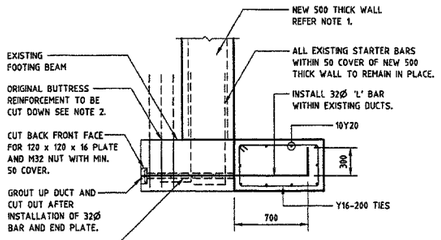


VARIATION DETAIL FOR WEST WALL



PLAN ON EXPANSION JOINT TO EXISTING BOND BEAM

SCALE 1:25

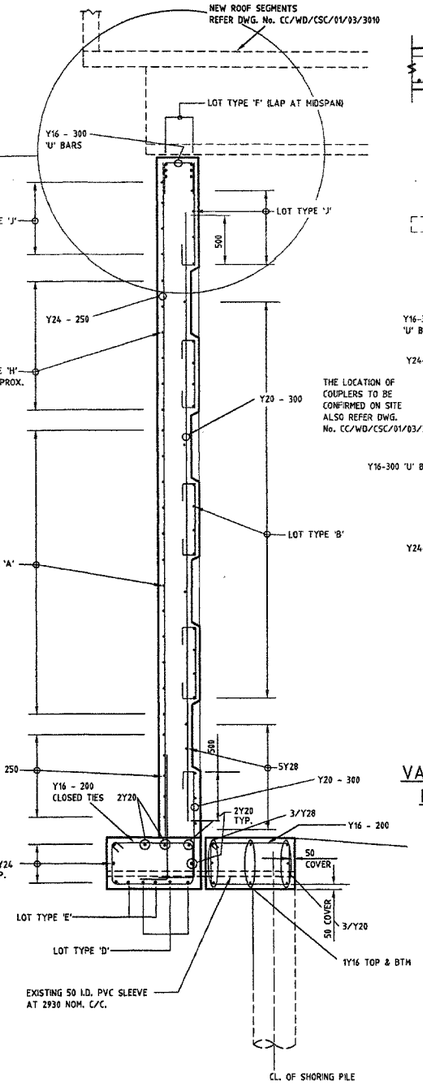


TYPICAL SECTION OF NEW WORKS AT EXISTING FOOTING BEAM LOCATIONS

SCALE 1:25

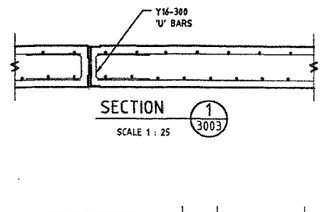
NOTES:

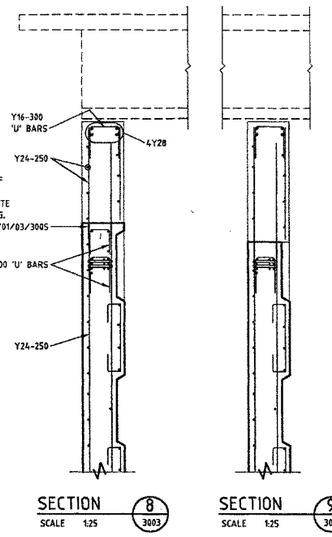
1. FOR NEW 500 THICK WALL REINFOREMENT, REFER 'SECTION AT NEW WALL' ON THIS DWG.
2. APPROVED COVER PROTECTION TO BE PROVIDED TO ALL BUTTRESS STEELWORK AFTER IT IS CUT BACK.



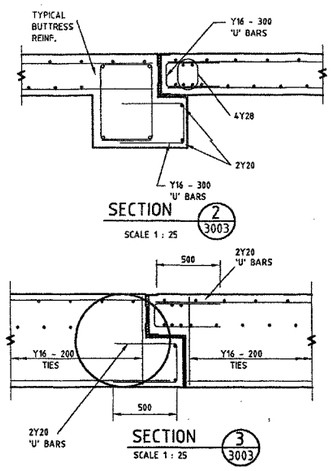
SECTION AT MIDSPAN OF EXISTING WALL

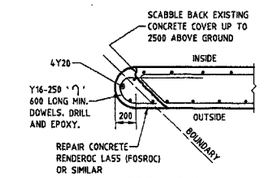
SCALE 1:25





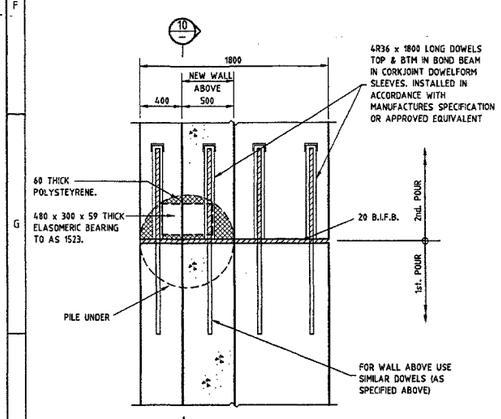
VARIATION TO WALL REINFORCEMENT AT THE EXISTING FORMWORK STRUCTURE RECESS





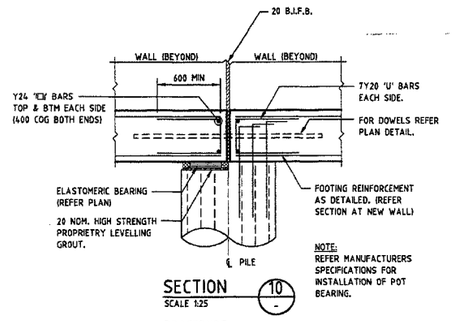
NORTH END WEST SIDE WALL

SCALE 1 : 25



PLAN ON EXPANSION JOINT TO NEW FOOTING BEAM

SCALE 1:25



NOTE: REFER MANUFACTURERS SPECIFICATIONS FOR INSTALLATION OF POT BEARING.

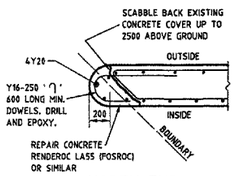
PROCEDURE:

- DEMOLISH PILE ON ONE SIDE TO REQUIRED LEVEL AND CUT FLUSH PILE REINF. (IF ANY)
- APPLY HIGH STRENGTH LEVELLING GROUT ON THE SEMI-CIRCULAR SURFACE. (±1mm TOLERANCE)
- PLACE ELASTOMERIC BEARING ON LEVEL SURFACE.
- PLACE POLYSTYRENE ON REMAINING AREA. (REFER PLAN)
- INSTALL REINFORCEMENT AND B.I.F.B. AS SHOWN.
- POUR CONCRETE.

EXISTING WALL REINF. SCHEDULE FOR VARYING SPAN LENGTHS

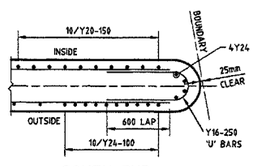
SPAN LENGTH (mm)	REINFORCEMENT							
	LOT TYPE 'A'	LOT TYPE 'B'	LOT TYPE 'C'	LOT TYPE 'D'	LOT TYPE 'E'	LOT TYPE 'F'	LOT TYPE 'G'	
◄ 8800	Y28 AT 250 LAPPED AS REQUIRED	4Y20 LAPPED AS REQUIRED	3Y20 4000 LONG	3Y28 LAPPED OVER SUPPORT	2Y28 6500 LONG	6Y28 LAPPED AS REQUIRED		
8801 TO 9500	Y28 AT 225 LAPPED AS REQUIRED	4Y20 LAPPED AS REQUIRED	3Y24 4200 LONG	3Y28 LAPPED OVER SUPPORT	2Y28 6500 LONG	6Y28 LAPPED AS REQUIRED	NOT USED	
9501 TO 10500	Y28 AT 200 LAPPED AS REQUIRED	4Y24 LAPPED AS REQUIRED	3Y24 4800 LONG	3Y28 LAPPED OVER SUPPORT	3Y28 7200 LONG	8Y28 LAPPED AS REQUIRED		
10501 TO 11500	Y28 AT 175 LAPPED AS REQUIRED	4Y24 LAPPED AS REQUIRED	3Y28 5300 LONG	3Y28 LAPPED OVER SUPPORT	4Y28 7900 LONG	8Y28 LAPPED AS REQUIRED		

SPAN LENGTH (mm)	LOT TYPE 'H'	LOT TYPE 'J'
SECTION OF WALL BETWEEN LAUNCHING BUTTRESS AND EXPANSION JOINT No2	8Y28	4Y28
BETWEEN JOINTS 2 & 3	6Y24	4Y28
BETWEEN JOINTS 3 & 4	6Y20	4Y24
SOUTH OF JOINT 4	6Y20	4Y20



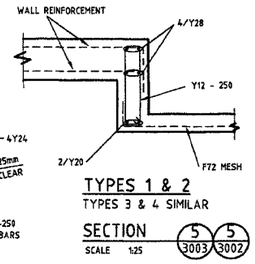
NORTH END EAST SIDE WALL

SCALE 1 : 25



SOUTH END NEW WALL DETAIL

OTHER END SIMILAR
SCALE 1 : 25

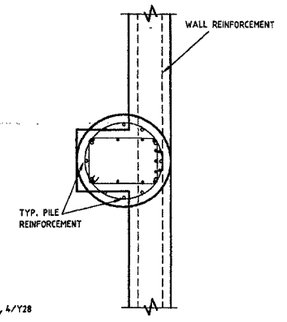


TYPES 1 & 2

TYPES 3 & 4 SIMILAR

SECTION 5 3003 5 3002
SCALE 1:25

SECTION 6 3003 6 3002 SIMILAR

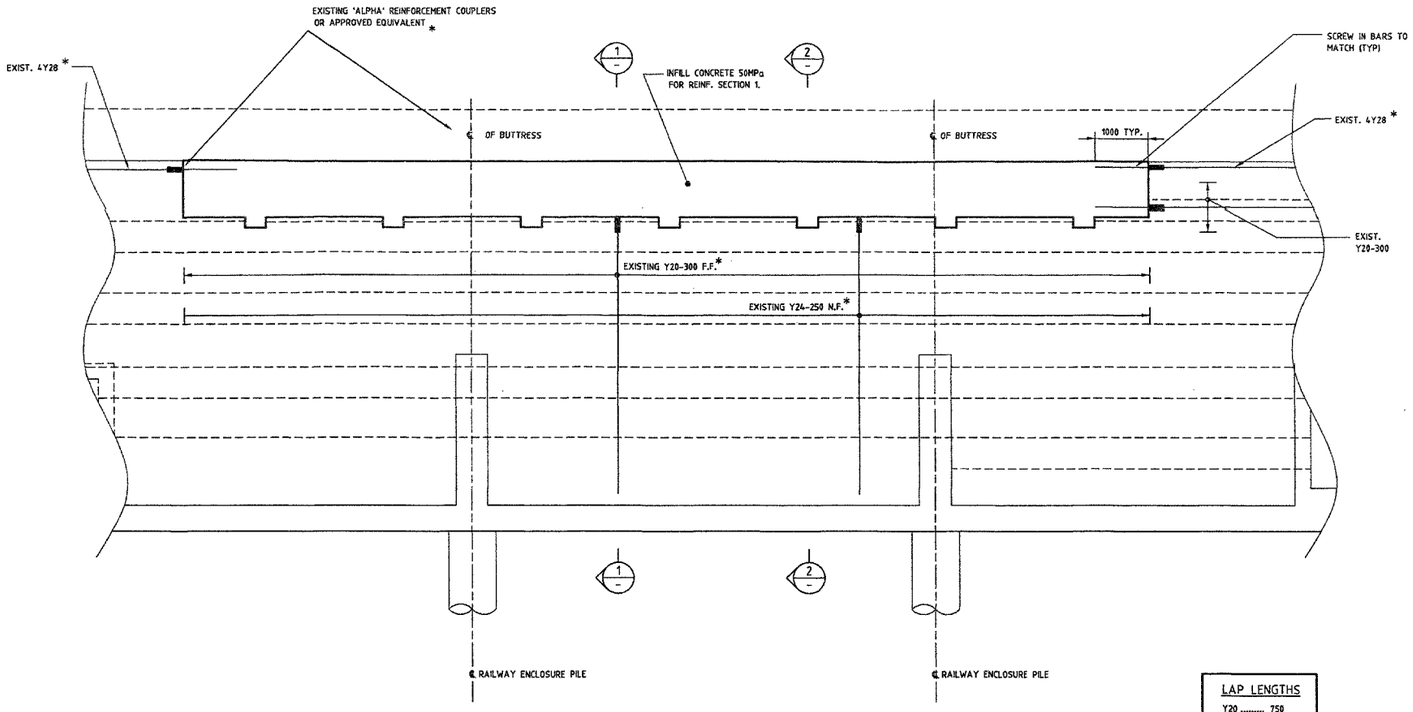


WORK AS EXECUTED

EDMS Nº CV0278724 WARNING SCANNED IMAGE

NOTES

1. COVER TO ALL REINFORCEMENT SHALL BE 30mm U.N.O.
2. B.F. DENOTES BOTH FACES
   F.F. DENOTES FAR FACE
   N.F. DENOTES NEAR FACE



FORMWORK STRUCTURE RECESS EAST WALL PART ELEVATION

SCALE 1 : 50

WEST WALL SIMILAR OPPOSITE HAND (APPROX. 180mm HIGHER)

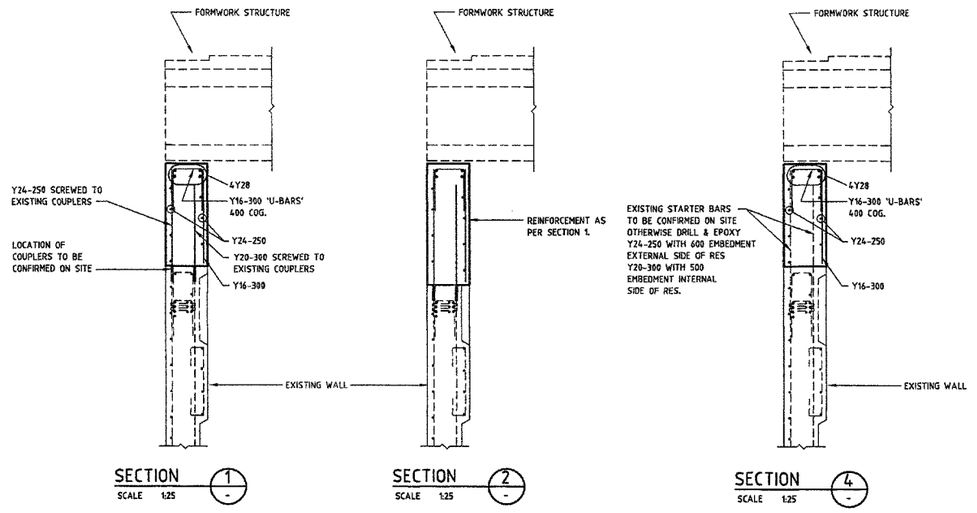
NOTE:

* TO BE CONFIRMED ON SITE.

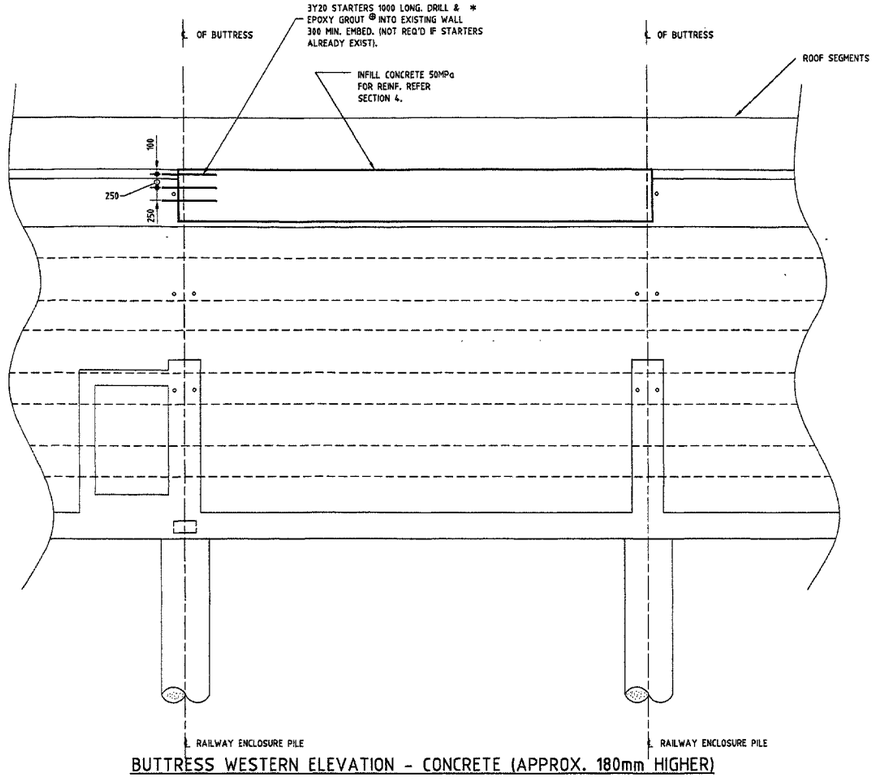
LAP LENGTHS

Y20	750
Y24	900
Y28	1000

⊕ NOTE:
ALTERNATIVELY USE FOSROC "CONBEXTRA GP" OR APPROVED EQUIVALENT.



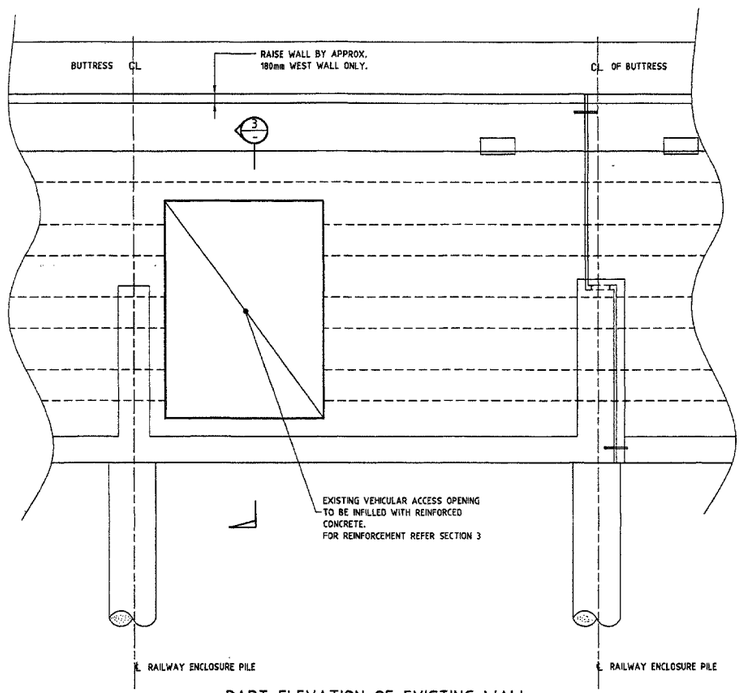
VARIATION TO WALL REINFORCEMENT AT THE EXISTING FORMWORK STRUCTURE RECESS



BUTTRESS WESTERN ELEVATION - CONCRETE (APPROX. 180mm HIGHER)

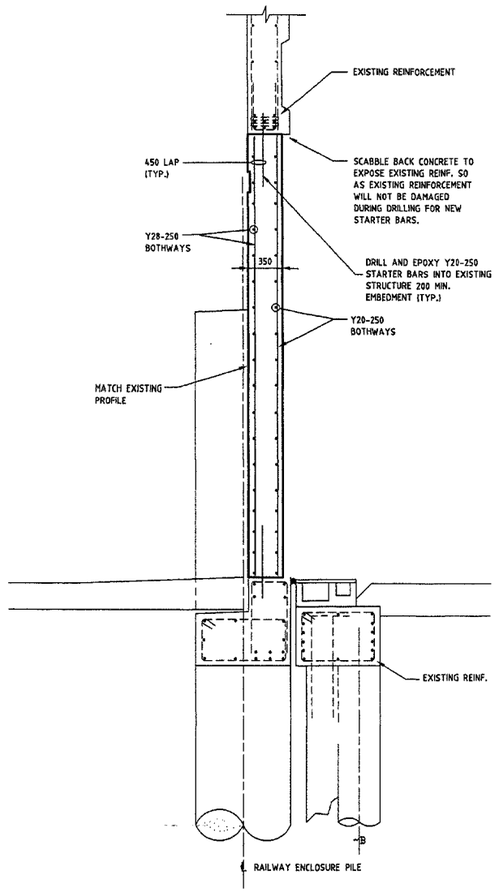
SCALE 1:50

(EASTERN ELEVATION SIMILAR OPPOSITE HAND)



PART ELEVATION OF EXISTING WALL

SCALE 1:50



SECTION 3 SCALE 1:25

EDMS Nº CV0278725 WARNING SCANNED IMAGE

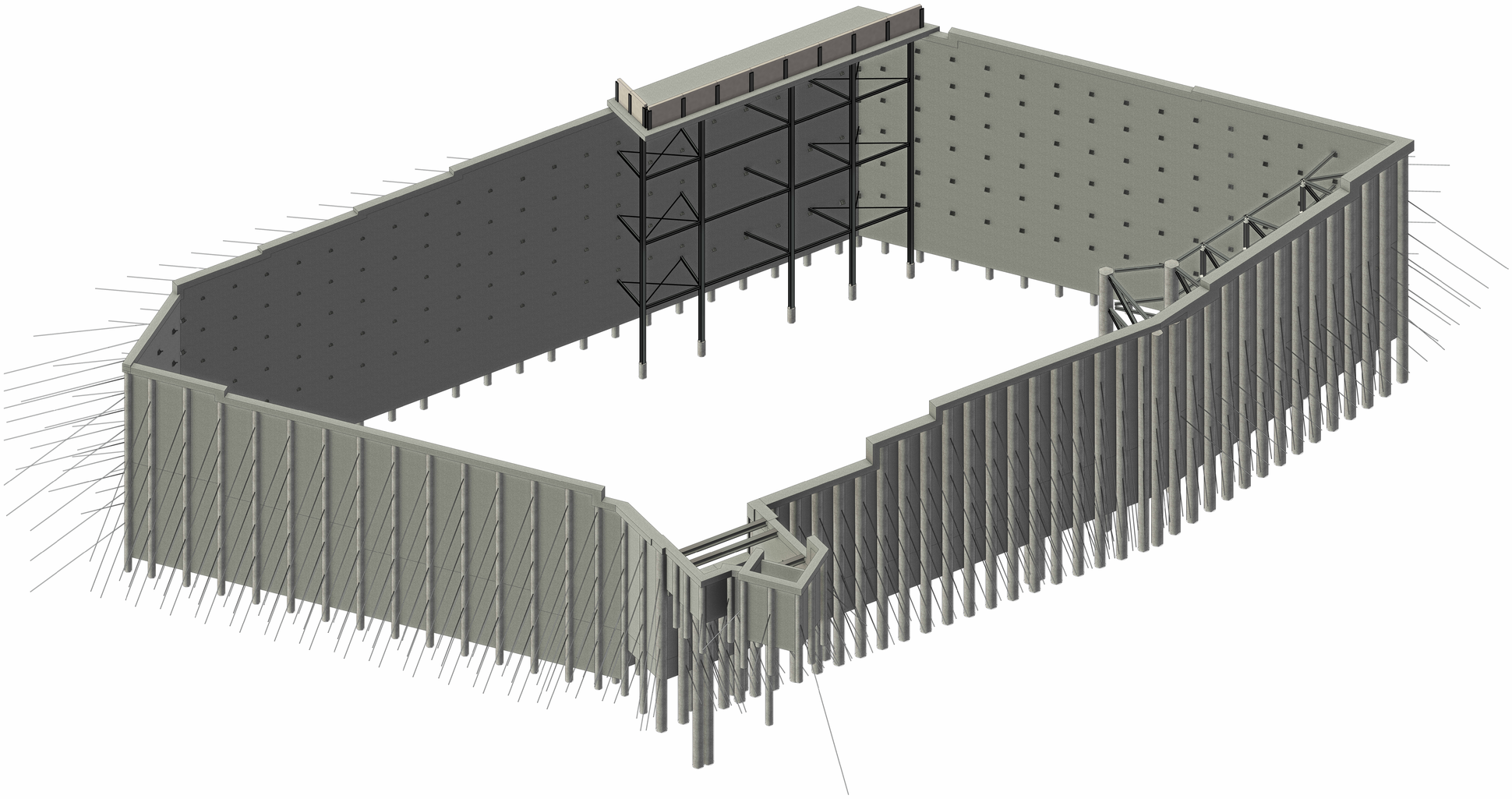
WORK AS EXECUTED

Annexure C: Shoring design drawings issued by Cadigal Group

NON-REGULATED DESIGN RECORD				
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.				
PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
COVER SHEET & DRAWING LIST		DA No: DRAWING No: S00001		
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO

MIXED USE DEVELOPMENT

849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.



SHORING (SOLDIER PILE SYSTEM)

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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Project: **849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.**

Developer: Billbergia creating communities®

Contractor:

Architect : pbd architects

Design Consultant:

CADIGAL GROUP
1002, 22-24 Market Street,
Sydney , NSW 2000
Australia
T: +61 2 8630 8559
info@cadigalgroup.com.au

© Copyright

Drawing Title:

COVER PAGE

STRUCTURAL DRAWINGS

Designed:	NAA	Project Director Approved	Date	North
Modelled:	RT	JT	24.05.15	
Scale:		Project Ref.	Drawing No.	Rev
Sheet:	A0	01-100084	S10000	H

0 10 20 30 50 100

NON DECLARED DESIGN				
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.				
PROJECT TITLE: CHADSWOOD				
CONSENT No.:			BODY CORP REG TAG:	
DRAWING TITLE: SPECIFICATION NOTES - SH1			DWG No: S00010	
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO

STANDARD NOTES:

GENERAL:

G1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL AND OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS OR SKETCHES AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE SUPERINTENDENT BEFORE PROCEEDING WITH WORK.

G2. MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATION, CURRENT SAA CODES, BUILDING REGULATIONS AND THE REQUIREMENTS OF ANY OTHER RELEVANT STATUTORY AUTHORITIES.

G3. MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATION, CURRENT SAA CODES, BUILDING REGULATIONS AND THE REQUIREMENTS OF ANY OTHER RELEVANT STATUTORY AUTHORITIES.

G4. THE CONSULTING ENGINEER HAS DESIGNED THE PERMANENT STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, IMPLEMENTATION AND CERTIFICATION OF ALL TEMPORARY WORKS, PROPPING, NEEDLING, FALSE WORK, BRACING, BACK-PROPPING, AND SO FORTH, NECESSARY TO COMPLETE THE WORK.

G5. DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. THE CONTRACTOR SHALL ALLOW TO ENGAGE A CHARTERED (NPER-3) ENGINEER TO DESIGN, INSPECT THE TEMPORARY WORKS AND VERIFY THE TEMPORARY STABILITY OF THE STRUCTURE.

G6. THE APPROVAL OF A SUBSTITUTION SHALL BE SOUGHT FROM THE SUPERINTENDENT BUT IS NOT AN AUTHORIZATION OF A COST VARIATION. THE SUPERINTENDENT MUST APPROVE ANY COST VARIATION INVOLVED BEFORE ANY WORK STARTS.

G7. THESE DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION UNTIL ISSUED AS "FOR CONSTRUCTION" BY THIS OFFICE.

G8. THE CONTRACTOR RETAINS RESPONSIBILITY OF THE WORKS EVEN IF THE ENGINEER HAS INSPECTED THE WORKS DURING CONSTRUCTION.

G9. WHERE ADDITIONAL CONSTRUCTION LOADS, SUCH AS TEMPORARY SHORING, MOBILE CRANES, ETC., ARE TO BE IMPOSED ON THE STRUCTURE, THE CONTRACTOR SHALL SUBMIT FULL DETAILS OF THE PROPOSED TEMPORARY SUPPORTS TO THE ENGINEER FOR REVIEW. SUCH INFORMATION MUST BE PROVIDED A MINIMUM OF 7 WORKING DAYS PRIOR TO THE PROPOSED WORKS COMMENCING.

G10. IF THE CONTRACTOR INTENDS TO VARY THE SCOPE OR METHOD OF WORKS OR MATERIALS USED, THE CONTRACTOR SHALL SUBMIT FULL DETAILS OF THE PROPOSAL TO THE DESIGN SUPERINTENDENT FOR DESIGN CHECK.

G11. ALL PROPRIETARY PRODUCTS SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

G12. ALL REQUIRED TESTS TO COMPLETE THE WORKS SHALL BE AT THE CONTRACTOR'S EXPENSE.

HEALTH AND SAFETY:

H1. THE OBLIGATION OF CADIGAL GROUP PTY LTD [OR OTHER RELEVANT CADIGAL ENTITY] (CADIGAL) AS THE DESIGN ENGINEER IS LIMITED TO ENSURING THAT THOSE PARTS OF THE STRUCTURE THAT ARE TO BE USED AS A WORKPLACE ARE, AS FAR AS REASONABLY PRACTICABLE, DESIGNED TO BE SAFE AND WITHOUT RISKS TO THE HEALTH OF THOSE PERSONS USING THE STRUCTURE AS A WORKPLACE FOR THE PURPOSE FOR WHICH IT WAS DESIGNED IN ACCORDANCE WITH SECT. 28 OF THE OCCUPATIONAL HEALTH AND SAFETY ACT 2004 (VIC).

H2. CADIGAL IS NOT RESPONSIBLE FOR THE OCCUPATIONAL HEALTH AND SAFETY OF PERSONS AT THE SITE AS THOSE OBLIGATIONS RESIDE WITH THE CONTRACTORS AND/OR SUBCONTRACTORS WHO OCCUPY OR HAVE CONTROL OF THE SITE IN ACCORDANCE WITH APPLICABLE OCCUPATIONAL HEALTH AND SAFETY LEGISLATION, CODES OR PRACTICE, GUIDANCE NOTES, AUSTRALIAN STANDARDS AND OTHER RELEVANT DOCUMENTATION.

H3. ANY ADVICE OR GUIDANCE CONCERNING OCCUPATIONAL HEALTH AND SAFETY ISSUES ARISING AT THE SITE SHOULD BE DIRECTED TO THE HEALTH AND SAFETY EXECUTIVE OR OFFICER NOMINATED FOR THE PROJECT.

FOUNDATIONS:

F1. REFER TO THE GEOTECHNICAL REPORT FOR A DESCRIPTION OF THE ANTICIPATED SITE CONDITIONS. THE BUILDER IS TO STUDY THE REPORT AND MAKE HIS OWN EVALUATION ON THE SITE CONDITIONS. ANY ADDITIONAL COSTS INCURRED SHALL BE BORNE BY THE BUILDER.

F2. ALL FOOTINGS SHALL BE FOUNDED AT THE RECOMMENDED DEPTH AND INTO THE APPROPRIATE MATERIAL AS SPECIFIED IN THE GEOTECHNICAL REPORT. THE ALLOWABLE BEARING CAPACITY SHALL BE AS SPECIFIED IN THE FOOTING SCHEDULE. THE TOPS OF FOOTINGS SHALL BE A MINIMUM OF 300mm BELOW THE LOWEST ADJACENT STRUCTURAL FLOOR LEVEL UNLESS NOTED OTHERWISE.

F3. THE ALLOWABLE BEARING CAPACITY SHALL BE VERIFIED BY GEOTECHNICAL ENGINEER, WHO SHALL BE EMPLOYED BY THE BUILDER, BEFORE ANY CONCRETE IS PLACED, WHEREVER THE BEARING CAPACITY AT THE FOOTING BASE IS INADEQUATE, EXCAVATION SHALL CONTINUE UNTIL SUITABLE MATERIAL IS FOUND OR THE FOOTING IS ENLARGED TO THE ENGINEER DETAILS.

F4. BASES OF ALL FOOTINGS SHALL BE CLEANED OF ALL LOOSE MATERIAL PRIOR TO POURING OF CONCRETE. IN WET CONDITIONS, A 300 x 300 x 300 PIT SHALL BE DUG AT THE CORNER OF THE FOOTING FOR DEWATERING THE EXCAVATION BEFORE CONCRETING. A 50mm MINIMUM BLINDING LAYER OF N15 GRADE CONCRETE SHALL BE USED, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

F5. WHENEVER A FOOTING IS LOCATED CLOSE TO A BATTER , AN EXISTING FOOTING, EXISTING OR NEW SERVICES, A LINE DRAWN AT THE BOTTOM OF THE FOOTING AT 40 DEGREES TO THE HORIZONTAL SHALL FALL BELOW THE BATTER, EXISTING FOOTING OR SERVICES. IF THIS DOES NOT HAPPEN THE FOOTING BASE SHALL BE DEEPENED AS REQUIRED TO ACHIEVE THE FORMER.

F6. THE OVER BREAK BETWEEN THE APPROVED FOUNDING LEVEL AND THE UNDERSIDE OF THE FOOTING SHALL BE FILLED WITH GRADE N15 CONCRETE. ANY OVER BREAK AT THE SIDES OF THE FOOTING SHALL BE FILLED WHEN CONCRETING THE FOOTING.

F7. THE BUILDER SHALL REMOVE ALL SPOIL FROM THE SITE, AND DEWATER THE EXCAVATION AS REQUIRED.

BULK EXCAVATION NOTES :

B1. THE CONTRACTOR IS TO NOTIFY ALL SERVICE AUTHORITIES AND ARRANGE FOR DISCONNECTION OF SERVICES OR SUPPLY AS APPLICABLE INCLUDING ALL CUTTING, DISCONNECTION OR SEALING OFF OF SERVICES AND DRAINS AS REQUIRED. SERVICES OR SUPPLY LINES THAT ARE TO BE RETAINED SHALL REMAIN UNDAMAGED AND GIVEN ALL NECESSARY PROTECTION.

B2. THE BULK EXCAVATION SHALL BE CARRIED OUT TO THE BULK EXCAVATION PROFILE ON THE DRAWINGS OR TO THE UNDERSIDE OF THE STRUCTURE, INCLUSIVE OF SUBBASE MATERIALS. THE CONTRACTOR SHALL VERIFY ANY LEVELS SHOWN ON THE STRUCTURAL DOCUMENTS WITH THE ARCHITECTURAL DOCUMENTS. ANY DISCREPENCY SHALL BE REFERRED TO THE ENGINEER FOR DIRECTION.

B3. UNLESS AUTHORISED BY THE ENGINEER OVER- EXCAVATIONS SHALL NOT BE CLAIMED AS VARIATION. SUCH EXCESS EXCAVATIONS SHALL BE FILLED WITH 3% CEMENT STABILISED SAND UNLESS COMPACTED BACKFILLING IS APPROVED BY THE ENGINEER.

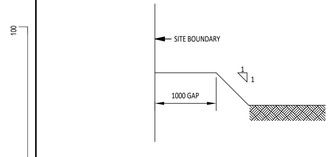
B4. THE CONTRACTOR SHALL PROVIDE ALL BRACING NECESSARY TO RETAIN EARTH BANKS, ROADS, PAVEMENTS, WALLS AND FOOTINGS OF ADJOINING PROPERTIES AND PREVENT CAVING AND DISPLACEMENT OF ADJACENT SOIL OR STRUCTURES. THE CONTRACTOR SHALL PROVIDE AND DESIGN ALL NECESSARY COMPONENTS OF SUCH BRACING.

B5. EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE. THIS MATERIAL SHALL NOT BE USED FOR LEVELLING, FILLING EXCESS EXCAVATIONS OR BACKFILLING BEHIND RETAINING WALLS UNLESS WRITTEN APPROVAL HAS BEEN OBTAINED FROM THE ENGINEER. CONTAMINATED MATERIAL SHALL BE RETAINED AND USED AS NON-ENGINEERED FILL UNDER THE BUILDING.

B6. EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE. THIS MATERIAL SHALL NOT BE USED FOR LEVELLING, FILLING EXCESS EXCAVATIONS OR BACKFILLING BEHIND RETAINING WALLS UNLESS WRITTEN APPROVAL HAS BEEN OBTAINED FROM THE ENGINEER. CONTAMINATED MATERIAL SHALL BE RETAINED AND USED AS NON-ENGINEERED FILL UNDER THE BUILDING.

B7. ALL GROUND UNSUITABLE FOR THE PURPOSES OF THE WORKS, SHALL BE REMOVED AND FILLED WITH 3% CEMENT STABILISED SAND OR APPROVED COMPACTED BACKFILLING AS NOMINATED BY THE GEOTECHNICAL ENGINEER.

B8. BULK EXCAVATION BATTERS AROUND THE PERIMETER OF THE SITE ARE TO BE AS SHOWN BELOW UNLESS NOTED OTHERWISE ON THE DRAWINGS OR GEOTECHNICAL REPORT.



STRUCTURAL NOTES

PILING NOTES:

BP1. THE WORK TO BE CARRIED OUT BY THE PILING CONTRACTOR COMPRISES OF THE DESIGN AND CONSTRUCTION OF THE BORED PILES TO THE REQUIREMENTS OF AS2159. PILE DETAILS ON THESE DOCUMENTS ARE TO BE USED AS A GUIDE.

BP2. THE PILING CONTRACTOR SHALL DESIGN THE PILES FOR THE REQUIRED SAFE WORKING LOADS AS NOTED ON THESE DRAWINGS AND THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.

BP3. PILE DESIGN COMPUTATIONS CERTIFICATION AND DOCUMENTATION SHALL BE SUBMITTED TO THE ENGINEER FOR COMMENT PRIOR TO CONSTRUCTION.

BP4. THE PILING CONTRACTOR IS FULLY RESPONSIBLE FOR THE PILE PERFORMANCE.UNDER THE SCHEDULED PILE LOADS, THE PILE SETTLEMENTS SHALL NOT EXCEED:
TOTAL LONG TERM SETTLEMENT = 10mm DIFFERENTIAL SETTLEMENT BETWEEN ADJACENT PILES = 5mm OR DISTANCE/1000, WHICH EVER IS LESS

BP5. FOUNDING LEVELS OF THE BORED PILE BASES ARE TO BE DETERMINED ON SITE AND APPROVED BY THE GEOTECHNICAL ENGINEER.

BP6. THE TRIMMED TOP OF THE PILES SHALL BE WITHIN ± 25mm OF THE UNDERSIDE OF THE FOUNDATION WORKS.

BP7. THE PILE LOCATION NOMINATED ON THE DOCUMENTS ARE TO BE WITHIN 75mm IN ANY DIRECTION OF THE POSITION SHOWN ON THESE DRAWINGS. TOLERANCE ON DEPARTURE FROM TRUE VERTICAL SHALL BE LESS THAN 4%.

BP8. THE SOCKET IS THE BOTTOM LENGTH OF THE SHAFT OF THE PILE THAT IS ENTIRELY IN THE FOUNDING MATERIAL. THE SURFACE OF THE SOCKET SHALL BE ROUGHENED BY SPIRAL GROOVING. IT MUST BE FREE FROM LOOSE MATERIAL AND/OR CLAY SMEAR.

THE PILING CONTRACTOR IS TO MAKE ADJUSTMENTS TO THE LENGTH OF THE SOCKET AS NECESSARY TO SUIT THE ACTUAL FOUNDING MATERIAL ENCOUNTERED DURING BORING OPERATIONS.

BP9. TEMPORARY LINING OF SHAFTS SHALL BE PROVIDED BY THE CONTRACTOR TO PREVENT COLLAPSE DUE TO THE PRESENCE OF UNSTABLE MATERIAL, GROUND WATER OR OTHER UNFORESEEN CIRCUMSTANCES. THE PLACEMENT AND REMOVAL OF TEMPORARY LINERS.
PERMANENT LINING IF USED SHALL BE CONSIDERED IN THE DESIGN AND SHALL BE DETAILED ON THE PILE DOCUMENTS BY THE CONTRACTOR.

BP10. THE SHAFT BASES SHALL BE CLEANED OUT AND RECEIVE APPROVAL FROM THE GEOTECHNICAL ENGINEER BEFORE REINFORCEMENT CAGES ARE SET IN POSITION AND CONCRETE PLACED. THE CONTRACTOR SHALL RECORD THE PILE LENGTH AND LOG THE EXCAVATED MATERIAL. BOTH THE CONTRACTOR AND GEOTECHNICAL ENGINEER SHALL PROVIDE A STATEMENT REGARDING THE COMPLIANCE OF THE MATERIAL TO THE ASSUMED DESIGN CONDITIONS AND SOIL REPORT.
CLEARING OUT THE BASE MEANS THAT ALL LOOSE AND SOFTENED MATERIAL SHALL BE REMOVED.

BP11. SHOULD GROUND WATER BE ENCOUNTERED, THE CONTRACTOR SHALL SUPPLY AND INSTALL A PUMP OF ADEQUATE CAPACITY TO DIVERT WATER TO A PROPERLY SITED SUMP. A STANDBY PUMP OF SIMILAR CAPACITY SHALL ALSO BE AVAILABLE.

BP12. ALL REINFORCEMENT SHALL COMPLY WITH AS4671 AND AS3600.

BP13. REINFORCEMENT SHALL BE FREE OF LOOSE MILL SCALE, RUST, OIL, PAINT, GREASE AND OTHER. IT SHALL BE FREE OF SUCH MATTER UNTIL CONCRETE IS PLACED.

BP14. REINFORCEMENT SHALL BE PROPERLY FABRICATED INTO CAGES THAT SHALL BE INSTALLED IMMEDIATELY AT THE BASE OF ANY SHAFT THAT HAS BEEN APPROVED. REINFORCEMENT SHALL BE SECURELY FIXED SO THAT NO VERTICAL MOVEMENT OCCURS WHILST CONCRETE IS BEING PLACED. APPROVED SPACERS SHALL BE PROVIDED AT 2 METRES MAXIMUM CENTRES ALONG THE LENGTH OF THE PILE TO MAINTAIN ADEQUATE COVER.

BP15. CONCRETE SHALL BE PLACED USING A TREMIE CONTINUOUSLY TO THE TOP OF THE SHAFT. WHERE PERMITTED BY THE ENGINEER, CONCRETE MAY BE PLACED UNDERWATER. THE POUR SHALL PROCEED WITH THE TREMIE DISCHARGE AT ALL TIMES 1.5 METRES BELOW THE SURFACE OF THE CONCRETE.

BP16. PILES SHALL BE POURED TO NO LESS THAN 75mm ABOVE THE REQUIRED CUT OFF LEVEL OR HIGHER IF NECESSARY TO ALLOW FOR CONTAMINATED CONCRETE REMOVAL. THE PILE SHALL BE TRIMMED TO THE REQUIRED LEVEL REMOVING ALL WEAK CONCRETE AND LATENCY CARE SHALL BE TAKEN THAT THE FULL CROSS SECTION OF THE PILE IS LEVEL AND THE REINFORCEMENT IS UNDAMAGED.

BP17. EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE.

SLAB ON GROUND NOTES:

SOG1. ALL CONCRETE WORK TO COMPLY WITH AS 3600.CONCRETE CODE, AND BCA SECTIONS 3.1 AND 3.2

SOG2. CONCRETE GRADE N20 MINIMUM (RESIDENTIAL)
CONCRETE GRADE N32 MINIMUM (ALL OTHER STRUCTURES)

SOG3. ALL VEGETATION SHALL BE STRIPPED TO A MINIMUM DEPTH OF 150mm. ANY SOFT SPOTS OR DELETERIOUS MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED GRANULAR FILLING COMPACTED TO 100% AS. STANDARD COMPACTION. MINOR FILLING (800 MAXIMUM) SHALL BE PROVIDED WHERE REQUIRED TO BRING SUB GRADE TO REQUIRED LEVEL IN ACCORDANCE WITH LIMITS STATED IN AS 2870 AND BCA. FILLING SHALL BE APPROVED GRANULAR MATERIAL PLACED IN 150mm AND COMPACTED TO 100% AS. STANDARD COMPACTION.

SOG4. A 0.2mm VAPOUR BARRIER SHALL BE USED, LAPPED A MINIMUM OF 200mm AT JOINTS AND TAPED AROUND SERVICES FITTINGS WITH ADHESIVE TAPE NOT INFERIOR TO DOUBLE SIDED BUTYL ADHESIVE TAPE. THE VAPOUR BARRIER SHALL BE PLACED ON A 50mm MINIMUM SAND BED OR SIMILAR APPROVED MATERIAL. PROTECT MEMBRANE FROM DAMAGE.

SOG5. TRENCH MESH IN BEAMS SHALL BE OVERLAPPED BY THE WIDTH OF FABRIC AT 'T' AND 'L' INTERSECTIONS AND SPLICED WITH A LAP OF 500mm. RANDOM LAPS IN N12 BARS BY 500mm STAGGERED. THE OUTER BAR AT 'L' INTERSECTION MUST BE BENT AND CONTINUED FOR 500mm AROUND THE CORNER.

SOG6. SLAB FABRIC TO BE LAPPED SUCH THAT THE TWO OUTERMOST TRANSVERSE WIRE OF ONE SHEET OF MESH OVERLAP THE TWO OUTERMOST TRANSVERSE WIRES OF THE SHEET BEING LAPPED BY A MINIMUM OF 25mm AND BE SUPPORTED ON BAR CHAIRS AT 800mm MAXIMUM CENTERS.

SOG7. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE SITE INVESTIGATION REPORT TO DETERMINE FOUNDING DEPTHS.

SOG8. SITE CLASSIFICATION TO AS 2870 CLASS H ENGINEERING PRINCIPLES TO SECTIONS 4 OF AS 2870.

SOG9. LOAD BEARING EXTERNAL AND INTERNAL BEAMS AND LOAD SUPPORT THICKENINGS ARE TO BE FOUNDED ON NATURAL SOIL WITH AN ALLOWABLE BEARING PRESSURE OF NOT LESS THAN 100 kPa.

SOG10. SLAB PANELS ARE TO BE FOUNDED ON NATURAL SOIL WITH AN ALLOWABLE BEARING PRESSURE OF NOT LESS THAN 50 kPa.

SOG11. TOP OF SLAB SHALL BE 150mm MINIMUM ABOVE THE FINAL GROUND LEVEL.

SOG12. DRAINAGE AND GRADING AWAY FROM SLAB SHALL BE PROVIDED TO PREVENT WATER COLLECTING ADJACENT TO SLAB. TREATMENT OF AREAS SURROUNDING SLAB SHALL ALSO BE IN ACCORDANCE WITH RECOMMENDATIONS BY THE HOUSING GUARANTEE FUND AND THE CONCRETE SOCIETY PUBLICATION CURRENT AT THE TIME OF CONSTRUCTION SHEET No. 10-19.

SOG13. BRICKWORK CONTROL JOINTS ARE TO BE PROVIDED ON SIDES EXCEEDING 6000mm IN LENGTH OR THROUGH LARGE OPENINGS FROM EAVES TO SLAB OR THROUGH FULL HEIGHT WINDOWS AND DOORS.

SOG14. WHERE REQUIRED BY COUNCIL PROTECT THE STRUCTURE FROM SUBTERRANEAN TERMITES IN ACCORDANCE WITH AS 3660 AND BCA

SUSPENDED SLAB ON GROUND NOTES:

SSG1. ALL CONCRETE WORK TO COMPLY WITH AS 3600 CONCRETE CODE, AND BCA VOLUME 1, SECTIONS 3.1 AND 3.2

SSG2. CONCRETE GRADE N32 MINIMUM

SSG3. ALL VEGETATION SHALL BE STRIPPED TO A MINIMUM DEPTH OF 150mm.

SSG4. ALLOW FOR COMPACTION OF EXISTING GROUND SURFACE OR FILL SUFFICIENT TO SUPPORT WET WEIGHT OF SUSPENDED SLAB ON GROUND PLUS FORMWORK AND PROPPED STRUCTURE ABOVE, AS ADVISED BY GEOTECHNICAL CONSULTANT

SSG5. ANY SOFT SPOTS OR DELETERIOUS MATERIAL SHALL BE REMOVED AND REPLACED WITH SELECTED FILL COMPACTED IN ACCORDANCE WITH NOTE SSG4.

SSG6. PROVIDE SELECTED FILL TO ACHIEVE REQUIRED SUB-GRADE R.L., COMPACTED IN ACCORDANCE WITH NOTE SSG4.

SSG7A. 0.2mm VAPOUR BARRIER SHALL BE USED, LAPPED A MINIMUM OF 200mm AT JOINTS AND TAPED AROUND SERVICES FITTINGS WITH ADHESIVE TAPE NOT INFERIOR TO DOUBLE SIDED BUTYL ADHESIVE TAPE. THE VAPOUR BARRIER SHALL BE PLACED ON A 50mm MINIMUM SAND BED OR SIMILAR APPROVED MATERIAL TO PROTECT MEMBRANE FROM DAMAGE.

SSG8. TOP OF SLAB SHALL BE 150mm MINIMUM ABOVE THE FINAL GROUND LEVEL.

SSG9. DRAINAGE AND GRADING AWAY FROM SLAB SHALL BE PROVIDED TO PREVENT WATER COLLECTING ADJACENT TO SLAB.

SSG10. WHERE REQUIRED BY COUNCIL PROTECT THE STRUCTURE FROM SUBTERRANEAN TERMITES IN ACCORDANCE WITH AS 3660 AND BCA.

SSG11. BAR CHAIR BASES ARE TO BE PROVIDED BENEATH ALL REINFORCING BAR CHAIRS TO ENSURE NO SETTLEMENT TO REINFORCEMENT OR DAMAGE TO VAPOUR BARRIER.

SSG12. SUB-GRADE AND SAND LAYER TO BE PREPARED SUCH THAT A STABLE AND LEVEL PLATFORM IS CONSTRUCTED ENSURING UNIFORM COVER TO REINFORCEMENT IS ACHIEVED ACROSS THE ENTIRE EXTENT OF THE SLAB.

POST TENSIONED CONCRETE: SHALL COMPLY TO AS3600 AND AS3610

PT1. FULL COMPUTATIONS AND DETAILS OF PROPOSED SYSTEM SHALL BE SUBMITTED TO THE ENGINEERS FOR APPROVAL, INCLUDING DEAD, LIVE ANCHORAGE DETAILS AND LOSSES OCCURRING THROUGHOUT THE ANCHOR AND ATTACHMENTS. ANY POST TENSIONING MATERIALS AND OPERATIONS SHALL COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATION AND WITH AS 3600.

PT2. CONCRETE: f'c = 32 MPa
SLUMP = 60mm ± 15mm
BASIC SHRINKAGE STRAIN = 700 x 10^-6 AT 56 DAYS

PT3. TENDONS SHALL COMPRISE OF A NUMBER OF STRANDS AS NOTED ON THE DRAWINGS. STRANDS SHALL BE 7 WIRE STRESS RELIEVED LOW RELAXATION 12.7mm DIAMETER SUPERGRADE STRAND OF 1840N MINIMUM BREAKING LOAD. WHERE 15.2mm DIAMETER STRANDS ARE SPECIFIED THEY SHALL BE SUPERGRADE STRANDS OF 2500N MINIMUM BREAKING LOAD. STEEL PRESTRESSING MATERIALS FOR CONCRETE SHALL COMPLY WITH AS/NZS 4672. WHERE APPLICABLE, MATERIALS SHALL BE CUT AND BENT IN ACCORDANCE WITH AS 3600, AS 5100 OR AS 2870. ACCEPTABLE MANUFACTURERS AND PROCESSORS OF STEEL REINFORCING AND PRESTRESSING MATERIALS MUST ALSO HOLD A VALID CERTIFICATE OF APPROVAL, ISSUED BY THE AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEELS LTD (ACRS). MATERIALS CERTIFIED TO AN ALTERNATIVE SYSTEM SHALL NOT BE USED WITHOUT DEMONSTRATED EQUIVALENCE AND SUBSEQUENT WRITTEN APPROVAL FROM THE SPECIFIER. EVIDENCE OF COMPLIANCE WITH THIS CLAUSE MUST BE OBTAINED WHEN CONTRACT BIDS ARE RECEIVED.

PT4. THE CONTRACTOR MUST SUBMIT FOR APPROVAL OF SHOP DRAWINGS OF THE TENDON LAYOUT SHOWING TENDON PROFILES, ANCHOR DETAILS AND PROPOSED STRESSING SEQUENCE.

PT5. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL CALIBRATION DATA FOR EVERY JACK TO BE USED ON THE JOB.

PT6. THE POST TENSIONED STRUCTURE SHALL BE CAST AS INDICATED ON THE PLAN WITH 25% PARTIAL TENSIONING APPLIED AT NOT MORE THAN 24 HOURS AFTER CASTING. AND WHEN fcp = 7 MPa (FOR 12.7mm DIA. STRANDS), OR WHEN fcp = 9 MPa (FOR 15.2mm DIA. STRANDS).

PT7. FINAL TENSIONING SHALL BE APPLIED NOT LESS THAN 4 DAYS AFTER FINAL CASTING AND WHEN fcp = 20 MPa (BY TEST). THE NEW FLOOR OVER SHALL NOT BE POURED UNTIL FINAL TENSIONING HAS BEEN APPLIED TO THE FLOOR BELOW.

PT8. TENDONS SHALL BE STRESSED TO A MAXIMUM OF 85 % OF THE TENSILE STRENGTH OF THE STRAND. RESTRESSING OF TENDON (AFTER INITIAL STRESSING) SHALL BE CARRIED OUT WHERE NECESSARY TO MAINTAIN "DESIGN" PRESTRESSING FORCES AT ANCHORAGES AT THE LEVELS SPECIFIED.

PT9. THE FLOOR DESIGN ASSUMES A 75mm WIDE x 19mm DEEP DUCT OF ZINC COATED STEEL HAVING A CURVATURE COEFFICIENT (u) = 0.20 AND AN ANGULAR COEFFICIENT (B) = 0.02

PT10. DRAPED DIMENSIONS ARE MEASURED FROM THE CONCRETE SOFFIT TO UNDERSIDE OF DUCT. ANCHORAGE DIMENSIONS ARE FROM CONCRETE SOFFIT TO CENTRE LINE OF DUCT. TENDON DRAPE BETWEEN POINTS NOMINATED ARE PARABOLIC WITH SHALLOW CURVATURE AT CHANGE OF GRADE AS REQUIRED. THE SLAB TENDON PROFILES SHALL BE KEPT HORIZONTAL ACROSS THE WIDTH OF THE BEAMS UNLESS OTHERWISE NOTED. THE TOLERANCE ON THE TENDON PROFILE IS TO BE ± 3mm. TENDON SETOUTS SHALL TAKE PRECEDENCE OVER NON-TENSIONED REINFORCEMENT.

PT11. ENSURE MINIMUM 50mm SPACING BETWEEN BARS AND TENDONS FOR CONCRETE PLACING. PROVIDE SPECIAL CARE TO ENSURE PLACEMENT AND PROPER COMPACTION OF CONCRETE AROUND TENDONS AND ANCHORAGES.

PT12. ALL STRESSING EXTENSIONS RESULTS ARE TO BE SUBMITTED FOR APPROVAL BEFORE ANY STRANDS ARE CUT. TENDONS SHALL BE FULLY GROUTED AFTER APPROVAL OF STRAND EXTENSION RESULTS AND WITHIN 4 WEEKS OF POURING IN A MANNER APPROVED BY THE ENGINEER.

CONCRETE: SHALL COMPLY TO AS3600 AND AS3610

C1. CONCRETE SIZES DO NOT INCLUDE FINISHES.

C2. NO HOLES, CHASES OR EMBEDEMENTS OTHER THAN THOSE SHOWN ON DRAWINGS SHALL BE MADE IN CONCRETE ELEMENTS WITHOUT ENGINEER'S APPROVAL.

C3. DEPTHS OF BEAMS ARE GIVEN FIRST AND INCLUDE SLAB THICKNESS, SLABS AND BEAMS SHALL BE CAST TOGETHER UNLESS OTHERWISE NOTED.

C4. CONCRETE SHALL BE KEPT FREE OF SUPPORTING MASONRY WITH TWO LAYERS OF SUITABLE MEMBRANE (MALTHOID OR EQUAL). VERTICAL FACES SHALL BE SEPARATED BY 12mm BITUMINOUS CANETTE. ALL NON - LOAD BEARING WALLS SHALL BE KEPT 20 mm CLEAR OF THE UNDERSIDE OF SLABS AND BEAMS UNLESS NOTED OTHERWISE.

C5. CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED AND LOCATED TO THE SATISFACTION OF THE ENGINEER. BUILDER SHALL ALLOW FOR ALL NECESSARY CONSTRUCTION JOINTS.

C6. WHERE NOTED ON DRAWINGS CAMBER TO SUSPENDED SLABS AND BEAMS SHALL BE 5 FOR EVERY 2500 OF SPAN UNLESS OTHERWISE NOTED. WHERE THE CONCRETE SOFFITS ARE CAMBERED, THE UPPER SURFACE SHALL BE SIMILARLY CAMBERED. DEPTH GAUGES SHALL BE USED TO VERIFY THE SLAB THICKNESS.

C7. REINFORCEMENT IS SHOWN DIAGRAMATICALLY AND IS NOT NECESSARILY IN TRUE PROJECTION. SPLICES TO REINFORCEMENT SHALL BE MADE ONLY AT THE LOCATION SHOWN ON AS OTHERWISE APPROVED BY THE ENGINEER. WELDING OF REINFORCEMENT SHALL BE CARRIED OUT BY A QUALIFIED WELDER IN ACCORDANCE WITH AS/NZS 1554 AND THE REINFORCEMENT SUPPLIER RECOMMENDATIONS. THE INTERPASS TEMPERATURE SHALL BE LESS THAN 200 DEGREES IN ACCORDANCE WITH AS/NZS 1554 PART 3.

C8. THE REINFORCEMENT SYMBOLS ARE:
N NORMAL DUCTILITY CLASS HOT ROLLED 500N DEFORMED BARS WITH fsy = 500 MPa.
R NORMAL DUCTILITY CLASS 250N PLAIN ROUND BARS WITH fsy = 250 MPa.
L LOW DUCTILITY CLASS HARD DRAWN 500L WIRE REINFORCING MESH WITH fsy = 500MPa.
DO NOT USE LOW DUCTILITY CLASS L REINFORCEMENT UNLESS SHOWN ON THE DRAWINGS.
THE NUMBER FOLLOWING THE REINFORCEMENT SYMBOL IS THE NOMINAL BAR DIAMETER IN MILLIMETERS. ALL REINFORCEMENT SHALL COMPLY WITH AS/NZS 4671.
STEEL REINFORCING MATERIALS FOR CONCRETE SHALL COMPLY WITH AS/NZS 4671. WHERE APPLICABLE, MATERIALS SHALL BE CUT AND BENT IN ACCORDANCE WITH AS 3600, AS 5100 OR AS 2870.
ACCEPTABLE MANUFACTURERS AND PROCESSORS OF STEEL REINFORCING AND PRESTRESSING MATERIALS MUST ALSO HOLD A VALID CERTIFICATE OF APPROVAL, ISSUED BY THE AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEELS LTD (ACRS). MATERIALS CERTIFIED TO AN ALTERNATIVE SYSTEM SHALL NOT BE USED WITHOUT DEMONSTRATED EQUIVALENCE AND SUBSEQUENT WRITTEN APPROVAL FROM THE SPECIFIER. EVIDENCE OF COMPLIANCE WITH THIS CLAUSE MUST BE OBTAINED WHEN CONTRACT BIDS ARE RECEIVED.

C9. HOOKS AND COGS SHALL COMPLY WITH AS3600 UNLESS NOTED OTHERWISE. ALL PULL OUT BARS SHALL BE TEMPCORE BARS OR APPROVED EQUIVALENT. BENDING AND REBENDING OF BARS SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3600, AS/NZS 4671, THE SPECIFICATIONS AND THE REINFORCEMENT SUPPLIER RECOMMENDATIONS. BARS SHALL NOT BE HEATED ABOVE 400 DEGREES WITHOUT THE ENGINEER'S WRITTEN APPROVAL. THERMAL CRAYONS SHALL BE USED TO ENSURE COMPLIANCE WITH THIS TEMPERATURE LIMIT.

C10. COVER TO REINFORCEMENT (IN mm) AND CONCRETE GRADES SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE: THE COVER SHALL NOT BE LESS THAN THE BAR DIAMETER AND:

ELEMENT	FORMED INTERNAL	FORMED AND EXPOSED TO WEATHER (1.)	NOT FORMED CAST AGAINST GROUND (2.)
FOOTINGS, PILE CAPS	-	60	75
COLUMNS, PEDESTALS	40	50	75
SLABS, BAND BEAMS	20	40	60
BEAMS	30	40	60
WALLS HORIZONTAL	30	40	60
VERTICAL	40	50	60

1. FOR EXPOSURE CLASSIFICATION B2 ADD 5mm TO THE COVER AND THE CONCRETE GRADE SHALL BE N40 MINIMUM.
2. IF THE ELEMENT IS CAST ON A DAMP PROOF MEMBRANE, DECREASE THE COVER BY 20mm.
3. FOR PRESTRESSING TENDONS THE MINIMUM COVER SHALL BE 25mm.
4. IN CORROSIVE SOILS AND WATER: N50

NOTES:

(i) COVER IS THE CLEAR DISTANCE BETWEEN ANY REINFORCING (INCLUDING FITMENTS) AND THE FACE OF THE STRUCTURAL ELEMENT.

(ii) FOR ALL EXTERNAL SURFACES, PROVIDE FULLY PLASTIC BAR CHAIRS. TIE WIRE SHALL NOT BE NAILED TO THE FORMS, REINFORCING BARS SHALL NOT BE USED TO KEEP FORMS APART AND A THROUGH TIE SYSTEM SHALL BE USED TO TIE FORMS.

(iii) PROVIDE AN APPROVED

NON DECLARED DESIGN

PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.

PROJECT TITLE: CHADSWOOD

CONSENT No.: BODY CORP REG TAG:

DRAWING TITLE: SPECIFICATION NOTES - SH2 DA No: S00011

REV	DATE	DESCRIPTION	DP FULL NAME	REG NO

DESIGN CRITERIA NOTES:

DC1. THE SUPERIMPOSED DEAD AND LIVE LOADS SHALL BE CALCULATED IN ACCORDANCE WITH AS1170.1 AND AS1170.0. REFER TO THE GENERAL ARRANGEMENT DRAWINGS FOR SPECIFIC LOAD CRITERIA.

DC2. THE WIND LOADS SHALL BE CALCULATED IN ACCORDANCE WITH AS1170.2 AND AS1170.0. THE FOLLOWING CRITERIA APPLY:

TERRAIN CATEGORY	3
PROBABILITY OF EXCEEDANCE	1/1000
REGION	A2

DC3. THE EARTHQUAKE LOADING SHALL BE CALCULATED IN ACCORDANCE WITH AS1170.4. THE FOLLOWING CRITERIA APPLY:

IMPORTANCE LEVEL	3
PROBABILITY OF EXCEEDANCE	1/1000
PROBABILITY FACTOR	1.3
HAZARD FACTOR	0.08
SITE SUBSOIL CLASS	Ce
EARTHQUAKE DESIGN CATEGORY	III

DC4. THE MINIMUM LATERAL RESISTANCE LOAD OF 2.5% OF (Gi+ c Qi) FOR EACH LEVEL, SHALL BE APPLIED SIMULTANEOUSLY AT EACH LEVEL FOR A GIVEN DIRECTION, IN ACCORDANCE WITH AS1170.0.

DC5. THE CADIGAL GROUP PTY STRUCTURAL DESIGN BASIS RECORD SHALL FORM PART OF THE DESIGN CRITERIA FOR ANY PROJECT ASSOCIATED DESIGN COMPLETED AND IS AVAILABLE UPON REQUEST.

DC6. THE GENERAL DEFLECTION LIMITS ARE AS FOLLOWS:

ELEMENT	SERVICEABILITY PARAMETER	ELEMENT RESPONSE
TOTAL DEFLECTION	MIDSPAN	SPAN / 250
TOTAL DEFLECTION	CANTILEVER	SPAN / 125
MEMBERS SUPPORTING BRITTLE PARTITIONS	MIDSPAN (AFTER ADDITION OF PARTITIONS)	SPAN / 500
MEMBERS SUPPORTING BRITTLE PARTITIONS	CANTILEVER (AFTER ADDITION OF PARTITIONS)	SPAN / 250
WIND LOAD STEEL BUILDING WITH BRITTLE (MASONRY) FINISHES	DEFLECTION AT TOP	HEIGHT / 240
WIND LOAD BUILDING CLAD IN STEEL / ALUMINIUM (NO BRITTLE INTERNAL FINISHES)	DEFLECTION AT TOP	HEIGHT / 150
WIND LOAD MULTISTOREY CONCRETE BUILDING SWAY	DEFLECTION AT TOP	HEIGHT / 600
HORIZONTAL DEFLECTION OF HANDRAIL HORIZONTALS	MIDSPAN	SPAN / 240
HORIZONTAL DEFLECTION OF HANDRAIL STANCHIONS	DEFLECTION AT TOP	HEIGHT / 60
GLAZING SUPPORT FRAME	MIDSPAN	MAX OF SPAN / 240 OR 20mm
GLAZING SYSTEM (BOWING)	MIDSPAN	SPAN / 400

DESIGN FOR SAFER WORKPLACES:

DS1. THIS PROPOSED BUILDING OR STRUCTURE, OR PART OF IT, HAS BEEN DESIGNED TO BE USED AS A WORKPLACE UNDER THE COMMON DEFINITION OF THE RESPECTIVE OHS ACT.

DS2. THE ABOVE HAS BEEN DETERMINED VIA ARCHITECTURAL DRAWINGS. REFER TO THE ARCHITECTURAL DRAWINGS FOR ALL WALKWAY, BALUSTRADE AND ACCESS SYSTEM DETAILS.

DS3. THE PURPOSE, OR FORESEEABLE PURPOSE OF THE PROPOSED BUILDING / STRUCTURE IS A MIXED-USE DEVELOPMENT.

DS4. THE BELOW TABLE IS PROVIDED TO THE CLIENT FOR THEIR RECORDS. THE RISKS IDENTIFIED ARE CURRENT AT THE TIME THIS DOCUMENT WAS CREATED. WITH WHAT INFORMATION WAS AVAILABLE. THE CLIENT MAY WISH TO SEEK FURTHER ADVICE FROM CADIGAL GROUP OR A SPECIALIST OHS PROFESSIONAL ON HOW TO FURTHER REDUCE THEIR RESIDUAL RISKS.

DS5. ALL FALL ARREST AND FALL RESTRAINT SYSTEMS SHALL BE DESIGNED, DOCUMENTED AND CERTIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL ALLOW PROVISION OF ADDITIONAL SUPPORT STRUCTURE FOR ALL CONNECTION POINTS OF THE FALL ARREST OR RESTRAINT SYSTEM.

HAZARD CATEGORY	HAZARD / ISSUES IDENTIFIED	IDENTIFIED LEVEL OF RISK (MEDIUM / HIGH)	RISK CONTROL MEASURES	RESIDUAL RISKS
SITING	CHANGES IN LEVEL	LOW (TRIP HAZARD)	BCA REQUIREMENT REFER ARCHITECT DRAWINGS FOR STEP TREATMENT	NONE
HIGH CONSEQUENCE	NONE	N / A	N / A	N / A
SYSTEM OF WORK	ROOF / CEILING MOUNTED SERVICE ACCESS FACADE ACCESS GUTTER ROOF MAINTENANCE	MEDIUM (FALL)	BCA REQUIREMENT REFER ARCHITECT DRAWINGS FOR ALL ACCESS SYSTEMS	CLIENT TO MAINTAIN ALL ACCESS SYSTEMS
INCIDENT MITIGATION	NONE	N / A	N / A	N / A

SITE SUPERVISION AND INSPECTION NOTES:

SI1. THE CONTRACTOR SHALL ENSURE A SUITIBLY QUAUIFIED, REGISTERED BUILDING PRACTITIONER CARRIES OUT ALL THE REQUIRED INSPECTIONS, AS SPECIFIED BY THE BUILDING SURVEYOR, TO ENABLE IT TO PROVIDE A CERTIFICATE OF COMPLIANCE - CONSTRUCTION AT THE CONCLUSION OF THE WORKS.

SI2. CADIGAL GROUP PTY LTD HAVE ALLOWED FOR STRUCTURAL INSPECTIONS TO SATISFY OUR PROFESSIONAL OBLIGATIONS IN ASSISTING THE CONTRACTOR TO FOLLOW THE DESIGN INTENT OF OUR DOCUMENTS BUT NOT NECESSARILY TO INSPECT ALL ELEMENTS.

SI3. THE CONTRACTOR SHALL GIVE A MINIMUM OF TWO (2) WORKING DAYS NOTICE PRIOR TO INSPECTIONS BEING REQUIRED. SCHEDULED INSPECTIONS SHOULD BE CANCELLED A MINIMUM OF FOUR (4) WORKING HOURS PRIOR TO THE SCHEDULED TIME IF WORK WILL NOT BE READY FOR INSPECTION.

IF AN AREA OF WORK IS NOT COMPLETED AT THE SCHEDULED TIME OF INSPECTION, OR IT IS DEFECTIVE AND REQUIRES RE-INSPECTION, THE RE-INSPECTION SHALL BE AT THE CONTRACTORS EXPENSE.

INSPECTION TIMES SHALL BE BETWEEN THE ENGINEERS WORKING HOURS OF 9AM TO 4PM MONDAY TO FRIDAY (EXCLUDING PUBLIC HOLIDAYS). GENERALLY NO INSPECTIONS SHALL BE CARRIED OUT ON SATURDAYS, SUNDAYS OR PUBLIC HOLIDAYS EXCEPT IN EMERGENCY SITUATIONS AND BY SPECIAL BOOKING ARRANGEMENTS (INCLUDING PROVISION FOR ADDITIONAL FEES FOR THE ENGINEER).

SI4. THE CONTRACTOR SHALL ALLOW IN THEIR PROGRAMME A MINIMUM PERIOD OF TEN (10) WORKING DAYS FROM RECEIPT OF THE SHOP DRAWINGS BY THE ENGINEER TO APPROVAL OF THE DRAWINGS.

UNLESS OTHERWISE ARRANGED, THE DRAWINGS SHALL BE SUBMITTED PROGRESSIVELY IN COMPLETED PACKAGES (RELATING TO MARKING PLANS) SO AS TO ALLOW THE ENGINEER TO CHECK THE DRAWINGS IN A TIMELY MANNER.

WATERPROOFING:

1. REFER TO ARCHITECTS DOCUMENTATION FOR WATERPROOFING DETAILS AND PRODUCT SPECIFICATIONS GENERALLY.
2. WHILE THE SELECTION AND DETAILING OF WATERPROOFING PRODUCTS IS OUTSIDE THE SCOPE OF THE STRUCTURAL DOCUMENTATION, THE FOLLOWING ITEMS MUST BE NOTED:

(i) REINFORCED CONCRETE AND REINFORCED CONCRETE BLOCKWORK ON THEIR OWN ARE NOT WATERPROOF.

(ii) CADIGAL GROUP RECOMMENDS WATERPROOFING MEASURES FOR ALL EXTERNAL SLABS OVER USABLE SPACES AND EXTERNAL SINGLE SKIN MASONRY.

(iii) FAILURE TO PROVIDE WATERPROOFING, OR INADEQUATE WATERPROOFING MEASURES MAY RESULT IN LEAKS.

(iv) PROLONGED LEAKS CAN LEAD TO PREMATURE DETERIORATION OF STRUCTURAL ELEMENTS.

(v) WATER LEAKING THROUGH CONCRETE STRUCTURES TYPICALLY CONTAINS CALCIUM WHICH CAN DAMAGE PAINTWORK.

REINFORCEMENT:

1. REINFORCEMENT IS TO BE IN ACCORDANCE WITH THE AS/NZS4671 AND TO BE FIXED AS SHOWN ON THE DRAWINGS.

MATERIAL IS INDICATED BY THE FOLLOWING SYMBOLS:

N- HOT ROLLED RIBBED REBAR (500 MPa)
R - HOT ROLLED PLAIN ROUND (250 MPa)
SL - SQUARE MESH
RL - RECTANGULAR MESH
TM - TRENCH MESH

THE BAR SIZE IS INDICATED BY A NUMBER AFTER THE ABOVE SYMBOL, WHICH INDICATES THE BAR DIAMETER IN MILLIMETRES.

2. CONCRETE STRENGTHS TO CONCRETE ELEMENTS AND LAP LENGTHS TO REINFORCEMENT BARS IN SLABS AND BEAMS IS TO BE AS NOTED ON THE RELEVANT DRAWINGS. IF RELEVANT INFORMATION IS NOT SUPPLIED THE CONTRACTOR IS TO CONTACT THE ENGINEER IMMEDIATELY.
3. COVER TO BE MAINTAINED DURING POURING BY USE OF PLASTIC TIPPED METAL CHAIRS, PLASTIC CHAIRS AND/OR MORTAR BLOCKS. COVER SHALL BE AS NOTED ON DRAWINGS. CHAIRING SHALL BE SPACED SUCH THAT THE FOLLOWING TOLERANCES ARE ACHIEVED DURING CONCRETE POUR

ABOVE GROUND - +10 mm/-5 mm
BELOW GROUND - +40 mm/-20 mm

4. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITION SHOWN. WRITTEN APPROVAL BY THE STRUCTURAL ENGINEER SHALL BE OBTAINED FOR ANY OTHER SPLICES.
5. WELDING OF REINFORCEMENT WILL BE PERMITTED ONLY AFTER APPROVAL BY THE STRUCTURAL ENGINEER.
6. REINFORCEMENT SHALL BE BENT COLD IN ACCORDANCE WITH AS3600 EXCEPT WHERE APPROVED BY THE STRUCTURAL ENGINEER. NO RE-BENDING SHALL BE PERMITTED UNLESS APPROVED BY THE STRUCTURAL ENGINEER.
7. ALL REINFORCEMENT SHALL BE SECURELY SUPPORTED IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED PLASTIC BAR CHAIRS U.N.O. MAXIMUM CENTRES OF SUPPORTING CHAIRS SHALL BE 600mm FOR FABRIC, 600mm FOR BARS UP TO 12mm DIAMETER, 900mm FOR BARS 16mm AND GREATER.
8. ALL OPENINGS AND RE-ENTRANT CORNERS IN THE CONCRETE SHALL HAVE 2-N12 BARS x 1200 LONG TOP AND BOTTOM, CENTRED DIAGONALLY ACROSS THE CORNER.

ANCHORAGE / SPLICE LENGTH TABLE

SPLICE LENGTHS OF TENSION BARS IN SLABS AND BEAMS (mm)

BAR SIZE	LESS THAN 300mm OF CONCRETE BELOW BAR OR VERTICAL BAR				MORE THAN 300mm OF CONCRETE BELOW BAR			
	CONCRETE GRADE							
	N32		>=N40		N32		>=N40	
	SLAB	BEAM SLAB		BEAM	SLAB	BEAM	SLAB	BEAM
N10	400	400	400	400	500	450	500	400
N12	500	500	500	500	650	550	600	500
N16	750	650	700	650	1000	850	900	750
N20	1000	900	900	800	1300	1150	1150	1050
N24	1250	1150	1100	1050	1600	1500	1450	1350
N28	1500	1450	1350	1300	2000	1900	1750	1700
N32	1800	1750	1600	1600	2300	2300	2050	2050
N36	2100	2100	1900	1900	2700	2700	2400	2400
APPROXIMATE SPLICE RULE	55 db		50 db		75 db		65 db	
APPROXIMATE ANCHORAGE RULE	45 db		40 db		60 db		55 db	

1. THESE LENGTHS APPLY FOR ALL BARS IN BEAMS AND SLABS.
2. THE MINIMUM COVER TO THE BAR UNDER CONSIDERATION IS TO BE THE GREATER OF 20MM FOR SLABS, 35MM FOR BEAMS, OR THE BAR DIAMETER.
3. THE CLEAR SPACING BETWEEN SPLICED BARS MUST BE LESS THAN ONE BAR DIAMETER.
4. FOR N25 CONCRETE, MULTIPLY THE LENGTHS OF N32 CONCRETE BY 1.15.
5. UNLESS SHOWN ON THE DRAWINGS THE SPLICE LOCATIONS MUST BE APPROVED BY THE ENGINEER.
6. FOR ANCHORAGE LENGTHS OF BARS, MULTIPLY THE SPLICE LENGTHS BY 0.8
7. DB DENOTES BAR DIAMETER .
8. THE MINIMUM CLEAR SPACING OF BARS TO BE 120MM.

PILE SPLICES AND ANCHORAGES

THE PILE SPLICE LENGTH MAY BE REDUCED FROM 40 TO 32 BAR DIAMETER AND THE ANCHORAGE LENGTH MAY BE REDUCED FROM 22 TO 16.5 BAR DIAMETER , IF THE FOLLOWING TIES AND SPACINGS OCCUR WITHIN THE ANCHORAGE AND SPLICE LENGTHS.

LONGITUDINAL BAR SIZE (mm)	MINIMUM LIGATURE SIZE (mm)	MINIMUM LIGATURE SIZE (mm)	LAP LENGTH (mm)	ANCHORAGE LENGTH
20	10	250	650	350
24	10	170	800	400
24	12	240	800	400
28	10	120	900	500
28	12	170	900	500
32	12	130	1050	550
32	16	250	1050	550
36	12	100	1150	600
36	16	190	1150	600

FORMWORK:

1. FORMWORK SHALL BE DESIGNED BY A REGISTERED ENGINEER ENGAGED BY THE FORMWORK CONTRACTOR AND ERECTED IN ACCORDANCE WITH AS3610-1995 AND AS3610.1-2010.
2. MINIMUM DESIGN LOADS FOR THE FORMWORK SHALL INCLUDE AT LEAST THE FOLLOWING:

(a) THE WEIGHT OF CONCRETE DURING PLACING, PLUS AN ALLOWANCE FOR REINFORCING,
(b) LIVE LOADING OF 1.0 kPa GENERALLY, OR 3.0 kPa CONCENTRATED LOAD OVER AN AREA OF 1.6 m², WHICHEVER IS MORE SEVERE,
(c) A LOADING OF 4.0 kPa FROM STACKED MATERIALS.

3. MINIMUM STRIPPING TIMES ARE TO COMPLY WITH AS3610-1995, TABLE 5.4.1.
4. BACKPROPPING SHALL BE DESIGNED BY A REGISTERED ENGINEER ENGAGED BY THE FORMWORK CONTRACTOR TAKING INTO ACCOUNT THE VARIATION IN THE STRENGTH OF THE CONCRETE WITH AGE, THE DESIGN LOADINGS FOR THE SLABS, AND THE CONSTRUCTION CYCLE.
5. DESIGN LOADS FOR THE PERMANENT STRUCTURE ARE AS NOTED ON THE DRAWINGS AND CARE SHALL BE TAKEN TO ENSURE THAT THE DESIGN LOADS ARE NOT EXCEEDED DURING CASTING OF CONCRETE OR BY STACKED CONSTRUCTION MATERIALS.
6. PRECAMBER SHALL BE PROVIDED IN SLABS WHERE NOTED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL SUBMIT THE PROPOSED POURING SEQUENCE TO THE ENGINEER FOR APPROVAL.

CHEMICAL & MECHANICAL ANCHORS:

1. "CHEMSET" DENOTES RAMSET GRADE 5.8 HOT DIPPED GALV. STUDS FIXED WITH RAMSET CHEMSET REO 502 WITH THE FOLLOWING MINIMUM EMBEDMENTS:

M12 CHEMSETS - 110mm EMBEDMENT U.N.O.
(MIN EDGE DISTANCE - 175)

M16 CHEMSETS - 125mm EMBEDMENT U.N.O.
(MIN EDGE DISTANCE - 190)

M20 CHEMSETS - 150mm EMBEDMENT U.N.O.
(MIN EDGE DISTANCE - 255)

M24 CHEMSETS - 160mm EMBEDMENT U.N.O.
(MIN EDGE DISTANCE - 315)

2. "CHEMSET MAXIMA CAPSULES" DENOTES RAMSET CHEMSET MAXIMA SPIN CAPSULES WITH STUDS AND EMBEDMENTS AS DEFINED IN NOTE 1.
3. "TRUBOLTS" DENOTES RAMSET TRUBOLT HOT DIPPED GALV. STUD ANCHORS WITH THE FOLLOWING MINIMUM EMBEDMENTS WITH MIN. EDGE DISTANCE OF 300mm:

M12 TRUBOLTS - 80mm EMBEDMENT U.N.O.
M16 TRUBOLTS - 110mm EMBEDMENT U.N.O.
M20 TRUBOLTS - 135mm EMBEDMENT U.N.O.

4. "CHEMSET 101 ANCHORS" DENOTES RAMSET GRADE 5.8 HOT DIPPED GALV. STUDS, FIXED WITH AN EFFECTIVE DEPTH OF 70mm INTO EXTRUDED BRICK OR HOLLOW CONCRETE BLOCK, USING THE MANUFACTURER'S SLEEVES/SIEVES AND RAMSET CHEMSET INJECTION 101.
5. ALL ANCHORS ARE TO BE FIXED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN RECOMMENDATIONS.
6. REINFORCEMENT BARS FIXED INTO CONCRETE USING RAMSET CHEMSET REO 502 EPOXY ARE TO HAVE THE FOLLOWING MINIMUM EMBEDMENTS:

N12 (500 MPa) BARS - 110mm EMBEDMENT U.N.O.
(MIN EDGE DISTANCE - 175)

N16 (500 MPa) BARS - 125mm EMBEDMENT U.N.O.
(MIN EDGE DISTANCE - 190)

N20 (500 MPa) BARS - 175mm EMBEDMENT U.N.O.
(MIN EDGE DISTANCE - 255)

N24 (500 MPa) BARS - 400mm EMBEDMENT U.N.O.
(MIN EDGE DISTANCE - 315)

N GRADE BAR DIAMETERS GREATER THAN THE ABOVE ARE TO BE REFERRED TO THE STRUCTURAL ENGINEER FOR ASSESSMENT. MINIMUM EDGE DISTANCE FOR ALL EPOXIED BARS TO BE 150mm UNO.

STEELWORK:

1.(a) FABRICATE & ERECT THE STRUCTURAL STEELWORK IN ACCORDANCE WITH CURRENT REVISIONS OF AS4100, AS1554 PARTS 1 & 2, AND AS1101 PART 3.

(b) AT LEAST 7 BUSINESS DAYS BEFORE FABRICATION COMMENCES, THE CONTRACTOR SHALL SUBMIT TWO COPIES OF SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL OF THE GENERAL ARRANGEMENT OF STRUCTURAL ELEMENTS.

(c) ALL DIMENSIONS RELEVANT TO SETTING OUT AND SITE WORK ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO WORK COMMENCING.

(d) DO NOT SCALE DRAWINGS.

(e) UNLESS NOTED OTHERWISE :-
(i) ALL BOLTS SHALL BE M20 8.8/S.
(ii) INSTALL ALL BOLTS IN ACCORDANCE WITH AS4100.
(iii) CONNECTION & STIFFENER PLATES SHALL BE 10mm THICK.
(iv) ALL WELDS TO BE 6 mm CONTINUOUS FILLET WELDS. MADE WITH E48XX MILD STEEL ELECTRODES.
(v) UNLESS NOTED OTHERWISE ALL STRUCTURAL STEEL SHALL BE :-
GRADE 250 HOT ROLLED PLATES & FLATS.
GRADE 300 PLUS UB, UC, PFC, TFB, EA & UA.
GRADE 300 WB, WC.
GRADE 350 RHS, SHS & CHS.

(f) TEMPORARY BRACING TO BE PROVIDED IN ACCORDANCE WITH AS4100.
(g) CHIP ALL WELDS FREE OF SLAG.
(h) UNLESS NOTED OTHERWISE, ALL STEELWORK SHALL BE PREPARED, PRIMED AND PAINTED IN ACCORDANCE WITH THE SPECIFICATION. ALL EXTERNAL STEELWORK TO BE HOT DIP GALVANISED.

(i) UNLESS NOTED OTHERWISE, ALL HOLDING DOWN BOLTS TO BE M20 H.D. BOLTS HOT DIP GALVANISED.

2. THE CONTRACTOR SHALL IDENTIFY SAFE WORKING PRACTICES FOR THE ERECTION OF STRUCTURAL STEEL AND INCORPORATE THEM INTO THE WORKPLACE HEALTH AND SAFETY PLAN FOR THE PROJECT. THE WORKING PRACTICES IDENTIFIED SHALL COVER AT LEAST THE FOLLOWING ITEMS:

(a) HANDLING, LIFTING, STORAGE, STACKING AND TRANSPORTATION OF STEEL COMPONENTS.
(b) SAFE ACCESS FOR ERECTION.
(c) THE ERECTION SEQUENCE.

3. ERECTION TOLERANCES FOR STRUCTURAL STEELWORK AS PER AS4100.
4. ALL BOLTS, NUTS, WASHERS AND OTHER FASTENERS SHALL COMPLY WITH THE CURRENT EDITIONS OF THE FOLLOWING STANDARDS, AS APPROPRIATE: AS/NZS1110, AS/NZS1111, AS/NZS1112, AS/NZS1252, AS1275, AS/NZS1559 AND AS4291.
5. FOR GRADE 8.8 BOLTS, COPIES OF MANUFACTURER'S TEST CERTIFICATES & STATEMENTS OF COMPLIANCE BASED ON LOCAL NATA ACCREDITED TESTING TO THE CURRENT AUSTRALIAN STANDARDS SPECIFIC TO THE BATCH OF BOLTS BEING USED SHALL BE PROVIDED TO THE ENGINEER.
6. WHERE FABRICATION INVOLVES FULL PENETRATION BUTT WELDS, THE FABRICATOR SHALL CARRY OUT NON-DESTRUCTIVE TESTING BY ULTRASONIC, RADIOGRAPHIC OR OTHER METHODS APPROVED BY THE ENGINEER. NON-DESTRUCTIVE TESTING SHALL BE CARRIED OUT AT A RATE IN ACCORDANCE WITH AS1554 PART 1, BUT SHALL BE NOT LESS THAN 5% OF BUTT WELDS, UNLESS NOTED OTHERWISE ON THE DRAWINGS. ACCEPTANCE OF WELDS SHALL BE IN ACCORDANCE WITH SECTION 6 OF AS1554 PART 1.
7. COLD FORMED SECTIONS SHALL BE WELDED WHERE REQUIRED WITH A 2mm CONTINUOUS FILLET WELD USING AN E70 OR E80 LOW HYDROGEN COATED ELECTRODE OR MIG. EQUIVALENT. ALL WELDS SHALL BE TOUCHED UP WITH AN APPROVED ZINC RICH PRIMER.
8. BOLT TYPES (AND DESIGNATIONS, WHERE USED) SHALL BE AS FOLLOWS:

• 4.6/S - COMMERCIAL BOLTS TO AS1111 AND AS1112 SNUG TIGHTENED.

• 8.8/S - HIGH STRENGTH STRUCTURAL BOLTS, NUTS AND HARDENED WASHERS TO AS1252, SNUG TIGHTENED.

• 8.8/TF - HIGH STRENGTH STRUCTURAL BOLTS AS ABOVE, FULLY TENSIONED TO AS1511 IN FRICTION TYPE JOINT AND UNLESS NOTED OTHERWISE, WITH CONTACT SURFACE LEFT UNCOATED.

• 8.8/TB - HIGH STRENGTH STRUCTURAL BOLTS AS ABOVE, FULLY TENSIONED IN BEARING TYPE JOINT.

9. ALL BOLTS, NUTS AND WASHERS INCLUDING H.D. BOLTS ARE TO BE HOT DIP GALVANISED. ALL CAST IN FERRULES AND MASONRY ANCHORS TO BE PASSIVATED ZINC COATED. ALL GALVANISED COMPONENTS TO BE CAST INTO CONCRETE MUST BE PASSIVATED.
10. THE FOLLOWING STEELWORK SHALL BE HOT DIP GALVANISED:

• PLATE/ANCHOR ROD ASSEMBLIES CAST INTO CONCRETE.
• ALL MEMBERS BUILT INTO BLOCKWORK OR BRICKWORK.
• ALL EXTERNAL EXPOSED STEELWORK.

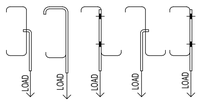
11. ALL STRUCTURAL STEEL FIXING DETAILS ARE TO BE BASED ON A.S.I. STANDARDISED STRUCTURAL CONNECTIONS, UNLESS NOTED OTHERWISE.

• ALL BOLT HOLES 2mm OVERSIZE U.N.O.
• HOLES FOR H.D. BOLTS 6mm OVERSIZE U.N.O. OVERSIZE HOLES FOR H.D. BOLTS WILL REQUIRE OVER SIZE WASHERS UNDER NUTS.
• BOLT HOLES IN STEELWORK CONNECTING TIMBER SHALL PROVIDE A SNUG FIT, i.e. NO GREATER THAN 0.5 mm LARGER THAN BOLT DIA.

12. STIFFENER PLATES WHERE DETAILED ARE TO BE PLACED ON BOTH SIDES OF WEB TO U.B.'S AND U.C.'S.
13. THE ENDS OF ALL TUBULAR MEMBERS ARE TO BE SEALED WITH 6mm THICK PLATES AND CONTINUOUS SEAL WELDS, UNLESS DETAILED OTHERWISE.
14. CLEANING AND PAINTING OF STRUCTURAL STEELWORK:

ABRASIVE BLAST CLEAN TO CLASS 2 AND 1/2.
ONE COAT PRIMER (GREY) MINIMUM DRY FILM THICKNESS OF 0.05 mm.
ONE COAT OF (SELECTED COLOUR) TO A DRY FILM THICKNESS OF 0.04 mm.
ASPECTS OF THE PREPARATION AND APPLICATION OF THE PAINT SYSTEM ARE TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN SPECIFICATION.

15. THE CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AND LEAVE IN PLACE UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED, SUCH TEMPORARY BRACING AS IS NECESSARY TO STABILISE THE STRUCTURE DURING ERECTION.
16. ALL FLOOR JOISTS USED TO SUPPORT CEILINGS, PIPES, MECHANICAL DUCTS ETC. SHALL BE SUPPORTED USING ONLY THE METHODS SHOWN IN THE DIAGRAMS BELOW:



IF IN DOUBT, OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO PROCEEDING WITH ANY WORKS.

ALTERATIONS AND ADDITIONS:

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT.
2. ALL DISCREPANCIES SHALL BE REFERRED TO THE ARCHITECT FOR DECISION BEFORE PROCEEDING WITH THE WORK.
3. THE WORK SHOWN ON THESE DRAWINGS IS BASED ON INFORMATION DERIVED FROM AN INSPECTION OF THE EXISTING BUILDING. ON OPENING UP, SHOULD THE BUILDER ASSERTAIN THAT CONDITIONS ARE NOT AS HAVE BEEN ASSUMED, HE SHALL INFORM THE CONSULTING ENGINEER AND OBTAIN INSTRUCTIONS BEFORE PROCEEDING FURTHER.
4. THE BUILDER SHALL BE RESPONSIBLE AT ALL TIMES FOR MAINTAINING THE BUILDING IN A STABLE AND SAFE CONDITION. DETAILS OF PROPOSED TEMPORARY WORKS, METHODS AND PROCEDURES SHALL BE SUBMITTED TO THE CONSULTING ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK.
5. THE BUILDER SHALL SECURELY NEEDLE, TOM, PROP AND BRACE ALL EXISTING BRICKWORK, BEAMS AND OTHER STRUCTURE AS NECESSARY TO PREVENT ANY MOVEMENT AND TO ENSURE SAFETY OF PERSONS DURING BUILDING OPERATIONS.
6. TOMMING AND PROPPING OF THIS STRUCTURE SHALL BE DETERMINED BY A CHARTERED STRUCTURAL ENGINEER TO THE APPROVAL OF THE ENGINEER.
7. NEW BEAMS INCLUDED TO PROVIDE SUPPORT TO EXISTING BRICKWORK OR SLAB SHALL BE WEDGED DOWN FROM THAT BRICKWORK OR SLAB AFTER SECURELY BEDDING AT ENDS AND GROUTING UP ACCORDINGLY.
8. WEDGES TO BE OF MILD STEEL AND POSITIONED AT 1200mm MAXIMUM CENTRES. WHEN IN FINAL POSITION WEDGES TO BE SPOT WELDED TO BEAM TO AVOID MOVEMENT DURING GROUTING PROCESS.
9. CONTRACTOR IS TO ALLOW TO FIRE RATE ALL EXISTING (INCLUDING REPLACEMENT OF ANY FIRE RATING MATERIAL FOR THE PURPOSES OF COMPLETING THE WORKS) AND NEW STRUCTURE INCLUDING BUT NOT LIMITED TO STRUCTURAL STEEL, RISERS, PENETRATIONS ETC. IN ACCORDANCE WITH THE REQUIRED CODES AND STANDARDS.

PROPPING AND TOMMING:

1. THE BUILDER SHALL SECURELY NEEDLE, TOM, PROP AND BRACE ALL EXISTING RETAINING WALLS, BRICKWORK, BEAMS AND OTHER STRUCTURE AS NECESSARY TO PREVENT ANY MOVEMENT AND TO ENSURE SAFETY OF PERSONS DURING BUILDING OPERATIONS.
2. TOMMING AND PROPPING OF THIS STRUCTURE SHALL BE DETERMINED BY A CHARTERED STRUCTURAL ENGINEER TO THE APPROVAL OF THE ENGINEER.
3. NEW BEAMS INCLUDED PROVIDED TO PROVIDE SUPPORT TO EXISTING BRICKWORK OR SLAB SHALL BE WEDGED DOWN FROM THAT BRICKWORK OR SLAB AFTER SECURELY BEDDING AT ENDS AND GROUTING UP ACCORDINGLY.
4. WEDGES TO BE OF MILD STEEL AND POSITIONED AT 1200mm MAXIMUM CENTRES WHEN IN FINAL POSITION WEDGES TO BE SPOT WELDED TO BEAM TO AVOID MOVEMENT DURING THE GROUTING PROCESS.
5. IF WHEN THE JOB IS OPENED UP, IT IS FOUND THAT THE EXISTING CONDITIONS DIFFER FROM THAT ASSUMED, THE BUILDER IS TO INFORM THE BUILDERS ENGINEER IMMEDIATELY. SINCE ADDITIONAL DESIGN MAY BE NECESSARY. THIS SHALL BE DONE TO THE APPROVAL OF THE ENGINEER.

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT
C	ISSUED FOR INFORMATION ONLY (DD 30%)	25.01.17	RM	JT
B	ISSUED FOR INFORMATION ONLY	24.08.05	RM	JT
A	ISSUED FOR INFORMATION ONLY	24.05.15	RM	JT

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Project:

849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.

Developer:

Billbergia creating communities®

Contractor:

Architect :

pbd architects

Design Consultant:

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Drawing Title:

SPECIFICATION NOTES -SH2

STRUCTURAL DRAWINGS

Designed: NAA	Project Director Approved	Date	North
Drawn: RT	JT	24.05.15	
Scale AS SHOWN	Project Ref.	Drawing No.	Rev
Sheet A1	01-100084	S00011	E

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NON DECLARED DESIGN

PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.

PROJECT TITLE: CHADSWOOD

CONSENT No.: BODY CORP REG TAG:

DRAWING TITLE: SPECIFICATION NOTES - SH3 DA No: S00012

REV	DATE	DESCRIPTION	DP FULL NAME	REG NO

DEMOLITION NOTES:

1. SOFT STRIP OUT OF FLOOR CAN OCCUR SIMULTANIOUSLY ON ALL LEVELS.
2. ONCE ALL STRIP OUT HAS OCCURED, A VISUAL INSPECTION OF ALL STRUCTURE TO BE CARRIED OUT BY STRUCTURAL ENGINEER.
3. VISUAL INSPECTION OF STRUCTURE AND REPORT / RECORDING TO OCCUR PRIOR TO DEMOLITION, DURING AND AFTER DEMOLITION. TO BE COMPLETED AND CROSS REFERENCED AGAINST DILAPIDATION REPORT.
4. DEMOLTION SHALL BE CARRIED OUT IN A MANNER TO ENSURE THAT STRUCTURE TO BE RETAINED IS MAINTAINED IN AN UNDAMAGED CONDITION.
5. CONTRACTOR TO ALLOW FOR TREATMENT OF EXPOSED REINFORCEMENT WITH CONCRESSIVE 2525 OR APPROVED EQUIVALENT.
6. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR THE STRENGTH AND STABILITY OF THE PRIMARY STRUCTURE IN ITS COMPLETED FORM.
7. THE CONTRACTOR IS RESPONSIBLE FOR:
   - COORDINATING DETAILS AND ACCURACY OF THE WORK
   - CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS
   - SELECTING FABRICATION PROCESSES
   - PERFORMING WORK IN A SAFE AND SECURE MANNER
8. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF DEMOLITION AND ALL JOBS RELATED TO SAFETY STANDARDS TO MEET LEGISLATIVE REQUIREMENTS.
9. THE CONTRACTOR SHALL AT THEIR DISCRETION EMPLOY A REGISTERED PROFESSIONAL ENGINEER FOR THE DESIGN OF ANY TEMPORARY BRACING AND SHORING REQUIRED DURING DEMOLITION.
10. THE CONTRACTOR IS RESPONSIBLE FOR THE STRENGTH AND STABILITY OF THE STRUCTURE DURING DEMOLITION AND CONSTRUCTION AND SHALL PROVIDE TEMPORARY SHORING, BRACING AND OTHER ELEMENTS REQUIRED TO MAINTAIN STABILITY UNTIL THE STRUCTURE IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE WORK REQUIRED IN THE CONSTRUCTION DOCUMENTATION AND THE REQUIREMENTS FOR EXECUTING IT PROPERLY.
11. LOADS ON THE STRUCTURE DURING CONSTRUCTION SHALL NOT EXCEED THE DESIGN LOADS AS NOTED.
12. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE INCLUDING EXISTING STRUCTURE. CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT / ENGINEER PRIOR TO PROCEEDING WITH THE WORKS.
13. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL ADJACENT UNDERGROUND UTILITIES PRIOR TO EARTHWORKS, FOUNDATIONS, SHORING AND EXCAVATION. ANY UTILITIES INFORMATION SHOWN ON THE DRAWINGS AND DETAILS IS APPROXIMATE AND NOT NECESSARILY COMPLETE.
14. ALTERNATE PRODUCTS OF SIMILAR STRENGTH, NATURE AND FORM FOR SPECIFIED ITEMS MAY BE SUBMITTED WITH ADEQUATE TECHNICAL DOCUMENTATION TO THE ARCHITECTS / ENGINEER FOR REVIEW. ALTERNATE MATERIALS THAT ARE SUBMITTED WITHOUT ADEQUATE TECHNICAL DOCUMENTATION OR THAT SIGNIFICANTLY DEVIATE FROM THE DESIGN INTENT OF MATERIALS SPECIFIED MAY BE RETURNED WITHOUT REVIEW. ALTERNATES THAT REQUIRE SUBSTANTIAL EFFORT TO REVIEW WILL NOT BE REVIEWED UNLESS AUTHORIZED BY THE OWNER.
15. ALL SCABBLING OF EXISTING STRUCTURES TO BE MINIMUM CSP 8 REFERENCED IN GUIDELINE No. 310-2R-2013 (PUBLISHED BY INTERNATIONAL CONCRETE REPAIR INSTITUTE) UNLESS NOTED OTHERWISE.

CONTRACTOR SUBMISSIONS:

1. THE REINFORCEMENT, PRESTRESSING AND STRUCTURAL STEEL MATERIAL SUPPLIER MUST BE CERTIFIED BY ACRS (AUSTRALIAN STANDARDS CERTIFICATION AND VERIFICATION OF REINFORCING, PRESTRESSING AND STRUCTURAL STEELS) FOR THE SUPPLY OF REINFORCEMENT, PRESTRESSING AND STRUCTURAL STEEL.
2. SUBMIT CURRENT CERTIFICATES.

SHORING GENERAL NOTES:

G1. THESE DRAWINGS AND NOTES SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANT'S DRAWINGS, REPORTS, SPECIFICATIONS AND ANY OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF CONSTRUCTION. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR CLARIFICATION OR DECISION BEFORE PROCEEDING WITH THE WORK.

G2. CONSTRUCTION FROM THESE DRAWINGS SHALL NOT COMMENCE UNTIL THEY ARE APPROVED BY THE RELEVANT AUTHORITIES.

G3. DIMENSIONS SHALL NOT BE OBTAINED FROM THE STRUCTURAL DRAWINGS BY WAY OF SCALING (OR DETERMINING UNDIMENSIONED MEASUREMENTS FROM THE ELECTRONIC DRAWING). WALL, PIER, AND COLUMN THICKNESS', AND STRUCTURAL MEMBER SIZES SHOWN ON THESE DRAWINGS SHALL TAKE PRECEDENCE OVER THOSE SHOWN ON THE ARCHITECT'S DRAWINGS. THE BUILDER SHALL VERIFY ALL DIMENSIONS ON SITE AND BE RESPONSIBLE FOR THE SETTING OUT OF THE BUILDING.

G4. ELEMENTS INDICATED ON THESE DRAWINGS ARE SHOWN IN THEIR INTENDED COMPLETE STATE. THE BUILDER SHALL PROVIDE ANY TEMPORARY WORKS INCLUDING PROPPING, BRACING, SHORING AND ANY OTHER REQUIREMENTS NECESSARY TO MAINTAIN THE STRUCTURE, OR ANY PART OF IT, IN A STABLE CONDITION DURING CONSTRUCTION. IF THE BUILDER IS IN ANY DOUBT AS TO HOW TO ACHIEVE THIS HE SHALL OBTAIN ADVICE FROM APPROPRIATELY QUALIFIED AND EXPERIENCED PERSONNEL. UNLESS STATED OTHERWISE TEMPORARY WORKS SHALL BE THE BUILDERS RESPONSIBILITY.

G5. THE BUILDING SHALL NOT BE ERECTED ON OR ADJACENT TO ANY OF THE FOLLOWING HAZARDS UNLESS THE HAZARD IS INDICATED ON THE STRUCTURAL DRAWING:- EMBANKMENTS, BATTERS, WATER RETAINING STRUCTURES, RETAINING WALLS, PITS, SEWERS, SERVICE TRENCHES, DRAINAGE CHANNELS, STREAMS OR ANY POTENTIAL SOURCE OF DAMAGE TO THE STRUCTURE. IF ANY SUCH HAZARDS ARE ENCOUNTERED THE ENGINEER SHALL BE NOTIFIED AND HIS APPROVAL OBTAINED BEFORE PROCEEDING.

G6. THE BUILDER SHALL LOCATE ALL EXISTING AND PROPOSED SERVICES AND EASEMENTS, ON AND ADJACENT TO THE SITE. THE APPROVAL OF THE RELEVANT STATUTORY AUTHORITY AND THE ENGINEER SHALL BE OBTAINED BEFORE BUILDING ON OR OVER ANY SERVICES OR EASEMENTS.

G7. THE BUILDER SHALL NOT EXCAVATE BELOW THE LEVEL OF THE FOOTINGS TO ANY EXISTING BUILDINGS WITHOUT THE WRITTEN CONSENT OF THE ENGINEER.

G8. THE WRITTEN CONSENT OF ADJOINING PROPERTY OWNERS SHALL BE OBTAINED BEFORE INSTALLATION OF UNDERPINNING, ANCHORING WORK, DRAINAGE LINES OR ANY OTHER WORK BEYOND THE PROPERTY BOUNDARY.

G9. ADJACENT STRUCTURE ON BOUNDARY. THE FOUNDATION TYPE AND FOUNDING LEVEL OF THE FOOTING OF THE ADJACENT BUILDING NEIGHBOURING STRUCTURE MUST BE EXPOSED AND CONFIRMED PRIOR TO CONSTRUCTION SO THAT CADIGAL GROUP PTY LTD MAY INSPECT AND CONFIRM THE APPROPRIATE UNDERPINNING AND RETENTION SOLUTION.

G10. NO HOLES OR CHASES SHALL BE MADE IN ANY STRUCTURAL ELEMENT, UNLESS SHOWN ON THESE DRAWINGS OR WRITTEN APPROVAL OF THE ENGINEER.

G11. A FULL DEPTH 'V' JOINT SHALL BE STRUCK IN RENDER WHERE TWO DIFFERING STRUCTURAL MATERIALS ABUT. i.e. AT THE JUNCTION OF MASONRY WITH CONCRETE.

G12. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS, THE BUILDING CODE OF AUSTRALIA, AND THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES. ALL WORKMANSHIP SHALL BE CONSISTENT WITH GOOD TRADE PRACTICE.

G13. AUSTRALIAN STANDARDS REFERRED TO ON THESE DRAWINGS SHALL BE THE LATEST REVISIONS OF THE NOMINATED STANDARD.

G14. APPROVAL OF A SUBSTITUTION OR ALTERNATIVE FROM THE ENGINEER IS NOT, IN ITSELF AUTHORISATION FOR A VARIATION.

G15. THE ENGINEER SHALL BE GIVEN 48 HOURS NOTICE FOR INSPECTIONS.

G16. THE WORD ENGINEER AS USED IN THESE NOTES REFERS TO AN EMPLOYEE OR NOMINATED REPRESENTATIVE OF CADIGAL GROUP PTY LTD.

G17. UNLESS OTHERWISE NOTED, ALL LEVELS ARE GIVEN IN METRES AND ALL DIMENSIONS ARE IN MILLIMETERS. REDUCED LEVELS (RL'S) ARE REFERENCED TO AUSTRALIAN HEIGHT DATUM.

G18. A DILAPIDATION SURVEY OF ADJACENT PROPERTIES AND STRUCTURES IS REQUIRED IMMEDIATELY PRIOR TO THE COMMENCEMENT OF THE WORKS. COMPARISON DILAPIDATION SURVEY IS REQUIRED TO BE UNDERTAKEN AT THE COMPLETION OF THE WORKS.

G19. ALL SITE RECORDS RELATED TO THE WORKS SHALL BE SUBMITTED TO CADIGAL GROUP PTY LTD ON A WEEKLY BASIS FOR REVIEW.

G20. THE CONTRACTOR SHALL ENSURE A SERVICES SEARCH HAS BEEN CARRIED OUT, AND THAT ALL EXISTING STRUCTURES, SERVICES (INCLUDING REDUNDANT SERVICES) AND UTILITIES ARE LOCATED PRIOR TO COMMENCEMENT OF WORKS. THE ACCURACY OF THIS INFORMATION SHOULD BE VERIFIED AS NECESSARY BEFORE WORK COMMENCES ON SITE.

G21. CONTRACTOR TO REVIEW LOCATIONS OF SERVICES AND UTILITIES AND TO IMPLEMENT PROTECTION AND AVOIDANCE METHODS TO ENSURE NO DAMAGE OCCURS IN THE PROCESS OF CARRYING OUT THE WORKS.

G22. CADIGAL GROUP PTY LTD HAS RELIED ON THE ACCURACY OF THE GEOTECHNICAL INVESTIGATION CONDUCTED BY GEOTECHNICAL ENGINEER FOR DETERMINING SUBSURFACE CONDITIONS.

G23. CADIGAL GROUP PTY LTD SHALL BE NOTIFIED IMMEDIATELY IF SUBSURFACE GROUND CONDITIONS ENCOUNTERED ON SITE DIFFER FROM THE GEOTECHNICAL INVESTIGATION, DESIGN REPORT OR DRAWINGS AND/OR FOR ANY REASON THE REQUIRED DESIGN DEPTH CANNOT BE ACHIEVED.

G24. UNDER NO CIRCUMSTANCES SHALL ANY OF THE WORKS BE DAMAGED BY ANY PLANT/MACHINERY OR DURING WORKS BY OTHER TRADES. IN THE EVENT THAT DAMAGE DOES OCCUR, CADIGAL GROUP PTY LTD SHALL BE NOTIFIED IMMEDIATELY.

G25. WHERE TRIMMING IS REQUIRED, CARE SHALL BE TAKEN TO PREVENT CRACKING OR OTHERWISE DAMAGING THE STRUCTURAL ELEMENTS BELOW CUT-OFF LEVEL OR DAMAGING THE STEEL REINFORCEMENT. ADOPTED METHODOLOGY FOR TRIMMING SHALL BE PRESENTED TO CADIGAL GROUP PTY LTD FOR APPROVAL PRIOR TO COMMENCEMENT OF TRIMMING WORKS.

G26. AT THE COMPLETION OF THE WORKS, THE CONTRACTOR SHALL PROVIDE A CERTIFICATE STATING THAT ALL WORKS HAVE BEEN COMPLETED IN ACCORDANCE WITH CADIGAL GROUP PTY LTD DRAWINGS AND THE RELEVANT AUSTRALIAN STANDARDS.

SAFETY IN DESIGN INFORMATION

ARE THERE ANY ADDITIONAL HAZARDS / RISKS NOT NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING?

☒ NO ☐ YES

DO NOT SCALE FROM THIS DRAWING

WORKING PLATFORM NOTES:

WP1. WORKING PLATFORM TO BE DESIGNED BY OTHERS TO MEET MINIMUM STABILITY AND BEARING REQUIREMENTS AS PROVIDED BY THE PILING CONTRACTOR.

WP2. INDEPENDENT VERIFICATION OF PILING PLATFORM AND ISSUE OF PLATFORM CERTIFICATE REQUIRED PRIOR TO COMMENCEMENT OF WORKS.

WP3. NO OVER-EXCAVATION FOR BASEMENT PLATFORM OR SUBGRADE HAS BEEN ALLOWED FOR IN THE SHORING DESIGN.

SHORING WALL NOTES:

SW1. SETOUT OF INDIVIDUAL PILES IS THE CONTRACTORS RESPONSIBILITY.

SW2. DESIGN EXCAVATION LEVELS SHOWN ON THE DRAWINGS ARE THE MAXIMUM EXCAVATION LEVELS ALLOWED FOR IN THE DESIGN. WRITTEN APPROVAL MUST BE OBTAINED FROM CADIGAL GROUP PTY LTD PRIOR TO ANY EXCAVATION (DETAIL OR OTHERWISE) BELOW THESE LEVELS.

SW3. THE SHORING WALL DESIGN HAS NOT CONSIDERED ANY UNPLANNED OVER-EXCAVATION. THE BUILDER AND CONTRACTOR SHALL ENSURE NO UNPLANNED OVER-EXCAVATION OCCURS. IF THIS REQUIREMENT CANNOT BE ADHERED TO, PLEASE ADVISE CADIGAL GROUP PTY LTD FOR REDESIGN OF THE SHORING WALL PRIOR TO THE COMMENCEMENT OF WORKS.

SW4. STABILITY OF ALL TEMPORARY BATTERS IS THE BUILDERS/CONTRACTORS RESPONSIBILITY.

SW5. A GEOTECHNICAL INSPECTION WILL BE REQUIRED FOR ANY UNSUPPORTED EXCAVATION IN ROCK.

SW6. THE MAXIMUM ESTIMATED DEFLECTION IS 15mm. CADIGAL GROUP PTY LTD HAVE MADE NO ASSESSMENT OF THE EFFECT OF ESTIMATED DEFLECTIONS ON ADJACENT STRUCTURES AND/OR SERVICES. IF THESE DEFLECTIONS AND THE ASSOCIATED RISK OF DAMAGE TO ADJACENT STRUCTURES AND/OR SERVICES IS NOT ACCEPTABLE, PLEASE NOTIFY CADIGAL GROUP PTY LTD FOR THE SHORING WALL TO BE REDESIGNED PRIOR TO THE COMMENCEMENT OF WORKS.

SW7. EXCAVATION BELOW GROUND ANCHOR LEVELS SHALL BE NO MORE THAN 500mm UNTIL GROUND ANCHORS ARE STRESSED AND CERTIFIED.

SW8. MAX 15kPa CONSTRUCTION SURCHARGE ALLOWANCE FOR THE SHORING WALL DESIGN. UNLESS NOTED OTHER WISE THESE SURCHARGES MUST NOT BE EXCEEDED AT ANY TIME. PRIOR WRITTEN APPROVAL FROM CADIGAL GROUP PTY LTD IS REQUIRED IF ANY SPECIFIED GENERAL SURCHARGES ARE REQUIRED TO BE EXCEEDED FOR TEMPORARY CONSTRUCTION REQUIREMENTS, SUCH AS MOBILE CRANES, BOOM PUMPS, MATERIALS STORAGE ETC.

SW9. CAPPING BEAM MUST BE INSTALLED PRIOR TO EXCAVATION, UNO.

SW10. FOR SOLDIER PILES, ENSURE THE LONGITUDINAL BARS OF THE PILE REINFORCEMENT CAGE ARE ALIGNED TO ALLOW FOR ANCHOR INSTALLATION THROUGH THE PILE AT THE SPECIFIED ANGLE.

SW11. A GEOTECHNICAL DESIGN AND INSPECTION IS REQUIRED FOR ANY PILING EMBEDMENT LENGTH WITHIN SOIL.

SHOTCRETE NOTES:

SC1. MINIMUM SHOTCRETE F'c = 40 MPa AT 28 DAYS, UNO.

SC2. LAPS NOT SHOWN ON DRAWINGS SHALL BE STAGGERED SO THAT NO MORE THAN 50% OF BARS ARE LAPPED IN ANY ONE CROSS SECTION.

SC3. MINIMUM LAP LENGTHS FOR N16 BARS = 500mm UNLESS NOTED OTHERWISE

SC4. MINIMUM COVER = 60mm FOR F'c = 40MPa, UNO.

SC5. ENSURE PILES HAVE BEEN CLEANED OF ALL SOIL/ROCK PRIOR TO SHOTCRETING TO ENSURE THERE IS NO CONTAMINATION OF THE COLD JOINT.

MONITORING REQUIREMENTS FOR SHORING:

BUILDER TO NOTE THE MONITORING REQUIREMENTS FOR ALL SHORING INSTALLATIONS AND THIS INCLUDES:

1. A DAILY WALK AROUND THE SITE AND REGULAR PHOTOGRAPH.
2. REGULAR, ACCURATE SURVEY OF MONITORING POINTS LOCATED BOTH ALONG AND DOWN THE FACE OF THE SHORING WALL.
3. REGULAR, ACCURATE READING OF OTHER MONITORING INSTRUMENTS. (i.e. SURVEY POINTS)
4. MONITORING RESULTS TO BE PROVIDED TO THE ENGINEER WITH 48 HOURS
5. PROPOSED TRIGGER LEVEL FOR THE LATERAL DEFORMATION OF THE SHORING WALL IS 15mm AT THE TOP OF CAPPING BEAM.
6. IN CASE OF DEFLECTION MORE THAN THE ABOVE MENTIONED LIMIT THE STRUCTURAL AND GEOTECHNICAL ENGINEER TO BE INFORMED IMMEDIATELY

THRESHHOLD VIBRATION LIMITS:

ASSET TYPE	THRESHOLD VALUES FOR VELOCITY (PPV) MEASURED ON THE ASSET IN MM/S
BRITTLE PIPE ASSETS- RC, VC/EW, CICL	MAXIMUM PPV FOR INTERMITTENT VIBRATIONS 10MM/S MAXIMUM PPV FOR CONTINUOUS VIBRATIONS 5MM/S
DUCTILE PIPE ASSETS- SCL, DI, PVC, PE, PP, GRP	MAXIMUM PPV FOR INTERMITTENT VIBRATIONS 20MM/S MAXIMUM PPV FOR CONTINUOUS VIBRATIONS 10MM/S
MASONARY	3 MM/S
UNREINFORCED CONCRETE	3 MM/S

NOTE: THIS IS APPLICABLE FOR BURIED ASSETS, IN SOUND CONDITION, AND LAID IN A TYPICAL SOIL TRENCH IN STABLE GROUND. ALTERNATIVE CRITERIA SHALL BE DEVELOPED FOR OTHER ASSET TYPES, ABOVE GROUND ASSETS, CONCRETE ENCASED PIPES, PIPES ON PILED/ SPECIAL SUPPORTS AND PIPES IN TUNNELS OR OF OTHER UNUSUAL CONSTRUCTION OR GROUND CONDITIONS.

MONITORING IS TO BE CARRIED OUT AT THE FOLLOWING STAGES FOR SHORING WALLS:

1. AFTER CONSTRUCTION OF THE RETAINING STRUCTURES, BUT BEFORE COMMENCEMENT OF EXCAVATION TO DETERMINE BASELINE READINGS, TWO INDEPENDENT SETS OF MEASUREMENTS MUST BE TAKEN CONFIRMING MEASUREMENTS CONSISTENCY.
2. AFTER EXCAVATION TO EACH ROW OF SUPPORTS, BUT PRIOR TO INSTALLATION OF SUPPORTS OR ANCHORS.
3. AFTER EXCAVATION TO THE BASE OF THE EXCAVATION.
4. AFTER COMPLETION OF THE EXCAVATIONS NOT LESS THAN A WEEK APART SHOWING NO FURTHER MOVEMENTS.
5. AFTER DE-STRESSING AND REMOVAL OF ANY ROW OF SUPPORTS.
6. ONE MONTH LATER COMPLETION OF THE PERMANENT RETAINING STRUCTURE OR AFTER THREE CONSECUTIVE MEASUREMENTS NOT LESS THAN A WEEK APART SHOWING NO FURTHER MOVEMENTS, WHICH EVER IS THE LATER.
7. ALL MONITORING DEVICES SHOULD BE KEPT IN OPERATIONAL CONDITION AT ALL TIMES. CONSTRUCTION WORKS SHOULD BE SUSPENDED WHERE MORE THAN 30% OF THE DEVICES MALFUNCTIONED.

INSTRUMENTATION AND MONITORING MUST BE CARRIED OUT BY A COMPETENT PERSON EXPERIENCED IN THE EQUIPMENT USED. THE RESULTS OF EACH MONITORING STAGE MUST BE REPORTED TO THE DESIGN ENGINEER. BEFORE WORK PROCEEDS TO THE NEXT STAGE THE DESIGN ENGINEER MUST VERIFY THAT ON THE MONITORING RESULTS AND INSPECTION CARRIED OUT THE STRUCTURE IS PERFORMING IN ACCORDANCE WITH THE DESIGN INTENT AND THAT WHERE TRIGGER LEVELS HAVE BEEN EXCEEDED, ACTION HAS BEEN TAKEN IN ACCORDANCE WITH THE MONITORING PLAN. VERIFICATION BY THE DESIGN ENGINEER MUST CONSTITUTE A 'HOLD POINT' FOR EACH STAGE OF CONSTRUCTION.

TRIGGER CRITERIA:

ALERT (UNITS)	ACTION (UNITS)	ALARM (UNITS)
70% OF MAXIMUM PREDICTED	<100% OF MAXIMUM PREDICTED	>=100 OF MAXIMUM PREDICTED (BUT NOT GREATER THAN ASSET CAPACITY)

INCLINOMETER NOTE:

TAKE AT LEAST TWO BASELINE READINGS BEFORE THE COMMENCEMENTS OF EXCAVATIONS.

DILAPIDATION NOTE:

DILAPIDATION SURVEY INCLUDING THE PAVEMENT AND ROAD DRAINAGE SHOULD BE PREPARED PRIOR TO ANY EXCAVATION WORKS. A COPY OF THE REPORT SHOULD BE FORWARDED TO RMS PRIOR TO ANY EXCAVATION ACTIVITY ON SITE FOR RECORD PURPOSES

DIAL 1100 BEFORE DIG

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WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT
C	ISSUED FOR INFORMATION ONLY (DD 30%)	25.01.17	RM	JT
B	ISSUED FOR INFORMATION ONLY	24.08.05	RM	JT
A	ISSUED FOR INFORMATION ONLY	24.05.15	RM	JT

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Project:

849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.

Developer:

Billbergia creating communities®

Contractor:

Architect :

pbd architects

Design Consultant:

CADIGAL GROUP

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Drawing Title:

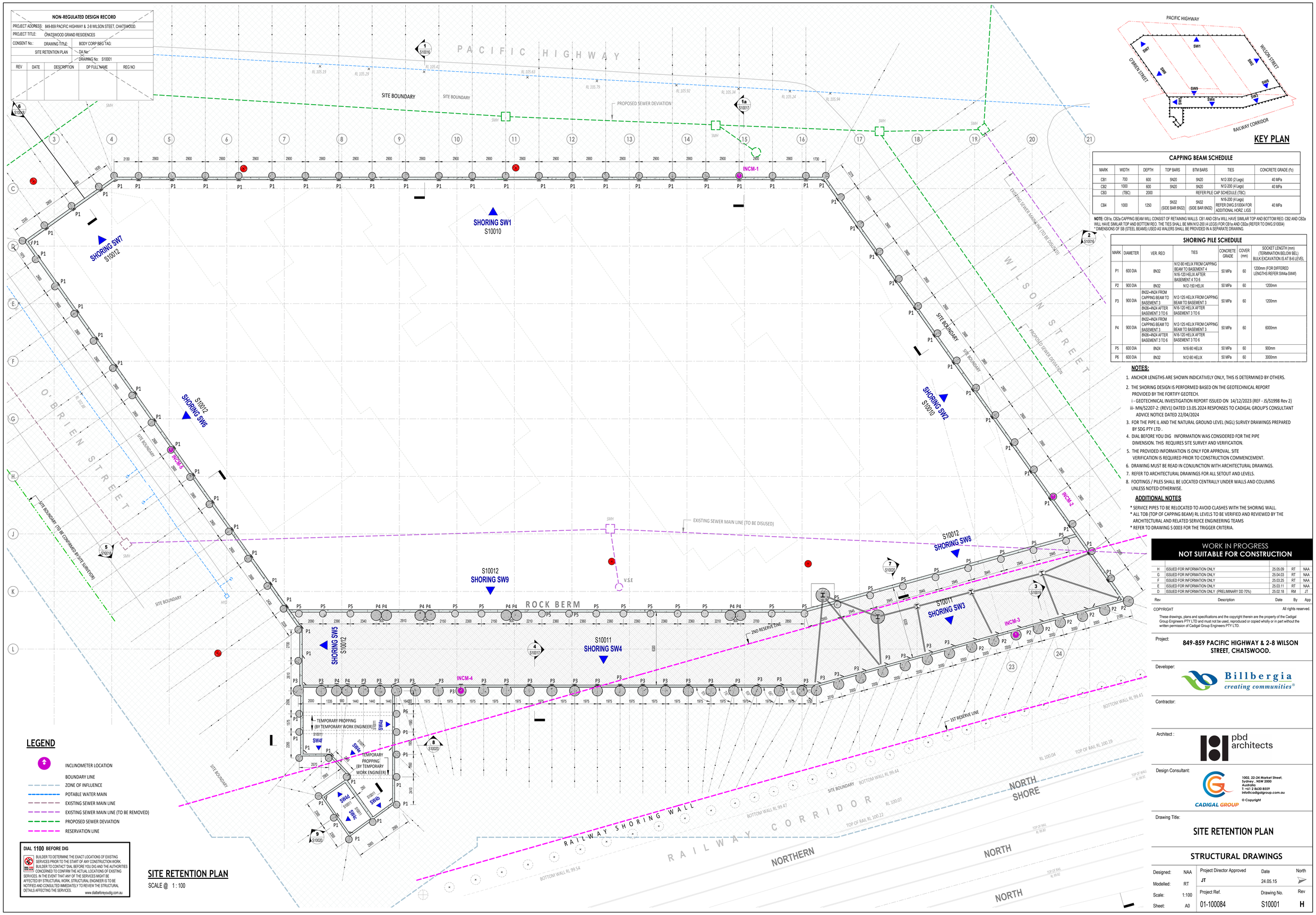
SPECIFICATION NOTES -SH3

STRUCTURAL DRAWINGS

Designed:	NAA	Project Director Approved	Date	North
Drawn:	RT	JT	04/12/24	
Scale		Project Ref.	Drawing No.	Rev
Sheet	A1	01-100084	S00012	E

0 10 20 30 50 100

NON-REGULATED DESIGN RECORD				
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.				
PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
SITE RETENTION PLAN	DA No:			
	DRAWING No: S10001			
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



KEY PLAN

CAPPING BEAM SCHEDULE

MARK	WIDTH	DEPTH	TOP BARS	BTM BARS	TIES	CONCRETE GRADE (f'c)
CB1	700	600	5N20	5N20	N12-300 (2 Legs)	40 MPa
CB2	1000	600	5N20	5N20	N12-200 (4 Legs)	40 MPa
CB3	(TBC)	2000	REFER PILE CAP SCHEDULE (TBC)			
CB4	1000	1250	5N32 (SIDE BAR 8N32)	5N32 (SIDE BAR 8N32)	N16-200 (4 Legs) REFER DWG.S10004 FOR ADDITIONAL HORZ. LGS	40 MPa

NOTE: CB1a, CB2a CAPPING BEAM WILL CONSIST OF RETAINING WALLS. CB1 AND CB1a WILL HAVE SIMILAR TOP AND BOTTOM REO. CB2 AND CB2a WILL HAVE SIMILAR TOP AND BOTTOM REO. THE TIES SHALL BE MIN N12-200 (4 LEGS) FOR CB1a AND CB2a (REFER TO DWG.S10004)
* DIMENSIONS OF SB (STEEL BEAMS) USED AS WALERS SHALL BE PROVIDED IN A SEPARATE DRAWING.

SHORING PILE SCHEDULE

MARK	DIAMETER	VER. REO	TIES	CONCRETE GRADE	COVER (mm)	SOCKET LENGTH (mm) (TERMINATION BELOW BEL) BULK EXCAVATION IS AT B-6 LEVEL
P1	600 DIA	8N32	N12-90 HELIX FROM CAPPING BEAM TO BASEMENT 4 N16-120 HELIX AFTER BASEMENT 4 TO 6	50 MPa	60	1200mm (FOR DIFFERED LENGTHS REFER SW4a-SW4f)
P2	900 DIA	8N32	N12-150 HELIX	50 MPa	60	1200mm
P3	900 DIA	8N32+4N24 FROM CAPPING BEAM TO BASEMENT 3 8N36+4N24 AFTER BASEMENT 3 TO 6	N12-125 HELIX FROM CAPPING BEAM TO BASEMENT 3 N16-120 HELIX AFTER BASEMENT 3 TO 6	50 MPa	60	1200mm
P4	900 DIA	8N32+4N24 FROM CAPPING BEAM TO BASEMENT 3 8N36+4N24 AFTER BASEMENT 3 TO 6	N12-125 HELIX FROM CAPPING BEAM TO BASEMENT 3 N16-120 HELIX AFTER BASEMENT 3 TO 6	50 MPa	60	6000mm
P5	600 DIA	8N24	N16-90 HELIX	50 MPa	60	900mm
P6	600 DIA	8N32	N12-90 HELIX	50 MPa	60	3000mm

NOTES:

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2. THE SHORING DESIGN IS PERFORMED BASED ON THE GEOTECHNICAL REPORT PROVIDED BY THE FORTIFY GEOTECH.
   i - GEOTECHNICAL INVESTIGATION REPORT ISSUED ON 14/12/2023 (REF - JS/S1998 Rev 2)
   iii- MN/S2207-2: (REV1) DATED 13.05.2024 RESPONSES TO CADIGAL GROUP'S CONSULTANT ADVICE NOTICE DATED 22/04/2024
3. FOR THE PIPE IL AND THE NATURAL GROUND LEVEL (NGL) SURVEY DRAWINGS PREPARED BY SDG PTY LTD .
4. DIAL BEFORE YOU DIG INFORMATION WAS CONSIDERED FOR THE PIPE DIMENSION. THIS REQUIRES SITE SURVEY AND VERIFICATION.
5. THE PROVIDED INFORMATION IS ONLY FOR APPROVAL. SITE VERIFICATION IS REQUIRED PRIOR TO CONSTRUCTION COMMENCEMENT.
6. DRAWING MUST BE READ IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS.
7. REFER TO ARCHITECTURAL DRAWINGS FOR ALL SETOUT AND LEVELS.
8. FOOTINGS / PILES SHALL BE LOCATED CENTRALLY UNDER WALLS AND COLUMNS UNLESS NOTED OTHERWISE.

ADDITIONAL NOTES

* SERVICE PIPES TO BE RELOCATED TO AVOID CLASHES WITH THE SHORING WALL.
* ALL TOB (TOP OF CAPPING BEAM) RL LEVELS TO BE VERIFIED AND REVIEWED BY THE ARCHITECTURAL AND RELATED SERVICE ENGINEERING TEAMS
* REFER TO DRAWING S 0003 FOR THE TRIGGER CRITERIA.

LEGEND

- INCLINOMETER LOCATION
- BOUNDARY LINE
- ZONE OF INFLUENCE
- POTABLE WATER MAIN
- EXISTING SEWER MAIN LINE
- EXISTING SEWER MAIN LINE (TO BE REMOVED)
- PROPOSED SEWER DEVIATION
- RESERVATION LINE

DIAL 1100 BEFORE DIG

BUILDER TO DETERMINE THE EXACT LOCATIONS OF EXISTING SERVICES PRIOR TO THE START OF ANY CONSTRUCTION WORK. BUILDER TO CONTACT 'DIAL BEFORE YOU DIG AND THE AUTHORITIES CONCERNED TO CONFIRM THE ACTUAL LOCATIONS OF EXISTING SERVICES. IN THE EVENT THAT ANY OF THE SERVICES MIGHT BE AFFECTED BY STRUCTURAL WORK, STRUCTURAL ENGINEER IS TO BE NOTIFIED AND CONSULTED IMMEDIATELY TO REVIEW THE STRUCTURAL DETAILS AFFECTING THE SERVICES.
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SITE RETENTION PLAN

SCALE @ 1 : 100

0 10 20 50 100

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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Project:
849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.

Developer:
Billbergia creating communities®

Contractor:

Architect :
pbd architects

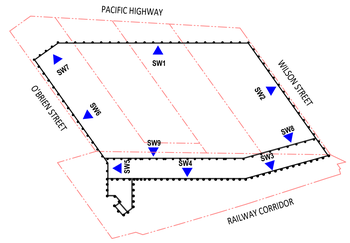
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Drawing Title:
SITE RETENTION PLAN

STRUCTURAL DRAWINGS

Designed:	NAA	Project Director Approved	Date	North
Modelled:	RT	JT	24.05.15	
Scale:	1:100	Project Ref.	Drawing No.	Rev
Sheet:	A0	01-100084	S10001	H

NON-REGULATED DESIGN RECORD				
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.				
PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
SPLAYED GROUND ANCHOR LAYOUT	DA No:			
	DRAWING No: S10002			
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



KEY PLAN

NOTES:

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   i - GEOTECHNICAL INVESTIGATION REPORT ISSUED ON 14/12/2023 (REF - JS/S1998 Rev 2)
   iii- MN/S2207-2- (REV1) DATED 13.05.2024 RESPONSES TO CADIGAL GROUP'S CONSULTANT ADVICE NOTICE DATED 22/04/2024
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* ALL TOB (TOP OF CAPPING BEAM) RL LEVELS TO BE VERIFIED AND REVIEWED BY THE ARCHITECTURAL AND RELATED SERVICE ENGINEERING TEAMS
* REFER TO DRAWING S 0003 FOR THE TRIGGER CRITERIA.

LEGEND

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- ZONE OF INFLUENCE
- POTABLE WATER MAIN
- EXISTING SEWER MAIN LINE
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SPLAYED GROUND ANCHOR LAYOUT

SCALE @ 1 : 125

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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Project: **849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.**

Developer: Billbergia creating communities®

Contractor:

Architect : pbd architects

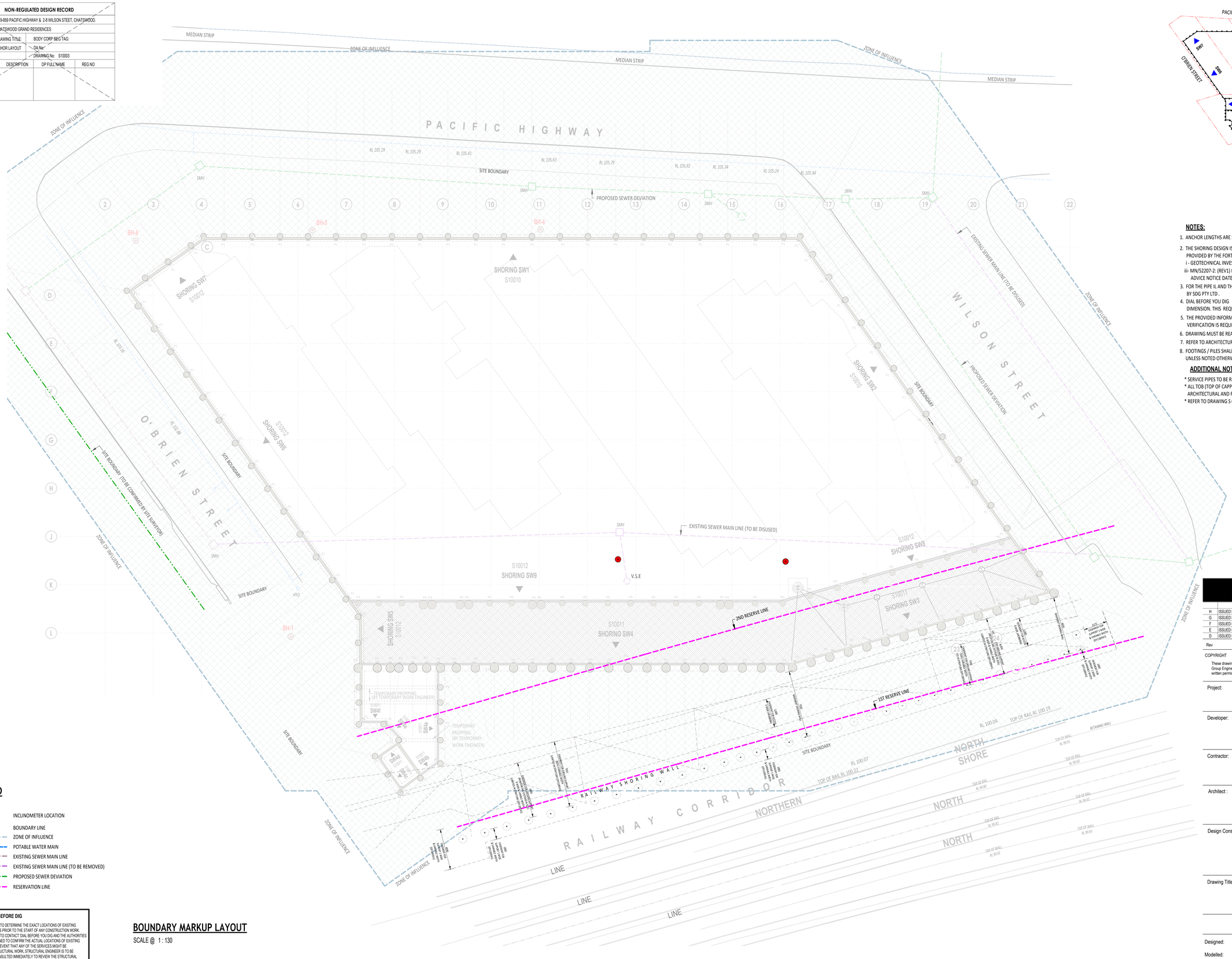
Design Consultant:
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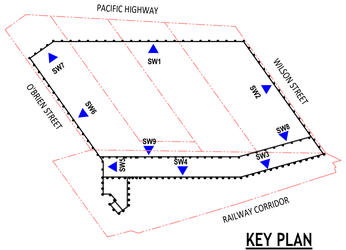
Drawing Title: **SPLAYED GROUND ANCHOR LAYOUT**

STRUCTURAL DRAWINGS

Designed:	NAA	Project Director Approved	Date	North
Modelled:	RT	JT	24.05.15	
Scale:	1:125	Project Ref.	Drawing No.	Rev
Sheet:	A0	01-100084	S10002	H

NON-REGULATED DESIGN RECORD				
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.				
PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP BEG TAG:		
SPLAYED GROUND ANCHOR LAYOUT		DA No:		
		DRAWING No: S10003		
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO





KEY PLAN

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2. THE SHORING DESIGN IS PERFORMED BASED ON THE GEOTECHNICAL REPORT PROVIDED BY THE FORTIFY GEOTECH.
   i - GEOTECHNICAL INVESTIGATION REPORT ISSUED ON 14/12/2023 (REF - JS/S1998 Rev 2)
   iii- MN/S2207-2: (REV1) DATED 13.05.2024 RESPONSES TO CADIGAL GROUP'S CONSULTANT ADVICE NOTICE DATED 22/04/2024
3. FOR THE PIPE IL AND THE NATURAL GROUND LEVEL (NGL) SURVEY DRAWINGS PREPARED BY SDG PTY LTD .
4. DIAL BEFORE YOU DIG INFORMATION WAS CONSIDERED FOR THE PIPE DIMENSION. THIS REQUIRES SITE SURVEY AND VERIFICATION.
5. THE PROVIDED INFORMATION IS ONLY FOR APPROVAL. SITE VERIFICATION IS REQUIRED PRIOR TO CONSTRUCTION COMMENCEMENT.
6. DRAWING MUST BE READ IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS.
7. REFER TO ARCHITECTURAL DRAWINGS FOR ALL SETOUT AND LEVELS.
8. FOOTINGS / PILES SHALL BE LOCATED CENTRALLY UNDER WALLS AND COLUMNS UNLESS NOTED OTHERWISE.

ADDITIONAL NOTES

* SERVICE PIPES TO BE RELOCATED TO AVOID CLASHES WITH THE SHORING WALL.
* ALL TOB (TOP OF CAPPING BEAM) RL LEVELS TO BE VERIFIED AND REVIEWED BY THE ARCHITECTURAL AND RELATED SERVICE ENGINEERING TEAMS
* REFER TO DRAWING S 0003 FOR THE TRIGGER CRITERIA.

LEGEND

- INCLINOMETER LOCATION
- BOUNDARY LINE
- ZONE OF INFLUENCE
- POTABLE WATER MAIN
- EXISTING SEWER MAIN LINE
- EXISTING SEWER MAIN LINE (TO BE REMOVED)
- PROPOSED SEWER DEVIATION
- RESERVATION LINE

DIAL 1100 BEFORE DIG

BUILDER TO DETERMINE THE EXACT LOCATIONS OF EXISTING SERVICES PRIOR TO THE START OF ANY CONSTRUCTION WORK. BUILDER TO CONTACT 'DIAL BEFORE YOU DIG AND THE AUTHORITIES CONCERNED TO CONFIRM THE ACTUAL LOCATIONS OF EXISTING SERVICES. IN THE EVENT THAT ANY OF THE SERVICES MIGHT BE AFFECTED BY STRUCTURAL WORK, STRUCTURAL ENGINEER IS TO BE NOTIFIED AND CONSULTED IMMEDIATELY TO REVIEW THE STRUCTURAL DETAILS AFFECTING THE SERVICES.
www.dialbeforeyoudig.com.au

BOUNDARY MARKUP LAYOUT

SCALE @ 1 : 130

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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Project: **849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.**

Developer: Billbergia creating communities®

Contractor:

Architect : pbd architects

Design Consultant: CADIGAL GROUP
1002, 22-24 Market Street, Sydney , NSW 2000 Australia
T: +61 2 8630 8559
info@cadigalgroup.com.au

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Drawing Title: **BOUNDARY MARKUP LAYOUT**

STRUCTURAL DRAWINGS

Designed:	NAA	Project Director Approved	Date	North
Modelled:	RT	JT	24.05.15	
Scale:	1:100	Project Ref.	Drawing No.	Rev
Sheet:	A0	01-100084	S10003	H

NON DECLARED DESIGN

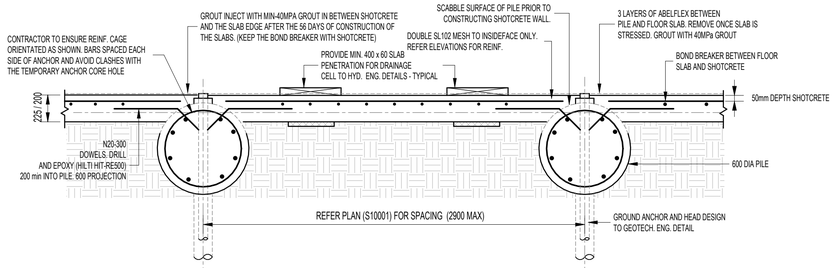
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.

PROJECT TITLE: CHADSWOOD

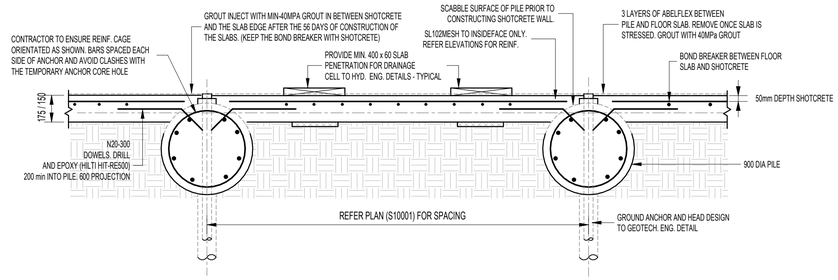
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DRAWING TITLE: SPECIFICATION NOTES - SH3 | DA-No: S00012

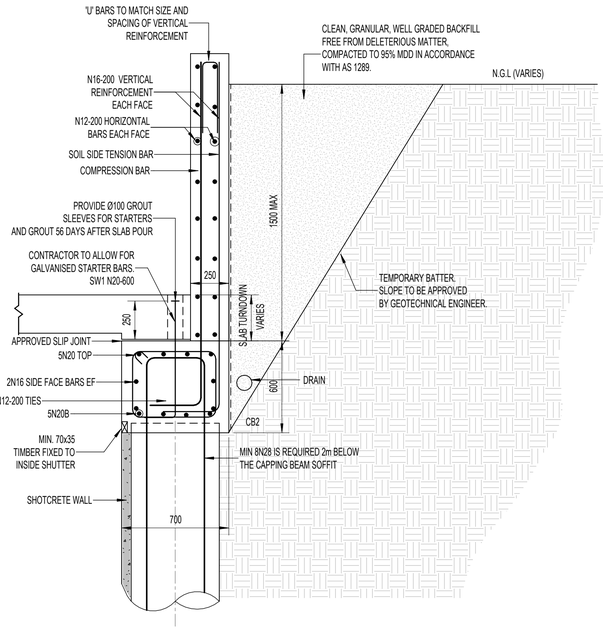
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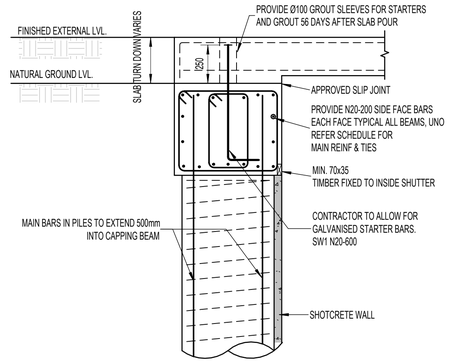
TYPICAL 600 DIA SHORING PILE FOR 200/225 THK SHOTCRETE WALL PLAN - 32MPa



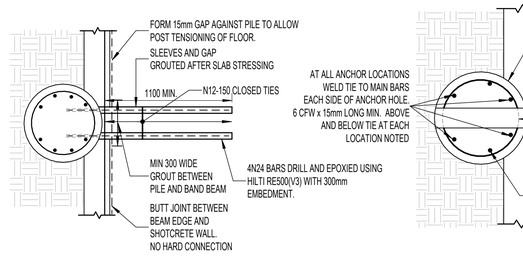
TYPICAL 900 DIA SHORING PILE FOR 175/150 THK SHOTCRETE WALL PLAN - 32MPa



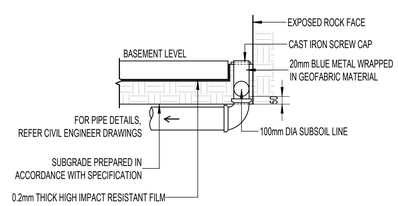
TYPICAL CB2 CAPPING BEAM DETAIL



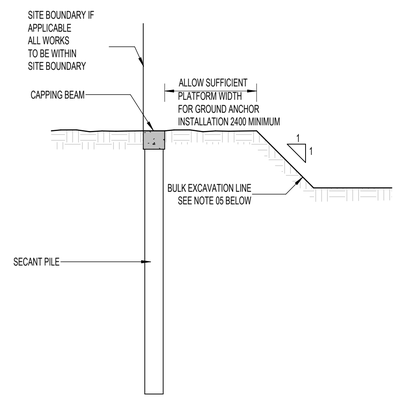
TYPICAL CAPPING BEAM SECTION



TYPICAL SHORING PILE TO BAND BEAM CONNECTION DETAIL

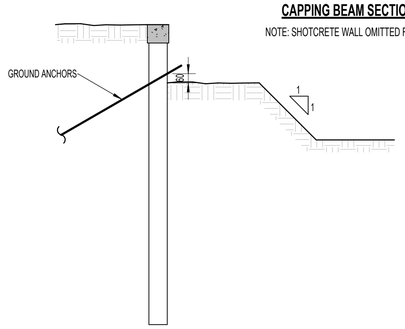


WALL DRAINAGE DETAIL - EXPOSED ROCKFACE (TYP)



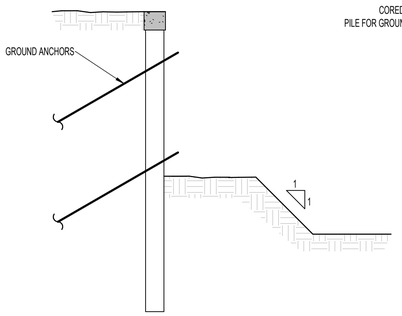
STAGE 1

01. BORE PILE TO THE SET-OUT AND DEPTH AS SHOWN ON PLAN AND ELEVATIONS. SOCKETS SHALL BE DE-WATERED AND INSPECTED BY A GEOTECHNICAL ENGINEER TO VERIFY THAT THE FOUNDATION CONDITIONS COMPLY WITH THE DESIGN ASSUMPTIONS. SOCKETS SHALL BE CLEANED OF DEBRIS.
02. PLACE THE REINFORCEMENT CAGES INTO THE HOLES ENSURING THAT SPECIFIED COVER AND ORIENTATION IS ACHIEVED.
03. POUR CONCRETE FOR SOLDIERS.
04. CONSTRUCT THE CAPPING BEAM ALONG TOP OF SOLDIER WHERE INDICATED ON ELEVATIONS AND SECTIONS.
05. BULK EXCAVATION MAY PROCEED AS INDICATED ABOVE WHILST SOLDIERS ARE BEING CONSTRUCTED.



STAGE 2

01. EXCAVATE LOCALLY ADJACENT TO SOLDIERS TO A LEVEL 300 BELOW THE FIRST ROW OF ANCHORS.
02. DRILL, INSTALL, PROOF TEST AND LOCK OFF GROUND ANCHORS.



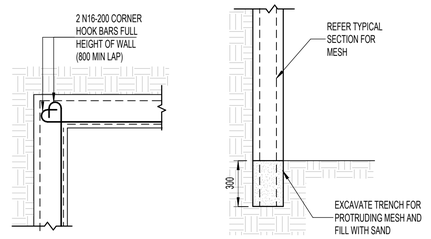
STAGE 3

01. REPEAT STAGE 2 300 BELOW NEXT ANCHOR.
02. COMPLETE EXCAVATION TO FINAL LEVEL IN SUITABLE DROPS.
03. INSTALL ANY SUBSEQUENT ROWS OF GROUND ANCHORS SHOWN ON WALL ELEVATIONS.

CONSTRUCTION PROCEDURE FOR SECANT PILES RETENTION

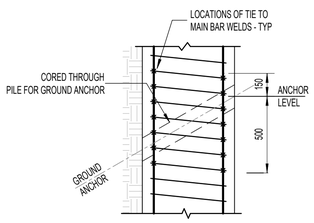
CAPPING BEAM SECTION SW3

NOTE: SHOTCRETE WALL OMITTED FOR CLARITY

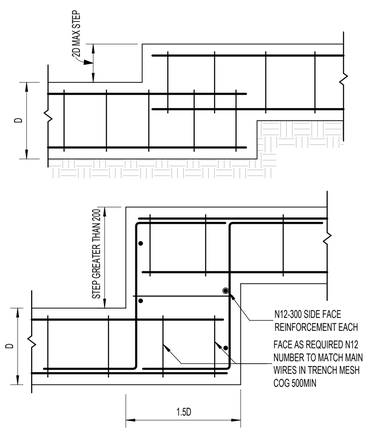


TYPICAL SHOTCRETE WALL CORNER

HORIZONTAL SHOTCRETE CONST. JOINT



TYPICAL PILE REINFORCEMENT



TYPICAL STEP IN CAPPING BEAM DETAILS U.N.O

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT
C	ISSUED FOR INFORMATION ONLY (DD 30%)	25.01.17	RM	JT
B	ISSUED FOR INFORMATION ONLY	24.08.05	RM	JT

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Developer: Billbergia creating communities®

Contractor:

Architect : pbd architects

Design Consultant: CADIGAL GROUP

1002, 22-24 Market Street, Sydney , NSW 2000 Australia
T: +61 2 8630 8559
info@cadigalgroup.com.au

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Drawing Title:

TYPICAL SHORING WALL DETAIL

STRUCTURAL DRAWINGS

Designed:	NAA	Project Director Approved	Date	North
Drawn:	RT	JT	03/25/25	
Scale		Project Ref.	Drawing No.	Rev
Sheet	A1	01-100084	S10004	F

100 50 30 20 10 0

NON DECLARED DESIGN

PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.

PROJECT TITLE: CHADSWOOD

CONSENT No.: DRAWING TITLE: BODY CORP REG TAG:

SHORING LOADING DIAGRAM DA No:

DRAWING No: S10005

REV	DATE	DESCRIPTION	DP FULL NAME	REG NO

PACIFIC HIGHWAY

WILSON STREET

O'BRIEN STREET

RAILWAY CORRIDOR

SW1 SHORING WALL

SW2 SHORING WALL

SW3 SHORING WALL

SW4 SHORING WALL

SW4a

SW4b

SW4c

SW4d

SW4e

SW4f

SW5 SHORING WALL

SW6 SHORING WALL

SW7 SHORING WALL

0 10 20 30 50 100

LEGEND

SU = TfNSW Considerations 300 LA

SU = 20 kPa

SU = 5 kPa

TYPICAL SURCHARGE VALUE

Road	20 kPa
On Ground Car Parking	20 kPa
Apartments (Per Floor)	20 kPa
Residential Housing	20 kPa

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	18.02.25	RM	JT
C	ISSUED FOR INFORMATION ONLY (DD 30%)	17.01.25	RM	JT
B	ISSUED FOR INFORMATION ONLY	05.08.24	RM	JT
A	ISSUED FOR INFORMATION ONLY	20.04.24	RM	JT

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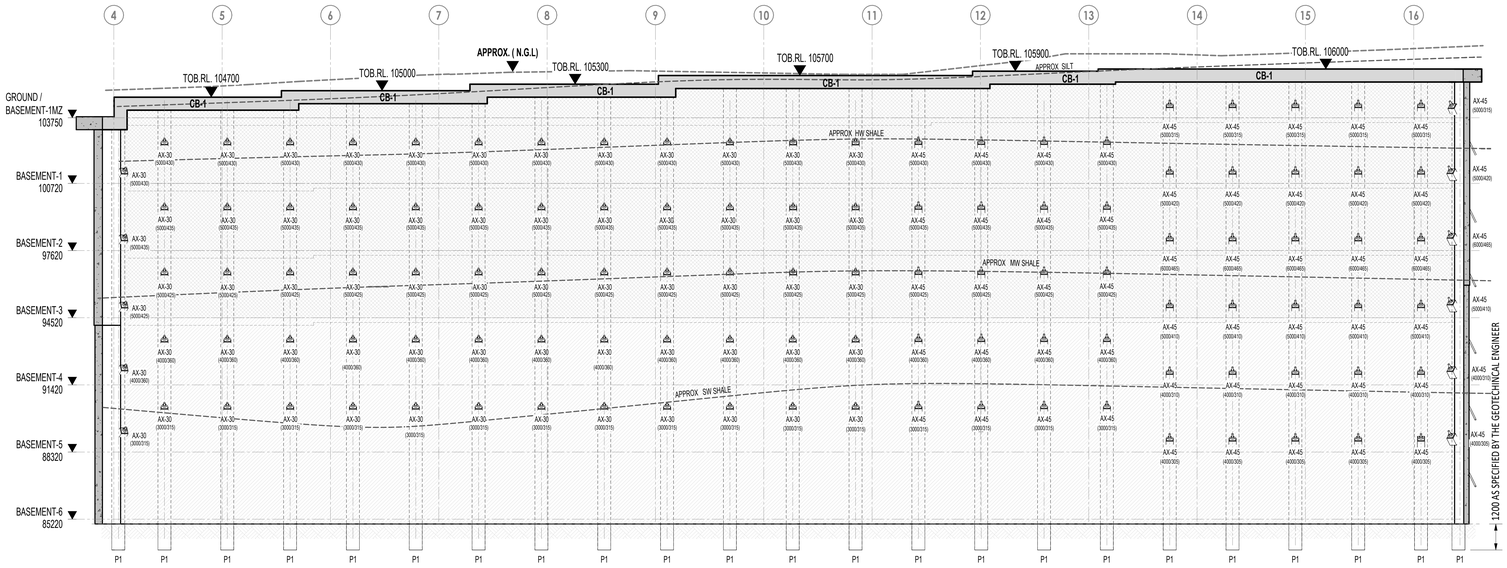
Drawing Title:

SHORING LOADING DIAGRAM

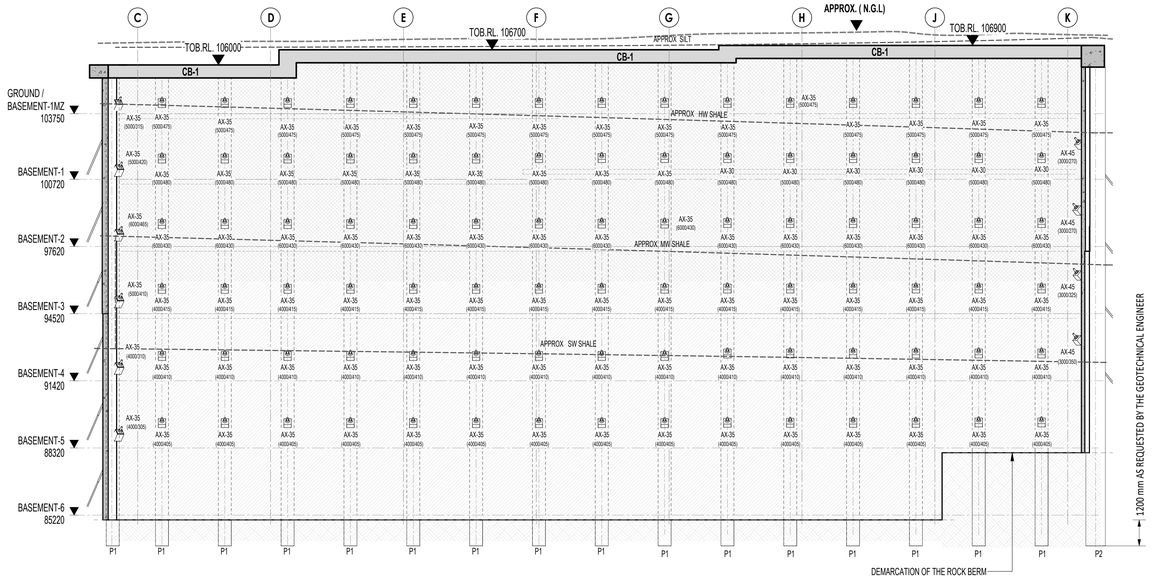
STRUCTURAL DRAWINGS

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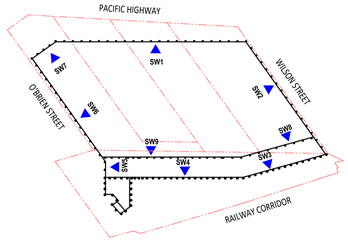
NON-REGULATED DESIGN RECORD				
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.				
PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
SHORING ELEVATION SW1	DA No:			
	DRAWING No: S10010			
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



01 S10001 **SHORING WALL ELEVATION -SW1**
SCALE @ 1:100



02 S10001 **SHORING WALL ELEVATION -SW2**
SCALE @ 1:100



KEY PLAN

NOTES:

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRG S-0006 -SITE RETENTION PLAN

SHORING ELEVATION NOTES:

1. DRAWING MUST BE READ IN CONJUNCTION WITH ARCHITECTS DRAWINGS.
2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL SETOUT U.N.O.
3. DO NOT SCALE ANY DIMENSIONS FROM THIS STRUCTURAL DRAWING.
4. FLOOR LEVELS (RL) SHOWN IN THIS DRAWING ARE FOR THE STRUCTURAL ENGINEERS USE ONLY. REFER TO ARCHITECTS DRAWINGS FOR LEVELS AND OTHER GEOMETRY RELATED DIMENSIONS.
5. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SERVICES DRAWINGS. THE CONTRACTOR MUST CONTACT THE STRUCTURAL ENGINEER SHOULD ANY DISCREPANCIES OCCUR.
7. SOIL TYPES AND GROUND WATER LEVEL (IF ENCOUNTERED) SHOWN ARE INDICATIVE ONLY AND ARE AN EXTRAPOLATION BASED ON THE GEOTECHNICAL REPORT

GROUND ANCHOR TAGS

AX-45 (0000/000)

- DENOTES NUMBER OF STRANDS (DESIGN BY OTHERS)
- DENOTES ANCHOR LOAD IN kN (SERVICE LOAD)
- DENOTES DECLINATION ANGLE
- DENOTES ANCHOR BOND LENGTH IN (MM)

SHORING WALL SW1

- DENOTES EXPOSED ROCK / SHALE FACE TO BE RETAINED WITH SHOTCRETE AND ROCK BOLTS TO GEOTECHNICAL ENGINEERS' DETAILS
- DENOTES 175 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 150 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 200 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH
- DENOTES 225 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH

NOTE :
EXTENT OF SHOTCRETE WALLS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
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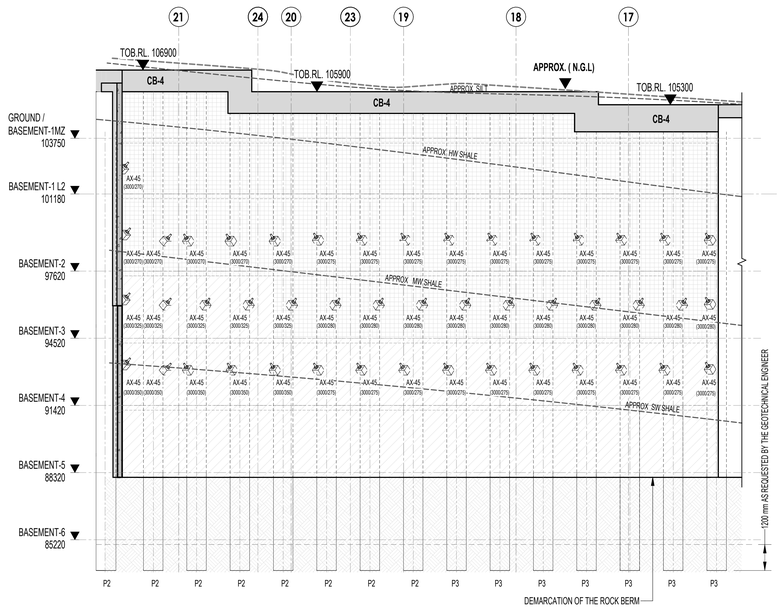
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Drawing Title:
SHORING WALL ELEVATIONS - SHEET 1

STRUCTURAL DRAWINGS

Designed:	NAA	Project Director Approved	Date	North
Modelled:	RT	JT	24.05.15	
Scale:	1:100	Project Ref.	Drawing No.	Rev
Sheet:	A0	01-100084	S10010	H

NON-REGULATED DESIGN RECORD				
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.				
PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
SHORING ELEVATION SW2	DA No:			
	DRAWING No: S10011			
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO

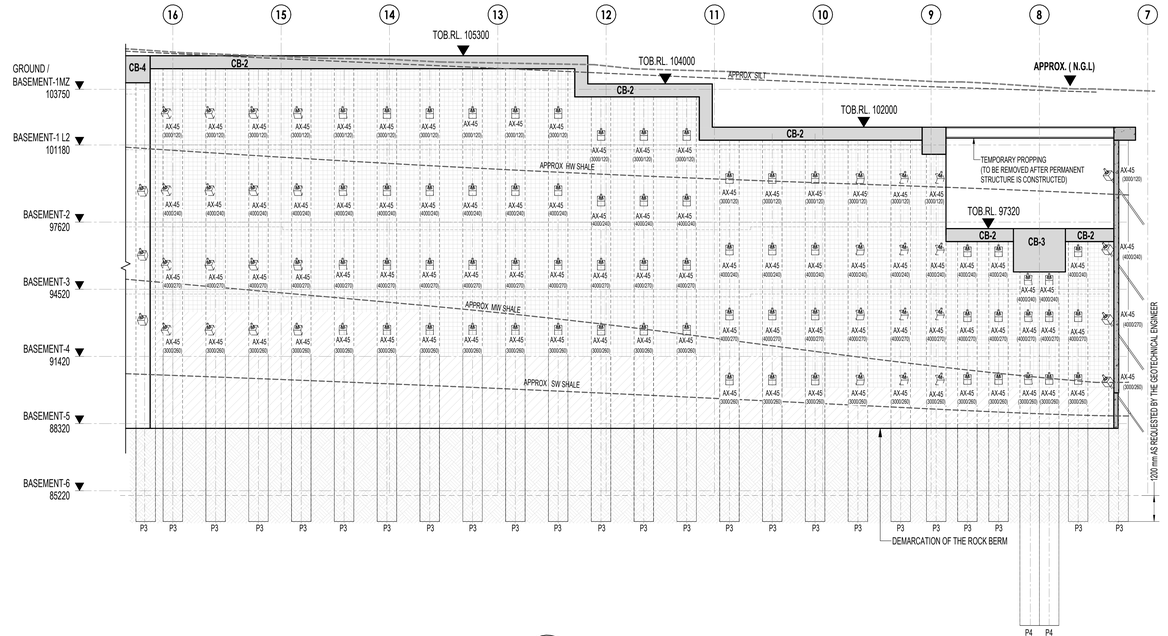


03 S10001 **SHORING WALL ELEVATION -SW3**

SCALE @ 1:100

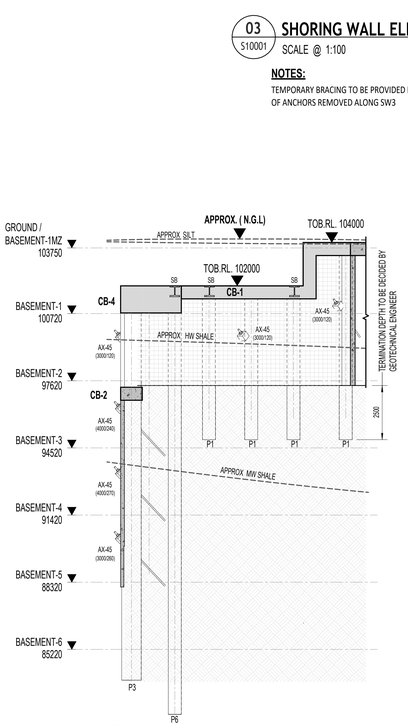
NOTES:

TEMPORARY BRACING TO BE PROVIDED IN LIEU OF THE 1ST LAYER OF ANCHORS REMOVED ALONG SW3



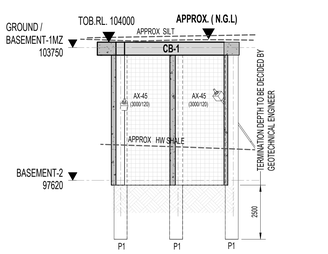
04 S10001 **SHORING WALL ELEVATION -SW4**

SCALE @ 1:100



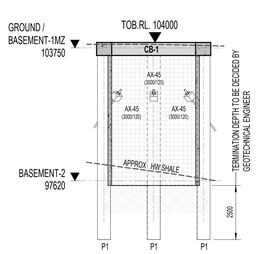
4a S10001 **SHORING WALL ELEVATION -SW4a**

SCALE @ 1:100



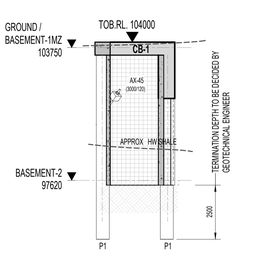
4b S10001 **SHORING WALL ELEVATION -SW4b**

SCALE @ 1:100



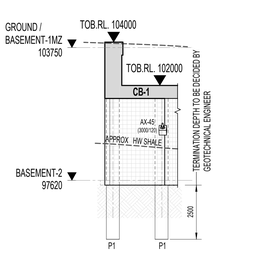
4c S10001 **SHORING WALL ELEVATION -SW4c**

SCALE @ 1:100



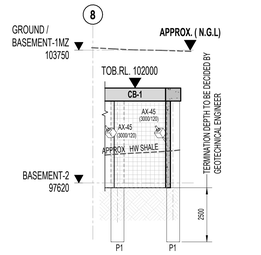
4d S10001 **SHORING WALL ELEVATION -SW4d**

SCALE @ 1:100



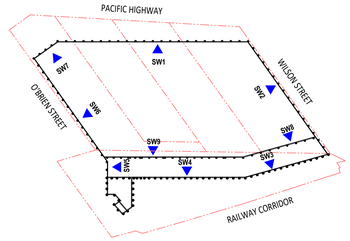
4e S10001 **SHORING WALL ELEVATION -SW4e**

SCALE @ 1:100



4f S10001 **SHORING WALL ELEVATION -SW4f**

SCALE @ 1:100



KEY PLAN

NOTES:

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AX-45 (0000/000)

- AX-45 — DENOTES NUMBER OF STRANDS (DESIGN BY OTHERS)
- 0000 — DENOTES DECLINATION ANGLE
- 000 — DENOTES ANCHOR LOAD IN kN (SERVICE LOAD)
- 0000 — DENOTES ANCHOR BOND LENGTH IN (MM)

SHORING WALL SW1

- DENOTES EXPOSED ROCK / SHALE FACE TO BE RETAINED WITH SHOTCRETE AND ROCK BOLTS TO GEOTECHNICAL ENGINEERS' DETAILS
- DENOTES 175 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 150 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 200 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH
- DENOTES 225 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH

NOTE :

EXTENT OF SHOTCRETE WALLS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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Project: **849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.**

Developer: Billbergia creating communities®

Contractor:

Architect : pbd architects

Design Consultant:

CADIGAL GROUP
1002, 22-24 Market Street, Sydney , NSW 2000 Australia
T: +61 2 8630 8559
info@cadigalgroup.com.au

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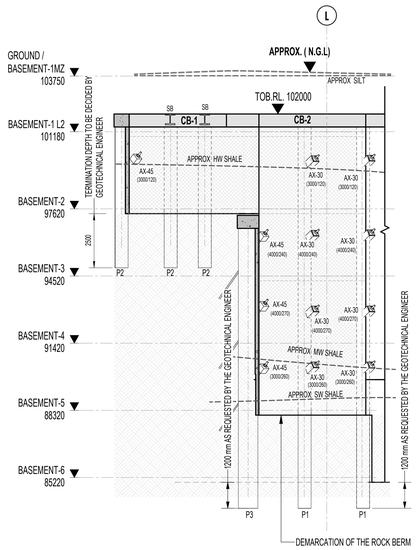
SHORING WALL ELEVATIONS - SHEET 2

STRUCTURAL DRAWINGS

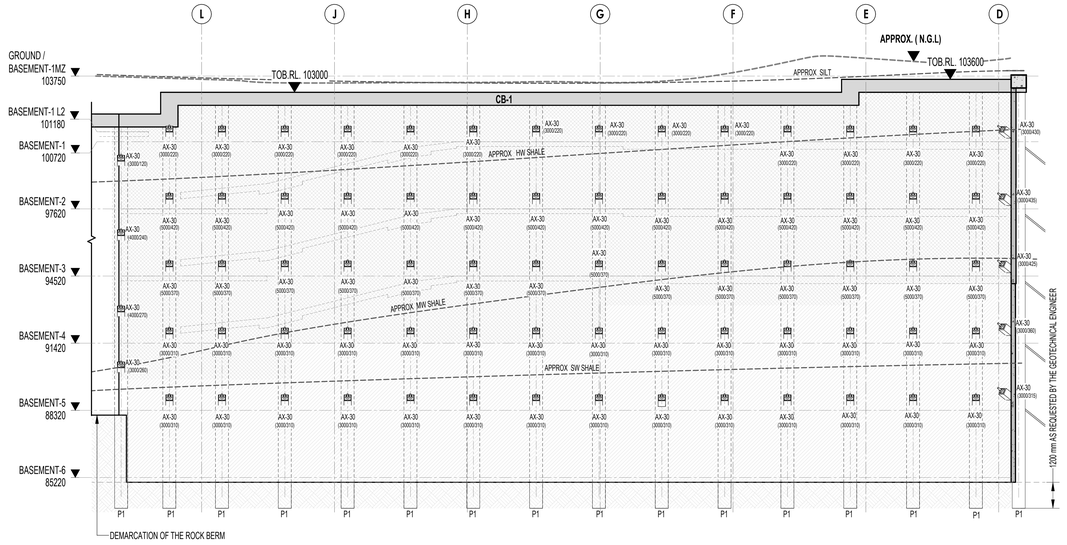
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Modelled:	RT	JT	24.05.15	
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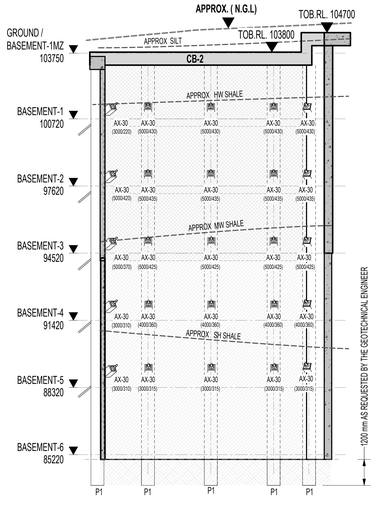
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
SHORING ELEVATION SW3	DA No:			
	DRAWING No: S10012			
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



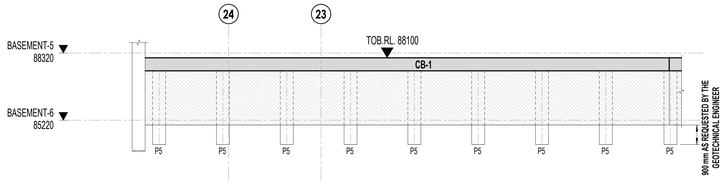
05 S10001 **SHORING WALL ELEVATION -SW5**
SCALE @ 1:100



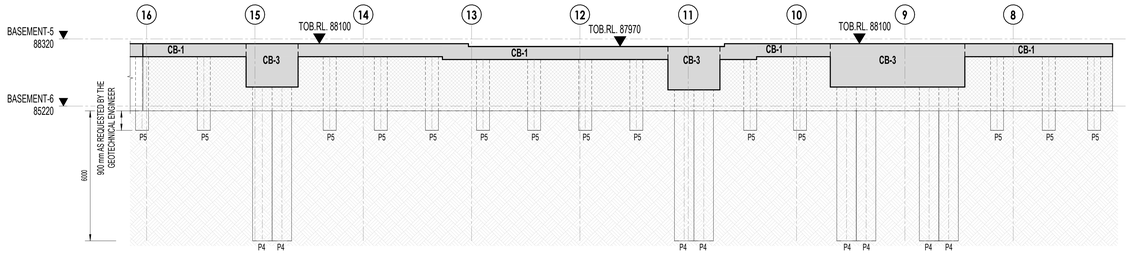
06 S10001 **SHORING WALL ELEVATION -SW6**
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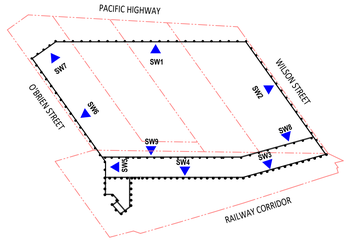
07 S10001 **SHORING WALL ELEVATION -SW7**
SCALE @ 1:100



08 S10001 **SHORING WALL ELEVATION -SW8**
SCALE @ 1:100



09 S10001 **SHORING WALL ELEVATION -SW9**
SCALE @ 1:100



KEY PLAN

NOTES:

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRG S-0006 -SITE RETENTION PLAN

SHORING ELEVATION NOTES:

1. DRAWING MUST BE READ IN CONJUNCTION WITH ARCHITECTS DRAWINGS.
2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL SETOUT U.N.O.
3. DO NOT SCALE ANY DIMENSIONS FROM THIS STRUCTURAL DRAWING.
4. FLOOR LEVELS (RL) SHOWN IN THIS DRAWING ARE FOR THE STRUCTURAL ENGINEERS USE ONLY. REFER TO ARCHITECTS DRAWINGS FOR LEVELS AND OTHER GEOMETRY RELATED DIMENSIONS.
5. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SERVICES DRAWINGS. THE CONTRACTOR MUST CONTACT THE STRUCTURAL ENGINEER SHOULD ANY DISCREPANCIES OCCUR.
7. SOIL TYPES AND GROUND WATER LEVEL (IF ENCOUNTERED) SHOWN ARE INDICATIVE ONLY AND ARE AN EXTRAPOLATION BASED ON THE GEOTECHNICAL REPORT

GROUND ANCHOR TAGS

AX-45 (0000/000)

- DENOTES NUMBER OF STRANDS (DESIGN BY OTHERS)
- DENOTES ANCHOR LOAD IN kN (SERVICE LOAD)
- DENOTES DECLINATION ANGLE
- DENOTES ANCHOR BOND LENGTH IN (MM)

SHORING WALL SW1

- DENOTES EXPOSED ROCK / SHALE FACE TO BE RETAINED WITH SHOTCRETE AND ROCK BOLTS TO GEOTECHNICAL ENGINEERS' DETAILS
- DENOTES 175 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 150 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 200 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH
- DENOTES 225 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH

NOTE :
EXTENT OF SHOTCRETE WALLS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

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H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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Project:
849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.

Developer:
Billbergia creating communities®

Contractor:

Architect :
pbd architects

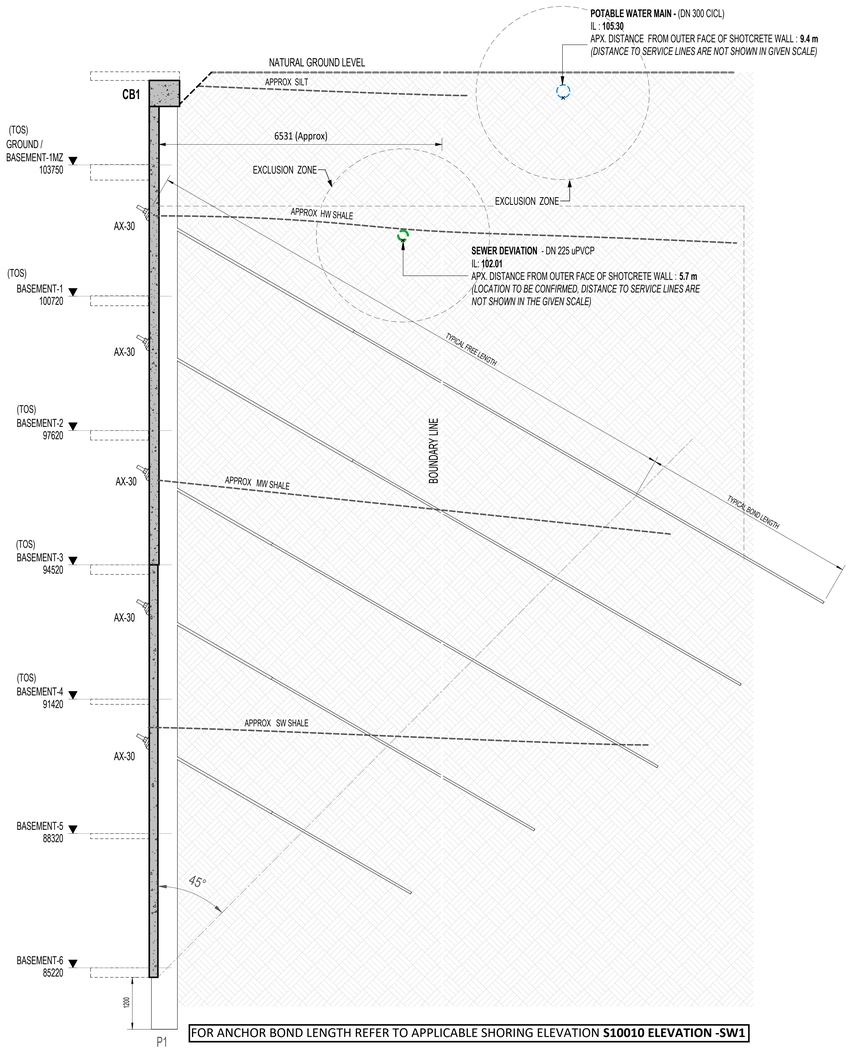
Design Consultant:
1002, 22-24 Market Street,
Sydney , NSW 2000
Australia
T: +61 2 8430 8559
info@cadigalgroup.com.au
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Drawing Title:
SHORING WALL ELEVATIONS - SHEET 3

STRUCTURAL DRAWINGS

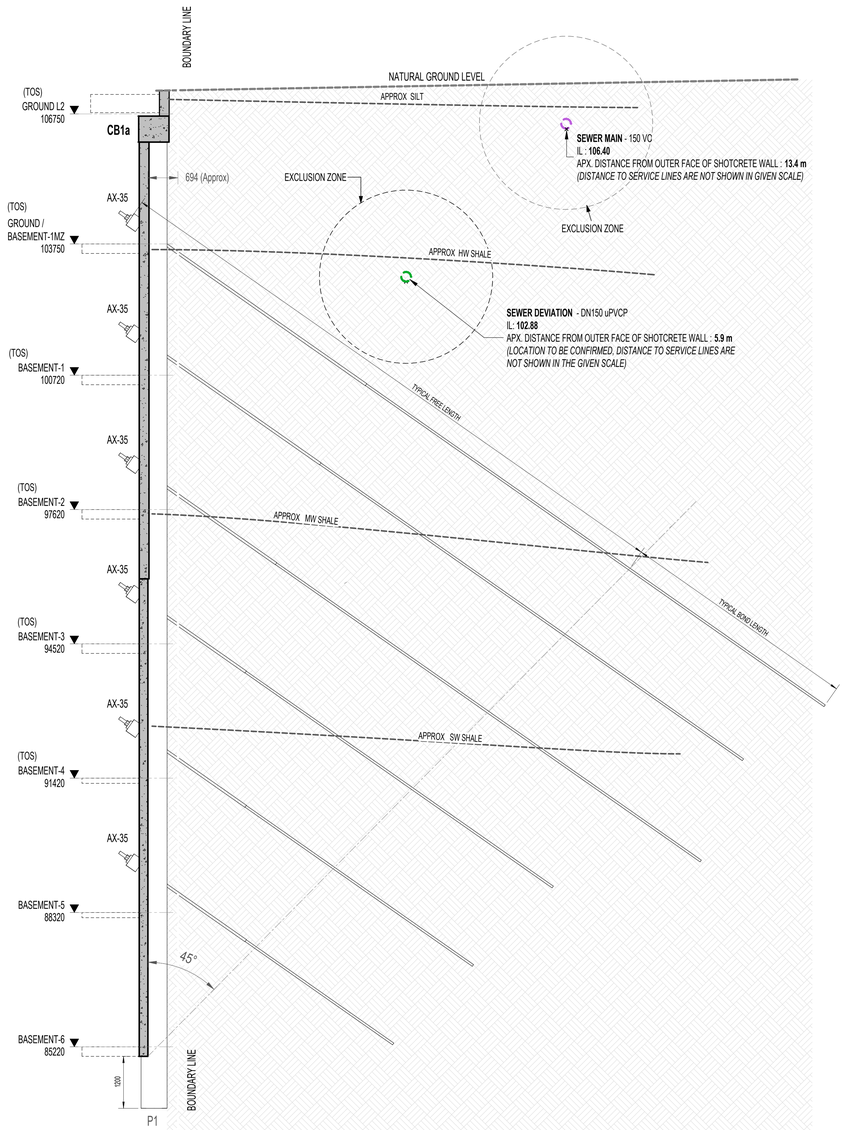
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NON-REGULATED DESIGN RECORD				
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.: DRAWING TITLE:		BODY CORP REG TAG:		
SHORING SECTIONS SH1		DA No: DRAWING No: S10016		
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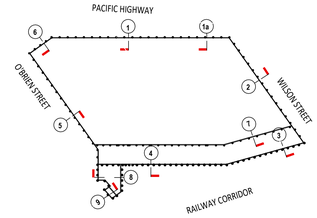
FOR ANCHOR BOND LENGTH REFER TO APPLICABLE SHORING ELEVATION **S10010 ELEVATION -SW1**

01 S10001 **SECTION -1**
SCALE @ 1:50



FOR ANCHOR BOND LENGTH REFER TO APPLICABLE SHORING ELEVATION **S10010 ELEVATION -SW2**

02 S10001 **SECTION -2**
SCALE @ 1:50



KEY PLAN

NOTES:

1. BOUNDARY DIMENSIONS ARE SHOWN INDICATIVELY ONLY. PLEASE FOLLOW ARCHITECT DRAWINGS FOR THE DETAILS.
2. THE POTABLE WATER PIPE DIAMETER IS TENTATIVELY ASSUMED TO BE 110mm
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRG S-0006 -SITE RETENTION PLAN

SHORING WALL SW1

- DENOTES EXPOSED ROCK / SHALE FACE TO BE RETAINED WITH SHOTCRETE AND ROCK BOLTS TO GEOTECHNICAL ENGINEERS' DETAILS
- DENOTES 175 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 150 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 200 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH
- DENOTES 225 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH

NOTE :
EXTENT OF SHOTCRETE WALLS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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Project:
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Developer: Billbergia creating communities®

Contractor:

Architect : pbd architects

Design Consultant:
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1002, 22-24 Market Street,
Sydney , NSW 2000
Australia
T: +61 2 8630 8559
info@cadigalgroup.com.au
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Drawing Title:
SHORING WALL SECTIONS - SHEET 1

STRUCTURAL DRAWINGS

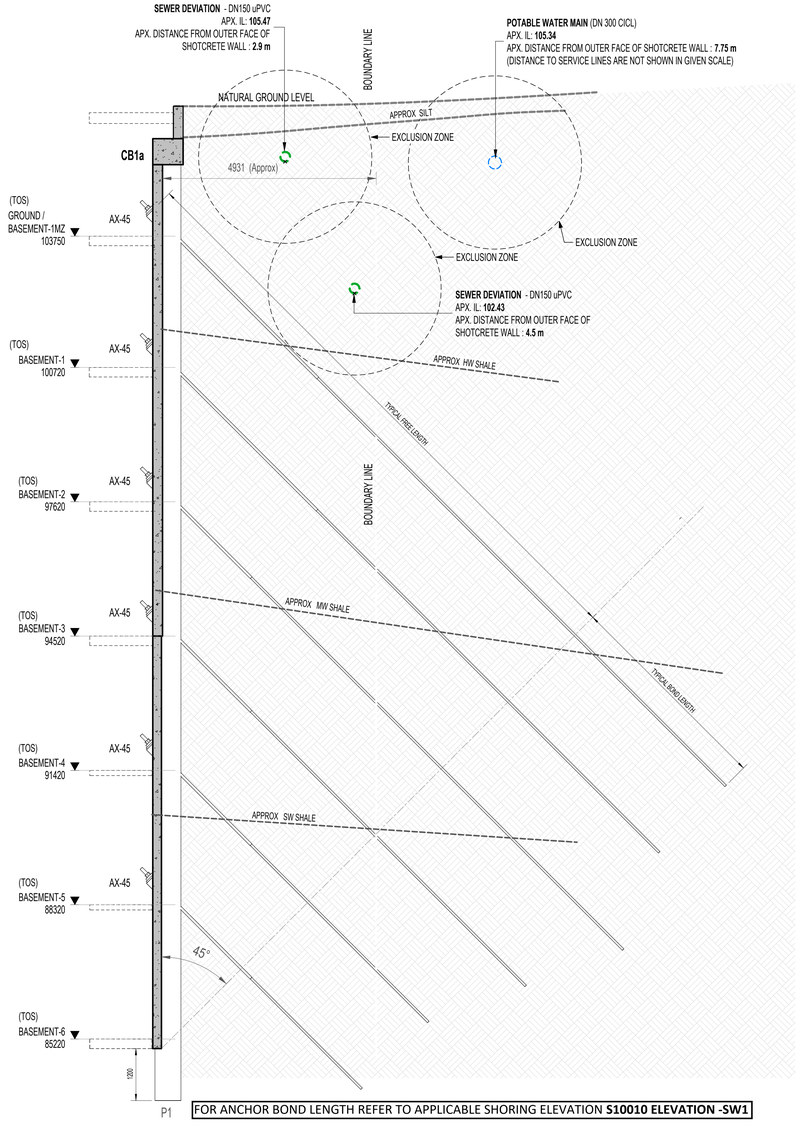
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NON-REGULATED DESIGN RECORD				
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
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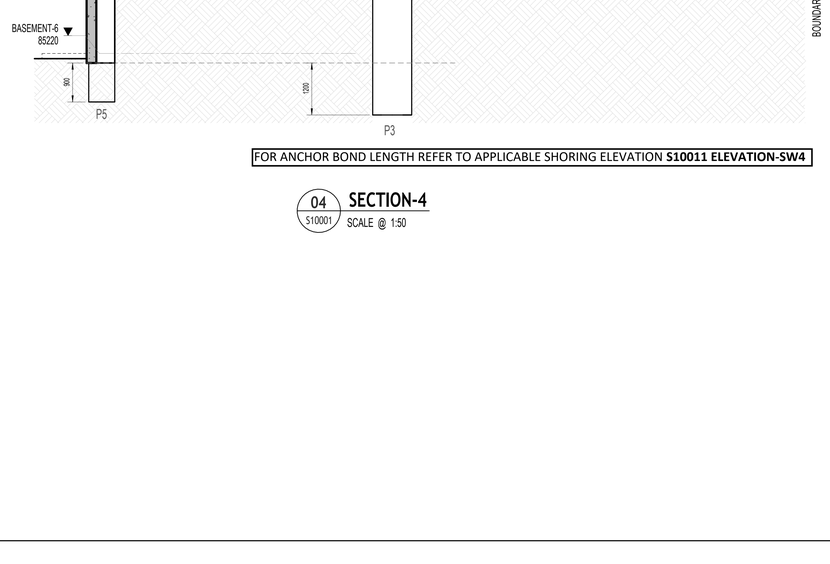
NOTES:

1. BOUNDARY DIMENSIONS ARE SHOWN INDICATIVELY ONLY. PLEASE FOLLOW ARCHITECT DRAWINGS FOR THE DETAILS.
2. THE POTABLE WATER PIPE DIAMETER IS TENTATIVELY ASSUMED TO BE 110mm



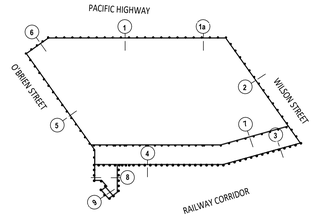
FOR ANCHOR BOND LENGTH REFER TO APPLICABLE SHORING ELEVATION **S10010 ELEVATION -SW1**

07 / S10001 **SECTION -1a**
SCALE @ 1:50



FOR ANCHOR BOND LENGTH REFER TO APPLICABLE SHORING ELEVATION **S10011 ELEVATION-SW4**

04 / S10001 **SECTION-4**
SCALE @ 1:50



KEY PLAN

NOTES:

1. BOUNDARY DIMENSIONS ARE SHOWN INDICATIVELY ONLY. PLEASE FOLLOW ARCHITECT DRAWINGS FOR THE DETAILS.
2. THE POTABLE WATER PIPE DIAMETER IS TENTATIVELY ASSUMED TO BE 110mm
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRG S-0006 -SITE RETENTION PLAN

SHORING WALL SW1

- DENOTES EXPOSED ROCK / SHALE FACE TO BE RETAINED WITH SHOTCRETE AND ROCK BOLTS TO GEOTECHNICAL ENGINEERS' DETAILS
- DENOTES 175 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 150 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 200 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH
- DENOTES 225 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH

NOTE :
EXTENT OF SHOTCRETE WALLS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
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E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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T: +61 2 8630 8559
info@cadigalgroup.com.au

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Drawing Title:

SHORING WALL SECTIONS - SHEET 2

STRUCTURAL DRAWINGS

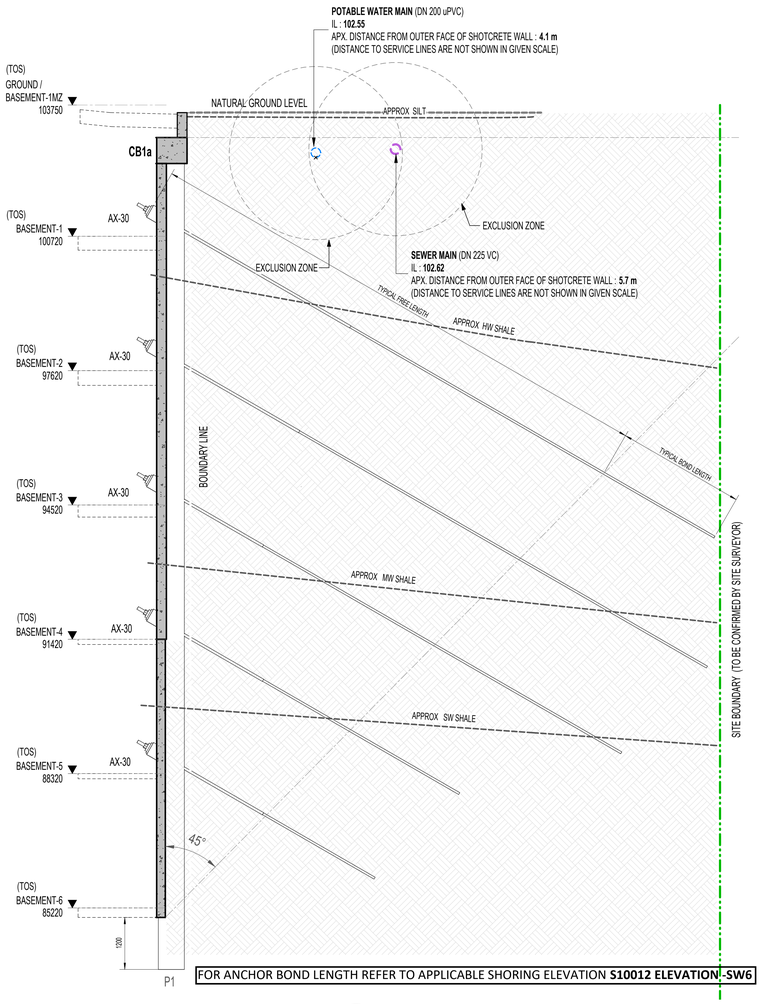
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP BEG TAG:		
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	DRAWING No: S10018			
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO

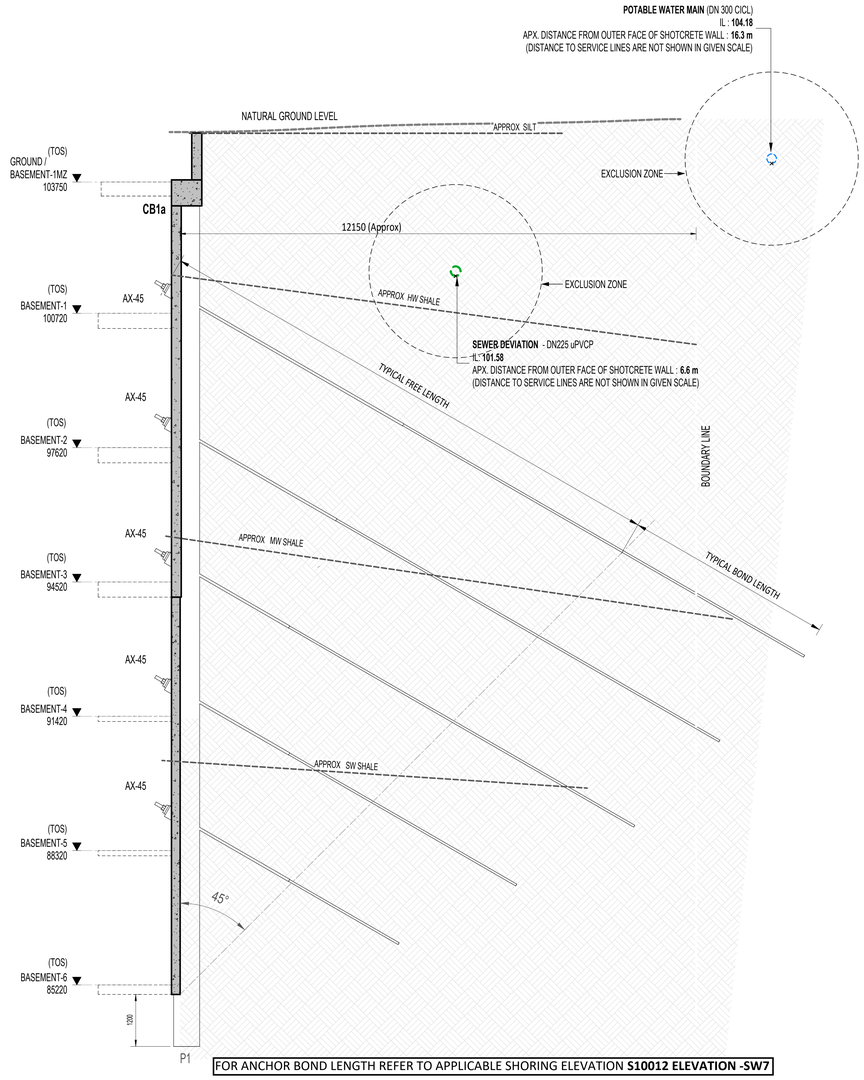
NOTES:

1. BOUNDARY DIMENSIONS ARE SHOWN INDICATIVELY ONLY. PLEASE FOLLOW ARCHITECT DRAWINGS FOR THE DETAILS.
2. THE POTABLE WATER PIPE DIAMETER IS TENTATIVELY ASSUMED TO BE 110mm



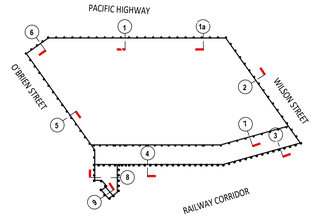
FOR ANCHOR BOND LENGTH REFER TO APPLICABLE SHORING ELEVATION **S10012 ELEVATION -SW6**

05 / S10001 **SECTION -5**
SCALE @ 1:50



FOR ANCHOR BOND LENGTH REFER TO APPLICABLE SHORING ELEVATION **S10012 ELEVATION -SW7**

06 / S10001 **SECTION -6**
SCALE @ 1:50



KEY PLAN

NOTES:

1. BOUNDARY DIMENSIONS ARE SHOWN INDICATIVELY ONLY. PLEASE FOLLOW ARCHITECT DRAWINGS FOR THE DETAILS.
2. THE POTABLE WATER PIPE DIAMETER IS TENTATIVELY ASSUMED TO BE 110mm
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRG S-0006 -SITE RETENTION PLAN

SHORING WALL SW1

- DENOTES EXPOSED ROCK / SHALE FACE TO BE RETAINED WITH SHOTCRETE AND ROCK BOLTS TO GEOTECHNICAL ENGINEERS' DETAILS
- DENOTES 175 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 150 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 200 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH
- DENOTES 225 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH

NOTE :
EXTENT OF SHOTCRETE WALLS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER

WORK IN PROGRESS
NOT SUITABLE FOR CONSTRUCTION

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Australia
T: +61 2 8630 8559
info@cadigalgroup.com.au
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Drawing Title:

SHORING WALL SECTIONS - SHEET 3

STRUCTURAL DRAWINGS

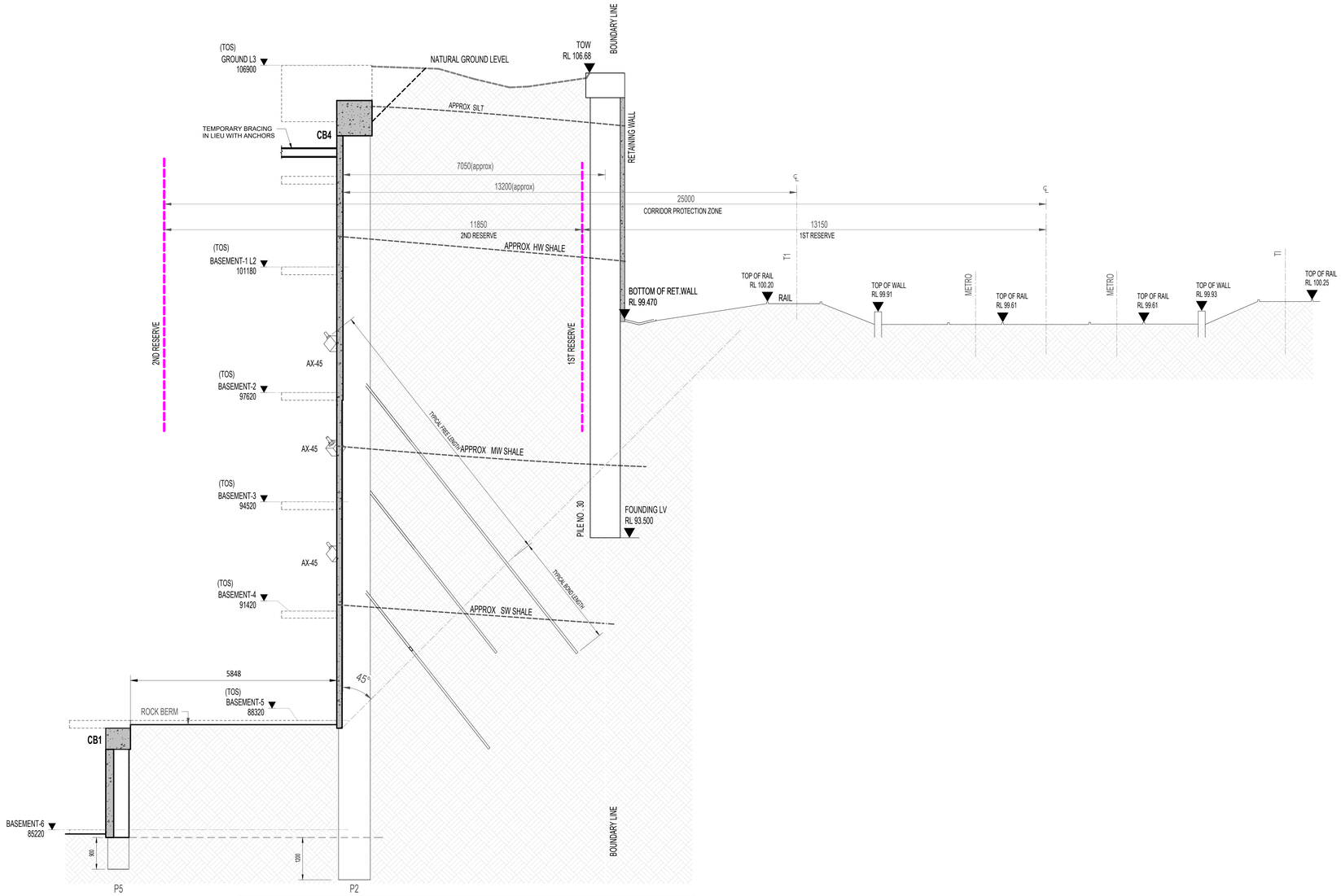
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NON-REGULATED DESIGN RECORD				
PROJECT ADDRESS: 849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.				
PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
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		DRAWING No: S10019		
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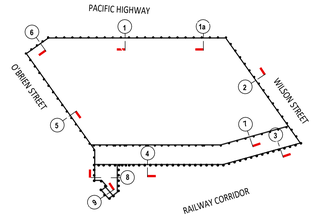
1. BOUNDARY DIMENSIONS ARE SHOWN INDICATIVELY ONLY. PLEASE FOLLOW ARCHITECT DRAWINGS FOR THE DETAILS.
2. THE POTABLE WATER PIPE DIAMETER IS TENTATIVELY ASSUMED TO BE 110mm



FOR ANCHOR BOND LENGTH REFER TO APPLICABLE SHORING ELEVATION **S10011 ELEVATION -SW3**

03 S10001 **SECTION -3**

SCALE @ 1:50



KEY PLAN

NOTES:

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SHORING WALL SW1

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Australia
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Drawing Title:

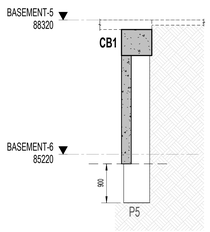
SHORING WALL SECTIONS - SHEET 4

STRUCTURAL DRAWINGS

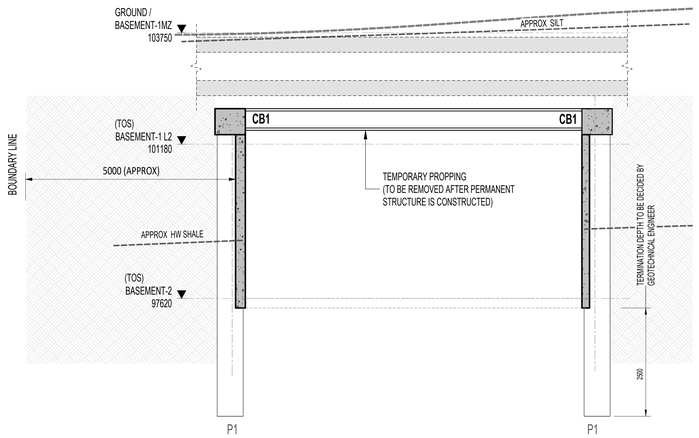
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Modelled:	RT	JT	24.05.15	
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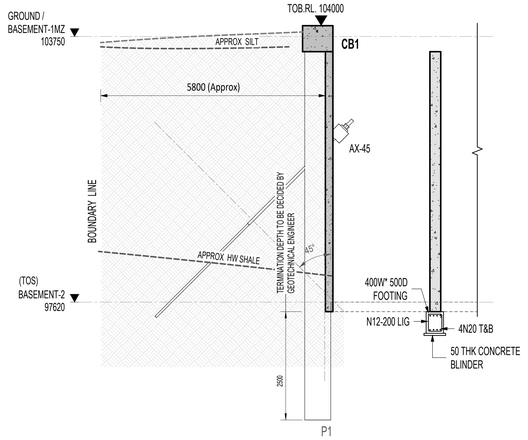
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP BEG TAG:		
	SHORING ELEVATION SW6	DA No:		
		DRAWING No: S10020		
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



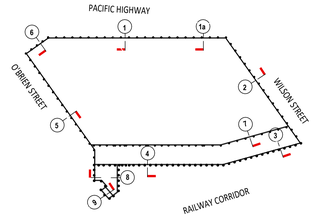
07 S10001 **SECTION -7**
SCALE @ 1:50



08 S10001 **SECTION-8**
SCALE @ 1:50



09 S10001 **SECTION-9**
SCALE @ 1:50



KEY PLAN

NOTES:

1. BOUNDARY DIMENSIONS ARE SHOWN INDICATIVELY ONLY. PLEASE FOLLOW ARCHITECT DRAWINGS FOR THE DETAILS.
2. THE POTABLE WATER PIPE DIAMETER IS TENTATIVELY ASSUMED TO BE 110mm
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRG S-0006 -SITE RETENTION PLAN

SHORING WALL SW1

- DENOTES EXPOSED ROCK / SHALE FACE TO BE RETAINED WITH SHOTCRETE AND ROCK BOLTS TO GEOTECHNICAL ENGINEERS' DETAILS
- DENOTES 175 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 150 THK. SHOTCRETE WALL WITH REO. SL102MESH
- DENOTES 200 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH
- DENOTES 225 THK. SHOTCRETE WALL WITH REO. DOUBLE SL102MESH

NOTE :
EXTENT OF SHOTCRETE WALLS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER

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Rev	Description	Date	By	App
H	ISSUED FOR INFORMATION ONLY	25.05.09	RT	NAA
G	ISSUED FOR INFORMATION ONLY	25.04.03	RT	NAA
F	ISSUED FOR INFORMATION ONLY	25.03.25	RT	NAA
E	ISSUED FOR INFORMATION ONLY	25.03.11	RT	NAA
D	ISSUED FOR INFORMATION ONLY (PRELIMINARY DD 70%)	25.02.18	RM	JT

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Project:
849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.

Developer:
Billbergia creating communities®

Contractor:

Architect :
pbd architects

Design Consultant:
CADIGAL GROUP
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Sydney , NSW 2000
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Drawing Title:
SHORING WALL SECTIONS - SHEET 5

STRUCTURAL DRAWINGS

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NON-REGULATED DESIGN RECORD

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PROJECT TITLE:	CHATSWOOD GRAND RESIDENCES
CONSENT No.:	DRAWING TITLE: SW3 TEMPORARY BRACING -3D VIEW
	BODY CORP REG TAG:
	DA No:
	DRAWING No: S10100

REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



SW3 - TEMPORARY BRACING - 3D VIEW

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A	ISSUED FOR INFORMATION ONLY	25.03.21	RT	NAA

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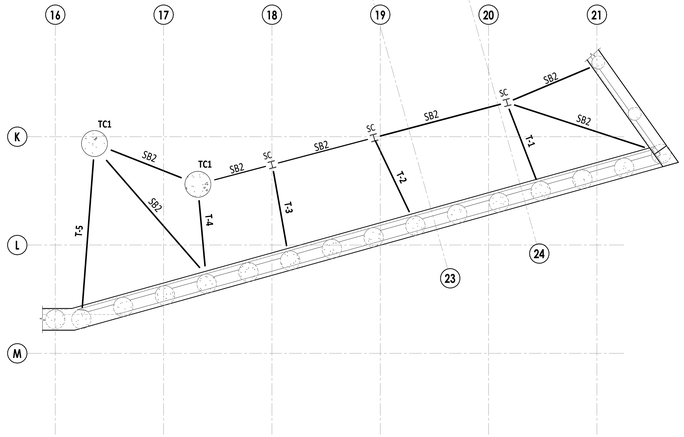
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Sydney , NSW 2000
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Drawing Title:
TEMPORARY BRACING-3D VIEW

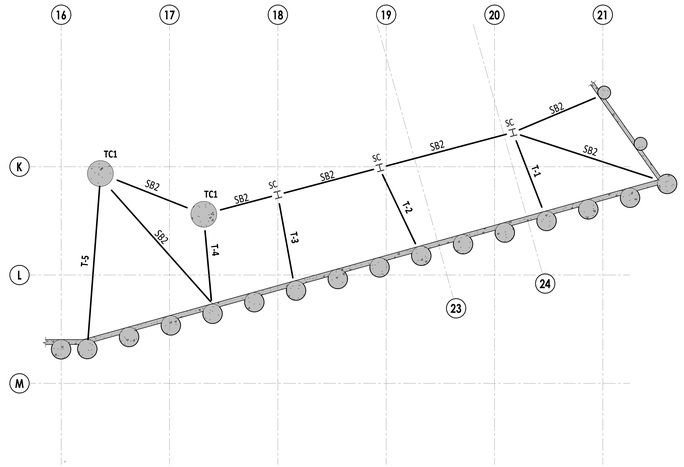
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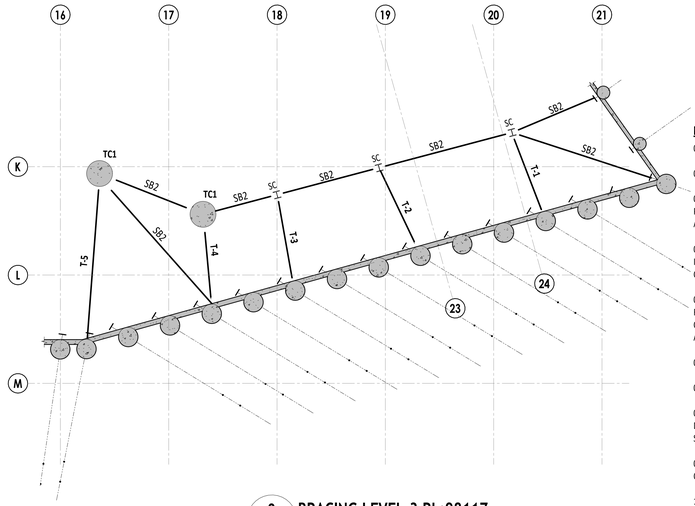
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
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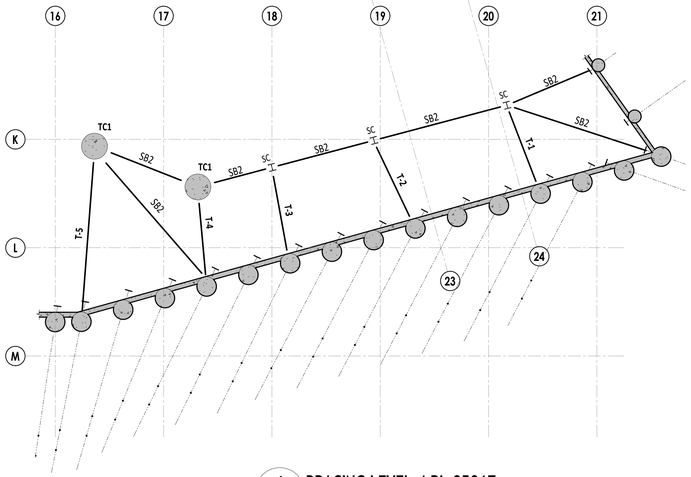
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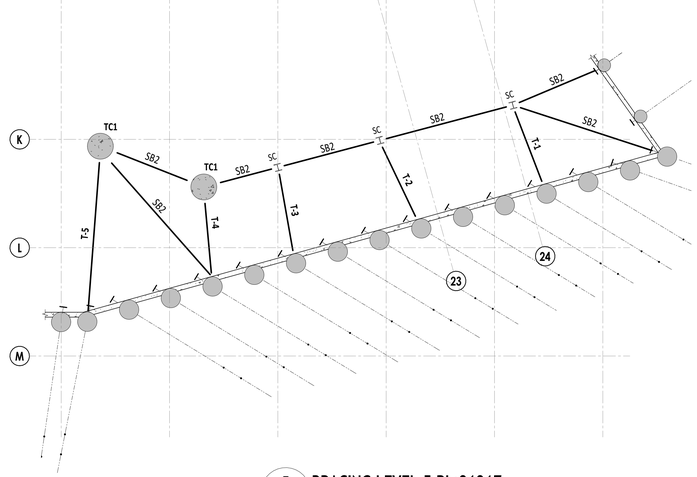
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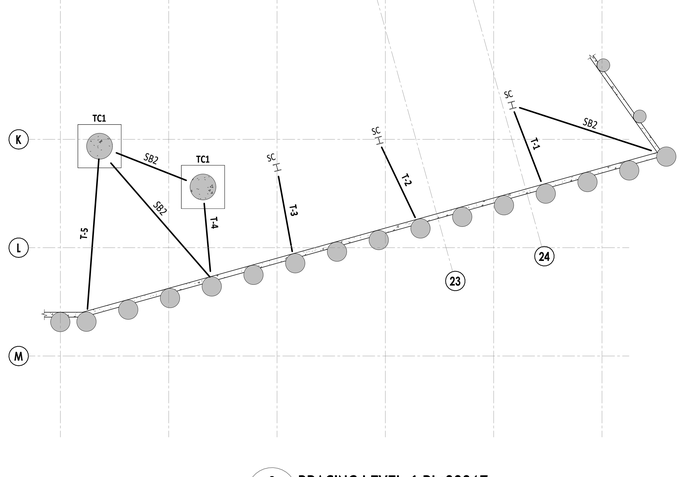
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4 BRACING LEVEL-4 RL:95017
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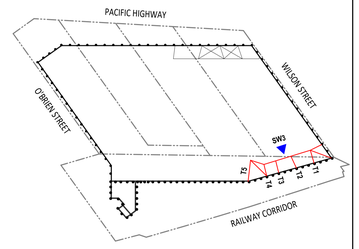
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6 BRACING LEVEL-6 RL:88817
SCALE @ 1 : 100

TEMPORARY BRACING -PLANS

SCALE @ 1:100



KEY PLAN

NOTES:

01.REFER DRAWINGS S10001-S10005,S10012 & S10019 FOR SHORING DETAILS.

02.REFER DRAWINGS S30002-S30008 FOR GENERAL ARRANGEMENTS

03.UNLESS NOTED OTHERWISE, ALL STEELWORK SHALL BE PREPARED, PRIMED AND PAINTED IN ACCORDANE WITH THE SPECIFICATION. ALL EXTERNAL EXPOSED STEELWORK TO BE HOT DIP GALVANISED.

04.UNLESS NOTED OTHERWISE, ALL EXTERNAL EXPOSED STEELWORK IN SOIL SHALL BE COATED WITH EPOXY PROTECTIVE COATINGS CONFORMING TO AS/NZS 2312.

05.UNLESS NOTED OTHERWISE, ALL WELDS TO BE 8mm CONTINUOUS FILLETS, LAID DOWN WITH APPROVED COVERED ELECTRODES. ALL WELDS SHALL BE CATEGORY SP. WELDS SHALL CONFORM TO AS/NZS 1554 AND ELECTRODES TO AS/NZS 1553.

06.REFER TO CORRESPONDING ARCHITECTURAL DRAWINGS FOR RL VALUES.

07.ALL DIMENSIONS ARE IN MILLIMETERS.

08.GEOTECHNICAL ENGINEER TO INSPECT EXPOSED SHALE FACE REGULARY DURING EXCAVATION AND NOMINATED APPROPRIATE SOIL ANCHORS AND SHOTCRETE AS REQUIRED TO ENSURE STABILITY AT ALL TIMES.

09.ANCHOR LENGTH ARE SHOWN INDICATIVELY ONLY, THIS IS DETERMINED BY OTHERS.

10.THE SHORING DESIGN IS PERFORMED BASED ON THE GEOTECHNICAL REPORT PROVIDED BY THE FORTIFY GEOTECH.

i - GEOTECHNICAL INVESTIGATION REPORT ISSUED ON 14/12/2023 (REF - JS/S1998 Rev 2)

iii - MN/S2207-2: (REV1) DATED 13.05.2024 RESPONSES TO CADIGAL GROUP'S CONSULTANT ADVICE NOTICE DATED 22/04/2024

STEEL FRAMING SCHEDULE	
MARK	SIZE
SB1	250UC89.5 (GR 300)
SB2	200UC52.2 (GR 300)
SB3	250UC72.9 (GR 300)
SB4	200UC46.2 (GR 300)
SC	310UC158 (GR 300)

COLUMN SCHEDULE		
MARK	SIZE	GRADE
TC1	1200 DIA	N80

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Drawing Title:
TEMPORARY BRACING -PLANS

STRUCTURAL DRAWINGS

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Sheet:	A0	01-100084	S10101	A

DIAL 1100 BEFORE DIG

BUILDER TO DETERMINE THE EXACT LOCATIONS OF EXISTING SERVICES PRIOR TO THE START OF ANY CONSTRUCTION WORK. BUILDER TO CONTACT 'DIAL BEFORE YOU DIG AND THE AUTHORITIES CONCERNED TO CONFIRM THE ACTUAL LOCATIONS OF EXISTING SERVICES. IN THE EVENT THAT ANY OF THE SERVICES MIGHT BE AFFECTED BY STRUCTURAL WORK, STRUCTURAL ENGINEER IS TO BE NOTIFIED AND CONSULTED IMMEDIATELY TO REVIEW THE STRUCTURAL DETAILS AFFECTING THE SERVICES.

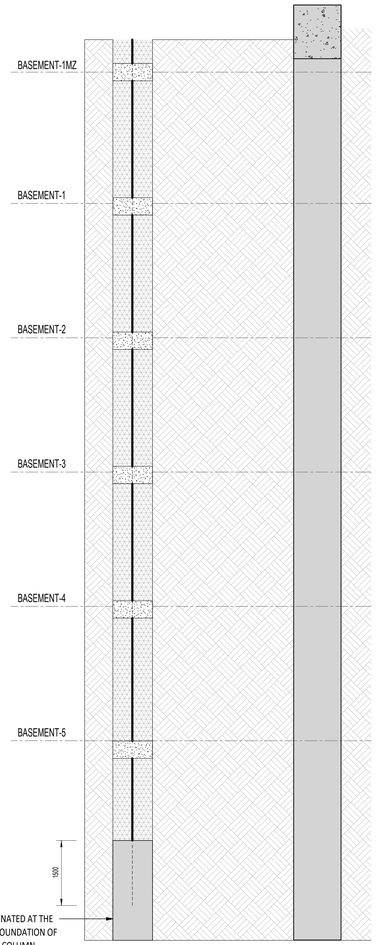
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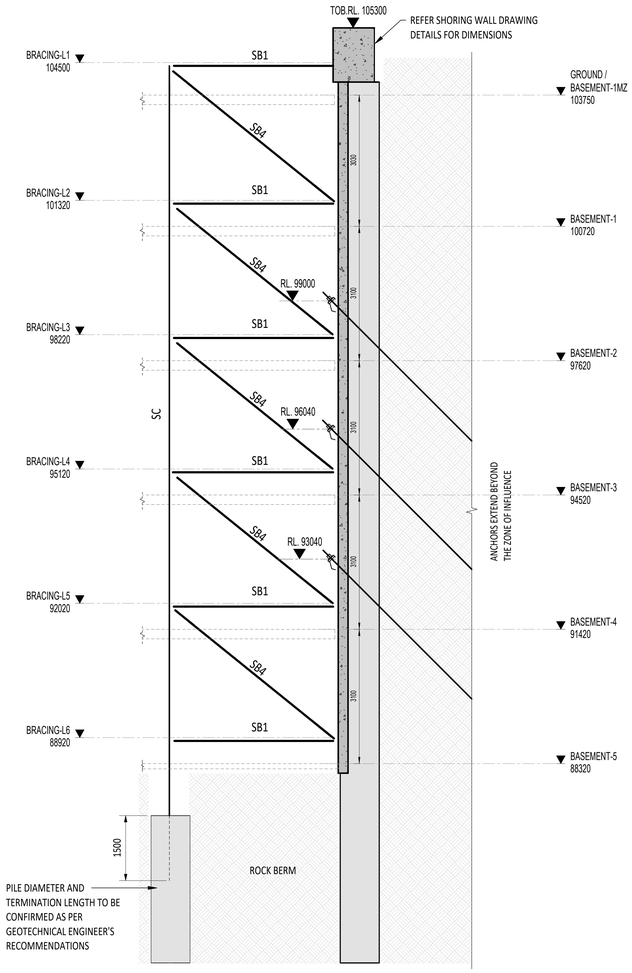
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PROJECT TITLE:	CHATSWOOD GRAND RESIDENCES			
CONSENT No.:	DRAWING TITLE:	BODY CORP BEG TAG:		
CONNECTION DETAILS OF TRUSS T-4	DA No:			
	DRAWING No: S10105			

REV	DATE	DESCRIPTION	DP FULL NAME	REG NO

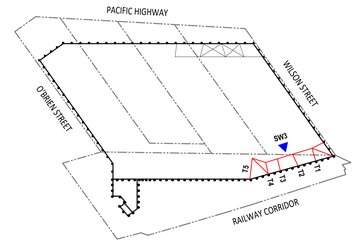


TYPICAL STEEL COLUMN INSTALLATION DETAIL



TRUSS T-1

SCALE @ 1 : 50



KEY PLAN

NOTE:

ALL STEEL COLUMNS SHALL BE INSTALLED IN ACCORDANCE WITH THE 'TYPICAL COLUMN INSTALLATION DETAIL.' THIS DETAIL MUST BE FOLLOWED FOR ALL LOCATIONS AS APPLICABLE.

STEEL FRAMING SCHEDULE	
MARK	SIZE
SB1	250UC89.5 (GR 300)
SB2	200UC52.2 (GR 300)
SB3	250UC72.9 (GR 300)
SB4	200UC46.2 (GR 300)
SC	310UC158 (GR 300)

SHORING WALL SW1

DENOTES SOIL FILL

DENOTES MASS CONCRETE FILL

DENOTES ROCK BERM

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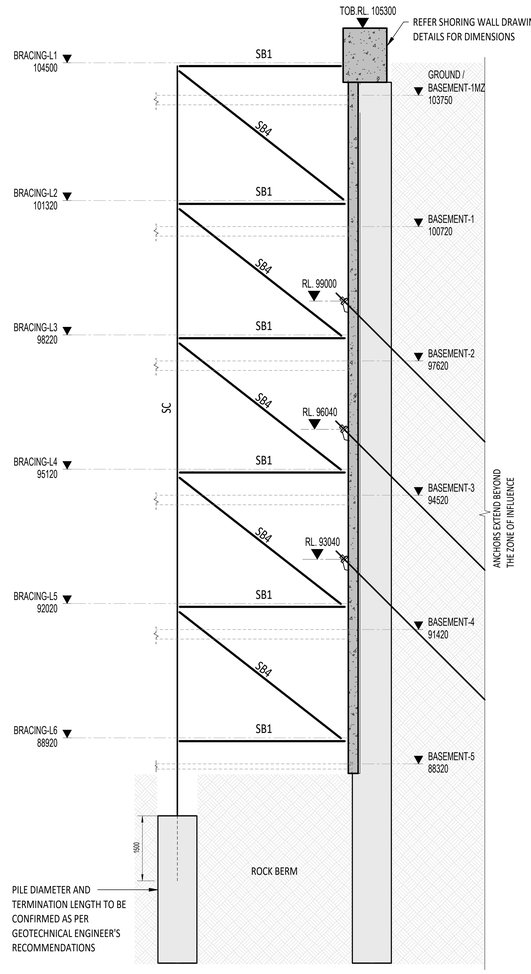
BRACING DETAIL-SH1

STRUCTURAL DRAWINGS

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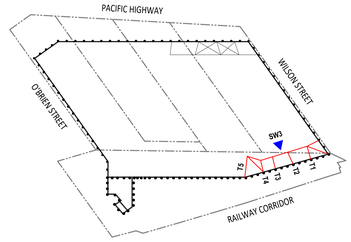
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NON-REGULATED DESIGN RECORD				
PROJECT ADDRESS:	849-859 PACIFIC HIGHWAY & 2-8 WILSON STEET, CHATSWOOD.			
PROJECT TITLE:	CHATSWOOD GRAND RESIDENCES			
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
	DA No:			
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



TRUSS T-2

SCALE @ 1 : 50



KEY PLAN

NOTE:

ALL STEEL COLUMNS SHALL BE INSTALLED IN ACCORDANCE WITH THE 'TYPICAL COLUMN INSTALLATION DETAIL.' THIS DETAIL MUST BE FOLLOWED FOR ALL LOCATIONS AS APPLICABLE.

STEEL FRAMING SCHEDULE	
MARK	SIZE
SB1	250UC89.5 (GR 300)
SB2	200UC52.2 (GR 300)
SB3	250UC72.9 (GR 300)
SB4	200UC46.2 (GR 300)
SC	310UC158 (GR 300)

SHORING WALL SW1

DENOTES SOIL FILL

DENOTES MASS CONCRETE FILL

DENOTES ROCK BERM

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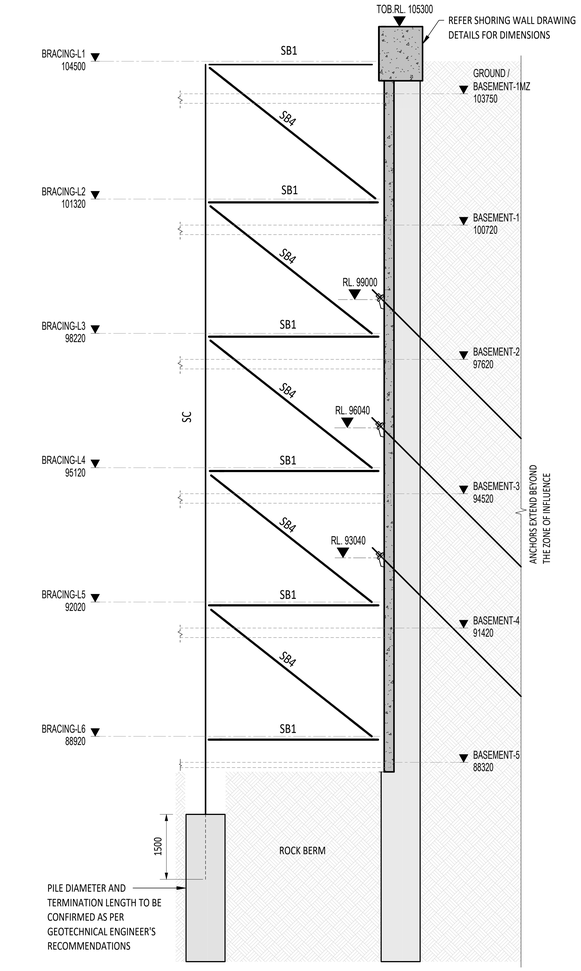
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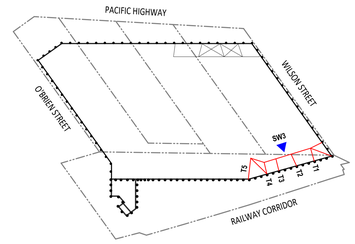
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CONSENT No.: DRAWING TITLE:		BODY CORP REG TAG:		
CONNECTION DETAILS OF TRUSS T-1		DA No:		
		DRAWING No: S10102		
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



TRUSS T-3

SCALE @ 1 : 50



KEY PLAN

NOTE:

ALL STEEL COLUMNS SHALL BE INSTALLED IN ACCORDANCE WITH THE 'TYPICAL COLUMN INSTALLATION DETAIL.' THIS DETAIL MUST BE FOLLOWED FOR ALL LOCATIONS AS APPLICABLE.

STEEL FRAMING SCHEDULE	
MARK	SIZE
SB1	250UC89.5 (GR 300)
SB2	200UC52.2 (GR 300)
SB3	250UC72.9 (GR 300)
SB4	200UC46.2 (GR 300)
SC	310UC158 (GR 300)

SHORING WALL SW1

DENOTES SOIL FILL

DENOTES MASS CONCRETE FILL

DENOTES ROCK BERM

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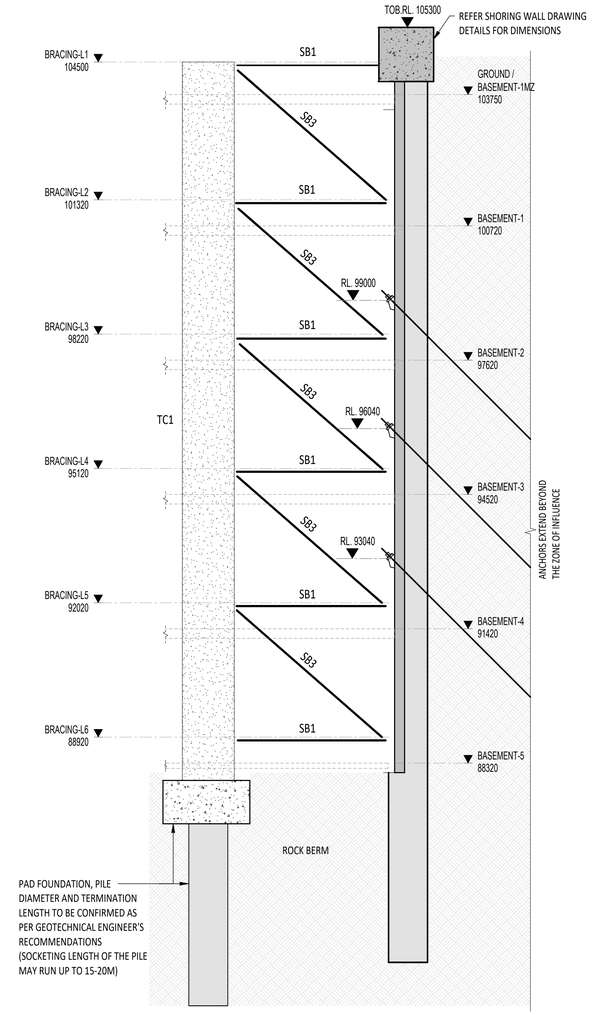
Drawing Title:

BRACING DETAIL-SH3

STRUCTURAL DRAWINGS

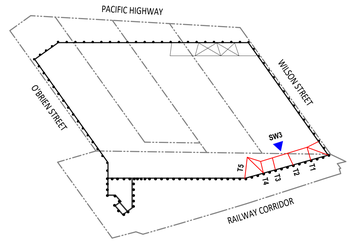
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Modelled:	RT	JT	03/21/25	
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NON-REGULATED DESIGN RECORD				
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.: DRAWING TITLE:		BODY CORP REG TAG:		
CONNECTION DETAILS OF TRUSS T-2		DA No: DRAWING No: S10103		
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



TRUSS T-4

SCALE @ 1 : 50



KEY PLAN

COLUMN SCHEDULE		
MARK	SIZE	GRADE
TC1	1200 DIA	N80

STEEL FRAMING SCHEDULE	
MARK	SIZE
SB1	250UC89.5 (GR 300)
SB2	200UC52.2 (GR 300)
SB3	250UC72.9 (GR 300)
SB4	200UC46.2 (GR 300)
SC	310UC158 (GR 300)

SHORING WALL SW1

DENOTES SOIL FILL

DENOTES MASS CONCRETE FILL

DENOTES ROCK BERM

DIAL 1100 BEFORE DIG

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Project: **849-859 PACIFIC HIGHWAY & 2-8 WILSON STREET, CHATSWOOD.**

Developer: Billbergia creating communities®

Contractor:

Architect : pbd architects

Design Consultant:

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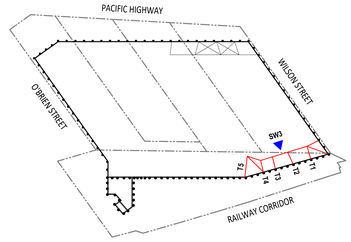
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BRACING DETAIL-SH4

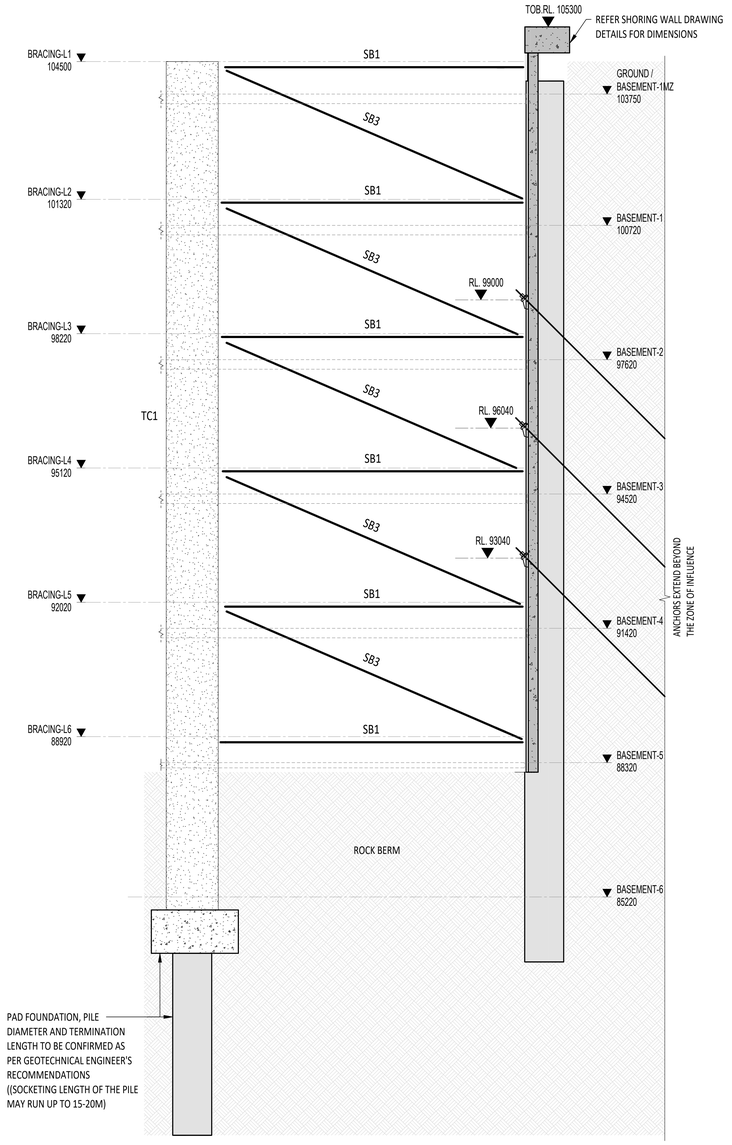
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.: DRAWING TITLE:		BODY CORP BEG TAG:		
CONNECTION DETAILS OF TRUSS T-3		DA No:		
		DRAWING No: S10104		
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



KEY PLAN



TRUSS T-5

SCALE @ 1 : 50

COLUMN SCHEDULE		
MARK	SIZE	GRADE
TC1	1200 DIA	N80

STEEL FRAMING SCHEDULE	
MARK	SIZE
SB1	250UC89.5 (GR 300)
SB2	200UC52.2 (GR 300)
SB3	250UC72.9 (GR 300)
SB4	200UC46.2 (GR 300)
SC	310UC158 (GR 300)

SHORING WALL SW1

DENOTES SOIL FILL

DENOTES MASS CONCRETE FILL

DENOTES ROCK BERM

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Developer:
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Contractor:

Architect :
pbd architects

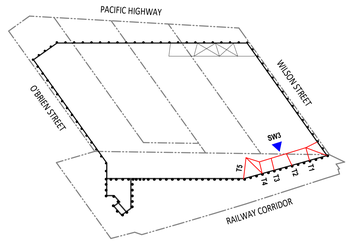
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Drawing Title:
BRACING DETAIL-SH5

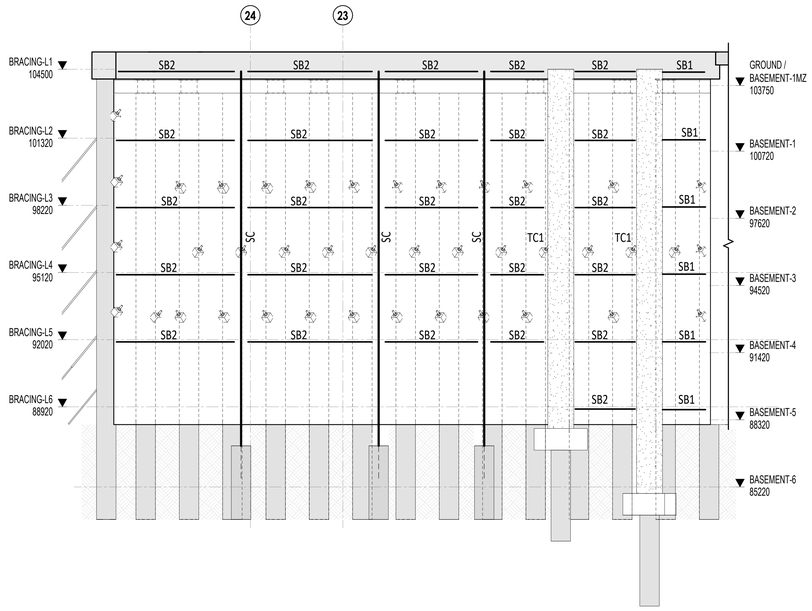
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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.: DRAWING TITLE: BODY CORP REG TAG:				
TEMP. BRACING FRONT ELEVATION DA No:				
DRAWING No: S10106				
REV	DATE	DESCRIPTION	DP FULL NAME	REG NO



KEY PLAN



TEMPORARY BRACING - FRONT ELEVATION

SCALE @ 1 : 100

COLUMN SCHEDULE		
MARK	SIZE	GRADE
TC1	1200 DIA	N80

STEEL FRAMING SCHEDULE	
MARK	SIZE
SB1	250UC89.5 (GR 300)
SB2	200UC52.2 (GR 300)
SB3	250UC72.9 (GR 300)
SB4	200UC46.2 (GR 300)
SC	310UC158 (GR 300)

SHORING WALL SW1

DENOTES SOIL FILL

DENOTES MASS CONCRETE FILL

DENOTES ROCK BERM

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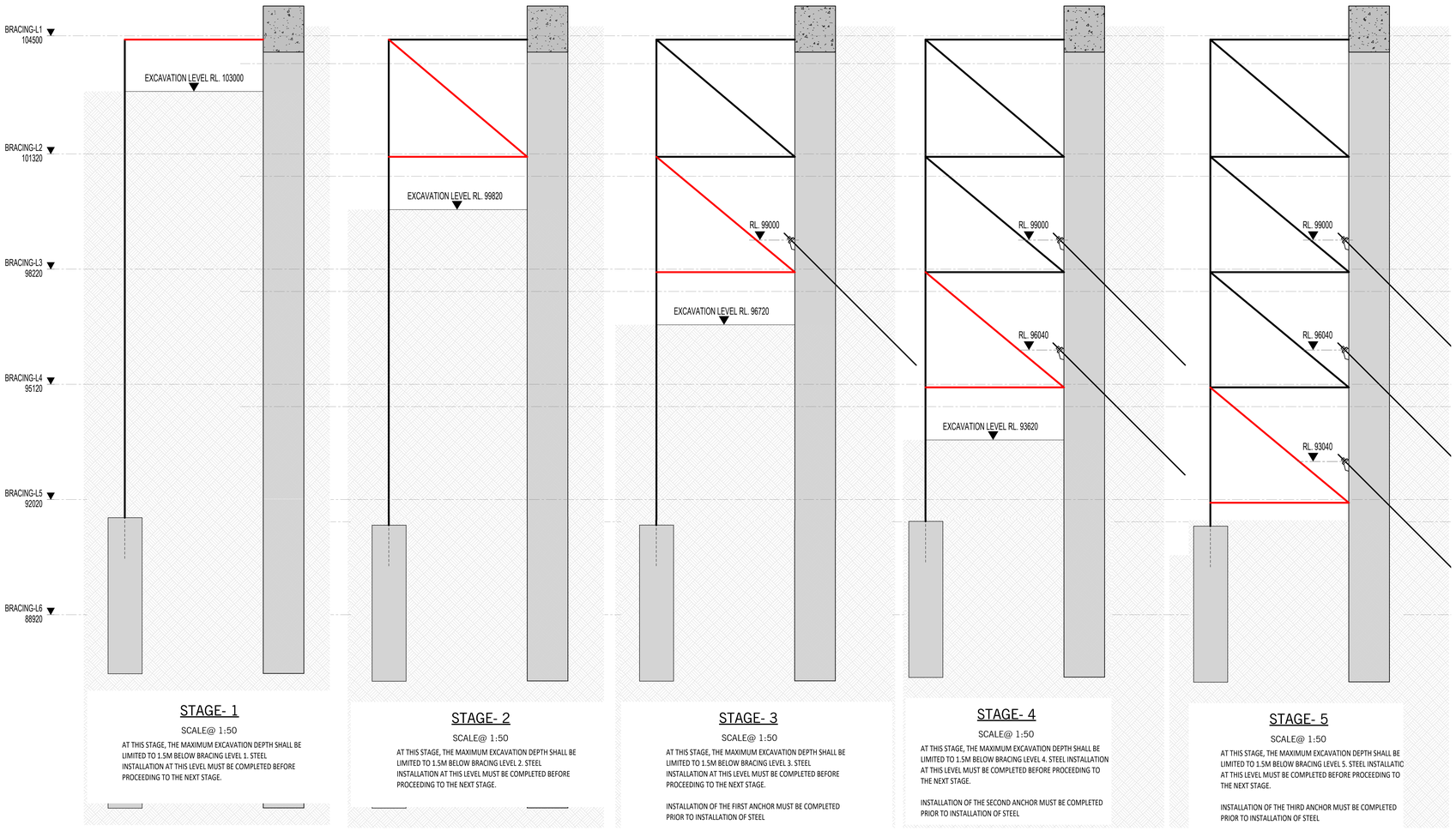
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BRACING - FRONT ELEVATION

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PROJECT TITLE: CHATSWOOD GRAND RESIDENCES				
CONSENT No.:	DRAWING TITLE:	BODY CORP REG TAG:		
		DA No:		
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STAGE- 1

SCALE@ 1:50

AT THIS STAGE, THE MAXIMUM EXCAVATION DEPTH SHALL BE LIMITED TO 1.5M BELOW BRACING LEVEL 1. STEEL INSTALLATION AT THIS LEVEL MUST BE COMPLETED BEFORE PROCEEDING TO THE NEXT STAGE.

STAGE- 2

SCALE@ 1:50

AT THIS STAGE, THE MAXIMUM EXCAVATION DEPTH SHALL BE LIMITED TO 1.5M BELOW BRACING LEVEL 2. STEEL INSTALLATION AT THIS LEVEL MUST BE COMPLETED BEFORE PROCEEDING TO THE NEXT STAGE.

STAGE- 3

SCALE@ 1:50

AT THIS STAGE, THE MAXIMUM EXCAVATION DEPTH SHALL BE LIMITED TO 1.5M BELOW BRACING LEVEL 3. STEEL INSTALLATION AT THIS LEVEL MUST BE COMPLETED BEFORE PROCEEDING TO THE NEXT STAGE.

INSTALLATION OF THE FIRST ANCHOR MUST BE COMPLETED PRIOR TO INSTALLATION OF STEEL

STAGE- 4

SCALE@ 1:50

AT THIS STAGE, THE MAXIMUM EXCAVATION DEPTH SHALL BE LIMITED TO 1.5M BELOW BRACING LEVEL 4. STEEL INSTALLATION AT THIS LEVEL MUST BE COMPLETED BEFORE PROCEEDING TO THE NEXT STAGE.

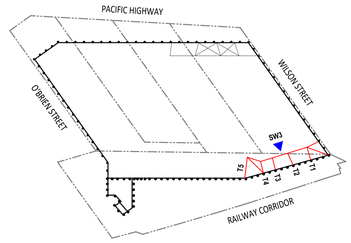
INSTALLATION OF THE SECOND ANCHOR MUST BE COMPLETED PRIOR TO INSTALLATION OF STEEL

STAGE- 5

SCALE@ 1:50

AT THIS STAGE, THE MAXIMUM EXCAVATION DEPTH SHALL BE LIMITED TO 1.5M BELOW BRACING LEVEL 5. STEEL INSTALLATIC AT THIS LEVEL MUST BE COMPLETED BEFORE PROCEEDING TO THE NEXT STAGE.

INSTALLATION OF THE THIRD ANCHOR MUST BE COMPLETED PRIOR TO INSTALLATION OF STEEL



KEY PLAN

STEEL FRAMING SCHEDULE	
MARK	SIZE
SB1	250UC89.5 (GR 300)
SB2	200UC52.2 (GR 300)
SB3	250UC72.9 (GR 300)
SB4	200UC46.2 (GR 300)
SC	310UC158 (GR 300)

SHORING WALL SW1

DENOTES SOIL FILL

DENOTES MASS CONCRETE FILL

DENOTES ROCK BERM

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CONSTRUCTION SEQUENCE

STRUCTURAL DRAWINGS

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100 50 30 20 10 0

Annexure D: Analysis of P2 and P3 structural element extracted from RAPT software.

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RAPT - Version: 7.1.3.0
Reinforced And Post-Tensioned Concrete Analysis & Design Package
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Licensee
Cadigal Group Engineers Pty Ltd
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22 Market St
SYDNEY
New South Wales 2000
Australia
11531971300824WPN1

Input

General

Design Code	List	Australia - AS3600-2018*SAVED*
Material	List	Australia - Australian Materials - 2018*SAVED*
Reinforcement Type	List	Reinforced
Member Type	List	Beam
Panel Type	List	Internal
Strip Type	List	One way - Nominal Width
Column Stiffness	List	Equivalent Column
Concrete Type	List	Standard Concrete
Concrete - Spanning Members	List	50MPa
Concrete - Columns	List	50MPa
Top Reinforcement Cover	mm	60
Bottom Reinforcement Cover	mm	60
Top Reinforcement Axis Depth Limit	mm	30
Bottom Reinforcement Axis Depth Limit	mm	30
Concrete Unit Weight	kn/m3	25
Self Weight Definition	List	Program Calculated
Pattern Live Load	Y/N	
Earthquake Design	List	None
Moment Redistribution	%	0
Design Surface Levels	List	Extreme Surfaces

Span

Span	Span Length	Slab Depth	Panel Width Left	Panel Width Right
	mm	mm	mm	mm
LE	0			
1	1000	200	1000	1000
RE	0			

Columns

Column	Column Grid Reference	Support Type	Transverse Column spacing	Transverse prestress (P/A)
	A	List	mm	MPa
1	1	Knife-Edge	1000	
2	2	Knife-Edge	1000	

Beams

Beam Number	Beam Depth	Beam Width at Slab	Beam Width	Effective Flange Width
	mm	mm	mm	mm
1	788	788	788	988

Load Cases

Load Case	Load Type	Load Definition	Live Load Deflection Case	Description
	List	List	Y/N	A
1	Self Weight	Applied Loads		

Load Case	Load Type	Load Definition	Live Load Deflection Case	Description
	List	List	Y/N	A
2	Initial Dead Load	Applied Loads		

1. Self Weight - Line

Load	Left End Reference Column	Left end of load from reference column	Load at left end	Right End reference column	Right end of load from reference column	Load at right end	Description
	#	mm	kN/m	#	mm	kN/m	A
1	1	0	16.58	2	0	16.58	

2. Initial Dead Load - Point

Load	Reference column	Distance to Load from reference column	Load	Load Length	Description
	#	mm	kN	mm	A
1	1	500	840	0	

Load Combinations : Ultimate

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	0	1.5
2	Live Load	0	0.9
3	Dead Load	0	1.35

Load Combinations : Short Term Service

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	1	1

Load Combinations : Permanent Service

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	1	1

Load Combinations : Deflection

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Short Term - Deflection	1	1
2	Permanent - Deflection	1	1
3	Initial - Deflection	1	1

Load Combinations : Transfer Prestress

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Transfer	1	0

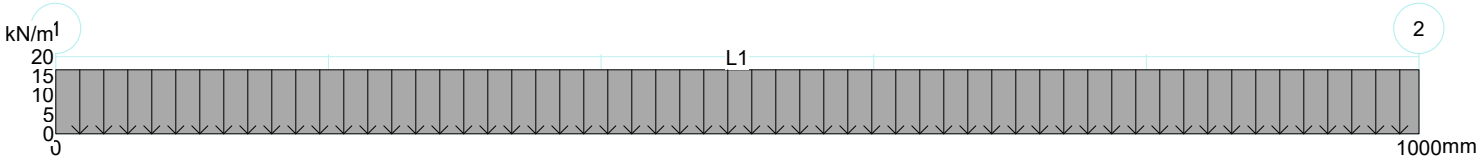
Load Combinations : Pre Existing

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Pre Existing	1	0

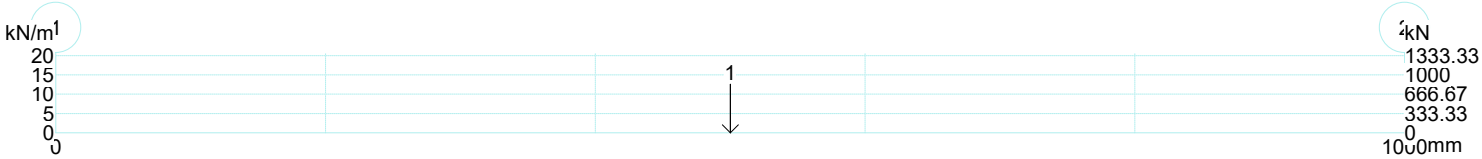
Load Combinations : Construction

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Construction	1	0

Load Case 1 : 1. Self Weight



Load Case 2 : 2. Initial Dead Load



Reinforcement

Reinforcement Use	Reinforcement Type	Preferred Bar Size	Number of Legs
	List	List	#
Flexural Bar	N 500MPa		
Flexural Mesh	F 450MPa		
Shear Option 1	N 500MPa	16	2
Shear Option 2	N 500MPa	16	4
Shear Option 3	N 500MPa	16	6
Punching Shear	N 500MPa	12	1

Reinforcement

	Maximum Bar Spacing	Minimum Bar Spacing	Minimum Continuous Reinforcement	Minimum Span Reinforcement into End Support	Minimum Span Reinforcement into Internal Support	Infill Bars	Stagger Bars
	mm	mm	#.#	#.#	#.#	Y/N	Y/N
Support Reinforcement	300	60	0			N	N
Span Reinforcement	300	60		0	0	N	N

Design Zones

Layer Number	Steel type	Left End Reference Column	Distance to left end of bar	Bar stagger length at left end	Top Cover at left end	Right End Reference Column	Distance to right end of bar	Bar stagger length at right end	Top Cover at Right end	Maximum Bar Size	Minimum Bar Size	Preferred bar size	Minimum Number of Bars	Maximum Spacing of Bars
	List	#	mm	mm	mm	#	mm	mm	mm	List	List	List	#	mm
1	Bar	1	0	0	60	2	0	0	60	36	16	28	0	0

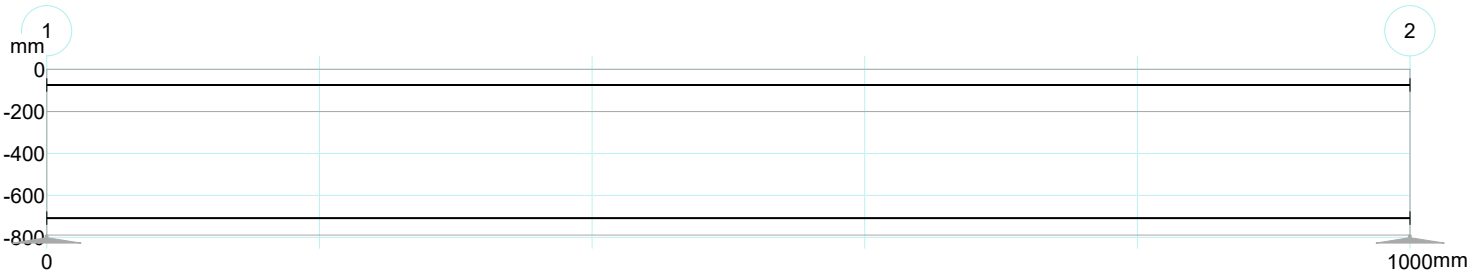
Layer Number	Minimum Steel area as %	% in Flange
	%	%
1	0	0

Design Zones

Layer Number	Steel type	Left End Reference Column	Distance to left end of bar	Bar stagger length at left end	Bottom Cover at left end	Right End Reference Column	Distance to right end of bar	Bar stagger length at right end	Bottom Cover at Right End	Maximum Bar Size	Minimum Bar Size	Preferred bar size	Minimum Number of Bars
	List	#	mm	mm	mm	#	mm	mm	mm	List	List	List	#
1	Bar	1	0	0	60	2	0	0	60	40	32	40	0

Layer Number	Maximum Spacing of Bars	Minimum Steel area as %	Minimum Reinforcement placed at	% in Flange
	mm	%	List	%
1	400	0	Tension Points	0

Reinforcement Design Zones



Design Data

Capacity Reduction factor (phi) for Flexure	#.#	0.85
Capacity Reduction factor (phi) for Shear	#.#	0.7
Capacity Reduction factor (phi) for Shear with transverse reinf	#.#	0.75
Material Factor for Concrete in Flexure	#.#	1
Material Factor for Concrete in Shear	#.#	1
Material Factor for Reinforcement	#.#	1
Maximum Ratio of Neutral Axis Depth for Ductility	#.#	0.4
Ductility Limit - Strain	#.#	0
Ductility Check at Left End Column	Y/N	Y
Ductility Check at Right End Column	Y/N	Y
Minimum Reinforcement Strength Limit - #.## x M*	#.#	0
Flexural Critical Section - Consider Transverse Beams	Y/N	Y
Flexural Critical Section - Distance from centre of Support	#.#	-1
Beam Left Sideface Cover (Internal)	mm	25
Beam Right Sideface cover	mm	40
Prestress Minimum Reinforcement Basis	List	Program Default
Shear Enhancement at Supports	Y/N	N
Ast Value in Shear Calculations	List	Calculated
Limit Reinforcement Strain	Y/N	Y
Include Strain Hardening of Reinforcement	Y/N	N
Beam Shear Critical Section Location	List	Code Critical Section

Maximum Service Stress Change - Prestressed Sections	MPa	0
Maximum Service Stress Change - Reinforced Sections	MPa	0
Relative Humidity	%	50
Average Temperature	C.	20
Prestress Losses Calculations based on	List	Program Default
Crack Width Calculations	List	Code default
AS3600 Shrinkage and Temperature Reinforcement	List	Moderate
Degree of Restraint in Primary Direction	%	0
Degree of Restraint in Secondary Direction	%	0
Concrete Strength Gain Rate	List	N

Concrete Tensile Strength for Deflection Calculations- #.## x (Fc)n	#.#	-1
Maximum Value of Ieff/Igross for Deflection Calculations	#.#	0.6
Total Deflection Warning Limit - Maximum Span/Deflection	#.#	250
Total Deflection Warning Limit - Maximum Deflection	mm	25
Incremental Deflection Warning Limit - Maximum Span/Deflection	#.#	500
Incremental Deflection Warning Limit - Maximum Deflection	mm	25
Initial Time for Shrinkage	List	Full Shrinkage
Time of Loading in days	#.#	10
Age Adjustment Factor	#.#	0.76
Concrete Strength at Time of Loading	MPa	42.25
Loaded Period in years	#.#	30
Tension stiffening Approach	List	Modified Concrete Tensile Modulus Method
Top Surface Shrinkage Factor - General	#.#	1
Bottom Surface Shrinkage Factor - General	#.#	1
Top Surface Shrinkage Factor - Metal Decking	#.#	1.2
Bottom Surface Shrinkage Factor - Metal Decking	#.#	0.2

Live Load Pattern Factor	#.#
Pattern Live Load for Ultimate Strength	Y/N
Pattern Live Load for Crack Control	Y/N
Pattern Live Load For Deflections	Y/N
Pattern Live Load for Deflection Permanent Load Combination	Y/N

Material Properties

Concrete : Standard Concrete : Concrete Strength Basis - Cylinder

Description	A	50MPa
Characteristic Compressive Strength	MPa	50
Mean Compressive Strength	MPa	59.7
Lower Characteristic Tensile Strength	MPa	4.24
Upper Characteristic Tensile Strength	MPa	7.64

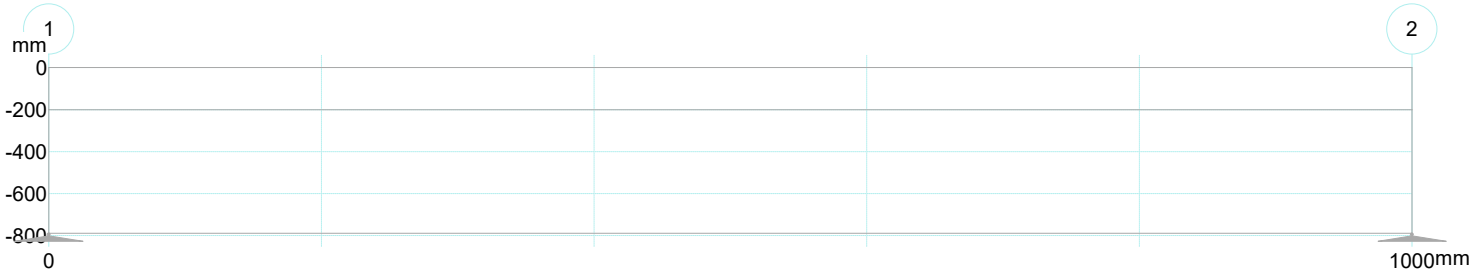
Concrete Density	kg/m3	2447
Design Concrete Modulus	MPa	34013.6
Mean Concrete Modulus	MPa	35820.8
Basic Shrinkage Strain	mm/mm	800
Shrinkage Multiplier	#.#	1
Basic Creep Factor	#.#	2.4
Creep Multiplier	#.#	1
Concrete Strain at Peak Stress	#.#	0.002
Squash Load Factor	#.#	0.9
Concrete Strain Limit	#.#	0.004
Strength Gain Rate	List	Normal
Maximum Aggregate Size	mm	20

Reinforcement Bar

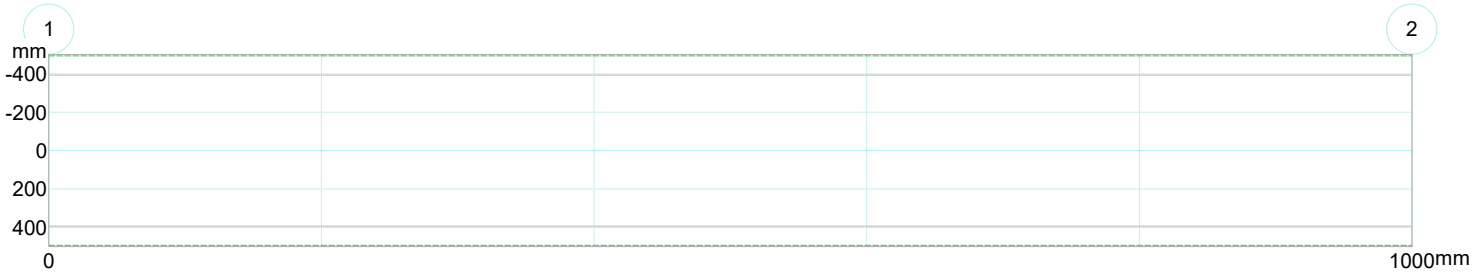
Designation	Type	Yield Stress	Elastic Modulus	Ductility	Peak Strain	Peak Stress	Design Strain Limit	Material Factor Flexure	Material Factor Shear	Material Capacity Reduction Factor - Flexure	Material Capacity Reduction Factor - Shear	Include as Flexural Reinforcement for Shear	Description
N	Deformed	500	2e5	N	0.05	540	90	-1	-1	-1	-1	Y	

Nominal Bar Size	Bar Diameter	Bar Area	Bar Inertia	Bar Weight	Stock Length
A	mm	mm2	mm4	kg/m	mm
10	10	78.5	491.07	0.62	12000
12	12	113	1018.29	0.89	12000
16	16	201	3218.29	1.58	12000
20	20	314	7857.14	2.47	12000
24	24	452	16292.6	3.55	12000
28	28	616	30184	4.83	12000
32	32	804	51492.6	6.31	12000
36	36	1020	82481.1	7.99	12000
40	40	1260	1.257e5	9.86	12000

Elevation view



Plan view



Warnings

Input

Warning:No Live Load Case defined for deflection calculations.

Output

No errors or warnings were found.

Bending Moments

Load Cases

Column Actions

Col No. 1		Self Weight	Initial Dead Load
Moment Above	kNm	-0	-0
Moment Below	kNm	-0	-0
Reaction	kN	8.29	420

Col No. 1		Self Weight	Initial Dead Load
Elastic Rotation	#.#	0	0
Elastic Axial Shortening	mm	0	0

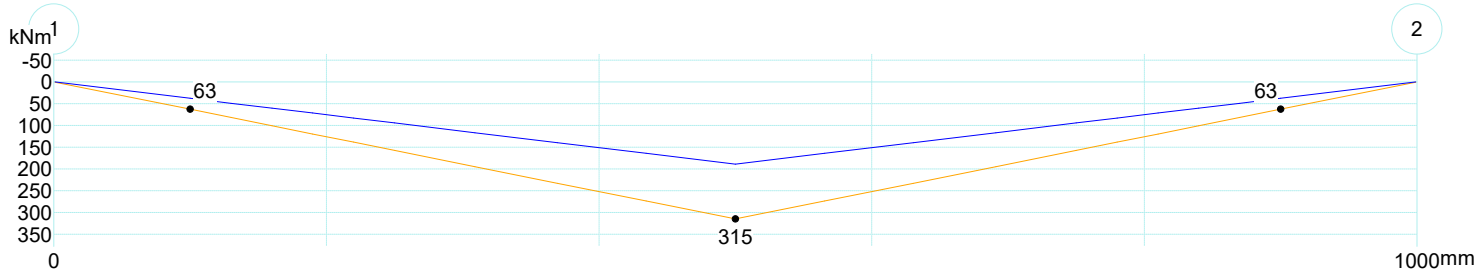
Col No. 2		Self Weight	Initial Dead Load
Moment Above	kNm	-0	-0
Moment Below	kNm	-0	-0
Reaction	kN	8.29	420
Elastic Rotation	#.#	0	0
Elastic Axial Shortening	mm	0	0

Load Combinations
Column Actions

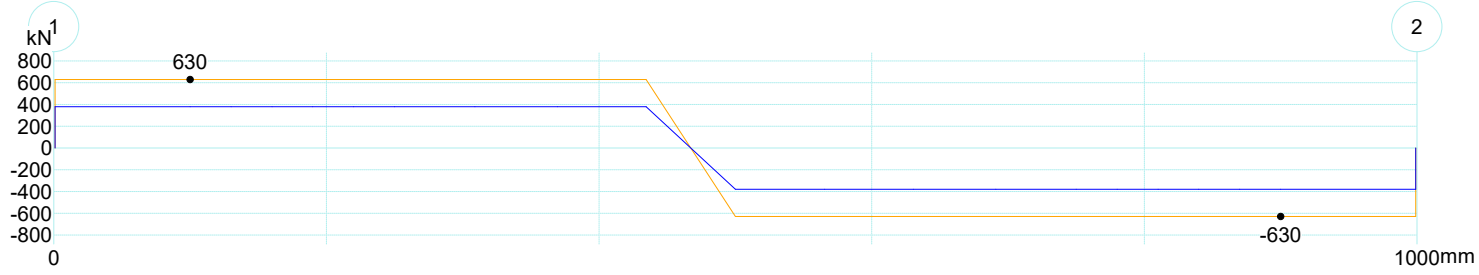
Col No. 1		Characteristic Service	Characteristic Service (Reversal)	Service	Service (Reversal)	Ultimate Flexure	Ultimate Flexure (Reversal)	Ultimate Shear	Ultimate Shear (Reversal)
Moment Above	kNm	0	0	0	0	0	0	0	0
Moment Below	kNm	0	0	0	0	0	0	0	0
Reaction	kN	428.29	428.29	428.29	428.29	630	630	378	630
Elastic Rotation	#.#	0	0	0	0	0	0	0	0
Elastic Axial Shortening	mm	0	0	0	0	0	0	0	0

Col No. 2		Characteristic Service	Characteristic Service (Reversal)	Service	Service (Reversal)	Ultimate Flexure	Ultimate Flexure (Reversal)	Ultimate Shear	Ultimate Shear (Reversal)
Moment Above	kNm	0	0	0	0	0	0	0	0
Moment Below	kNm	0	0	0	0	0	0	0	0
Reaction	kN	428.29	428.29	428.29	428.29	630	630	378	630
Elastic Rotation	#.#	0	0	0	0	0	0	0	0
Elastic Axial Shortening	mm	0	0	0	0	0	0	0	0

Ultimate Design
Flexure

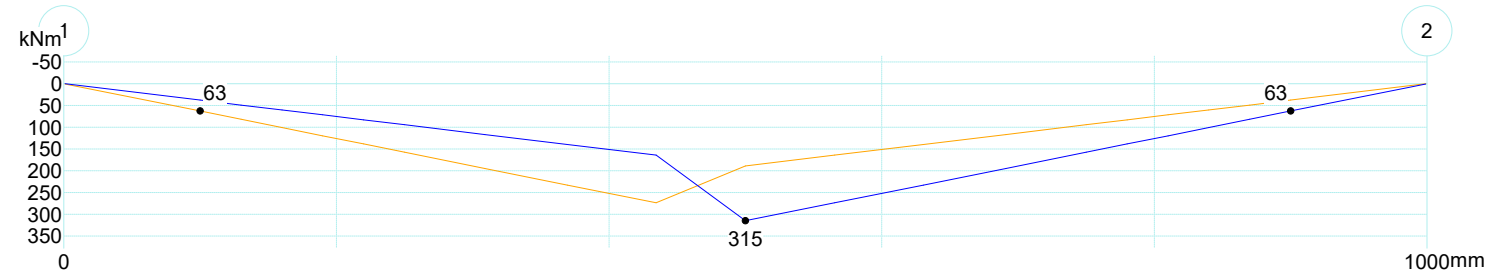


Moment Moment 1 Moment 2

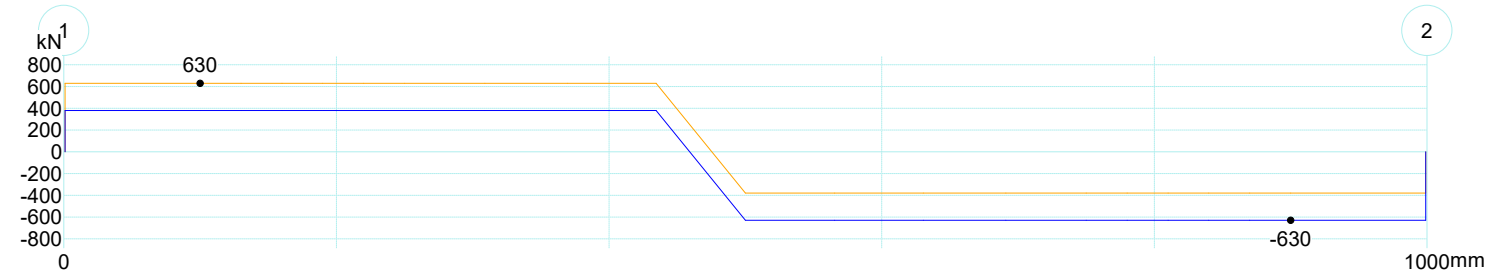


Shear Shear 1 Shear 2

Shear

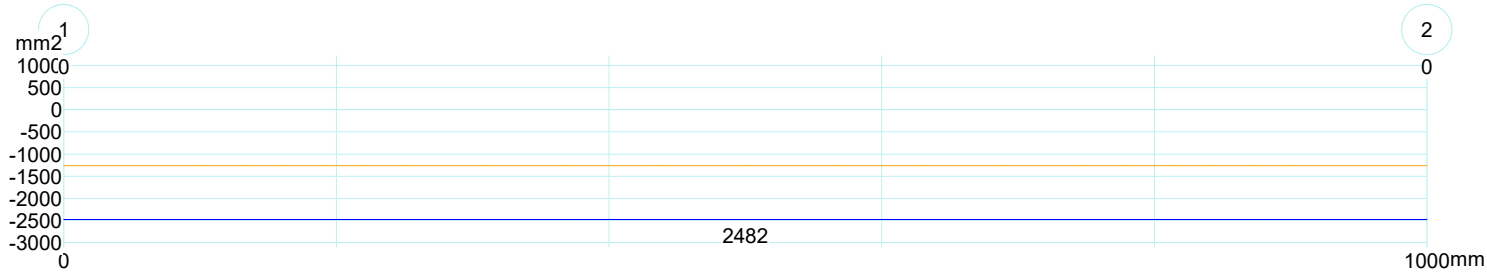


Moment Moment 1 Moment 2

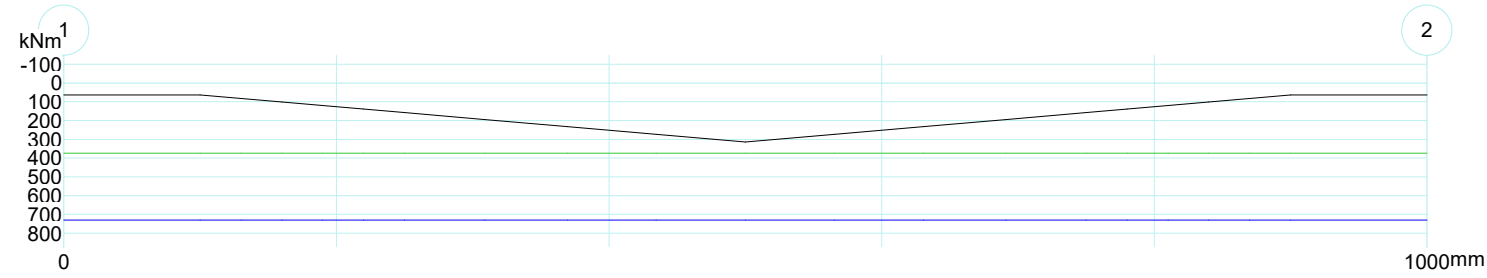


Shear Shear 1 Shear 2

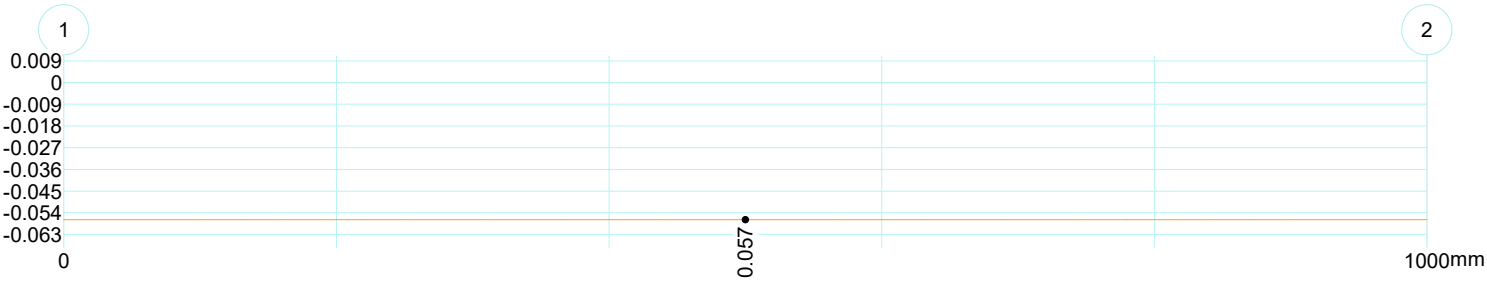
Flexural Design
Ultimate



Reinforcement Top Total Bottom Total Top Ultimate Bottom Ultimate Min Top Min Bot



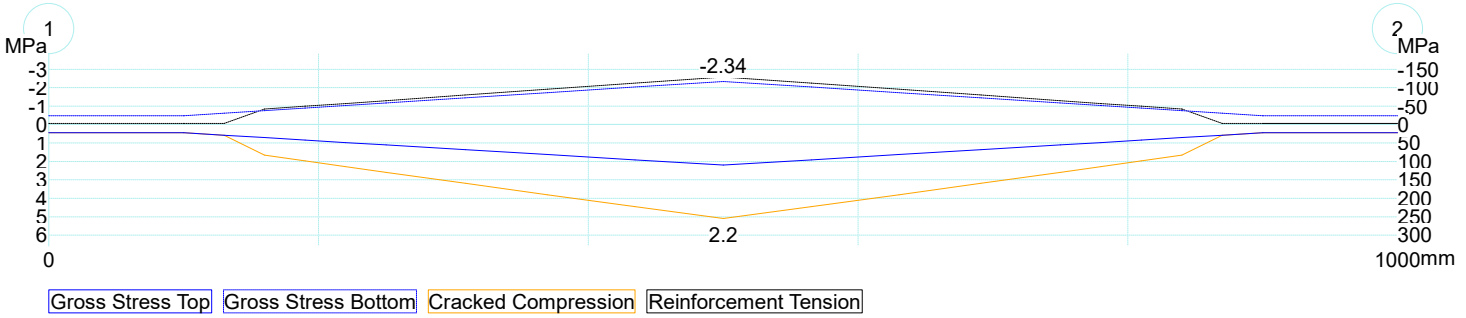
Capacity Minimum Ultimate Design Initial Final



Neutral Axis Depth Initial Final

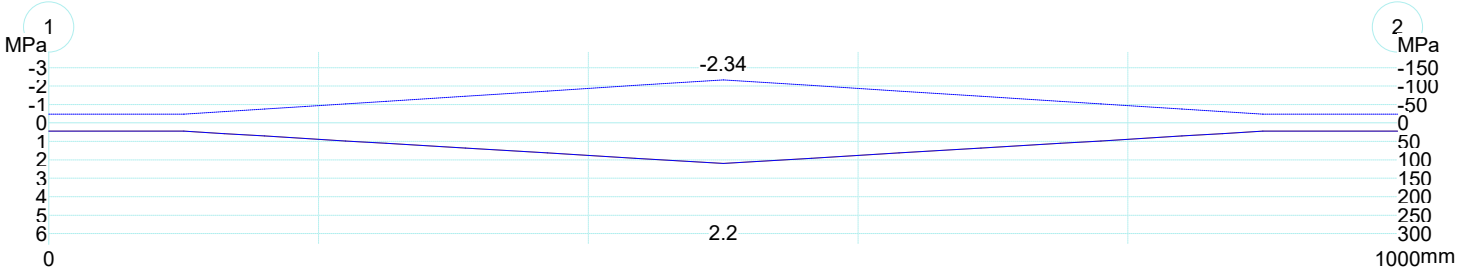
Service

Maximum Moment Condition



Gross Stress Top | Gross Stress Bottom | Cracked Compression | Reinforcement Tension

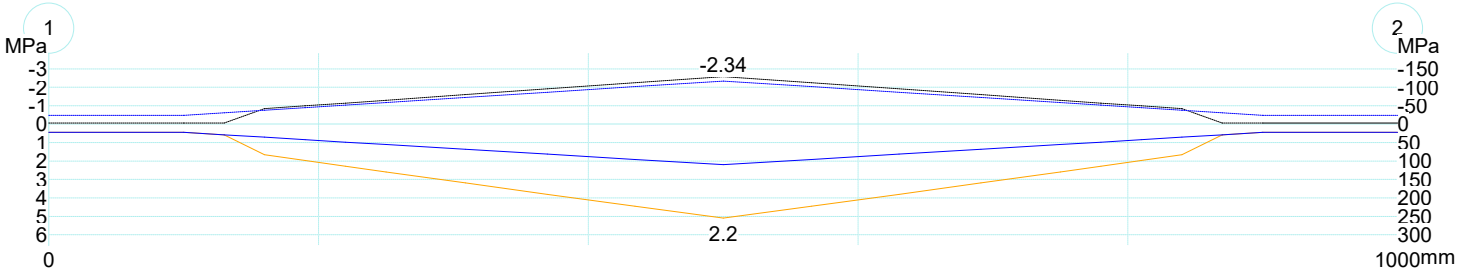
Reversal Moment Condition



Gross Stress Top | Gross Stress Bottom | Cracked Compression | Reinforcement Tension

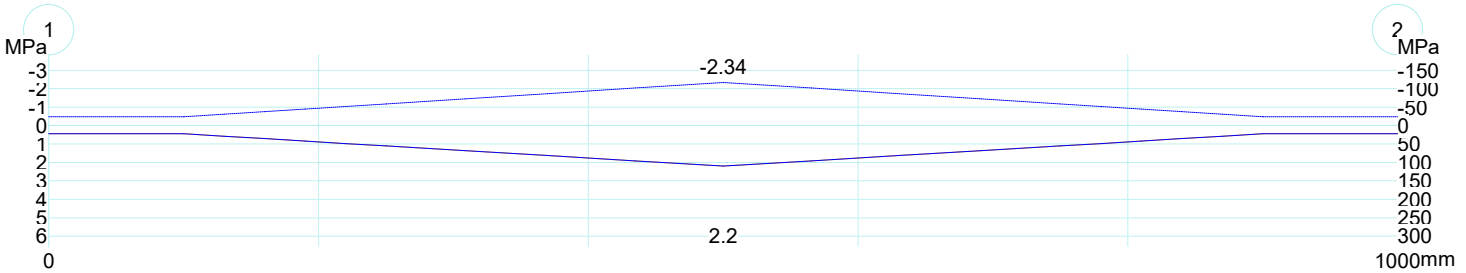
Permanent

Maximum Moment Condition



Gross Stress Top | Gross Stress Bottom | Cracked Compression | Reinforcement Tension

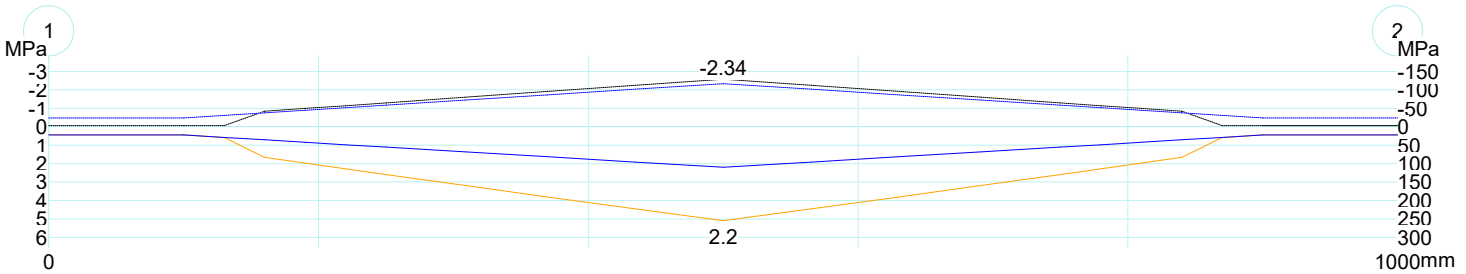
Reversal Moment Condition



Gross Stress Top | Gross Stress Bottom | Cracked Compression | Reinforcement Tension

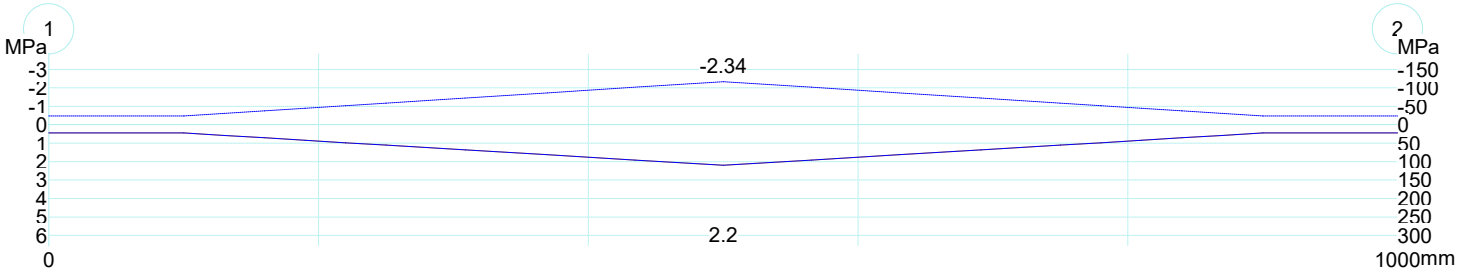
Characteristic Service

Maximum Moment Condition



Gross Stress Top | Gross Stress Bottom | Cracked Compression | Reinforcement Tension

Reversal Moment Condition



Shear Design

Beam

Span 1

Locat	V*	Mv*	Pv	d	Ast	bv	phi Vu	ks phi Vu	Phi Vumax	phi VuMin	phi Vus	Theta	Asv/sSpacing of Sets				
														2 legs N16	4 legs N16	6 legs N16	Min legs N16
mm	kN	kNm	kN	mm	mm2	mm	kN	kN	kN	kN	kN	#.#	mm2/mm	mm	mm	mm	mm
100	630	63	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
130	630	81.9	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
160	630	100.8	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
190	630	119.7	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
220	630	138.6	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
250	630	157.5	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
309	630	194.67	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
369.6	630	232.85	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
434.6	630	273.8	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
500	-630	315	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
565.4	-630	273.8	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
630.4	-630	232.85	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
691	-630	194.67	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
750	-630	157.5	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
780	-630	138.6	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
810	-630	119.7	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
840	-630	100.8	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
870	-630	81.9	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500
900	-630	63	0	637.2	2482.2	788	284.16	0	4216.04	640.65	263.16	37.8832	0.89	450.9	500	500	500

Minimum Legs	Shear Comments
#	A
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel

Punching

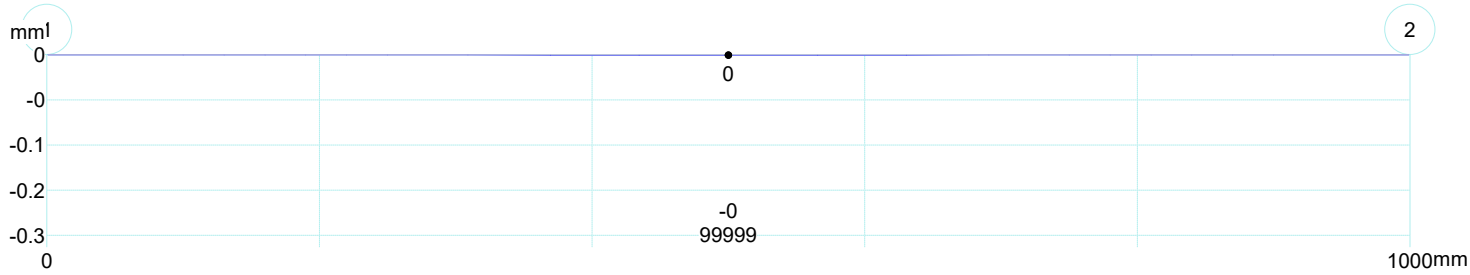
Column Head Critical Section

Column No.	Bh	a	at	u	d	fcv	P/A	Asw/s min	V*	Mv*	phi Vuo	phi Vu	phi VuMin	phi Vumax	side beam	Moment Transfer	Asw/s reqd	result
A	#.#	mm	mm	mm	mm	MPa	MPa	mm2/mm	kN	kNm	kN	kN	kN	kN	A	A	mm2/mm	A
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	Check Not Carried Out!
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	Check Not Carried Out!

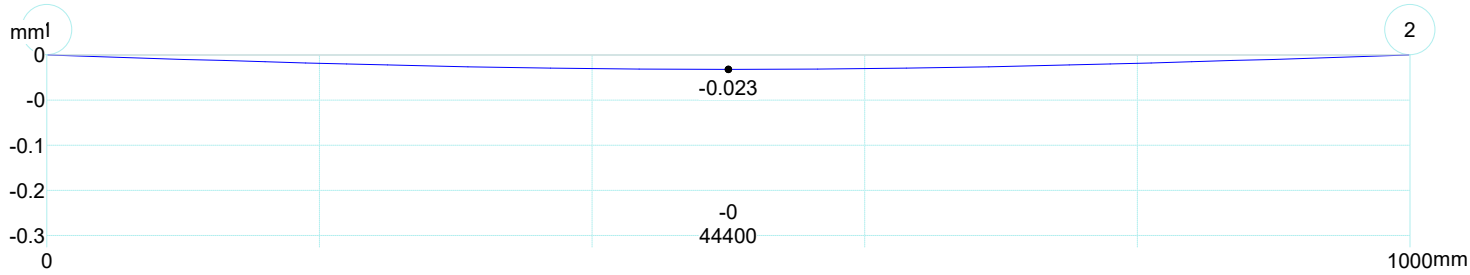
Deflections

All Spans Loaded

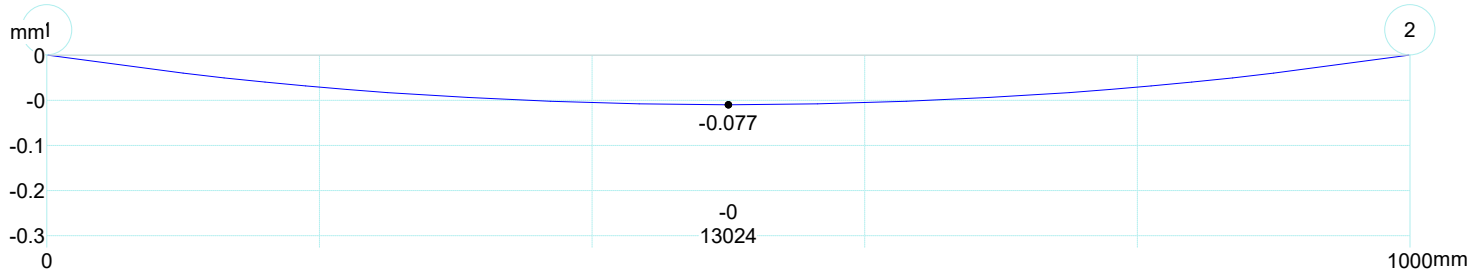
Transfer



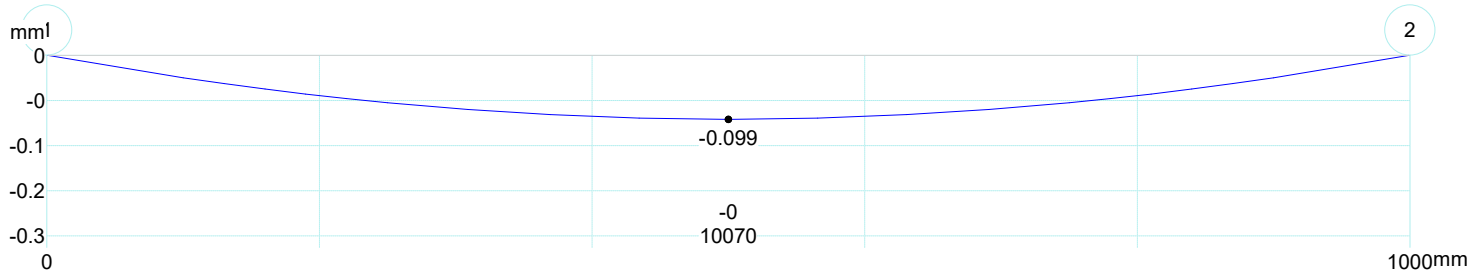
Short Term



Incremental



Total Long Term



Detailed Reinforcement

Span 1

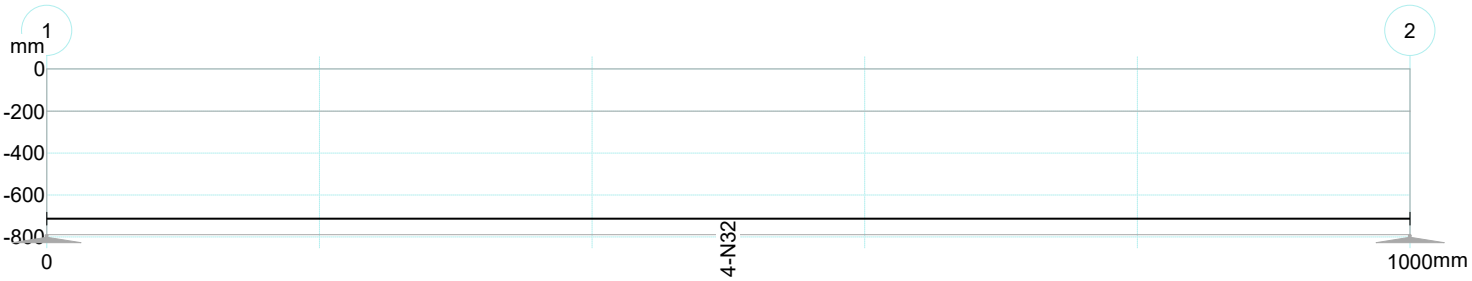
	Top Reinforcement						Bottom Reinforcement					
Locat	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd
mm	mm	mm	mm2	mm	mm	A	mm	mm	mm2	mm	mm	A
100	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
130	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
160	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
190	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
220	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
250	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
309	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
369.6	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
434.6	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
500	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
565.4	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
630.4	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
691	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
750	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
780	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
810	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
840	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
870	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7

	Top Reinforcement						Bottom Reinforcement					
Locat	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd
mm	mm	mm	mm2	mm	mm	A	mm	mm	mm2	mm	mm	A
900	0	0	0	74	988	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7

Shear Reinforcement						
	Spacing of Sets					
Area	2 legs N16	4 legs N16	6 legs N16	Min legs N16	Minimum Legs	Shear Comments
mm2/mm	mm	mm	mm	mm	#	A
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel

Design Comments:-
- - Span 1 - Required Bar Size is smaller than the Preferred Bar Size. Maintaining the same cover will require slightly less reinforcement than calculated.
- Span - 1 - Reinforcement added at left span contraflexure point for Offset of Bending Moment Diagram for Shear - 1070.01mm2
- Span - 1 - Reinforcement added at right span contraflexure point for Offset of Bending Moment Diagram for Shear - 1070.01mm2

Reinforcement Layout



- - Span 1 - Required Bar Size is smaller than the Preferred Bar Size. Maintaining the same cover will require slightly less reinforcement than calculated.
Design Comments:-
- Span - 1 - Reinforcement added at left span contraflexure point for Offset of Bending Moment Diagram for Shear - 1070.01mm2
- Span - 1 - Reinforcement added at right span contraflexure point for Offset of Bending Moment Diagram for Shear - 1070.01mm2

C:\Users\Sasi Parameswaran\OneDrive - Cadigal Group\D1\Cadigal Group\Cadigalgroup-SL - Cadigalgroup-SL\01-100084_ Wilson Street Chatswood\03_Calculations\11_Soldier pile design\XS2\900 DIA_Sec2.rpf

RAPT - Version: 7.1.3.0
Reinforced And Post-Tensioned Concrete Analysis & Design Package
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Licensee
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1002
22 Market St
SYDNEY
New South Wales 2000
Australia
11531971300824WPN1

Input

General

Design Code	List	Australia - AS3600-2018*SAVED*
Material	List	Australia - Australian Materials - 2018*SAVED*
Reinforcement Type	List	Reinforced
Member Type	List	Beam
Panel Type	List	Internal
Strip Type	List	One way - Nominal Width
Column Stiffness	List	Equivalent Column
Concrete Type	List	Standard Concrete
Concrete - Spanning Members	List	50MPa
Concrete - Columns	List	50MPa
Top Reinforcement Cover	mm	60
Bottom Reinforcement Cover	mm	60
Top Reinforcement Axis Depth Limit	mm	30
Bottom Reinforcement Axis Depth Limit	mm	30
Concrete Unit Weight	kn/m3	25
Self Weight Definition	List	Program Calculated
Pattern Live Load	Y/N	
Earthquake Design	List	None
Moment Redistribution	%	0
Design Surface Levels	List	Extreme Surfaces

Span

Span	Span Length	Slab Depth	Panel Width Left	Panel Width Right
	mm	mm	mm	mm
LE	0			
1	650	200	1000	1000
RE	0			

Columns

Column	Column Grid Reference	Support Type	Transverse Column spacing	Transverse prestress (P/A)
	A	List	mm	MPa
1	1	Knife-Edge	1000	
2	2	Knife-Edge	1000	

Beams

Beam Number	Beam Depth	Beam Width at Slab	Beam Width	Effective Flange Width
	mm	mm	mm	mm
1	788	788	788	918

Load Cases

Load Case	Load Type	Load Definition	Live Load Deflection Case	Description
	List	List	Y/N	A
1	Self Weight	Applied Loads		

Load Case	Load Type	Load Definition	Live Load Deflection Case	Description
	List	List	Y/N	A
2	Initial Dead Load	Applied Loads		

1. Self Weight - Line

Load	Left End Reference Column	Left end of load from reference column	Load at left end	Right End reference column	Right end of load from reference column	Load at right end	Description
	#	mm	kN/m	#	mm	kN/m	A
1	1	0	16.58	2	0	16.58	

2. Initial Dead Load - Point

Load	Reference column	Distance to Load from reference column	Load	Load Length	Description
	#	mm	kN	mm	A
1	1	375	740	0	

Load Combinations : Ultimate

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	0	1.5
2	Live Load	0	0.9
3	Dead Load	0	1.35

Load Combinations : Short Term Service

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	1	1

Load Combinations : Permanent Service

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	1	1

Load Combinations : Deflection

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Short Term - Deflection	1	1
2	Permanent - Deflection	1	1
3	Initial - Deflection	1	1

Load Combinations : Transfer Prestress

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Transfer	1	0

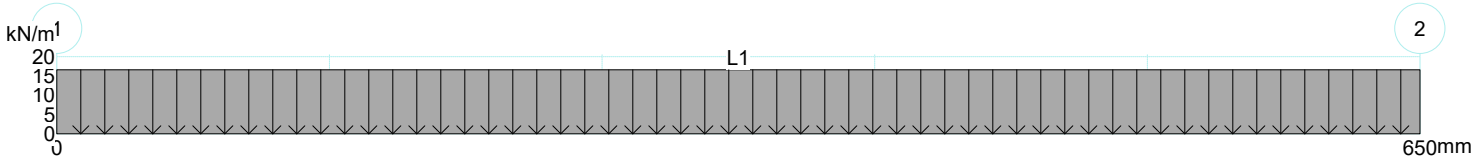
Load Combinations : Pre Existing

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Pre Existing	1	0

Load Combinations : Construction

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Construction	1	0

Load Case 1 : 1. Self Weight



Load Case 2 : 2. Initial Dead Load



Reinforcement

Reinforcement Use	Reinforcement Type	Preferred Bar Size	Number of Legs
	List	List	#
Flexural Bar	N 500MPa		
Flexural Mesh	F 450MPa		
Shear Option 1	N 500MPa	16	2
Shear Option 2	N 500MPa	16	4
Shear Option 3	N 500MPa	16	6
Punching Shear	N 500MPa	12	1

Reinforcement

	Maximum Bar Spacing	Minimum Bar Spacing	Minimum Continuous Reinforcement	Minimum Span Reinforcement into End Support	Minimum Span Reinforcement into Internal Support	Infill Bars	Stagger Bars
	mm	mm	#.#	#.#	#.#	Y/N	Y/N
Support Reinforcement	300	60	0			N	N
Span Reinforcement	300	60		0	0	N	N

Design Zones

Layer Number	Steel type	Left End Reference Column	Distance to left end of bar	Bar stagger length at left end	Top Cover at left end	Right End Reference Column	Distance to right end of bar	Bar stagger length at right end	Top Cover at Right end	Maximum Bar Size	Minimum Bar Size	Preferred bar size	Minimum Number of Bars	Maximum Spacing of Bars
	List	#	mm	mm	mm	#	mm	mm	mm	List	List	List	#	mm
1	Bar	1	0	0	60	2	0	0	60	36	16	28	0	0

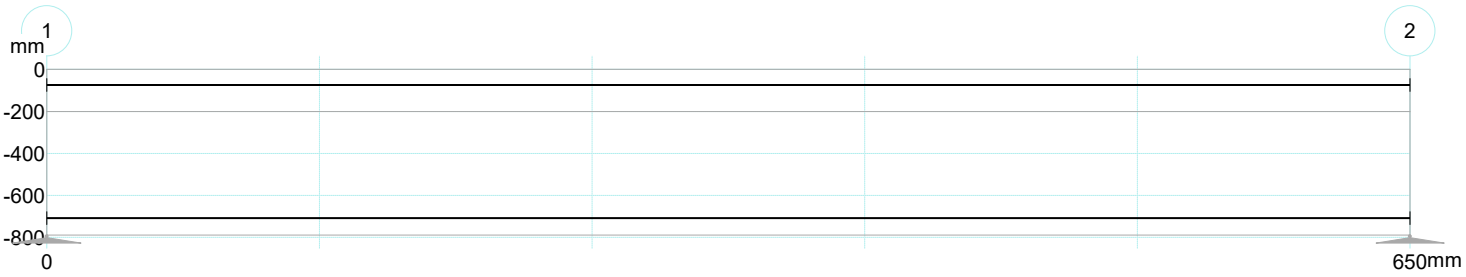
Layer Number	Minimum Steel area as %	% in Flange
	%	%
1	0	0

Design Zones

Layer Number	Steel type	Left End Reference Column	Distance to left end of bar	Bar stagger length at left end	Bottom Cover at left end	Right End Reference Column	Distance to right end of bar	Bar stagger length at right end	Bottom Cover at Right End	Maximum Bar Size	Minimum Bar Size	Preferred bar size	Minimum Number of Bars
	List	#	mm	mm	mm	#	mm	mm	mm	List	List	List	#
1	Bar	1	0	0	60	2	0	0	60	40	32	40	0

Layer Number	Maximum Spacing of Bars	Minimum Steel area as %	Minimum Reinforcement placed at	% in Flange
	mm	%	List	%
1	400	0	Tension Points	0

Reinforcement Design Zones



Design Data

Capacity Reduction factor (phi) for Flexure	#.#	0.85
Capacity Reduction factor (phi) for Shear	#.#	0.7
Capacity Reduction factor (phi) for Shear with transverse reinf	#.#	0.75
Material Factor for Concrete in Flexure	#.#	1
Material Factor for Concrete in Shear	#.#	1
Material Factor for Reinforcement	#.#	1
Maximum Ratio of Neutral Axis Depth for Ductility	#.#	0.4
Ductility Limit - Strain	#.#	0
Ductility Check at Left End Column	Y/N	Y
Ductility Check at Right End Column	Y/N	Y
Minimum Reinforcement Strength Limit - #.## x M*	#.#	0
Flexural Critical Section - Consider Transverse Beams	Y/N	Y
Flexural Critical Section - Distance from centre of Support	#.#	-1
Beam Left Sideface Cover (Internal)	mm	25
Beam Right Sideface cover	mm	40
Prestress Minimum Reinforcement Basis	List	Program Default
Shear Enhancement at Supports	Y/N	N
Ast Value in Shear Calculations	List	Calculated
Limit Reinforcement Strain	Y/N	Y
Include Strain Hardening of Reinforcement	Y/N	N
Beam Shear Critical Section Location	List	Code Critical Section

Maximum Service Stress Change - Prestressed Sections	MPa	0
Maximum Service Stress Change - Reinforced Sections	MPa	0
Relative Humidity	%	50
Average Temperature	C.	20
Prestress Losses Calculations based on	List	Program Default
Crack Width Calculations	List	Code default
AS3600 Shrinkage and Temperature Reinforcement	List	Moderate
Degree of Restraint in Primary Direction	%	0
Degree of Restraint in Secondary Direction	%	0
Concrete Strength Gain Rate	List	N

Concrete Tensile Strength for Deflection Calculations- #.## x (Fc)n	#.#	-1
Maximum Value of Ieff/Igross for Deflection Calculations	#.#	0.6
Total Deflection Warning Limit - Maximum Span/Deflection	#.#	250
Total Deflection Warning Limit - Maximum Deflection	mm	25
Incremental Deflection Warning Limit - Maximum Span/Deflection	#.#	500
Incremental Deflection Warning Limit - Maximum Deflection	mm	25
Initial Time for Shrinkage	List	Full Shrinkage
Time of Loading in days	#.#	10
Age Adjustment Factor	#.#	0.76
Concrete Strength at Time of Loading	MPa	42.25
Loaded Period in years	#.#	30
Tension stiffening Approach	List	Modified Concrete Tensile Modulus Method
Top Surface Shrinkage Factor - General	#.#	1
Bottom Surface Shrinkage Factor - General	#.#	1
Top Surface Shrinkage Factor - Metal Decking	#.#	1.2
Bottom Surface Shrinkage Factor - Metal Decking	#.#	0.2

Live Load Pattern Factor	#.#
Pattern Live Load for Ultimate Strength	Y/N
Pattern Live Load for Crack Control	Y/N
Pattern Live Load For Deflections	Y/N
Pattern Live Load for Deflection Permanent Load Combination	Y/N

Material Properties

Concrete : Standard Concrete : Concrete Strength Basis - Cylinder

Description	A	50MPa
Characteristic Compressive Strength	MPa	50
Mean Compressive Strength	MPa	59.7
Lower Characteristic Tensile Strength	MPa	4.24
Upper Characteristic Tensile Strength	MPa	7.64

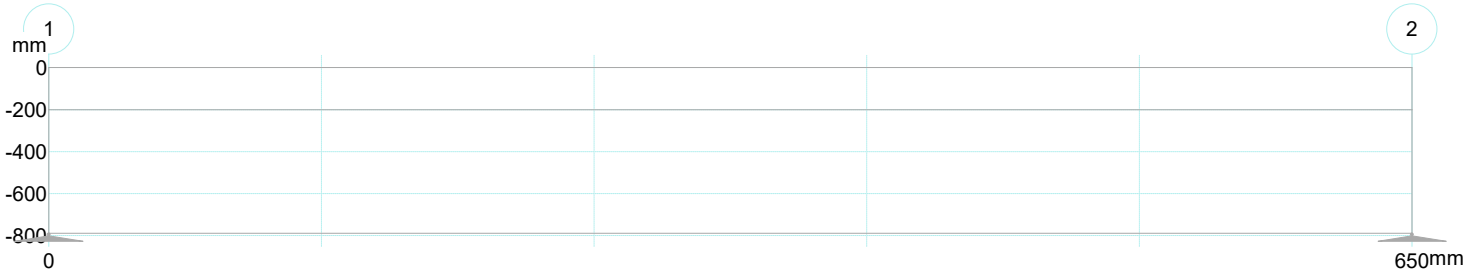
Concrete Density	kg/m3	2447
Design Concrete Modulus	MPa	34013.6
Mean Concrete Modulus	MPa	35820.8
Basic Shrinkage Strain	mm/mm	800
Shrinkage Multiplier	#.#	1
Basic Creep Factor	#.#	2.4
Creep Multiplier	#.#	1
Concrete Strain at Peak Stress	#.#	0.002
Squash Load Factor	#.#	0.9
Concrete Strain Limit	#.#	0.004
Strength Gain Rate	List	Normal
Maximum Aggregate Size	mm	20

Reinforcement Bar

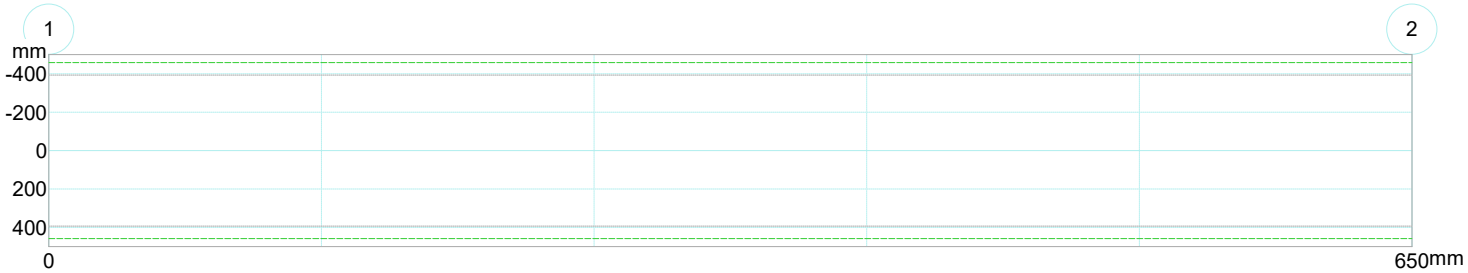
Designation	Type	Yield Stress	Elastic Modulus	Ductility	Peak Strain	Peak Stress	Design Strain Limit	Material Factor Flexure	Material Factor Shear	Material Capacity Reduction Factor - Flexure	Material Capacity Reduction Factor - Shear	Include as Flexural Reinforcement for Shear	Description
N	Deformed	500	2e5	N	0.05	540	90	-1	-1	-1	-1	Y	

Nominal Bar Size	Bar Diameter	Bar Area	Bar Inertia	Bar Weight	Stock Length
A	mm	mm2	mm4	kg/m	mm
10	10	78.5	491.07	0.62	12000
12	12	113	1018.29	0.89	12000
16	16	201	3218.29	1.58	12000
20	20	314	7857.14	2.47	12000
24	24	452	16292.6	3.55	12000
28	28	616	30184	4.83	12000
32	32	804	51492.6	6.31	12000
36	36	1020	82481.1	7.99	12000
40	40	1260	1.257e5	9.86	12000

Elevation view



Plan view



Warnings

Input

Warning:No Live Load Case defined for deflection calculations.

Output

No errors or warnings were found.

Bending Moments

Load Cases

Column Actions

Col No. 1		Self Weight	Initial Dead Load
Moment Above	kNm	-0	-0
Moment Below	kNm	-0	-0

Col No. 1		Self Weight	Initial Dead Load
Reaction	kN	5.39	313.08
Elastic Rotation	#.#	0	0
Elastic Axial Shortening	mm	0	0

Col No. 2		Self Weight	Initial Dead Load
Moment Above	kNm	-0	-0
Moment Below	kNm	-0	-0
Reaction	kN	5.39	426.92
Elastic Rotation	#.#	0	0
Elastic Axial Shortening	mm	0	0

Load Combinations

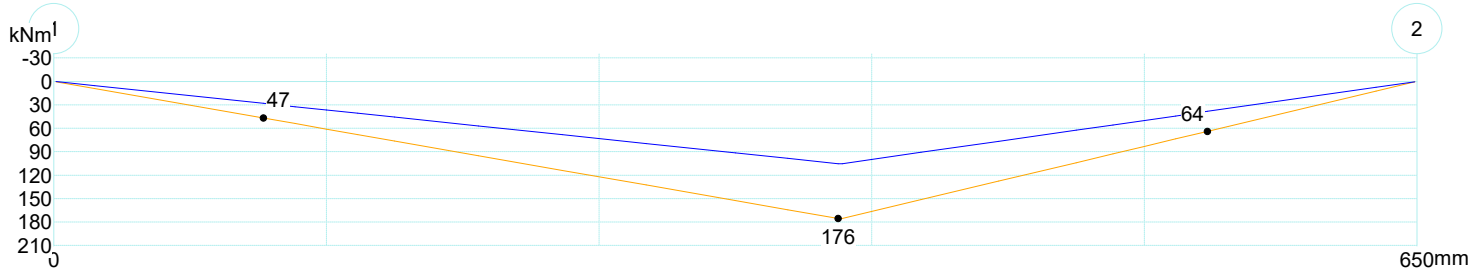
Column Actions

Col No. 1		Characteristic Service	Characteristic Service (Reversal)	Service	Service (Reversal)	Ultimate Flexure	Ultimate Flexure (Reversal)	Ultimate Shear	Ultimate Shear (Reversal)
Moment Above	kNm	0	0	0	0	0	0	0	0
Moment Below	kNm	0	0	0	0	0	0	0	0
Reaction	kN	318.47	318.47	318.47	318.47	469.62	469.62	281.77	469.62
Elastic Rotation	#.#	0	0	0	0	0	0	0	0
Elastic Axial Shortening	mm	0	0	0	0	0	0	0	0

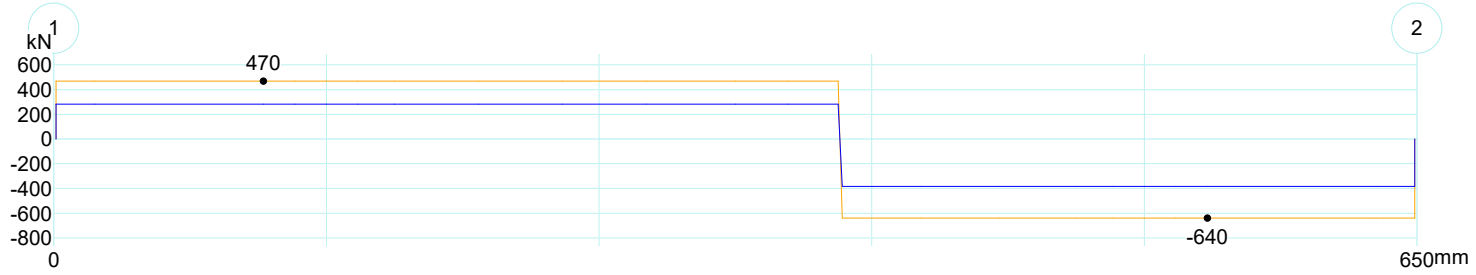
Col No. 2		Characteristic Service	Characteristic Service (Reversal)	Service	Service (Reversal)	Ultimate Flexure	Ultimate Flexure (Reversal)	Ultimate Shear	Ultimate Shear (Reversal)
Moment Above	kNm	0	0	0	0	0	0	0	0
Moment Below	kNm	0	0	0	0	0	0	0	0
Reaction	kN	432.31	432.31	432.31	432.31	640.38	640.38	384.23	640.38
Elastic Rotation	#.#	0	0	0	0	0	0	0	0
Elastic Axial Shortening	mm	0	0	0	0	0	0	0	0

Ultimate Design

Flexure

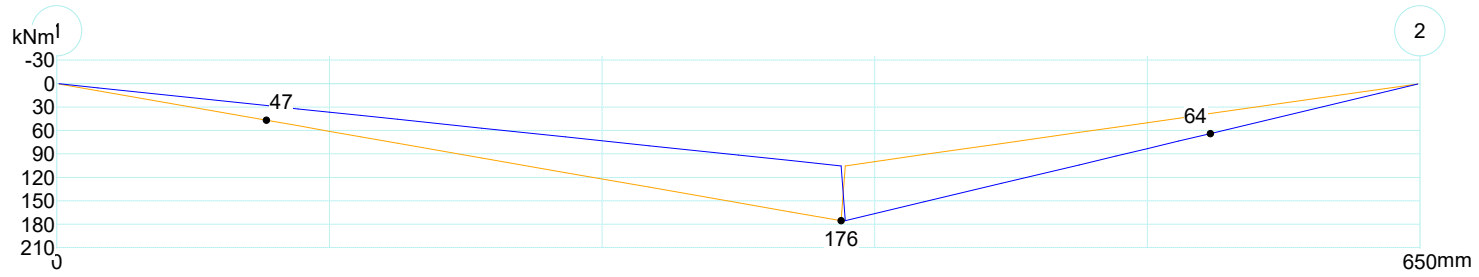


Moment Moment 1 Moment 2

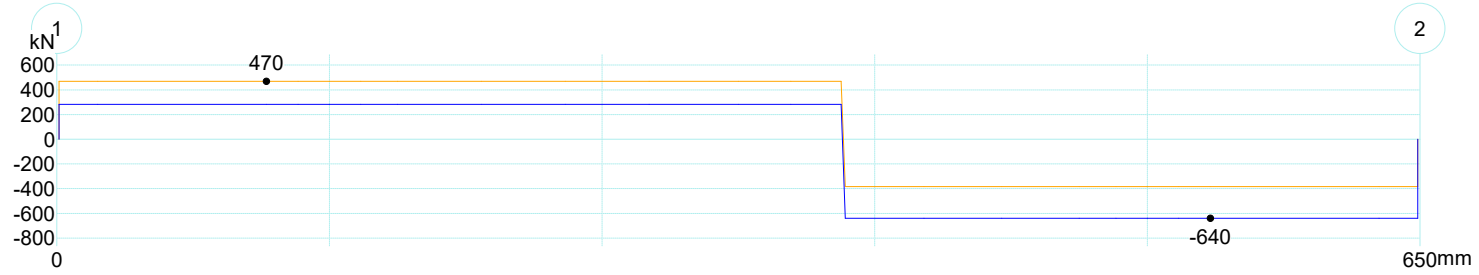


Shear Shear 1 Shear 2

Shear

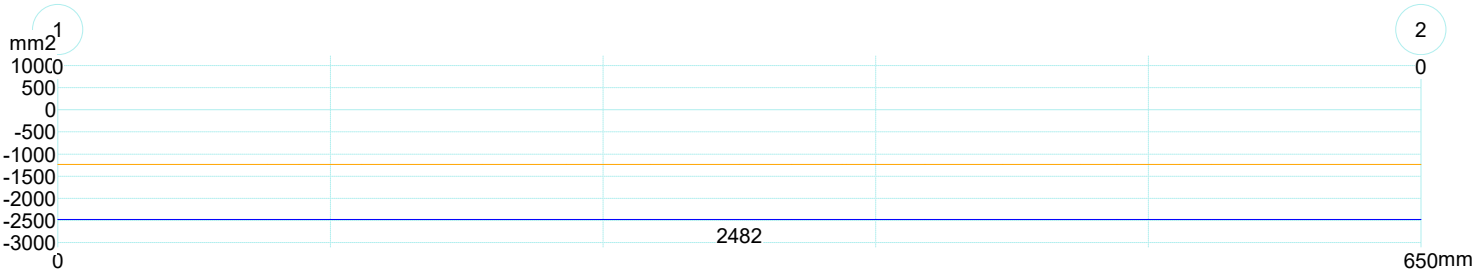


Moment Moment 1 Moment 2

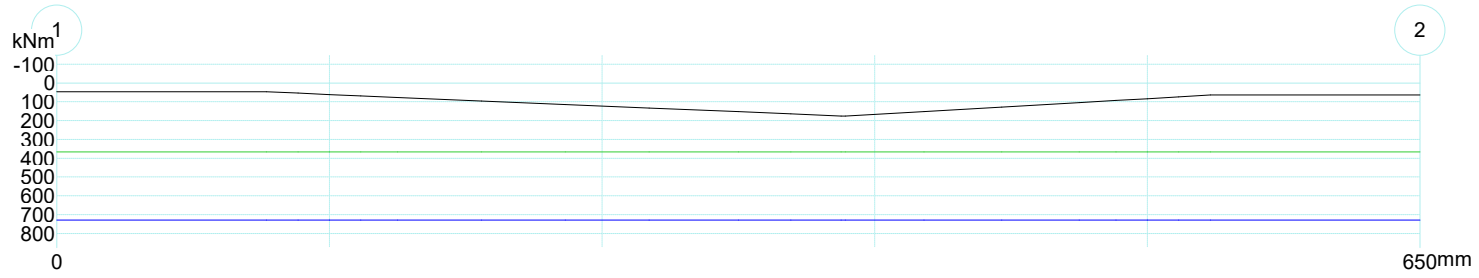


Shear Shear 1 Shear 2

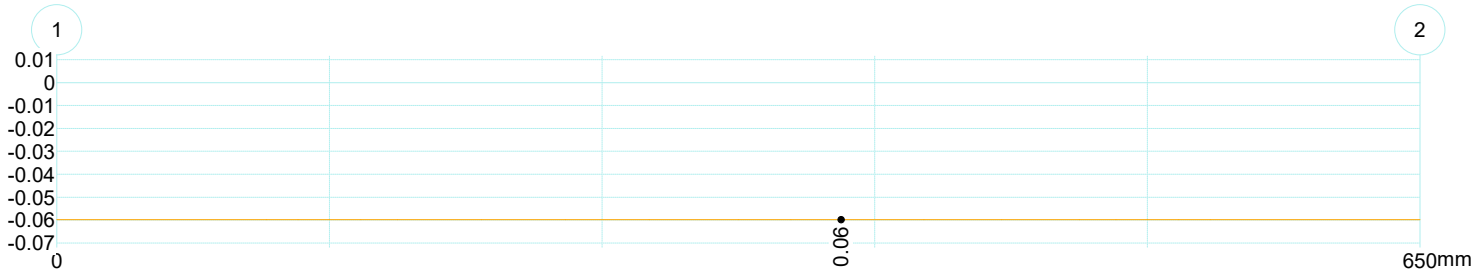
Flexural Design
Ultimate



Reinforcement Top Total Bottom Total Top Ultimate Bottom Ultimate Min Top Min Bot



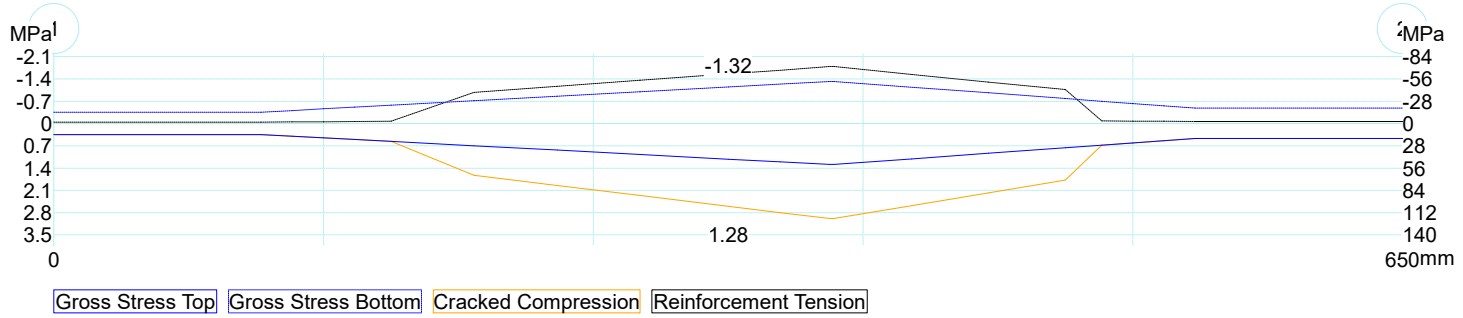
Capacity Minimum Ultimate Design Initial Final



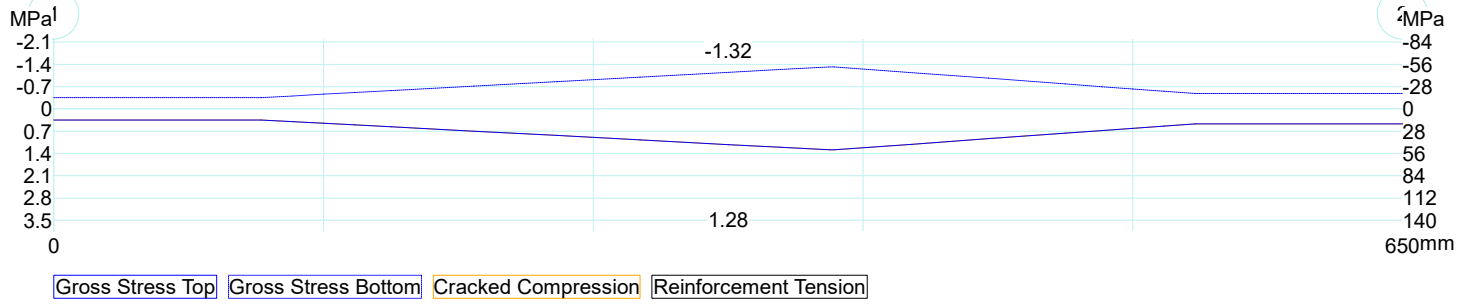
Neutral Axis Depth Initial Final

Service

Maximum Moment Condition

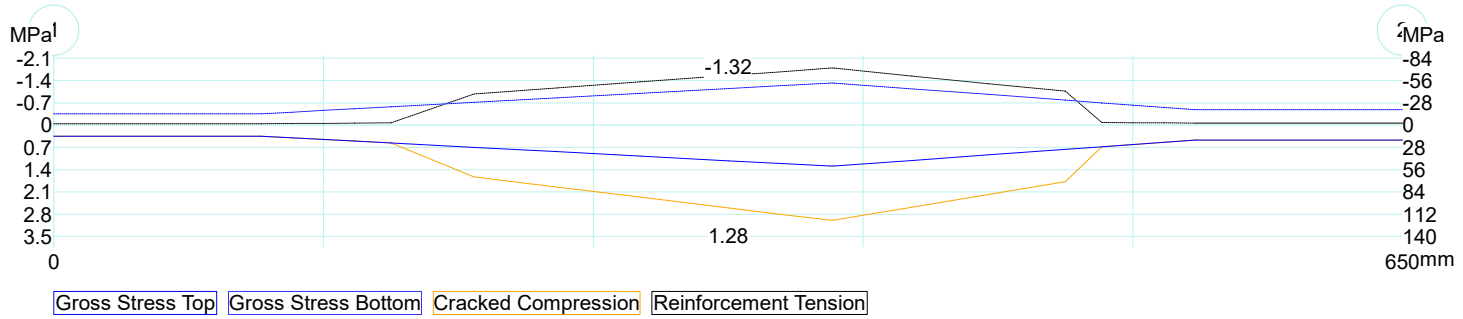


Reversal Moment Condition

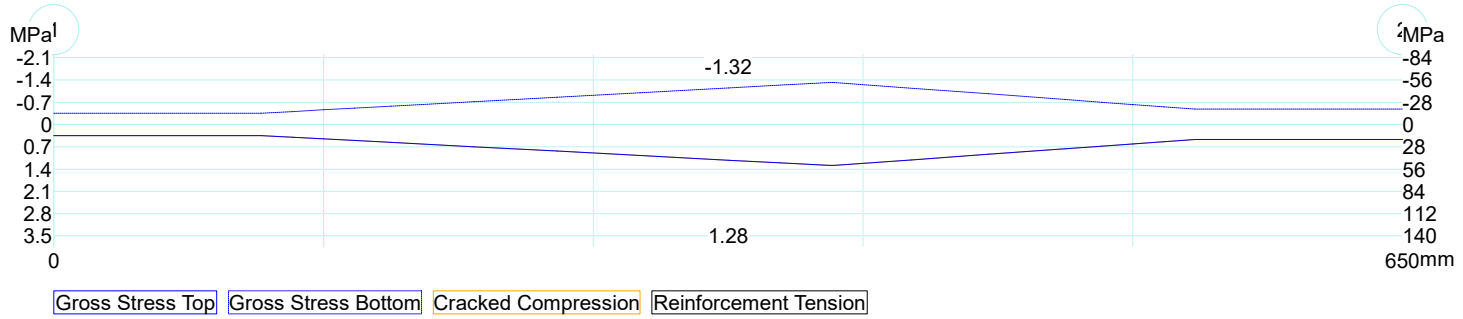


Permanent

Maximum Moment Condition

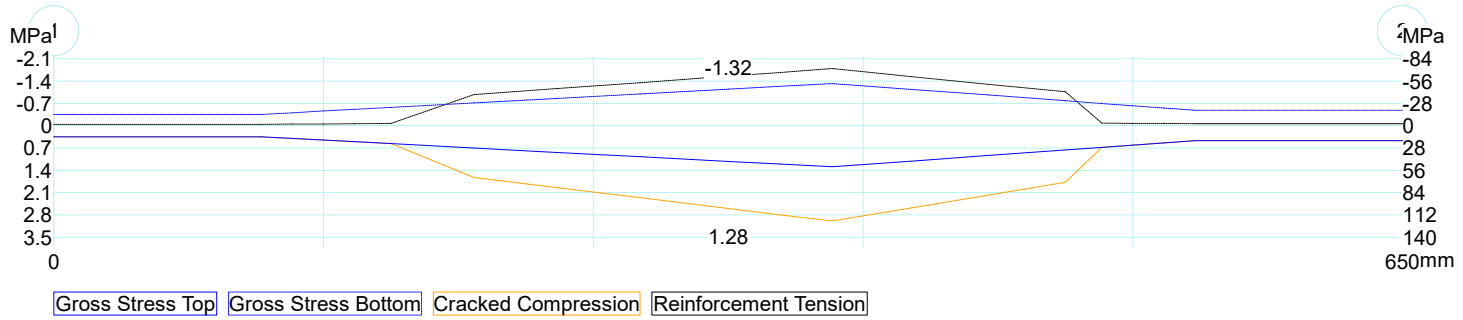


Reversal Moment Condition

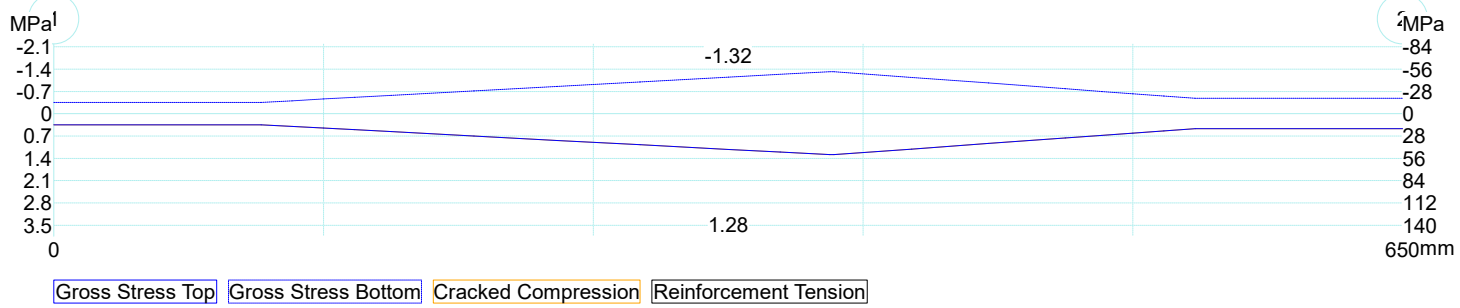


Characteristic Service

Maximum Moment Condition



Reversal Moment Condition



Shear Design

Beam

Span 1

Locat	V*	Mv*	Pv	d	Ast	bv	phi Vu	ks phi Vu	Phi Vumax	phi VuMin	phi Vus	Theta	Asv/sSpacing of Sets				
														2 legs N16	4 legs N16	6 legs N16	Min legs N16
mm	kN	kNm	kN	mm	mm2	mm	kN	kN	kN	kN	kN	#.#	mm2/mm	mm	mm	mm	mm
100	469.62	46.96	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
115	469.62	54.01	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
130	469.62	61.05	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
145	469.62	68.09	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
162.5	469.62	76.31	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
202.5	469.62	95.1	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
242.5	469.62	113.88	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
282.5	469.62	132.67	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
325	469.62	152.62	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
350	469.62	164.37	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
374	469.62	175.64	0	637.2	2482.2	788	341.08	0	4118.57	737.65	29.28	35.6218	0.89	450.9	500	500	500
376	-640.38	175.47	0	637.2	2482.2	788	281.12	0	4221.45	635.29	277.47	38.0297	0.91	300	300	300	300
413.5	-640.38	151.45	0	637.2	2482.2	788	281.12	0	4221.45	635.29	277.47	38.0297	0.91	300	300	300	300
450.5	-640.38	127.76	0	637.2	2482.2	788	281.12	0	4221.45	635.29	277.47	38.0297	0.91	300	300	300	300
487.5	-640.38	104.06	0	637.2	2482.2	788	281.12	0	4221.45	635.29	277.47	38.0297	0.91	300	300	300	300
505	-640.38	92.86	0	637.2	2482.2	788	281.12	0	4221.45	635.29	277.47	38.0297	0.91	300	300	300	300
520	-640.38	83.25	0	637.2	2482.2	788	281.12	0	4221.45	635.29	277.47	38.0297	0.91	300	300	300	300
535	-640.38	73.64	0	637.2	2482.2	788	281.12	0	4221.45	635.29	277.47	38.0297	0.91	300	300	300	300
550	-640.38	64.04	0	637.2	2482.2	788	281.12	0	4221.45	635.29	277.47	38.0297	0.91	300	300	300	300

Minimum Legs	Shear Comments
#	A
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	Minimum Steel
3	
3	
3	
3	
3	
3	
3	
3	

Punching

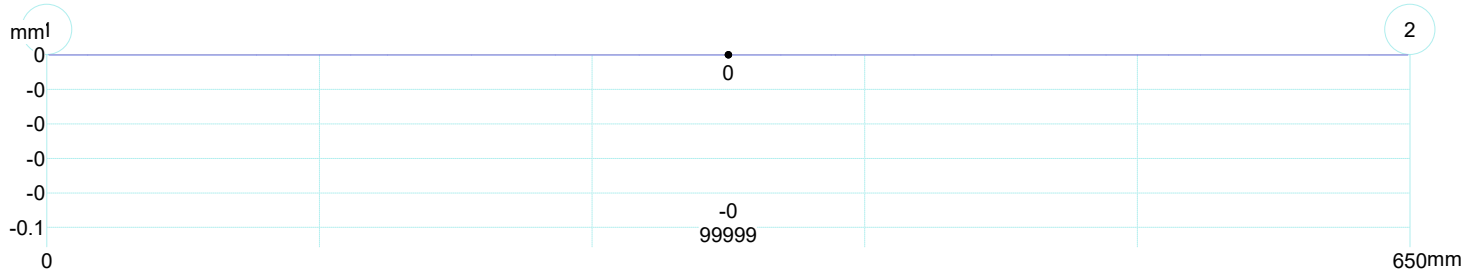
Column Head Critical Section

Column No.	Bh	a	at	u	d	fcv	P/A	Asw/s min	V*	Mv*	phi Vuo	phi Vu	phi VuMin	phi Vumax	side beam	Moment Transfer	Asw/s reqd	result
A	#.#	mm	mm	mm	mm	MPa	MPa	mm2/mm	kN	kNm	kN	kN	kN	kN	A	A	mm2/mm	A
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	Check Not Carried Out!
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	Check Not Carried Out!

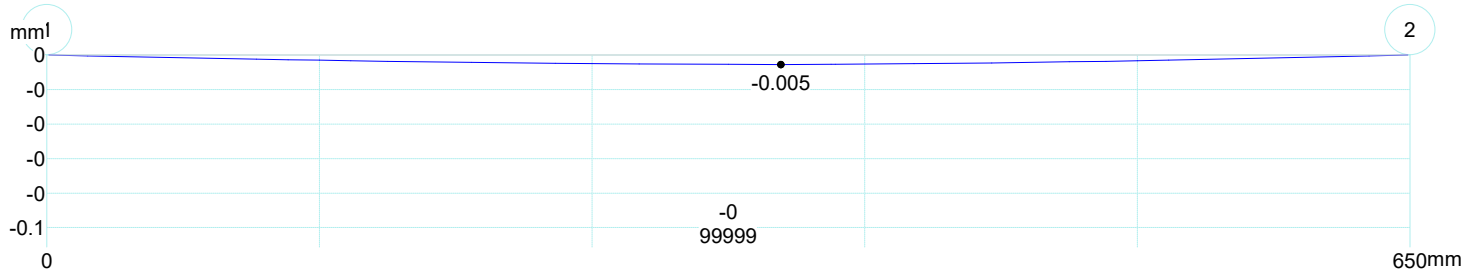
Deflections

All Spans Loaded

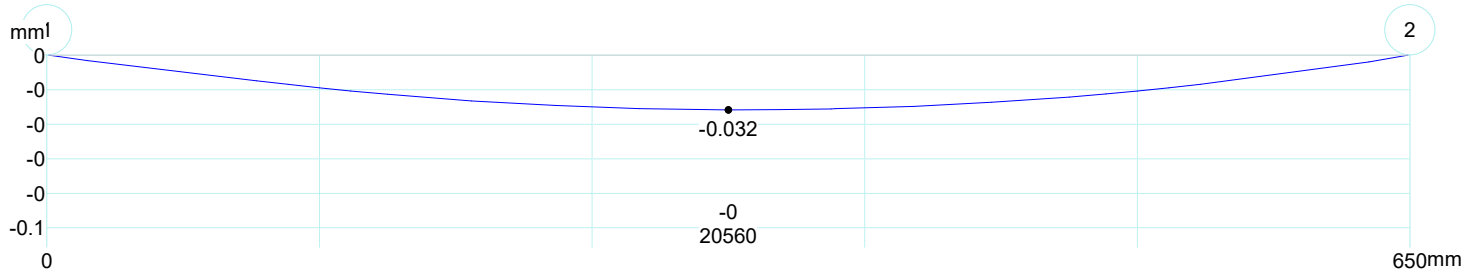
Transfer



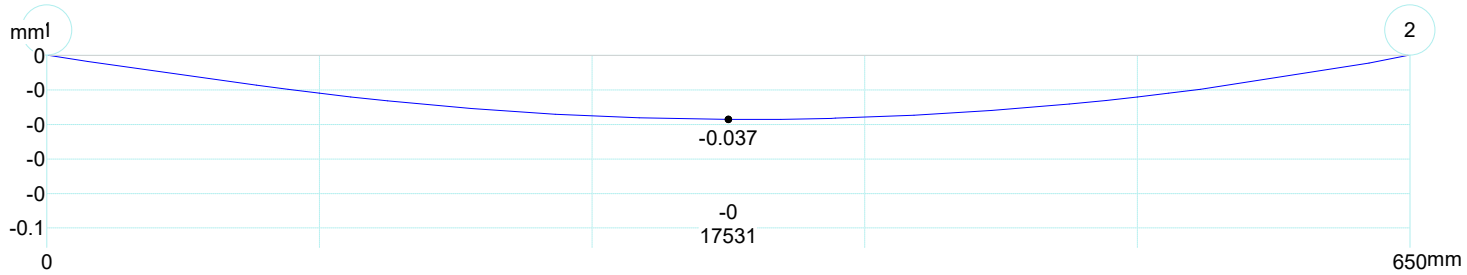
Short Term



Incremental



Total Long Term



Detailed Reinforcement

Span 1

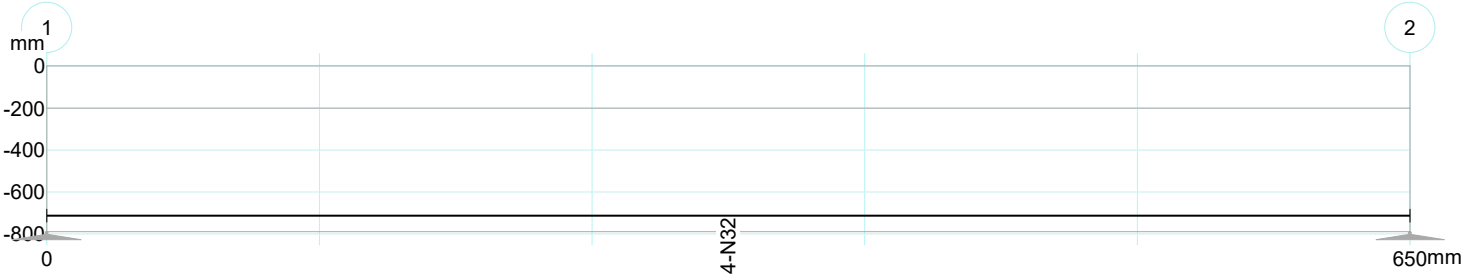
	Top Reinforcement						Bottom Reinforcement					
Locat	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd
mm	mm	mm	mm2	mm	mm	A	mm	mm	mm2	mm	mm	A
100	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
115	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
130	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
145	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
162.5	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
202.5	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
242.5	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
282.5	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
325	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
350	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
374	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
376	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
413.5	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
450.5	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
487.5	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
505	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
520	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
535	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7

	Top Reinforcement						Bottom Reinforcement					
Locat	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd
mm	mm	mm	mm2	mm	mm	A	mm	mm	mm2	mm	mm	A
550	0	0	0	74	918	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7

Shear Reinforcement						
	Spacing of Sets					
Area	2 legs N16	4 legs N16	6 legs N16	Min legs N16	Minimum Legs	Shear Comments
mm2/mm	mm	mm	mm	mm	#	A
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.89	450.9	500	500	500	3	Minimum Steel
0.91	300	300	300	300	3	
0.91	300	300	300	300	3	
0.91	300	300	300	300	3	
0.91	300	300	300	300	3	
0.91	300	300	300	300	3	
0.91	300	300	300	300	3	
0.91	300	300	300	300	3	
0.91	300	300	300	300	3	

Design Comments:-
- - Span 1 - Required Bar Size is smaller than the Preferred Bar Size. Maintaining the same cover will require slightly less reinforcement than calculated.
- Span - 1 - Reinforcement added at left span contraflexure point for Offset of Bending Moment Diagram for Shear - 597.44mm2
- Span - 1 - Reinforcement added at right span contraflexure point for Offset of Bending Moment Diagram for Shear - 597.44mm2

Reinforcement Layout



- - Span 1 - Required Bar Size is smaller than the Preferred Bar Size. Maintaining the same cover will require slightly less reinforcement than calculated.
Design Comments:-
- Span - 1 - Reinforcement added at left span contraflexure point for Offset of Bending Moment Diagram for Shear - 597.44mm2
- Span - 1 - Reinforcement added at right span contraflexure point for Offset of Bending Moment Diagram for Shear - 597.44mm2

C:\Users\Sasi Parameswaran\OneDrive - Cadigal Group\D1\Cadigal Group\Cadigalgroup-SL - Cadigalgroup-SL\01-100084_ Wilson Street Chatswood\03_Calculations\11_Soldier pile design\XS2\900 DIA_Sec3.rpf

RAPT - Version: 7.1.3.0
Reinforced And Post-Tensioned Concrete Analysis & Design Package
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Licensee
Cadigal Group Engineers Pty Ltd
1002
22 Market St
SYDNEY
New South Wales 2000
Australia
11531971300824WPN1

Input

General

Design Code	List	Australia - AS3600-2018*SAVED*
Material	List	Australia - Australian Materials - 2018*SAVED*
Reinforcement Type	List	Reinforced
Member Type	List	Beam
Panel Type	List	Internal
Strip Type	List	One way - Nominal Width
Column Stiffness	List	Equivalent Column
Concrete Type	List	Standard Concrete
Concrete - Spanning Members	List	50MPa
Concrete - Columns	List	50MPa
Top Reinforcement Cover	mm	60
Bottom Reinforcement Cover	mm	60
Top Reinforcement Axis Depth Limit	mm	30
Bottom Reinforcement Axis Depth Limit	mm	30
Concrete Unit Weight	kn/m3	25
Self Weight Definition	List	Program Calculated
Pattern Live Load	Y/N	
Earthquake Design	List	None
Moment Redistribution	%	0
Design Surface Levels	List	Extreme Surfaces

Span

Span	Span Length	Slab Depth	Panel Width Left	Panel Width Right
	mm	mm	mm	mm
LE	0			
1	780	200	1000	1000
RE	0			

Columns

Column	Column Grid Reference	Support Type	Transverse Column spacing	Transverse prestress (P/A)
	A	List	mm	MPa
1	1	Knife-Edge	1000	
2	2	Knife-Edge	1000	

Beams

Beam Number	Beam Depth	Beam Width at Slab	Beam Width	Effective Flange Width
	mm	mm	mm	mm
1	788	788	788	944

Load Cases

Load Case	Load Type	Load Definition	Live Load Deflection Case	Description
	List	List	Y/N	A
1	Self Weight	Applied Loads		

Load Case	Load Type	Load Definition	Live Load Deflection Case	Description
	List	List	Y/N	A
2	Initial Dead Load	Applied Loads		

1. Self Weight - Line

Load	Left End Reference Column	Left end of load from reference column	Load at left end	Right End reference column	Right end of load from reference column	Load at right end	Description
	#	mm	kN/m	#	mm	kN/m	A
1	1	0	16.58	2	0	16.58	

2. Initial Dead Load - Point

Load	Reference column	Distance to Load from reference column	Load	Load Length	Description
	#	mm	kN	mm	A
1	1	390	880	0	

Load Combinations : Ultimate

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	0	1.5
2	Live Load	0	0.9
3	Dead Load	0	1.35

Load Combinations : Short Term Service

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	1	1

Load Combinations : Permanent Service

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Live Load	1	1

Load Combinations : Deflection

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Short Term - Deflection	1	1
2	Permanent - Deflection	1	1
3	Initial - Deflection	1	1

Load Combinations : Transfer Prestress

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Transfer	1	0

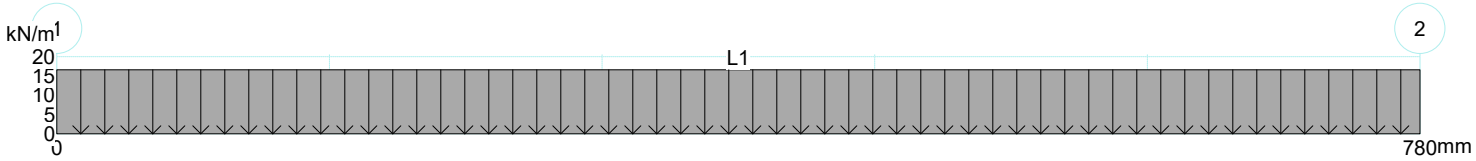
Load Combinations : Pre Existing

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Pre Existing	1	0

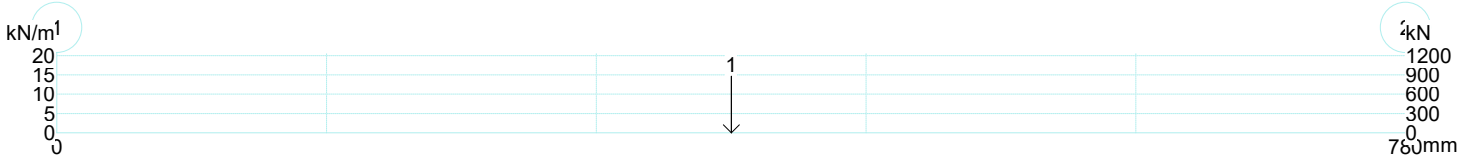
Load Combinations : Construction

Load Combination	Description	1. Self Weight	2. Initial Dead Load
	A	#.#	#.#
1	Construction	1	0

Load Case 1 : 1. Self Weight



Load Case 2 : 2. Initial Dead Load



Reinforcement

Reinforcement Use	Reinforcement Type	Preferred Bar Size	Number of Legs
	List	List	#
Flexural Bar	N 500MPa		
Flexural Mesh	F 450MPa		
Shear Option 1	N 500MPa	16	2
Shear Option 2	N 500MPa	16	4
Shear Option 3	N 500MPa	16	6
Punching Shear	N 500MPa	12	1

Reinforcement

	Maximum Bar Spacing	Minimum Bar Spacing	Minimum Continuous Reinforcement	Minimum Span Reinforcement into End Support	Minimum Span Reinforcement into Internal Support	Infill Bars	Stagger Bars
	mm	mm	#.#	#.#	#.#	Y/N	Y/N
Support Reinforcement	300	60	0			N	N
Span Reinforcement	300	60		0	0	N	N

Design Zones

Layer Number	Steel type	Left End Reference Column	Distance to left end of bar	Bar stagger length at left end	Top Cover at left end	Right End Reference Column	Distance to right end of bar	Bar stagger length at right end	Top Cover at Right end	Maximum Bar Size	Minimum Bar Size	Preferred bar size	Minimum Number of Bars	Maximum Spacing of Bars
	List	#	mm	mm	mm	#	mm	mm	mm	List	List	List	#	mm
1	Bar	1	0	0	60	2	0	0	60	36	16	28	0	0

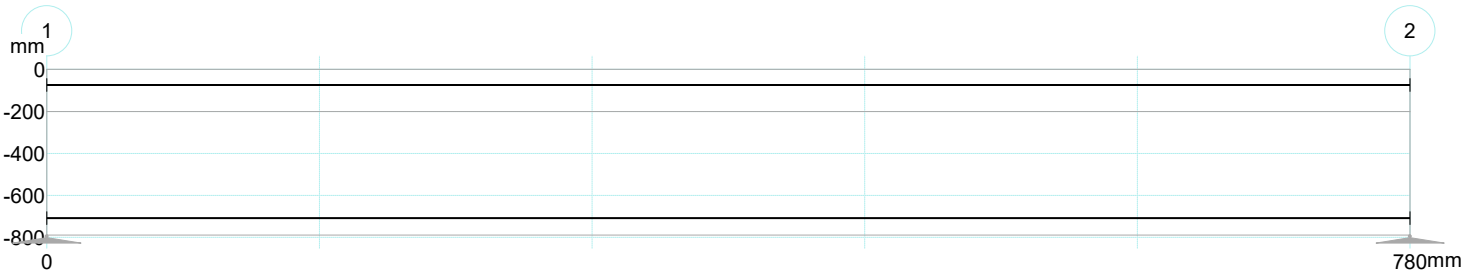
Layer Number	Minimum Steel area as %	% in Flange
	%	%
1	0	0

Design Zones

Layer Number	Steel type	Left End Reference Column	Distance to left end of bar	Bar stagger length at left end	Bottom Cover at left end	Right End Reference Column	Distance to right end of bar	Bar stagger length at right end	Bottom Cover at Right End	Maximum Bar Size	Minimum Bar Size	Preferred bar size	Minimum Number of Bars
	List	#	mm	mm	mm	#	mm	mm	mm	List	List	List	#
1	Bar	1	0	0	60	2	0	0	60	40	32	40	0

Layer Number	Maximum Spacing of Bars	Minimum Steel area as %	Minimum Reinforcement placed at	% in Flange
	mm	%	List	%
1	400	0	Tension Points	0

Reinforcement Design Zones



Design Data

Capacity Reduction factor (phi) for Flexure	#.#	0.85
Capacity Reduction factor (phi) for Shear	#.#	0.7
Capacity Reduction factor (phi) for Shear with transverse reinf	#.#	0.75
Material Factor for Concrete in Flexure	#.#	1
Material Factor for Concrete in Shear	#.#	1
Material Factor for Reinforcement	#.#	1
Maximum Ratio of Neutral Axis Depth for Ductility	#.#	0.4
Ductility Limit - Strain	#.#	0
Ductility Check at Left End Column	Y/N	Y
Ductility Check at Right End Column	Y/N	Y
Minimum Reinforcement Strength Limit - #.## x M*	#.#	0
Flexural Critical Section - Consider Transverse Beams	Y/N	Y
Flexural Critical Section - Distance from centre of Support	#.#	-1
Beam Left Sideface Cover (Internal)	mm	25
Beam Right Sideface cover	mm	40
Prestress Minimum Reinforcement Basis	List	Program Default
Shear Enhancement at Supports	Y/N	N
Ast Value in Shear Calculations	List	Calculated
Limit Reinforcement Strain	Y/N	Y
Include Strain Hardening of Reinforcement	Y/N	N
Beam Shear Critical Section Location	List	Code Critical Section

Maximum Service Stress Change - Prestressed Sections	MPa	0
Maximum Service Stress Change - Reinforced Sections	MPa	0
Relative Humidity	%	50
Average Temperature	C.	20
Prestress Losses Calculations based on	List	Program Default
Crack Width Calculations	List	Code default
AS3600 Shrinkage and Temperature Reinforcement	List	Moderate
Degree of Restraint in Primary Direction	%	0
Degree of Restraint in Secondary Direction	%	0
Concrete Strength Gain Rate	List	N

Concrete Tensile Strength for Deflection Calculations- #.## x (Fc)n	#.#	-1
Maximum Value of Ieff/Igross for Deflection Calculations	#.#	0.6
Total Deflection Warning Limit - Maximum Span/Deflection	#.#	250
Total Deflection Warning Limit - Maximum Deflection	mm	25
Incremental Deflection Warning Limit - Maximum Span/Deflection	#.#	500
Incremental Deflection Warning Limit - Maximum Deflection	mm	25
Initial Time for Shrinkage	List	Full Shrinkage
Time of Loading in days	#.#	10
Age Adjustment Factor	#.#	0.76
Concrete Strength at Time of Loading	MPa	42.25
Loaded Period in years	#.#	30
Tension stiffening Approach	List	Modified Concrete Tensile Modulus Method
Top Surface Shrinkage Factor - General	#.#	1
Bottom Surface Shrinkage Factor - General	#.#	1
Top Surface Shrinkage Factor - Metal Decking	#.#	1.2
Bottom Surface Shrinkage Factor - Metal Decking	#.#	0.2

Live Load Pattern Factor	#.#
Pattern Live Load for Ultimate Strength	Y/N
Pattern Live Load for Crack Control	Y/N
Pattern Live Load For Deflections	Y/N
Pattern Live Load for Deflection Permanent Load Combination	Y/N

Material Properties

Concrete : Standard Concrete : Concrete Strength Basis - Cylinder

Description	A	50MPa
Characteristic Compressive Strength	MPa	50
Mean Compressive Strength	MPa	59.7
Lower Characteristic Tensile Strength	MPa	4.24
Upper Characteristic Tensile Strength	MPa	7.64

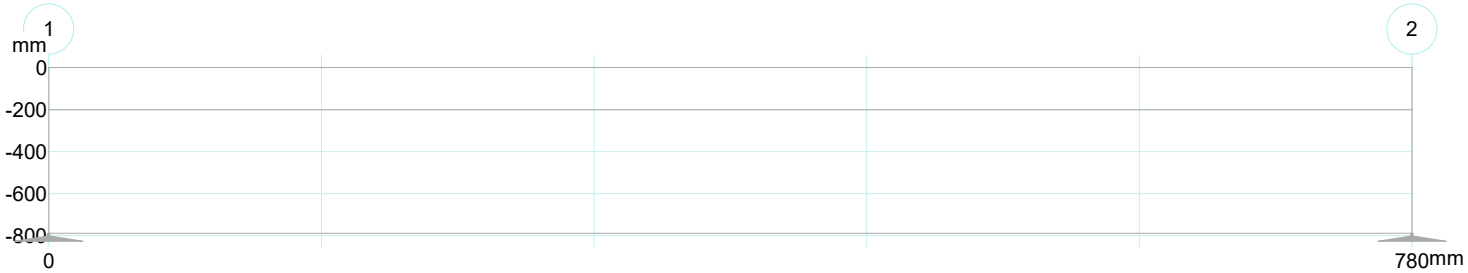
Concrete Density	kg/m3	2447
Design Concrete Modulus	MPa	34013.6
Mean Concrete Modulus	MPa	35820.8
Basic Shrinkage Strain	mm/mm	800
Shrinkage Multiplier	#.#	1
Basic Creep Factor	#.#	2.4
Creep Multiplier	#.#	1
Concrete Strain at Peak Stress	#.#	0.002
Squash Load Factor	#.#	0.9
Concrete Strain Limit	#.#	0.004
Strength Gain Rate	List	Normal
Maximum Aggregate Size	mm	20

Reinforcement Bar

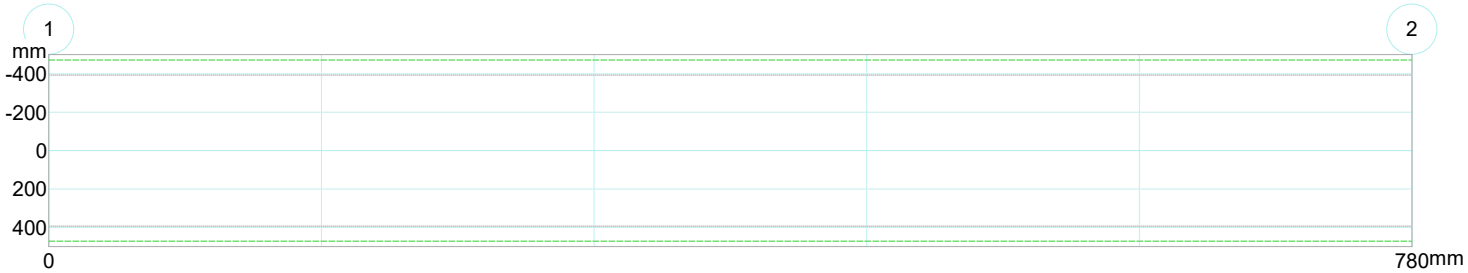
Designation	Type	Yield Stress	Elastic Modulus	Ductility	Peak Strain	Peak Stress	Design Strain Limit	Material Factor Flexure	Material Factor Shear	Material Capacity Reduction Factor - Flexure	Material Capacity Reduction Factor - Shear	Include as Flexural Reinforcement for Shear	Description
N	Deformed	500	2e5	N	0.05	540	90	-1	-1	-1	-1	Y	

Nominal Bar Size	Bar Diameter	Bar Area	Bar Inertia	Bar Weight	Stock Length
A	mm	mm2	mm4	kg/m	mm
10	10	78.5	491.07	0.62	12000
12	12	113	1018.29	0.89	12000
16	16	201	3218.29	1.58	12000
20	20	314	7857.14	2.47	12000
24	24	452	16292.6	3.55	12000
28	28	616	30184	4.83	12000
32	32	804	51492.6	6.31	12000
36	36	1020	82481.1	7.99	12000
40	40	1260	1.257e5	9.86	12000

Elevation view



Plan view



Warnings

Input

Warning:No Live Load Case defined for deflection calculations.

Output

No errors or warnings were found.

Bending Moments

Load Cases

Column Actions

Col No. 1		Self Weight	Initial Dead Load
Moment Above	kNm	-0	-0
Moment Below	kNm	-0	-0
Reaction	kN	6.47	440

Col No. 1		Self Weight	Initial Dead Load
Elastic Rotation	#.#	0	0
Elastic Axial Shortening	mm	0	0

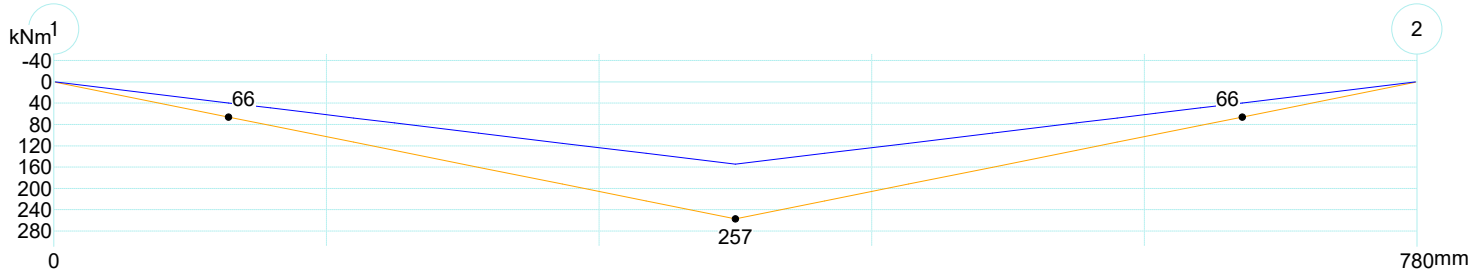
Col No. 2		Self Weight	Initial Dead Load
Moment Above	kNm	-0	-0
Moment Below	kNm	-0	-0
Reaction	kN	6.47	440
Elastic Rotation	#.#	0	0
Elastic Axial Shortening	mm	0	0

Load Combinations
Column Actions

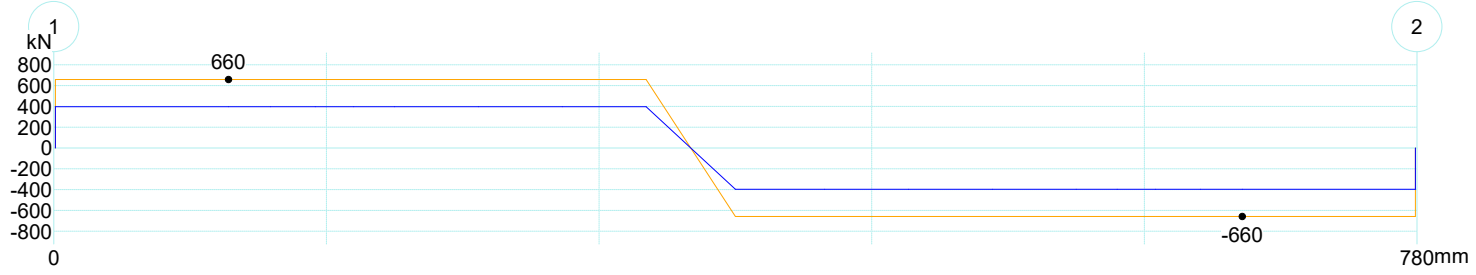
Col No. 1		Characteristic Service	Characteristic Service (Reversal)	Service	Service (Reversal)	Ultimate Flexure	Ultimate Flexure (Reversal)	Ultimate Shear	Ultimate Shear (Reversal)
Moment Above	kNm	0	0	0	0	0	0	0	0
Moment Below	kNm	0	0	0	0	0	0	0	0
Reaction	kN	446.47	446.47	446.47	446.47	660	660	396	660
Elastic Rotation	#.#	0	0	0	0	0	0	0	0
Elastic Axial Shortening	mm	0	0	0	0	0	0	0	0

Col No. 2		Characteristic Service	Characteristic Service (Reversal)	Service	Service (Reversal)	Ultimate Flexure	Ultimate Flexure (Reversal)	Ultimate Shear	Ultimate Shear (Reversal)
Moment Above	kNm	0	0	0	0	0	0	0	0
Moment Below	kNm	0	0	0	0	0	0	0	0
Reaction	kN	446.47	446.47	446.47	446.47	660	660	396	660
Elastic Rotation	#.#	0	0	0	0	0	0	0	0
Elastic Axial Shortening	mm	0	0	0	0	0	0	0	0

Ultimate Design
Flexure

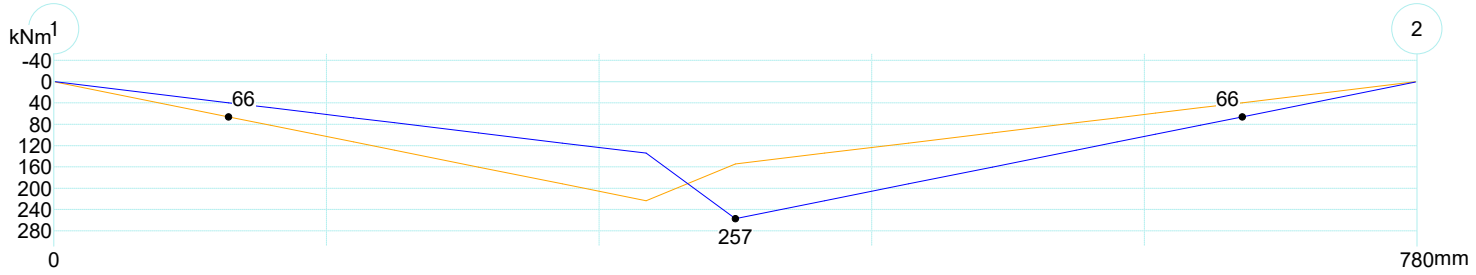


Moment Moment 1 Moment 2

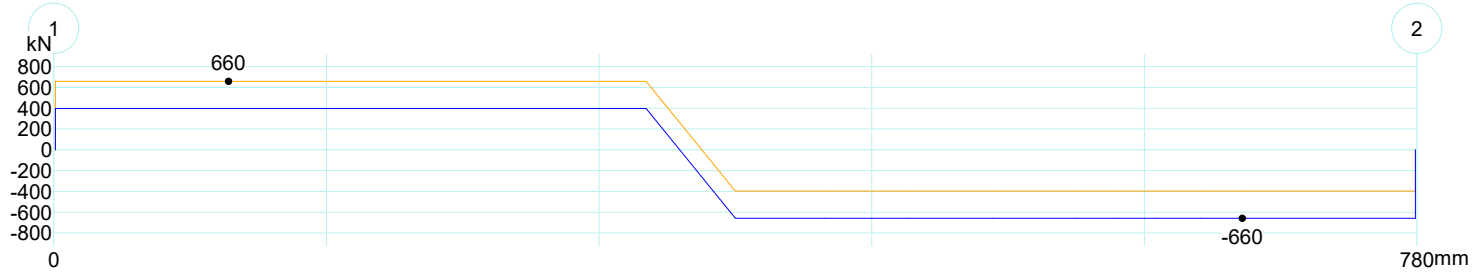


Shear Shear 1 Shear 2

Shear

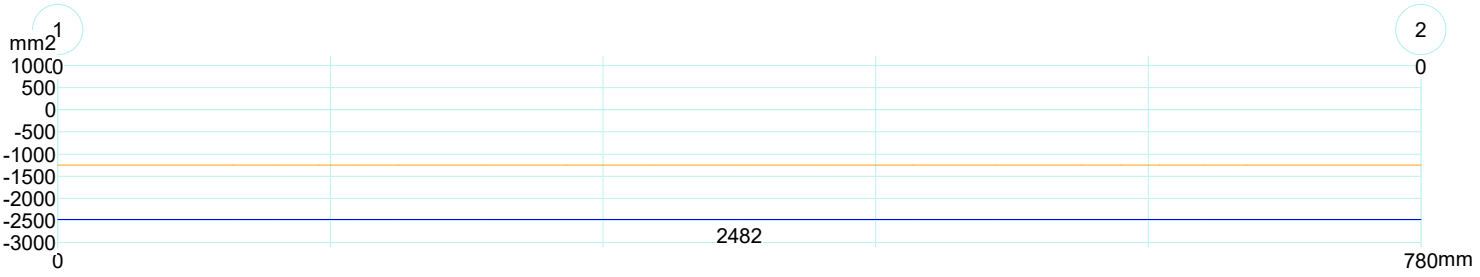


Moment Moment 1 Moment 2

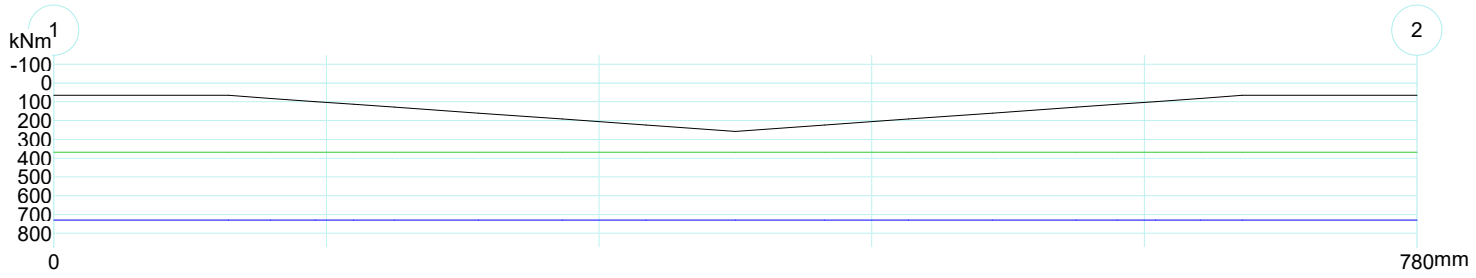


Shear Shear 1 Shear 2

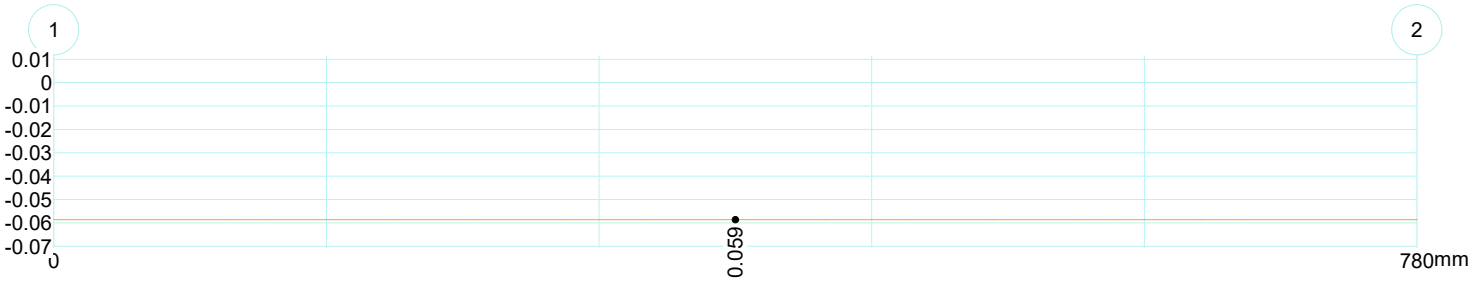
Flexural Design
Ultimate



Reinforcement Top Total Bottom Total Top Ultimate Bottom Ultimate Min Top Min Bot



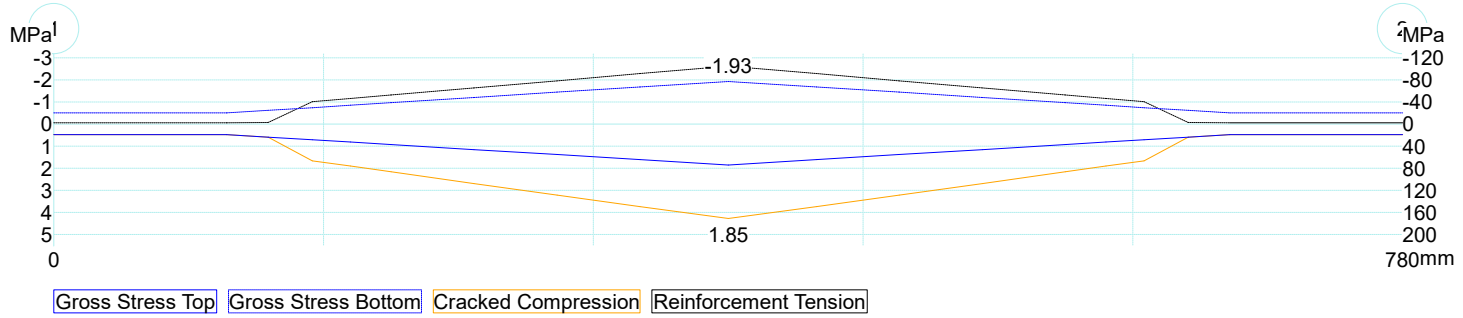
Capacity Minimum Ultimate Design Initial Final



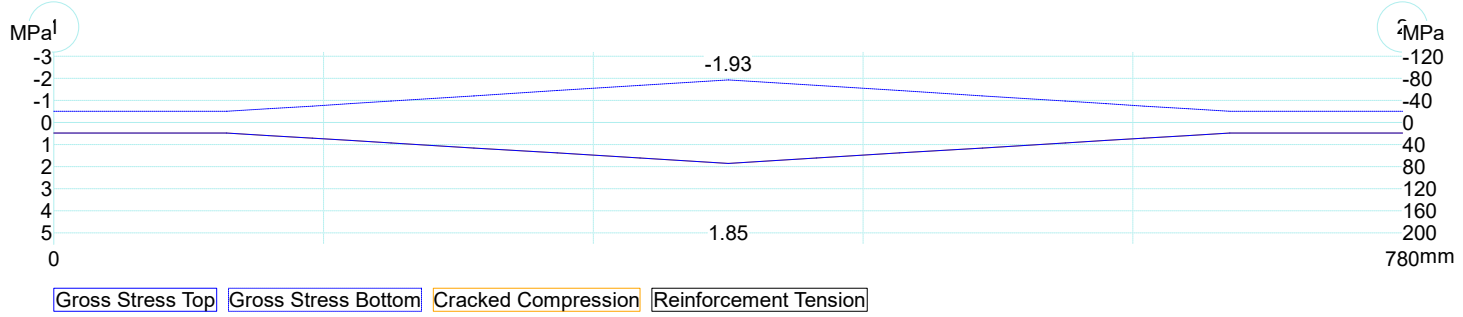
Neutral Axis Depth Initial Final

Service

Maximum Moment Condition

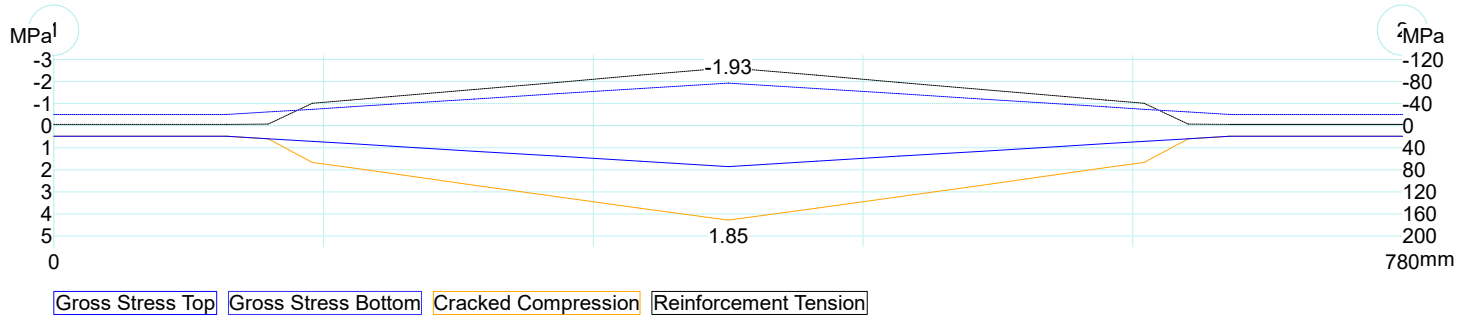


Reversal Moment Condition

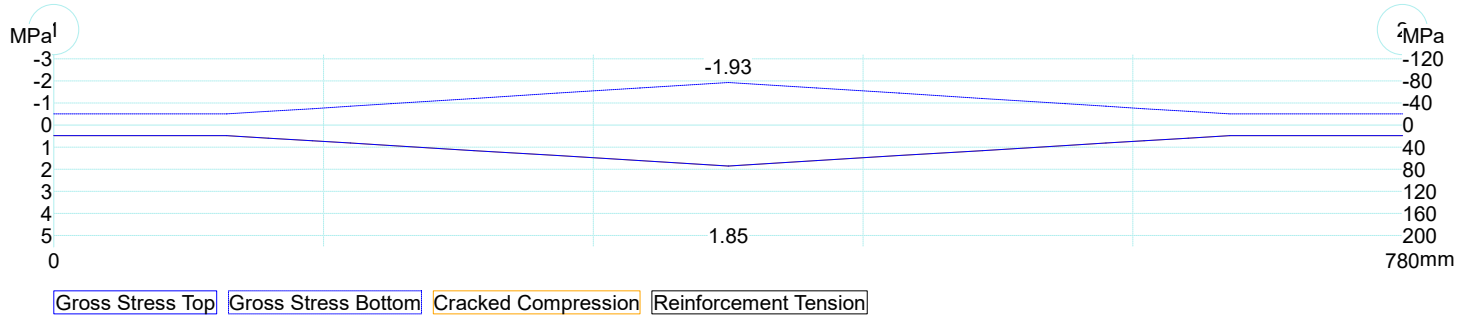


Permanent

Maximum Moment Condition

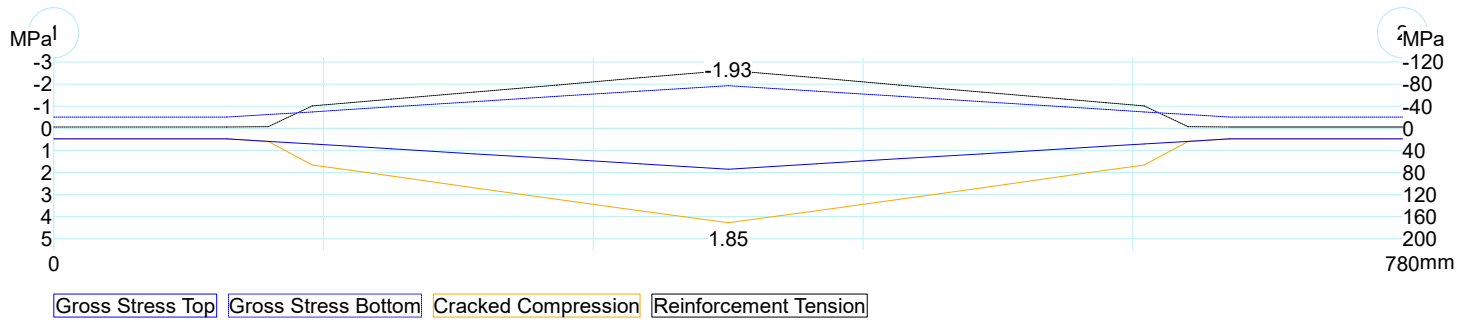


Reversal Moment Condition

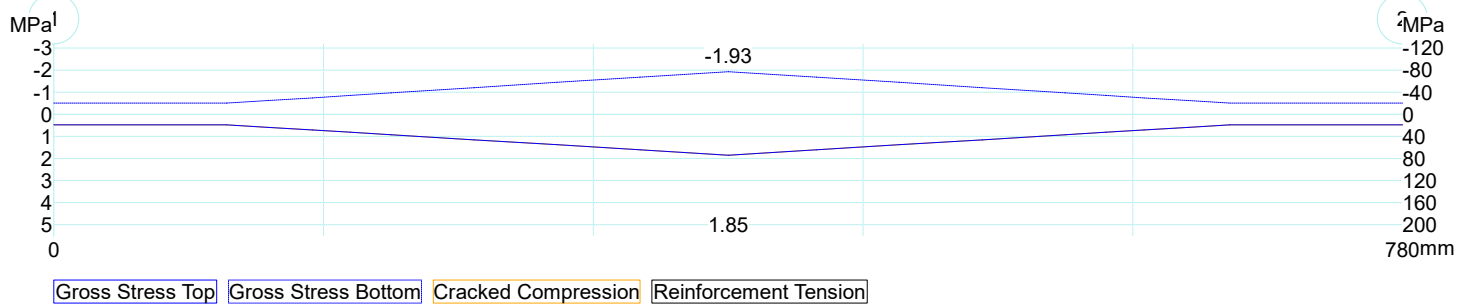


Characteristic Service

Maximum Moment Condition



Reversal Moment Condition



Shear Design

Beam

Span 1

Locat	V*	Mv*	Pv	d	Ast	bv	phi Vu	ks phi Vu	Phi Vumax	phi VuMin	phi Vus	Theta	Asv/sSpacing of Sets				
														2 legs N16	4 legs N16	6 legs N16	Min legs N16
mm	kN	kNm	kN	mm	mm2	mm	kN	kN	kN	kN	kN	#.#	mm2/mm	mm	mm	mm	mm
100	660	66	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
124	660	81.84	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
149.6	660	98.74	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
171.6	660	113.26	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
195	660	128.7	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
243	660	160.38	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
291	660	192.06	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
339	660	223.74	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
390	-660	257.4	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
441	-660	223.74	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
489	-660	192.06	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
537	-660	160.38	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
585	-660	128.7	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
608.4	-660	113.26	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
630.4	-660	98.74	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
656	-660	81.84	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300
680	-660	66	0	637.2	2482.2	788	275.55	0	4231.37	625.42	304.26	38.3063	1.01	300	300	300	300

Minimum Legs	Shear Comments
#	A
3	
3	
3	
3	
3	
3	
3	
3	
3	
3	
3	
3	
3	
3	
3	
3	
3	

Punching

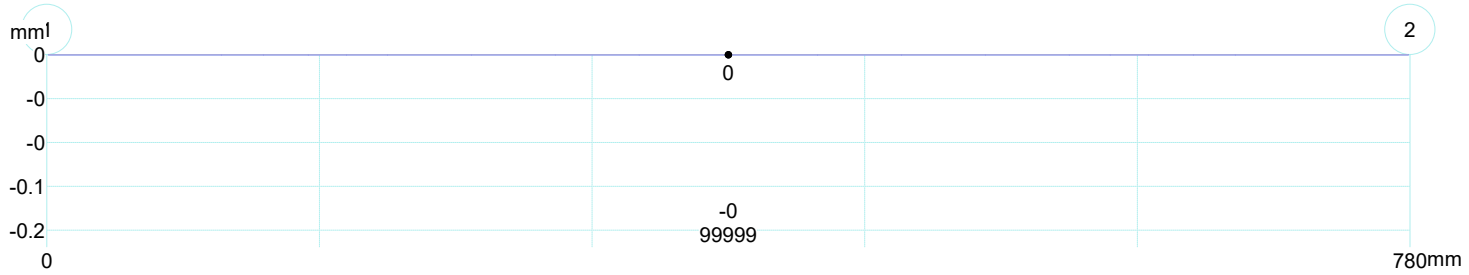
Column Head Critical Section

Column No.	Bh	a	at	u	d	fcv	P/A	Asw/s min	V*	Mv*	phi Vuo	phi Vu	phi VuMin	phi Vumax	side beam	Moment Transfer	Asw/s reqd	result
A	#.#	mm	mm	mm	mm	MPa	MPa	mm2/mm	kN	kNm	kN	kN	kN	kN	A	A	mm2/mm	A
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	Check Not Carried Out!
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	Check Not Carried Out!

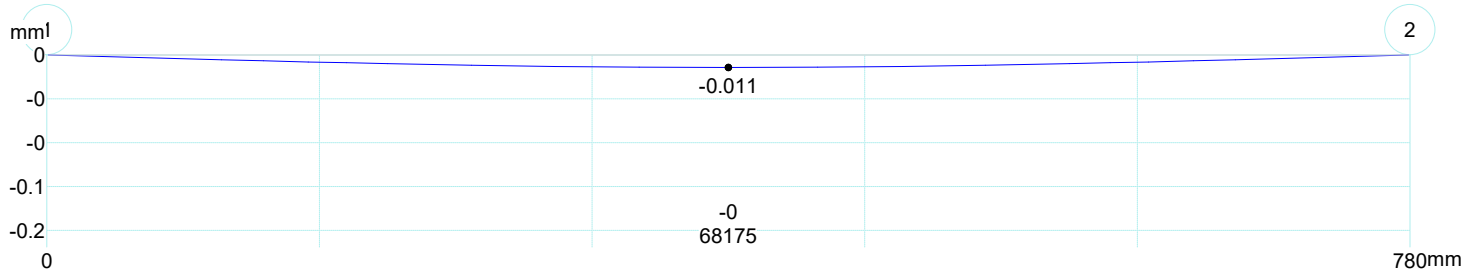
Deflections

All Spans Loaded

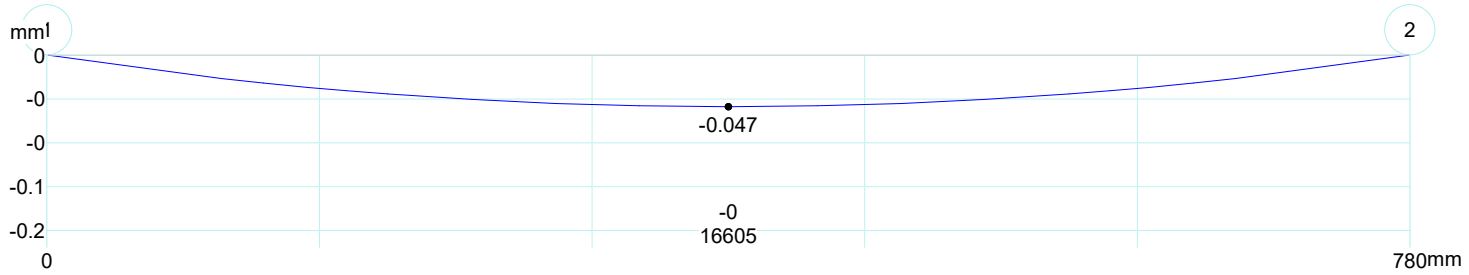
Transfer



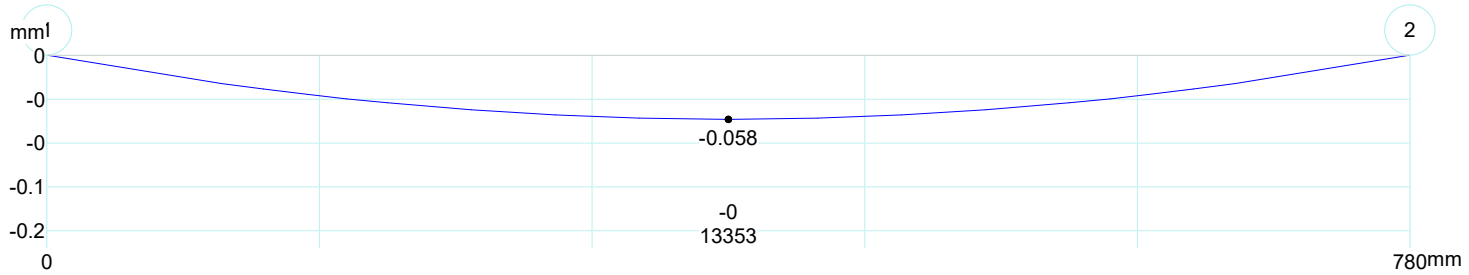
Short Term



Incremental



Total Long Term



Detailed Reinforcement

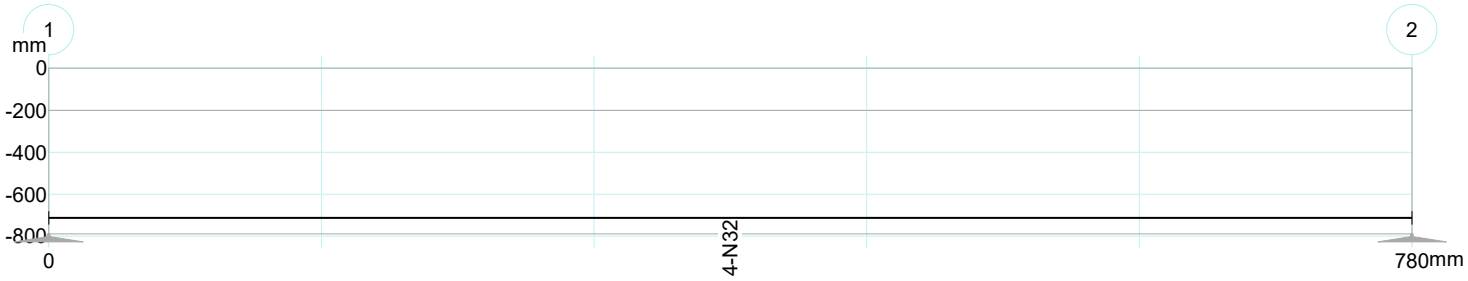
Span 1

	Top Reinforcement						Bottom Reinforcement					
Locat	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd	Max Size	Max Space	Area	Depth	Section Width	Rebar Reqd
mm	mm	mm	mm2	mm	mm	A	mm	mm	mm2	mm	mm	A
100	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
124	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
149.6	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
171.6	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
195	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
243	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
291	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
339	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
390	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
441	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
489	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
537	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
585	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
608.4	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
630.4	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
656	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7
680	0	0	0	74	944	No Steel Added	40	300	2482.2	708	788	4 N32 @ 219.7

Shear Reinforcement						
	Spacing of Sets					
Area	2 legs N16	4 legs N16	6 legs N16	Min legs N16	Minimum Legs	Shear Comments
mm2/mm	mm	mm	mm	mm	#	A
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	
1.01	300	300	300	300	3	

Design Comments:-
- - Span 1 - Required Bar Size is smaller than the Preferred Bar Size. Maintaining the same cover will require slightly less reinforcement than calculated.
- Span - 1 - Reinforcement added at left span contraflexure point for Offset of Bending Moment Diagram for Shear - 875.09mm2
- Span - 1 - Reinforcement added at right span contraflexure point for Offset of Bending Moment Diagram for Shear - 875.09mm2

Reinforcement Layout



- - Span 1 - Required Bar Size is smaller than the Preferred Bar Size. Maintaining the same cover will require slightly less reinforcement than calculated.
Design Comments:-
- Span - 1 - Reinforcement added at left span contraflexure point for Offset of Bending Moment Diagram for Shear - 875.09mm2
- Span - 1 - Reinforcement added at right span contraflexure point for Offset of Bending Moment Diagram for Shear - 875.09mm2