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E26733.G12

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Groundwater Seepage Analysis
Proposed Development
135 Badgerys Creek Road, Bradfield NSW

1 INTRODUCTION

At the request of Creative Vision on behalf of Bradfield Corporation Pty Ltd (the Client), EI Australia (EI) has prepared this Groundwater Seepage Analysis (GSA) for the proposed development at 135 Badgerys Creek Road, Bradfield NSW.

The following documents provided by the Client were used to assist in the preparation of this analysis:

- Architectural plans prepared by Plus Architecture – Job No. 20799, Drawing Nos. DA-10B1 to 10B3, and DA-1000 to 1012, 110, 120, 200 to 204, dated on 11 September 2025; and
- Site survey plan prepared by SDG – Referenced 9165, revision B 94, dated on 8 August 2024.

EI has previously prepared the following relevant reports for this site:

- Geotechnical Investigation (GI) Draft Report, Reference E26733.G03, dated 11 July 2025.

Based on the provided documents, EI understands that the proposed development involves the construction of a mixed use residential and commercial development comprising four, mixed commercial (retail) and residential (apartment) buildings, and one hotel building with associated childcare. Excavation is planned for three detached two-level basements, comprising Stage 1 basement underlying the hotel and childcare towards the eastern boundary, Stage 2 basement underlying commercial and residential buildings towards the centre of the site, and Stage 3 underlying further commercial and residential buildings towards the western boundary. Stage 1 and 2 basements are shown to have a shared wall with Stage 2 and 3 separated by a riparian corridor with water course and a proposed local street.

The lowest basement level is proposed to have a Finished Floor Level (FFL) of between RL 69.2m and 69.0m Australian Height Datum (AHD). A Bulk Excavation Level (BEL) ranging between RL 68.9m and 68.7m is assumed, which includes allowance for the construction of the basement slab. To achieve the BEL, excavation depths from 6.0m to 11.0m Below Existing Ground Level (BEGL) have been estimated. Locally deeper excavations may be required for footings, lift overrun pits, crane pads, and service trenches.

The basement extends up to the northern and eastern site boundaries for the Stage 1 and 2 basements, and is set back from the southern boundary by about 3m. The Stage 3 basement is set back also about 3m from the southern site boundary, and about 10m from the western boundary, and a minimum of 6m from the northern site boundary.

1.1 ASSESSMENT OBJECTIVES

The objective of this GSA is to provide an estimation of the groundwater take volumes that require pumping out during the construction and operational stages of the development with estimation of the groundwater drawdown and drawdown settlement as a result of the excavation dewatering.

2 SITE MODEL

2.1 MODELLED SECTIONS

For the purpose of GSA, a half section has been modelled for each basement, utilising the most conservative subsurface conditions for each basement, the locations of these sections is shown in the attached **Figure 1:**

- Section A-A': Western Basement
- Section B-B': Eastern Basement

2.2 SUBSURFACE CONDITIONS

The subsurface conditions outlined in our GI report were utilised in this analysis to model the geological subsurface conditions for the section.

A summary of the permeability values which were adopted for the assessment of groundwater take volumes is presented in **Table 1**.

Table 1 Summary of Subsurface Conditions and Adopted Design Parameters

Material [1]	Adopted RL of Top of Unit; Section A-A' (m AHD) [2]	Adopted RL of Top of Unit; Section B-B' (m AHD) [2]	Adopted Permeability (m/s)	$k_{vertical}/k_{horizontal}$
Topsoil/Residual Soil[3]	78.9	78.8	1.0×10^{-7}	1.0
XW Siltstone[3]	77.3	77.3	1.0×10^{-9}	1
DW Siltstone[4]	76.1	75.4	6.0×10^{-8}	1
SW-FR Siltstone[5]	72.4	72.8	1.8×10^{-7}	0.2

Notes:

1 For more detailed descriptions of subsurface conditions reference should be made to our GI report.
2 Minor idealisations have been made to the adopted ground profile based on borehole logs.
3 Permeability value has been correlated using Pells (2019).
4 Permeability value was adopted based on the average value of rising head tests carried out by EI encountered in BH2M and BH3M discussed in Section 2.2.1.
5 Permeability value was adopted based on the average value of rising head tests carried out by EI encountered in BH1M, BH5M and BH6M discussed in Section 2.2.1.

2.2.1 GROUNDWATER PERMEABILITY TESTS

Rising Head tests were undertaken by EI in five monitoring wells to estimate the permeability of the soil. The test involves removing the water from the well and measuring the rise in water level within the well at regular time intervals. The data was then used to calculate the hydraulic conductivity of the material screened by each well using the Hvorslev method (results are presented graphically in **Appendix B**).

A summary of the rising head test results for each monitoring well are presented in below.

Table 2 Summary of Monitoring Well Details and Rising Head Test Results

Monitoring Well ID	Total Well Depth (m BEGL)	Screen Length (m)	Screened Section	Latest Date of Test	Approximate RL of Groundwater Level (m AHD)	Calculated Permeability (m/s)
BH1M	10.9	3.00	SW-FR Siltstone	8/05/2025	75.64	5.56×10^{-7}
BH1M	10.9		SW-FR Siltstone	23/09/2025	75.5	4.76×10^{-7}
BH2M	6.6	3.00	DW Siltstone	8/05/2025	74.34	2.70×10^{-8}
BH2M	6.6		DW Siltstone	23/09/2025	75.21	1.20×10^{-8}
BH3M	6.2	3.00	DW Siltstone	23/09/2025	75.32	1.41×10^{-7}
BH5M [1]	12.1	3.00	SW-FR Siltstone	8/05/2025	73.27	1.0×10^{-9}
BH5M [1]	12.1		SW-FR Siltstone	23/09/2025	73.51	1.0×10^{-9}
BH6M [1]	9.1	3.00	SW-FR Siltstone	8/05/2025	73.45	1.0×10^{-9}

BH6M	9.1		SW-FR Siltstone	23/09/2025	73.67	4.7×10^{-8}

Notes:

1 Due to very low water inflow during the test resulting in no rising head, EI have assumed the lowest estimated mass hydraulic conductivity of Class II Shale as per Pells (2019)

2.3 GROUNDWATER LEVEL OBSERVATIONS

The groundwater levels observed within all monitoring wells during various site visits are summarised in **Table 3**.

Table 3 Summary of Groundwater Levels

Monitoring Well ID	Groundwater Levels		
	Date of Observation	Approximate Depth to Groundwater Level (m BEGL)	Approximate RL of Groundwater Level (m AHD)
BH1M	6/05/2025 8/05/2025 23/09/2025	4.58 4.66 4.80	75.72 75.64 75.5
BH2M	6/05/2025 8/05/2025 23/09/2025	4.44 5.36 4.49	75.27 74.34 75.21
BH3M	6/05/2025 8/05/2025 23/09/2025	1.52 1.62 1.48	75.28 75.18 75.32
BH5M	6/05/2025 8/05/2025 23/09/2025	6.36 7.43 7.19	74.34 73.27 73.51
BH6M	6/05/2025 8/05/2025 23/09/2025	4.19 5.25 5.02	74.51 73.45 73.68

Based on groundwater levels observed on the site, the following design groundwater levels (GWL) for each section have been adopted for this analysis:

- **Section A-A'**: Design groundwater levels of RL 76.7 m AHD was adopted for the western side of the site, incorporating a 1 m increase above the observed levels to account for possible seasonal variation.
- **Section B-B'**: Design groundwater levels of RL 76.3 m AHD was adopted for the eastern side of the site, incorporating a 1 m increase above the observed levels to account for possible seasonal variation.

The estimated maximum extent of the cone of depression has been determined using Sichardt's Formula, as follows:

$$R = 3000\,(H - h)\sqrt{k}$$

where:

- R = Maximum extent of the cone of depression
- h = Estimated groundwater level at the BEL due to full duration of dewatering (m).
- k = Hydraulic conductivity of the aquifer (m/s).

The coefficient of 3000 is based on empirical observations, predominantly for sandy aquifers. The lowest coefficient outlined in Sichardt's formula is approximately 1000, which would result in a smaller radius of influence. Therefore, using a coefficient of 3000 in this case is considered conservative.

Based on the formula above, the maximum extent of the cone of depression is estimated to be approximately 50m from the basement outline. This extent has been adopted in the numerical modelling.

2.4 SHORING SYSTEM

At the time of this analysis, no detailed structural design was available. However, the system was conservatively assumed to be soldier pile wall socketed below BEL based on the recommendations of the GI. During excavation and operation, any seepage will be freely allowed to enter the basement.

This analysis does not assess the overall stability of the shoring system. Once the designs relating to the adopted shoring system are updated, this analysis should be revised accordingly.

3 GROUNDWATER TAKE ASSESSMENT

3.1 GROUNDWATER SEEPAGE VOLUMES DURING CONSTRUCTION PHASE

Groundwater seepage analysis for flow through and beneath the excavation face during construction has been undertaken using two sections of PLAXIS 2D (Version 2024.1.0.1060). PLAXIS 2D is a commercially available finite element package intended for the two dimensional analysis in geotechnical engineering. It is equipped with features to deal with various aspects of geotechnical structures and construction processes using robust and theoretically sound computational procedures. PLAXIS 2D estimates the seepage rate of water entering the excavation through and beneath excavation face. This model estimates the volume of water which will be required to be dewatered during the construction of the basement and until the dewatering is turned off.

For the purpose of this modelling, it has been assumed that:

- The subsurface conditions from **Table 1** were modelled to horizontally beyond the basement boundary.
- The permeability values presented in **Table 1** above were adopted for each unit.
- Design groundwater level for Section A-A' at RL 76.7m and Section B-B' at RL 76.3m.
- The excavation face is assumed to be permeable and free to drain as per Section 2.4 of this report.
- The base of the basement excavation is assumed to be permeable and free to drain.
- Temporary dewatering will be undertaken to the proposed bulk excavation level, about RL 68.9m AHD for western basement and RL 68.7m AHD for eastern basement.
- A total footprint length of approximately 257m and 408m was measured for the western (Section A-A') and eastern (Section B-B') excavation respectively.
- The external design groundwater levels were assumed to be constant at 50m from the excavation faces as discussed in **Section 2.4** of this report.

The PLAXIS 2D models are presented in **Appendix A**. **Table 5** provides the estimated groundwater inflow rate into the proposed excavation and maximum drawdown depths.

Table 1 Summary of Analysis Results

Basement	Inflow into excavation (m^3/day/m)	Inflow into excavation (m^3/day)	Inflow into excavation (ML/year)
Western Basement (Section A-A')	0.12	30.4	11.1
Eastern Basement (Section B-B')	0.095	38.8	14.2

3.2 ASSESSMENT OF GROUNDWATER TAKE DURING OPERATIONAL PHASE

Based on our geotechnical and ground water investigation and utilising PLAXIS 2D, it is estimated that the western basement will encounter an inflow of approximately 11.1ML/year. Whilst, the eastern basement will encounter an inflow of approximately 14.2 ML/year.

3.3 GROUNDWATER DRAWDOWN INDUCED SETTLEMENT

EI utilised PLAXIS 2D to estimate the potential drawdown-induced settlements as a result of dewatering. The maximum predicted groundwater drawdown and its associated maximum ground settlement surrounding the basement boundary is summarised in **Table 6**. It should be noted that these predicted settlements accounts **only for water drawdown** and does not consider other factors, such as shoring wall deflection, surcharge loading, relaxation of the bedrock/soil or other construction-related influences. Figures illustrating the estimated drawdown-induced settlement are provided in **Appendix A**.

Table 2 Summary of Maximum Groundwater Drawdown and Associated Maximum Ground Settlement

Section	Maximum Drawdown (m)	Maximum Ground Settlement (mm)
Western Basement (Section A'A')	5.7	1
Eastern Basement (Section B-B')	6.2	2

As tabulated above, the maximum predicted ground settlements occur immediately outside of the excavation is negligible (<3.0mm). The maximum predicted ground settlements are much less than 10mm and are considered to be a 'negligible' risk in regards to category of damage risk due to dewatering, as defined in Cashman and Preene (2021), as shown in the excerpt in **Plate 1**.

Although the PLAXIS modelling provides predicted drawdown-induced ground settlement values, it would be prudent for a thorough assessment of potential risks posed on neighbouring structures to be completed by a qualified and experienced structural engineer.

Risk category [a]	*Maximum settlement (mm)* [b]	*Building tilt* [c]	*Anticipated effects*
Negligible	<10	<1/500	Superficial damage unlikely
Slight	10–50	1/500–1/200	Possible superficial damage; unlikely to have structural significance
Moderate	50–75	1/200–1/50	Expected superficial damage and possible structural damage to buildings; possible damage to rigid pipelines
Severe	75	>1/50	Expected structural damage to buildings and expected damage to rigid pipelines or possible damage to other pipelines

Source: Preene, M., *Proceedings of the Institution of Civil Engineers—Geotechnical Engineering*, 143(4), 177–190, 2000. With permission.

[a] The risk category is to be based on the more severe of the settlement or tilt criteria.
[b] Maximum settlement is based on the nearest edge of the structure to the groundwater control system.
[c] Tilt is based on rigid body rotation, assuming that all of the maximum settlement occurs as differential settlement across the width of the structure or across an element of the structure.

Plate 1 **Excerpt from Cashman and Preene (2021)**

4 CONCLUSIONS AND COMMENTS

Based on the findings of this report and within the limitations of available data, EI concludes that:

- Construction and operational phase groundwater take will be approximately 11.1 ML per year for the western basement and 14.2 ML per year for the eastern basement..
- The above estimate is based on the following assumptions:
  - The shoring wall system is a permeable system as per **Section 2.4** of this report;
  - Continuous dewatering in order to maintain the groundwater at BEL during construction; and
  - The basement walls and slab will be designed as drained for the developments lifetime.
  - This assessment does not take into consideration any excavation that may be required for footings, service trenches, lift pits, or crane pads. This additional excavation, if required, is not expected to affect the retention or the dewatering system.
- The groundwater drawdown surrounding the basement boundary is predicted to be up to about 6 m.
- The ground settlements due to the predicted groundwater drawdown behind the shoring wall, within the cone of depression, are estimated to be less than 3 mm. This level of settlement falls within the 'negligible' risk category for damage risk resulting from ground settlement due to dewatering, as per Cashman and Preene (2021). It would be prudent for potential risks to neighbouring structures to be assessed by a qualified and experienced structural engineer.
- Alternatively, if the basement is designed as 'tanked' then the operational phase dewatering volumes will be negligible.
- Should any design or construction conditions differ from that adopted in this report; this GSA should be reviewed and updated as required.

5 LIMITATIONS

This report has been prepared for the exclusive use of Bradfield Corporation Pty Ltd who is the only intended beneficiary of EI's work. The scope of the inspections carried out for the purpose of this report is limited to those agreed with Bradfield Corporation Pty Ltd.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised in similar tasks by reputable members of the geotechnical industry in Australia as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section of this report must be read in conjunction with the whole of this report, including its appendices and attachments.

The conclusions presented in this report are based on a limited assessment of conditions, with specific locations chosen to be as representative as possible under the given circumstances.

EI's professional opinions are reasonable and based on its professional judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation, observations, or validation testing and analysis during remedial activities. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

6 CLOSURE

Please do not hesitate to contact the undersigned should you have any questions.

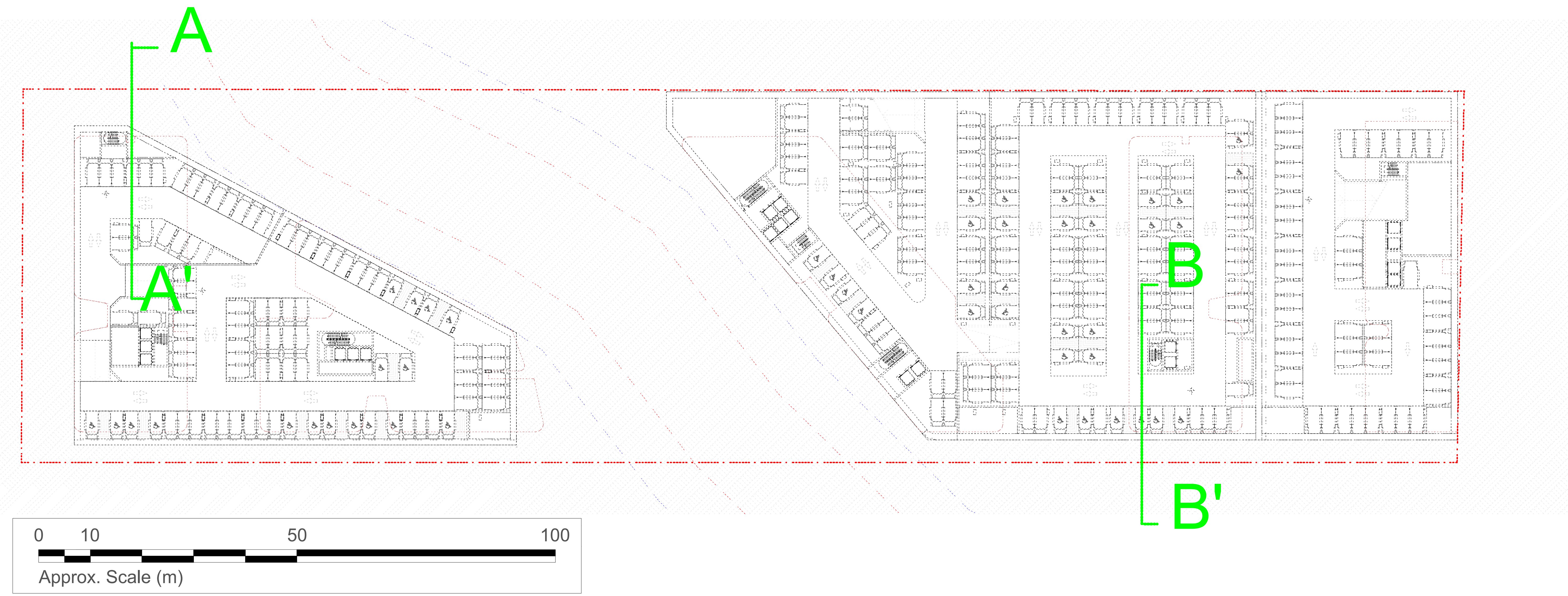
For and on behalf of
EI Australia

Author	Technical Reviewer
Prince Shrestha Geotechnical Engineer	Stephen Kim Associate Geotechnical Engineer

APPENDICES:
Figure 1 – Site Plan
Appendix A – PLAXIS 2D Model and Results (Section A-A')
PLAXIS 2D Model and Results (Section B-B')
Appendix B – Rising Head Permeability Test Results
Appendix D – Important Information

Figures

Figure 1 Analysed Sections Plan



Map Source: Plus Architecture, Job Number: 20799, date: 6/2/2025

LEGEND (All Locations are Approximate)

Site Boundary

eiaustralia
Practical Solutions for Built Environments
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	P.S
Approved:	
Date:	6/08/2025

Bradfield Corporation Pty Ltd
Cross Secition for Plaxis Modelling
135 Badgerys Creek Roas, Bradfield NSW

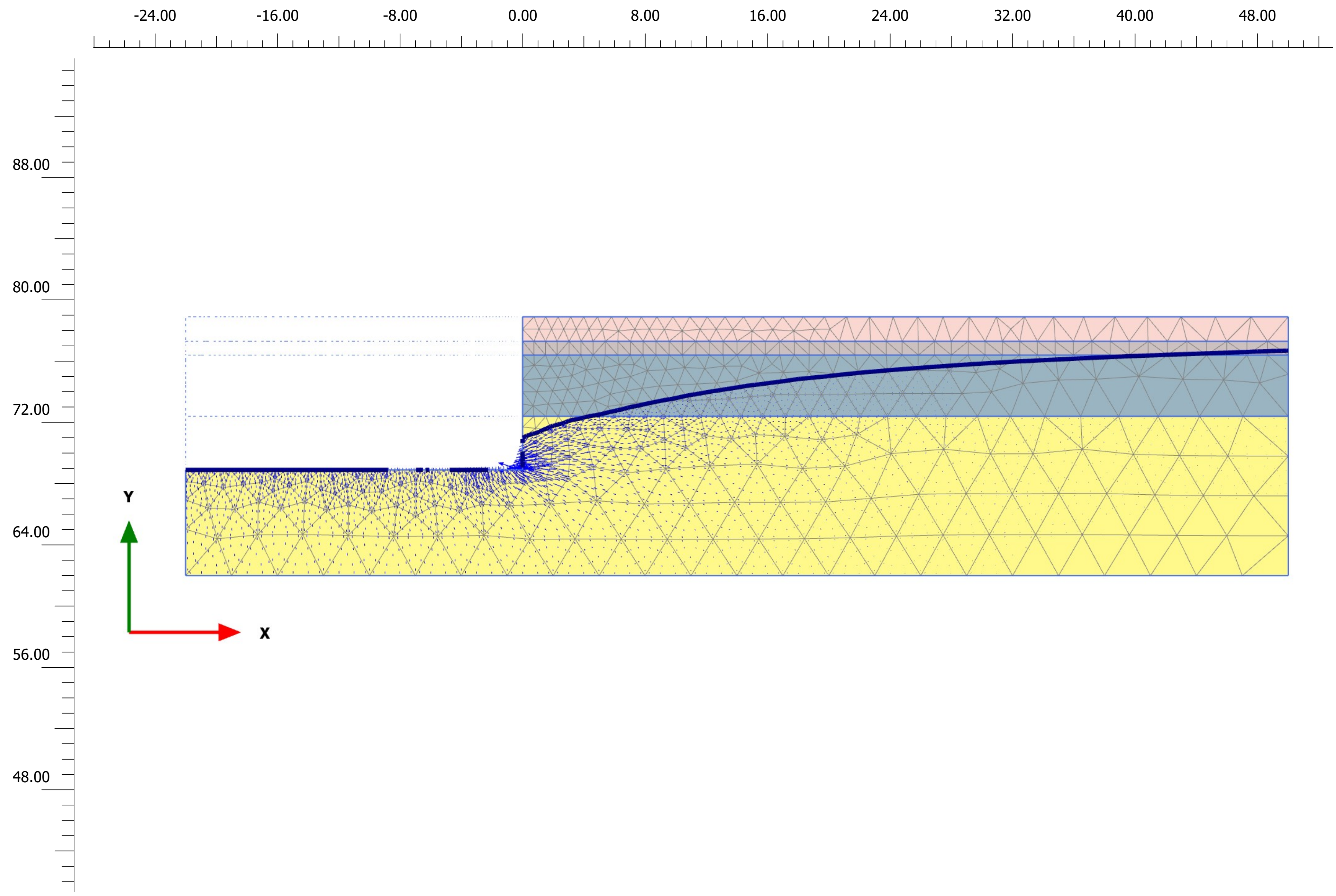
Figure:
1

Project: E26326.G05

Appendix A – PLAXIS 2D Model and Results

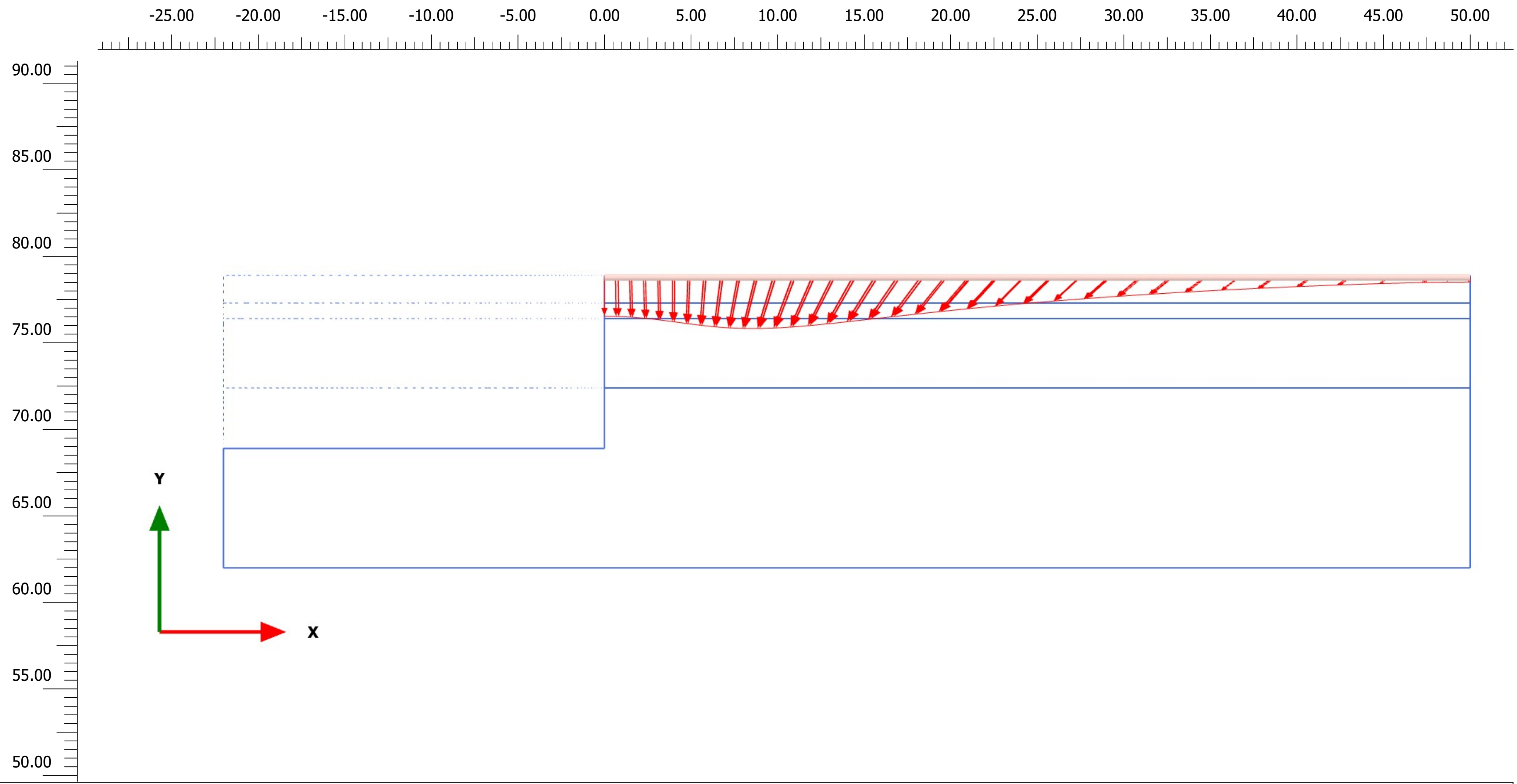
(Section A-A' and Section B-B')

Output Version 2024.2.0.1144



PLAXIS® 2D

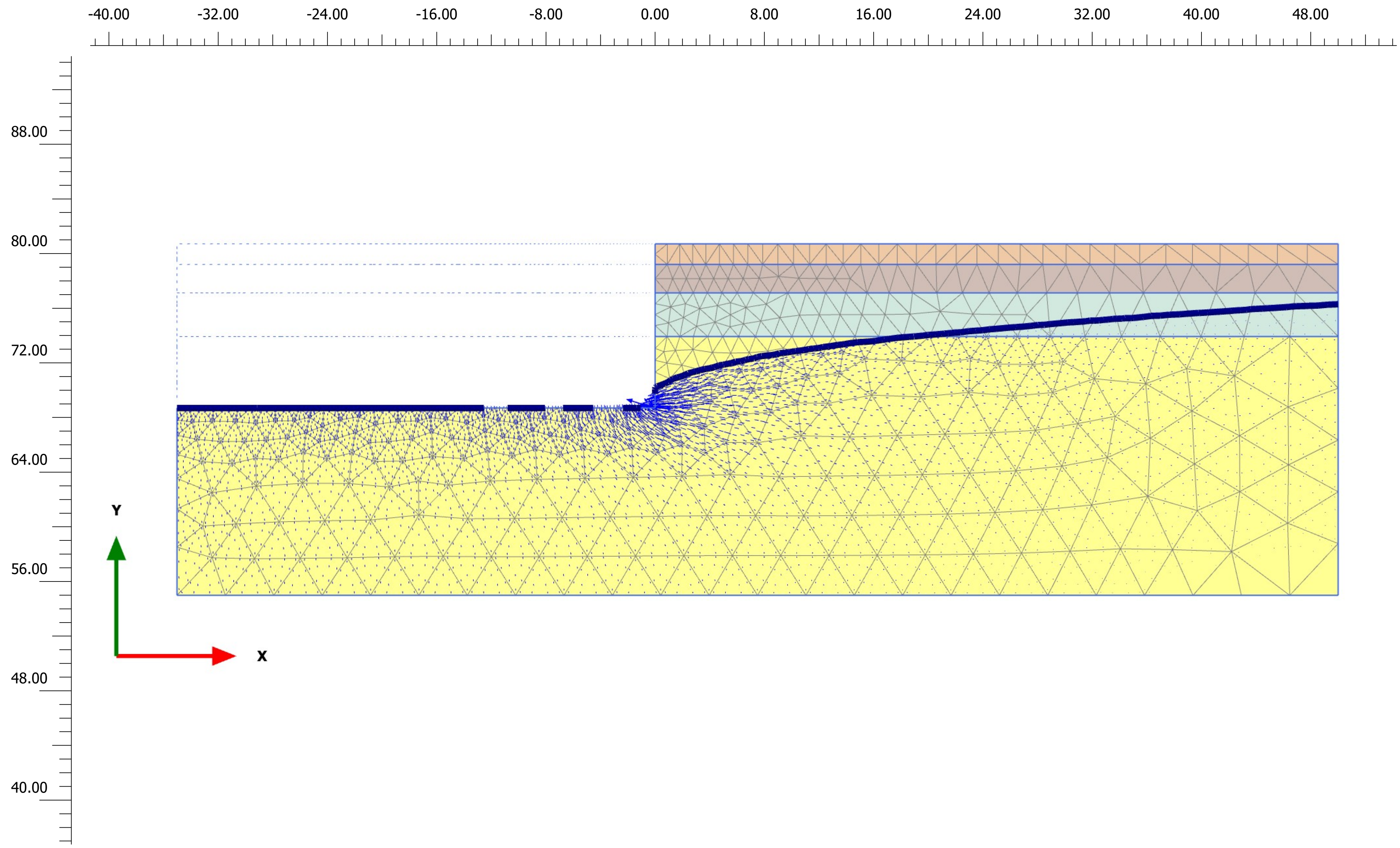
Project description			Date
Groundwater Flow and Drawdown Curve for Section A-A'			29/09/2025
Project filename	**Step**	**Company**	
E26733.G12.01_Bradfield ...	3	EI Australia	



Total displacements |u| (scaled up 2.00*10^3 times)

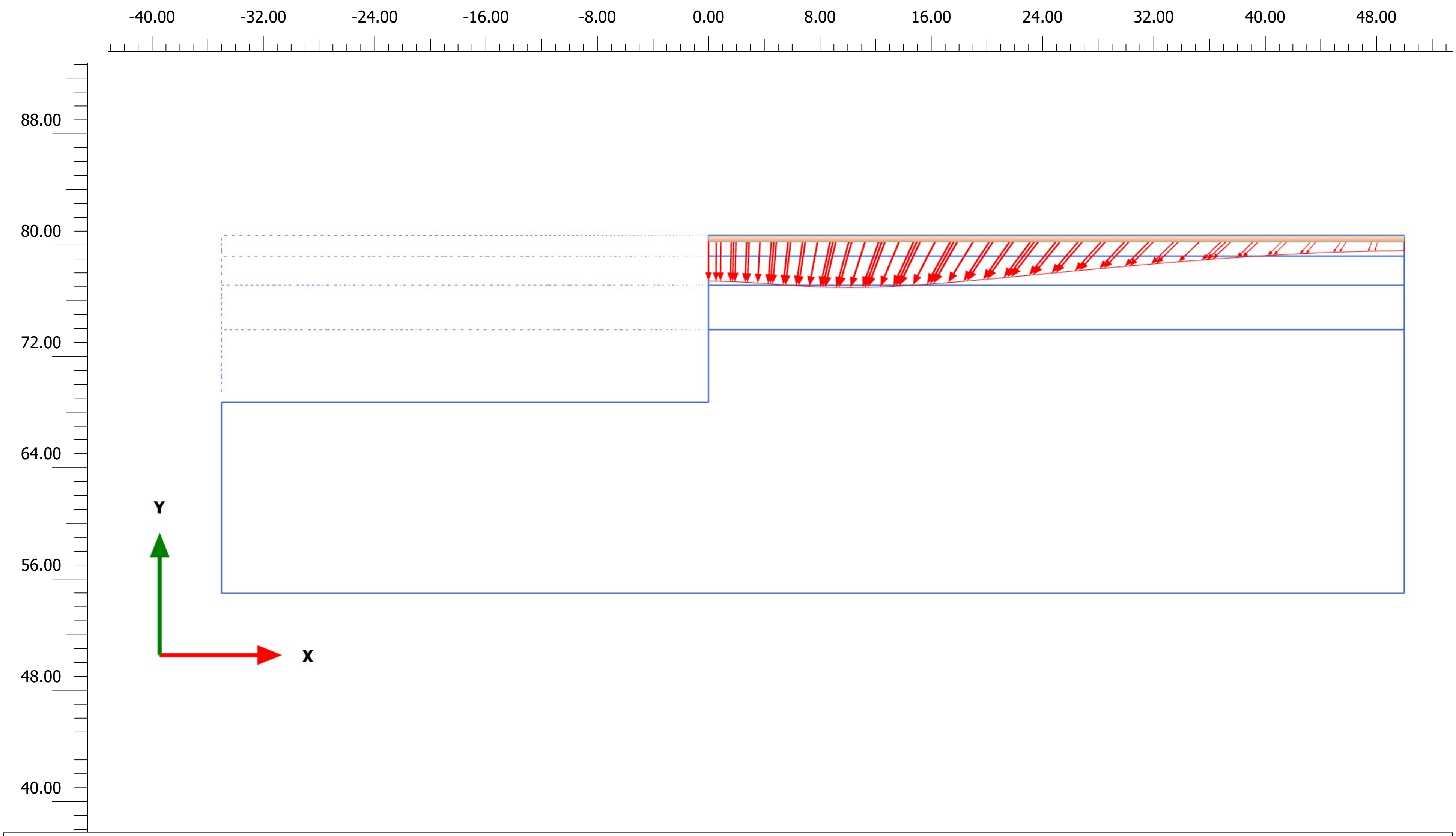
Maximum value = 1.569*10^{-3} m

PLAXIS® 2D	*Project description*		*Date*
	Drawdown-Induced Settlements Beyond Northen Elevation		29/09/2025
	Project filename E26733.G12.01_Bradfield_ ...	*Step* 3	*Company* EI Australia



PLAXIS® 2D

Project description			Date
Groundwater Flow and Drawdown Curve for Section B-B'			29/09/2025
Project filename	Step	Company	
E26733.G12.01_Bradfield	6	EI Australia	



Total displacements |u| (scaled up 2.00*10^3 times)

Maximum value = 1.865*10^{-3} m

PLAXIS® 2D	*Project description* Drawdown-induced Settlements Beyond Southern El ...		*Date* 29/09/2025
	Project filename E26733.G12.01_Bradfield	*Step* 6	*Company* EI Australia

Appendix B – Rising Head Permeability Tests

Rising Head Permeability Test

EI Job No.	E26733.G12		Test Date	23/09/2025
By	MS		Location	135 Badgerys Creek Road, Bradfield NSW

Borehole Detail

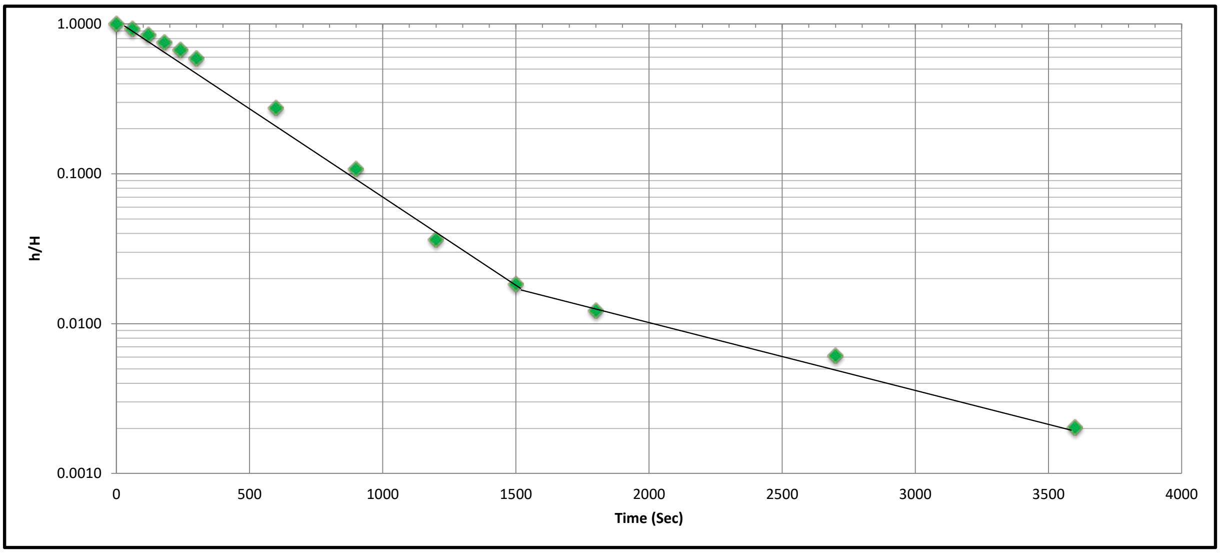
BH No.	BH1M
Casing Stick-up (m)	0.86
Effective Piezo Screen Length (m)	3.00
Piezo Radius r (m)	0.025
Bore radium (drillhole radius) (m)	0.038
Depth of the piezometer (m BGL)	10.90
Static Water Level (m BToC)	5.68
Lag time T0 (sec)	
Calculated Permeability k	**4.76E-07** m/sec

Based on Hvorslev Method

$$K = \frac{r^2}{2L} \ln\left(\frac{L}{R}\right)\left[\frac{\ln(h_1/h_2)}{t_2 - t_1}\right]$$

t1	1500
t2	3600
h1	0.0183
h2	0.0020

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			5.68		
0	0		10.61	4.93	1.0000
1	60		10.23	4.55	0.9229
2	120		9.83	4.15	0.8418
3	180		9.38	3.70	0.7505
4	240		8.99	3.31	0.6714
5	300		8.58	2.90	0.5882
10	600		7.03	1.35	0.2738
15	900		6.21	0.53	0.1075
20	1200		5.86	0.18	0.0365
25	1500		5.77	0.09	0.0183
30	1800		5.74	0.06	0.0122
45	2700		5.71	0.03	0.0061
60	3600		5.69	0.01	0.0020



Rising Head Permeability Test

EI Job No.	E26733.G12		Test Date	23/09/2025
By	MS		Location	135 Badgerys Creek Road, Bradfield NSW

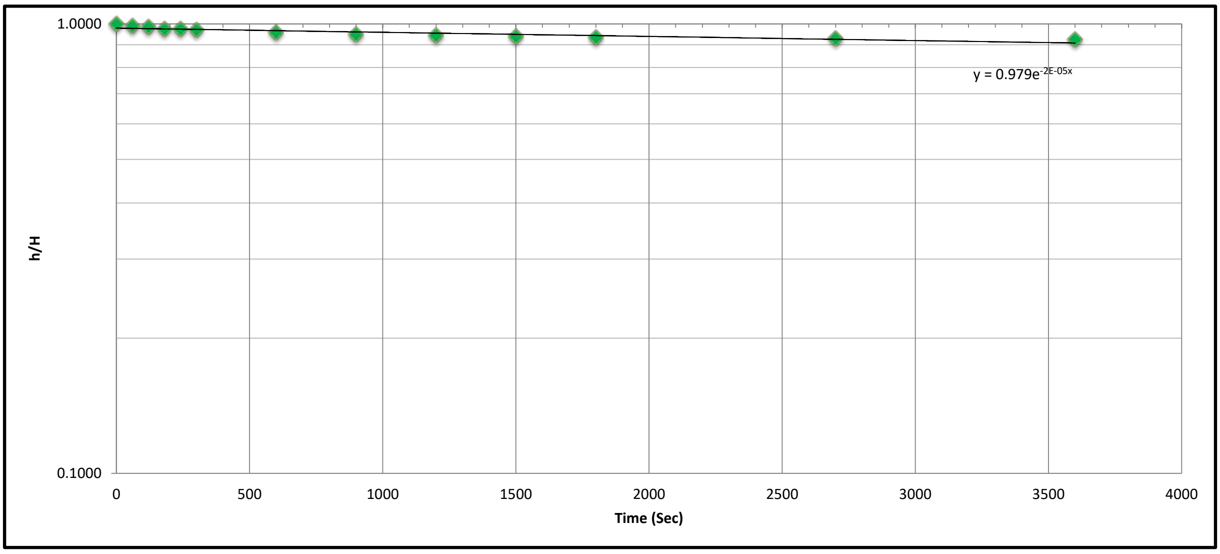
Borehole Detail

BH No.	BH2M
Casing Stick-up (m)	0.95
Effective Piezo Screen Length (m)	2.06
Piezo Radius r (m)	0.025
Bore radium (drillhole radius) (m)	0.038
Depth of the piezometer (m BGL)	6.55
Static Water Level (m BToC)	5.44
Lag time T0 (sec)	48601.09
Calculated Permeability k	**1.20E-08** m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			5.44		
0	0		7.37	1.93	1.0000
1	60		7.35	1.91	0.9896
2	120		7.34	1.90	0.9845
3	180		7.32	1.88	0.9741
4	240		7.32	1.88	0.9741
5	300		7.31	1.87	0.9689
10	600		7.29	1.85	0.9585
15	900		7.27	1.83	0.9482
20	1200		7.26	1.82	0.9430
25	1500		7.25	1.81	0.9378
30	1800		7.24	1.80	0.9326
45	2700		7.23	1.79	0.9275
60	3600		7.22	1.78	0.9223



Rising Head Permeability Test

EI Job No.	E26733.G12		Test Date	23/09/2025
By	MS		Location	135 Badgerys Creek Road, Bradfield NSW

Borehole Detail

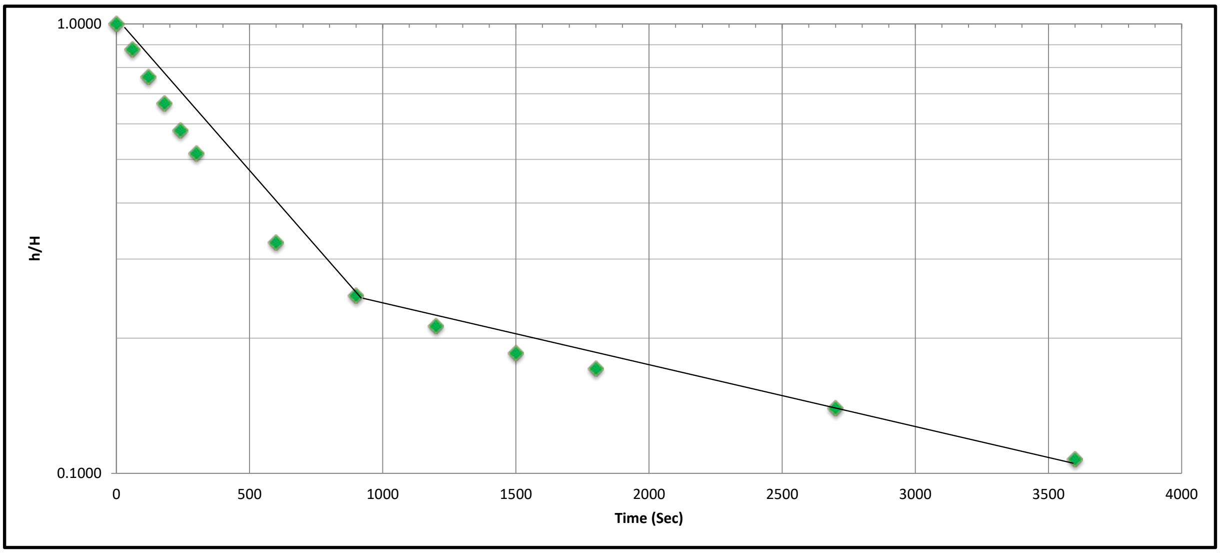
BH No.	BH3M
Casing Stick-up (m)	0.61
Effective Piezo Screen Length (m)	3.00
Piezo Radius r (m)	0.025
Bore radium (drillhole radius) (m)	0.038
Depth of the piezometer (m BGL)	22.30
Static Water Level (m BToC)	2.08
Calculated Permeability k	**1.41E-07** m/sec

Based on Hvorslev Method

$$\mathbf{K} = \frac{\mathbf{r}^2}{2\mathbf{L}} \ln\left(\frac{\mathbf{L}}{\mathbf{R}}\right)\left[\frac{\ln(\mathbf{h_1}/\mathbf{h_2})}{\mathbf{t_2}-\mathbf{t_1}}\right]$$

t1	900
t2	3600
h1	0.2483
h2	0.1075

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			2.08		
0	0		11.10	9.02	1.0000
1	60		10.00	7.92	0.8780
2	120		8.95	6.87	0.7616
3	180		8.08	6.00	0.6652
4	240		7.30	5.22	0.5787
5	300		6.72	4.64	0.5144
10	600		5.02	2.94	0.3259
15	900		4.32	2.24	0.2483
20	1200		4.00	1.92	0.2129
25	1500		3.75	1.67	0.1851
30	1800		3.62	1.54	0.1707
45	2700		3.34	1.26	0.1397
60	3600		3.05	0.97	0.1075



Rising Head Permeability Test

EI Job No.	E26733.G12		Test Date	23/09/2025
By	MS		Location	135 Badgerys Creek Road, Bradfield NSW

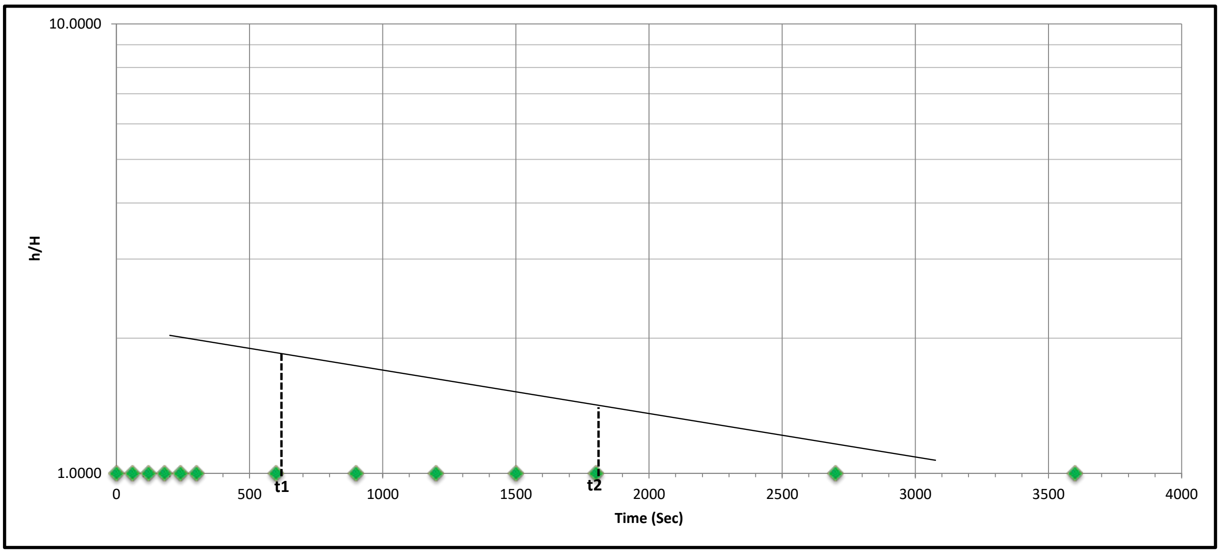
Borehole Detail

BH No.	BH5M
Casing Stick-up (m)	0.99
Effective Piezo Screen Length (m)	4.90
Piezo Radius r (m)	0.025
Bore radium (drillhole radius) (m)	0.038
Depth of the piezometer (m BGL)	12.10
Static Water Level (m BToC)	8.19
Calculated Permeability k	**N/A** m/sec

Based on Hvorslev Method

UNABLE TO TEST DUE TO SILT BUILDUP IN WELL

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			8.19		
0	0			-8.19	1.0000
1	60			-8.19	1.0000
2	120			-8.19	1.0000
3	180			-8.19	1.0000
4	240			-8.19	1.0000
5	300			-8.19	1.0000
10	600			-8.19	1.0000
15	900			-8.19	1.0000
20	1200			-8.19	1.0000
25	1500			-8.19	1.0000
30	1800			-8.19	1.0000
45	2700			-8.19	1.0000
60	3600			-8.19	1.0000



Rising Head Permeability Test

EI Job No.	E26733.G12		Test Date	23/09/2025
By	MS		Location	135 Badgerys Creek Road, Bradfield NSW

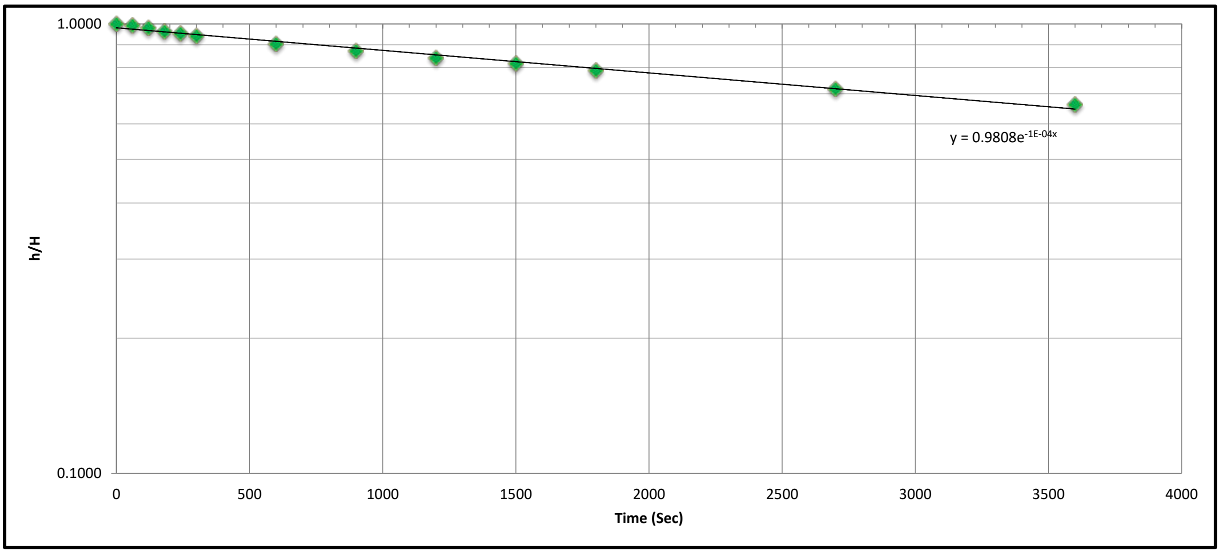
Borehole Detail

BH No.	BH6M	
Casing Stick-up (m)	0.90	
Effective Piezo Screen Length (m)	3.00	
Piezo Radius r (m)	0.025	
Bore radium (drillhole radius) (m)	0.038	
Depth of the piezometer (m BGL)	9.10	
Static Water Level (m BToC)	5.95	
Lag time T0 (sec)	9737.66	
Calculated Permeability k	**4.70E-08**	m/sec

Based on Hvorslev Method

$$\mathbf{K} = \frac{\mathbf{r^2 \ln(L/R)}}{\mathbf{2LT_0}}$$

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			5.95		
0	0		9.20	3.25	1.0000
1	60		9.18	3.23	0.9938
2	120		9.13	3.18	0.9785
3	180		9.08	3.13	0.9631
4	240		9.05	3.10	0.9538
5	300		9.01	3.06	0.9415
10	600		8.88	2.93	0.9015
15	900		8.78	2.83	0.8708
20	1200		8.68	2.73	0.8400
25	1500		8.60	2.65	0.8154
30	1800		8.51	2.56	0.7877
45	2700		8.28	2.33	0.7169
60	3600		8.10	2.15	0.6615



Appendix D – Important Information

Important Information

SCOPE OF SERVICES

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client And EI Australia ("EI"). The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

EI has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. EI has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, EI will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EI.

GEOTECHNICAL ENGINEERING

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

LIMITATIONS OF SITE INVESTIGATION

The investigation programme undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation programme and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. EI should be kept appraised of any such events, and should be consulted to determine if any additional tests are necessary.

VERIFICATION OF SITE CONDITIONS

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that EI be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

REPRODUCTION OF REPORTS

This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this Company. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the Client and no other party. EI assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EI or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

EI will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.