Consultant Design Brief

STRUCTURAL ENGINEERING CONSULTANCY

Project#: 20025
2 Mandala Pde, Castle Hill
Showground Precinct

for
DeiCorp Projects Showground Pty Ltd
Level 3, 161 Redfern St
REDFERN

30.06.2021 | Ref :20025: Rev A | Approved for Issue by : Ryan Campbell, Director ABC Consultants

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revision register

Rev A	DA Design	30/06/2021

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1. PROJECT DESCRIPTION AND REFERENCES

1.1 INTRODUCTION

This consultant's design brief has been prepared to outline the structural design criteria and performance requirements for all elements within the project designed by ABC Consultants and all Design and Construct Sub-consultants.

1.2 CLIENT AND PROJECT DETAILS

Client: DeiCorp Projects Showground Pty Ltd
Site address: 2 Mandala Pde, Castle Hill, NSW 2154

The development comprises of 4 x 20 storey concrete framed residential buildings on a large combined podium and retail precinct with 6 levels of basement.

The existing site is rectangular in shape and is bounded by Andalusian Way to the East, De Clambe Drive to the North, Doran Drive to the West and Mandala Pde to the South.

1.3 DEVELOPMENT CONSENT CONDITIONS

The design of the project will be in accordance with the Development Application conditions and relevant design practices, Australian Standards, and BCA provisions.

1.4 BASE ARCHITECTURAL DOCUMENTS

This report is based on architectural sketches and drawing produced by Turner Architects received May 2021.

1.5 STRUCTURE DESCRIPTION

The tower structure consists of a maximum 20 storey concrete frame building with post tensioned flat floor supported on blade concrete columns. The columns run through the building from the footing level to the roof with changes in size occurring over the height of the building. The columns are required to rotate or transition to a different column shape at the underside of the Level 2 typically and there is a full transfer level present at Level 2 along with additional transfer zones in Level 1 and Ground Floor as result of the large entrance driveway present and the loading dock located beneath one of the tower as shown in the attached structural scheme.

A concrete pad foundation system is proposed for the building due to the depth of excavation reaching the high strength rock. The final design would be confirmed after further design development is carried out.

Lateral loads due to robustness requirements, wind, earthquake and shoring walls are resisted by a combination of concrete lift and stair cores and outrigger walls.

1.6 OTHER DOCUMENTS

Other related consultant documents will be used on “As Required” basis.

1.7 AUSTRALIAN STANDARDS AND BCA

The following Australian Standards in combination with BCA are used in the structural design of this project.

AS/NZS 1170.0/2002 – Part 0: Structural design actions
AS/NZS 1170.1/2002 – Part 1: Permanent, imposed and other actions
AS/NZS 1170.2/2011 – Part 2: Wind actions
AS/NZS 1170.4/2007– Part 4: Earthquake loads
AS3600 – 2018: Concrete structures
AS4100 – 2020: Steel structures
AS3700 – 2018: Masonry structures
AS2159 – 2009: Piling
AS 4678-2002: Retaining walls
AS/NZS4600 – 2018: Cold-formed steel structures
AS/NZS3828 – Guidelines for the erection of building steelwork

2. SITE SPECIFIC INFORMATION AND GROUND CONDITIONS

ABC Consultants assumes that external reports are professionally prepared by appropriately qualified sub-consultants and reviewed by the client. ABC Consultants rely on the information provided in these external reports and will not be held responsible for any of the recommendations or advice contained within these reports.

2.1 GEOTECHNICAL REPORT

Geotechnical investigations and reports have been prepared by:

1. EI Australia Engineering Consultants – Report Ref: E24724.G03 dated 26 August 2020

The site is generally underlain by up to 2.5m of fill over extremely weathered sandstone at depths varying up to 5m with low to medium to high strength sandstone present past this point.

The geotechnical profile including the depth to the bedrock varies across the site. Refer to Geotechnical Report for additional information specific to the location of interest.

2.2 FOUNDATION DESIGN CONCEPT

A concrete pad and strip footing foundation is to be the most suitable option for this project given the very high bearing strengths present at BEL and with the project having 6 basement levels. The quantity and size of the pads would be determined during further design development.

2.3 SLAB ON GROUND

The ground slab will be constructed generally over engineered compacted fill. The slab would be constructed on vapour barrier over 50mm thick 20mm single sized granular fill over engineered compacted fill. The slab would be generally 120mm thick for light vehicle areas. It is understood no heavy vehicle traffic is expected on the slab including the garbage and removalist trucks.

2.4 TEMPORARY AND PERMANENT BATTERS

Refer to Geotechnical Report for any advice on temporary and permanent batters.

2.5 SITE RETENTION AND RETAINING WALLS

Excavation up to 29m is proposed for the site.

For the majority of the site, the shoring system is to be as documented in the structural drawings.

2.6 GROUND WATER TABLE

Geotechnical report has identified ground water at depths of 4-15m during or immediately after boring the holes, based on the initial investigation. No long term monitoring of water table levels has occurred.

2.7 EARTHQUAKE

The earthquake design will be carried out in accordance with the Earthquake Design Code AS1170.4-2007. Refer to Section 3.9 'Earthquake Loads' for design parameters.

2.8 WIND TUNNEL REPORTS

A pedestrian wind study will be undertaken as part of the DA works, please refer to this report for more details.

2.9 DILAPIDATION REPORTS

Dilapidation report of neighbouring sites including the Sydney Metro station might be required.

3. DESIGN LOADING INFORMATION

Loads and their appropriate load combinations will be in accordance with AS1170.0, AS1170.1, AS1170.2 and AS1170.4 and tenants design briefs. The applied loading is summarised in this section of this design brief.

3.1 SELF WEIGHT LOADS (SW)

Self Weight loads shall be calculated as provided for in the current version of AS1170. Part 1: Permanent, imposed and other actions.

Material densities are taken from AS1170.1.

3.2 SUPERIMPOSED PERMANENT AND IMPOSED LOADS

Imposed loads are taken from AS1170. Part 1: Permanent, imposed and other actions. The following table describes the more significant loading on the project, and further clarification of floor loads can be obtained by referring to the loading diagrams in the structural set of drawings.

Pattern imposed loads shall be considered if applicable in accordance with Clause 2.4.4 of AS3600. Imposed load reduction shall be applied as per AS1170.1 if appropriate for vertical elements.

Location	**Permanent (Dead) Load**	**Imposed (Live) Load**
Car park - General	0.5 kPa	2.5 kPa
Car park – Storage	1.5 kPa	2.4 kPa/m height
Loading Dock	1.5 kPa	15 kPa
Residential floor-internal	1.8 kPa	1.5 kPa
Residential Balconies	1.8 kPa	2.0 kPa
Roof	2.5 kPa	5.0 kPa
Plant rooms	2.0 kPa	7.5 kPa or plant loads whichever is less
Retail/Commercial - internal	1.5 kPa	5.0 kPa
Retail/Commercial Balconies	2.5 kPa	5.0 kPa
Lobbies/Stairs	1.5 kPa	4.0 kPa
Other Gravity Loads:		
Facade Loading	1.0 kPa/m height	

Refer to architectural specifications for the façade type for various building types and locations of landscaping with loads to be determined from architectural drawings. Generally, no heavy external facades/walls have been allowed for residential building such as double brick. Allowance for MRI machines has been made in the proposed medical tenancy on Level 1 with access via the external façade required for all replacements.

3.3 BALCONY BALUSTRADE LOADS

For balustrade type refer to architectural specifications. For balustrade gravity and imposed barrier loads refer to AS1170.1 appendix A and table 3.3 respectively.

3.4 TRANSFER LOADS

Transfer loads from columns or walls have been allowed for in the design of the transfer structure. These loads will be based on the permanent (dead) and imposed (live) loads provisions above along with the relevant wind and earthquake loadings.

3.5 RETAINING WALL EARTH PRESSURES

Temporary and permanent battering and retaining walls are to be designed in accordance with the geotechnical advice and AS 4678 requirements. A minimum surcharge of 20.0 kPa should be allowed for the perimeter retaining wall design with additional possibly required by the construction team. For the shoring wall design loads, please refer to the structural drawings.

3.6 HYDROSTATIC PRESSURES ON WALLS AND SLABS

All slabs and retaining walls have been assumed to be drained with no hydrostatic applied pressure. This requires provisions for drainage cells/strip drains for shoring walls.

3.7 BUILDING WIND LOADS

Wind loads would be as per AS1170.2 for Region A2 wind, Terrain Category 3, Building Importance Level of 3 and design life of 50 years.

3.8 CONSTRUCTION LIVE LOADS

No allowance has been made in the design for the construction loading exceeding the loading values noted in the section 3.2 of this report. It is assumed that all the slabs would be back propped down to the lowest level if subject to the construction loadings exceeding their design loadings.

3.9 SNOW LOADS

Based on AS1170.3 snow loads are not applicable to this project.

3.10 EARTHQUAKE LOADS

The following parameters should be adopted for the earthquake design as per AS1170.4-2007 and the BCA.

Hazard Factor:	Z = 0.08
Life Span:	50 years
Site subsoil classification	Ce
Probability of exceedance	kp = 1.0
Importance Level	3
Structural ductility factor	μ = 3.0

The adopted Structural ductility factor is based on a building frame system consisting of reinforced ductile concrete cores and shear walls.

3.11 ROBUSTNESS LOADS

In accordance with the draft requirements of AS1170.0/2002 Amendment 3 the robustness load is taken as 1.0% of each floor gravity load (G + ψcQ) for structural taller than 15m and 1.5% of each floor gravity load (G + ψcQ) for other buildings applied simultaneously at all floors.

3.12 BLAST AND IMPACT LOADING

It is noted that the design of the building and structure and boundary walls has not been designed for any vehicle impact loads (other than car-park barriers loads taken from AS1170.1), nor has the building or its structure been designed for any blast/explosion loadings or terrorist induced loading events.

4. LIMIT STATE DESIGN CRITERIA FOR STRUCTURAL ELEMENTS

4.1 GENERAL DESIGN APPROACH

The limit state design for strength, serviceability and stability of the relevant structural elements within the building will generally follow the established criteria in the relevant material design codes AS4100 and AS3600 unless noted otherwise below.

4.2 STRUCTURAL MOVEMENTS

Building Sways (Deflection) subject to service wind loads shall satisfy;

- Total lateral deflection to not exceed height/500.
- Inter-storey deflection to not exceed inter-storey/500 or 12mm, whichever is lesser

Floor Deflection criteria is to AS3600 table 2.3.2 requirements for concrete floors and AS 1170.0 table C1 requirements for Timber and steel structures. It is recommended that the total long term deflection of the concrete floors is limited to 20mm.
Building inter-story drift at the earthquake ultimate state loads, shall not exceed 1.5% of the storey height for each level.
Attachment of cladding and façade panels to the seismic force resisting system shall have sufficient deformation and rotational capacity to accommodate the design storey drift. In order to satisfy the Hebel fire rating detail, the maximum long term differential deflection between floors is limited to 10mm.

4.3 FIRE RESISTANCE

Generally the buildings are classified as Type A construction. The fire rating requirements for relevant Fire Construction Type/ class of building are specified in the BCA.
Structure has been designed to satisfy FRL requirements complying with AS3600, AS3700 and AS4100.

4.4 CRACK CONTROL

Generally, all internal suspended slabs will be designed for a moderate degree of crack control, except for external roof slabs over living areas where a strong degree of crack control will be adopted. For Post tension slabs, this will result in a minimum post tension stress of 1.4MPa and 1.8MPa for moderate and strong degree of crack control, respectively. Refer to Section 4.8 for further minimum requirement to external slabs over living areas.

The exposed slabs such as roof should be designed for temperature effects such as “Hot Top” effect.
Pour strips or Temporary Movement Joints (TMJs) should be introduced where appropriate to minimise the long-term creep and shrinkage effect of the concrete and these should be coordinated with the builder construction programme. None have been shown on the structural drawings produced by ABC Consultants.

4.5 MINIMUM CONNECTION REQUIREMENTS AND TIES

All connections, including but not limited to beam/slabs to columns/wall, precast, etc, shall be designed to clause 6.2.3 AS1170.0 for the transfer of the lateral loads and robustness.

4.6 DURABILITY & MAINTENANCE REQUIREMENTS

Durability requirement are to be as per AS 3600, AS 4100, AS 2311 and AS 2312. Unless noted otherwise a min 50 year design life for concrete elements and min 25 year for steelwork must be adopted. This could be overridden to higher values by Operation and Maintenance requirements imposed by builder and relevant authorities.

4.7 COLUMN AND SLAB STIFFNESS

For the purposes of both post tensioned and reinforced slab designs;

a. Column stiffness is to be limited to a maximum of 20% for the slab flexure and one-way shear design, but 100% for punching shear design.

b. Slab stiffness of un-cracked sections are to be limited to a maximum of 60% of gross section capacity for reinforced slab, and 85% in post tensioned slab. The use of a higher slab stiffness for post tensioned slabs may be used if justified by the PT designer. Justification should consider restraints from walls, cores and columns and include calculations.

4.8 CONCRETE ROOF SLABS OVER LIVING SPACES

External suspended slabs that form part of a roof immediately over a residential apartment will have the following minimum design measures to improve the performance of the slab, and minimise the risk of water egress to living area directly under them. However, the slab will not be designed to retain water alone and waterproofing measures to both the slab and joints are to be in accordance with the waterproofing consultant details.
Roof slabs immediately over apartments will include a minimum of the following;

1. A concrete strength of 40 MPa
2. A minimum post tensioned stress of 1.8MPa, and
3. A minimum of SL82 top reinforcement throughout.

Waterproofing membranes and concrete additives are to be provided as per Architects and Waterproofing consultant details.

4.9 FLOOR VIBRATIONS

Floors shall be designed to ensure that there are only slight perceptible vibrations under footfall effects, or from other internal or external sources.

Floors shall be designed to ensure they comply with the recommended acceleration and velocity limits in the relevant standards. The R value method outlined in Annex A of AS2670.2 and Appendix A of BS6472 will be used. A dynamic assessment shall be undertaken in accordance with SCI P354 Design Guidelines or approved equivalent. The floor structures shall be designed to achieve a maximum "Multiplying Factor" R value as follows:

a. Residential Areas R factor = 2.0 (maximum) daytime and 1.4 night time

The following parameters shall be used for the analysis:

a. Weight of 1 person 746N (76kg x 9.81)
b. Critical damping ratio – maximum of:
    - 2.0% for open areas such as open public spaces, restaurants and retail
    - 4.0% for residential areas with regularly spaced full height walls
c. Dynamic Concrete Modulus and Concrete Mass in accordance with Section 4.1.3 of SCI P354.

Slabs are not designed for vibration emanating from plant equipment, ducting, fans etc. All vibrations from plant are to be isolated at the source with dampers and vibration isolation devices.

5. CONSTRUCTION MATERIALS: CODES, PROPERTIES AND CONSTRUCTION PRACTICES

5.1 CONCRETE

The design, material properties and construction of all reinforced and pre-stressed concrete elements shall comply with the provisions of AS3600 and any other relevant reference noted in this brief.

For detailed information on the specification of concrete elements refer to the Concrete Specification. In particular, note of the curing requirements within the specification to prevent shrinkage and drying shrinkage cracking.

5.2 STRUCTURAL STEEL

The design, material properties and construction of all structural steel elements shall comply with the provisions of AS4100 and have ACRS compliance.
For detailed information on the specification of structural steel elements refer to the Structural Steel Specification.

5.3 MASONRY

The design, material properties and construction of all masonry elements shall comply with the provisions of AS3700 and any other relevant reference noted in this brief.

Appendix A – Structural Drawings by ABC Consultants

BORED PILES

1. REFER TO THE GEOTECHNICAL REPORT E24724.G03 BY EI AUSTRALIA (DATED 26 AUGUST 2020) FOR A DESCRIPTION OF THE ANTICIPATED SITE CONDITIONS. THE PILING CONTRACTOR IS TO STUDY THE REPORT AND MAKE HIS OWN EVALUATION OF THE SITE CONDITIONS. ANY ADDITIONAL COSTS INCURRED SHALL BE BORNE BY THE PILING CONTRACTOR.
2. THE BORED PILES ARE PROPORTIONED FOR THE SCHEDULED LOADS WITH ALLOWABLE SOCKET SKIN FRICTION AND END BEARING CAPACITY AS INDICATED IN THE REPORT. THE DEPTHS AND LENGTHS NOMINATED IN THE SCHEDULE ARE INDICATIVE ONLY. THEY MAY NEED TO BE VARIED DEPENDING ON THE SITE CONDITIONS ENCOUNTERED. THE PILING CONTRACTOR NEEDS TO INCORPORATE ANY DESIGN CHANGES REQUIRED.
3. ALL WORKMANSHIP AND MATERIAL SHALL BE IN ACCORDANCE WITH AS 2159.
4. THE BORED PILES SHALL BE LOCATED CONCENTRIC WITH THE COLUMNS AND WALLS UNLESS NOTED OTHERWISE.
5. DRILL AND INSTALL THE BORED PILES IN THE LOCATIONS SHOWN ON THE DRAWINGS AND THE ABOVE REQUIREMENTS.
6. THE PILING CONTRACTOR SHALL ALLOW FOR THE COST OF INTEGRITY TESTING OF 10% ALL BORED PILES IN ACCORDANCE WITH AS2159 CLAUSE 8.8. ALL PILE INTEGRITY TESTING IS TO BE WITNESSED BY THE PROJECT GEOTECHNICAL ENGINEER .
7. BEFORE ANY CONCRETE IS POURED, ALL ROCK SOCKETS SHALL BE DEWATERED AND INSPECTED BY A GEOTECHNICAL ENGINEER, WHO SHALL BE EMPLOYED BY THE BUILDER, TO VERIFY THE SOIL PARAMETERS. THE SOCKET BASE AND WALLS MUST BE CLEAN AND FREE FROM CLAY.
8. IF THE CONCRETE NEEDS TO BE TREMIED, SUPER PLASTICIZER MUST BE ADDED TO THE MIX AND THE CONCRETE GRADE INCREASED BY 30% . REFER TO THE SPECIFICATIONS FOR THE INSPECTION OF THE HOLE PRIOR TO CONCRETING.
9. ANY ALTERNATIVE DESIGN SHALL MEET THE ABOVE REQUIREMENTS AND THE SCHEDULED LOADS. THE PILING CONTRACTOR SHALL OBTAIN CERTIFICATION FOR THE CALCULATIONS OF THE ALTERNATIVE SYSTEM. THE DETAILS AND CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE PERFORMANCE OF THE ALTERNATIVE BORED PILES.
10. PILING CONTRACTOR TO ALLOW FOR CASING OF ALL PILES IN LOOSE MATERIAL.
11. SPLICING TO LONGITUDINAL PILE REINFORCEMENT IS TO BE AVOIDED WHERE POSSIBLE I.E. FOR PILE CAGE LENGTHS LESS THAN 12m. SPLICES OF CAGE REINFORCEMENT ARE TO ENSURE MINIMUM SPACING BETWEEN TIES ARE MAINTAINED. LOCATION OF SPLICED CAGES ARE TO BE APPROVED BY THE STRUCTURAL ENGINEER.

BULK EARTHWORKS AND SHORING NOTES

GEOTECHNICAL REPORT
REFER TO GEOTECHNICAL REPORT E24724.G03 BY EI AUSTRALIA (DATED 26 AUGUST 2020) AND THE CONTRACTOR IS TO ENSURE GEOTECH REPORT RECOMMENDATIONS ARE ADHERED TO.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SHORING DESIGN CRITERIA

STRUCTURE IMPORTANCE LEVEL:	3
DESIGN WORKING LIFE:	100 YEARS OR MORE
WIND ANNUAL PROBABILITY OF EXCEEDANCE:	1/1000
EARTHQUAKE ANNUAL PROBABILITY OF EXCEEDANCE:	1/1000
EARTHQUAKE DESIGN CATEGORY:	EDC II
CONCRETE EXPOSURE CLASSIFICATION:	B1
SURCHARGE:	REFER LOADING PLANS

GEOTECHNICAL DESIGN PARAMETERS

ALLOWABLE END BEARING CAPACITY (INC. GEOTECHNICAL REDUCTION FACTOR OF 0.5) CLASS III

PERMANENT SHORING WALLS HAVE BEEN DESIGNED IN ACCORDANCE WITH AS3600, AS1170, AS2159 AND AS5100 WITH A DURABILITY DESIGN LIFE OF 100 YEARS

CONCRETE GRADE

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

NOTE: ALL CEMENTITIOUS MATERIAL MUST CONFIRM TO TfNSW SPECIFICATION 3211

COVERS			
ELEMENT	TOP	BTM	SIDES
PILES	75mm	75mm	75mm
CAPPING BEAM	50mm	50mm	50mm
SHOTCRETE	50mm	50mm	50mm

TOLERANCE

1. BORES SHALL BE CENTERED WITHIN 50mm OF THE 'DESIGN' CENTRE AS INDICATED ON THE PLANS.
2. MAXIMUM "OUT OF PLUMB" OF BORES SHALL BE 75mm OR 1:500, WHICHEVER IS LESS
3. GROUND ANCHORS

MONITORING

1. MONITORING OF THE ADJACENT BUILDINGS AND TOP AND MIDDLE OF THE SOLDIERS SHALL BE CARRIED OUT IN ACCORDANCE WITH GEOTECHNICAL AND VIBRATION MONITORING PLANS 86806.02.R.002 PREPARED BY DOUGLAS PARTNERS.
2. MONITORING OF SURVEY POINTS SHALL BE BY A LICENSED SURVEYOR AND BE INITIALLY AT MAXIMUM THREE WEEK INTERVALS & FOR EVERY BASEMENT LEVEL EXCAVATED. SHALL BE MONITORING POINTS A MAXIMUM OF 10m APART
3. IF ANY MOVEMENTS ABOVE THE LIMITS NOMINATED BY THE GEOTECHNICAL ENGINEER ARE DETECTED, ALL WORKS SHALL BE CEASED, THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED. THE PROJECT MANAGER SHALL NOTIFY THE ADJOINING PROPERTY OWNERS.
4. RECORDS SHALL BE KEPT OF ALL MONITORING AND BE AVAILABLE FOR INSPECTION AT ANY TIME.

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

CONSTRUCTION SEQUENCE FOR EXTERNALLY ANCHORED SOLDIER WALLS:

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

CONSTRUCTION SEQUENCE FOR CONTIGUOUS WALLS BRACED INTERNALLY BY STEEL STRUTS:

1. UNLESS NOTED OTHERWISE IN PLANS, DETAILS OR ELEVATIONS, THE FOLLOWING CONSTRUCTION SEQUENCE IS TO BE ADOPTED FOR THE INSTALLATION OF ANCHORED CONCRETE SOLDIER PILE WALLS.
2. SETOUT THE LOCATION OF THE PILES AND CAPPING BEAMS AS NOTED ON PLANS, ELEVATION AND SECTIONS
3. **HOLD POINT** THE GEOTECHNICAL ENGINEER (WHO SHALL BE EMPLOYED BY THE BUILDER) IS REQUIRED TO CERTIFY THAT THE SOIL CONDITIONS COMPLY WITH THE DESIGN ASSUMPTIONS DETAILED IN THE GEOTECHNICAL INVESTIGATION REPORT. THE GEOTECHNICAL ENGINEER IS TO DETERMINE THE LEVEL OF SUPERVISION REQUIRED TO BE ABLE TO PROVIDE THIS CERTIFICATE. SUPERVISION OF THE MATERIAL REMOVED AS PILES ARE DRILLED MAY BE REQUIRED.
4. DRILL REQUIRED BORE HOLES TO THE DIAMETER SPECIFIED AND DEPTH SHOWN ON PLANS, ELEVATIONS AND SECTIONS. ENSURE THE SOCKET IS FULLY CLEANED AND ALL LOOSE MATERIAL IS REMOVED.
5. **HOLD POINT** THE STRUCTURAL ENGINEER IS TO WITNESS THE REINFORCEMENT CAGES PRIOR TO PLACEMENT IN THE BORED PILES. PLACEMENT OF THE CAGES WITHIN THE PILES FOR PILES GREATER THAN 6m DEEP IS TO BE WITNESSED ON SITE.
6. PLACE REINFORCEMENT CAGES IN HOLES ENSURING THAT CAGES ARE ORIENTATED AS PER THE DETAILS ON THIS DRAWING. END CAPS ARE TO BE PLACED AT THE BASE OF THE REINFORCEMENT CAGE AND ROLLER CHAIRS PLACED AT 2m INTERVALS ALONG THE LENGTH OF THE PILE (A MINIMUM OF 3 PER SECTION) TO ENSURE MINIMUM COVER TO THE CAGE IS MAINTAINED.
7. USING A TREMIE PIPE OR SIMILAR FROM THE BASE OF THE BORED HOLE TO ENSURE NO SEPARATION OF CONCRETE AGGREGATE, PLACE CONCRETE FROM THE BASE OF THE PILE TO UNDERSIDE OF CAPPING BEAM. VIBRATE CONCRETE PROGRESSIVELY FROM THE BASE OF THE PILE AS THE PILE IS FILLED.
8. INSTALL CAPPING BEAM REINFORCEMENT IN ACCORDANCE WITH DETAILS ON THESE DRAWINGS.
9. **HOLD POINT** THE STRUCTURAL ENGINEER IS TO WITNESS THE REINFORCEMENT OF THE CAPPING BEAM.
10. PLACE CAPPING BEAM CONCRETE AND ALLOW TO CURE FOR A MINIMUM OF 7 DAYS.
11. **HOLD POINT** PROJECT SURVEYOR IS TO ESTABLISH A DATUM OF THE CAPPING BEAM LOCATION PRIOR TO ANY EXCAVATION PAST THE CAPPING BEAM. REFER TO MONITORING NOTES. MONITORING OF THE WALL IS TO CONTINUE ON A REGULAR BASIS AS DETAILED IN THE MONITORING NOTES.
12. EXCAVATE AGAINST THE PILES TO THE TOP OF THE BATTER SLOPE LEVEL AS NOTED IN SECTIONS / ELEVATIONS.
13. CONTINUE EXCAVATION TO B.E.L. WHILE MAINTAINING A MAXIMUM 1V:1H BATTER SLOPE (OR AS ADVISED BY THE GEOTECHNICAL. ENGINEER). STABLISATION TO THE BATTER SLOPE TO BE PROVIDED WHERE REQUIRED BY THE GEOTECHNICAL ENGINEER. THE GEOTECHNICAL ENGINEER IS TO CONSIDER EFFECT OF SEISMIC ACTION ON THE BATTER SLOPE TO PROTECT PERSONNEL AGAINST ENGULFMENT SHOULD AN EVENT OCCUR DURING EXCAVATION.
14. EXCAVATE PAD FOOTINGS FOR STEEL STRUTS AND INSTALL REINFORCEMENT AS PER DETAILS.
15. **HOLD POINT** STRUCTURAL ENGINEER TO WITNESS PAD FOOTING REINFORCEMENT PRIOR TO PLACEMENT OF CONCRETE
16. PLACE PAD FOOTING CONCRETE AND ALLOW TO CURE FOR A MINIMUM OF 3 DAYS.
17. INSTALL STEEL STRUTS AND THEIR CONNECTIONS IN ACCORDANCE WITH PLANS AND DETAILS. THE CONTRACTOR IS TO ENSURE ANY MOVEMENT OR SLIP OF THE STEEL WORK IS TAKEN UP PRIOR TO LOADING. NOTE, THE BUILDER IS TO SCAN AND LOCATE ANY EXISTING STEEL REINFORCEMENT WITHIN THE CONCRETE CAPPING BEAM OR PAD FOOTING PRIOR TO INSTALLED POST-FIXED ANCHORS. NO REINFORCEMENT IS TO BE CUT OR DRILLED.
18. **HOLD POINT** STRUCTURAL ENGINEER TO INSPECT STEEL STRUTS.
19. ONCE THE PAD FOOTINGS HAVE REACHED 32MPa MINIMUM, EXCAVATION OF THE TEMPORARY BATTER SLOPE MAY CONTINUE.
20. CONTINUE CONSTRUCTION OF BUILDING STRUCTURE AS PER STRUCTURAL DOCUMENTATION.
21. STRUTS MAY BE REMOVED PROVIDED THE FOLLOWING IS COMPLETE:
ALL STRUCTURES UP TO GROUND FLOOR HAVE BEEN COMPLETED AND HAVE ACHIEVED A MINIMUM DESIGN STRENGTH OF 40MPa BASEMENT
SLABS HAVE BEEN COMPLETED FOR THE FULL BASEMENT WIDTH AND ANY GAPS BETWEEN THE SHORING WALL AND BASEMENT SLABS IS FILLED WITH NON-SHRINK 40MPa GROUT ANY BASEMENT SLABS DESIGNED AS POST TENSIONED HAVE BEEN ALLOWED TO CURE FOR A MINIMUM OF 56 DAYS.

ROCK ANCHORS - POST-TESNIONED STRAND

1. IN ADDITION TO ANY NOTES PROVIDED BELOW AND DETAILS SHOWN ON THESE DRAWINGS, ALL ROCK ANCHORS ARE TO BE INSTALLED IN ACCORDANCE WITH AS4678 AND TRANSPORT FOR NSW QA SPECIFICATION B114
2. ANCHORS SHALL CONSIST OF LOW RELAXATION STRESS-RELIEVED SUPERGRADE STEEL STRAND TO AS4672.1 AND AS4672.2 AND ANCHORAGES AND WEDGES SHALL CONFORM TO AS1314.
3. ALL STEEL ELEMENTS, INCLUDING BEARING PLATES AND WASHERS, MUST BE FABRICATED FROM GRADE 250 STEEL IN ACCORDANCE WITH AS3678. NUTS FOR THE ROCK BOLTS MUST BE GRADE C COMPLYING WITH AS1112.3 AND PROPERTY CLASS 5 COMPLYING WITH AS4291.2 OR EQUIVALENT TO SUIT THE END THREAD OF THE BOLT.
4. THE USE OF COUPLERS TO THE ANCHOR STRANDS IS NOT PERMITTED.
5. PRIOR TO ANY DRILLING OPERATIONS, THE BUILDER SHALL ACQUAINT THEMSELVES WITH ALL ADJACENT UNDERGROUND SERVICES AND ENSURE THAT NONE OF THESE ARE DISRUPTED BY ROCK ANCHORS. ALL APPROPRIATE APPROVALS, PERMITS AND AGREEMENTS SHALL BE OBTAINED BEFORE COmmENCEMENT OF THE WORK.
6. BORE HOLES FOR THE ROCK BOLTS MUST BE DRILLED USING ROTARY OR ROTARY PERCUSSION DRILLING EQUIPMENT. DRILLING FLUIDS AND CORE DRILLING ARE NOT PERMITTED. BORE HOLES MUST BE INSTALLED WITH A MAXIMUM DEVIATION FROM THE DESIGN INCLINATION IN ANY DIRECTION OF 2° AND A MAXIMUM DEVIATION FROM THE ENTRY POINT OF +/- 25mm.
7. CENTRALISERS MUST BE PROVIDED ALONG THE LENGTH OF THE STRAND AT 1000mm CENTRES WITHIN THE BOND LENGTH, 2000mm CENTRES WITHIN THE FREE LENGTH AND 300mm FROM EACH END TO ENSURE THE STRAND IS CENTRALISED TO THE CENTRE OF THE BOREHOLE. THE CENTRALISERS MUST BE; NON-CORRODIBLE, FIRMLY FIXED TO THE BOLT AND A SHAPE THAT PERMITS THE FREE FLOW OF GROUT TO FULLY ENCAPSULATE THE BOLT.
8. GROUT TUBES MUST EXTEND TO THE BASE OF THE LOWEST PORTION OF THE BORE HOLE AND BE SECURELY FIXED TO THE STRANDS. TUBING MUST BE OF ADEQUATE STRENGTH TO RESIST ANY DAMAGE DURING INSTALLATION AND GROUTING AND BE OF SUFFICIENT SIZE TO ALLOW PUMPING OF GROUT.
9. MATERIAL PROPERTIES OF THE GROUT MUST CONFORM TO TABLE B114.2 OF TFNSW QA SPECIFICATION R64. GROUTS MUST GENERALLY HAVE A HIGH BLEED RESISTANCE, LOW SHRINKAGE AND HIGH FLUIDITY. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF S20MPA AT THREE (3) DAYS. GROUT CYLINDERS SHALL BE TAKEN ON THE BASIS OF ONE SAMPLE (TWO CYLINDERS) FOR EVERY TEN ANCHORS AND TESTED ON THE DAY OF STRESSING. THE GROUT SHALL BE MIXED IN A HIGH SPEED IMPELLER TYPE MACHINE.
10. THE STRANDS SHALL PULLED TAUT AND MARKED AT THE FACE OF THE WEDGE PRIOR TO UNDERTAKING THE TENSIONING PROCEDURE. MEASUREMENTS FROM THE FACE OF THE WEDGE TO THE MARKING SHALL BE TAKEN AT 25%, 50%, 75%, 100% AND 125% AS THE STRAND IS PROGRESSIVELY TENSIONED TO THE PROOF LOAD. RESULTS OF THE MEASUREMENTS SHALL BE PROVIDED TO THE ENGINEER FOR COMPARISON AGAINST THEORETICAL EXTENSIONS.
11. EACH ANCHOR SHALL BE PROOF LOADED I.E. STRESSED TO 125% OF THE WORKING LOAD, HELD FOR FIVE MINUTES, AND SLOWLY EASED BACK. THE ANCHOR SHALL BE THEN STRESSED TO WORKING LOAD AND LOCKED OFF. ANY ANCHOR WHICH FAILS TO HOLD THE LOAD SHALL BE REMOVED AND REPLACED WITH ANOTHER ANCHOR. SUCH WORK SHALL BE CARRIED OUT IN THE PRESENCE OF AN ENGINEER.
12. STRANDS WHICH EXTEND EXCESSIVELY BEYOND THE FACE OF THE PILE MAY BE CUT TO A MINIMUM LENGTH OF 300mm + THE EXTENSION LENGTH FROM THE PILE FACE.
13. ALL ANCHORS TO BE TESTED USING THE INDUSTRY STANDARD 'WEDGE LIFT-OFF' TEST METHODOLOGY AND IN ADDITION 10% OF ALL ANCHORS TO BE ADDITIONALLY TESTED USING THE 'ANCHOR LIFT-OFF' TESTING METHODOLOGY IMMEDIATELY FOLLOWING LOCK-OFF OF THE ANCHORS.
14. ALL ROCK ANCHORS TO BE INSPECTED BY GEOTECHNICAL ENGINEER DURING INSTALLATION TO CONFIRM CORRECT INSTALLATION AND ANCHOR LOADS ACHIEVED.
15. MINIMUM DESIGN LIFE OF ALL TEMPORARY ROCK ANCHORS TO BE 2 YEARS OR AS NOMINATED BY BUILDER.
16. THE BUILDER SHALL KEEP ON SITE AN ADEQUATE SUPPLY OF ANCHOR CABLES, GROUT ETC. FOR EMERGENCY USE.
17. THE BUILDER SHALL REGULARLY MONITOR THE STRESS IN THE ANCHORS REGULARLY BY MEANS OF A LIFT OFF TEST TO ENSURE NO MAJOR LOSSES ARE OCCURRING. IF STRESS LOSSES ARE DETECTED THEY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.

ROCK ANCHORS - SOLID BAR

1. IN ADDITION TO ANY NOTES PROVIDED BELOW AND DETAILS SHOWN ON THESE DRAWINGS, ALL ROCK BOLTS ARE TO BE INSTALLED IN ACCORDANCE WITH AS 4678 AND TRANSPORT FOR NSW QA SPECIFICATION R64.
2. ROCKS BOLTS MUST BE STEEL REINFORCEMENT BARS GRADE 500N DEFORMED BAR TO AS4671. THE BOLTS MUST BE THREADED AT ONE END TO SUIT ISO COARSE PITCH THREAD TO AS1275.
3. ALL STEEL COMPONENTS OF THE ROCK BOLT SYSTEM, INCLUDING THE BOLT, BEARING PLATES, WASHERS AND NUTS MUST BE HOT-DIP GALVANISED TO AS/NZS4680 WITH A MINIMUM AVERAGE COATING WEIGHT OF 600 G/M2/.
4. ALL STEEL ELEMENTS, INCLUDING BEARING PLATES AND WASHERS, MUST BE FABRICATED FROM GRADE 250 STEEL IN ACCORDANCE WITH AS3678. NUTS FOR THE ROCK BOLTS MUST BE GRADE C COMPLYING WITH AS1112.3 AND PROPERTY CLASS 5 COMPLYING WITH AS 4291.2 OR EQUIVALENT TO SUIT THE END THREAD OF THE BOLT.
5. THE USE OF COUPLERS TO THE ROCK BOLTS IS NOT PERMITTED.
6. PRIOR TO ANY DRILLING OPERATIONS, THE BUILDER SHALL ACQUAINT THEMSELVES WITH ALL ADJACENT UNDERGROUND SERVICES AND ENSURE THAT NONE OF THESE ARE DISRUPTED BY ROCK ANCHORS. ALL APPROPRIATE APPROVALS, PERMITS AND AGREEMENTS SHALL BE OBTAINED BEFORE COMMENCEMENT OF THE WORK.
7. BORE HOLES FOR THE ROCK BOLTS MUST BE DRILLED USING ROTARY OR ROTARY PERCUSSION DRILLING EQUIPMENT. DRILLING FLUIDS AND CORE DRILLING ARE NOT PERMITTED. BORE HOLES MUST BE INSTALLED WITH A MAXIMUM DEVIATION FROM THE DESIGN INCLINATION IN ANY DIRECTION OF 2° AND A MAXIMUM DEVIATION FROM THE ENTRY POINT OF +/- 25mm.
8. CENTRALISERS MUST BE PROVIDED ALONG THE LENGTH OF THE BOLT AT 2000mm CENTRES AND 300mm FROM EACH END TO ENSURE THE BOLT IS CENTRALISED TO THE CENTRE OF THE BOREHOLE. THE CENTRALISERS MUST BE; NON-CORRODIBLE, FIRMLY FIXED TO THE BOLT AND A SHAPE THAT PERMITS THE FREE FLOW OF GROUT TO FULLY ENCAPSULATE THE BOLT.
9. GROUT TUBES MUST EXTEND TO THE BASE OF THE LOWEST PORTION OF THE BORE HOLE AND BE SECURELY FIXED TO THE ROCK BOLT. TUBING MUST BE OF ADEQUATE STRENGTH TO RESIST ANY DAMAGE DURING INSTALLATION AND GROUTING AND BE OF SUFFICIENT SIZE TO ALLOW PUMPING OF GROUT.
10. MATERIAL PROPERTIES OF THE GROUT MUST CONFORM TO TABLE R64.1 OF TFNSW QA SPECIFICATION R64. GROUTS MUST GENERALLY HAVE A HIGH BLEED RESISTANCE, LOW SHRINKAGE AND HIGH FLUIDITY. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF S20MPA AT THREE (3) DAYS. GROUT CYLINDERS SHALL BE TAKEN ON THE BASIS OF ONE SAMPLE (TWO CYLINDERS) FOR EVERY TEN ANCHORS AND TESTED ON THE DAY OF STRESSING. THE GROUT SHALL BE MIXED IN A HIGH SPEED IMPELLER TYPE MACHINE.
11. A MINIMUM OF 1% OF THE ROCK BOLTS MUST BE TESTED IN ACCORDANCE WITH THE “SUITABILITY TEST” AND A MINIMUM OF 3% OF THE ROCK BOLTS MUST BE TESTED IN ACCORDANCE WITH THE “ACCEPTANCE TEST” AS DEFINED IN TRANSPORT FOR NSW QA SPECIFICATION R64.
12. RE-BOLTING OF THE ROCK BOLTS AT THE DISCRETION OF THE GEOTECHNICAL AND STRUCTURAL ENGINEERS MAY BE REQUIRED WHERE THE BOLT BECOMES OVERSTRESSED DURING EXCAVATION OR EXCESSIVE DEFORMATION OF ANY INCLINED ROCK BEDS EXISTS.

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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

REV	DATE	REVISION DESCRIPTION	BY
P4	25.05.21	ISSUED FOR PRELIMINARY INFORMATION	AV
P3	12.04.21	ISSUED FOR PRELIMINARY INFORMATION	AV
P2	11.09.20	ISSUED FOR PRELIMINARY INFORMATION	AV
P1	14.07.20	ISSUED FOR PRELIMINARY INFORMATION	AV

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DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

SITE RETENTION NOTES

JOB NUMBER:	20025
DRG NUMBER:	S01.101
DESIGNED BY:	RC
DATE:	
DRAWN BY:	AV
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REV:	P4

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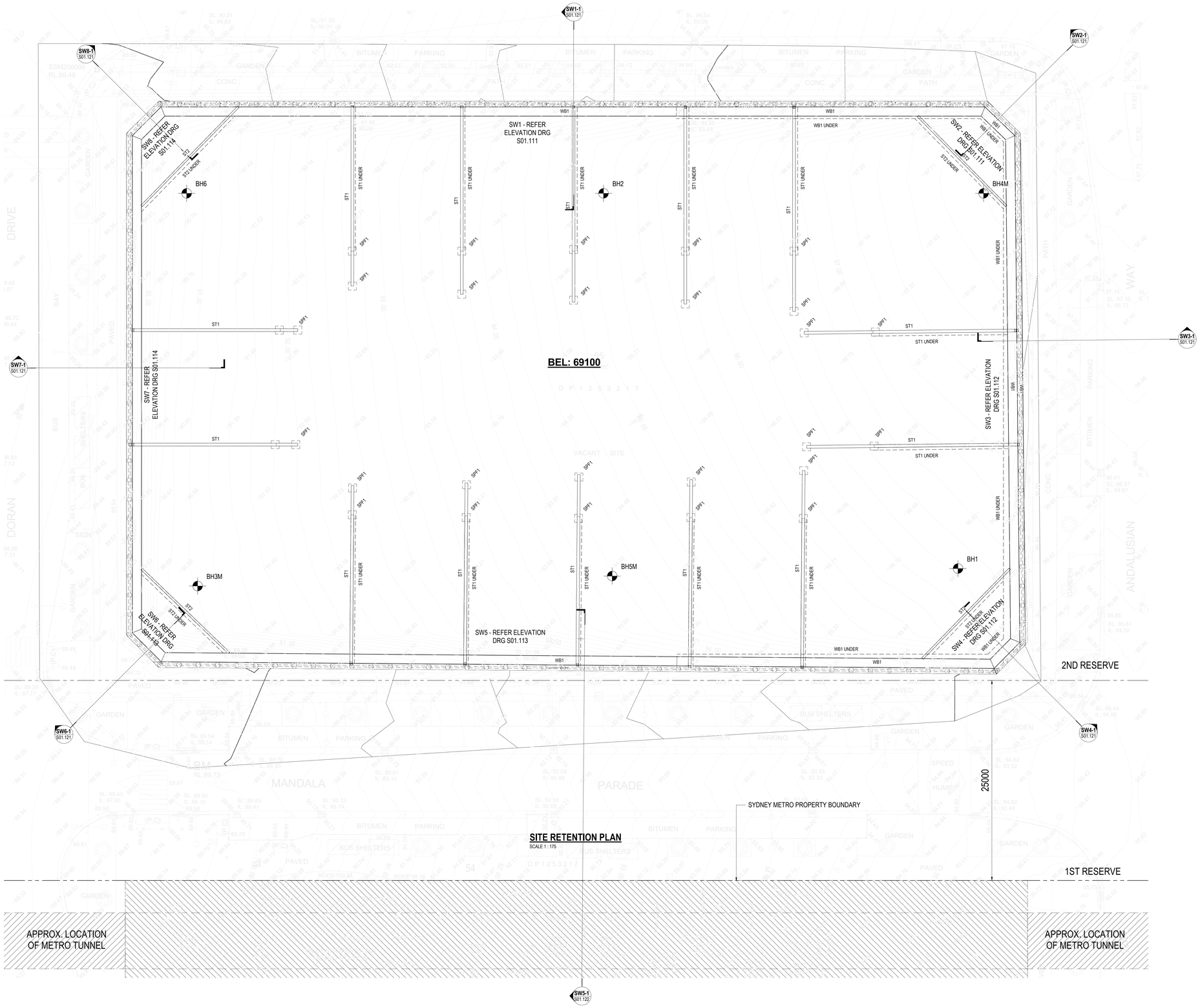

SITE RETENTION PLAN

SCALE 1 : 175

PRELIMINARY ISSUE
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P3	17.09.20	ISSUED FOR PRELIMINARY INFORMATION	AV
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SITE RETENTION PLAN

JOB NUMBER:	DRG NUMBER:	
20025	S01.105	
DESIGNED BY:	DATE:	
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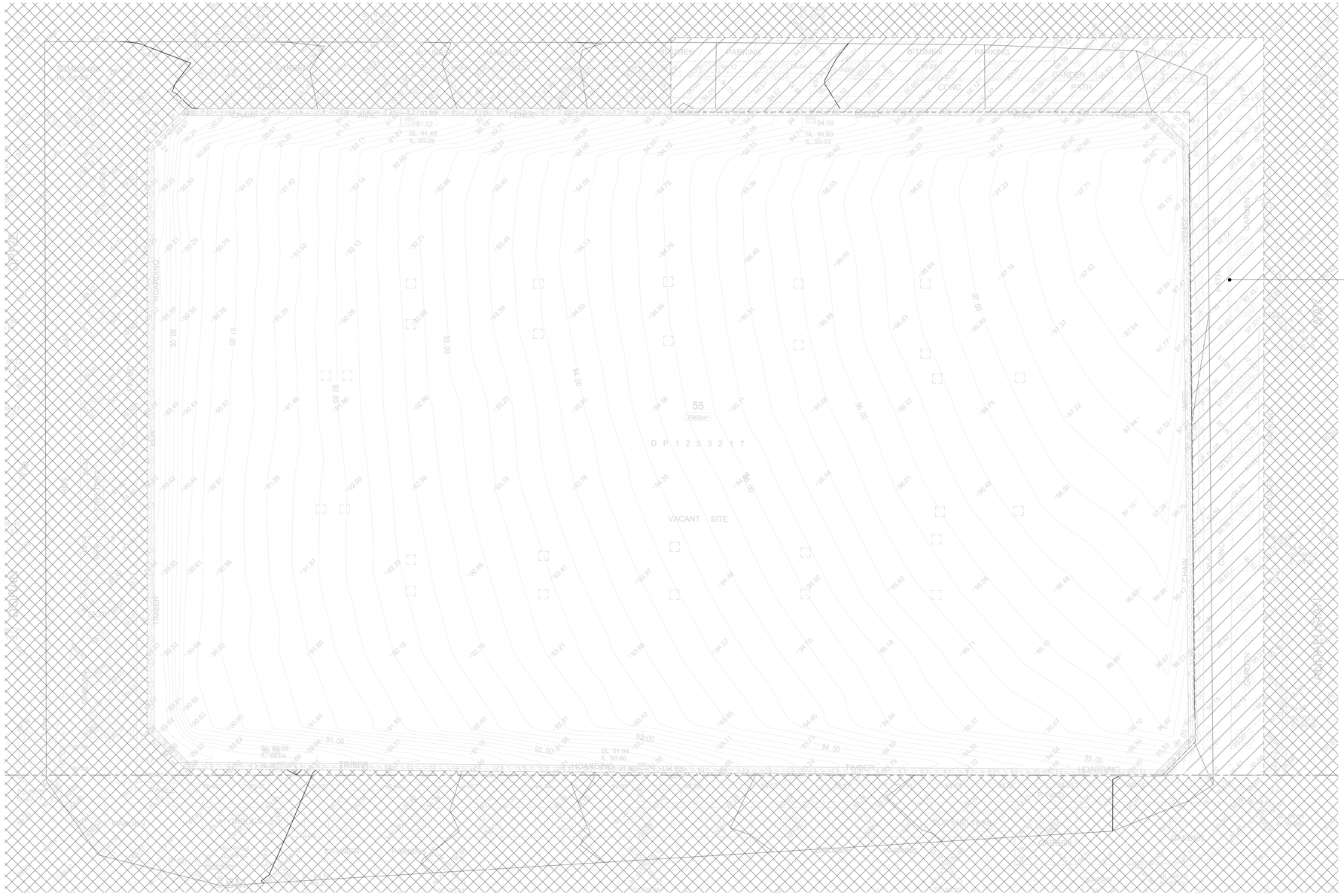

SHORING SURCHARGE KEY

5 kPa SURCHARGE LOADING

20 kPa SURCHARGE LOADING

SHORING SURCHARGE PLAN
SCALE 1 : 175

PRELIMINARY ISSUE
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REV	DATE	REVISION DESCRIPTION	BY
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SHORING SURCHARGE LOADING PLAN

JOB NUMBER:	20025
DRG NUMBER:	S01.106
DESIGNED BY:	RC
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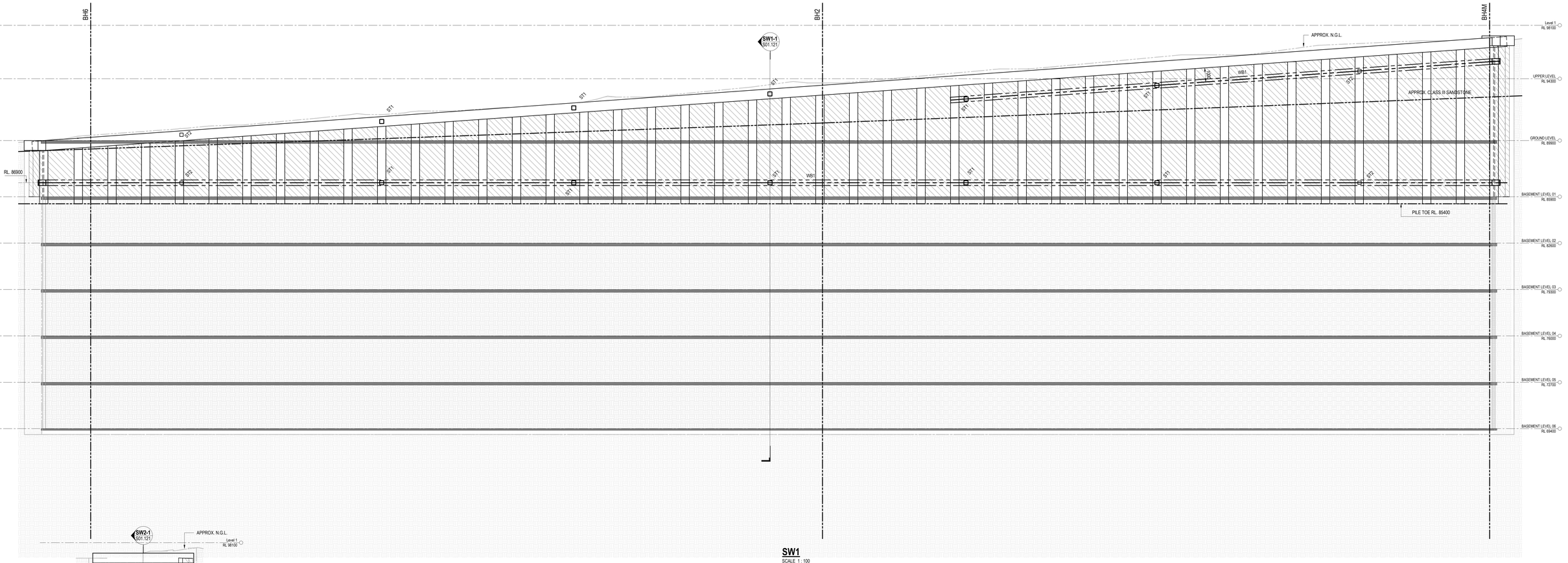

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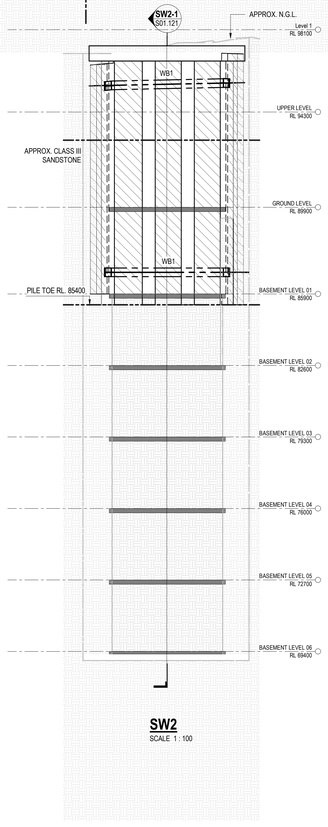


SW2
SCALE 1 : 100

SHORING PILE SCHEDULE			
MARK	DIA.	VERT. BARS	TIES
SP1	600	8N32	N16-150

STEELWORK MEMBER SCHEDULE		
MARK	SIZE	COMMENTS
ST1	350 x 350 x 12 SHS	ADDITIONAL CROSS BRACING REQUIRED. DETAILS TBC
ST2	250 x 250 x 10 SHS	ADDITIONAL CROSS BRACING REQUIRED. DETAILS TBC
WB1	1200 WB 342	

HATCH DENOTES EXTENT OF 180mm THK SHOTCRETE BETWEEN SHORING PILES

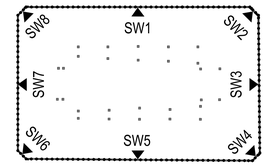
HATCH DENOTES EXPOSED ROCK FACE TO BE RETAINED WITH SHOTCRETE AND ROCKBOLTS TO GEOTECHNICAL ENG. DETAILS

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

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRAWING S01.101 - SITE RETENTION PLAN FOR SHORING PILE SETOUT DIMENSIONS.

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

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



KEY PLAN
SCALE 1 : 1000

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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DORAN DRIVE PRECINCT
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CASTLE HILL

SHORING WALL ELEVATIONS
SW1 & SW2

JOB NUMBER:	DRG NUMBER:	
20025	S01.111	
DESIGNED BY: RC	DATE:	
DRAWN BY: AV	SCALE: 1:100, 1:1000 @ A0	SIZE: A0 / REV: P5

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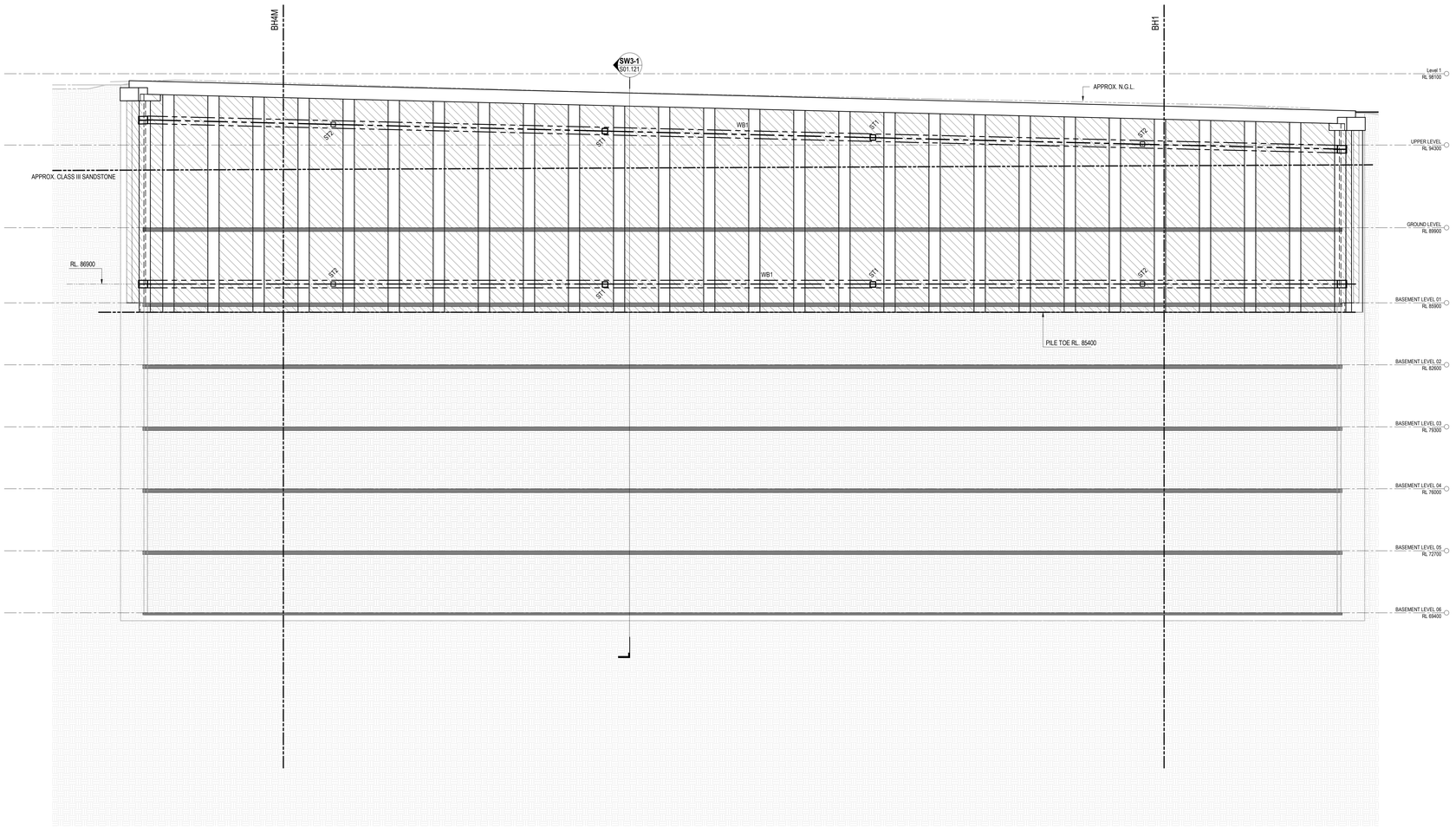

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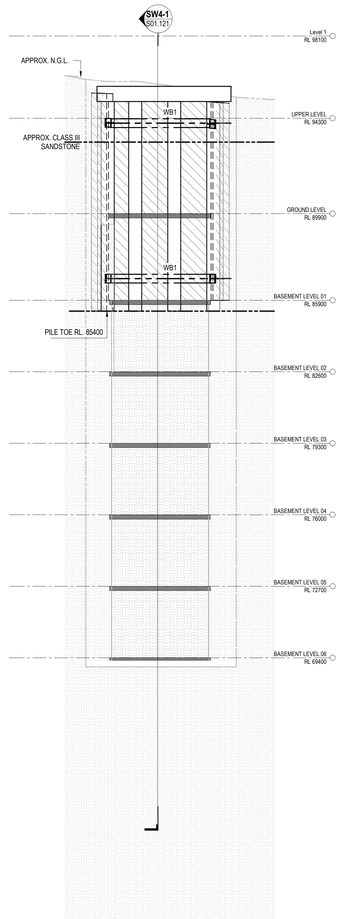


SW4
SCALE 1 : 100

SHORING PILE SCHEDULE			
MARK	DIA.	VERT. BARS	TIES
SP1	600	8N32	N16-150

STEELWORK MEMBER SCHEDULE		
MARK	SIZE	COMMENTS
ST1	350 x 350 x 12 SHS	ADDITIONAL CROSS BRACING REQUIRED. DETAILS TBC
ST2	250 x 250 x 10 SHS	ADDITIONAL CROSS BRACING REQUIRED. DETAILS TBC
WB1	1200 WB 342	

HATCH DENOTES EXTENT OF 180mm THK SHOTCRETE BETWEEN SHORING PILES

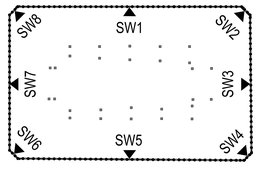
HATCH DENOTES EXPOSED ROCK FACE TO BE RETAINED WITH SHOTCRETE AND ROCKBOLTS TO GEOTECHNICAL ENG. DETAILS

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

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRAWING S01.101 - SITE RETENTION PLAN FOR SHORING PILE SETOUT DIMENSIONS.

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

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



KEY PLAN
SCALE 1 : 1000

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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

REV	DATE	REVISION DESCRIPTION	BY
P5	25.05.21	ISSUED FOR PRELIMINARY INFORMATION	AV
P4	12.04.21	ISSUED FOR PRELIMINARY INFORMATION	AV
P3	17.09.20	ISSUED FOR PRELIMINARY INFORMATION	AV
P2	11.09.20	ISSUED FOR PRELIMINARY INFORMATION	AV
P1	14.07.20	ISSUED FOR PRELIMINARY INFORMATION	AV

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NORTH RYDE BC NSW 1670

DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

SHORING WALL ELEVATIONS
SW3 & SW4

JOB NUMBER:	DRG NUMBER:	
20025	S01.112	
DESIGNED BY: RC	DATE:	
DRAWN BY: AV	SCALE: 1:100, 1:1000 @ A0	SIZE: A0 / REV: P5

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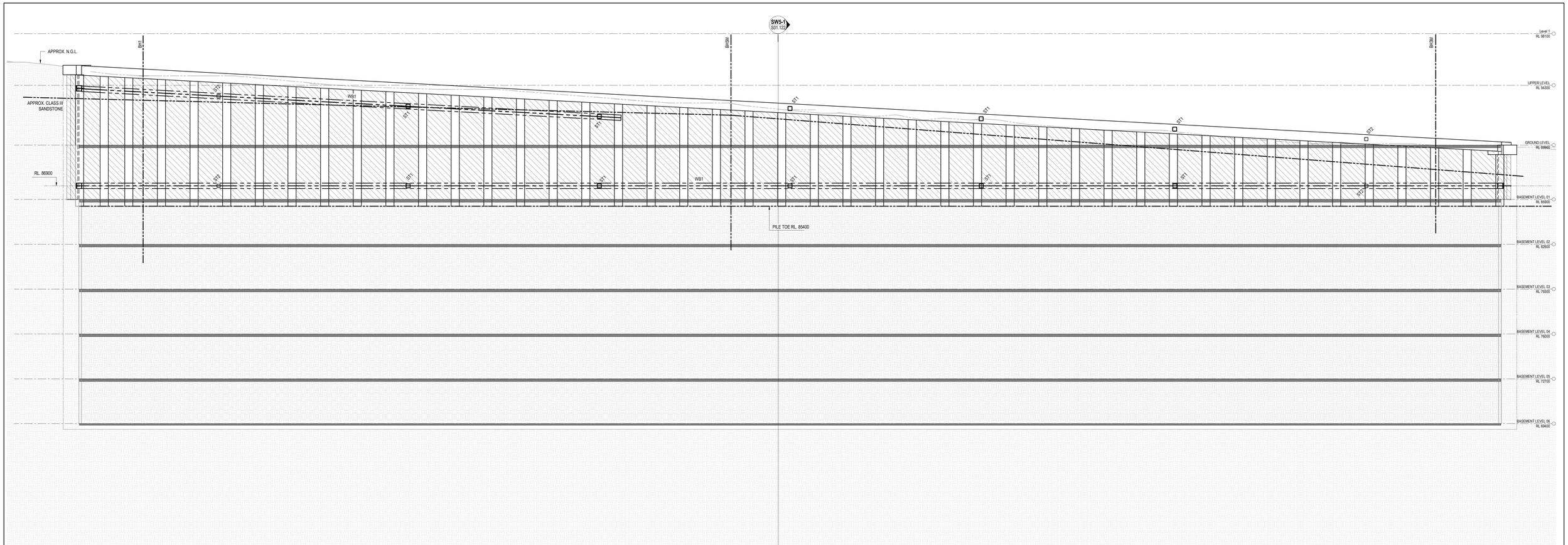
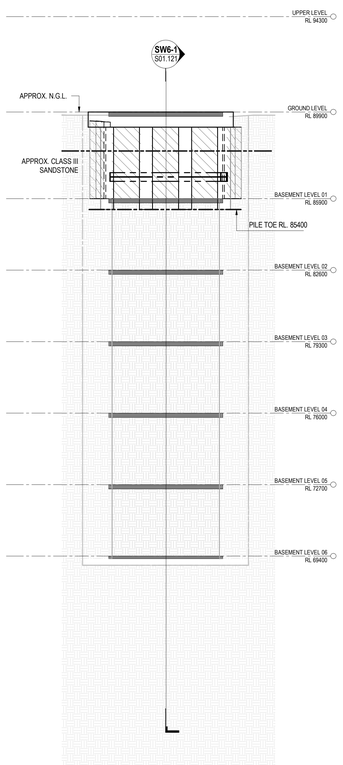


SW5
SCALE 1 : 100



SW6
SCALE 1 : 100

SHORING PILE SCHEDULE			
MARK	DIA.	VERT. BARS	TIES
SP1	600	8N32	N16-150

HATCH DENOTES EXTENT OF 180mm THK SHOTCRETE BETWEEN SHORING PILES

HATCH DENOTES EXPOSED ROCK FACE TO BE RETAINED WITH SHOTCRETE AND ROCKBOLTS TO GEOTECHNICAL ENG. DETAILS

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

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH DRAWING S01.101 - SITE RETENTION PLAN FOR SHORING PILE SETOUT DIMENSIONS.

STEELWORK MEMBER SCHEDULE		
MARK	SIZE	COMMENTS
ST1	350 x 350 x 12 SHS	ADDITIONAL CROSS BRACING REQUIRED. DETAILS TBC
ST2	250 x 250 x 10 SHS	ADDITIONAL CROSS BRACING REQUIRED. DETAILS TBC
WB1	1200 WB 342	

NOTE:
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NOTE:
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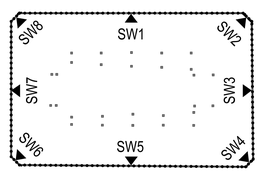

KEY PLAN
SCALE 1 : 1000

PRELIMINARY ISSUE
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P2	11.09.20	ISSUED FOR PRELIMINARY INFORMATION	AV
P1	14.07.20	ISSUED FOR PRELIMINARY INFORMATION	AV

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DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

SHORING WALL ELEVATIONS
SW5 & SW6

JOB NUMBER:	DRG NUMBER:
20025	S01.113
DESIGNED BY:	DATE:
RC	
DRAWN BY:	SCALE:
AV	1:100, 1:1000 @ A0

SIZE: A0 REV: P5

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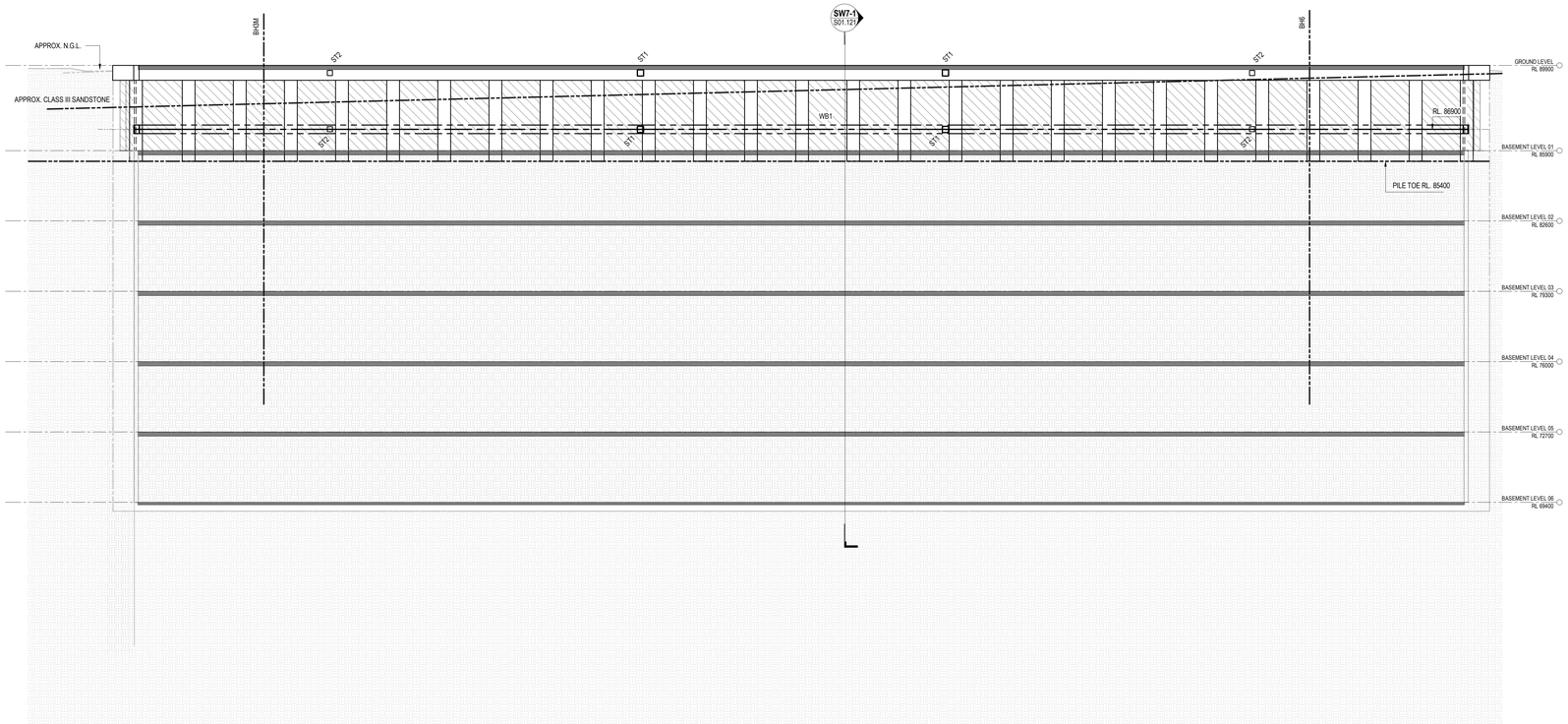
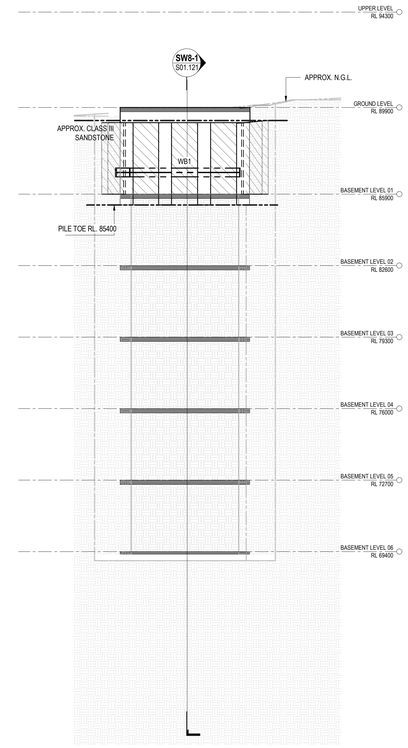


SW7
SCALE 1 : 100



SW8
SCALE 1 : 100

SHORING PILE SCHEDULE			
MARK	DIA.	VERT. BARS	TIES
SP1	600	8N32	N16-150

HATCH DENOTES EXTENT OF 180mm THK SHOTCRETE BETWEEN SHORING PILES

HATCH DENOTES EXPOSED ROCK FACE TO BE RETAINED WITH SHOTCRETE AND ROCKBOLTS TO GEOTECHNICAL ENG. DETAILS

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STEELWORK MEMBER SCHEDULE		
MARK	SIZE	COMMENTS
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ST2	250 x 250 x 10 SHS	ADDITIONAL CROSS BRACING REQUIRED. DETAILS TBC
WB1	1200 WB 342	

NOTE:
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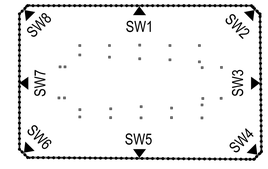

KEY PLAN
SCALE 1 : 1000

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

SHORING WALL ELEVATIONS
SW7 & SW8

JOB NUMBER:	DRG NUMBER:	
20025	S01.114	
DESIGNED BY:	DATE:	
RC		
DRAWN BY:	SCALE:	SIZE: / REV:
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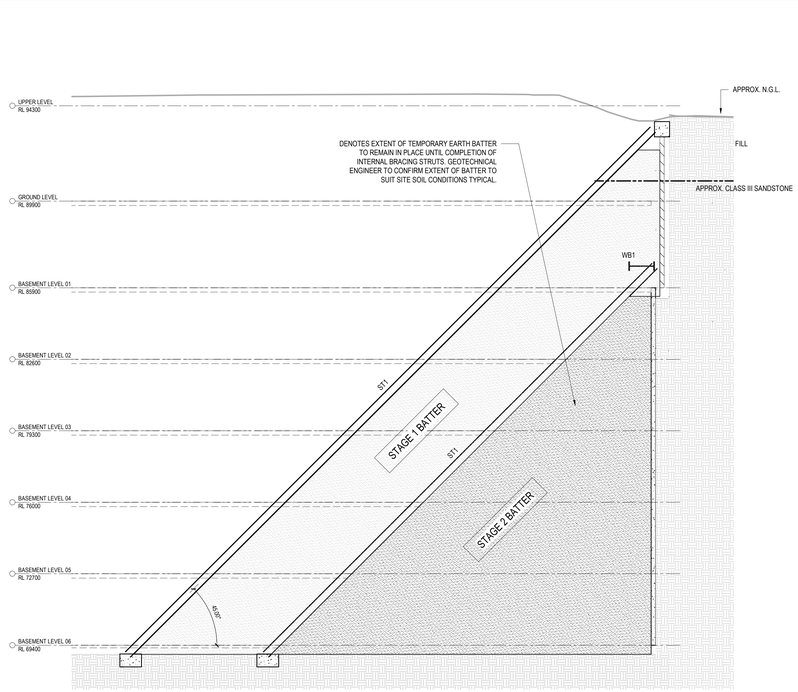

SECTION SW1-1
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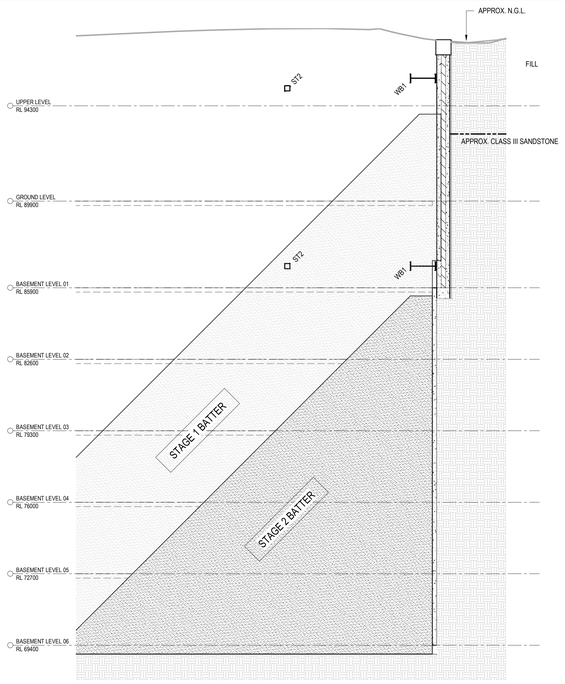

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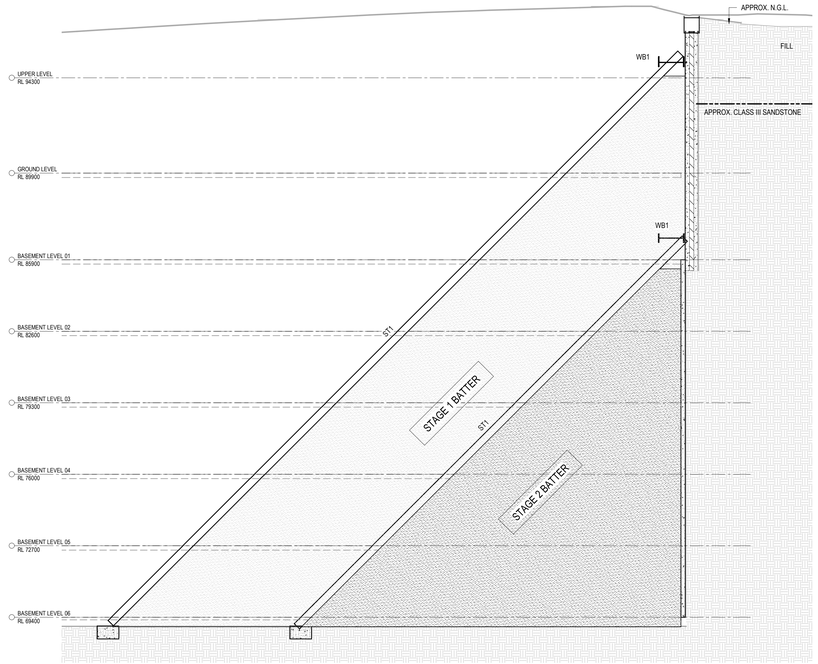
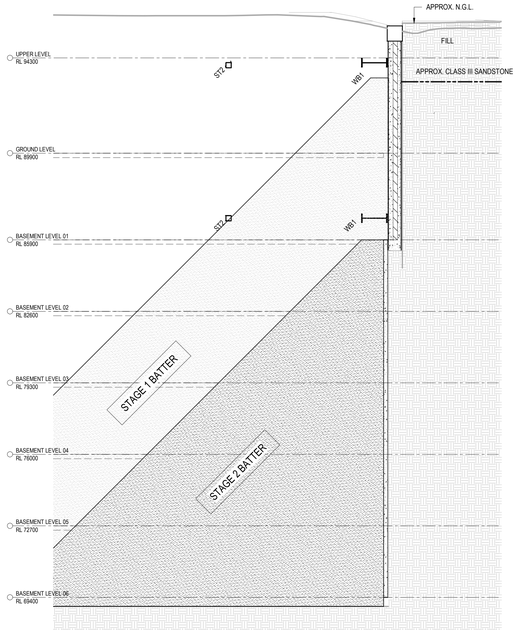
Scale 1 : 100 (S01.105)



SECTION SW3-1
Scale 1 : 100 (S01.105)



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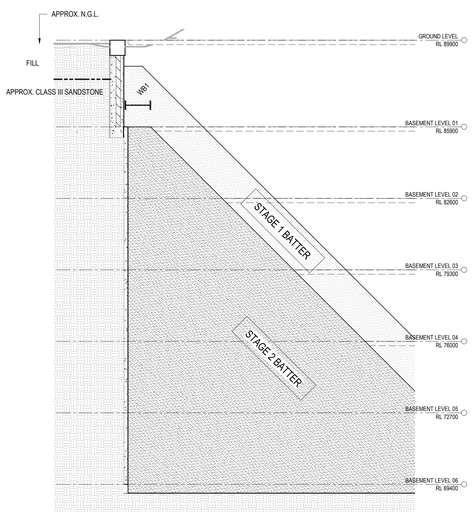

SECTION SW6-1
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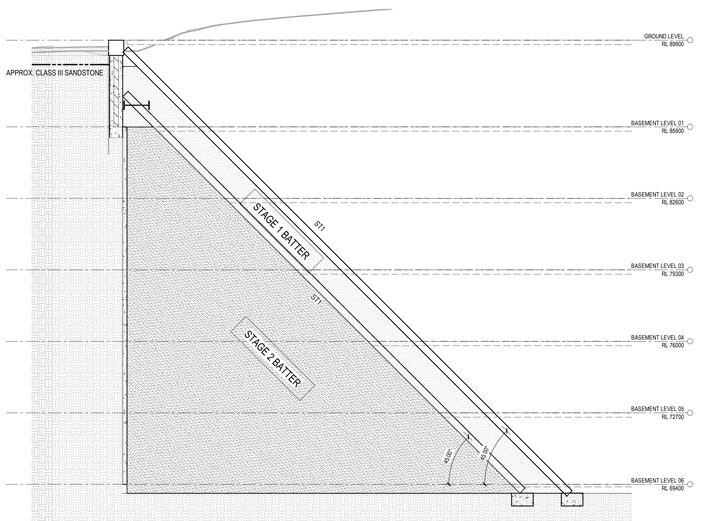
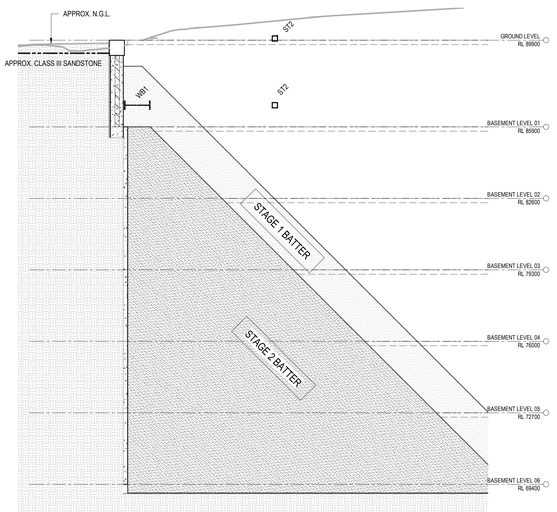


SECTION SW7-1
Scale 1 : 100 (S01.105)



SECTION SW8-1
Scale 1 : 100 (S01.105)

PRELIMINARY ISSUE
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P2	11.09.20	ISSUED FOR PRELIMINARY INFORMATION	AV
P1	14.07.20	ISSUED FOR PRELIMINARY INFORMATION	AV

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DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

SHORING SECTIONS
SHEET 1

JOB NUMBER:	DRG NUMBER:
20025	S01.121
DESIGNED BY: RC	DATE:
DRAWN BY: AV	SCALE: 1:100 @ A0
	SIZE: A0
	REV: P5

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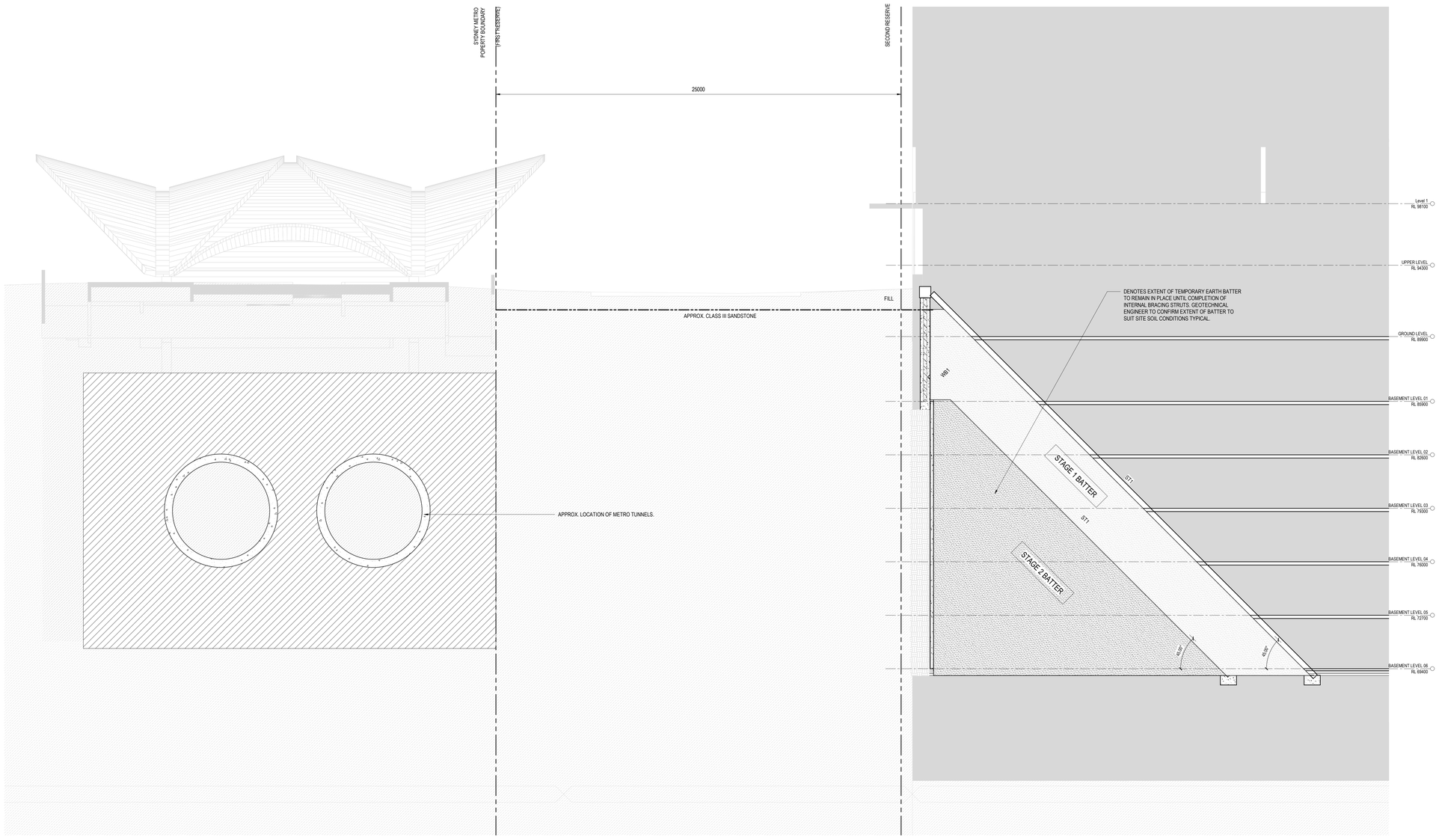

SECTION SW5-1
Scale 1 : 100 S01.105

PRELIMINARY ISSUE
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P2	11.09.20	ISSUED FOR PRELIMINARY INFORMATION	AV
P1	14.07.20	ISSUED FOR PRELIMINARY INFORMATION	AV

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DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

SHORING SECTIONS
SHEET 2

JOB NUMBER:	20025
DRG NUMBER:	S01.122
DESIGNED BY:	RC
DATE:	
DRAWN BY:	AV
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REV:	P5

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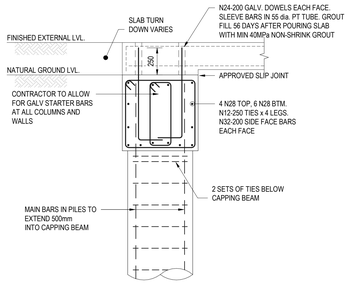
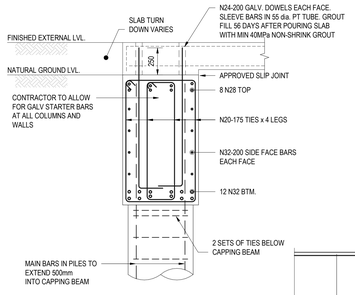


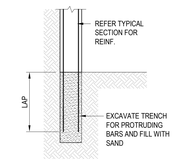
CAPPING BEAM - CB1

NOTE: SHOTCRETE WALL OMITTED FOR CLARITY

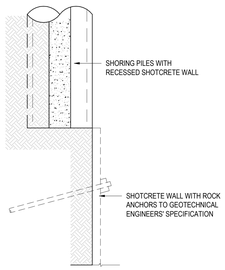


CAPPING BEAM - CB2

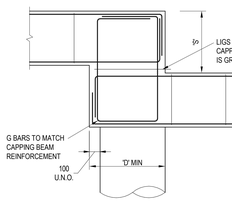
NOTE: SHOTCRETE WALL OMITTED FOR CLARITY



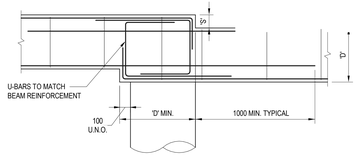
HORIZONTAL SHOTCRETE CONSTRUCTION JOINT



TYPICAL MID-LEVEL PILE BASE

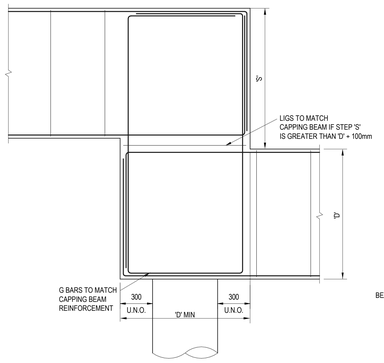


SETDOWN : 'S'= STEP GREATER THAN 'D'-50mm

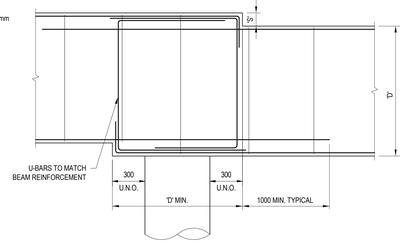


SETDOWN : 'S'= STEP LESS THAN 'D'-50mm

TYPICAL CAPPING BEAM STEP DETAILS - CB1

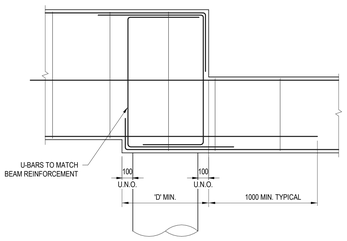


SETDOWN : 'S'= STEP GREATER THAN 'D'-50mm

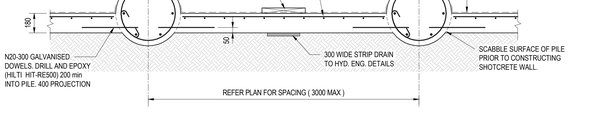


SETDOWN : 'S'= STEP LESS THAN 'D'-50mm

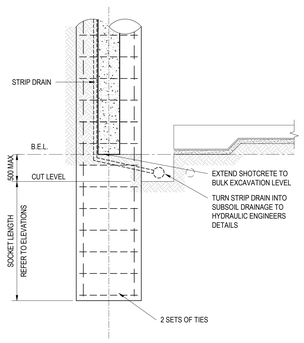
TYPICAL CAPPING BEAM STEP DETAILS - CB2



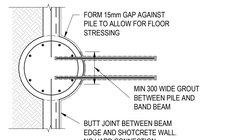
TYPICALCAPPING BEAM STEP DETAIL - CB1 TO CB2

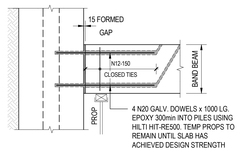


TYPICAL SHORING PILE & 180 THK SHOTCRETE WALL PLAN - 40MPa

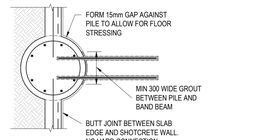


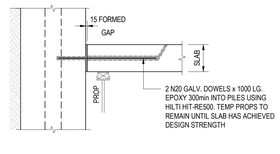
TYPICAL PILE SOCKET





TYPICAL PILE TO BAND BEAM CONNECTION DETAIL





TYPICAL PILE TO SLAB CONNECTION DETAIL

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

TYPICAL SITE RETENTION DETAILS
SHEET 1

JOB NUMBER:	DRG NUMBER:	
20025	S01.125	
DESIGNED BY: RC	DATE:	
DRAWN BY: AV	SCALE: 1:20 @ A0	SIZE: A0 / REV: P4

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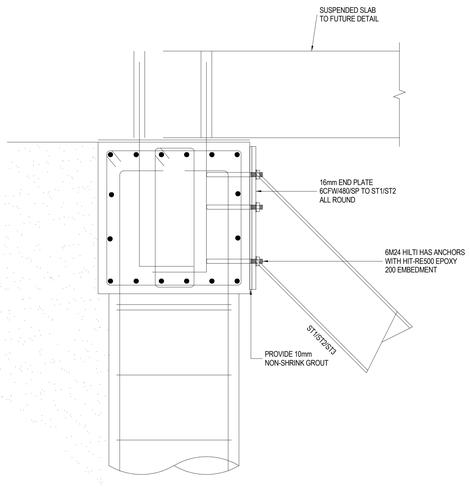
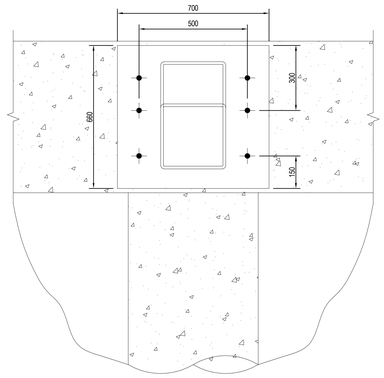
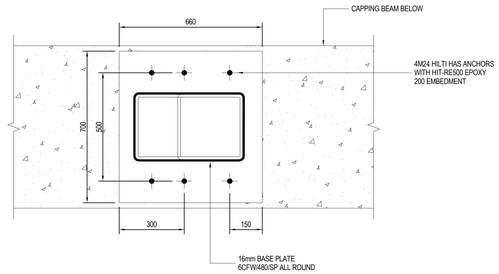


SECTION

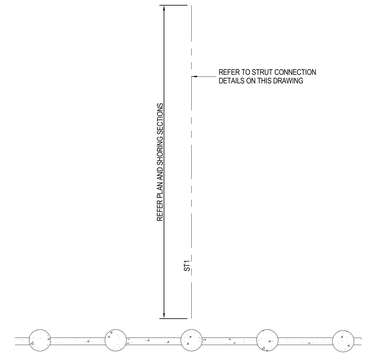


ELEVATION

STRUT TO CAPPING BEAM CONNECTION DETAIL
1:10



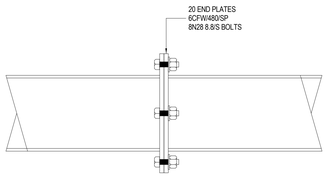
ST2 BASE PLATE PLAN VIEW
1:10



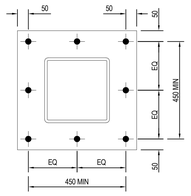
TYPICAL STRUT ARRANGEMENT PLAN
N.T.S

STRUCTURAL MEMBER SCHEDULE			
MARK	DESCRIPTION	SIZE	COMMENTS
ST1	STRUT BEAM	350 x 350 x 12.5 SHS	GRADE C350 45° ± 2.5°
ST2	STRUT BEAM	250 x 250 x 10.0 SHS	GRADE C350 45° ± 2.5°

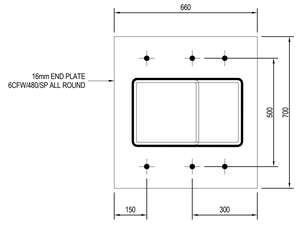
NOTE: ALL EXTERNAL STEEL TO BE HOT DIPPED GALVANISED



ELEVATION VIEW

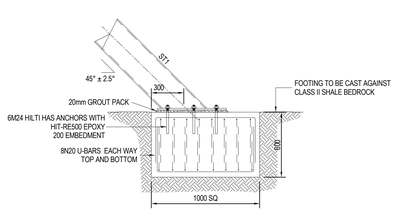


END PLATE VIEW

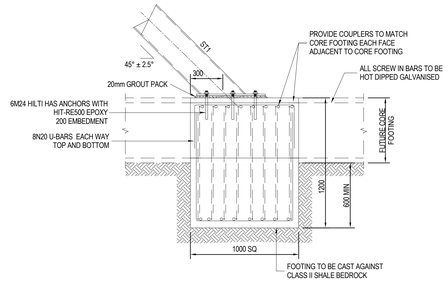


END PLATE PLAN VIEW
1:10

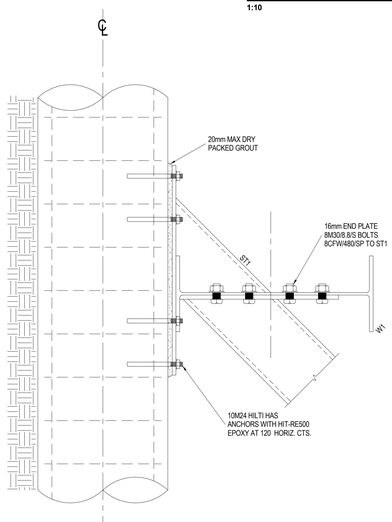
OPTIONAL STRUT SPLICE DETAIL
1:10



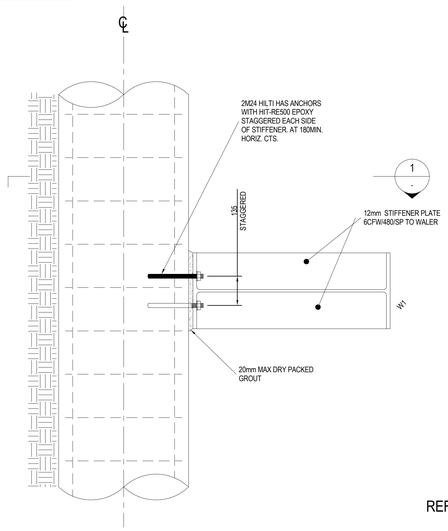
TYPICAL STRUT PAD FOOTING DETAIL SPF1
1:20



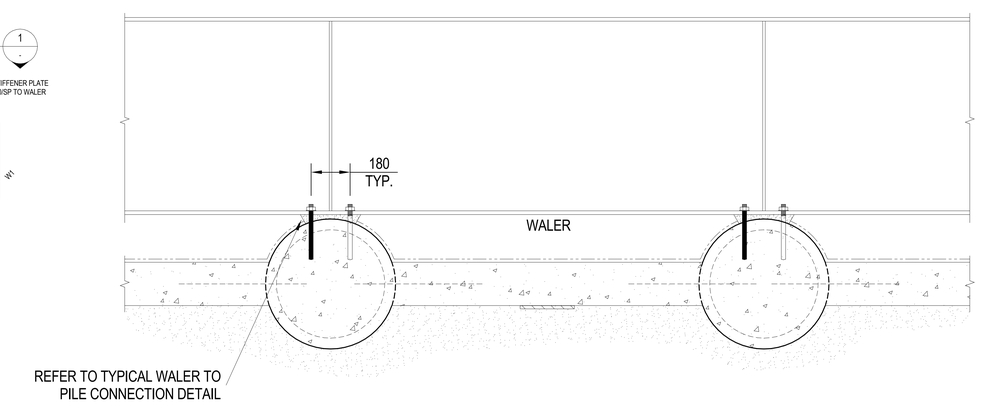
TYPICAL STRUT PAD FOOTING DETAIL SPF2
1:20



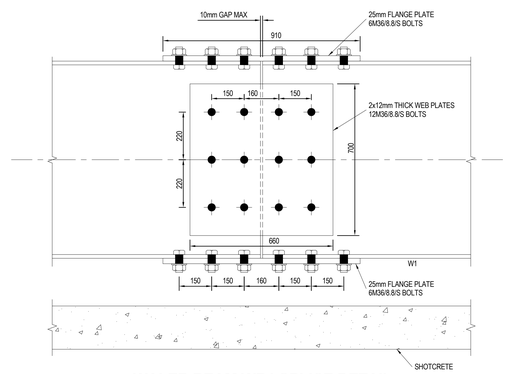
STRUT TO PILE CONNECTION DETAIL
N.T.S



WALER TO PILE CONNECTION DETAIL
N.T.S



SECTION 1/-
N.T.S



WALER BEAM WB1 SPLICE DETAIL
N.T.S

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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

REV	DATE	REVISION DESCRIPTION	BY
P1	25.05.21	ISSUED FOR PRELIMINARY INFORMATION	AV

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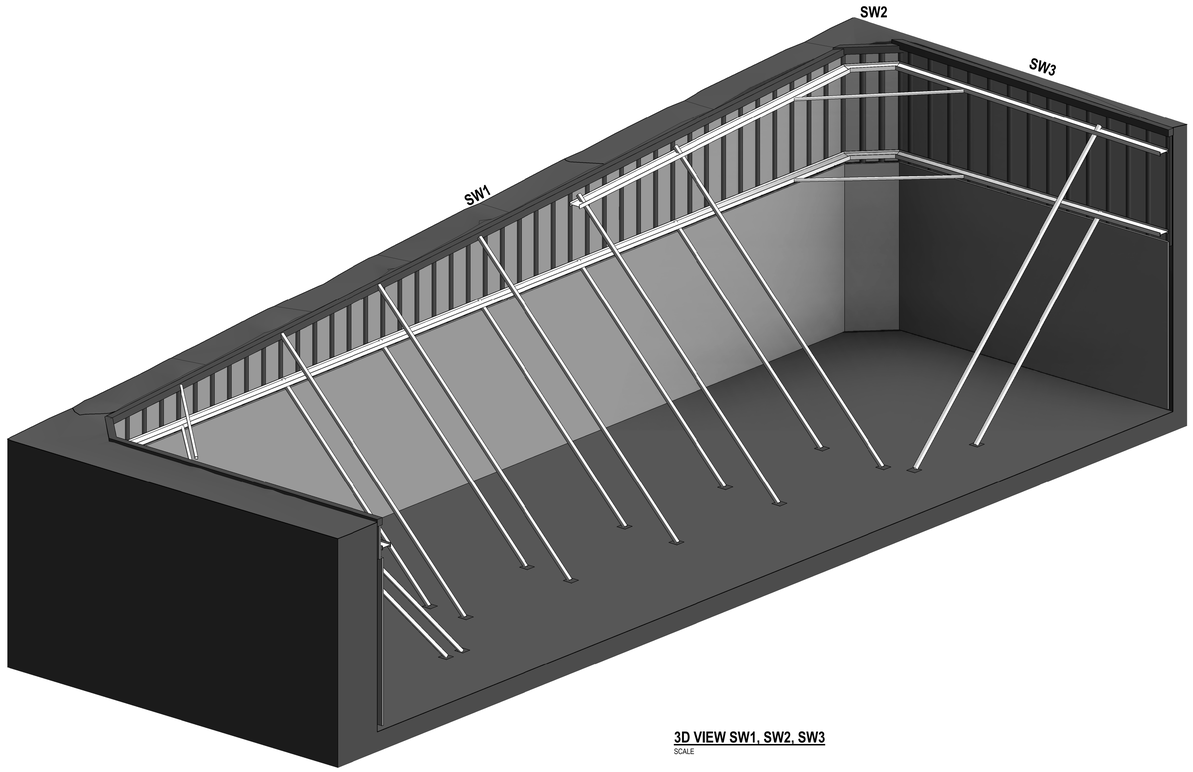
PO Box 77
NORTH RYDE BC NSW 1670

DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

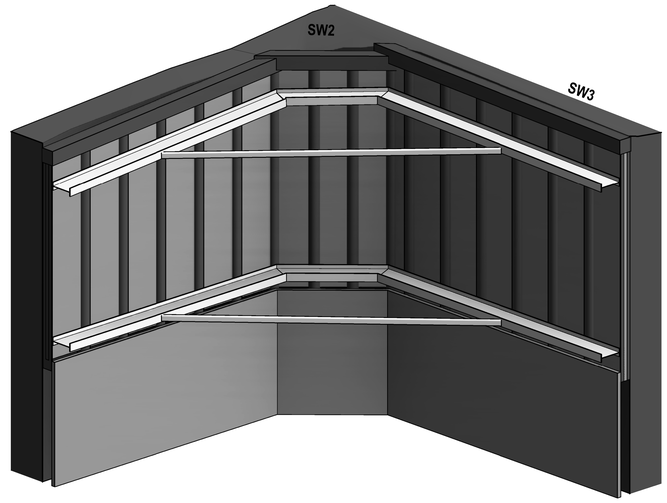
TYPICAL SITE RETENTION DETAILS
SHEET 2

JOB NUMBER:	DRG NUMBER:	
20025	S01.126	
DESIGNED BY:	DATE:	
RC		
DRAWN BY:	SCALE:	SIZE: / REV:
AV	1:10, 1:20 @ A0	A0 / P1

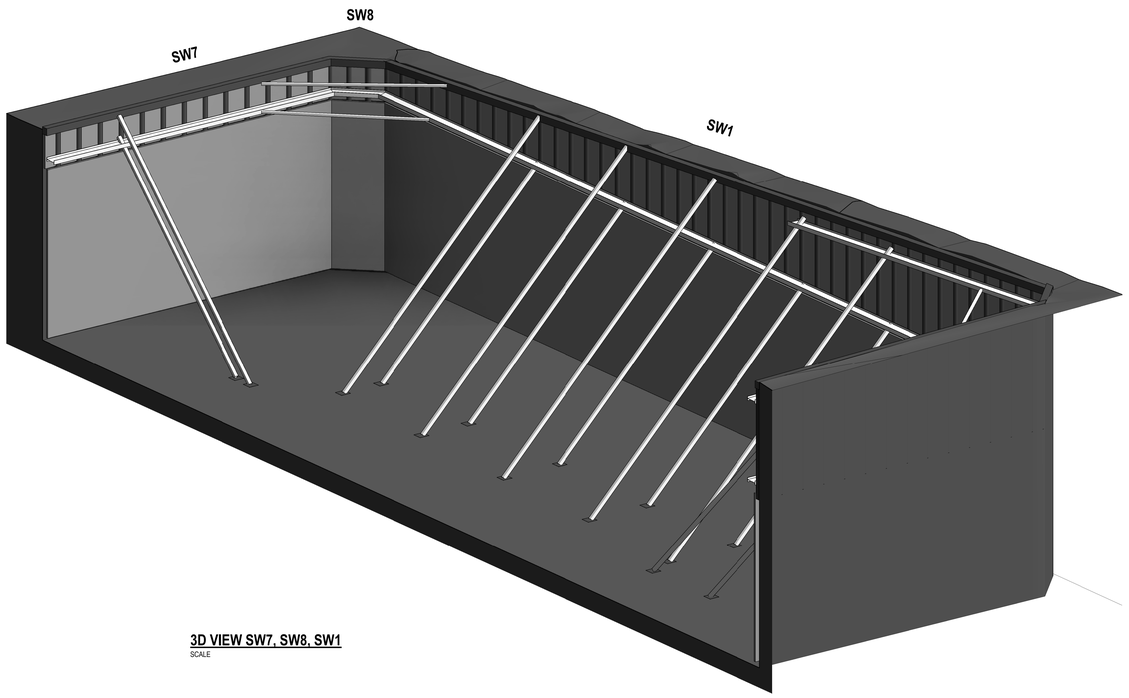
29/05/2021 11:19:22 AM



3D VIEW SW1, SW2, SW3
SCALE



3D VIEW SW2 CORNER STRUTS
SCALE



3D VIEW SW7, SW8, SW1
SCALE

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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REV	DATE	REVISION DESCRIPTION	BY
P1	25.05.21	ISSUED FOR PRELIMINARY INFORMATION	AV

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NORTH RYDE BC NSW 1670

DORAN DRIVE PRECINCT
2 MANDALA PARADE
CASTLE HILL

3D VIEW SW1, SW2, SW3

JOB NUMBER:	20025
DRG NUMBER:	S09.100
DESIGNED BY:	
DATE:	
DRAWN BY:	
SCALE:	1:100, 1:200 @ A0
SIZE:	A0
REV:	P1

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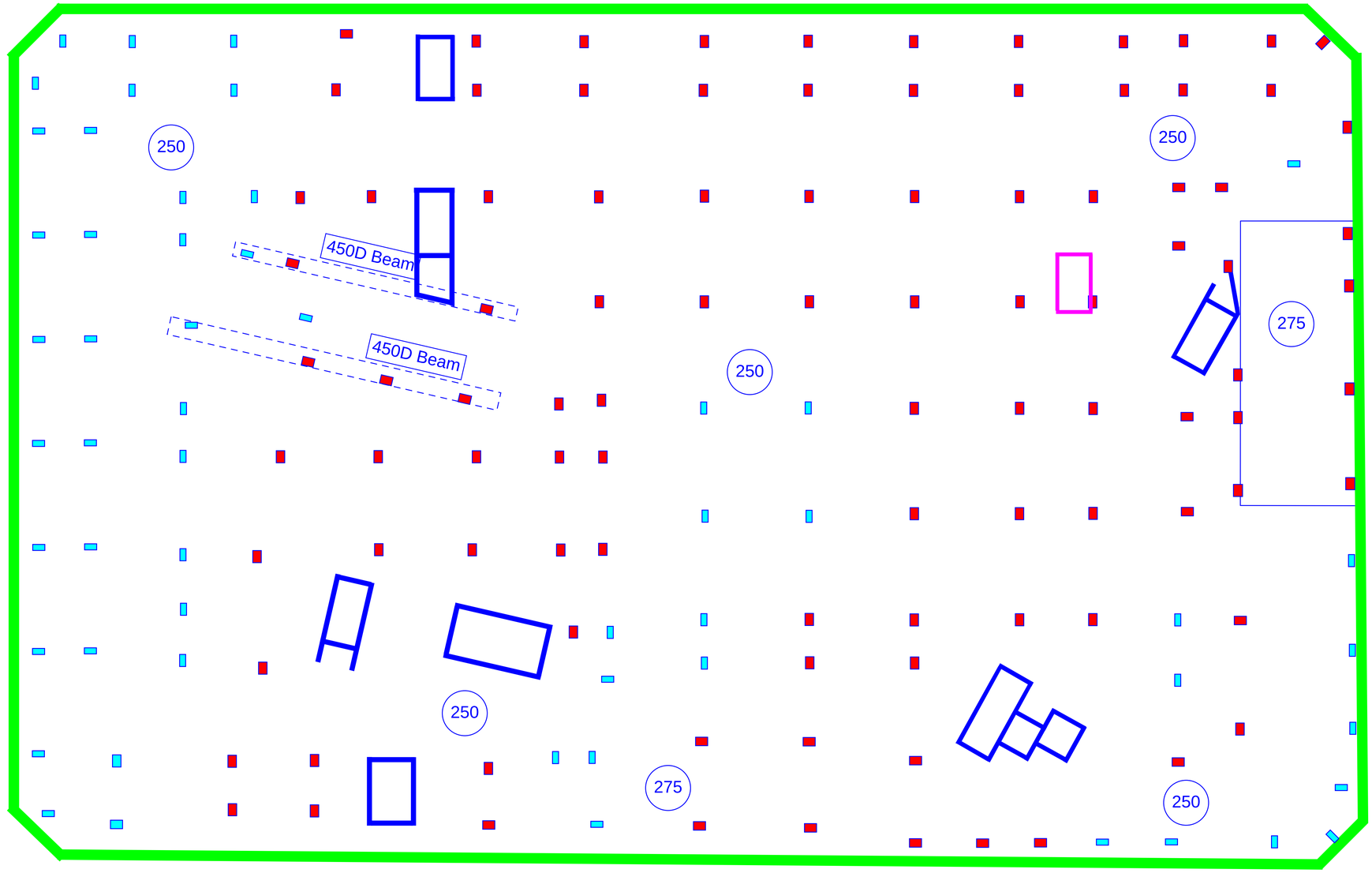

Preliminary Member Schedule:

- 1000x700 Column
- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
- 1000x500 Column
- 1500x250 Column
- 250 thk Wall
- 1000x250 Column
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- 200 thk Wall
- 2000x250 Column
- 300 thk Wall
- 1000x350 Column
- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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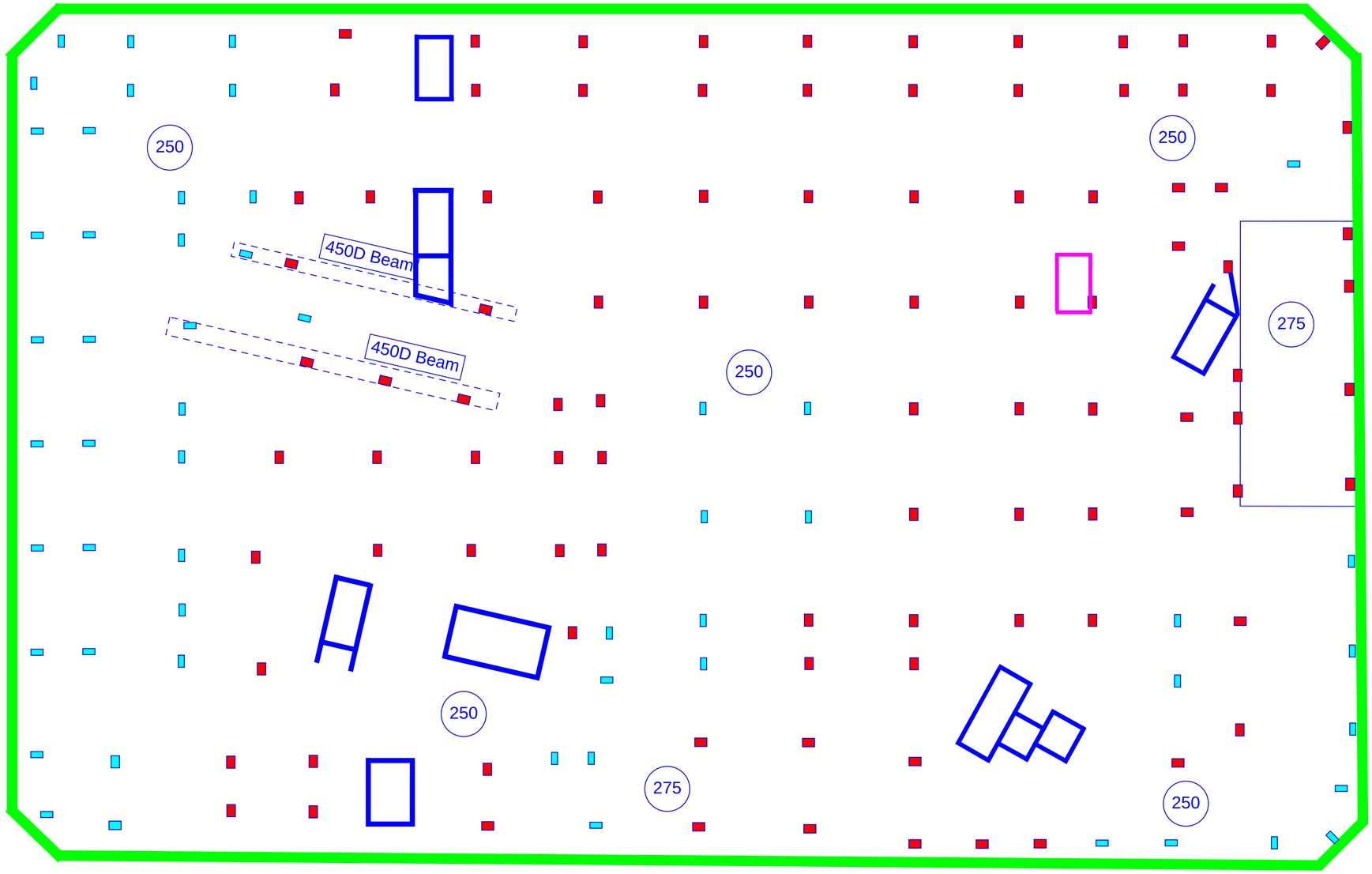
NORTH STRATHFIELD NSW 2137

PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level B5 Concrete Profile

JOB NUMBER:	DRG NUMBER:		
20025	SK-B5		
DESIGNED BY:	DATE:		
RC	July 20		
DRAWN BY:	SCALE:	SIZE:	REV:
RC	1:200@A1	A1	P12



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- 800 Thk Shoring Wall Zone (600 pile + tolerance)
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- 1000x350 Column
- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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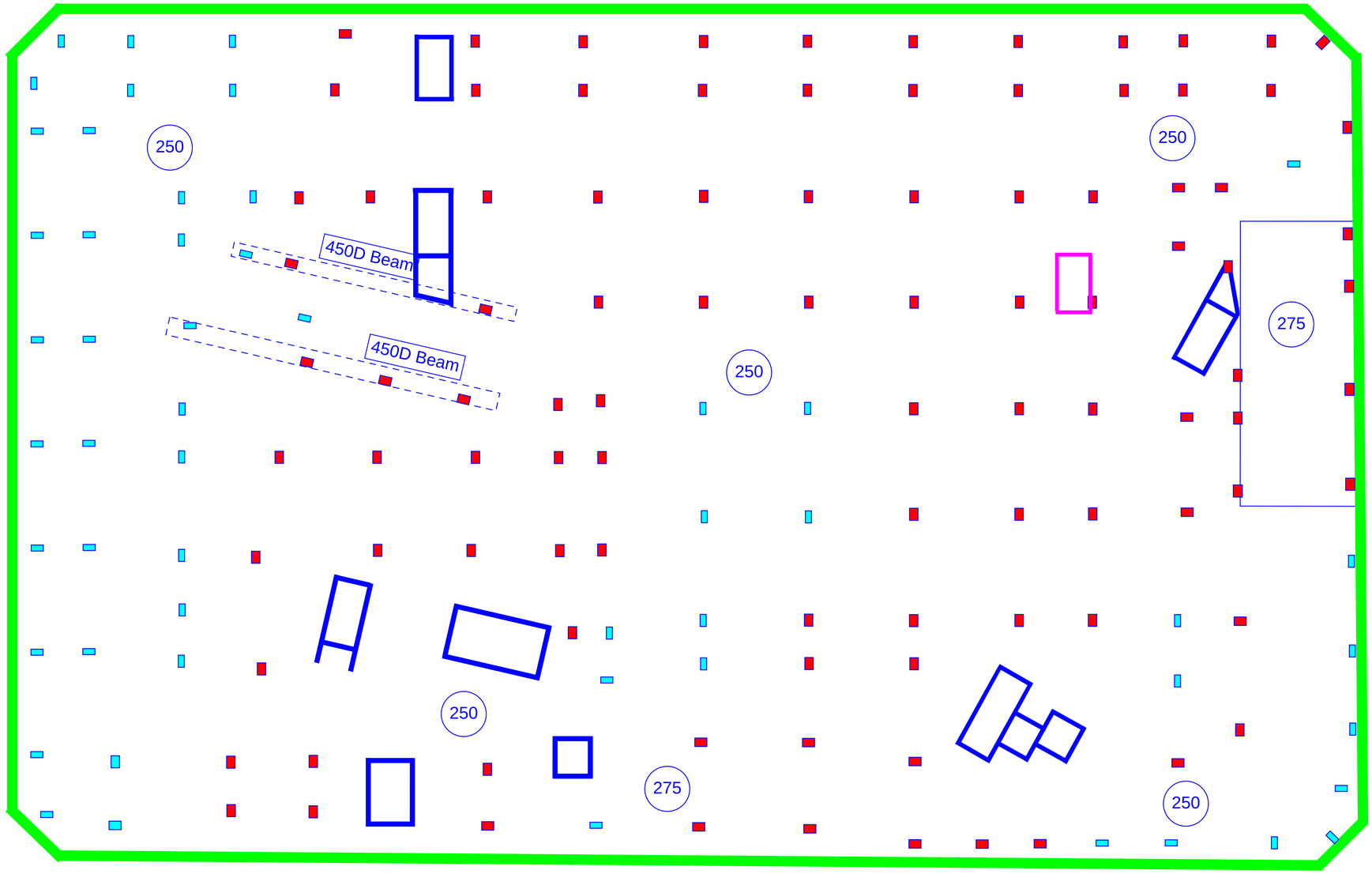
NORTH STRATHFIELD NSW 2137

PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level B4 Concrete Profile

JOB NUMBER:	DRG NUMBER:	
20025	SK-B4	
DESIGNED BY: RC	DATE: July 20	
DRAWN BY: RC	SCALE: 1:200@A1	SIZE: A1 / REV: P12



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- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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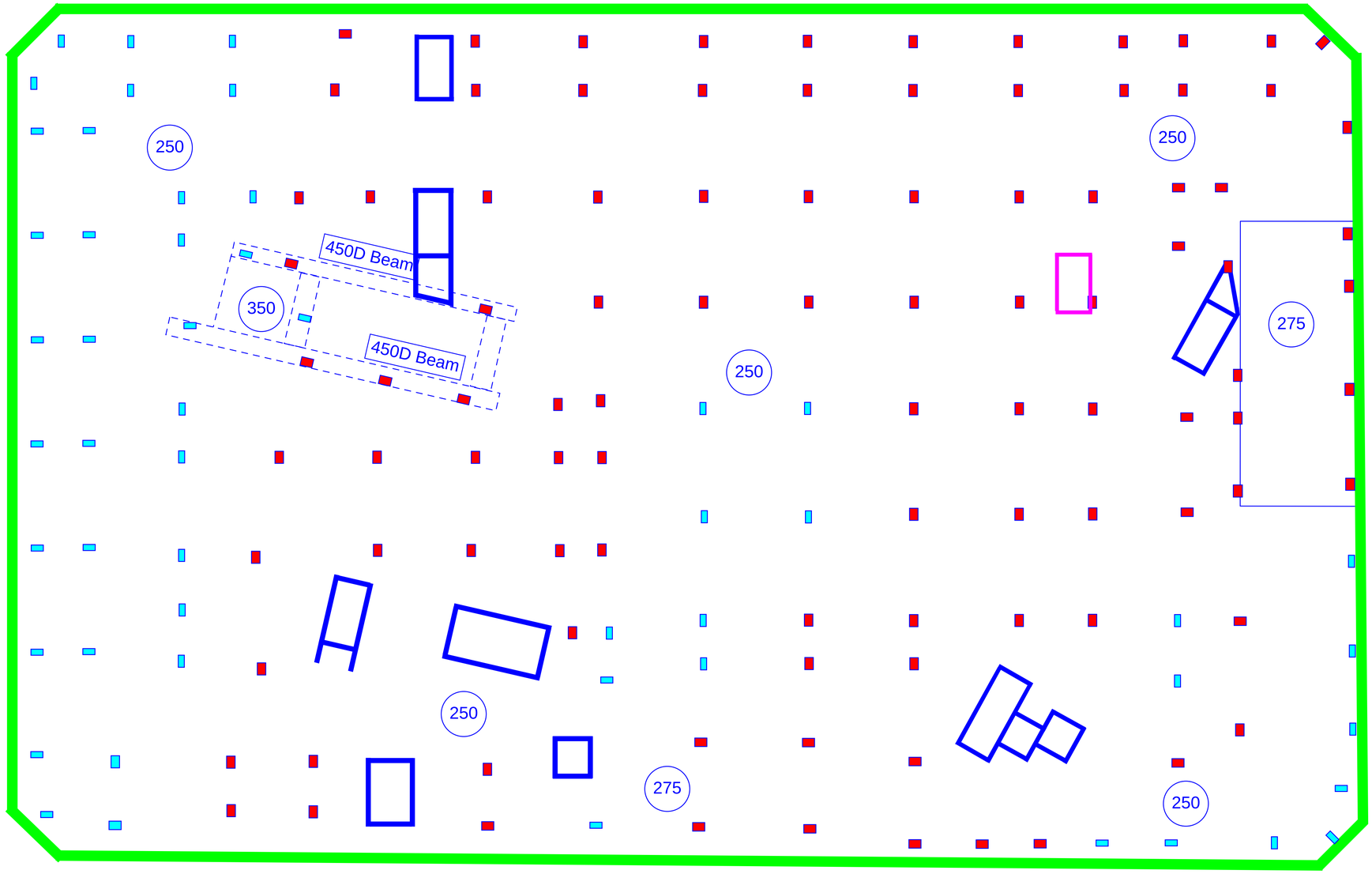
PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level B3 Concrete Profile

JOB NUMBER:	DRG NUMBER:		
20025	SK-B3		
DESIGNED BY:	DATE:		
RC	July 20		
DRAWN BY:	SCALE:	SIZE:	REV:
RC	1:200@A1	A1	P12



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- 1000x400 Column
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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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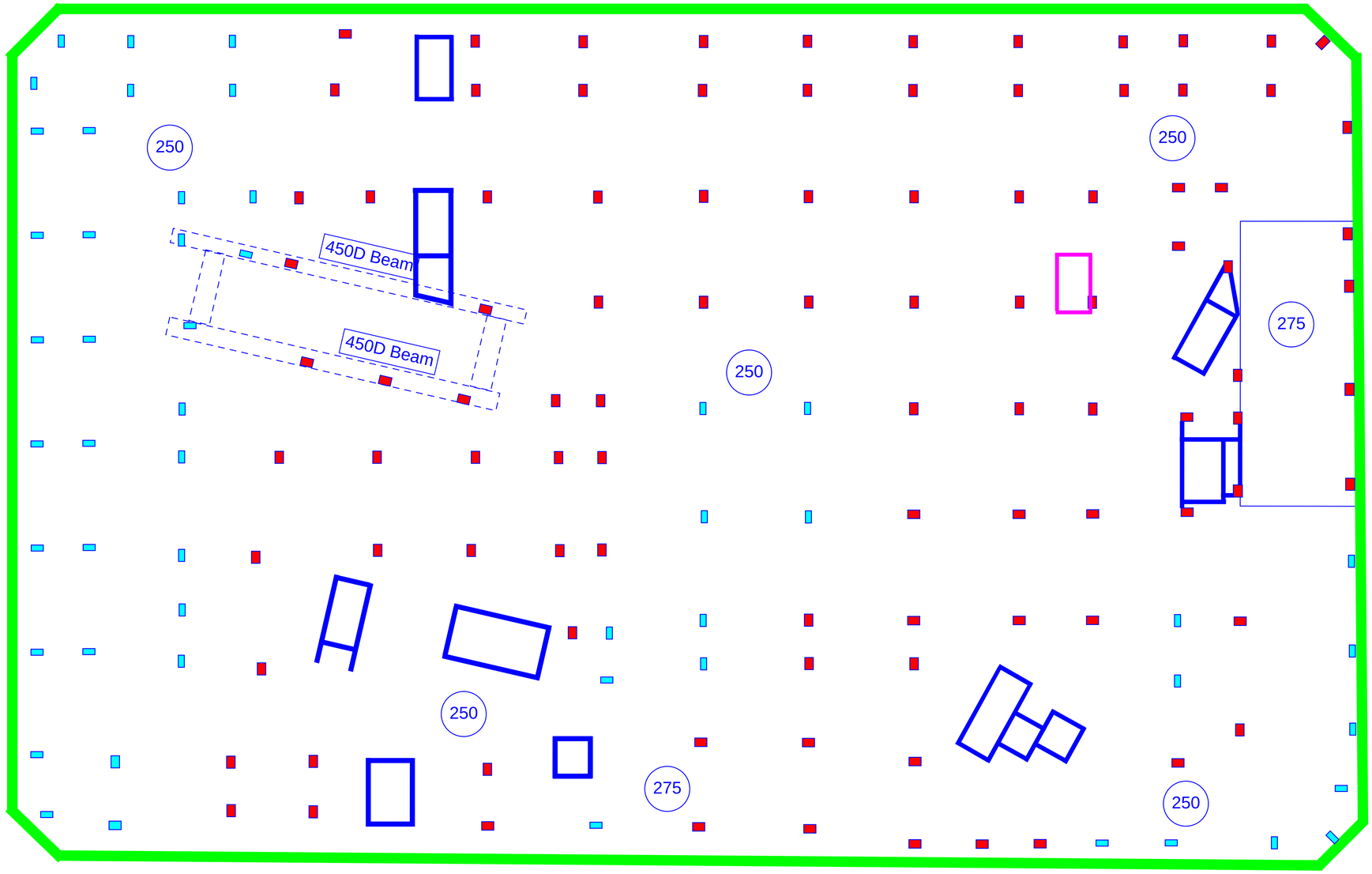
PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level B2 Concrete Profile

JOB NUMBER:	DRG NUMBER:	
20025	SK-B2	
DESIGNED BY: RC	DATE: July 20	
DRAWN BY: RC	SCALE: 1:200@A1	SIZE: A1 / REV: P12

Maintain min 1m of slab around void to support shoring wall.



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- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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

REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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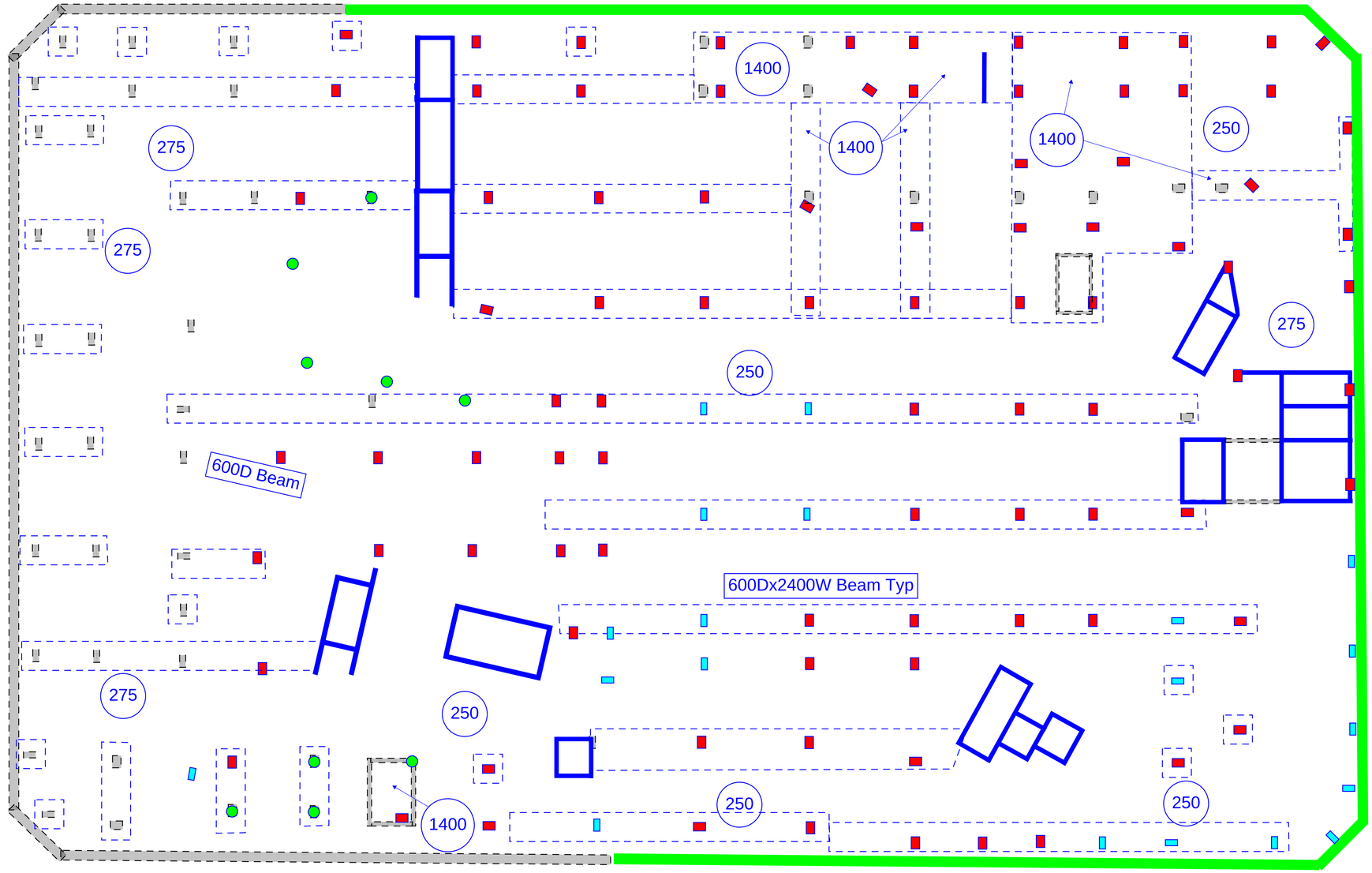
NORTH STRATHFIELD NSW 2137

PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level B1 Concrete Profile

JOB NUMBER:	DRG NUMBER:	
20025	SK-B1	
DESIGNED BY:	DATE:	
RC	July 20	
DRAWN BY:	SCALE:	SIZE: / REV:
RC	1:200@A1	A1 / P12



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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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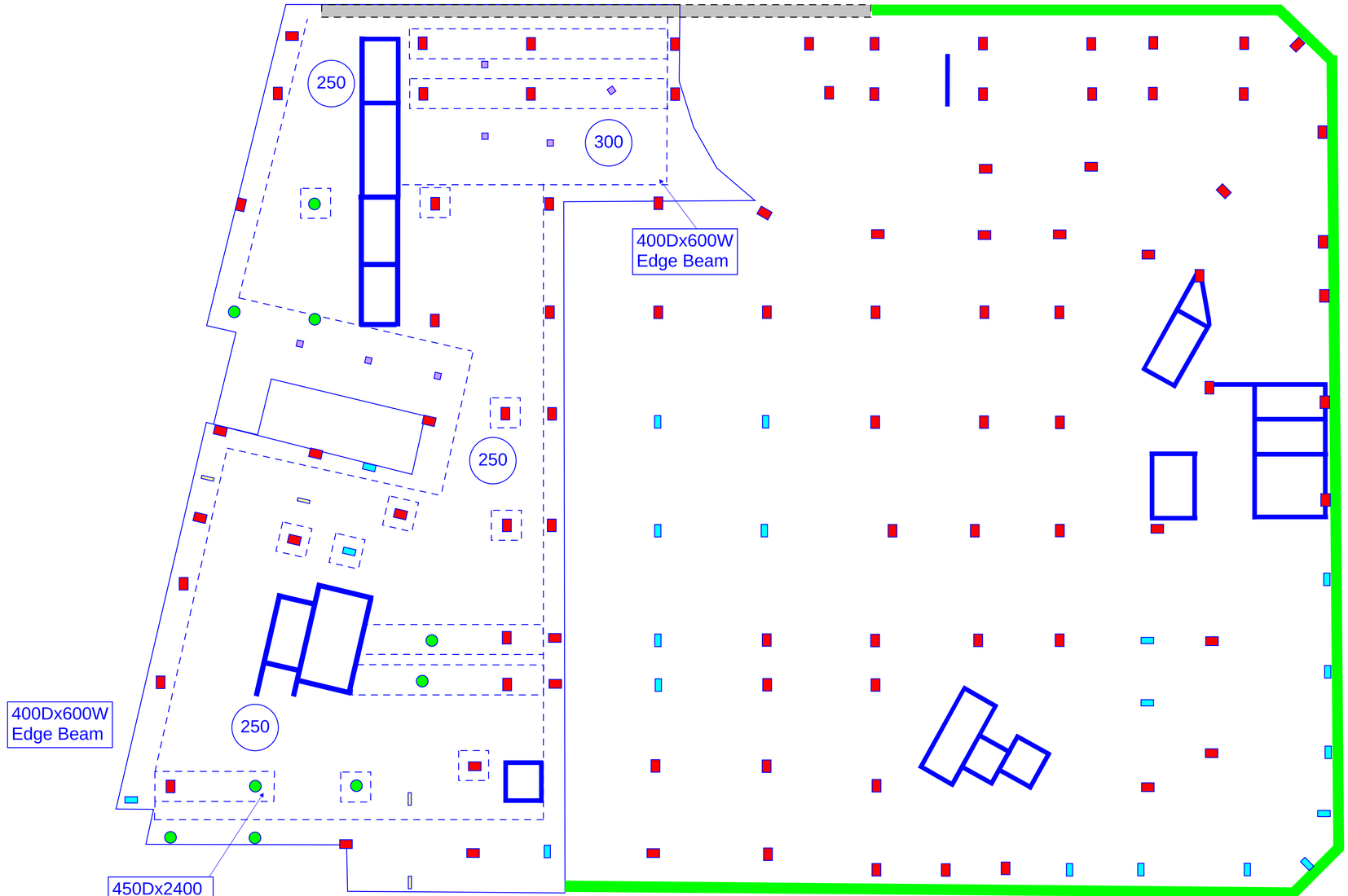
PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level Gnd Concrete Profile

JOB NUMBER:	DRG NUMBER:
20025	SK-Gnd
DESIGNED BY:	DATE:
RC	July 20
DRAWN BY:	SCALE:
RC	1:200@A1

SIZE: A1 REV: P12



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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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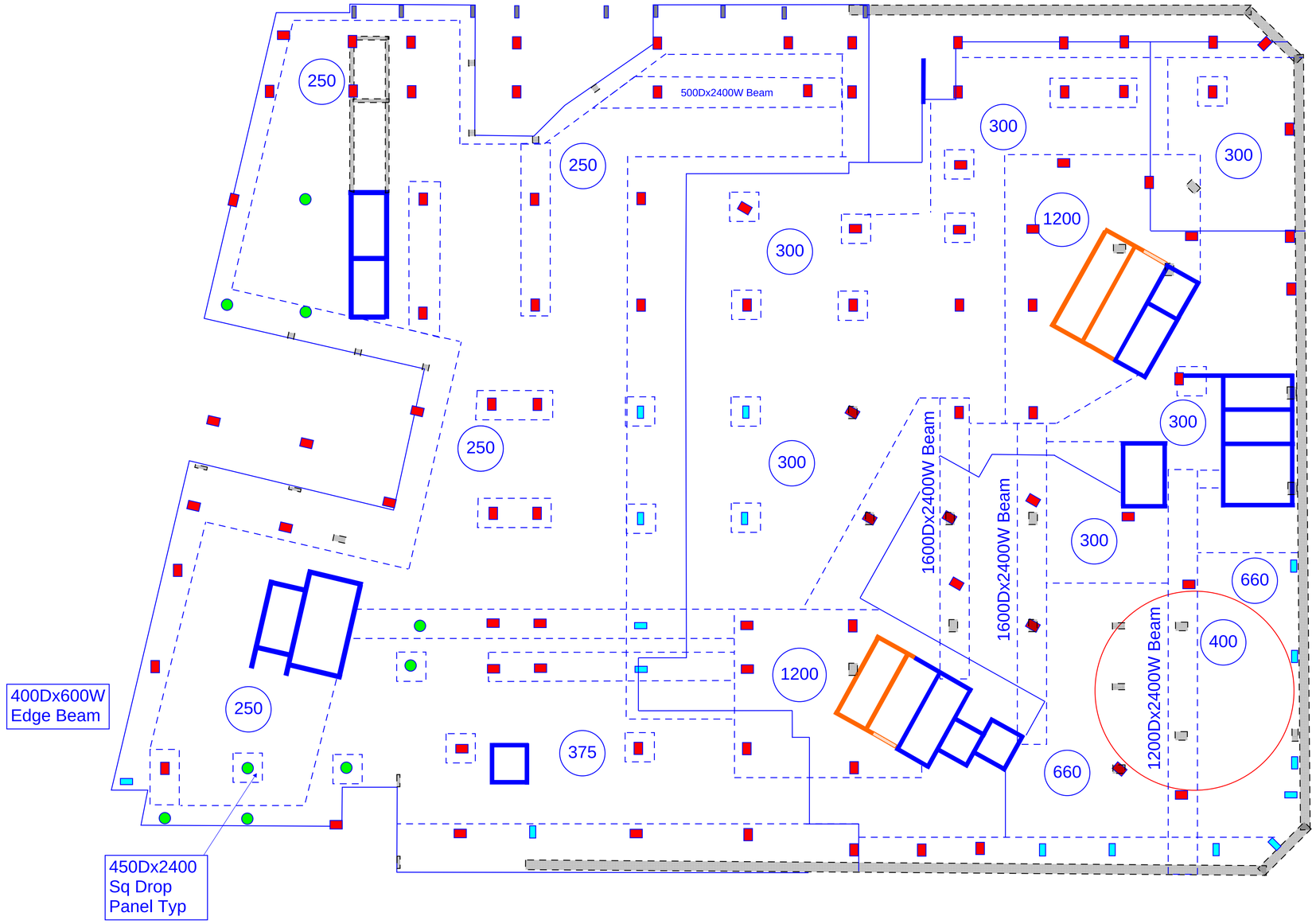
NORTH STRATHFIELD NSW 2137

PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Upp Gnd Concrete Profile

JOB NUMBER: 20025	ORG NUMBER: SK-UGnd
DESIGNED BY: RC	DATE: July 20
DRAWN BY: RC	SCALE: 1:200@A1
	SIZE: A1
	REV: P12



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- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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NORTH STRATHFIELD NSW 2137

PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 1 Concrete Profile

JOB NUMBER: 20025	DRG NUMBER: SK-L1		
DESIGNED BY: RC	DATE: July 20		
DRAWN BY: RC	SCALE: 1:200@A1	SIZE: A1	REV: P12

Preliminary Member Schedule:

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- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
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- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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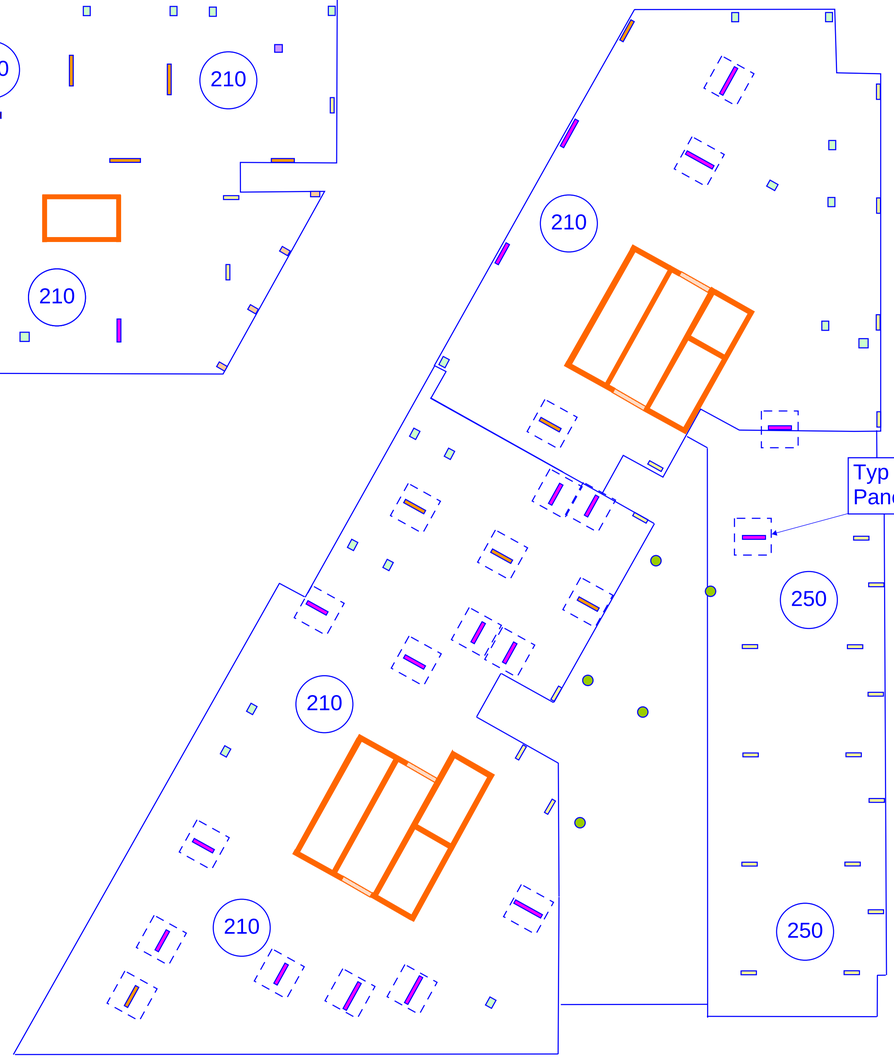
NORTH STRATHFIELD NSW 2137

PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 2 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L2
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12



Preliminary Member Schedule:

- 1000x700 Column
- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
- 1000x500 Column
- 1500x250 Column
- 250 thk Wall
- 1000x250 Column
- 600x450 Column
- 200 thk Wall
- 2000x250 Column
- 300 thk Wall
- 1000x350 Column
- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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

REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

CLIENT: DEICORP

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Web: www.abc-consultants.com.au
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1 Homebush Bay Drive
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Postal Address
PO Box 3339
NORTH STRATHFIELD NSW 2137

PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 3 Concrete Profile

JOB NUMBER:	DRG NUMBER:
20025	SK-L3
DESIGNED BY:	DATE:
RC	July 20
DRAWN BY:	SCALE:
RC	1:200@A1

SIZE: A1 REV: P12

Preliminary Member Schedule:

- 1000x700 Column
- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
- 1000x500 Column
- 1500x250 Column
- 250 thk Wall
- 1000x250 Column
- 600x450 Column
- 200 thk Wall
- 2000x250 Column
- 300 thk Wall
- 1000x350 Column
- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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

REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 4 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L4
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12

Preliminary Member Schedule:

- 1000x700 Column
- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
- 1000x500 Column
- 1500x250 Column
- 250 thk Wall
- 1000x250 Column
- 600x450 Column
- 200 thk Wall
- 2000x250 Column
- 300 thk Wall
- 1000x350 Column
- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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

REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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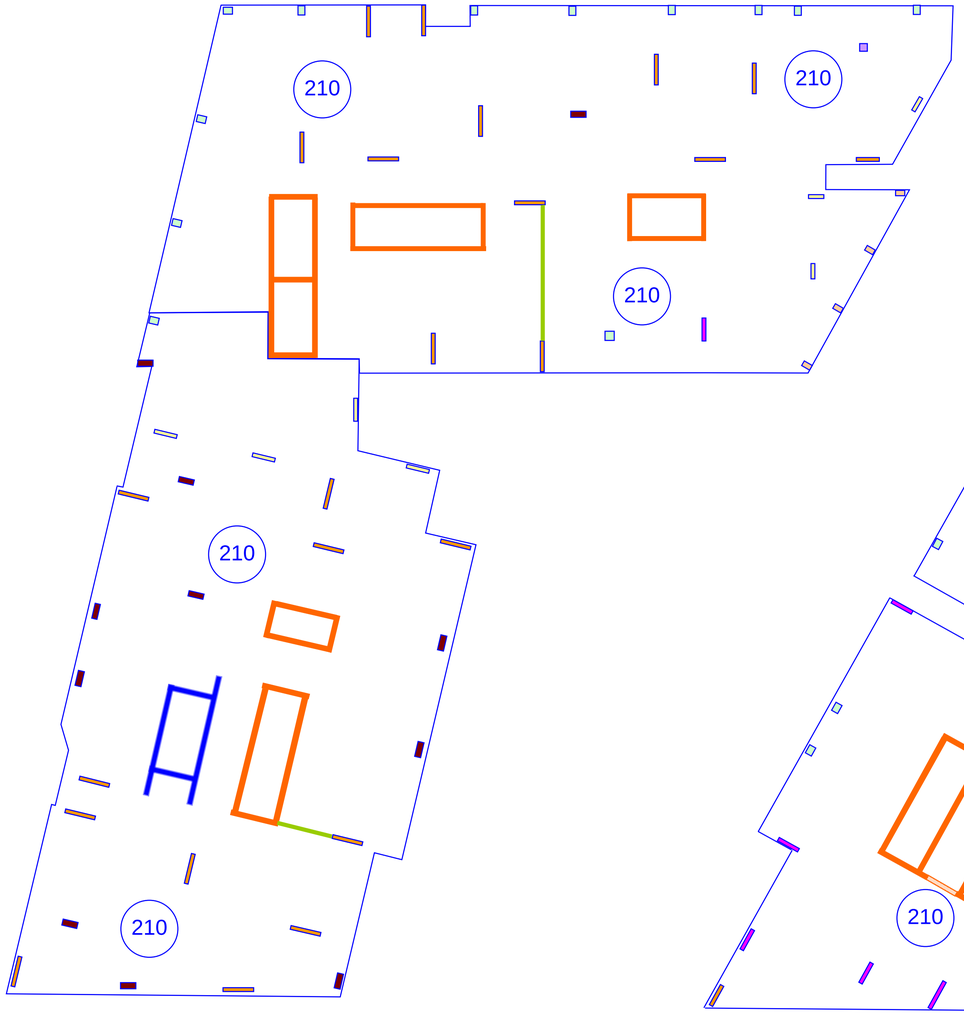
PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 5 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L5
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12



Preliminary Member Schedule:

- 1000x700 Column
- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
- 1000x500 Column
- 1500x250 Column
- 250 thk Wall
- 1000x250 Column
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- 300 thk Wall
- 1000x350 Column
- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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

REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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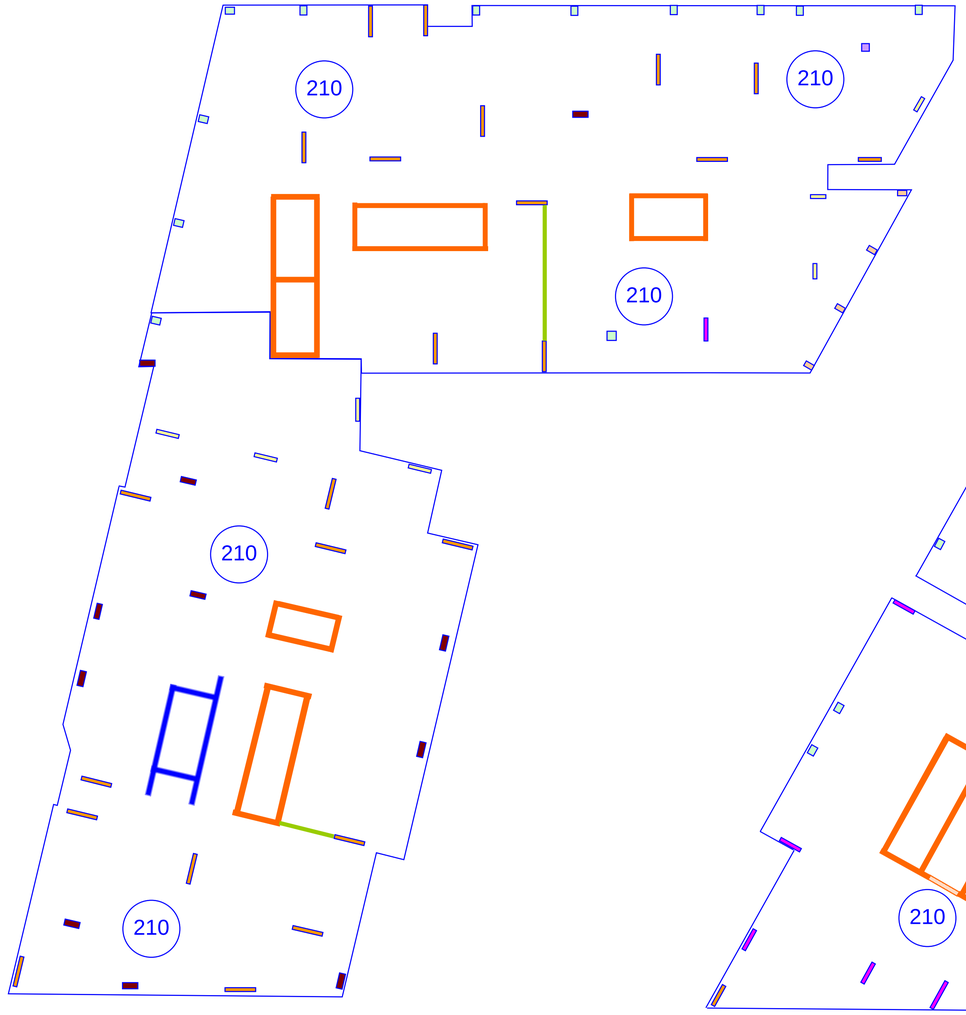
PROJECT: Doran Drive Precinct Castle Hill

TITLE: Level 6 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L6
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12



Preliminary Member Schedule:

- 1000x700 Column
- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
- 1000x500 Column
- 1500x250 Column
- 250 thk Wall
- 1000x250 Column
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- 1000x350 Column
- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
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P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 7 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L7
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12

Preliminary Member Schedule:

- 1000x700 Column
- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
- 1000x500 Column
- 1500x250 Column
- 250 thk Wall
- 1000x250 Column
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- 200 thk Wall
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- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
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P9	12/05/21	Preliminary Issue	RC

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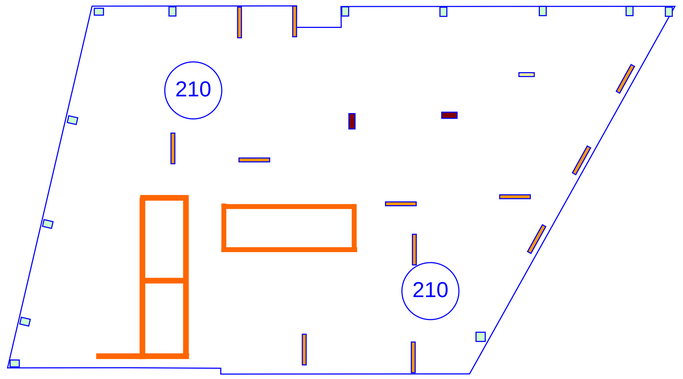
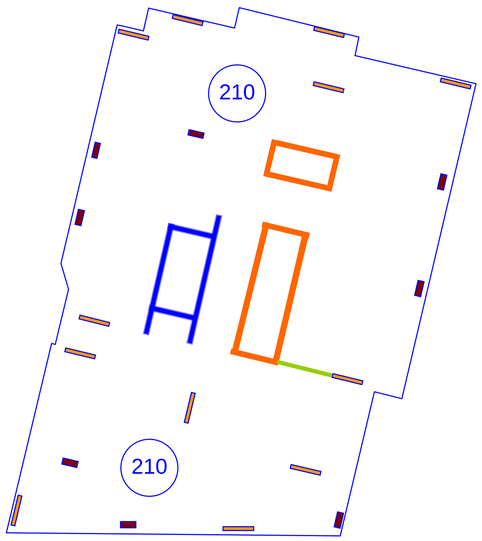
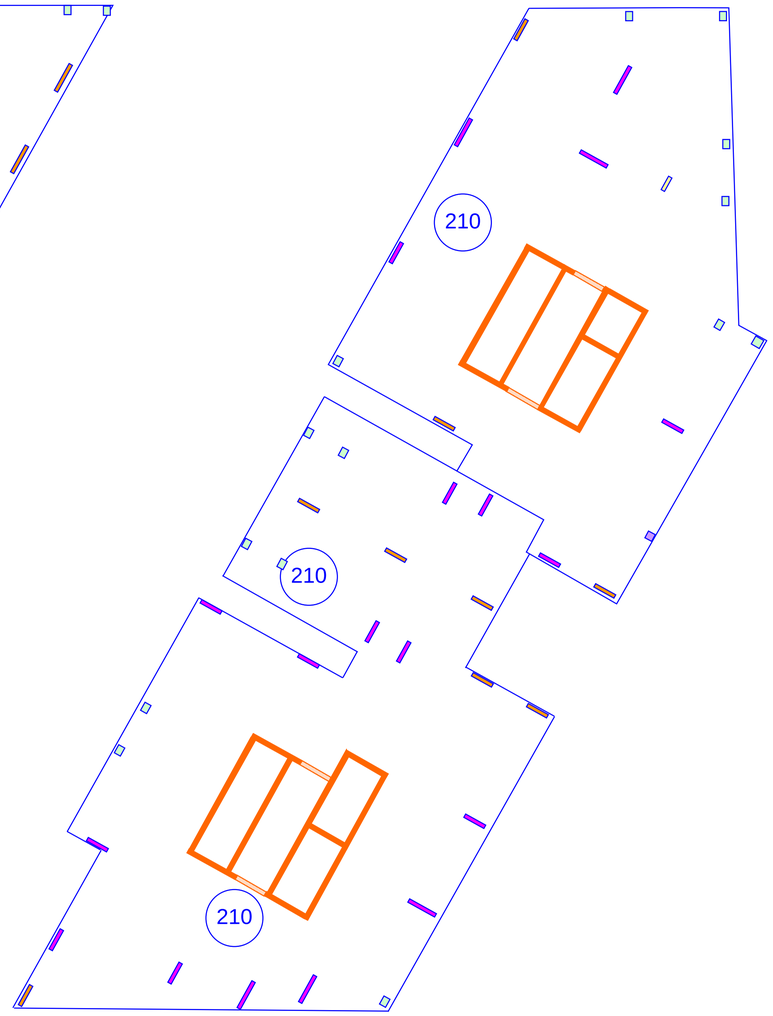
PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 8 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L8
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12







Preliminary Member Schedule:

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- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
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P9	12/05/21	Preliminary Issue	RC

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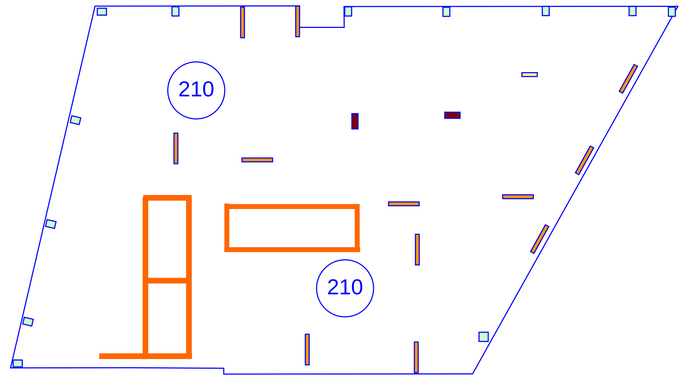
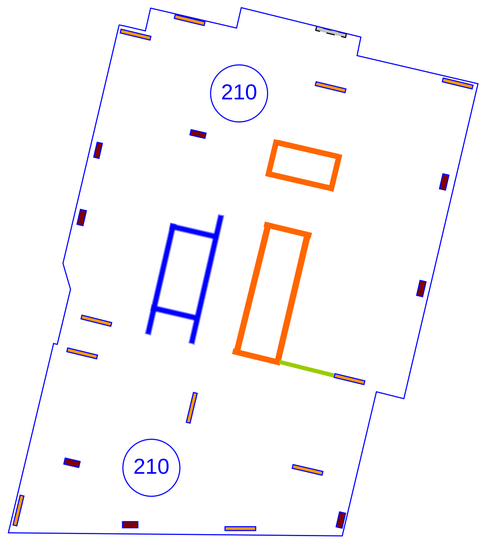
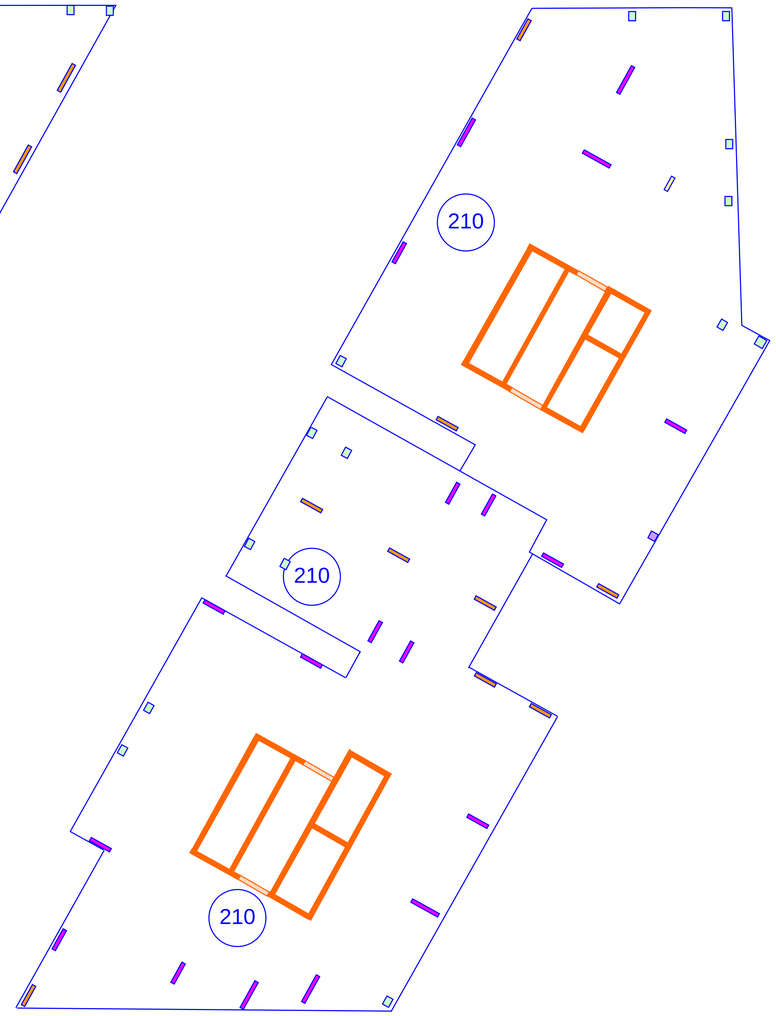
PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 9-10 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L9
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12







Preliminary Member Schedule:

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- 1500x250 Column
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- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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

REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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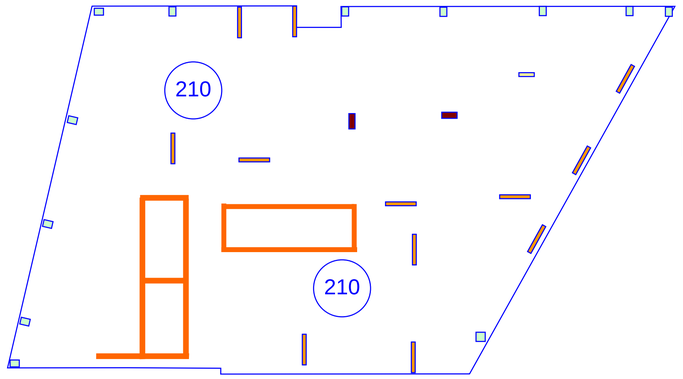
PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 11-15 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L11
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12



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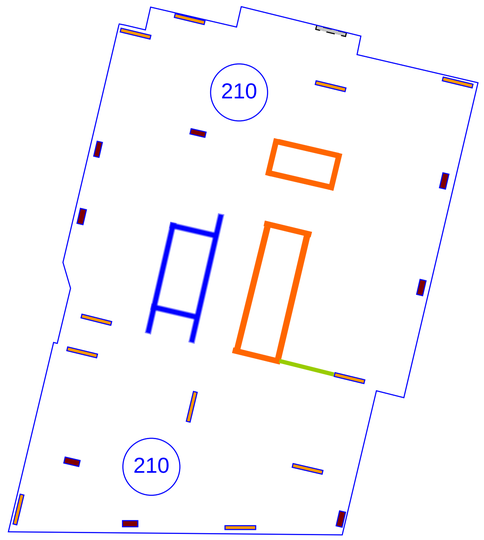

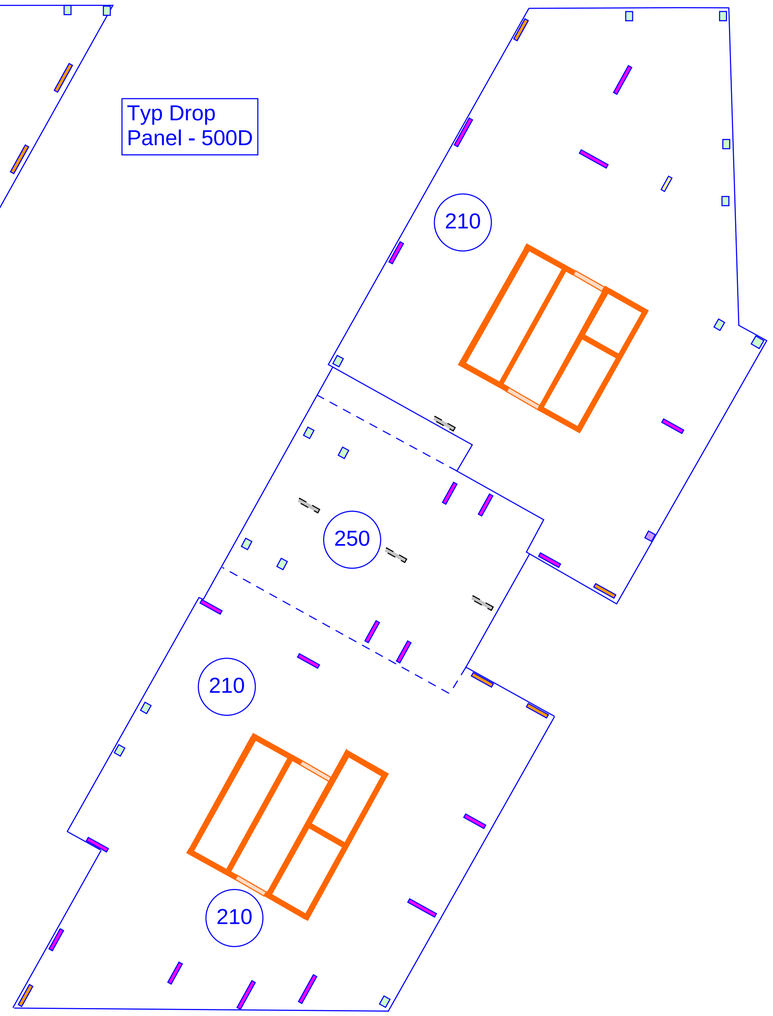

Preliminary Member Schedule:

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- 350 Thk Wall
- 800 Thk Shoring Wall Zone (600 pile + tolerance)
- 1000x500 Column
- 1500x250 Column
- 250 thk Wall
- 1000x250 Column
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- 1000x400 Column
- 500x500 Column
- 1000x300 Column
- 1000 dia Column

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P12	29/06/21	Preliminary Issue	RC
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P9	12/05/21	Preliminary Issue	RC

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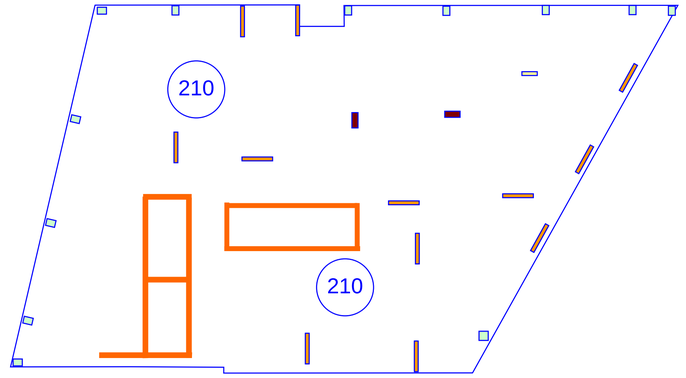
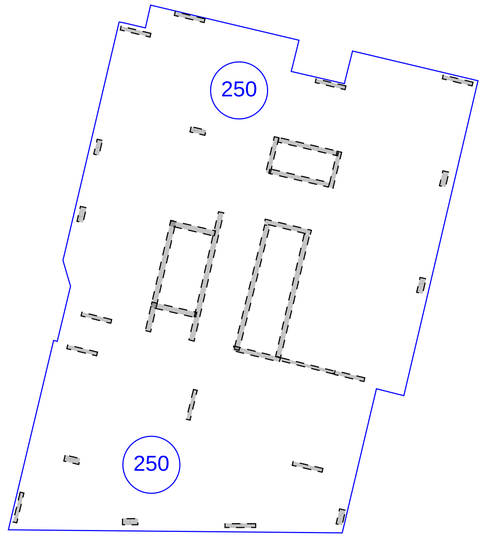
PROJECT: Doran Drive Precinct
Castle Hill

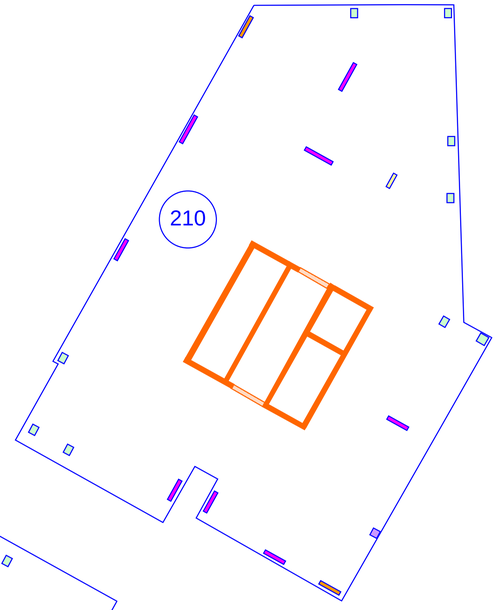
TITLE: Level 16 Concrete Profile

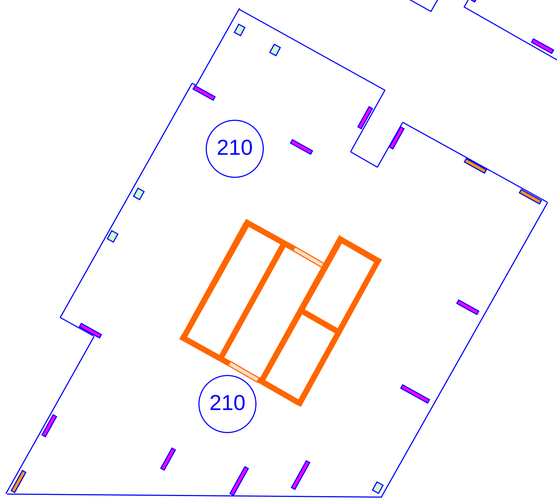
JOB NUMBER:	DRG NUMBER:
20025	SK-L16
DESIGNED BY:	DATE:
RC	July 20
DRAWN BY:	SCALE:
RC	1:200@A1

SIZE: A1
REV: P12









Preliminary Member Schedule:

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- 1000x400 Column
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- 1000x300 Column
- 1000 dia Column

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

REV	DATE	REVISION DESCRIPTION	BY
P12	29/06/21	Preliminary Issue	RC
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P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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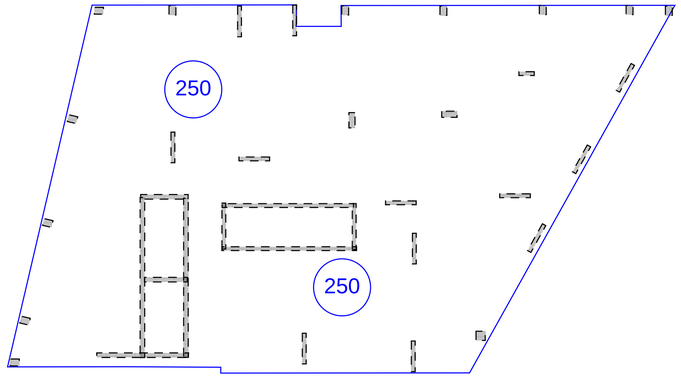
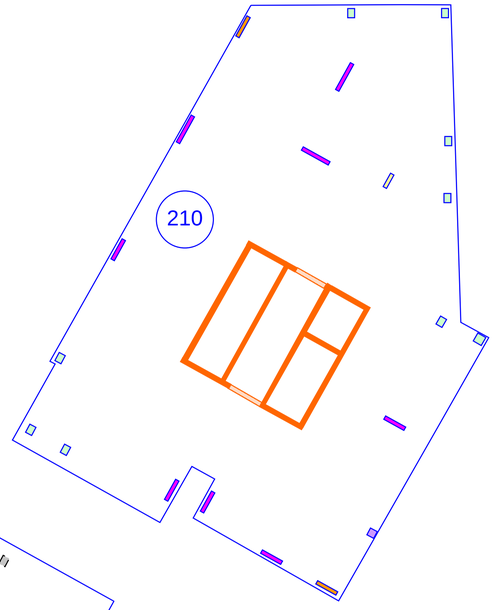
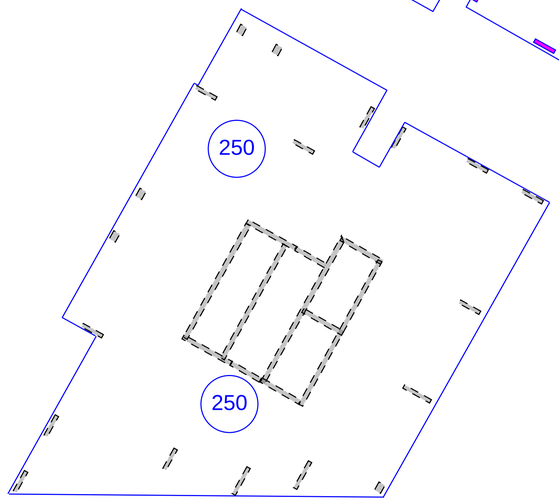
PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 19 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L19
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12







Preliminary Member Schedule:

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P11	26/05/21	Preliminary Issue	RC
P10	20/05/21	Preliminary Issue	RC
P9	12/05/21	Preliminary Issue	RC

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PROJECT: Doran Drive Precinct
Castle Hill

TITLE: Level 20 Concrete Profile

JOB NUMBER:	20025
DRG NUMBER:	SK-L20
DESIGNED BY:	RC
DATE:	July 20
DRAWN BY:	RC
SCALE:	1:200@A1
SIZE:	A1
REV:	P12