MONTE SCIENTIA PROJECT NSW

STRUCTURAL ENGINEERING DESIGN AND IMPACT ASSESSMENT REPORT FOR SYDNEY METRO

Issue: REVIEW

Prepared for: Richard Crookes Construction

Project No.: WD19133

15th January 2021

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1. INTRODUCTION

The purpose of this Structural Engineering Report is to provide our design summary of the proposed foundation and retention structure for the proposed project. The detailed design and analysis of the retention will be completed by the D & C Contractor at a later stage. The geotechnical analysis completed by Douglas Partners dated November 2020 report ID 73019.04 and including investigation report dated February 2020 report ID 73019.03 is based on the tender structural documentation by Webber Design dated October 2020.

The foundation and retention design has been documented by Webber Design and should be considered the minimum requirement to satisfy council condition and geotechnical parameters and recommendation.

A tender level set of structural design documentation (70% of full detailed design) for the project has been prepared based on the current architectural design. The structural design has been prepared based on geotechnical parameters, site limitations and building constraints to the best of our knowledge based on current information provided. We have identified these on our documentation including highlighting the key structural issues for the development in this report.

2. CLIENT AND PROJECT DETAILS

Client: Monte Sant Angelo Mercy College

Builder: Richard Crookes Constructions

Project Architect: Hayball Architects

3. SITE CONDITIONS

Geotechnical investigations were undertaken by Douglas Partners in February 2020 Reference 73019.03.00 and Numerical Modelling for the Sydney Metro Assessment dated November 2020. Refer to these reports for further information regarding the design parameters and overall geotechnical ground condition of the proposed development site. A summary of their findings as follows:

- Brick Pavers and Asphaltic Concrete in the upper portions where the borehole was first drilled
- Fill Material comprising of sandy gravel, sandy clay and clayey sand with varying proportions of igneous, ironstone and sandstone gravel, moderately and well compacted to depths of between 0.3 to 1.1m.
- Residual Soil generally very stiff and hard sandy clay to depths between 1.3-1.4m
- Bedrock very low, low and medium strength sandstone from depths of between 0.3 and 1.4m, generally becoming medium and/or high strength with depth. Some weathered seams and bands of very low and low strength sandstone and siltstone were present throughout the boreholes.

4. LOADING AND DESIGN CRITERIA

The minimum requirement for the retention design should be carried out based on the following codes and design parameters:

Australian Standards

- AS/NZS 1170.0 (2002) - Structural design action Part 0: General Principles
- AS 1170.1 (2002) - Structural design action Part 1: Permanent, imposed and other actions
- AS 1170.2 (2011) - Structural design action Part 2: Wind Actions
- AS 1170.4 (2007) - Structural design action Part 4: earthquake actions in Australia
- AS 2159 (2009) - Piling – Design and installation
- AS 3600 (2018) - Concrete Structures
- AS 3610 (2010) - Formwork for concrete
- AS 4100 (2003) - Steel Structures

Building Code of Australia

The 2019 version of the BCA must be adopted in consultation with the Building Surveyor.

Design Dead Loads and Live Loads

The following Design Dead Loads and Live Loads have been documented:

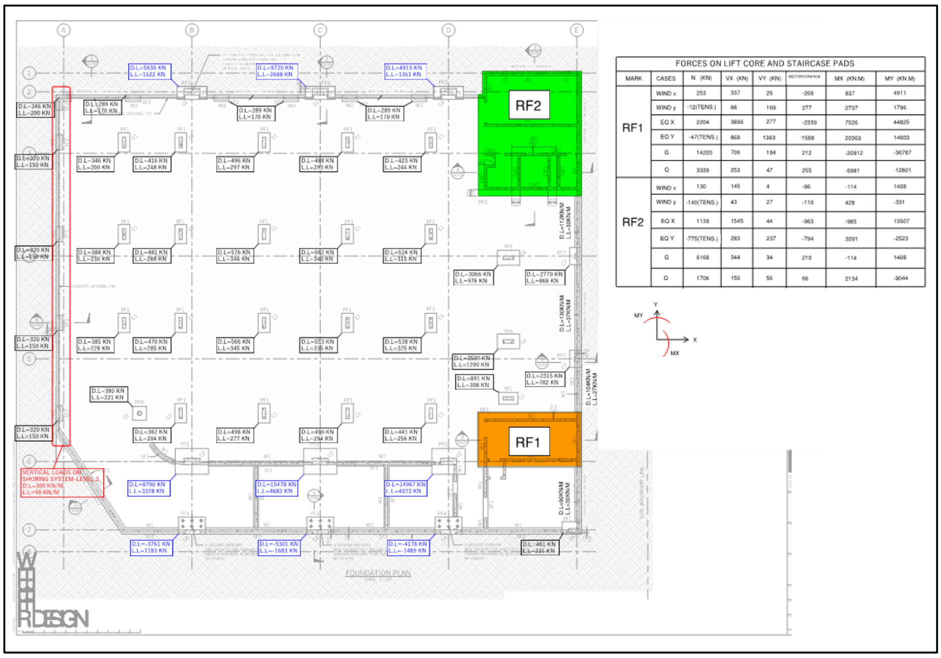


Figure 1. Foundation Loads

The design loads provided above has been included in the detailed analysis for the Sydney Metro Impact Assessment by Douglas Partners. A summary of their findings can be found in the impact assessment report.

5. KEY STRUCTURAL ELEMENTS

FOUNDATION AND RETENTION

The proposed excavation will extend within the zones of influence of the Sydney Metro 2nd Reserve however the findings in the geotechnical analysis and assessment has demonstrated that the overall impact to the tunnel is well within the tolerance provided. A cross section showing the location of the proposed development to the Sydney Metro Tunnel as indicated below:

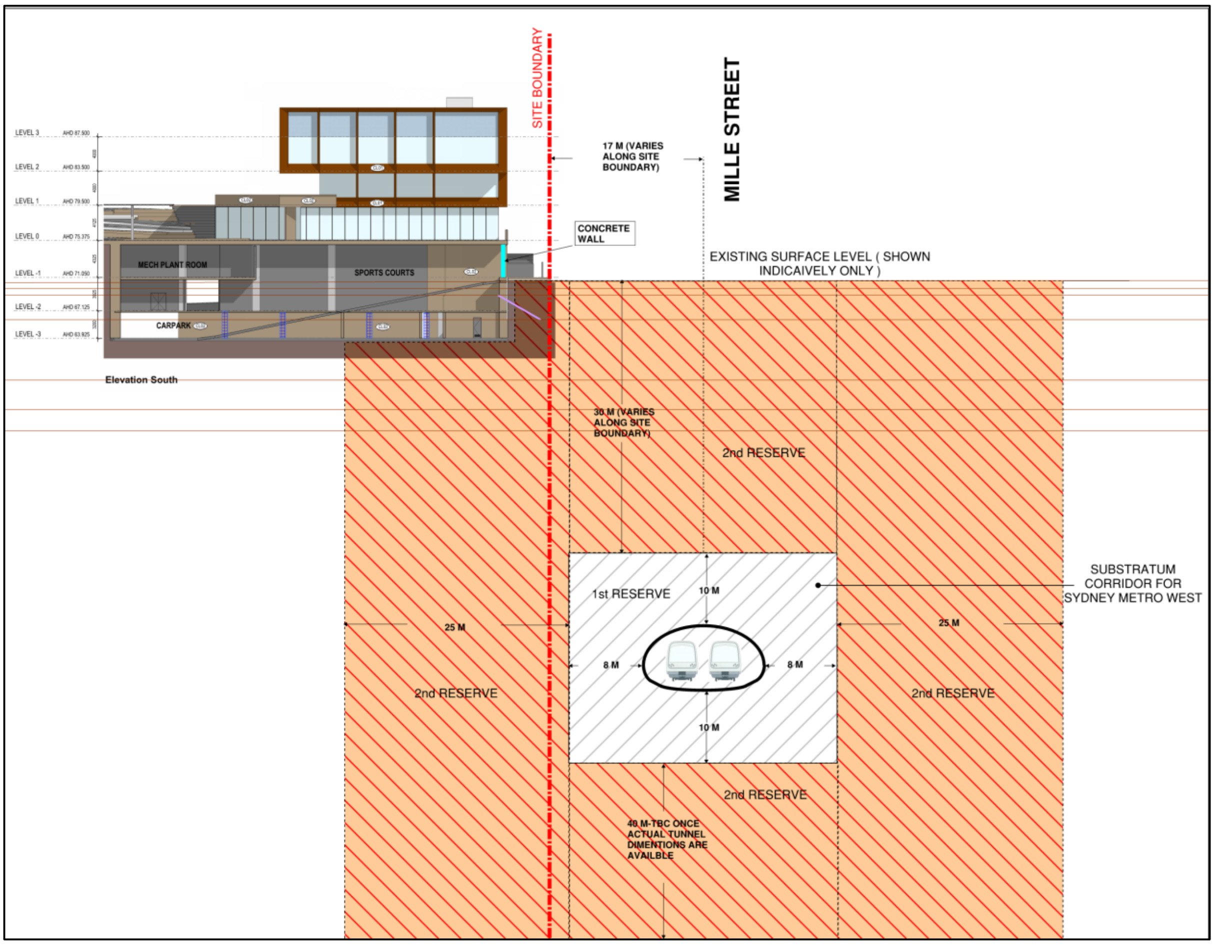


Figure 1. Location of the proposed development to Sydney Metro

The diagram above shows the relative depth of the tunnel in relation to the development. The results of the geotechnical investigation along with the foundation loads were used in the numerical analysis to determine the predicted movement within the tunnel.

The predicted maximum displacement of the Sydney Metro asset due to the excavation based on the numerical analysis completed by the Douglas Partners as follows:

Table 5: Summary of Modelling Results

Parameter	Units	Construct Cavern Lining (Stage 3)	Excavation to BEL (Stage 4)	Final Building Loads (Stage 6)
Maximum Horizontal Displacement in Station Cavern	mm	Baseline	2 (towards west)	1 (towards west)
Maximum Vertical Displacement in Station Cavern	mm	Baseline	1 (upwards)	1 (downwards)
Maximum Major Principal Stress in Tunnel Liner (σ_1)	kPa	116 (Compression) 451 (Compression)	-15 (Tension) 1108 (Compression)	67 (Compression) 1619 (Compression)
Maximum Minor Principal Stress in Tunnel Liner (σ_3)	kPa	-17 (Tension) 79 (Compression)	-428 (Tension) 145 (Compression)	-44 (Tension) 235 (Compression)

The design of the retention walls requires temporary ground anchors and permanent rock nails to restraint the contiguous pile wall. The design of the retention is still subjected to further detailed design and analysis by the D & C contractor however the location of the anchors is approximately 25m from the top of the 1st reserve.

6. DESIGN CONSIDERATION

The following items is a brief summary of some of the items to considered during the excavation of the development to ensure safe construction and minimal impact to the Sydney Metro Tunnel. A comprehensive description and detail of the works to be undertaken have been prepared by the demolition and excavation contractor prior to construction and has can be found in the Appendix C and D. The methodology and sequence as described in their report has been reviewed by Webber Design. A summary of the works to be undertaken as follows:

- On site Geotechnical supervision and investigation during excavation to ensure minimal soil/rock stratum changes that may impact retention and earthworks.
- Prior to construction a visual inspection in respect to varying ground conditions, edge protection and construction methodology to be provided.
- Exacting location of any existing in ground asset to be marked out if it hasn't been completed prior to excavation and retention works.

Construction works to be undertaken should consider but not limited to the following:

- Preparation of shop drawings, specifications and detailed calculation in report format that demonstrates a full detailed explanation of the proposed retention and excavation by the D & C contractor.

- Establishment of all proposed equipment including digger, cranes, mobile equipment, haulage trucks to and from site that will be used in the construction of the proposed retention and earthworks. Spreader plates over the zone of influence of any potential existing sewer and water asset will be placed to ensure minimal impact on existing infrastructure.
- Commencement of construction of retention.
- Design, supply, fixing and placing of reinforcement in contiguous pile wall in accordance with shop drawings prepared.
- Supply and placement of concrete. 40MPa minimum concrete strength to be provided. Higher strength may be required subjected to detailed design by contractor.
- Excavation and drilling for the construction of the retention to cut off (toe) level to be determined by the contractor. Note that the associated excavation works is generally done in a hit and miss type sequence.
- Monitor any existing infrastructure asset for any potential movement.
- Excavation and any temporary dewatering procedures and methodology to be provided for by the contractor.
- Contractor to install inclinometers to determine verticality and present to design team for review.

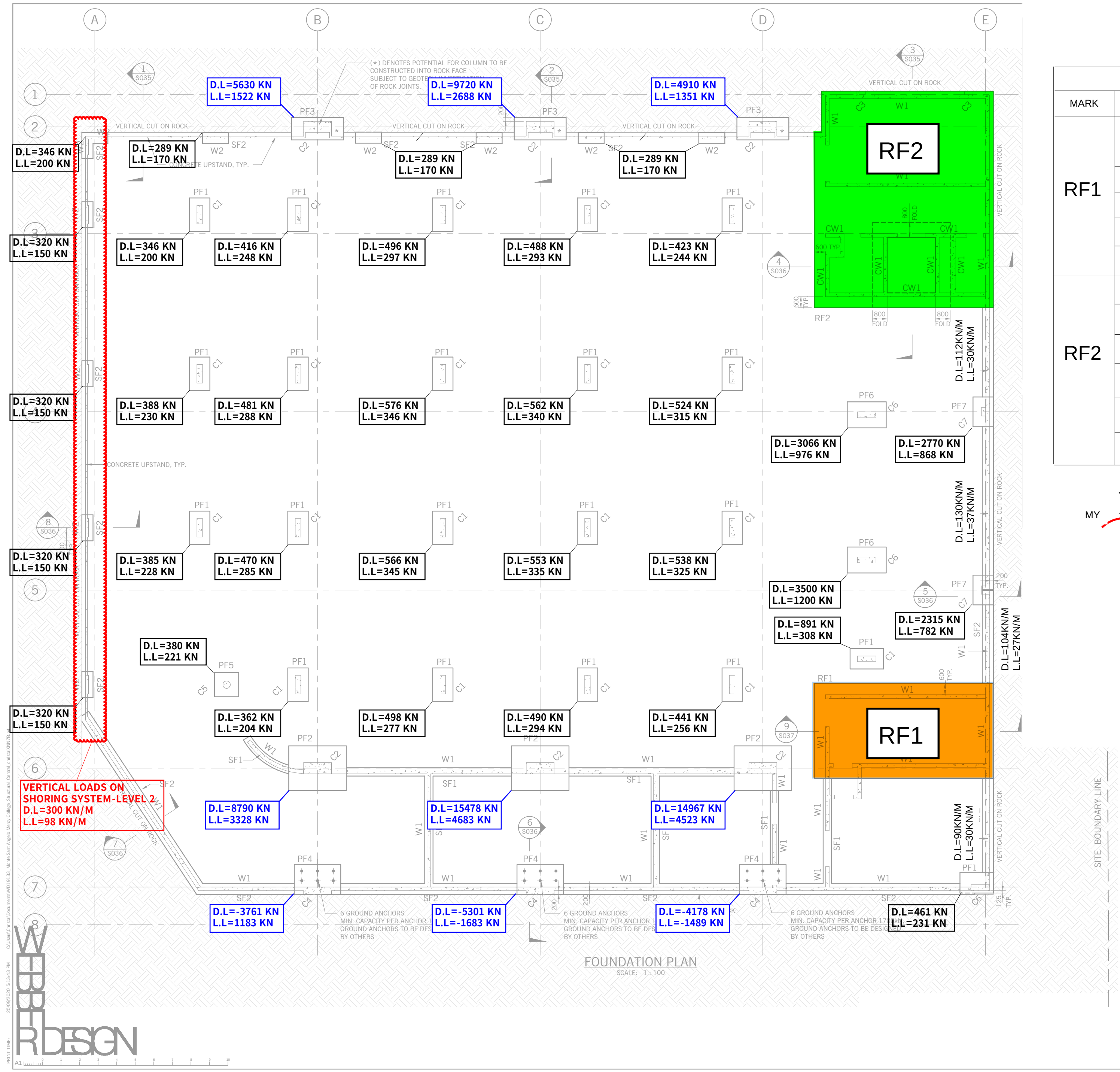
7. CONCLUSION

This structural engineering report has been written to confirm that the excavation and construction of the retention has demonstrated minimal impact to the Sydney Metro tunnel. This report also identifies some of the key structural consideration for the excavation, design and documentation of the proposed retention to be carried out by the contractor.

A summary of the predicted lateral movement onto the Sydney Metro tunnel has been presented and summarised by the geotechnical engineer using numerical modelling and can confirm that the overall predicted displacement is less than 3mm.

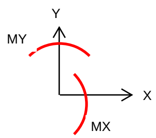
APPENDIX A

(STRUCTURAL DOCUMENTATION)



FORCES ON LIFT CORE AND STAIRCASE PADS

MARK	CASES	N (KN)	VX (KN)	VY (KN)	MZ(TORSION)KN.M	MX (KN.M)	MY (KN.M)
RF1	WIND x	253	337	26	-269	837	4911
	WIND y	-12(TENS.)	88	169	277	2737	1796
	EQ X	2204	3896	277	-2339	7026	44825
	EQ Y	-47(TENS.)	868	1363	-1568	20063	14603
	G	14200	706	184	212	-20912	-36787
	Q	3339	253	47	255	-6981	-12801
RF2	WIND x	130	145	4	-96	-114	1408
	WIND y	-140(TENS.)	43	27	-110	428	-331
	EQ X	1139	1545	44	-963	-985	13507
	EQ Y	-775(TENS.)	283	237	-794	3091	-2523
	G	6168	344	34	210	-114	1408
	Q	1706	150	56	66	2134	-9044



APPENDIX B

(GEOTECHNICAL ASSESSMENT)

Douglas Partners
Geotechnics / Environment / Groundwater

Report on
Numerical Modelling

Monte Scientia Project
128 Miller Street, North Sydney

Prepared for
Monte Sant' Angelo Mercy College
c/- Bloompark Consulting Pty Ltd

Project 73019.04
November 2020

Integrated Practical Solutions

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	73019.04	Document No.	R.001.Rev1
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Report prepared for	Monte Sant' Angelo Mercy College		
File name	73019.04.R.001.Rev1		

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Revision 0	Joel Huang	Peter Oitmaa	24 July 2020
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Distribution of copies

Status	Electronic	Paper	Issued to
Revision 1	1		Peter Brogan, Bloompark Consulting Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		27 November 2020
Reviewer		27 November 2020

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Report on Numerical Modelling
Monte Scientia Project
128 Miller Street, North Sydney

1. Introduction

This report presents the results of the updated numerical modelling undertaken by Douglas Partners Pty Ltd (DP) to assess the potential impacts that the proposed Monte Scientia Project at 128 Miller Street, North Sydney, may have on the underlying Sydney Metro City and South West tunnel infrastructure. The work was commissioned by Monte Sant' Angelo Mercy College in consultation with Bloompark Consulting Pty Ltd, project managers. The work was completed in accordance with DP's proposal SYD191047 dated 3 October 2019.

The purpose of the analysis was to estimate the induced stress changes in the permanent lining and the resulting displacements of the large-span cavern at Victoria Cross station, due to the basement excavation and the final building loading from the proposed development. A previous version of the numerical modelling (Report Ref: 73019.04.R.001.Rev0, dated 24 July 2020) was undertaken based on the uniformly distributed building loads (UDL). Webber Design, the structural engineers for this project, has subsequently provided DP with the detailed building foundation layout and load breakdowns on each individual foundation component, therefore, the numerical modelling was updated with the results presented in this report.

It is understood that the current architectural design of the proposed development includes a four-storey science and innovation building, a recreation facility and public domain, over a three-level basement, including the first two levels for a sports gymnasium and a basement carpark beneath the gymnasium at the lowest level. The bulk excavation level for the basement will be at around RL 63.6 m, relative to Australian Height Datum (AHD). This requires an excavation to the depths of around 16 m to 17 m above the crown of the station cavern.

Numerical analysis was undertaken using the *Phase²* computer program by Rocscience. The input parameters, model sequence and results are discussed in the following sections. The model was based on information provided in DP's geotechnical report and other reports and drawings provided by the client.

It is understood that this report will form part of a submission to Transport for NSW (TfNSW).

2. Background Information

The following information has been supplied to DP by the client:

- Project Brief titled *"Proposed Development Monte Sant Angelo Mercy College North Sydney NSW"*, prepared by Webber Design Ref: WD19133, dated 25th September 2019*;*

- Survey drawings including two sections showing the comparative position of the development in relation to the station cavern, by TSS Total Surveying Solutions, Ref: 192082_A Rev1 dated 10 July 2020; and
- Building Foundation Layout and Load Mark-up Drawing provided by Webber Design in an email dated 28 September 2020.

A geotechnical investigation report was prepared by DP (Ref. 73019.03.R.001.Rev2, dated February 2020). The information presented in the report, together with the geotechnical information from nearby sites, was used to develop an idealised cross-section and geotechnical model to represent conditions during the various stages of the proposed construction sequence.

3. Site Description

Monte Sant' Angelo Mercy College is located on a truncated triangular block bounded by Miller Street to the east, McLaren Street to the north, Angelo Street to the west and Berry Street to the south. Several residential properties along McLaren Street are also included within the block. The relevant part of the site for this analysis is the central-east portion of Monte Sant' Angelo Mercy College adjacent to Miller Street.

The ground surface across the site generally slopes downwards to the south-east, with changes in elevation from about RL 80 m relative to Australian Height Datum (AHD) at the north-west corner to about RL 72 m AHD at the south-east corner.

The proposed development is close to the Sydney Metro station cavern beneath Miller Street. Based on drawings provided by Sydney Metro, the Sydney Metro subsurface property stratum in plan view extends about 6 m within Monte Sant' Angelo Mercy College from Miller Street. The top of the Sydney Metro property stratum is at RL 56.6 m AHD, approximately 15-20 m below existing ground surface.

4. Victoria Cross Station Infrastructure Under Construction

The Victoria Cross station is one of seven new stations of the 14 km long "Sydney Metro City and Southwest" underground metro line running from Chatswood, under Sydney Harbour and then beneath the Sydney CBD to Central Station, daylighting from the dive structure at Marrickville. The excavation for the Victoria Cross Station adopted the road header excavation methodology to form a 265 metre long, 25 metre wide and 20 metre high single-span cavern in the strong Hawkesbury Sandstone, with an island platform in the middle. Both ends of the station cavern are to be connected to two entrance and service shaft structures.

The permanent support over the station cavern is a cast in-situ reinforced concrete lining with a sheet waterproofing membrane between the exposed rock face and the in-situ concrete. The cavern excavation is understood to have been completed at the time of preparing this report, with the construction of the in-situ concrete lining underway.

5. Geotechnical Model

The *Sydney 1:100 000 Geological Series Sheet* indicates that the site is underlain by Ashfield Shale (Rwa) but is close to the mapped boundary between Ashfield Shale and Hawkesbury Sandstone (Rh). Ashfield Shale typically comprises dark-grey to black shale, claystone and siltstone with fine sandstone laminae. Hawkesbury Sandstone typically comprises medium to coarse grained quartz sandstone with minor shale and laminite lenses. An intermediate unit, the Mittagong Formation, is often present below Ashfield Shale and above Hawkesbury Sandstone. The Mittagong Formation comprises interbedded shale, laminite and medium-grained quartz sandstone.

The geotechnical investigation confirmed the presence of fill, with residual sandy clays underlying the fill at some areas which are derived from weathering of the Hawkesbury Sandstone. The thicknesses of fill and residual soils encountered within the boreholes varied across the site due the change in surface topography.

The sandy clays are typically underlain by a weathered Hawkesbury Sandstone profile which is initially very low and low strength (Class V and Class IV). The sandstone increases to medium and high strength with depth (Class II/III) and was observed to the termination depths of the boreholes. Defects and weathered seams were present throughout the sandstone profile.

Our previous investigations at nearby sites indicated that the Class I Sandstone is typically present below the borehole termination depths of the site investigation.

Groundwater was measured at a depth of 9.6 m (RL 63.4 m AHD) in the monitoring well at BH03. The water observed in the monitoring well is considered to be perched seepage rather than the regional groundwater table. The groundwater table is likely to be well below the bedrock surface. Seepage near the rock surface and through joints/partings within the bedrock would be expected to occur.

6. Numerical Modelling

6.1 Key Assumptions

The following key assumptions have been made in the numerical modelling:

- One 2D cross-section was selected (i.e. Model Section A). The section is running transversely across the station cavern, intercepting the row of most heavily loaded pad footings and the building core RF1 (corresponding to Grid 6 of Webber Design's Foundation Layout). The location of the model section is illustrated in Drawing M1 attached.
- The subsurface strata adopted in the numerical model were primarily based on the ground profile encountered in BH2, together with information from other boreholes on and near site to define the rock properties. All sandstone layers were assumed to be horizontal for simplicity purposes.
- The 0.7 m – 0.8 m thick (measured from survey CAD files) permanent cast in-situ reinforced concrete lining was modelled using 6-noded triangular finite element (FE) continuum with localised refinement of the overall mesh size. The lining was activated after the cavern had been fully excavated so that there is no residual in-situ stress in the lining.

- The concrete lining was modelled as a continuum with linearly-elastic material. A Young's modulus of 30 GPa was assumed.
- The ground has been modelled as linearly-elastic materials and as a continuum. The rock mass modulus values used in the numerical modelling are lower than intact rock values, having taken into account jointing and other rock defects.
- Shoring structures for the proposed basement on site were not explicitly modelled and side faces of the excavation were kept stable due to the use of an elastic material model. For this reason, the estimated soil movements and the ground surface settlement adjacent to the excavation faces are not expected to be accurate but this is not relevant to the impacts on the Metro infrastructure.
- The analysis has been undertaken based on "working stress" principles (ie. 1.0 x G + 1.0 x Q). The wall, column and building core loads along Grid 6 were explicitly modelled and were consolidated into 2D equivalent line loads in the 2D model space based on the grid spacings. The surcharge on the slab-on-ground was assumed to be a UDL of 5 kPa. The foundation loads adopted are summarised in Table 1.

Table 1: Building Loads Adopted in Model

Grid	Footing Type	Total Working Load (G+Q)	Grid Spacing (m)	Equivalent 2D Load (kN/m)
A	Strip Footing SF2 (600 mm)	398 kN/m	Continuous	398
B	Pad Footing PF2 (3.1 m x 2.4 m)	12,118 kN	8.5	1,430
C	Pad Footing PF2 (3.1 m x 2.4 m)	20,161 kN	8.5	2,370
D	Pad Footing PF2 (3.1 m x 2.4 m)	19,490 kN	8.5	2,300
D-E	Building Core RF1 (9.7 m x 5.1 m)	17,539 kN	7.5	250
E	Strip Footing SF2 (600 mm)	131 kN/m	Continuous	131

6.2 Model Geometry

For the analysis, a 200 m wide and 98 m high model was set up with finite elements sized depending on the geometric complexity. The model grid consists of triangular elements with six nodes. The model base was fixed in both the lateral and vertical directions. The vertical boundaries were fixed in the x-direction at both far ends.

The bulk excavation level of the basement is at RL 63.6 m. The cavern crown is located at approximately RL 47 m. The geometries and relative positions of the Metro cavern and basement excavation on site are based on the section prepared by TSS Total Surveying Solutions.

The idealised numerical model geometry is shown in Drawing M2 in Appendix B.

6.3 Geotechnical Model

The idealised geotechnical profile is shown in Drawing M3 and is summarised in Table 2.

Table 2: Geotechnical Profile Used in the Model

Reduced Level Top (m, AHD)	Reduced Level Base (m, AHD)	Material Description
75.8	71.2	Fill and Residual Clay
71.2	69.2	Sandstone: Class V
69.2	67.2	Sandstone: Class IV
67.2	60.2	Sandstone: Class III
60.2	Model Base	Sandstone: Class II / I

6.4 Material Properties and Parameters

A linearly-elastic constitutive model was adopted. All of the properties adopted were isotropic in vertical and lateral directions; no movement can occur in the longitudinal direction since the analysis is plane strain. The geotechnical properties for the units adopted in the model, shown in Drawing M3, are summarised in Table 3.

Table 3: Material Properties Adopted in the Model

Material	Unit Weight (kN/m^3)	Deformation Modulus (MPa)	Poisson Ratio
Fill and Residual Clay	20	10	0.3
Sandstone: Class V	21	200	0.3
Sandstone: Class IV	22	400	0.3
Sandstone: Class III	24	1500	0.25
Sandstone: Class II / I	24	3000	0.2

6.5 In-situ stress

Pells (2002) in-situ stress relationship has been adopted for medium and high strength sandstone. This relationship is provided below:

σ_1= 1.5 MPa + (2 x σ_3)

σ_2 = 1.0 MPa + (1.2 x σ_3)

σ_3 = γ x H

where,
σ_1 = maximum principal stress (north-south direction, longitudinal direction in 2D model)
σ_2 = intermediate principal stress (east-west direction, transverse direction in 2D model)
σ_3 = minor principal stress (vertical)
γ = unit weight
H = depth below surface (m)

For weak rock (i.e. Class V / IV sandstone), a ratio of 1:1 horizontal to vertical stress has been used. The initial horizontal stress in soils were calculated by applying the 'at-rest' earth pressure coefficient K_0 (i.e. $\sigma_H = K_0$ x σ_v). A value of K_0 = 0.5 was adopted for fill and residual clay.

6.6 Construction Sequence

The construction sequence adopted is shown in Drawings M4 and M5 in Appendix B and is summarised in Table 4.

Table 4: Adopted Construction Stages

Construction Stage	Description	Comments
1	Set up initial stress	Initial model geometry and in-situ stress
2	Excavate Victoria Cross Station Cavern	Arched tunnel profile 'wished in place' prior to site development.
3	Construct reinforced concrete lining	Activate the concrete element
4	Basement excavation to BEL	Excavate to BEL of the basement at RL 63.6 m
5	Construct building foundation	Activate concrete footings
6	Apply final building loads	Apply the detailed wall, column and building core loads individually

6.7 Methodology

Numerical modelling was undertaken using the *Phase²* computer program. *Phase²* is a two-dimensional finite element program for modelling the interaction of soil, rock and structural elements that may undergo plastic yield when their specified yield limits are reached.

The analysis method adopted is a 'plane-strain' method where movement in the longitudinal direction (into the page) is assumed to be negligible and only considers small strain.

6.8 Results

The induced displacement contours at selected stages are shown in Drawings M6-M9, in Appendix B. The induced major/minor principal stresses in the concrete lining, at the initial stage (Stage 3), unloading (Stage 4) and the building loading (Stage 6) are shown in Drawings M10 and M15, in Appendix B.

A summary of the predicted total displacements at various points together with the principal stresses of the tunnel lining are provided in Table 5.

Table 5: Summary of Modelling Results

Parameter	Units	Construct Cavern Lining (Stage 3)	Excavation to BEL (Stage 4)	Final Building Loads (Stage 6)
Maximum Horizontal Displacement in Station Cavern	mm	Baseline	2 (towards west)	1 (towards west)
Maximum Vertical Displacement in Station Cavern	mm	Baseline	1 (upwards)	1 (downwards)
Maximum Major Principal Stress in Tunnel Liner (σ_1)	kPa	116 (Compression) 451 (Compression)	-15 (Tension) 1108 (Compression)	67 (Compression) <u>1619</u> (Compression)
Maximum Minor Principal Stress in Tunnel Liner (σ_3)	kPa	-17 (Tension) 79 (Compression)	<u>-428</u> (Tension) 145 (Compression)	-44 (Tension) 235 (Compression)

7. Comments

Based on the results of the numerical modelling, the proposed development is likely to result in very minor displacements within the station cavern. The displacements are upwards to the west towards the basement due to the heave in rock upon completion of bulk excavation and are downwards to the west upon final building loading, with predicated maximum horizontal and vertical cavern movements of approximately 1-2 mm. These movements are well below the displacement limit of 10 mm for the metro cast in-situ cavern lining, suggested by TfNSW (Reference 1).

Across all stages, the maximum induced principal stresses in the cavern lining are predicted to be approximately 0.43 MPa in tension and 1.6 MPa in compression. These values are considered well below the tensile / compressive strengths of the reinforced concrete lining, respectively.

The 2D model is likely to predict higher displacements and induced stresses on the tunnel structural lining compared with a 3D model. This is because the plain strain 2D model does not have the confining end boundary restraints of a 3D model.

8. References

1. *"Development Near Rail Tunnels"*, T-HR-CI-12051-ST, TfNSW, Version 2.0, dated 15 November 2018.
2. *"An Alternative View on Geotechnical Parameters for Tunnel Design in Sydney"*, D.A.F. Oliveira (2014)
3. *"Developments in the design of Tunnels and Caverns in the Triassic Rocks of the Sydney region"*, Pells P.J.N (2002)

9. Limitations

Douglas Partners (DP) has prepared this report for this project at Monte Sant' Angelo Mercy College at 128 Miller Street, North Sydney in accordance with DP's proposal SYD191047 dated 3 October 2019 and acceptance received from Peter Brogan of Bloompark Consulting Pty Ltd on behalf of Monte Sant' Angelo Mercy College, dated 8 July 2020. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Monte Sant' Angelo Mercy College and their agents for this project only and for the purposes as described in the report. It should not be used by or be relied upon for other projects or purposes on the same or other sites or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

DP's advice is based upon the conditions encountered during the geotechnical investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report.

Douglas Partners Pty Ltd

Appendix A

About This Report

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

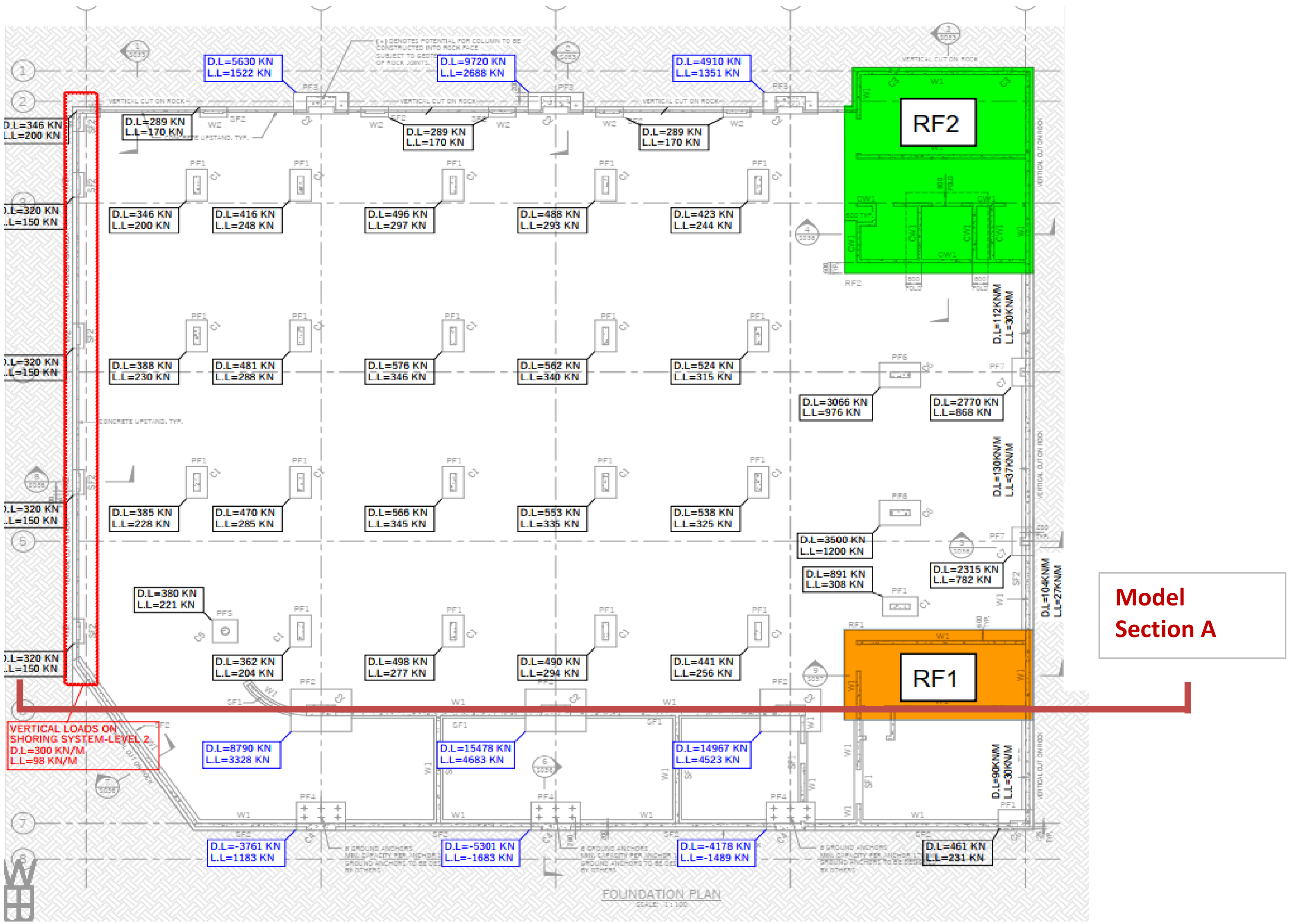
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

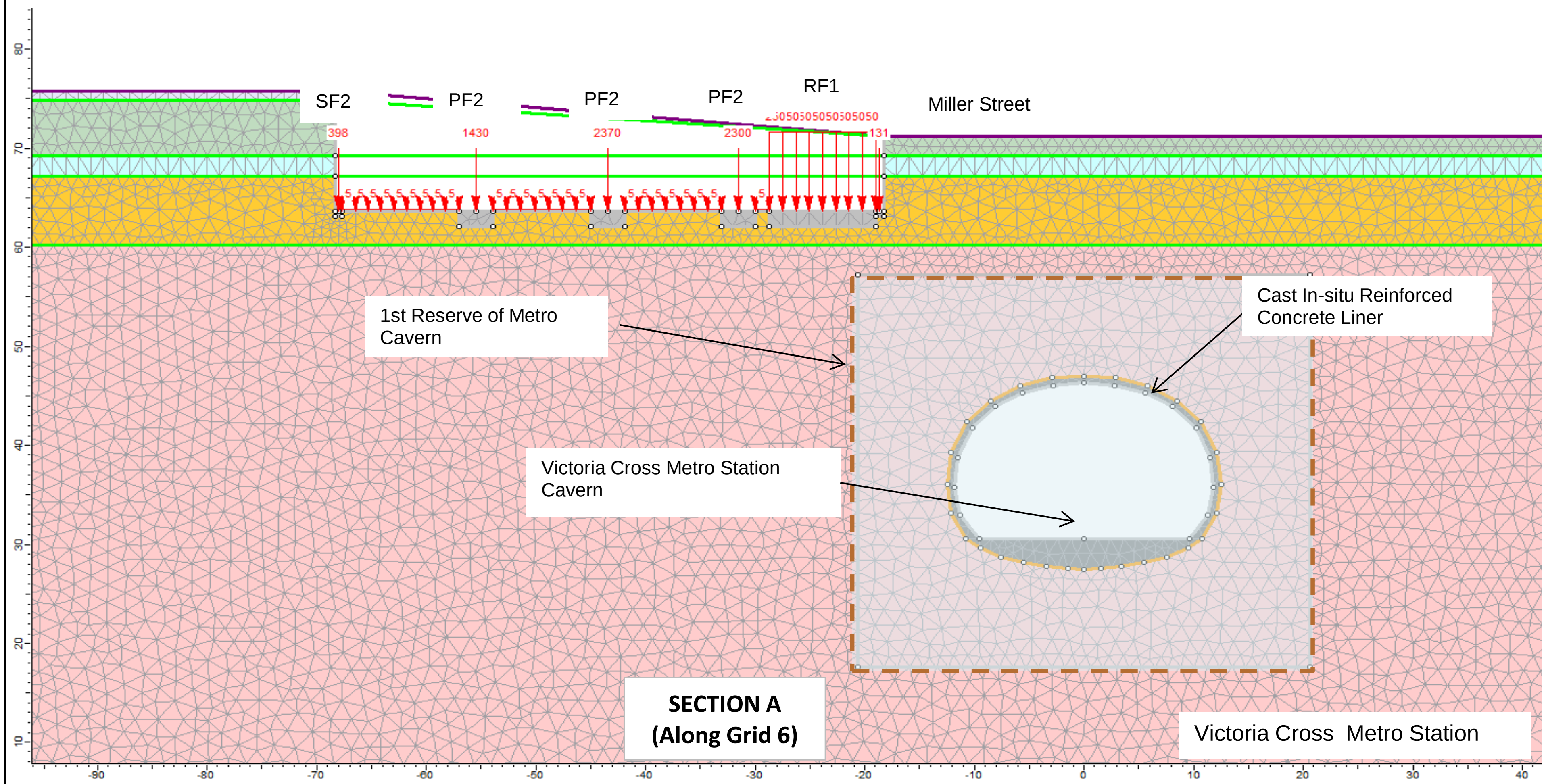
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

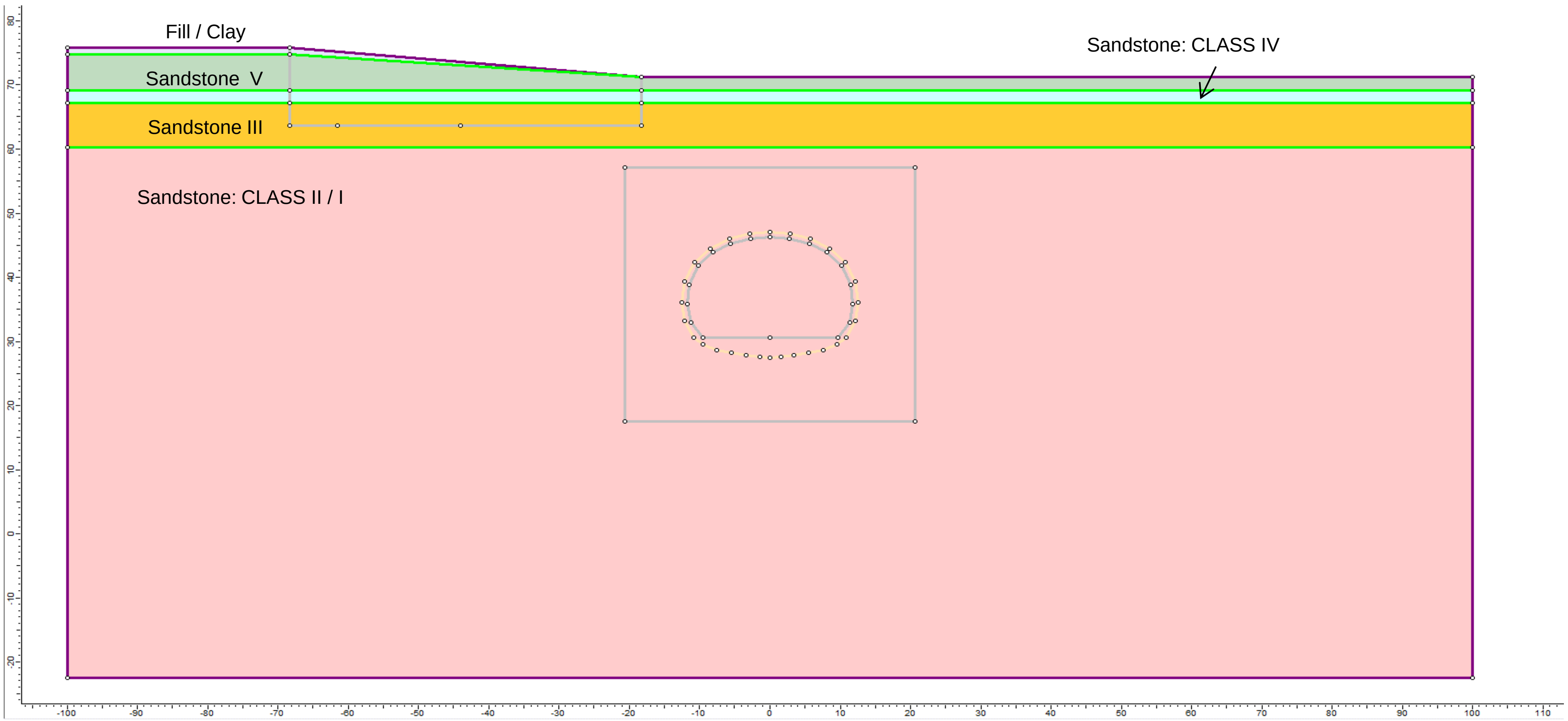
Phase^2 Outputs



Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Monte Sant' Angelo Mercy College	**Section Location**	PROJECT No:	73019.04
	OFFICE: Sydney	**Monte Scientia Project**	DWG No:	M1
	DATE: 18 Nov 2020	**128 Miller Street, North Sydney**	REVISION:	1

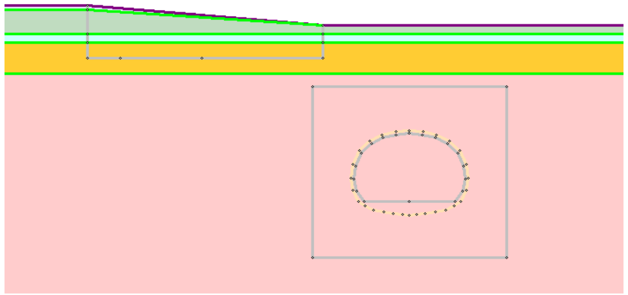


Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Monte Sant' Angelo Mercy College	Adopted Model Geometry	PROJECT No: 73019.04
	OFFICE: Sydney	Monte Scientia Project	DWG No: M2
	DATE: 18 Nov 2020	128 Miller Street, North Sydney	REVISION: 1

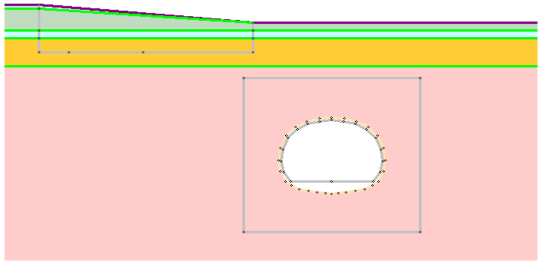


Material: Fill / Clay	Material: Sandstone V	Material: Sandstone IV	Material: Sandstone III	Material: SANDSTONE II / I
Unit weight: 20 kN/m^3	Unit weight: 21 kN/m^3	Unit weight: 22 kN/m^3	Unit weight: 24 kN/m^3	Unit weight: 24 kN/m^3
Young's modulus: 10 MPa	Young's modulus: 200 MPa	Young's modulus: 400 MPa	Young's modulus: 1500 MPa	Young's modulus: 3000 MPa
Poisson's ratio: 0.3	Poisson's ratio: 0.3	Poisson's ratio: 0.3	Poisson's ratio: 0.25	Poisson's ratio: 0.2
Material type: Linear Elastic	Material type: Linear Elastic	Material type: Linear Elastic	Material type: Linear Elastic	Material type: Linear Elastic

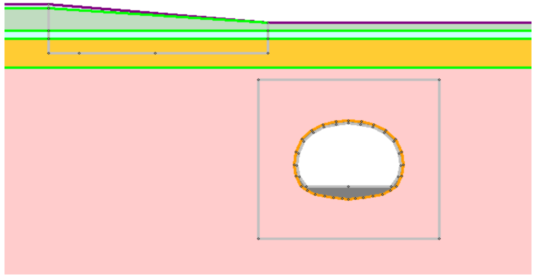
Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Monte Sant' Angelo Mercy College	**Geotechnical Units**	PROJECT No:	73019.04
	OFFICE: Sydney	**Monte Scientia Project**	DWG No:	M3
	DATE: 18 Nov 2020	**128 Miller Street, North Sydney**	REVISION:	1



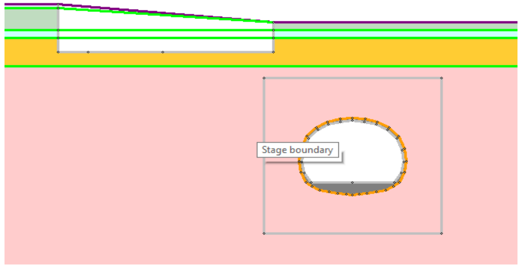
Stage 1 - Initial Equilibrium



Stage 2 - Excavate Metro Cavern



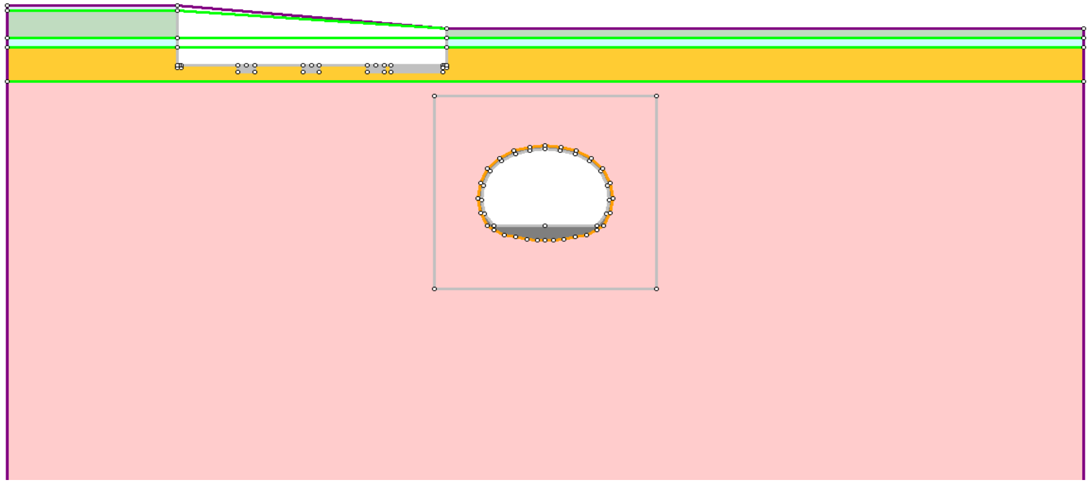
Stage 3 - Construct Concrete Lining



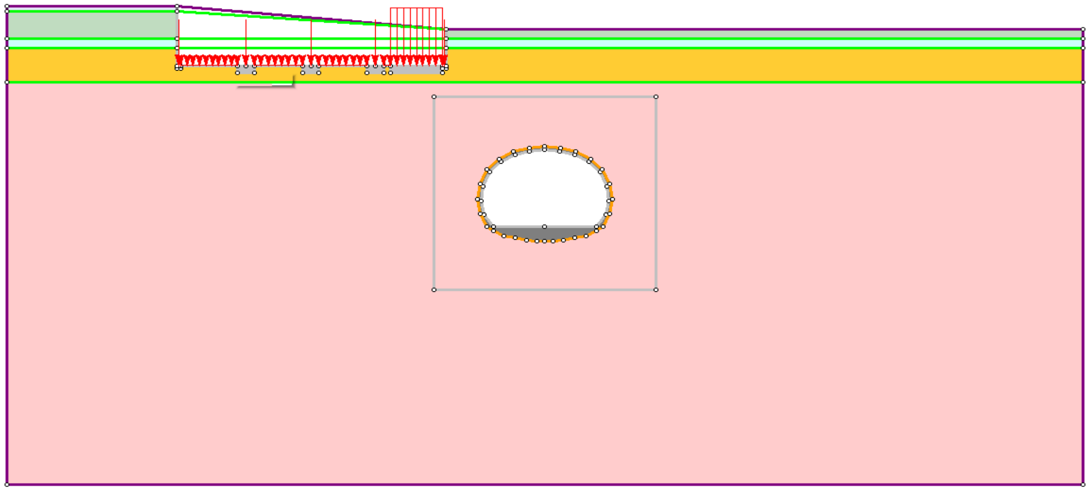
Stage 4 - Excavate the Site

SECTION A

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Monte Sant' Angelo Mercy College	**Model Stages 1-4**	PROJECT No: 73019.04
	OFFICE: Sydney	**Monte Scientia Project**	DWG No: M4
	DATE: 18 Nov 2020	**128 Miller Street, North Sydney**	REVISION: 1



Stage 5 - Construct Building Footings

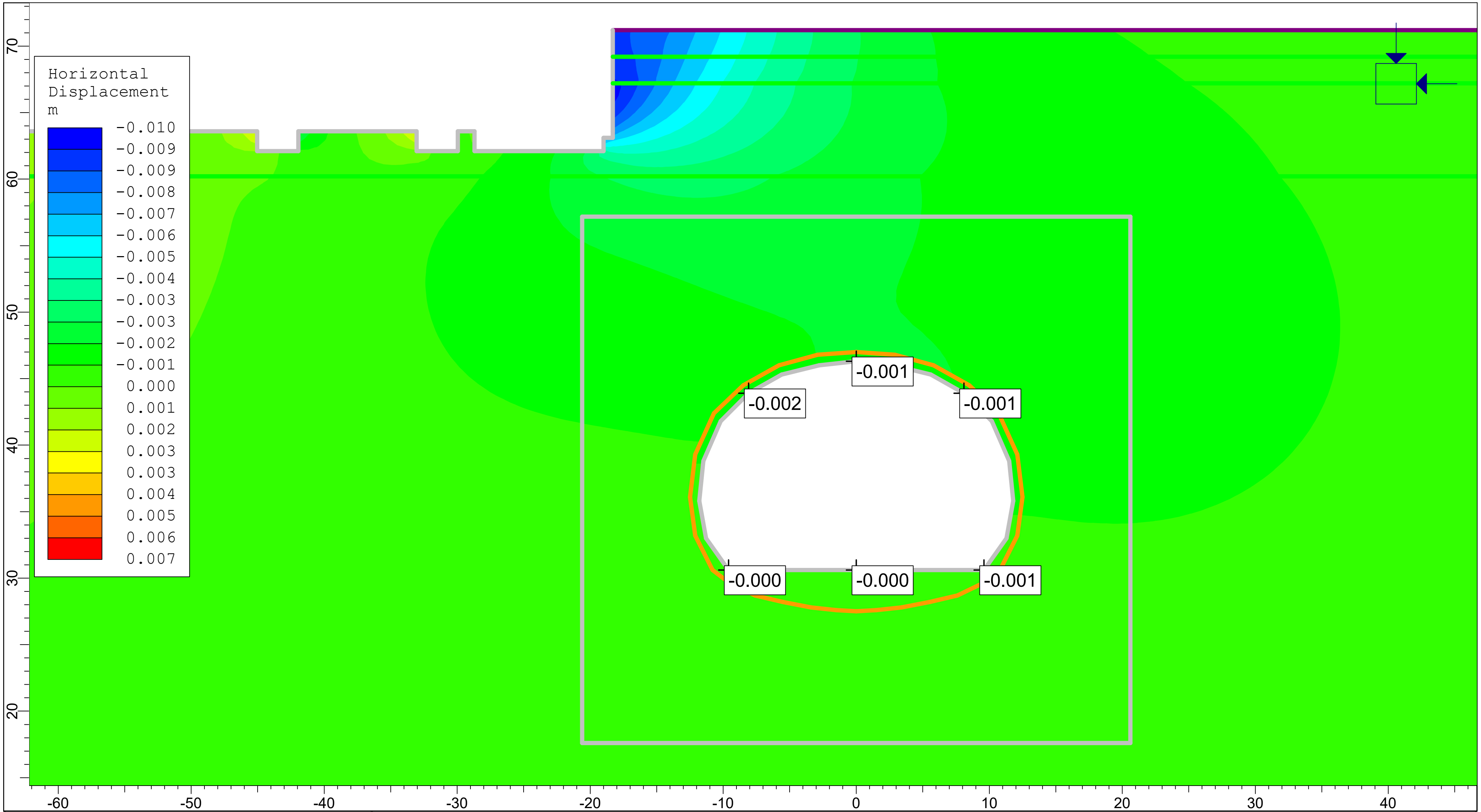


Stage 6 - Apply Building Loading

SECTION A

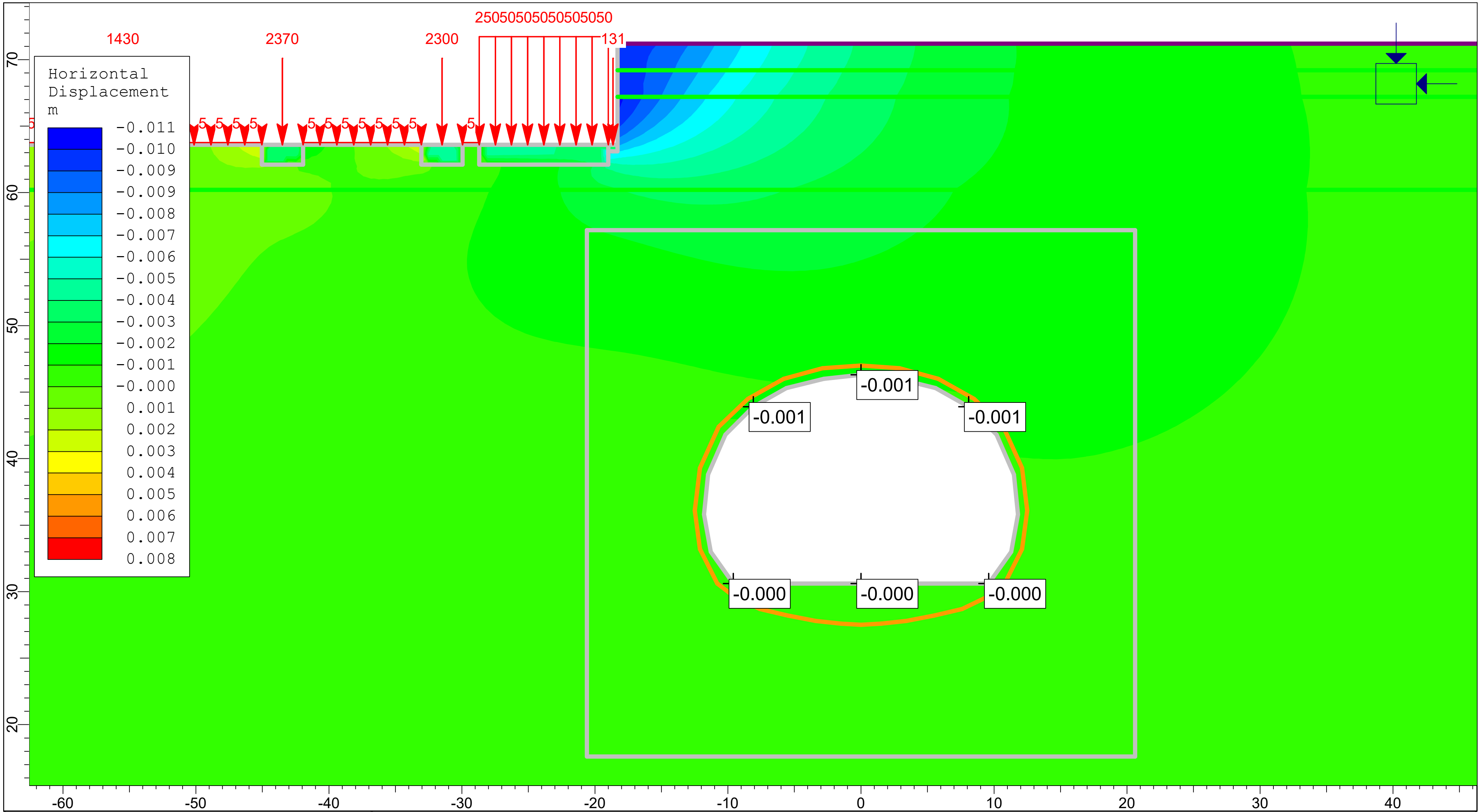
Douglas Partners — Geotechnics / Environment / Groundwater	CLIENT:	Monte Sant' Angelo Mercy College	**Model Stages 5**	PROJECT No:	73019.04
	OFFICE:	Sydney	**Monte Scientia Project**	DWG No:	M5
	DATE:	18 Nov 2020	**128 Miller Street, North Sydney**	REVISION:	1

Drawing M6 - Horizontal Displacement -
Stage 4 - Basement Excavation



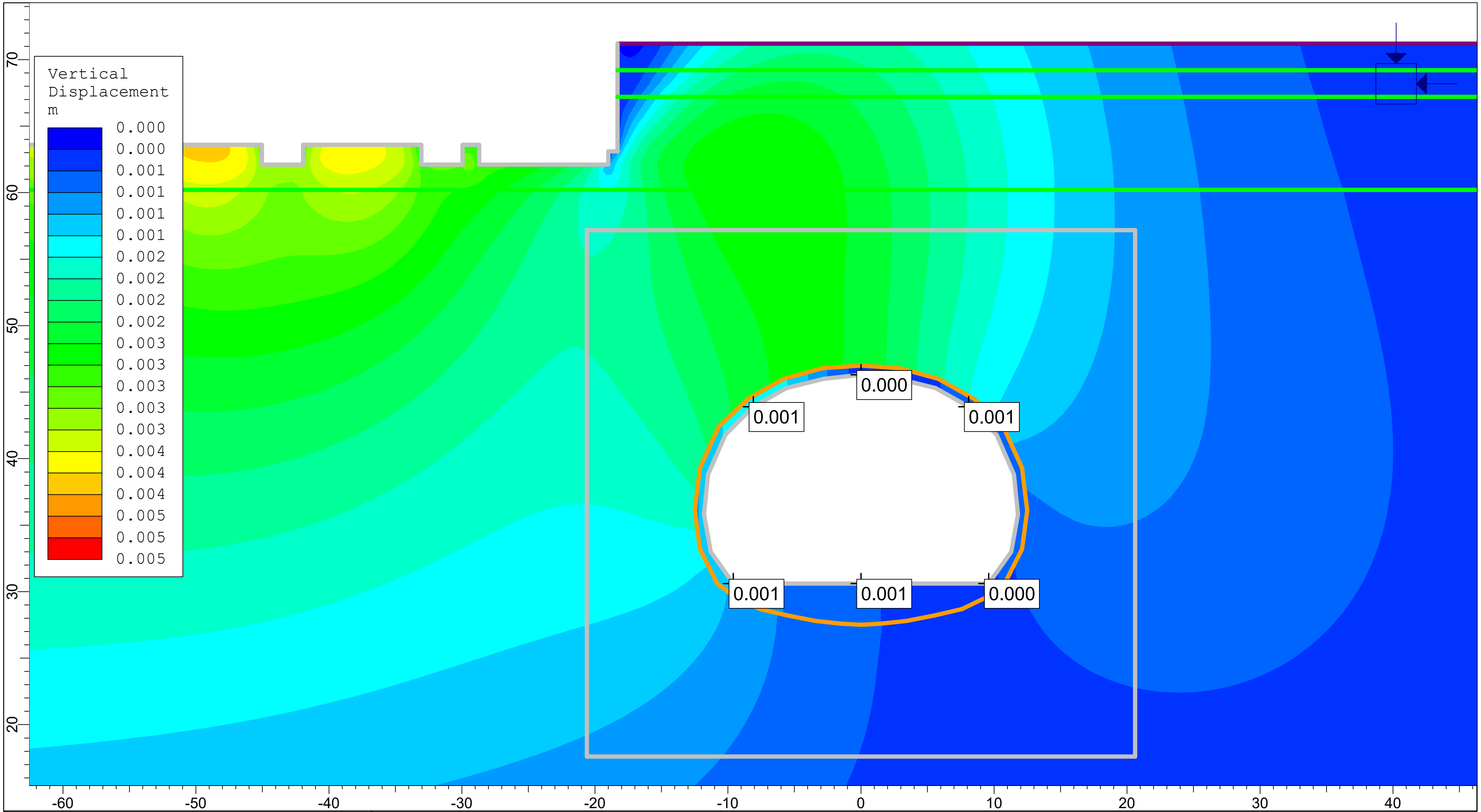
Douglas Partners	Project	Monte Scientia Project - 128 Miller Street	
	Analysis Description	Victoria Cross Metro Cavern	
	Drawn By: JH	Company: Douglas Partners	
INTERPRET 8.024	Date: Nov 2020	File Name: R01.fez	

Drawing M7 - Horizontal Displacement - Stage 6 - Building Loading



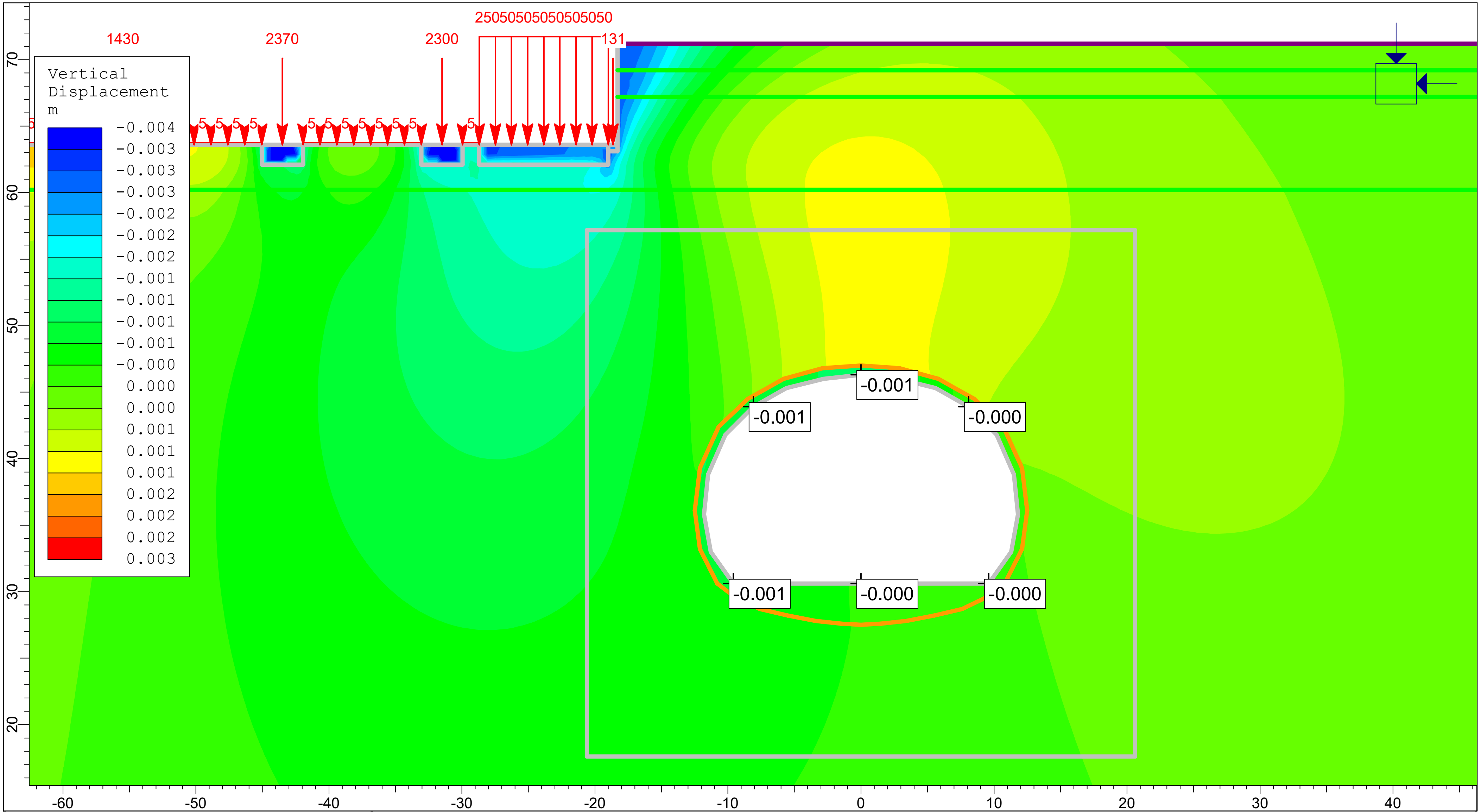
Douglas Partners	*Project*	Monte Scientia Project - 128 Miller Street	
	Analysis Description	Victoria Cross Metro Cavern	
	Drawn By JH	*Company* Douglas Partners	
INTERPRET 8.024	*Date* Nov 2020	*File Name* R01.fez	

Drawing M8 - Vertical Displacement -
Stage 4 - Basement Excavation



Douglas Partners	*Project* Monte Scientia Project - 128 Miller Street		
	Analysis Description Victoria Cross Metro Cavern		
	Drawn By JH	*Company* Douglas Partners	
INTERPRET 8.024	*Date* Nov 2020	*File Name* R01.fez	

Drawing M9 - Vertical Displacement -
Stage 6 - Building Loading

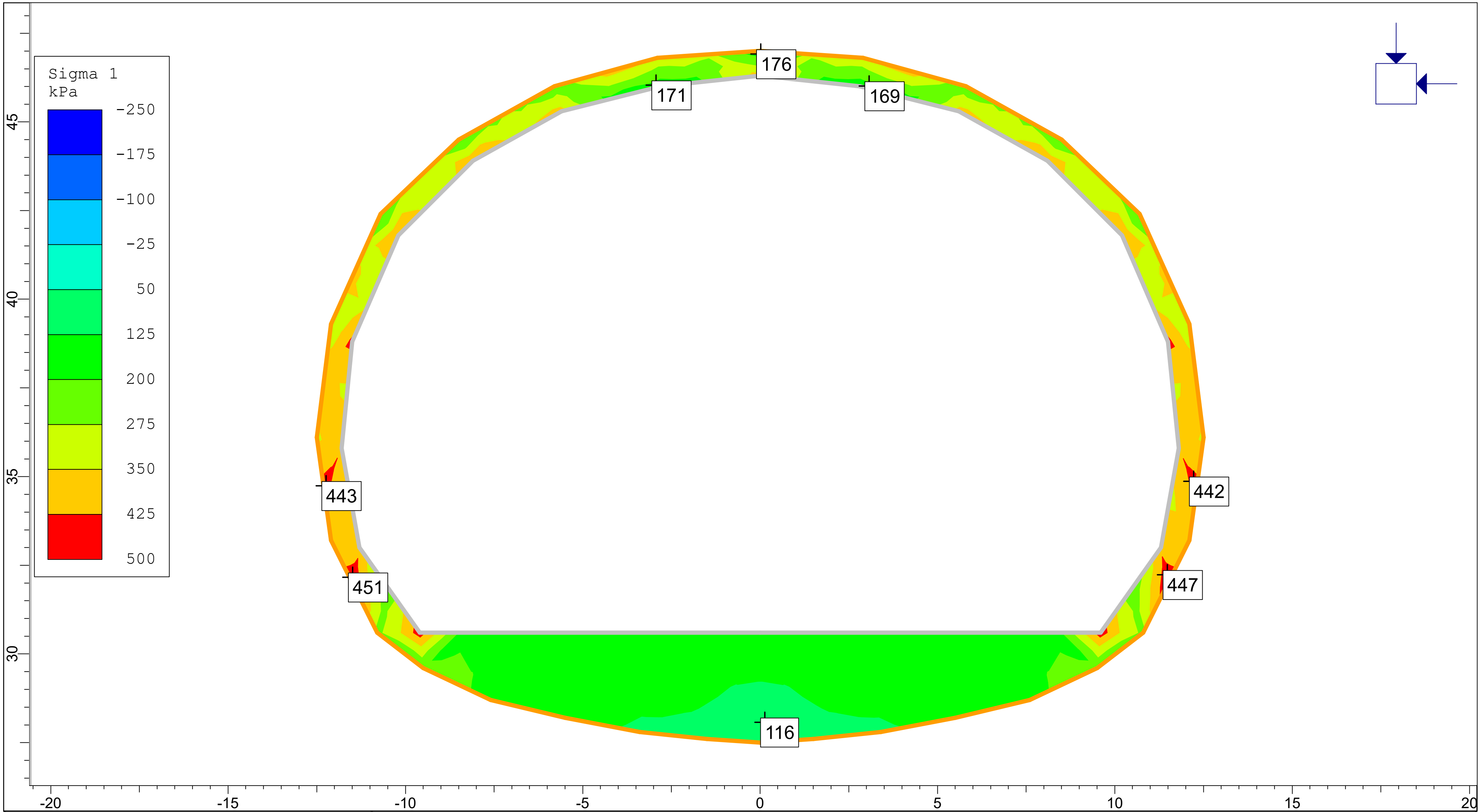


Project	Monte Scientia Project - 128 Miller Street		
Analysis Description	Victoria Cross Metro Cavern		
Drawn By	JH	Company	Douglas Partners
Date	Nov 2020	File Name	R01.fez

Douglas Partners

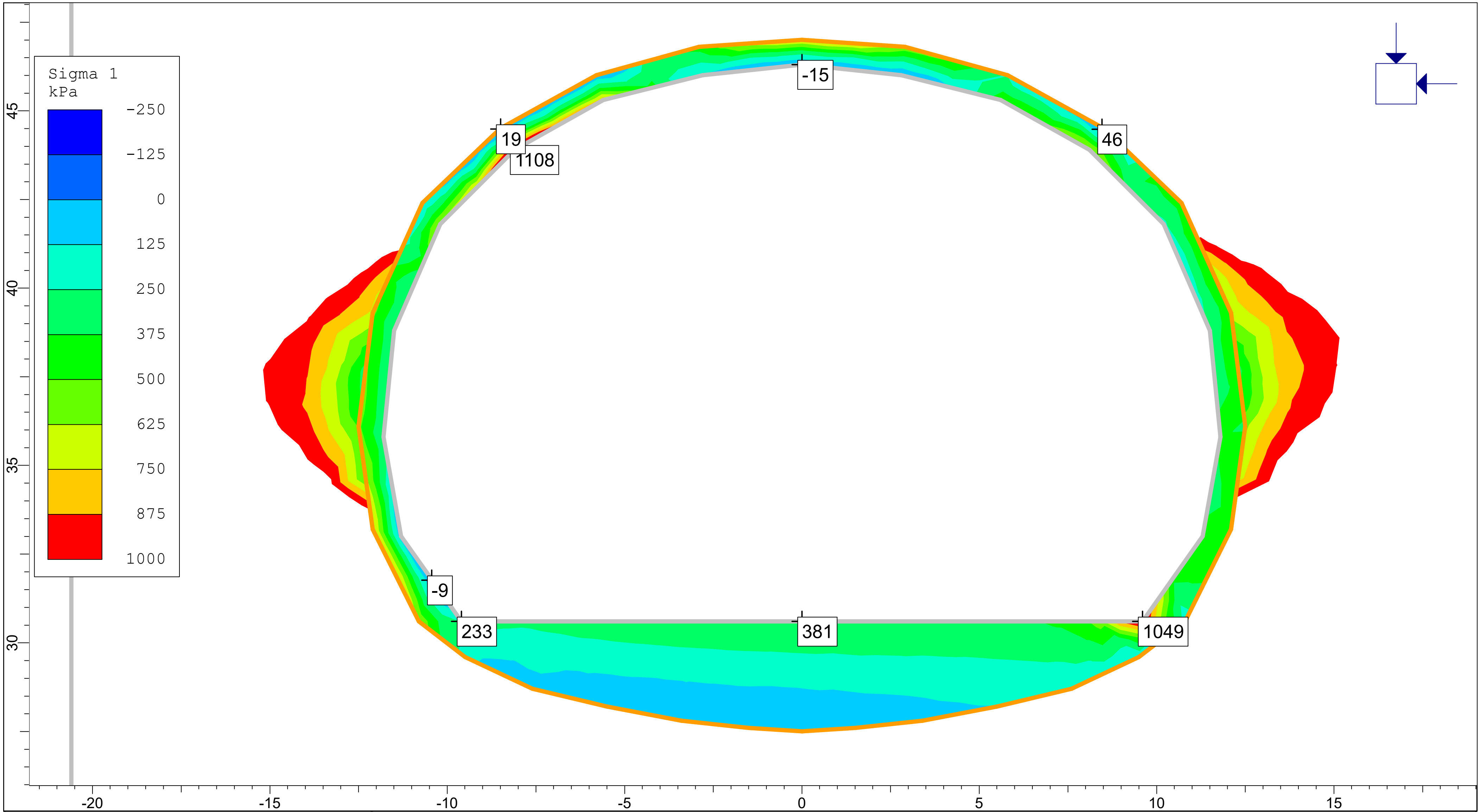
INTERPRET 8.024

Drawing M10 - Major Principal Stress
Stage 3 - Construct Station Cavern



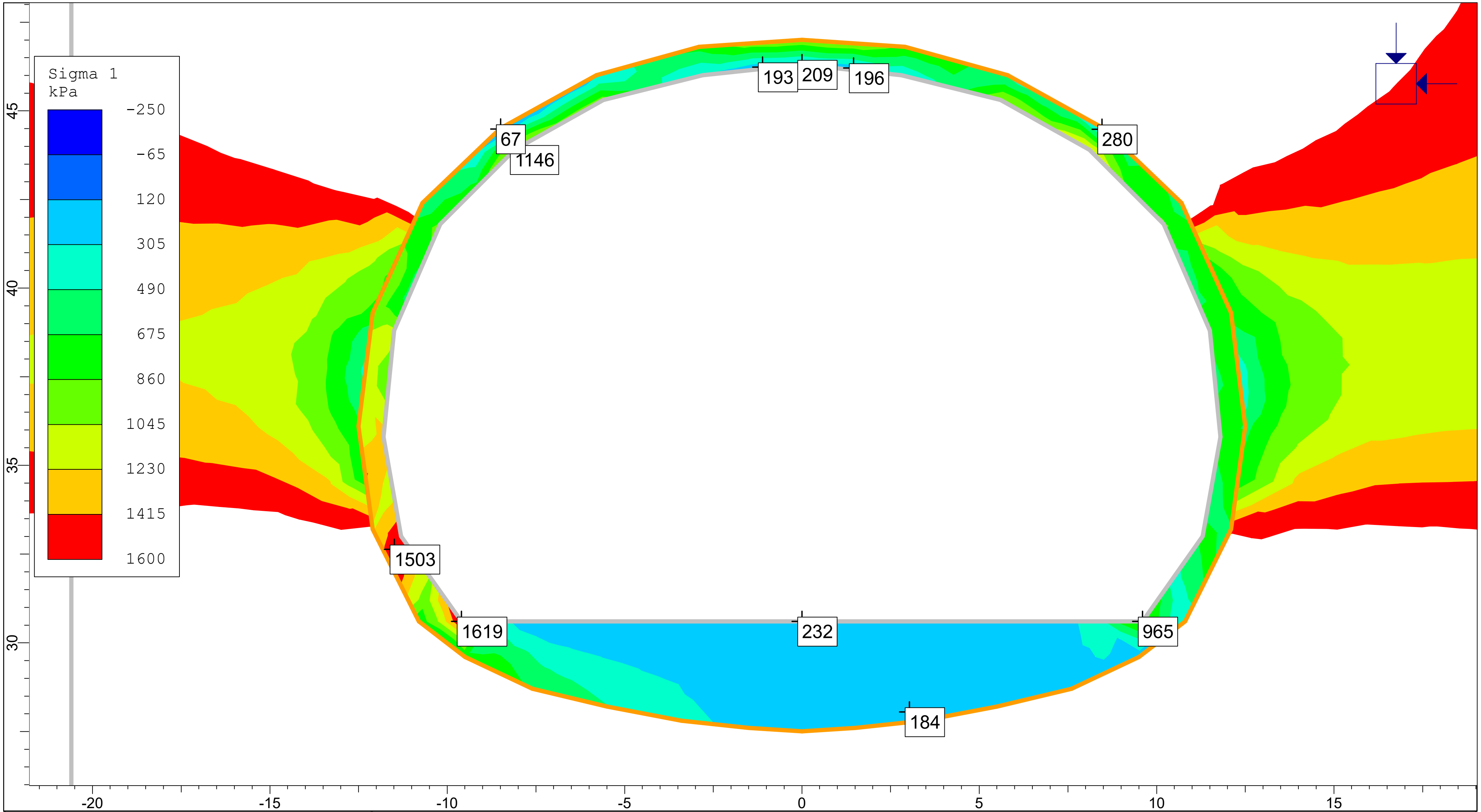
Douglas Partners	*Project* Monte Scientia Project - 128 Miller Street		
	Analysis Description Victoria Cross Metro Cavern		
	Drawn By JH	*Company* Douglas Partners	
INTERPRET 8.024	*Date* July 2020	*File Name* R00.fez	

Drawing M11 - Major Principal Stress
Stage 4 - Basement Excavation



Douglas Partners	Project	Monte Scientia Project - 128 Miller Street	
	Analysis Description	Victoria Cross Metro Cavern	
	Drawn By: JH	Company: Douglas Partners	
INTERPRET 8.024	Date: Nov 2020	File Name: R01.fez	

Drawing M12 - Major Principal Stress
Stage 6 - Building Loading

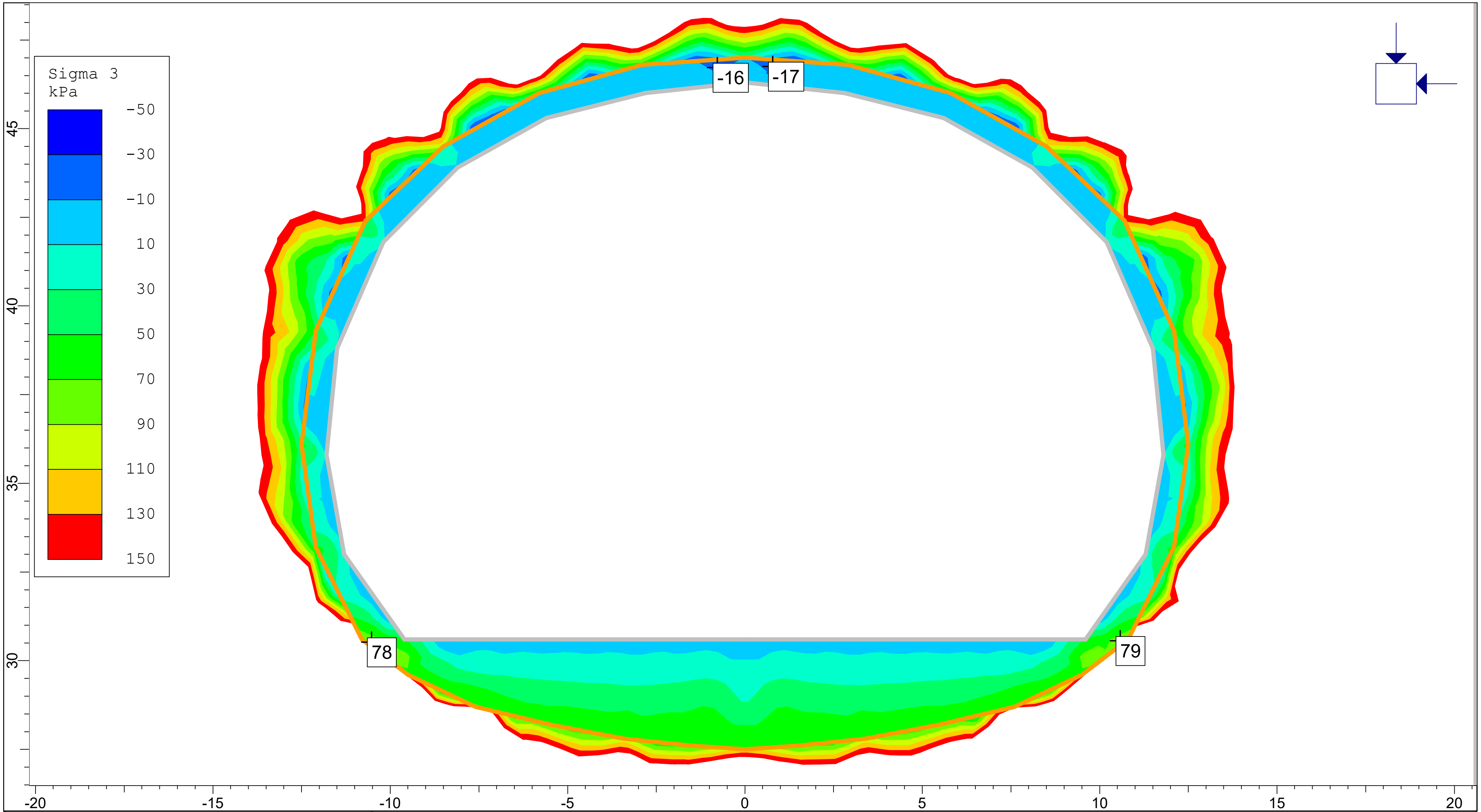


Project	Monte Scientia Project - 128 Miller Street		
Analysis Description	Victoria Cross Metro Cavern		
Drawn By	JH	Company	Douglas Partners
Date	Nov 2020	File Name	R01.fez

Douglas Partners

INTERPRET 8.024

Drawing M13 - Minor Principal Stress
Stage 3 - Construct Station Cavern



Douglas Partners	*Project* Monte Scientia Project - 128 Miller Street		
	Analysis Description Victoria Cross Metro Cavern		
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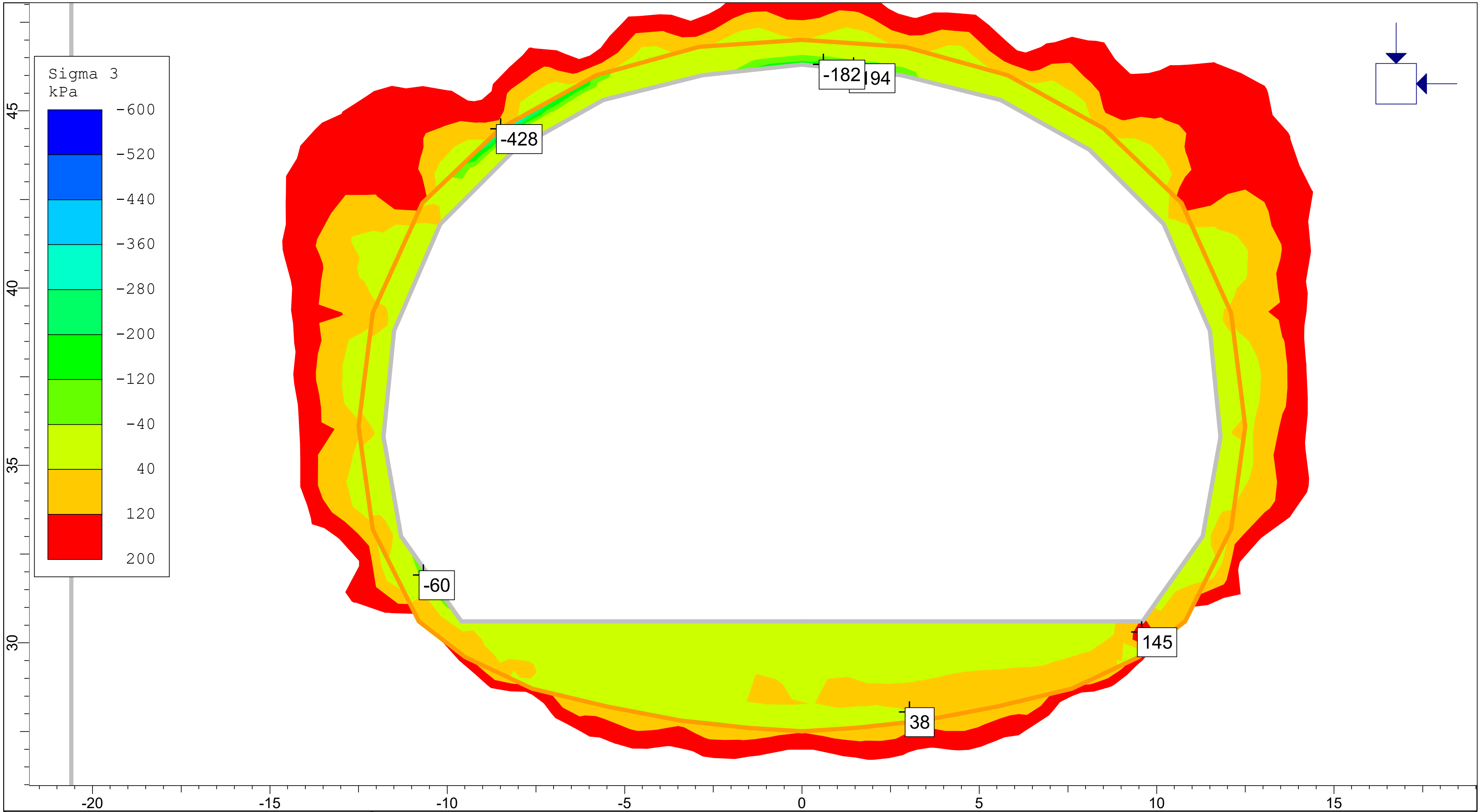
INTERPRET 8.024	*Date* July 2020	*File Name* R00.fez	

Drawing M14 - Minor Principal Stress
Stage 4 - Basement Excavation



Douglas Partners	*Project* Monte Scientia Project - 128 Miller Street		
	Analysis Description Victoria Cross Metro Cavern		
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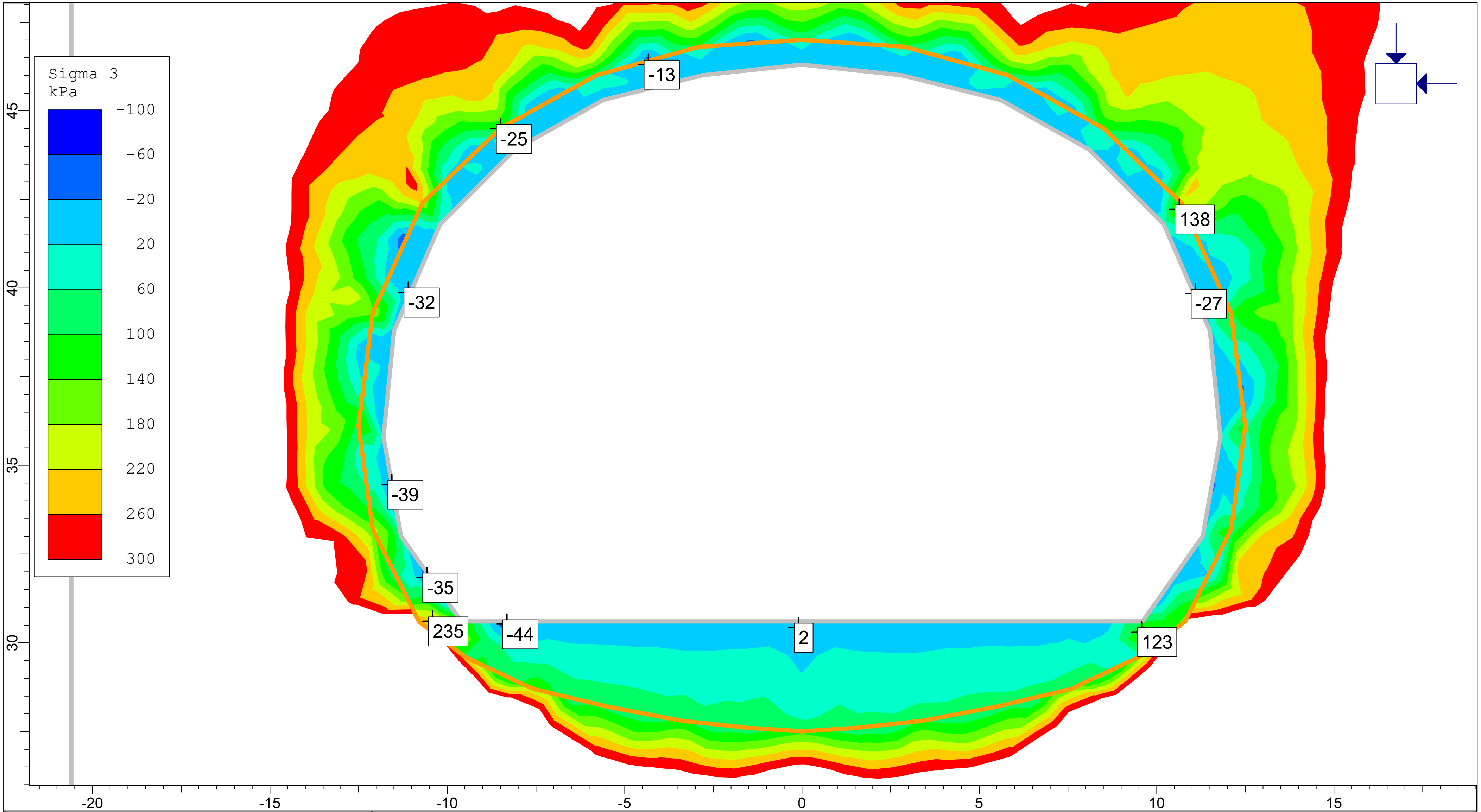
INTERPRET 8.024	*Date* Nov 2020	*File Name* R01.fez	

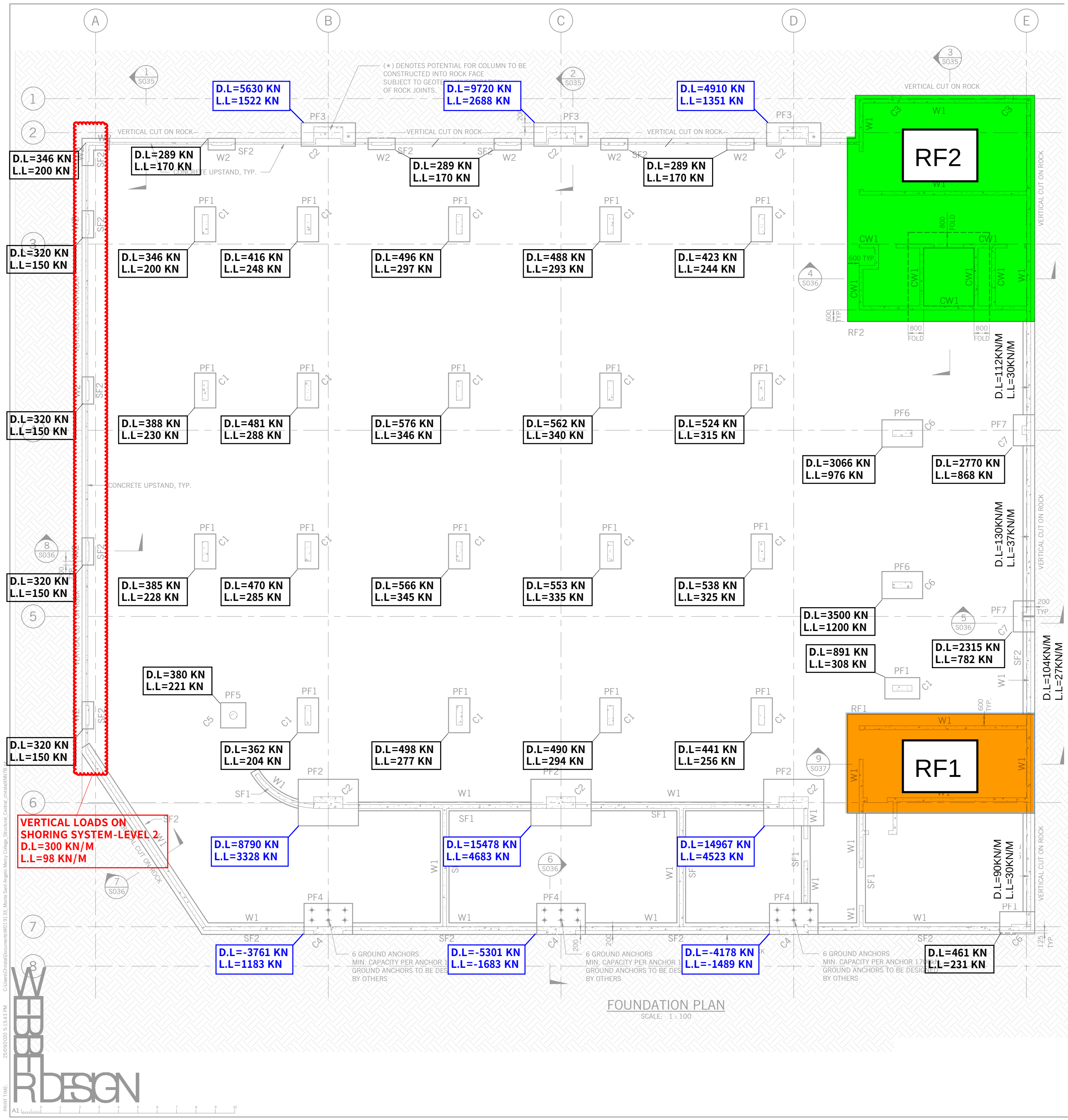
Drawing M15 - Minor Principal Stress
Stage 6 - Building Loading



Douglas Partners	*Project*	Monte Scientia Project - 128 Miller Street	
	Analysis Description	Victoria Cross Metro Cavern	
	Drawn By JH	*Company* Douglas Partners	
INTERPRET 8.024	*Date* Nov 2020	*File Name* R01.fez	

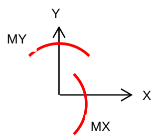
Appendix C

Drawings



FORCES ON LIFT CORE AND STAIRCASE PADS

MARK	CASES	N (KN)	VX (KN)	VY (KN)	MZ(TORSION)KN.M	MX (KN.M)	MY (KN.M)
RF1	WIND x	253	337	26	-269	837	4911
	WIND y	-12(TENS.)	88	169	277	2737	1796
	EQ X	2204	3896	277	-2339	7026	44825
	EQ Y	-47(TENS.)	868	1363	-1568	20063	14603
	G	14200	706	184	212	-20912	-36787
	Q	3339	253	47	255	-6981	-12801
RF2	WIND x	130	145	4	-96	-114	1408
	WIND y	-140(TENS.)	43	27	-110	428	-331
	EQ X	1139	1545	44	-963	-985	13507
	EQ Y	-775(TENS.)	283	237	-794	3091	-2523
	G	6168	344	34	210	-114	1408
	Q	1706	150	56	66	2134	-9044



APPENDIX C

(EXCAVATION MANAGEMENT PLAN)

Excavation management Plan

4/01/2021

Richard Crookes Constructions Pty Ltd

Monte Scientia
128 Miller St North Sydney

Jayden Lin
ACE CIVIL PTY LTD

Revision History

Revision number	Amended page(s)	Date
1	All	04/01/2021

Distribution Control

Controlled copies will be distributed to, and retained by key personnel.

Company	User	Date
ACE Civil Pty Ltd	Jayden Lin	04/01/2021

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1 Introduction

This document outlines the methodology of excavation that will be adopted by ACE Civil Pty Ltd (ACE) for the construction of one underground basement shoring system at the Richard Crookes Constructions Pty Ltd (RCC) educational development at 128 Miller St, North Sydney, NSW (Site)

2 Guidelines and Legislation

The excavation, removal, storage, handling and disposal of product and materials containing asbestos will be carried out in accordance with the relevant requirements of SafeWork NSW and the NSW Department of Environment & Conservation including:

- Work Health and Safety Act 2011;
- SafeWork NSW Code of Practice for the Safe Removal of Asbestos;
- Australian Standard 2601 ;
- The Protection of the Environment Operation Act 1997 and Protection of the Environment Operations (Waste) Regulation 1996 and;
- Relevant Department of Environment & Conservation (DEC)/Environment Protection Authority (EPA) and WorkCover NSW Guidelines;
- Work Cover NSW - Guidelines and Codes of Practice

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3 SITE LOCATION

Monte is located in the North Sydney Council local government area (LGA). It is directly to the north of the North Sydney CBD, which is the major commercial centre of North Sydney.

Monte is located approximately 3.5km north of the Sydney CBD, 500 metres north of North Sydney Railway Station. Victoria Cross Metro Station is currently under construction diagonally opposite the school at the south-eastern corner of Miller Street and Berry Street, as well as an entrance to the north-east on the corner of McLaren Street. Miller Street runs along the eastern boundary of the Site which provides a major bus corridor to the North Shore and Northern Beaches.

The key land use characteristics surrounding the School campus are:

- South: North Sydney CBD commercial core, primarily characterised by high-rise commercial buildings and support services including hotels, retail uses, and Shore Grammar School.
- North: mixed precinct including:
    - Low-density residential area within a heritage conservation area;
    - Community buildings including the North Sydney Council Chambers
    - Schools including St Mary's Primary, Wenona School, Marist College and North Sydney BoysHigh School.
    - St Leonards Park.
- East: The extension of the North Sydney CBD Commercial Core, generally characterised by high density residential and commercial buildings.
- West: Medium density residential and high-rise commercial buildings along the Pacific Highway. Further west is a low-density residential area which is identified as a heritage conservation area, and the Australian Catholic University.

Immediately surrounding the Monte campus is best described as:

- South (Berry Street): - Commercial buildings and the Victoria Cross Metro Station currently under construction.
- North (McLaren Street): McLaren Street is a heritage conservation area under the North Sydney LEP. Monte own most of the buildings on the southern side of McLaren Street which are generally single and two storey buildings originally built for residential purposes. The site at the southwestern corner of Miller Street and McLaren Street is an Italian restaurant and a four-storey commercial building with basement parking. The northern side of McLaren Street is primarily used for community facilities including a preschool, Council Chambers, community hall, and public plaza/park used for a weekend fresh produce market.
- East (Miller Street): Mix of commercial, residential and hotel towers, as well as the Rag and Famish Hotel at the corner of Miller and Berry Streets. A northern pedestrian portal to the Victoria Cross Metro Station is proposed on the north-eastern corner of Miller Street and McLaren Street intersection.
- West (Angelo Lane): mix of commercial and high-density residential buildings up to 16-storeys with basement parking.

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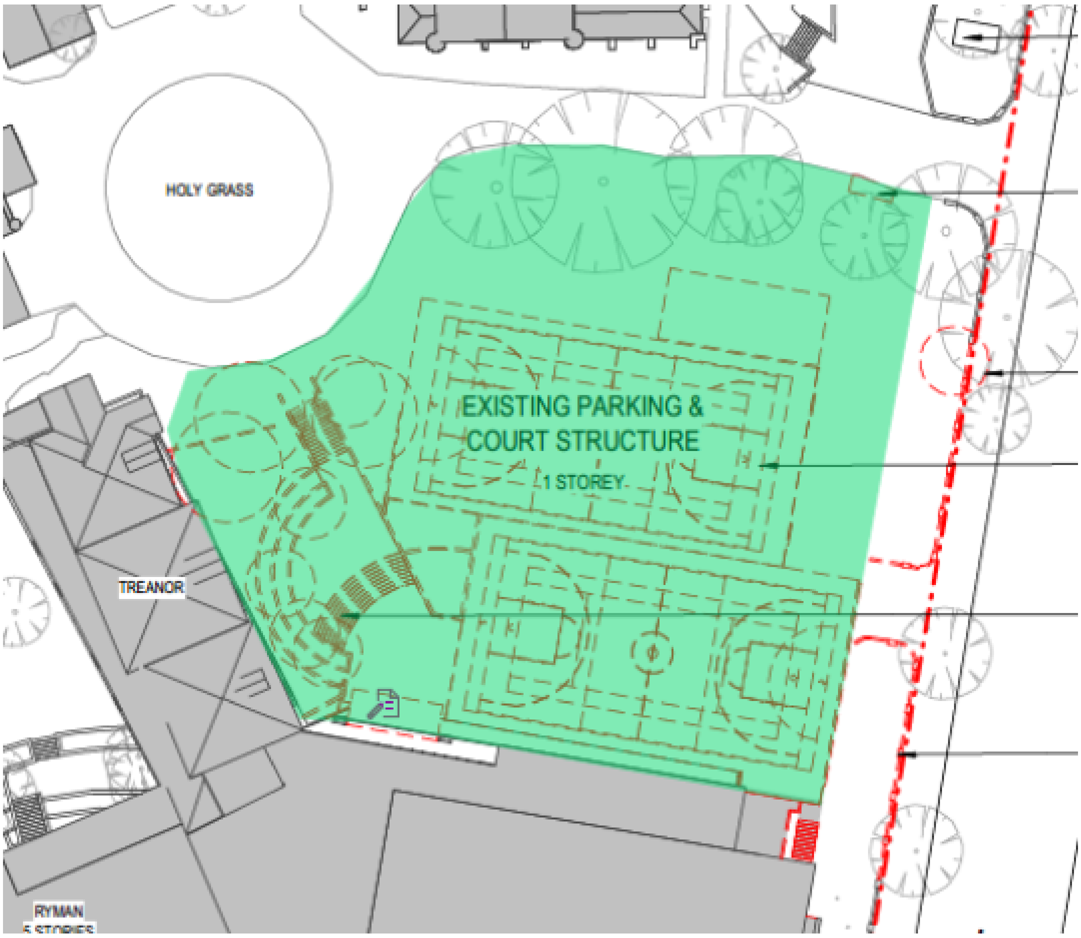

Site Location

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4 Investigation

4.1 Description of Materials

The Excavation is predominately sandstone with Fill material.
Type and estimated quantity of materials are as follows:

Sandstone - 140,000 Ton
Fill - 3500 Ton

4.2 Excavation

The excavators will dig using hydraulic hammer during the bulk and detail excavation.
The following excavators will be utilised:

Bulk Excavation:
30 ton – 45 ton Excavator for load out and Excavation
35 ton Excavator on rock saw cutting

Shoring and Retention:
Piling Rig
Anchor Rig
5 ton Excavator

Detail Excavation and Drainage Excavation:
14 ton Excavator
12 ton Excavator
5 ton Excavator

4.3 Contaminated Materials

A waste classification report which classifies the contaminated material will be provided prior to excavation, and the materials are to be removed prior to Excavation.

If the materials are tested positive for asbestos, hygienist is to be engaged and removal procedures must be as per the relevant WHS legislation.

The hazardous materials removal will be undertaken by ACE (licensed asbestos removal contractor) who will take possession of various areas throughout site for the remediation setup, such as exclusion zone, decontamination units and other controls (where required).

Areas will be demarcated, for persons requiring access contact the ACE Site Supervisor who will liaise with the Asbestos Removal Site Supervisor to organise appropriate measures. Do not under any circumstances enter an asbestos exclusion zone, tamper with warning signage or tamper with their equipment. Air monitoring will be undertaken daily throughout the structure, in site sheds and to the perimeter of the site. The results of monitoring will be posted daily in site sheds. The location of temporary and localised asbestos removal zones will be tool boxed talked daily.

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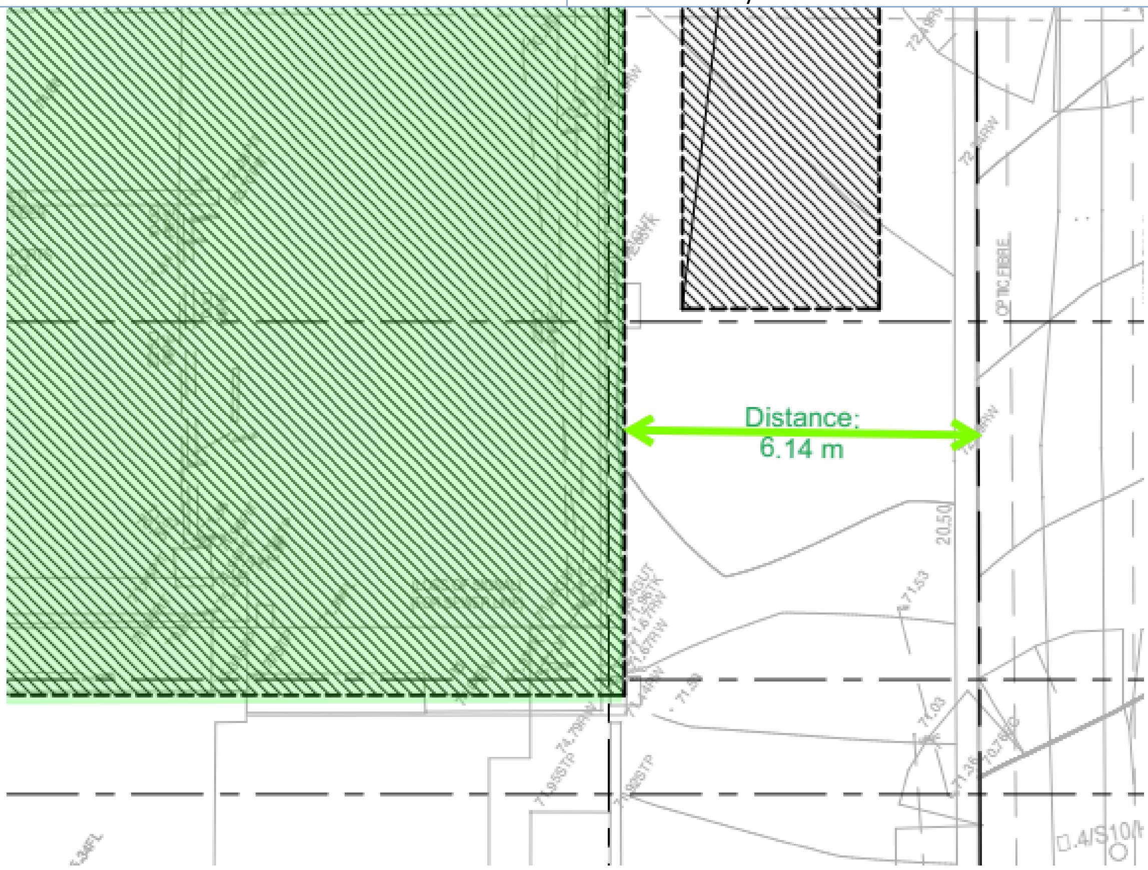
A clearance certificate will be obtained by a qualified Occupational Hygienist prior to Excavation.

In the case of encountering unidentified asbestos, work will stop in that area and ACE will seal the area and make safe. Hygienist will be notified, and their advice sought, sampling and identification of the suspect material may be undertaken. ACE will otherwise remove the asbestos in accordance with the Asbestos Removal Control Plan which will be amended, if necessary, to cover the unexpected find. This unexpected find will then be included in the clearance certificate document issued by Hygienist and provide a clearance certificate for the same.

4.4 Distance to Boundaries

Building Reference	**The Least Distance from Structure To Each Site Boundary**
Existing Parking and Court Structure	East Boundary – 6.14m
	West/North Boundary – 4.46m
	South Boundary – 0m



Distance to East Boundary

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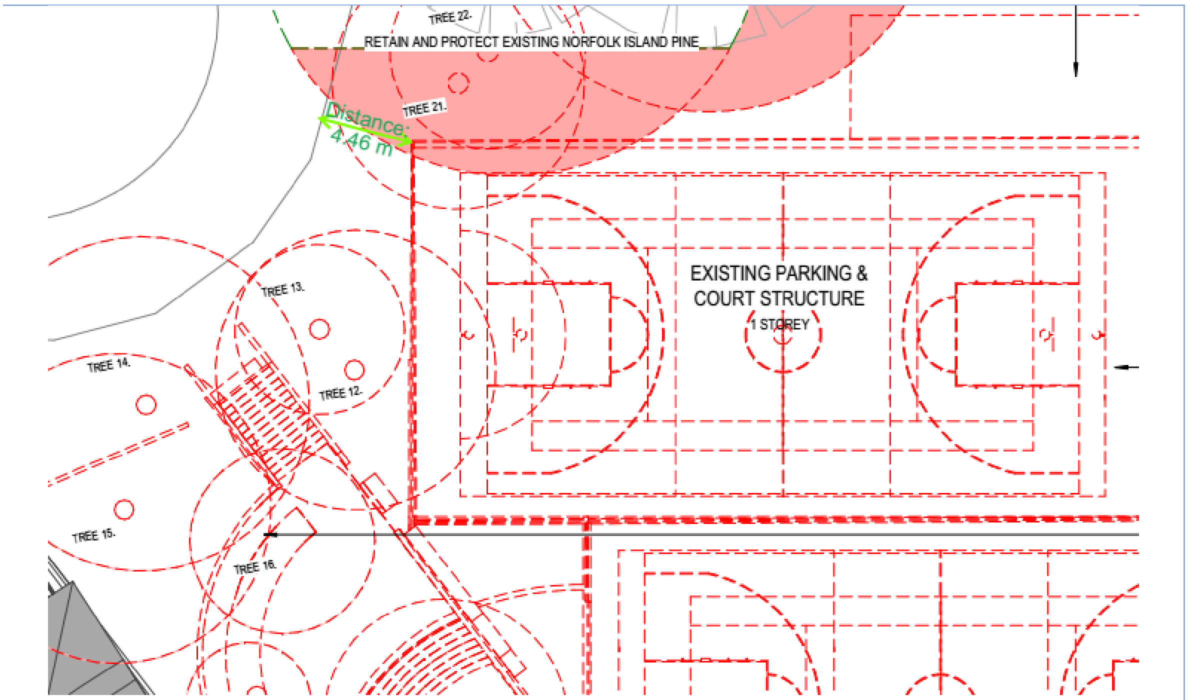

Distance to North/West Boundary

4.5 SERVICES

DBYD and GPR scanning are to be carried out prior to excavation works. All the underground services must be disconnected and diverted by the qualified trades.

Excavation works cannot be undertaken until the service disconnection is completed and signed off.

5 EXCAVATION

5.1 SEQUENCES

Excavation works will be carried out as per below sequences,

1. Service Disconnection Certification
2. Establishment of exclusion zone
3. Installation of sediment control
4. Classification of inground materials
5. Removal of fill materials as per classification reports
6. Installation of Piling Platform
7. Installation of Shoring System
8. Installation of Capping Beam
9. Excavation of First Drop
10. Installation of Shorcrete Panels
11. Installation of Anchor/Rock Bolts
12. Handover to client

5.2 TYPICAL METHODOLOGIES

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5.2.1 Typical Piling Methodology

- Confirming levels and excavation to underside of Capping Beam
- Installation of piling platform which is to be certified by Geotechnical Engineer
- Setting out of piers by Surveyor
- Installation of vibration monitoring as per Geotechnical monitoring program
- Set up drilling rig
- Installation of pile sleeves (if required)
- The length of the casing will be determined from the actual soil condition encountered on site.
- With the Auger inside the Pier Sleeve commence drilling
- (Where required only) The Pier Sleeve will be gradually inserted into the pier hole as the Auger progressively drills and removes the material
- The drilling process will be continued to the designed founding depth or to the commencement of rock head level by using augers and drilling buckets.
- Pile lengths shall be as per the current construction drawings.
- At the point of encountering the rock (as defined in the contract specification) head level, for example, where the soil drilling tools are unable to penetrate the strata any further, boring shall cease in order that the engineer may verify the occurrence and confirm the rock socketing criteria.
- For drilling through rock, rock drilling tools shall be applied. This shall include rock auger, core barrels, (round shank, roller bit) cross cutters and where necessary, chisels.
- Remove all pier spoil
- Spoil from piles will be cleared from the boring locations by means of an excavator as boring proceeds. Depending on the volume of spoil excavated, it will be removed to stockpile area or spoil pit, for drying before loading and removed off-site.
- Upon completion of boring, the bottom of the bored hole is thoroughly cleaned with the cleaning bucket
- Dewatering of piers as required via electrical pump
- Place reinforced cages
- The reinforcement cage will be prefabricated off site.
- The length, type and size of the steel cage will be according to contract drawings and engineer specifications.
- The cages will be provided with stiffening rings and other accessories to enable handling, lifting and installation without permanent deformations.
- Links on cages will be welded according to engineers specifications.
- Cages will be installed into the bored hole using either the Drilling Rig and/or an Excavator of the required lifting capacity
- Concrete spacers wired to the cage shall provide lateral support and ensure adequate concrete cover.
- Pile shall then be concreted by using the 'tremmie' method.
- The concrete mix will be discharged through a tremmie pipe, which is lowered centrally to the bottom of the bored hole prior to filling it with concrete. Alternative method is concrete pump lowered to the base of the pile and pulled out as concrete being pumped.

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- All testing and sampling of the concrete shall be carried out as instructed by the Engineer specifications and Australian Standards. A complete record of all cylinders taken shall be maintained in a proper form and slump test results shall be recorded on the 'Delivery Order' and the 'Pile Bore Log'. All compressive concrete tests will be carried out at the supplier's laboratory and independent lab. The client will be notified of the dates of the test by regular issuance in order for the tests to be witnessed.
- Trim piles as required.

5.2.2 Typical Anchoring and Excavation Methodology

Excavated in approximately 1.5m-2.5m lifts. The first lift will be excavated below the top row of anchors.

- Walls will be trimmed as the excavation is undertaken
- Confirm RL and inclination
- Core-holing/drilling through piers to the required length
- Extract materials and clean out
- Installation of anchor as per engineer design
- Survey Capping Beam prior to stressing anchors, movement < 10mm
- Installation of anchor plates, ensure compliance with proof loaded to 1.3 times the design working load in a minimum of four equal increments
- Load and extension of anchors recorded
- Grout tested
- Reinforcing mesh will be installed on the full 2.2m lift and the bottom 200mm will be backfilled to provide a lap for later connection.
- Continue excavation.

5.2.3 Typical Shotcrete Methodology

Shotcrete will be applied to wall and batter faces in a single layer, with thickness as noted on the drawings. Applied shotcrete will be installed on flat surfaces, mesh reinforced and unreinforced and may include a steel fiber additive or without. Shotcrete application will be undertaken in the following stages:

- Preparation/trimming of work area and rock face
- Setout of shotcrete depth to ensure adequate cover and alignment
- Installation of bolts, nails, vertical strip drains and reinforcing mesh
- Engineer inspection to shotcrete wall reinforcement
- Setup of shotcrete pump and hoses
- Application of shotcrete
- Curing for 4 days minimum
- Clean-up

5.3 Monitoring Program

5.3.1 Noise Monitoring

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If required, noise monitoring program will be implemented as per Acoustics Report. Noise monitors might be required during the excavation works.

5.3.2 Vibration Monitoring

As the adjacent structure will be retained and remain operational during the demolition and excavation works, vibration must be minimized to ensure the structural integrity of existing building and works are not undermining the any structure elements.

The following measures will ensure that disruptive vibration will not travel beyond site:

- Separation works to be done via saw cutting to ensure no further connection between structure to stay and structure to be demolished.
- Breakup of slabs, beams and columns into smaller pieces of rubble to reduce vibrations being felt from Drop Zone operation.
- Structural steel and large heavy objects will be craned off site.
- Installation of vibration monitor if required.

5.3.3 Dust Control

Dust suppression measures must be implemented by ACE to ensure the dust is kept below a level that adversely affects the surrounding buildings and site:

- Installing a minimum of 3 water points around site perimeter to ensure full coverage of water suppression.
- Each machine used in the demolition process will be accompanied by a laborer with a water hose to ensure water is available on each separate Excavation face and provide adequate dust suppression. Water runoff will be minimized
- Material will be saturated prior to being removed
- During load out of material, material will be wet down to minimize dust being generated
- Installation of Dust Monitor if required.

6 The Proposed Methods of Controlling and Maintaining Access and Egress to Workplace

Building Reference	
All buildings	Refer to RCC's project site amenities and access plan.

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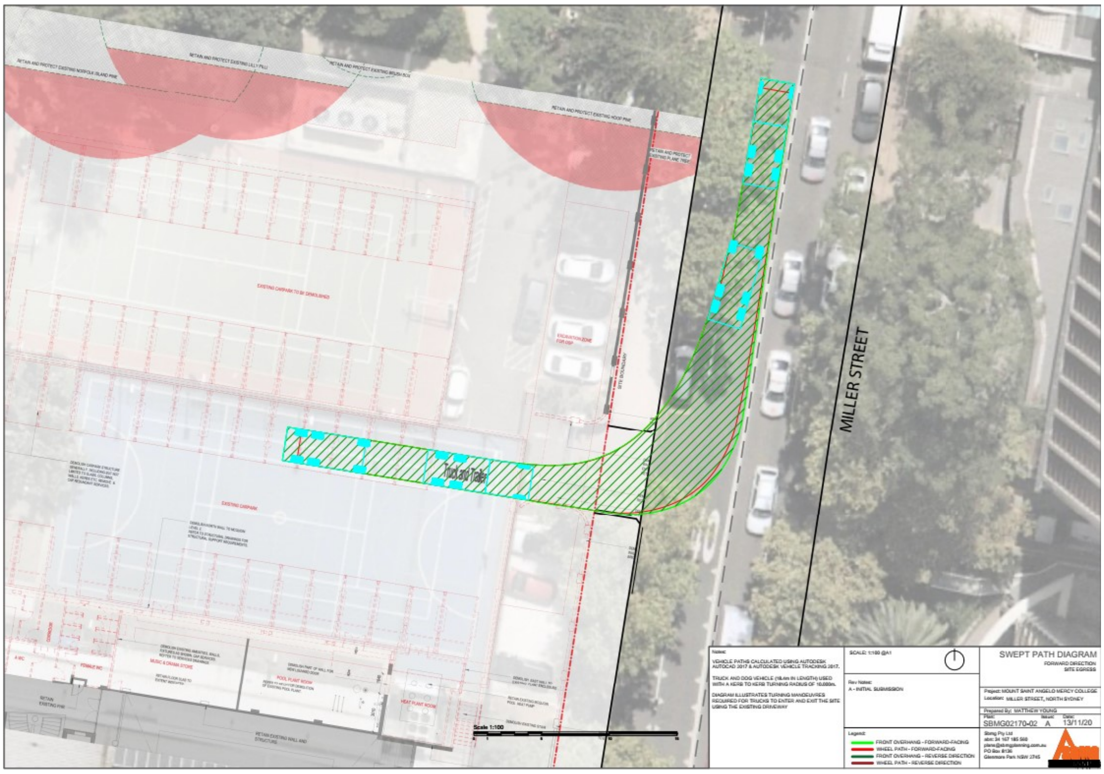
Access



Egress

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7 Unexpected Finds

Due to the nature of this project it is possible that Asbestos or other Hazardous Materials may be encountered at unexpected locations during the project. As a precautionary measure to ensure the protection of site workers and contractors and the site workers and occupants of nearby land, should an unexpected find be encountered (or any other unexpected potentially hazardous substance), the unexpected finds procedure is to be followed.

Unexpected finds of potential contamination on site may be identified by visual (appearance) and/or olfactory (odour/stain) evidence during earthworks and construction activities.

The following are examples of typical unexpected finds

- Buried or surface asbestos containing materials and/or buried asbestos pipes
  - This may include cement-bound asbestos (e.g. fibro cement in the form of small fragments, flat sheets, corrugated roofing, or pipe) or other bonded forms of asbestos (e.g. bitumen, textured coatings and floor tiles may also contain asbestos). Friable forms of asbestos including lagging and insulation may be seen as fibrous material which flakes and powders easily.
- Buried waste materials
  - This may include a variety of waste materials, inclusive of wood, plastic, metal fragments, building rubble (e.g. concrete, brick, asphalt, asbestos containing materials) and other general household/farm waste (e.g. tins and containers of farm chemicals and fuels).
- Hydrocarbon impacts
  - May be identified by a hydrocarbon odour which may vary in strength from possible (just detectable) to very strong (easily detectable at a distance from the source).
- Septic tanks (biological waste)
  - May be identified by a decaying odour (landfill/sewer/putrefied) which may vary in strength from possible (just detectable) to very strong (easily detectable at a distance from the source).
- Underground Storage Tanks (USTs)
  - These may be identified by encountering a buried cylindrical steel underground tank, deeper sand fill or relatively small concrete footings or steel pipelines, sometimes with observed hydrocarbon odours or staining.
- Other unexpected finds [Other indications of contamination include various chemical odours (solvent, acetone, alcohol odour, sulphur (rotten egg), acidic (acetic/formic/citric), ammonia, or caustic) or staining and discolouration of soils.]

It is not practical to cover all types of possible unexpected finds based on their very nature. It is possible that indications of contamination not specifically covered by the plan may be encountered. In such cases it is assumed that “if in doubt” about a potential find, the precautionary principal will be employed, and the unexpected finds procedure will be activated.

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7.1 Procedure in the event of an unexpected find

Identification

- Stop work in the potentially hazardous area as soon as it is safe to do so and move to a designated meeting point.

Make Safe

- Delineate an exclusion/quarantine zone around the affected area using fencing and/or appropriate barriers and signage
- Contact the site supervisor for advice and request an environmental consultant to visit the site to undertake an assessment of the unexpected find.

Environmental consultant

- Preliminary assessment of the contamination and need for immediate management controls (if any)
- What further assessment and/or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and guidelines.
- Preparation of a remediation action plan (if necessary)
- Remediation works required (where applicable)
- Validation works required following remediation works (if applicable).

Clearance

- If it is deemed safe to do so, the environmental consultant will provide clearance for works to proceed in the affected area.
- If it is not considered to be safe, works must remain on hold until appropriate assessment, remediation and/or validation measures have been actioned.

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APPENDIX D

(DEMOLITION WORK PLAN)

Demolition Work Plan

4/01/2021

Richard Crookes Constructions Pty Ltd

Monte Scientia
128 Miller St North Sydney

Jayden Lin
ACE CIVIL PTY LTD

Revision History

Revision number	Amended page(s)	Date
1	All	04/01/2021

Distribution Control

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ACE Civil Pty Ltd	Jayden Lin	04/01/2021

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1 APPLICATION

Given the specialist nature of demolition work, this document prepared to collate the key information relevant to the demolition work into a single document, including some information relevant to work health and safety. This demolition plan does not duplicate a WHS management plan or SWMS but may reference them.

The Demolition work code of practice September 2019 outlines the requirement of the demolition in appendix B to include:

- *the location of the site on which the structure to be demolished stands*
- *the overall height of the structure above ground level and the least distance from the structure to each site boundary*
- *the type of building (occupancy class), its structural support system and the principal materials of its construction*
- *the proposed methods of demolition including the number and types of major items of plant*
- *the proposed methods for handling and disposing of demolished materials and, in particular, of hazardous materials*
- *the proposed methods of controlling and maintaining access and egress to workplace*
- *the proposed sequence of carrying out the demolition works and an estimate of the time (in days) it is likely to take to complete all of each of the stages of the work*
- *the proposed hoardings, scaffolding and fencing and of any overhead sidewalk protection*
- *any other plans, illustrations, written documents, or specialist reports as may be necessary to support the proposed methods of work or protective structures*
- *traffic management arrangements, which includes managing vehicles and mobile plant hazards in relation to operation at the workplace and interaction with the public.*
- *the location and condition of the following:*
    - *underground essential services including:*
        - *electricity*
        - *drainage and sewerage*
        - *gas*
        - *water*
        - *communications cables (for example, telephone, radio and television relay lines)*
        - *hydraulic pressure mains*
        - *liquid fuel lines*
        - *lubrication systems*
        - *process lines (chemical, acid)*
    - *above ground essential services*
    - *hazardous materials, including asbestos*
    - *underground structures such as a basement, cellars, or storage tanks*
- *any confined spaces where work will be undertaken*
- *the general condition of structures on adjoining properties, particularly where these are close to or on the boundaries of the demolition workplace*
- *the effect demolition may have on people working in adjoining properties or seeking access to and egress from those properties, and*
- *the emergency arrangements, which should include equipment for the rescue of injured persons.*

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2 Hours of Works

The works will be carried out between the hours:

Description	From	To	Week days
All building, demolition and associated site works	7.00am	5.00pm	Mondays to Fridays inclusive
All building, demolition and associated site works	8.00am	12.00pm	Saturdays

As per DA conditions, all building, demolition and associated site works will take place outside of above-mentioned hours, Sundays, public holidays. No work and no deliveries are to take place on Sundays and public holidays.

3 Guidelines and Legislation

The demolition, removal, storage, handling and disposal of product and materials containing asbestos will be carried out in accordance with the relevant requirements of SafeWork NSW and the NSW Department of Environment & Conservation including:

- Work Health and Safety Act 2011;
- SafeWork NSW Code of Practice for the Safe Removal of Asbestos;
- Australian Standard 2601 ;
- The Protection of the Environment Operation Act 1997 and Protection of the Environment Operations (Waste) Regulation 1996 and;
- Relevant Department of Environment & Conservation (DEC)/Environment Protection Authority (EPA) and WorkCover NSW Guidelines;
- Work Cover NSW - Guidelines and Codes of Practice

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4 THE LOCATION OF THE SITE ON WHICH THE STRUCTURE TO BE DEMOLISHED STANDS

Monte is located in the North Sydney Council local government area (LGA). It is directly to the north of the North Sydney CBD, which is the major commercial centre of North Sydney.

Monte is located approximately 3.5km north of the Sydney CBD, 500 metres north of North Sydney Railway Station. Victoria Cross Metro Station is currently under construction diagonally opposite the school at the south-eastern corner of Miller Street and Berry Street, as well as an entrance to the north-east on the corner of McLaren Street. Miller Street runs along the eastern boundary of the Site which provides a major bus corridor to the North Shore and Northern Beaches.

The key land use characteristics surrounding the School campus are:

- South: North Sydney CBD commercial core, primarily characterised by high-rise commercial buildings and support services including hotels, retail uses, and Shore Grammar School.
- North: mixed precinct including:
  - Low-density residential area within a heritage conservation area;
  - Community buildings including the North Sydney Council Chambers
  - Schools including St Mary's Primary, Wenona School, Marist College and North Sydney BoysHigh School.
  - St Leonards Park.
- East: The extension of the North Sydney CBD Commercial Core, generally characterised by high density residential and commercial buildings.
- West: Medium density residential and high-rise commercial buildings along the Pacific Highway. Further west is a low-density residential area which is identified as a heritage conservation area, and the Australian Catholic University.

Immediately surrounding the Monte campus is best described as:

- South (Berry Street): - Commercial buildings and the Victoria Cross Metro Station currently under construction.
- North (McLaren Street): McLaren Street is a heritage conservation area under the North Sydney LEP. Monte own most of the buildings on the southern side of McLaren Street which are generally single and two storey buildings originally built for residential purposes. The site at the southwestern corner of Miller Street and McLaren Street is an Italian restaurant and a four-storey commercial building with basement parking. The northern side of McLaren Street is primarily used for community facilities including a preschool, Council Chambers, community hall, and public plaza/park used for a weekend fresh produce market.
- East (Miller Street): Mix of commercial, residential and hotel towers, as well as the Rag and Famish Hotel at the corner of Miller and Berry Streets. A northern pedestrian portal to the Victoria Cross Metro Station is proposed on the north-eastern corner of Miller Street and McLaren Street intersection.
- West (Angelo Lane): mix of commercial and high-density residential buildings up to 16-storeys with basement parking.

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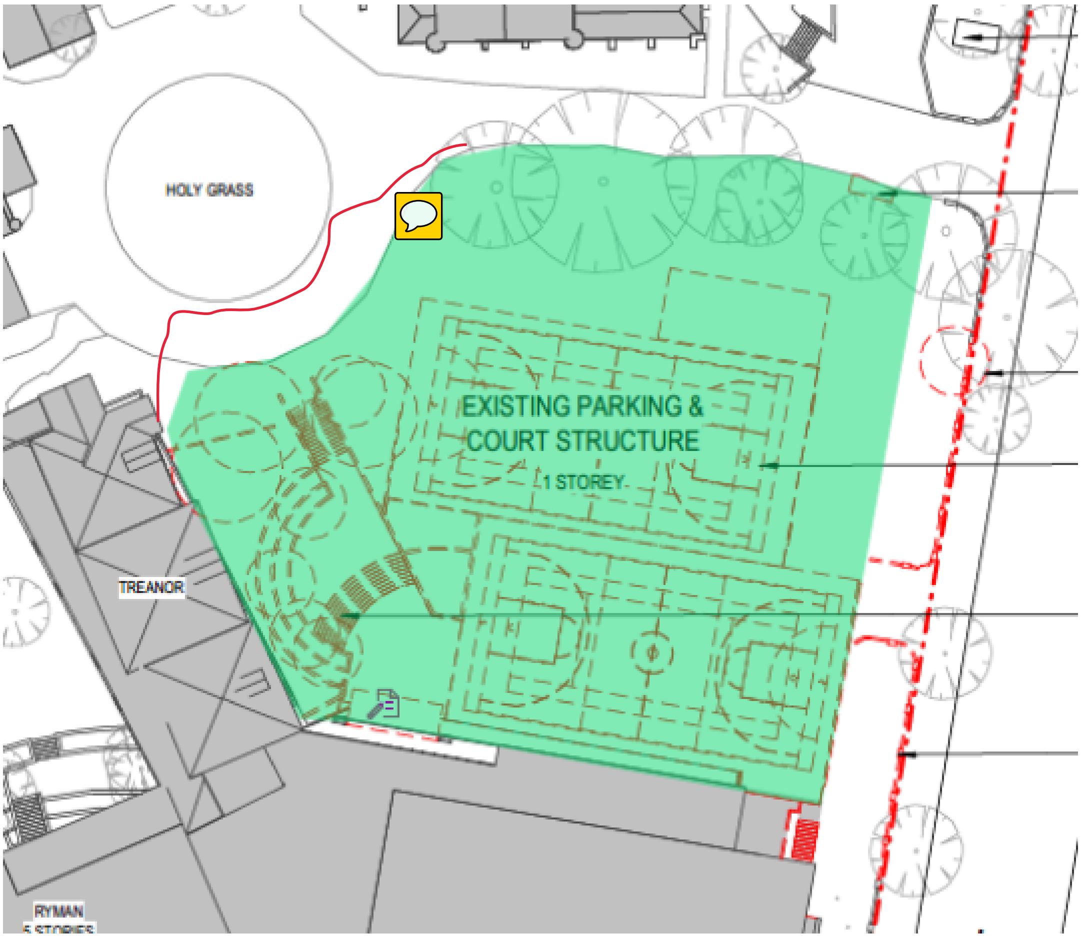
Demolition of two existing sport courts and associated undercroft staff carpark forms part of the construction of new sports and science building.



Site Location

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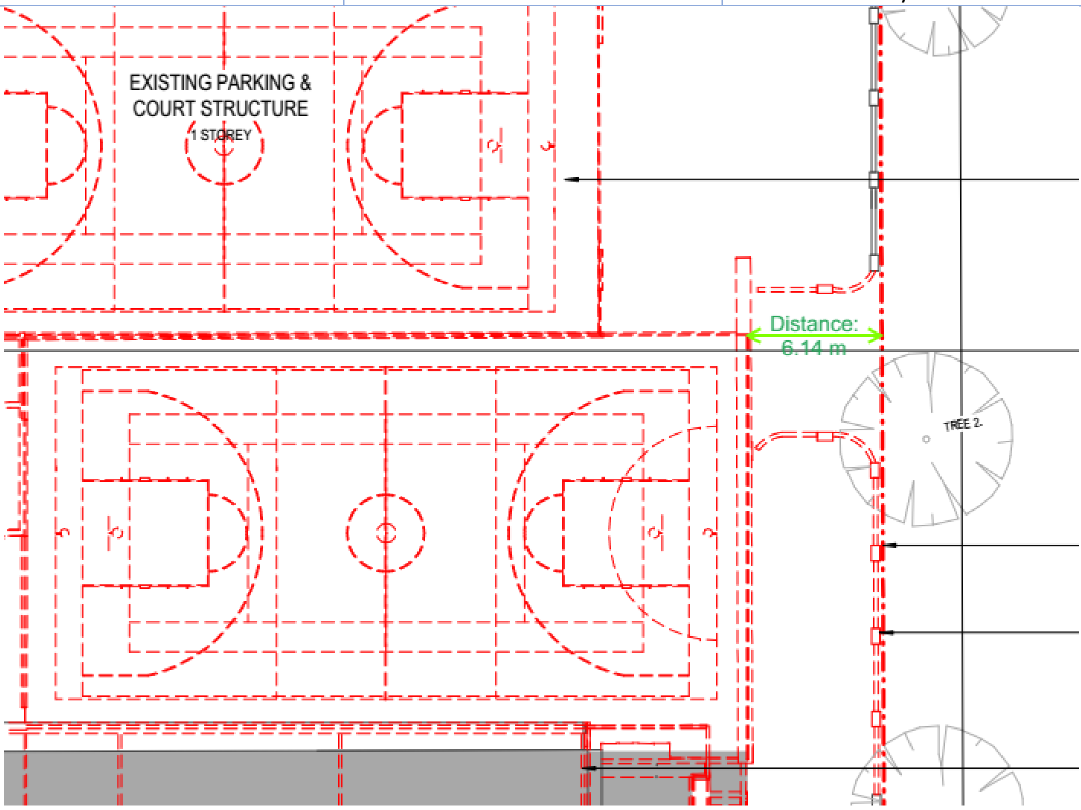
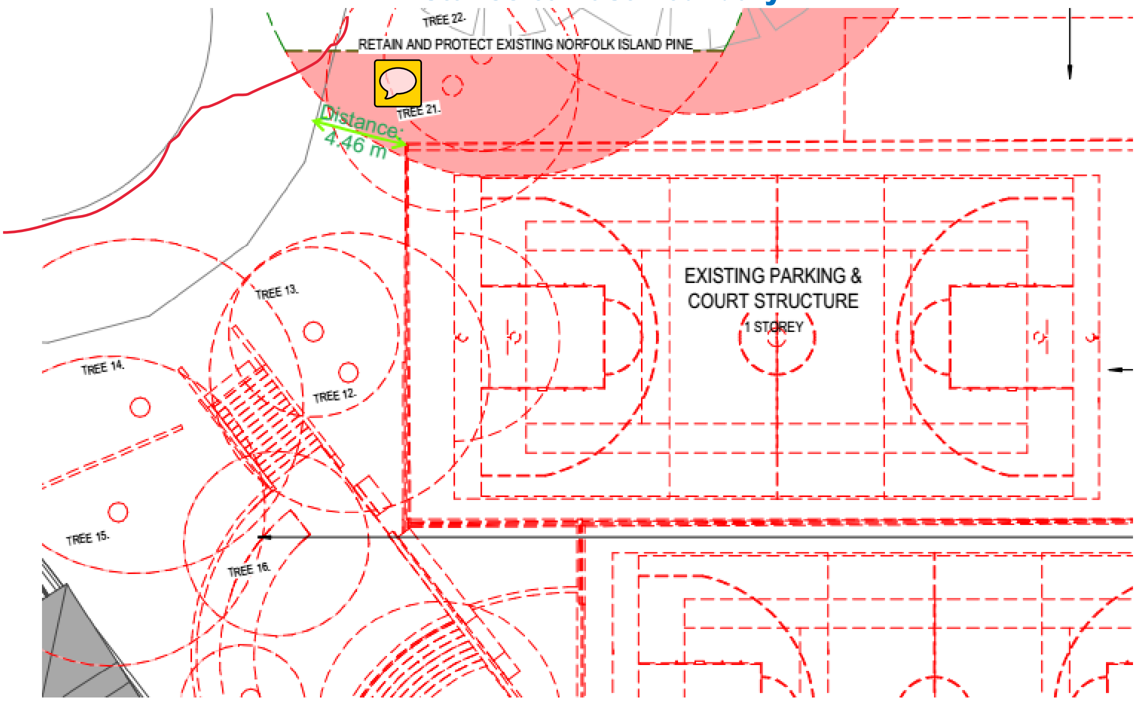
5 THE OVERALL HEIGHT OF THE STRUCTURE ABOVE GROUND LEVEL AND THE LEAST DISTANCE FROM THE STRUCTURE TO EACH SITE BOUNDARY

Building Reference	**Height of Above Ground Level**	**The Least Distance from Structure To Each Site Boundary**
Existing Parking and Court Structure	4.5m	East Boundary – 6.14m
		West/North Boundary – 4.46m
		South Boundary – 0m



Distance to East Boundary



Distance to North/West Boundary

6 THE TYPE OF BUILDING (OCCUPANCY CLASS), ITS STRUCTURAL SUPPORT SYSTEM AND THE PRINCIPAL MATERIALS OF ITS CONSTRUCTION

Building Reference	*Occupancy class*	Structural support system	Principal materials of construction
Parking and Court Structure	Education	Brick walls, concrete columns, slabs and etc	Bricks, concrete, steel and etc.

7 THE PROPOSED METHODS OF DEMOLITION INCLUDING THE NUMBER AND TYPES OF MAJOR ITEMS OF PLANT

Building Reference	Method of demolition	Type of major items of plant
All Buildings	Hazardous material to be removed – *refer to hazardous material work plan* • Asbestos Removal Control Plan • Hazardous Materials Survey (Ref#: 754-SYDEN271504 _Rev 1, Coffey, 14 Feb 2020) Hand demolition [soft demolition to internal parts of the building] Mechanical to the structures [walls, slabs, etc]	19-foot scissor lift Bobcat 5t – 10t excavator with bucket attachment 35t – 50t excavator with hydraulic hammer attachment 35t – 50t excavator with pulveriser attachment Bogie / T&D for waste transportation

8 THE PROPOSED METHODS FOR HANDLING AND DISPOSING OF DEMOLISHED MATERIALS AND, IN PARTICULAR, OF HAZARDOUS MATERIALS

Building Reference	Demolished materials	Methods of handling and disposing
All Buildings	Asbestos contaminated material Lead	Material to be handled in accordance with the hazardous material reports and plans mentioned in item number 7. The disposal of the hazardous material to an EPA licenced tipping facility accepting this type of material.
	Concrete and bricks	Material to be loaded using excavator into trucks and transported to licenced tipping facility – most of the bricks and concrete will be recycled by the tipping facilities
	General rubbish	The material will be collected and separated from the bricks, concrete and metals. The material will be loaded into trucks and transported to licenced tipping facilities – the tipping facilities will separate and
	Metal	The metal will be loaded into trucks and transported to licenced metal recycling yards

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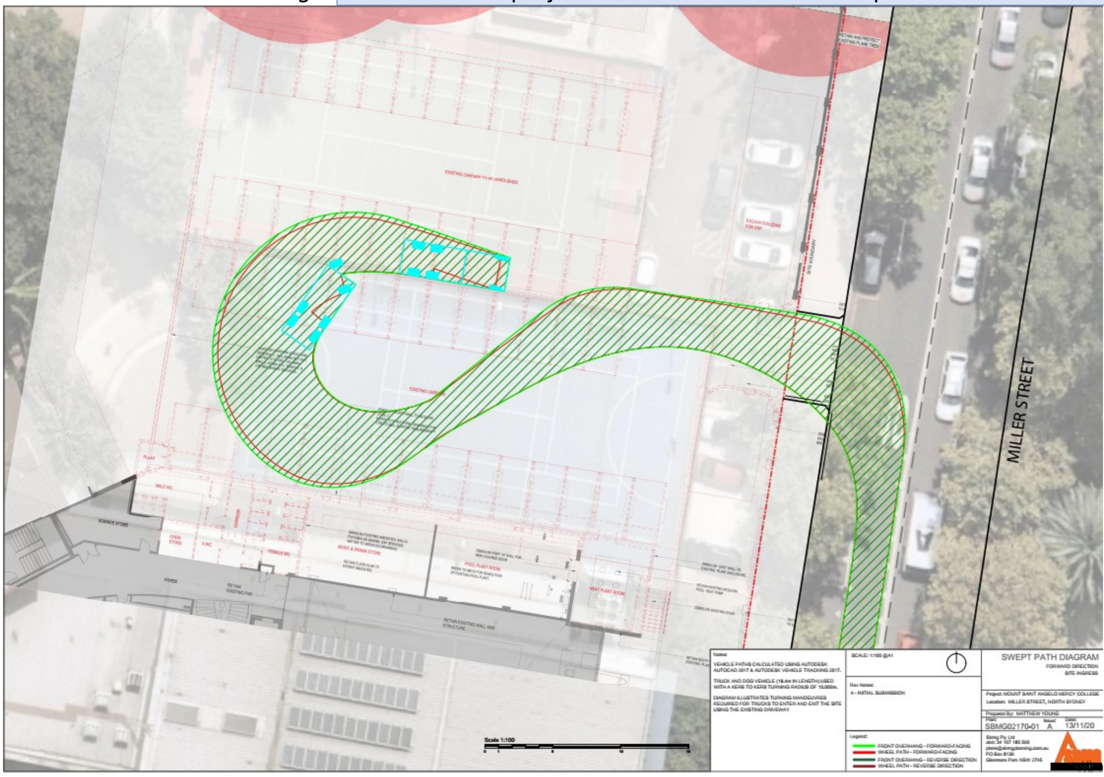
9 The proposed methods of controlling and maintaining access and egress to workplace

Building Reference	
All buildings	Refer to RCC's project site amenities and access plan.



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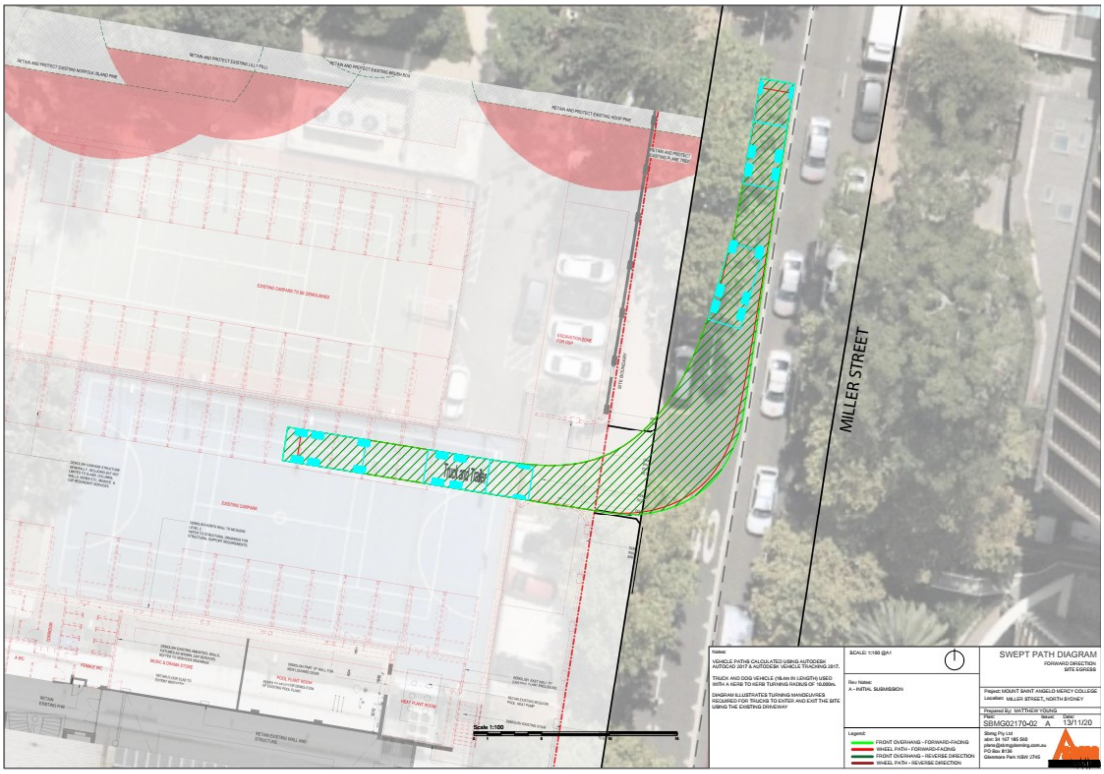


Egress

10 THE PROPOSED SEQUENCE OF CARRYING OUT THE DEMOLITION WORKS AND AN ESTIMATE OF THE TIME (IN DAYS) IT IS LIKELY TO TAKE TO COMPLETE ALL OF EACH OF THE STAGES OF THE WORK

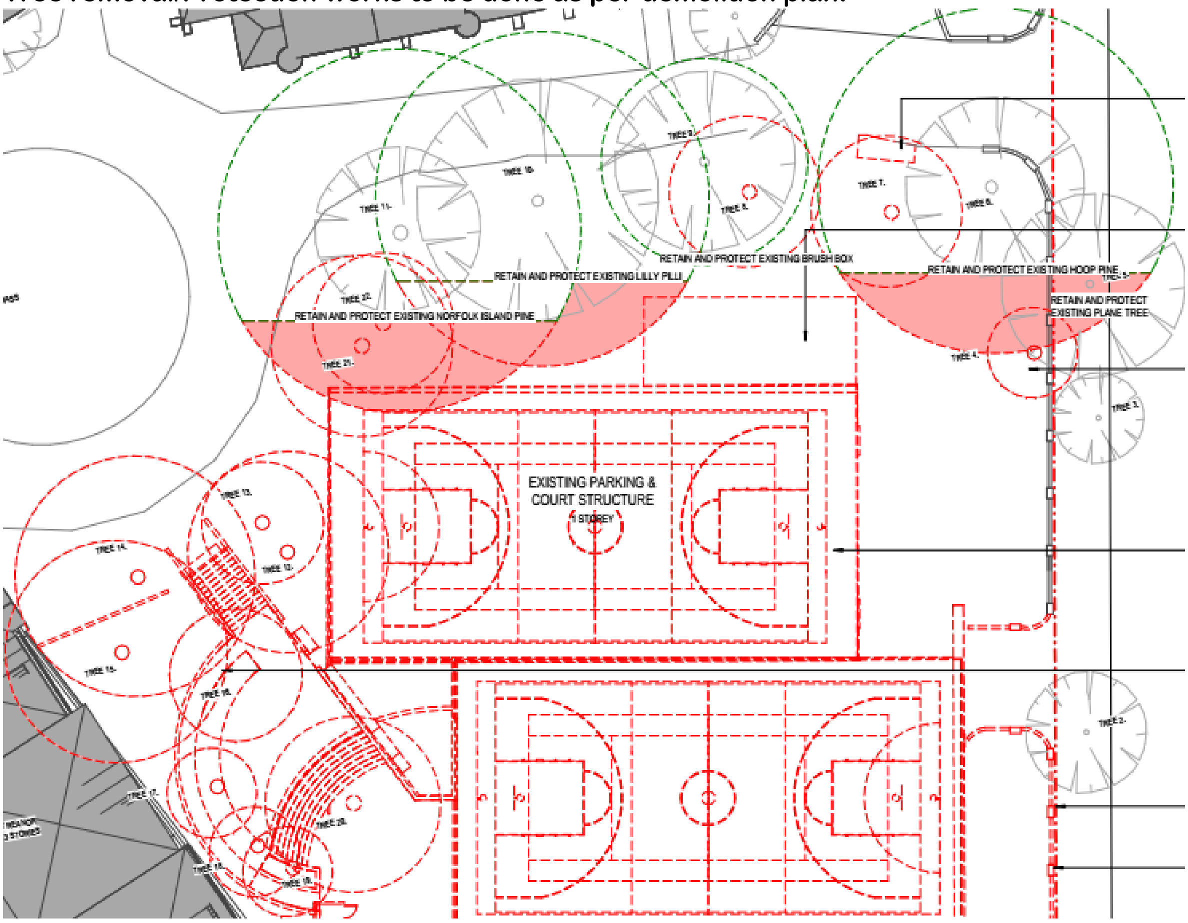
Sequence	Estimate time [days]
Stage 1. Preliminaries	5

1. Permit

- Prior to the scheduling of any works a SafeWork NSW Permit for both Demolition and Asbestos Removal will be obtained from the regulator. A period of five days' notice will be required for the application of these permits.
- SafeWork NSW permits to be issued for:
  - Asbestos Removal Works (Appendix 1)
  - Demolition Works (Appendix 1)
- Consultation with stakeholders and regulators will commence prior to site establishment and will continue throughout the project

2. Tree Removal/Protection 3

Tree removal/Protection works to be done as per demolition plan.



Trees To Be Removed and Protected

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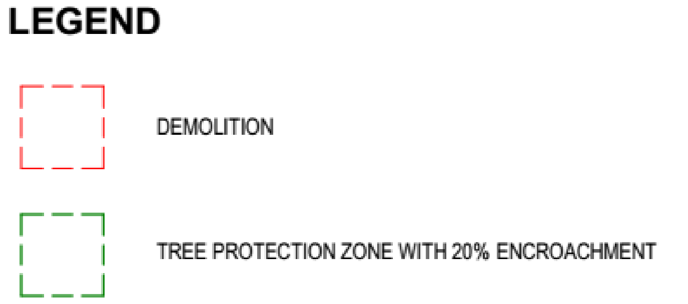
Sequence	Estimate time [days]



Legend

3. Exclusion zone 1

Establish the exclusion zone around the buildings to isolate the building to be demolished from other parties, ensure no personnel from other trades access to the demolition areas.

Note:

- **Signage to be placed and maintained properly, “Asbestos Removal in Progress”, “Demolition in Progress”, “Danger, Exclusion Zone” and all required signs must be secured and maintained on the fences for the specific demolition activities on site as the warnings to the public, in accordance with AS 1319**
- **Spotters to be in place and to ensure no unauthorized personnel enter the exclusion zone without approval from ACE supervisors.**

4. Loose Items Removal 4

All the loose items to be removed prior to the asbestos removal.

5. Service disconnection By others

- **All the services to be disconnected prior to the demolition work commencement.**
- **RCC to provide the disconnection certificates of services otherwise works must not take place.**

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Sequence	Estimate time [days]

Stage 2. Asbestos Removal

14 days

1. Asbestos Register

Area / Level	Room & Location	Feature	Item Description	Hazard Type	Sample No.	Sample Status	Friable	Asbestos Type	Product Type	Extent of Damage	Surface Treatment	Occupant Activity	Likelihood of Disturbance	Exposure Potential	Maintenance Activity	Risk Score	Action	Recommendations & Comments	Quantity	Reinspect Date	Photo No.
Exterior	Carpark, plant room doors	Infill panels	Fibre cement sheeting	Asbestos	A10280	No Asbestos Detected	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Interior	Pump room, booster pumps	Gasket	Rubbery gasket material	Asbestos	Visual Observation	None Suspected	-	-	-	-	-	-	-	-	-	-	-	Suspected negative due to age and appearance.	-	-	2
Exterior	Carpark	Air conditioning ductwork	Insulation material - internal	SMF	Visual Observation	Suspected SMF	-	-	-	Good	Sealed	Low	-	-	-	Low	-	Maintain in current condition if to remain in-situ. Remove under controlled SMF conditions as per the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].	100 m^2	-	-
Exterior	AC Plant room	Pipe work	Insulation material - external	SMF	Visual Observation	Suspected SMF	-	-	-	Good	Sealed	Low	-	-	-	Low	-	Maintain in current condition if to remain in-situ. Remove under controlled SMF conditions as per the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].	1 m	-	3
Interior	Pump room, booster pump	Pipe work	Woven material	SMF	Visual Observation	Suspected SMF	-	-	-	Good	Sealed	Low	-	-	-	Low	-	Maintain in current condition if to remain in-situ. Remove under controlled SMF conditions as per the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].	15 m	-	4
Interior	Plant room	Air conditioning ductwork	Insulation material - internal	SMF	Visual Observation	Suspected SMF	-	-	-	Good	Sealed	Low	-	-	-	Low	-	Maintain in current condition if to remain in-situ. Remove under controlled SMF conditions as per the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].	60 m^2	-	5
Interior	Plant room	Pipe work	Insulation material - external	SMF	Visual Observation	Suspected SMF	-	-	-	Good	Sealed	Low	-	-	-	Low	-	Maintain in current condition if to remain in-situ. Remove under controlled SMF conditions as per the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].	60 m	-	6
Interior	Store room	Air conditioning ductwork	Insulation material - external	SMF	Visual Observation	Suspected SMF	-	-	-	Good	Sealed	Low	-	-	-	Low	-	Maintain in current condition if to remain in-situ. Remove under controlled SMF conditions as per the Code of Practice for the Safe Use of Synthetic Mineral Fibres [NOHSC: 2006 (1990)].	15 m^2	-	7

Asbestos Register

2. Establishment

1

Barricades

- Barricades to be in place around the working areas where the asbestos are identified as per hazmat report.
- Appropriate signage to be secured on the fence and displayed – e.g. "Danger: Asbestos Removal in Progress"

Decontamination Units

- Set up decontamination area (with running water) adjacent or as close to working area as possible with water basin to wash down when decontaminating non-disposable equipment/PPE.

Skip Bins

- Skip bin/truck is to be fully lined with double layer of 200um plastic and all joints sealed with duct tape.

3. Air Monitors and Testing

On going

Install the air monitors around the site prior to the asbestos removal commencement.

- Installation locations and numbers depend on the locations where the asbestos removal work is undertaken and will be revised by hygienist progressively during the whole asbestos removal process
- Test results of air monitors to be submitted weekly

4. Removal of Asbestos

6

- If any, remove bonded asbestos walls, ceiling and cleaning of debris on floors using general hand tools etc.
- Remove screws using either end cut, bolt cutter, electric drill with screw bits or the appropriate hand tools.

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- Sheets removed will be stacked neatly, ready to be disposed of in a truck/bin fully wrap with 200um black plastic bag.
- Water will be used to wet down AC sheets to minimize dust when required.
- Any debris found are to be wet down with water before emu picked and placed in asbestos bag.

Note:

- ✓ All the plant documentation, service records, risk assessment to be provided
- ✓ Full PPE to be worn at all time during asbestos removal process (including coverall, P2 masks, gloves, goggle, harness and all other required protection equipment)

5. Clearance Certificate 1

Clearance Certificate of each floor to be obtained from the hygienist after the asbestos removal being finished on that level.

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Sequence	Estimate time [days]
Stage 3. Soft Strip	3

Stage 3. Soft Strip

1. **Loading/Drop Zone**

   Drop zones to be erected. Size to be revised and extended when required. Proposed drop zone locations for the structure to be nominated,

2. **Methodologies**

   ACE to strip out all the non-structural elements, including the fix joinery, partition walls and the like.

   All the extracted materials to be removed progressively from the building and dropped down into the drop zone at designated drop zones in a control manner.

   Note:

   - ✓ **Mobile scaffold to be utilized when demolishing the high section.**
   - ✓ **A spotter in place at all time and establish radio communication**
   - ✓ **Spotter to sign in and sign out daily**
   - ✓ **Proper signage to be secured on the drop zone fences**
   - ✓ **Dust control at all time during the soft strip work**

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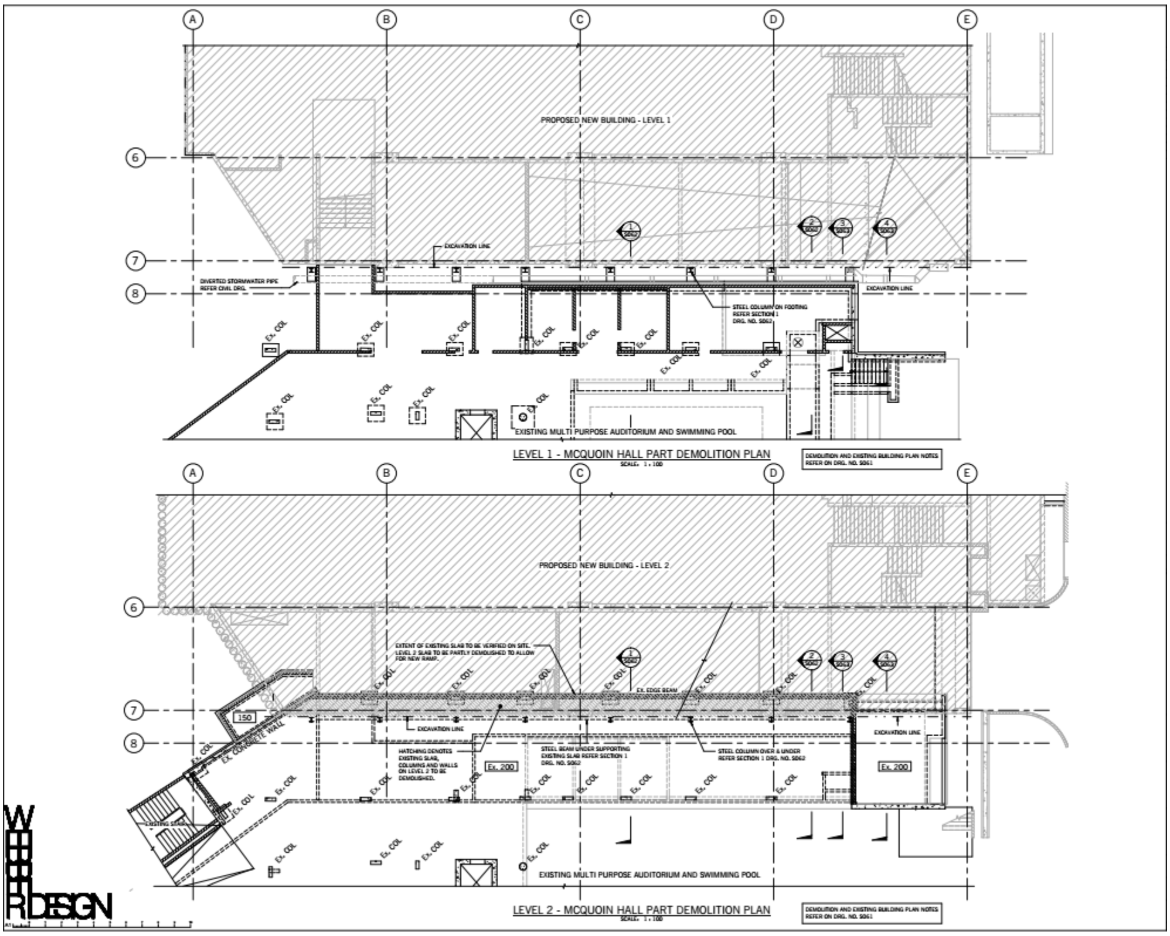
Sequence	Estimate time [days]
Stage 4. Main Structure Demolition	**12**

Stage 4. Main Structure Demolition

1. Detailed Demolition Works

Ace to undertake detailed demolition works including the building separation and hand demolition around McQuoin Hall as per Structural Plan S060, S061, S062 & S063.



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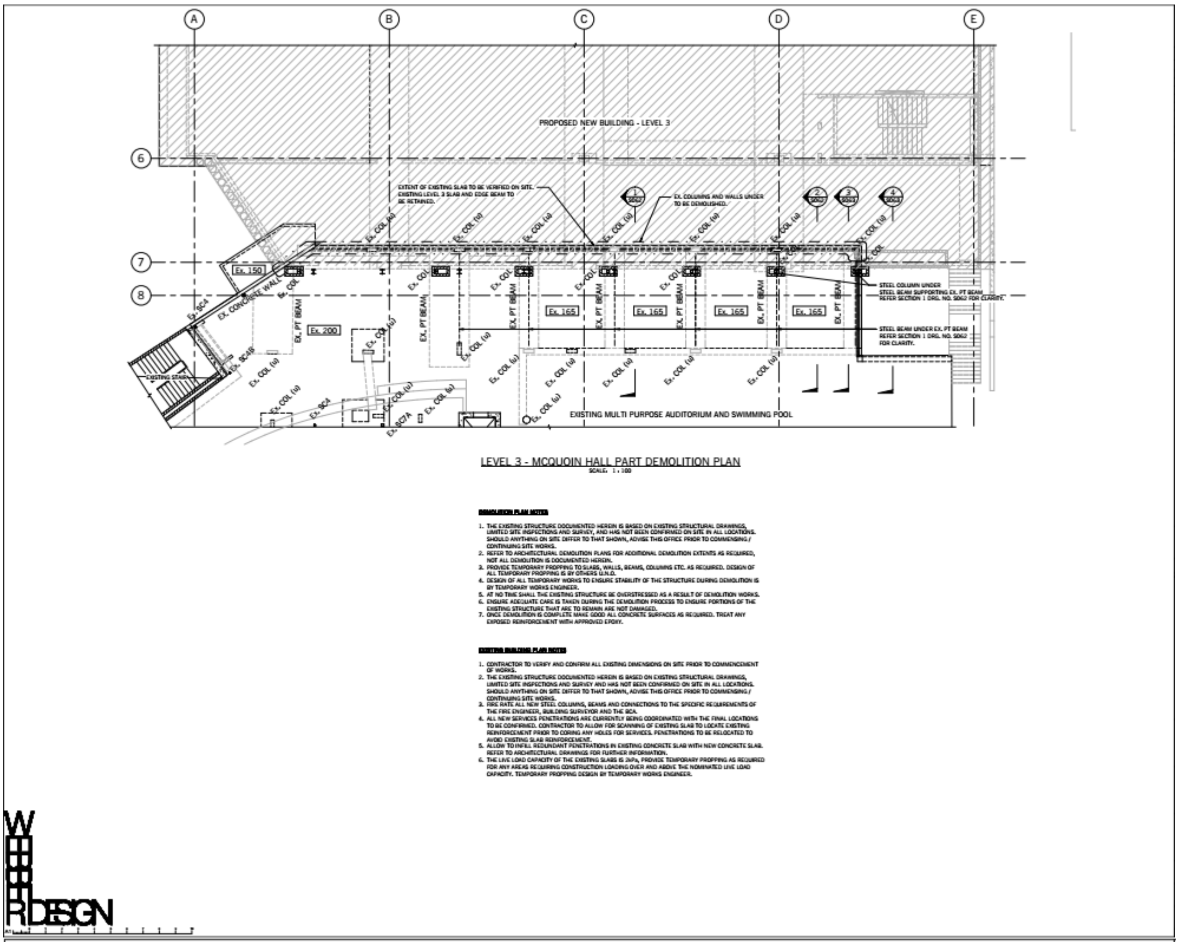

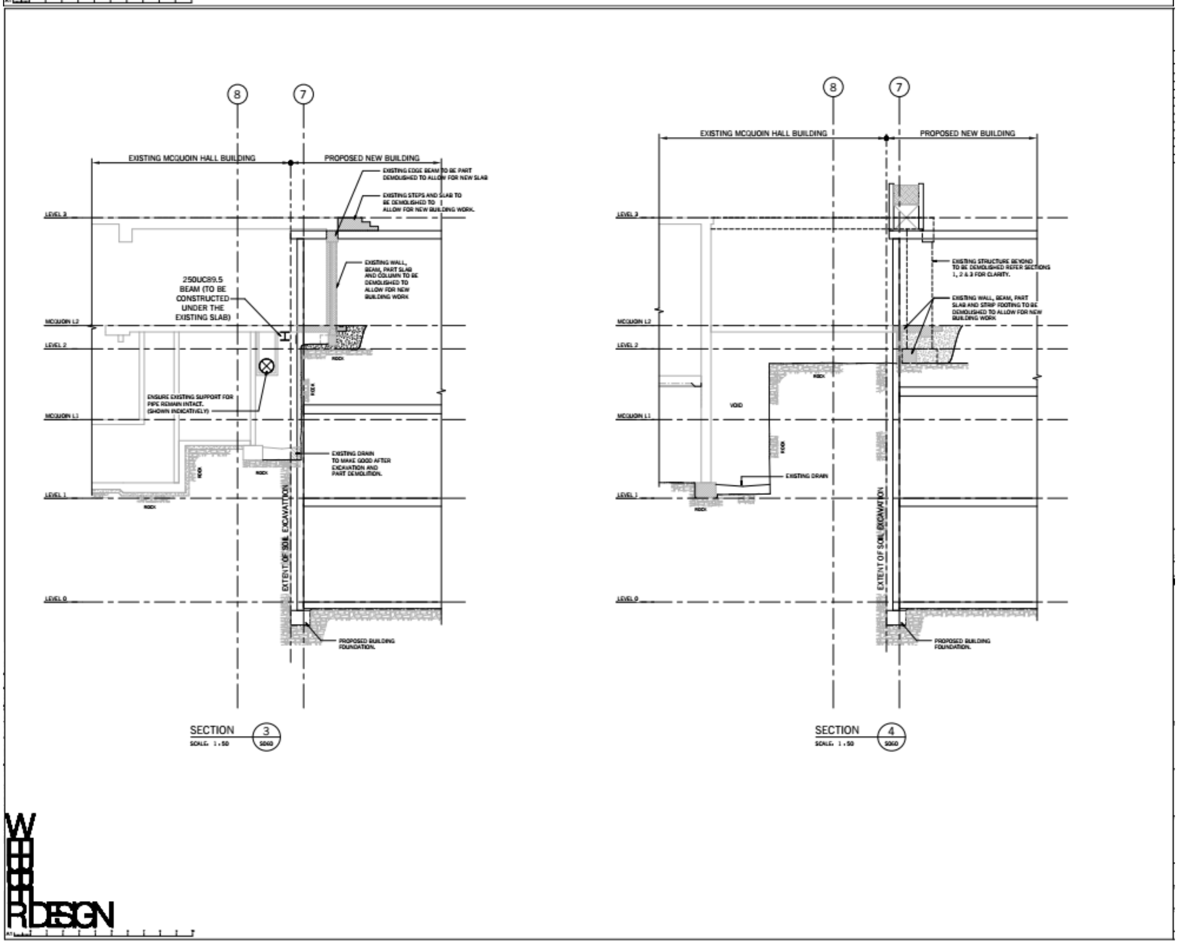

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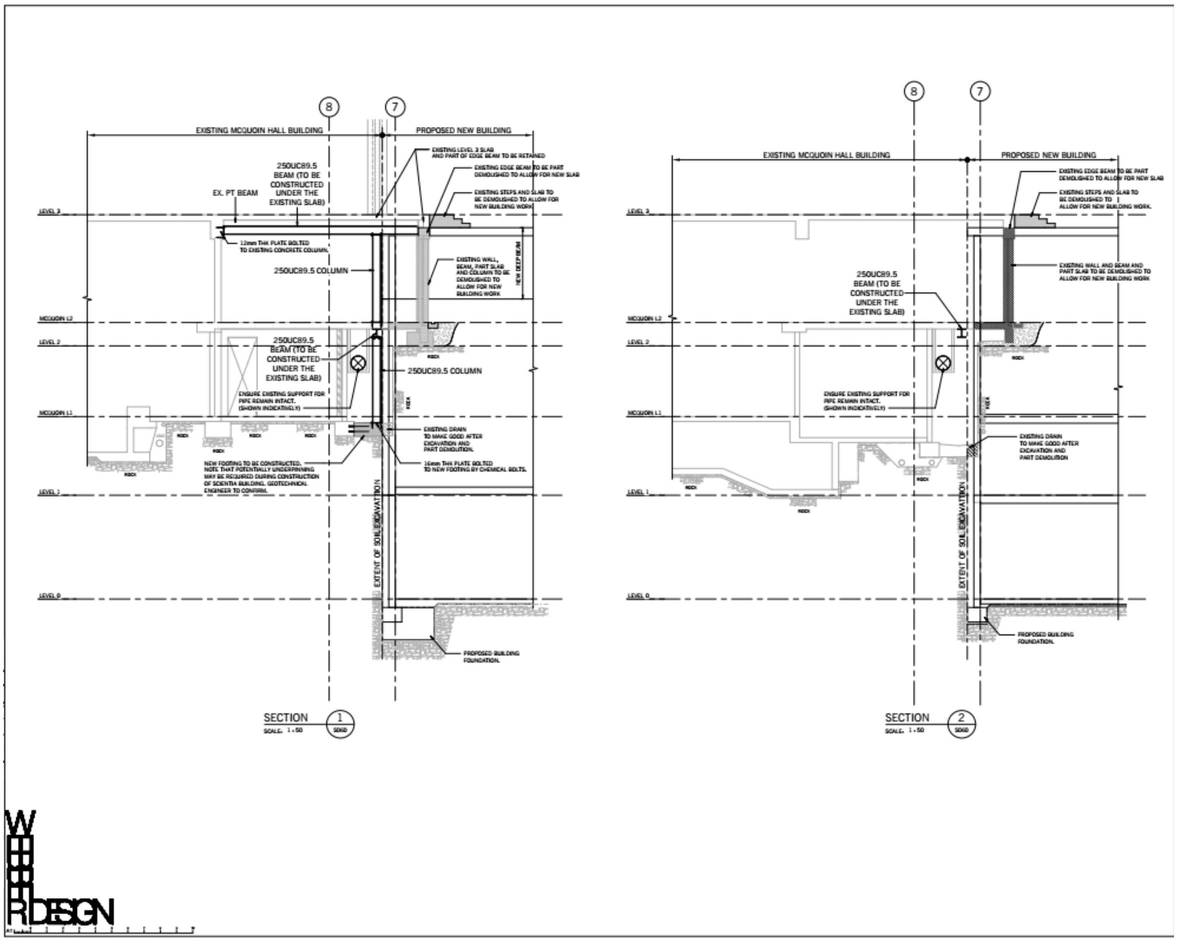

2. Mechanical Demolition

Mechanical Demolition to be undertaken after the building being adequately separated. Sequence as follows,

- **Establishment of 35t – 50t excavators with pulverizer and hydraulic hammer attachment next to the building.**
- **Then demolish the building munching the structure bay by bay from one side all the way back to the other side. Demolition of each section is from higher section to the lower section (Roof-> beam -> columns)**
- **No one will be working around that area when the demolition work is undertaken.**
- **Ace to demolish the whole last section mechanically to prevent any unexpected collapse of the structure**
- **No cantilever span will be left hanging when the work is completed at the end the day**

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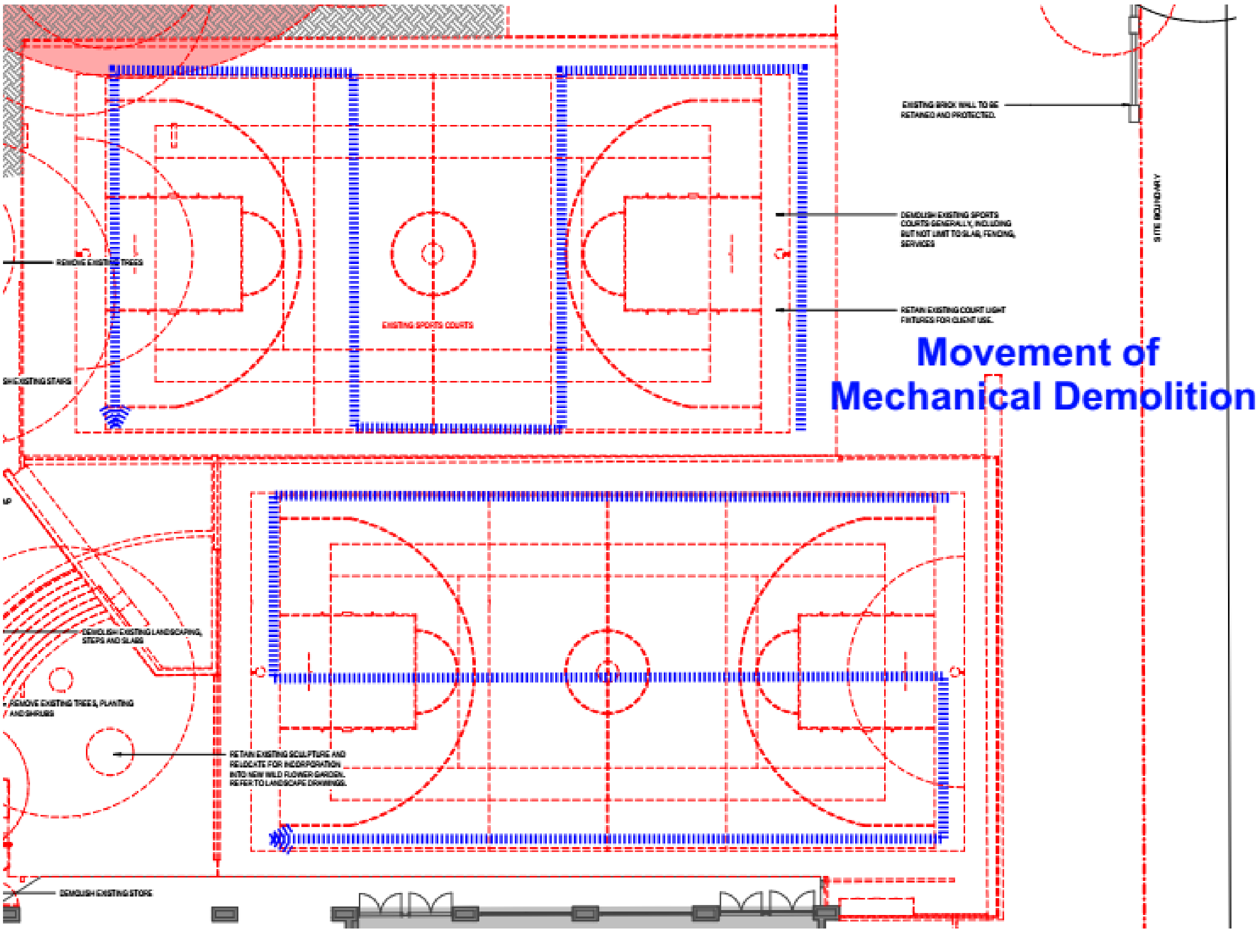

Movement of Mechanical Demolition

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Sequence	Estimate time [days]
	5

Stage 5. Waste Removal

1. Removal of materials
   - Segregate all the materials and load the materials to the tips by trucks.
   - Disposal of material must be in accordance with the EPA requirements.
   - Tipping records to be updated to RCC once available
   - Truck entering and leaving the jobsite refer to stage planning in line with CTMP

   Traffic controllers to coordinate traffic in and out the work area.

2. Sediment Control
   - Sediment control to be in place as per project specification and drawings provided.
   - Sweeper (bobcat) to clean the driveway frequently.
   - Dust Control: dust suppression from different locations to ensure the maximum dust catchment during the demolition process.

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11 The proposed hoardings, scaffolding and fencing and of any overhead sidewalk protection

Building Reference **proposed hoardings, scaffolding and fencing and of any overhead sidewalk protection**

All the hoardings and fencing refer to RCC's site plan

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12 Any other plans, illustrations, written documents, or specialist reports as may be necessary to support the proposed methods of work or protective structures

Building Reference	
All Buildings	Vibration & Noise Management Plan during the Demolition, Excavation & Construction
	Tree Report
	Dilapidation Report

13 Traffic management arrangements, which includes managing vehicles and mobile plant hazards in relation to operation at the workplace and interaction with the public.

Building Reference	
All Buildings	Refer to RCC's staging plan and CTMP

14 The location and condition of the following:

14.1 Underground essential services including:

Refer to appendix 2

14.2 Above ground essential services

Reference	location and condition
All Buildings	N/A

14.3 Hazardous materials, including asbestos

Reference	location and condition
	Refer to project hazardous material register Any additional hazardous material that is not sought by the hazmat report to be treated as unexpected findings

14.4 Underground structures such as a basement, cellars, or storage tanks

Reference	location and condition
All Buildings	N/A

15 Any confined spaces where work will be undertaken

Reference	location and condition
All Buildings	N/A

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16 The general condition of structures on adjoining properties, particularly where these are close to or on the boundaries of the demolition workplace

Reference	location and condition
All Buildings	N/A

17 The effect demolition may have on people working in adjoining properties or seeking access to and egress from those properties

Reference	location and condition
All Buildings	N/A

18 The emergency arrangements, which should include equipment for the rescue of injured persons.

Reference	location and condition
All Buildings	Refer to project emergency and rescue procedures ACE Safety Management Plan section 6 Emergency Management and associated RCC's Emergency Management Plan

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19 Unexpected Finds

Due to the nature of this project it is possible that Asbestos or other Hazardous Materials may be encountered at unexpected locations during the project. As a precautionary measure to ensure the protection of site workers and contractors and the site workers and occupants of nearby land, should an unexpected find be encountered (or any other unexpected potentially hazardous substance), the unexpected finds procedure is to be followed.

Unexpected finds of potential contamination on site may be identified by visual (appearance) and/or olfactory (odour/stain) evidence during earthworks and construction activities.

The following are examples of typical unexpected finds

- Buried or surface asbestos containing materials and/or buried asbestos pipes
  - This may include cement-bound asbestos (e.g. fibro cement in the form of small fragments, flat sheets, corrugated roofing, or pipe) or other bonded forms of asbestos (e.g. bitumen, textured coatings and floor tiles may also contain asbestos). Friable forms of asbestos including lagging and insulation may be seen as fibrous material which flakes and powders easily.
- Buried waste materials
  - This may include a variety of waste materials, inclusive of wood, plastic, metal fragments, building rubble (e.g. concrete, brick, asphalt, asbestos containing materials) and other general household/farm waste (e.g. tins and containers of farm chemicals and fuels).
- Hydrocarbon impacts
  - May be identified by a hydrocarbon odour which may vary in strength from possible (just detectable) to very strong (easily detectable at a distance from the source).
- Septic tanks (biological waste)
  - May be identified by a decaying odour (landfill/sewer/putrefied) which may vary in strength from possible (just detectable) to very strong (easily detectable at a distance from the source).
- Underground Storage Tanks (USTs)
  - These may be identified by encountering a buried cylindrical steel underground tank, deeper sand fill or relatively small concrete footings or steel pipelines, sometimes with observed hydrocarbon odours or staining.
- Other unexpected finds [Other indications of contamination include various chemical odours (solvent, acetone, alcohol odour, sulphur (rotten egg), acidic (acetic/formic/citric), ammonia, or caustic) or staining and discolouration of soils.]

It is not practical to cover all types of possible unexpected finds based on their very nature. It is possible that indications of contamination not specifically covered by the plan may be encountered. In such cases it is assumed that “if in doubt” about a potential find, the precautionary principal will be employed, and the unexpected finds procedure will be activated.

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19.1 PROCEDURE IN THE EVENT OF AN UNEXPECTED FIND

Identification

- Stop work in the potentially hazardous area as soon as it is safe to do so and move to a designated meeting point.

Make Safe

- Delineate an exclusion/quarantine zone around the affected area using fencing and/or appropriate barriers and signage
- Contact the site supervisor for advice and request an environmental consultant to visit the site to undertake an assessment of the unexpected find.

Environmental consultant

- Preliminary assessment of the contamination and need for immediate management controls (if any)
- What further assessment and/or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and guidelines.
- Preparation of a remediation action plan (if necessary)
- Remediation works required (where applicable)
- Validation works required following remediation works (if applicable).

Clearance

- If it is deemed safe to do so, the environmental consultant will provide clearance for works to proceed in the affected area.
- If it is not considered to be safe, works must remain on hold until appropriate assessment, remediation and/or validation measures have been actioned.

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20 Appendix 1
Notifications

Notice of Intent to Remove Non-friable Asbestos
ACE Demolition and Excavation Pty Ltd

Notice of Intent to Commence Demolition Works
ACE Demolition and Excavation Pty Ltd

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21 Appendix 2

Underground service location Dial Before You Dig and Project Surveyors underground services drawing

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APPENDIX E

(STRUCTURAL DRAWING TRANSMITTAL)

Project Name

Project No.

MONTE SANT ANGELO MERCY COLLEGE

19133

128 MILLER STREET, NORTH SYDNEY

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C - COURIER M - MAIL	YM - YOUR MESSENGER OM - OUR MESSENGER	E - EMAIL	EP	EP	EP
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REASON FOR ISSUE

A - FOR APPROVAL/CERT C - FOR CONSTRUCTION P - PRELIMINARY	S - SEPIA T - FOR TENDER X - FOR INFORMATION	RC - RECORD COPY AB - AS-BUILT	P	P	T
ISSUED BY			CP	CP	CP

ENCLOSED ARE COPIES OF DOCUMENTS AS LISTED BELOW **DATE OF ISSUE**

Doc Ref	Job No. 19133 MONTE SANT ANGELO MERCY COLLEGE 128 MILLER STREET, NORTH SYDNEY **DOCUMENT TITLE**	**Day** **Month** **Year** Current Rev	25 09 20	09 10 20	19 10 20
S000	COVER SHEET	T1	P1	P2	T1
S001	GENERAL NOTES - SHEET 1	T1	P1	P1	T1
S002	GENERAL NOTES - SHEET 2	T1	P1	P1	T1
S003	GENERAL NOTES - SHEET 3	T1	P1	P1	T1
S010	RETENTION NOTES - SHEET 1	T1	P1	P1	T1
S011	RETENTION & BULK EXCAVATION PLAN	T1	P1	P2	T1
S015	RETENTION ELEVATIONS - SHEET 1	T1	P1	P2	T1
S016	RETENTION ELEVATIONS - SHEET 2	T1	P1	P2	T1
S017	RETENTION ELEVATIONS - SHEET 3	T1	P1	P2	T1
S018	RETENTION SECTIONS - SHEET 1	T1	P1	P2	T1
S027	RETENTION DETAILS - SHEET 1	T1	P1	P1	T1
S028	RETENTION DETAILS - SHEET 2	T1	P1	P1	T1
S030	FOUNDATION PLAN	T1	P1	P1	T1
S035	FOUNDATION SECTIONS - SHEET 1	T1	P1	P1	T1
S036	FOUNDATION SECTIONS - SHEET 2	T1	P1	P1	T1
S037	FOUNDATION SECTIONS - SHEET 3	T1	P1	P1	T1
S048	FOUNDATION TYPICAL DETAILS - SHEET 1	T1	P1	P1	T1
S050	SYDNEY METRO WEST PROXIMITY PLAN	T1		P1	T1
S051	SYDNEY METRO WEST PROXIMITY SECTION - SHEET 1	T1		P1	T1
S060	EXISTING AND DEMOLITION PLAN - SHEET 1	T1	P1	P2	T1
S061	EXISTING AND DEMOLITION PLAN - SHEET 2	T1	P1	P2	T1
S062	EXISTING AND DEMOLITION SECTION - SHEET 1	T1	P1	P2	T1
S063	EXISTING AND DEMOLITION SECTION - SHEET 2	T1	P1	P2	T1
S068	PROPOSED MECHANICAL PLANT LOCATION AND DESIGN LOADS	T1	P1	P1	T1
S069	PROPOSED COOLING UNIT LOCATION AND DESIGN LOADS (ACC BLDG)	T1	P1	P1	T1
S090	LOADING PLANS - SHEET 1	T1	P1	P1	T1
S091	LOADING PLANS - SHEET 2	T1	P1	P1	T1
S100	LEVEL 0 - GENERAL ARRANGEMENT PLAN	T1	P1	P1	T1
S110	LEVEL 1 - GENERAL ARRANGEMENT PLAN	T1	P1	P1	T1
S115	LEVEL 1 (MCQUOIN L1)- GENERAL ARRANGEMENT PLAN WITH RAMP SECTION	T1	P1	P1	T1
S116	LEVEL 1 - SECTIONS AND DETAILS SHEET 1	T1	P1	P1	T1
S117	LEVEL 1 - SECTIONS AND DETAILS SHEET 2	T1	P1	P1	T1
S120	LEVEL 2 - GENERAL ARRANGEMENT PLAN	T1	P1	P2	T1
S125	LEVEL 2 - SECTIONS AND DETAILS - SHEET 1	T1	P1	P2	T1
S130	LEVEL 3 - GENERAL ARRANGEMENT PLAN	T1	P1	P2	T1
S135	LEVEL 3 - SECTIONS AND DETAILS - SHEET 1	T1	P1	P2	T1
S137	LEVEL 3 - MAIN BEAM SECTION - SHEET 1	T1	P1	P2	T1
S138	LEVEL 3 - MAIN BEAM SECTION - SHEET 2	T1	P1	P1	T1
S139	LEVEL 3 - MAIN BEAM SECTION - SHEET 3	T1	P1	P1	T1
S140	LEVEL 4 - GENERAL ARRANGEMENT PLAN	T1	P1	P2	T1

	Job No. 19133	Day	25	09	19														
Doc	MONTE SANT ANGELO MERCY COLLEGE	Month	09	10	10														
Ref	128 MILLER STREET, NORTH SYDNEY	Year	20	20	20														
	DOCUMENT TITLE	Current Rev																	
S145	LEVEL 4 - SECTIONS AND DETAILS - SHEET 1	T1	P1	P2	T1														
S146	LEVEL 4 - SECTIONS AND DETAILS - SHEET 2	T1	P1	P1	T1														
S150	LEVEL 5 - GENERAL ARRANGEMENT PLAN	T1	P1	P2	T1														
S155	LEVEL 5 - SECTIONS AND DETAILS - SHEET 1	T1		P1	T1														
S160	LEVEL 6 - GENERAL ARRANGEMENT PLAN	T1	P1	P2	T1														
S165	LEVEL 6 - SECTIONS AND DETAILS - SHEET 1	T1	P1	P2	T1														
S170	ROOF GENERAL ARRANGEMENT PLAN	T1	P1	P2	T1														
S200	LEVEL 3 - LANDSCAPE SUPPORT PLAN	T1	P1	P2	T1														
S201	LANDSCAPE SUPPORT SECTION - SHEET 1	T1	P1	P2	T1														
S202	LANDSCAPE SUPPORT SECTION - SHEET 2	T1	P1	P2	T1														
S800	INSITU CONCRETE COLUMN TYPICAL DETAILS - SHEET 1	T1	P1	P1	T1														
S820	STAIR AND LIFT CORE KEY PLANS - SHEET 1	T1			T1														
S821	STAIR AND LIFT CORE KEY PLANS - SHEET 2	T1			T1														
S825	STAIR AND LIFT CORE ELEVATIONS - SHEET 1	T1			T1														
S826	STAIR AND LIFT CORE ELEVATIONS - SHEET 2	T1			T1														
S827	STAIR AND LIFT CORE ELEVATIONS - SHEET 3	T1			T1														
S850	IN-SITU WALL KEY PLANS - SHEET 1	T1			T1														
S851	IN-SITU WALL KEY PLANS - SHEET 2	T1			T1														
S855	IN-SITU WALL ELEVATIONS - SHEET 1	T1			T1														
S856	IN-SITU WALL ELEVATIONS - SHEET 2	T1			T1														
S877	IN-SITU WALL DETAILS - SHEET 1	T1	P1	P1	T1														
S878	IN-SITU WALL DETAILS - SHEET 2	T1	P1	P1	T1														
S879	IN-SITU WALL DETAILS - SHEET 3	T1	P1	P1	T1														
S950	TYPICAL SLAB ON GROUND DETAILS - SHEET 1	T1	P1	P1	T1														
S951	TYPICAL SLAB ON GROUND DETAILS - SHEET 2	T1	P1	P1	T1														
S960	TYPICAL SUSPENDED SLAB DETAILS - SHEET 1	T1	P1	P1	T1														
S961	TYPICAL SUSPENDED SLAB DETAILS - SHEET 2	T1	P1	P1	T1														
S962	TYPICAL SUSPENDED SLAB DETAILS - SHEET 3	T1	P1	P1	T1														
S965	TYPICAL POST TENSIONING DETAILS - SHEET 1	T1	P1	P1	T1														
S966	TYPICAL POST TENSIONING DETAILS - SHEET 2	T1	P1	P1	T1														
S970	R.C. STAIR DETAILS - SHEET 1	T1	P1	P1	T1														
S971	R.C. STAIR DETAILS - SHEET 2	T1	P1	P1	T1														
S980	TYPICAL MASONRY DETAILS - SHEET 1	T1	P1	P1	T1														
S981	TYPICAL MASONRY DETAILS - SHEET 2	T1	P1	P1	T1														
S990	TYPICAL STEEL DETAILS - SHEET 1	T1	P1	P1	T1														

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