

Douglas Partners Responses to Sydney Metro Review Comments on Revised Numerical Modelling Report (Ref: 73019.04.R.001.Rev1, dated 27 November 2020)

- Condition B1:
 - (A) – A revised numerical report is provided. Clarification is required for the followings:
 - As stated in “Structural Impact Assessment Report”, the structural design is at a tender level for the project and the detailed design and analysis of the retention will be completed by the D & C Contractor at a later stage. A confirmation the analysis is still valid is required following the final design.

DP - 01. 02 . 2021 The numerical analysis is still valid following the final design.

- Table 1: Building Loads Adopted in Model – Line loads adopted for footings (in kN/m) in model rather than pressures on footing base (column load by footing base in kPa).

DP - 01. 02 . 2021 The building loads has been re-modelled using bearing pressure (kPa) applied at the footing bases. The updated horizontal and vertical displacement contour output is attached, which shows negligible changes to maximum displacement values and the distributions in the vicinity of the tunnel cavern.

Table 1: Building Loads

Grid	Footing Type	Total Working Load (G+Q)	Grid Spacing (m)	Equivalent 2D Load (kN/m)	Equivalent 2D Bearing Pressure (kPa)
A	Strip Footing SF2 (600 mm)	398 kN/m	Continuous	398	670
B	Pad Footing PF2 (3.1 m x 2.4 m)	12,118 kN	8.5	1,430	460
C	Pad Footing PF2 (3.1 m x 2.4 m)	20,161 kN	8.5	2,370	770
D	Pad Footing PF2 (3.1 m x 2.4 m)	19,490 kN	8.5	2,300	740
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	220

- It is noted that there are bending moments for RF1 as shown below. please clarify how these have been considered.

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The bending moments due to the Working loads (G+Q) in the cross-sectional direction (ie. My, align with 2D model orientation) has been considered in the updated analysis, modelled by a linearly increasing pressure from -210kPa to +210kPa. This pressure is then combined with the original bearing pressure due to vertical (downwards) pressure of 250 kPa, which gives a linearly increasing pressure from +40 kPa to +460 kPa.

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	14803
	G	14200	706	184	212	-20912	-36787
	Q	3339	253	47	255	-6981	-12801

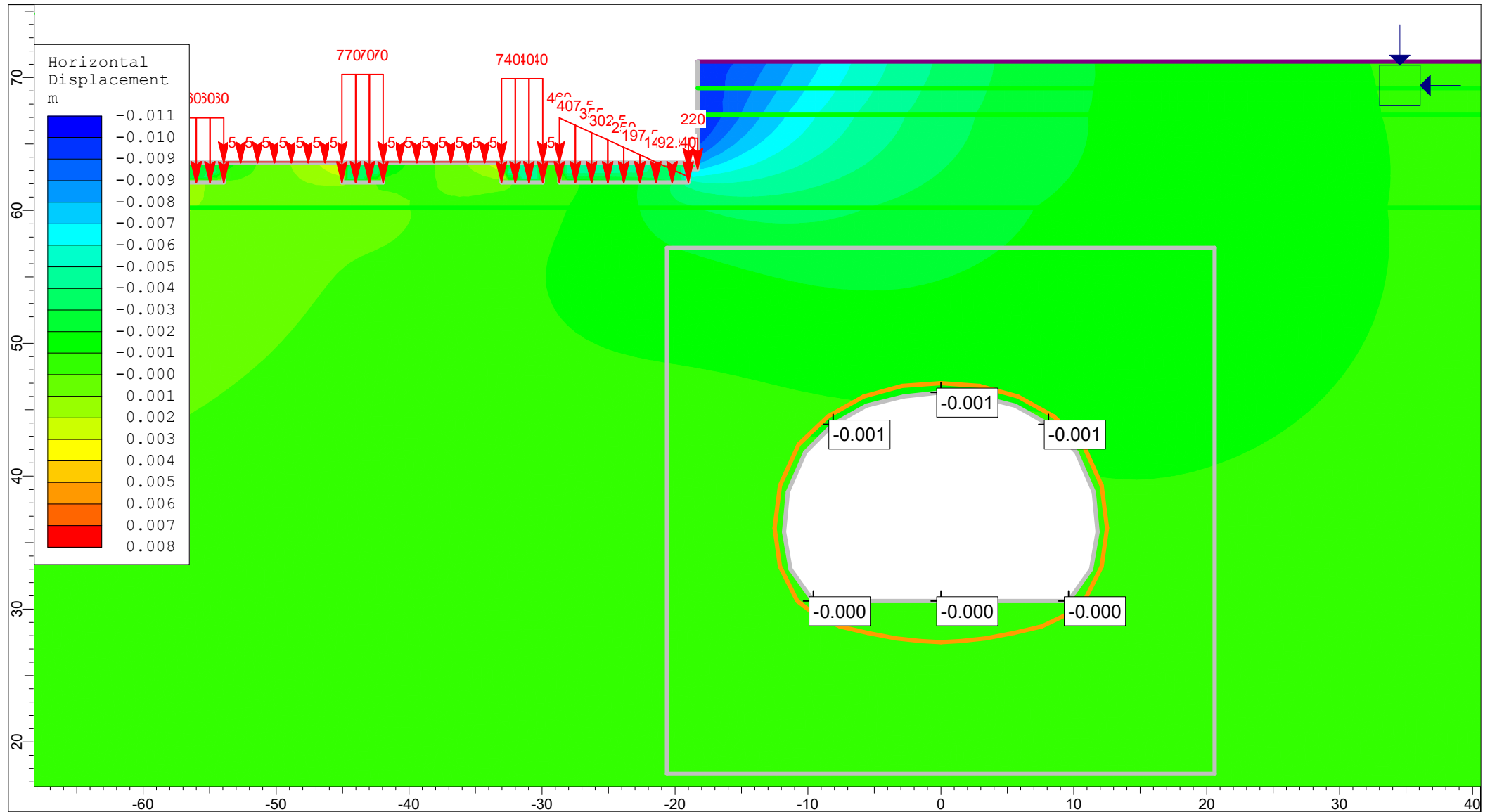
Grid	Footing Type	Total Working Moment My (G+Q)	Grid Spacing (m)	Equivalent 2D Moment	Equivalent 2D Bearing Pressure
D-E	Building Core RF1 (9.7 m x 5.1 m)	-36787+(-12801) = -49588 kN.m	7.5	-6612 kN.m	Linearly Increasing Pressure from -210 kPa (east) to +210 kPa (west)

The updated model shows negligible changes to maximum displacement values and the distributions in the vicinity of the tunnel cavern.

- (J) – Track monitoring is not required. However, surface monitoring to ensure the ground movement will be within the predicted values is still required as this is the way to validate the assumptions adopted in the impact assessment.

DP - 01. 02 . 2021

A Geotechnical Monitoring Plan (73019.05.R.001.Rev0) has been prepared by Douglas Partners to carry out surface monitoring.



Project

Monte Scientia Project - 128 Miller Street

[illegible]

Victoria Cross Metro Cavern

Drawn By

JH

	<i>Company</i>
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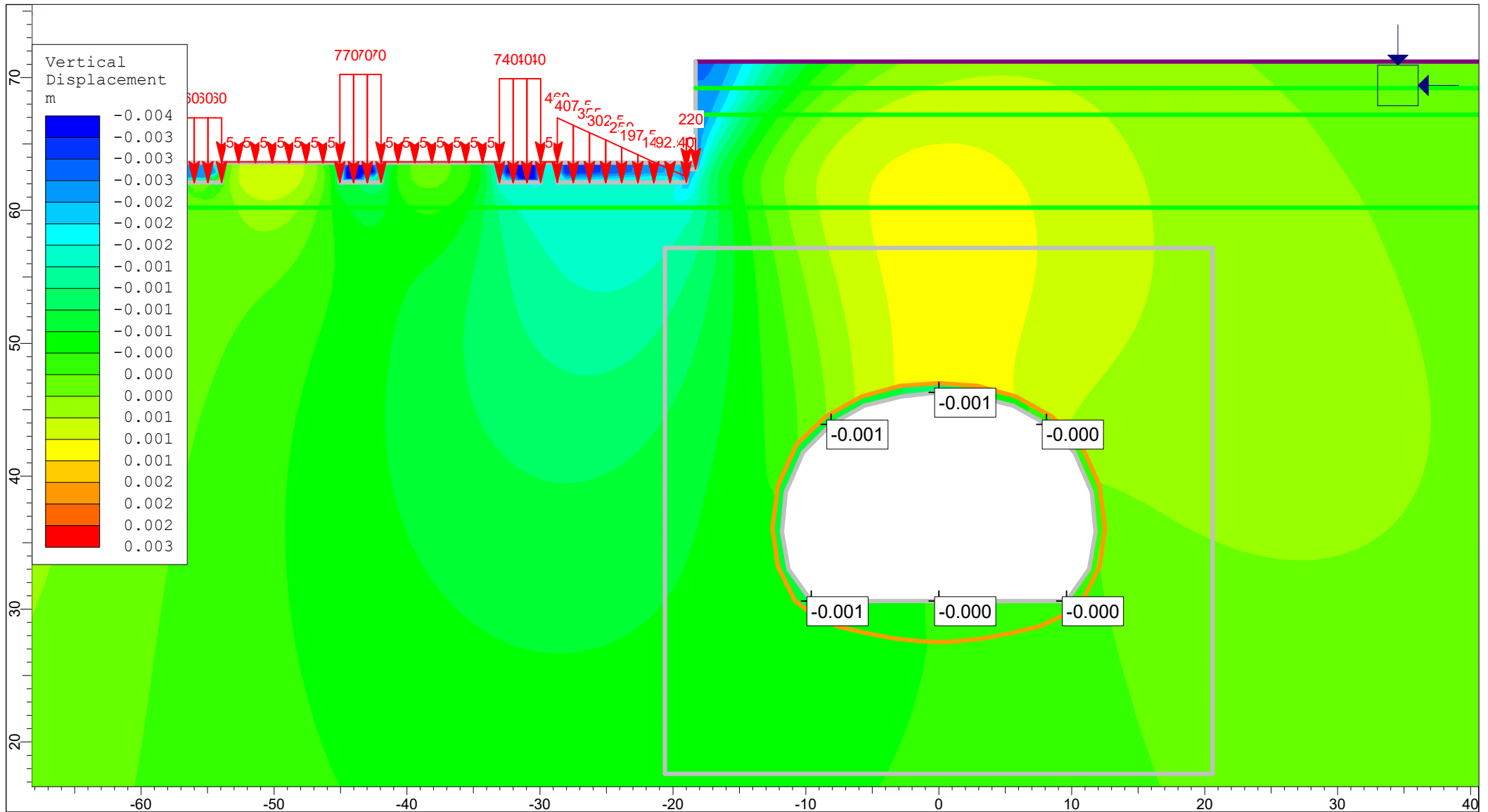
Douglas Partners

Date

Jan 2021

	<i>File Name</i>
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R02.fez



Project		Monte Scientia Project - 128 Miller Street	
Analysis Description		Victoria Cross Metro Cavern	
Drawn By	JH	Company	Douglas Partners
Date	Jan 2021	File Name	R02.fez