Memorandum

To	Aileen Craw
Copy	Greg Saul, Chris Fox, Carrie Hartley
From	Bryce Harrison
Office	Dunedin
Date	20 May 2024
File/Ref	6-CO082.00/0230C
Subject	Peer Review Global Stability Analyses

1 Introduction

This memorandum has been prepared to summarise key changes made to the global stability assessments analysed in response to the peer review comments provided by Tonkin & Taylor on 1 February 2024. Geotechnical design parameters and the Geological model have been maintained from the Geotechnical Interpretive Report by WSP dated 27 April 2023.

2 Seismicity

2.1 Seismic Design Criteria

New Zealand has no specific standard developed to assess design earthquakes for landfills, and landfills are not specifically mentioned within NZS1170.0:2002. We have assessed the importance level of the landfill facility based on the assumption that it is categorised within *'Buildings and facilities not designated as post disaster containing hazardous materials'* as described in Table 3.2 of NZS 1170.0: 2002.

Based on Tables 3.1 and 3.2 in NZS1170.0:2002, we consider the landfill to be an Importance Level 3 structure.

The landfill will have an operative life of approximately 35 years, followed by anticipated 15 - 20 years of aftercare. Therefore, we have adopted a design working life of 50 years to derive the seismic loads for the landfill.

2.2 Seismic Loads

The New Zealand Seismic Hazard Model (NSHM) has been updated and in line with this, the New Zealand Geotechnical Society (NZGS) (2021) released an updated Module 1 – Earthquake Geotechnical Engineering Guideline. The NZGS guideline provides interim peak ground accelerations recommended for use in design which have been provided in Table 1.

To anticipate potential change in seismic design criteria due to the revised NSHM (2023), PGAs sourced from the NSHM have been summarised in Table 1. The PGAs have been assessed for the landfill location assuming a V_{s_30} of 150m/s for the landfill development area. The increase in PGA sourced from the current MBIE guidelines compared to the NSHM translates to approximately a 25% increase for both SLS and DCLS events in terms of PGA and corresponds to 100% increase in ULS displacements as discussed in section 4.1.2.

Table 1: Summary of seismic loads for the site

Seismic Case	Annual Probability of Exceedance	Probability of Exceedance (% in 50 years)	MBIE Module 1 (2021) PGA (g)	NSHM (2023) PGA (g)**	Effective Magnitude***
Serviceability Limit State (SLS)	1/50	63%	0.08	0.10	6.0
Ultimate Limit State (ULS)	1/1000	5%	0.29	0.36	6.0

* Annual Probability of Exceedance (APE) are based on Table 3.3 of NZS 1170.0, Table 3.5 of NZS 1170.5 and Table 5.3 of Bridge Manual
** Typical values assuming a V_{s_30} of 150 m/s for the landfill development area.
*** Effective magnitudes are taken from Table A1 from MBIE Module 1 (2021)

3 Groundwater

3.1 Groundwater observations within the proposed landfill expansion area

Groundwater was recorded at depths ranging between approximately 1.2 m and 5.6 m bgl within the machine boreholes during the investigation. Several rounds of monitoring were undertaken of the piezometers installed in BH1 – BH6 and BH10. A summary of the readings to date is presented in the Geotechnical Factual Report by WSP dated 31 March 2023. A plot of groundwater levels (in m RL based on the NZ Vertical Datum 2016) carried out to date is presented in
Figure 1 below. The existing ground levels (in m RL) at borehole locations are presented on the plot legend. Borehole locations are shown indicatively in Appendix A.

Figure 1: Plot of groundwater levels recorded within standpipe piezometers since October 2022

As indicated in
Figure 1 above, the long-term groundwater level is anticipated at depths ranging between 6 m to 20 m RL (in the order of 1 m to 4 m below existing ground levels) across the site, with flow

towards the Clutha River / Mata-Au in the south. Across the western section of the site, long-term groundwater is anticipated at lie approximately 2 m bgl and within the alluvial deposits. The piezometer readings in the boreholes across the eastern section suggest groundwater typically lies within the fractured rock or close to the interface between rock and overlying soils. Except for a groundwater level of 2.3 m bgl (~ 18.7 m RL) measured in October 2022, the piezometer readings in BH6 at the proposed landfill site have indicated dry conditions. Elevated groundwater levels may be anticipated during heavy rainfalls and have been considered in the preliminary geotechnical analyses.

3.2 Seasonal Groundwater Fluctuation

Long-term monitoring of groundwater contamination has been undertaken in a selection of groundwater monitoring wells. As part of these monitoring activities, a record of the ground water levels has been maintained. The response zone is typically founded in greywacke of varying strength/weathering or inferred as greywacke based on the driller's logs..

The groundwater monitoring wells are concentrated more toward the existing landfill than the proposed landfill expansion area, however, this dataset still provides an indication for the anticipated seasonal fluctuation in groundwater level. A summary plot of the groundwater measurements from February 2020 to April 2024 has been provided in Figure 2 on the following page and a description of the observed behaviour has been described below:

- BH02 was installed to the north of the existing landfill site, on the northern bank of the railway line in October 2022. Monitoring data is limited at this location, but the data does indicate some seasonal fluctuation, peaking around May/June and at a minimum around November/December.
- GW2 is located east of the existing sedimentation pond. There has been no clear seasonal trend of the groundwater. However, there was an increase of approximately 1.0 m observed in July 2022 from the typical level.
- GW3 is positioned south of the existing access road in the western portion of the site. There appears to be clear indication of seasonal fluctuation in this monitoring well with a difference of approximately 2 m between the low in January/March compared with the high observed in June/August.
- GW4 is positioned north of the access track, towards the centre of the site. This well seems to be mostly insensitive to seasonal groundwater fluctuations.
- GW5 is positioned in proximity to the western face of the proposed landfill expansion. This monitoring well appears to be mildly sensitive to seasonal fluctuation with an approximate 0.5 m difference between the spring/winter high and the summer/autumn low.
- GW6 is positioned along the northern face of the existing landfill with the response zone beginning at approximately 0.7 m above the base of the landfill (7.8 m bgl). GW6 indicated a gradual increase in the level of approximately 5.5 m between February 2020 and July 2022. The cause for the rise in groundwater in GW6 over this period is inconclusive based on the available information. After the groundwater appears to peak in July 2022, the levels appear to follow a seasonal trend with fluctuations of approximately 1.0 – 1.5 m. The groundwater level is now typically about 5 m above the base of the landfill at this location.
- GW7 this monitoring well is located east of the existing sedimentation pond. There has been no clear trend that indicates seasonal fluctuation of the groundwater. However, there was an increase of approximately 1.5 m observed in July 2022 from the typical level.

In summary, the measurements taken over this observation period indicate that groundwater levels at the site could fluctuate as much as 1 – 2 m between seasons in select locations. However, the eastern portion of the site where the landfill expansion is proposed has been observed to be mostly insensitive to seasonal fluctuations.

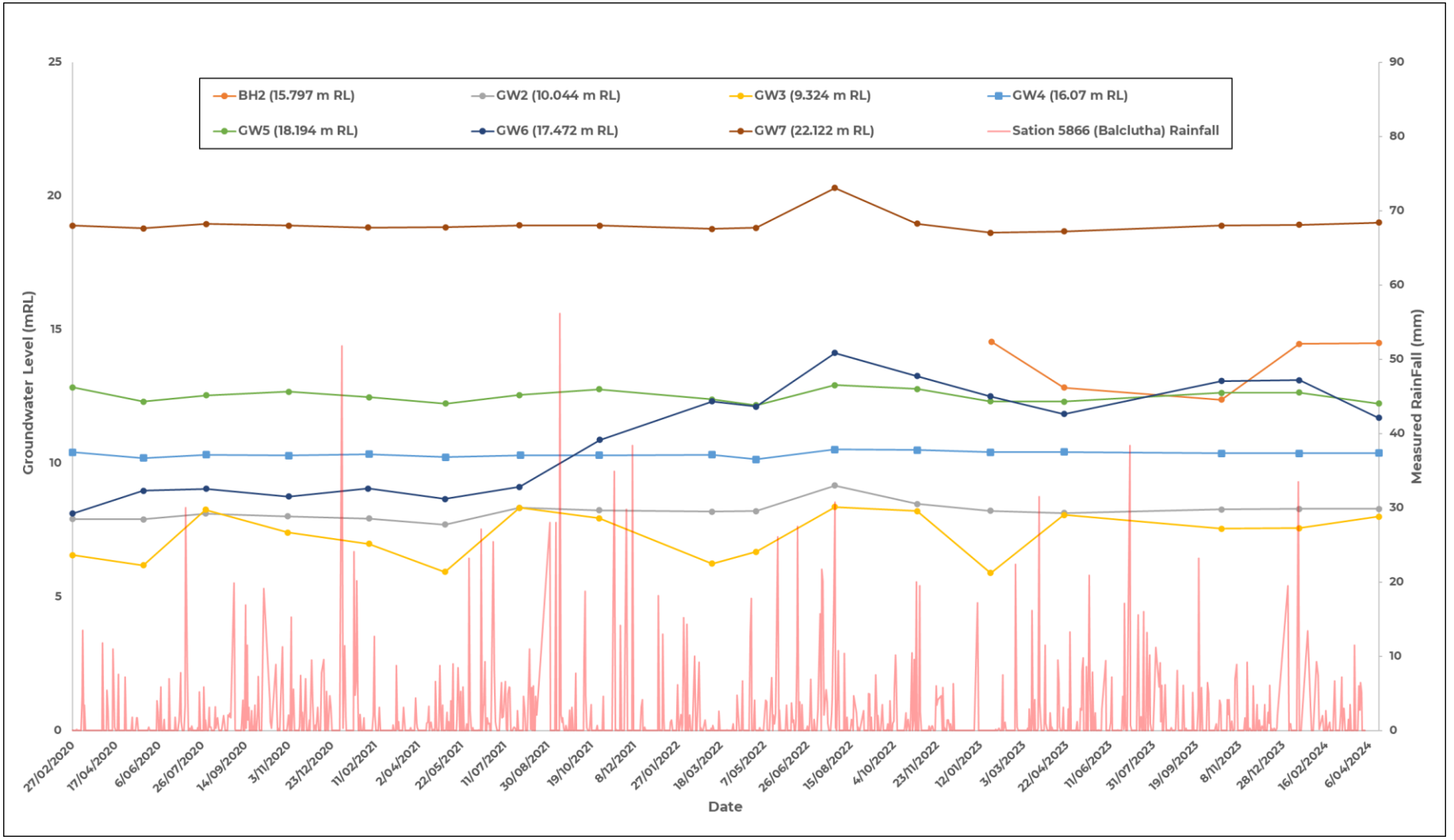

Figure 2: Seasonal fluctuation in groundwater

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4 Geotechnical Considerations

4.1 Global Stability

Preliminary global stability assessments have been carried out under static, seismic and high groundwater conditions using the GeoStudio software Slope/W (Version 2024.1.0). The assessment results are discussed below.

4.1.1 Landfill Expansion Stability

A preliminary global stability the proposed landfill expansion has been carried out under static, seismic and high groundwater conditions using the GeoStudio software Slope/W (Version 2024.1). The analyses have been based on four representative sections across the new landfill as described below. Indicative alignments of the sections are shown in Appendix B

- Section A-A' in the 'east/west' direction, over the piggy-back landfill.
- Section B-B' in the 'north/south' direction, over the piggy-back landfill
- Section C-C' in the 'north/south' direction, within the landfill expansion area
- Section D-D' in the 'east/west' direction, perpendicular to the drainage bund

The proposed landfill consists of 1(V): 4(H) side batters, with 1(V): 3(H) side slopes excavated into rock to form the landfill cell floor.

The minimum required Factors of Safety (FoS) in line with the industry practice are as follows:

- Minimum FoS of 1.5 and 1.25 under the 'static – long-term' and 'static – high groundwater level' conditions, respectively.
- Minimum FoS of 1.2 for the 'seismic' event, with allowance for seismically induced displacements if FoS < 1.2. These displacements have been estimated based on the methodologies by Jibson (2007), Ambraseys and Srbulov (1994) and Ambraseys & Menu (1988), as recommended by the Bridge Manual.

A summary of the global stability assessment results is presented in Table 2 below. Selected Slope/W outputs are presented in Appendix C of this report.

There is a very low risk of global instability of the proposed landfill extension toward the south (Clutha River / Mata-Au) due to the presence of bedrock at very shallow depth below the ground between the landfill and the highway. Therefore, the assessment is focused primarily on the stability of the landfill batters.

The assessments indicate the minimum factors of safety are achieved under the static case and the seismically induced slope movements are small and insignificant.

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Table 2: Global Stability Analysis Outputs

Case		Slope/W Factor of Safety	Minimum Target Factor of Safety	Yield Acceleration / Seismically Induced displacements (mm)
1.0 Section B'-B				
1.0.1	Static	2.3	1.5	
1.0.2	HGWL + Elevated Leachate	2.1	1.25	
1.0.3	SLS - Seismic	1.7	1.2	
1.0.4	ULS - Seismic	1.0	1.2*	0.27g/ <5 mm
1.0 Section B'-B (constrained)				
1.0.1	Static	1.9	1.5	
1.0.2	HGWL + Elevated Leachate	1.9	1.25	
1.0.3	SLS - Seismic	1.4	1.2	
1.0.4	ULS - Seismic	0.8	1.2*	0.18g/<15 mm
1.1 Section B-B'				
1.1.1	Static	2.1	1.5	
1.1.2	HGWL + Elevated Leachate	1.9	1.25	
1.1.3	SLS - Seismic	1.5	1.2	
1.1.4	ULS - Seismic	0.8	1.2*	0.21g/<10 mm
2.0 Section C'-C				
2.0.1	Static	1.9	1.5	
2.0.2	HGWL + Elevated Leachate	1.9	1.25	
2.0.3	SLS - Seismic	1.4	1.2	
2.0.4	ULS - Seismic	0.8	1.2*	0.20g/<10 mm
2.1 Section C-C'				
2.1.1	Static	2.3	1.5	
2.1.2	HGWL + Elevated Leachate	2.3	1.25	
2.1.3	SLS - Seismic	1.7	1.2	
2.1.4	ULS - Seismic	1.0	1.2*	0.29g/<5 mm
2.1 Section C-C' (Lower Slope)				
2.1.1 LS	Static	1.9	1.5	
2.1.2 LS	HGWL + Elevated Leachate	1.5	1.25	
2.1.3 LS	SLS - Seismic	1.3	1.2	
2.1.4 LS	ULS - Seismic	0.7	1.2*	0.16g/<25 mm

Case		Slope/W Factor of Safety	Minimum Target Factor of Safety	Yield Acceleration / Seismically Induced displacements (mm)
3.0 Section D-D'				
3.0.1	Static	1.9	1.5	
3.0.2	HGWL + Elevated Leachate	1.8	1.25	
3.0.3	SLS - Seismic	1.4	1.2	
3.0.4	ULS - Seismic	0.8	1.2*	0.17g/<20 mm
3.0.6	SLS - Seismic + HGWL + Elevated Leachate	1.3	1.2	
4.0 Section A'-A				
4.0.1	Static	2.1	1.5	
4.0.2	HGWL + Elevated Leachate	2.1	1.25	
4.0.3	SLS - Seismic	1.6	1.2	
4.0.4	ULS - Seismic	0.9	1.2*	0.24g/<5 mm
4.1 Section A-A'				
4.1.1	Static	2.3	1.5	
4.1.2	HGWL + Elevated Leachate	2.3	1.25	
4.1.3	SLS - Seismic	1.7	1.2	
4.1.4	ULS - Seismic	1.1	1.2*	0.29g<5 mm

* Factor of Safety of 1.2 or tolerable seismically induced displacements

4.1.2 Seismically Induced Ground Displacement

As reported above in Table 2, seismically induced displacements are expected to be less than 20 mm for the landfill batters based on the MBIE PGA values for the ULS design case. When considering the ULS PGA from the NSHM referenced in Table 2Table 1 the displacements are estimated to be up to 35 mm when adopting the critical yield acceleration for the landfill batters from analysis 3.0 (Section D-D'). We consider that an acceptable displacement limit of 40 mm (based on 10% yield strain[1] over a 400 mm development length, assessed from 20 m of waste overburden). We understand that HDPE liners can resist rupture from >500% strain which is equivalent to 2 m of strain. Sliding on the HDPE liner is only indicated in ULS seismic loading.

4.1.3 Temporary Stability

Temporary stability of the landfill has been assessed for section D-D', as this is understood to be the critical section for this analysis. Only the static conditions been analysed in this memorandum because they are temporary, and it is intended that the temporary batter slope be the same or flatter than the final slopes. Therefore, by inference the seismic performance would also be similar and deemed acceptable.

A selection of Slope/W outputs for the temporary stability case have been provided in Appendix D of this memo and a summary of the global stability outputs have been presented below in Table 3.

[1] Liner strain limits based on the recommendations by Qian et al. (2002)

Table 3: Temporary stability case

Landfill construction stage	Slope/W Factor of Safety	Minimum Target Factor of Safety
Stage 1 - Excavation	1.5	1.2
Stage 1	2.1	1.2
Stage 2	1.9	1.2
Stage 3	2.3	1.2
Stage 4	2.0	1.2

5 Summary

The above analyses indicate that the proposed landfill will be able to meet the required design criteria with the revisions suggested by the peer reviewer. The geotechnical design parameters, groundwater level and leachate level adopted are at least moderately conservative to demonstrate the insensitivity to the landfill geometry from these variables.

6 References

Ambraseys, N., & Menu, J. (1988). Earthquake-Induced Ground Displacements. *Earthquake Engineering and Structural Dynamics, Vol. 16*, 985-1006.

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Jibson, R. W. (2007). Regression models for estimating coseismic landslide displacement. *Engineering Geology 91*, 209 - 218.

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Qian, X., Koerner, R. M., & Gray, D. H. (2002). *Geotechnical Aspects of Landfill Design and Construction.* New Jersey: Prentice-Hall.

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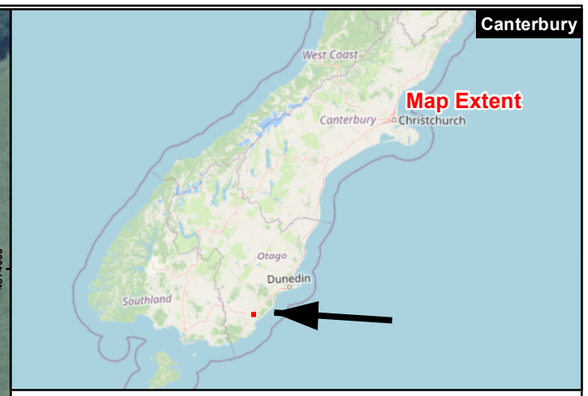
Appendix A

Site Plan



LEGEND

- Proposed New Shallow Groundwater Well
- Proposed Shared Hydro/Geotech Borehole
- Proposed Geotechnical Boreholes
- Existing Groundwater Monitoring Well
- Sediment Pond Monitoring Site
- Surface Water Monitoring Site
- Oxidation Ponds
- Pump Station
- Royds Boreholes (1993)
- Proposed Fill Area Expansion

ISSUED FOR COMMENT

DRAFT

NOTES

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2. Schematic only, not to be interpreted as an engineering design or construction drawing.

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0 50 100
Meters

REFERENCE SCALE: 1:2,200 (at A3)

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

CLIENT
CLUTHA DISTRICT COUNCIL

PROJECT
MT COOEE LANDFILL DEVELOPMENT PLAN

TITLE
MT COOEE PROPOSED DRILLING PLAN

CONSULTANT
wsp

YYYY-MM-DD	2022-07-06
PREPARED	KC

PROJECT NO.	REPORT	REV.	FIGURE
6-CO082.00	N/A	N/A	**01**

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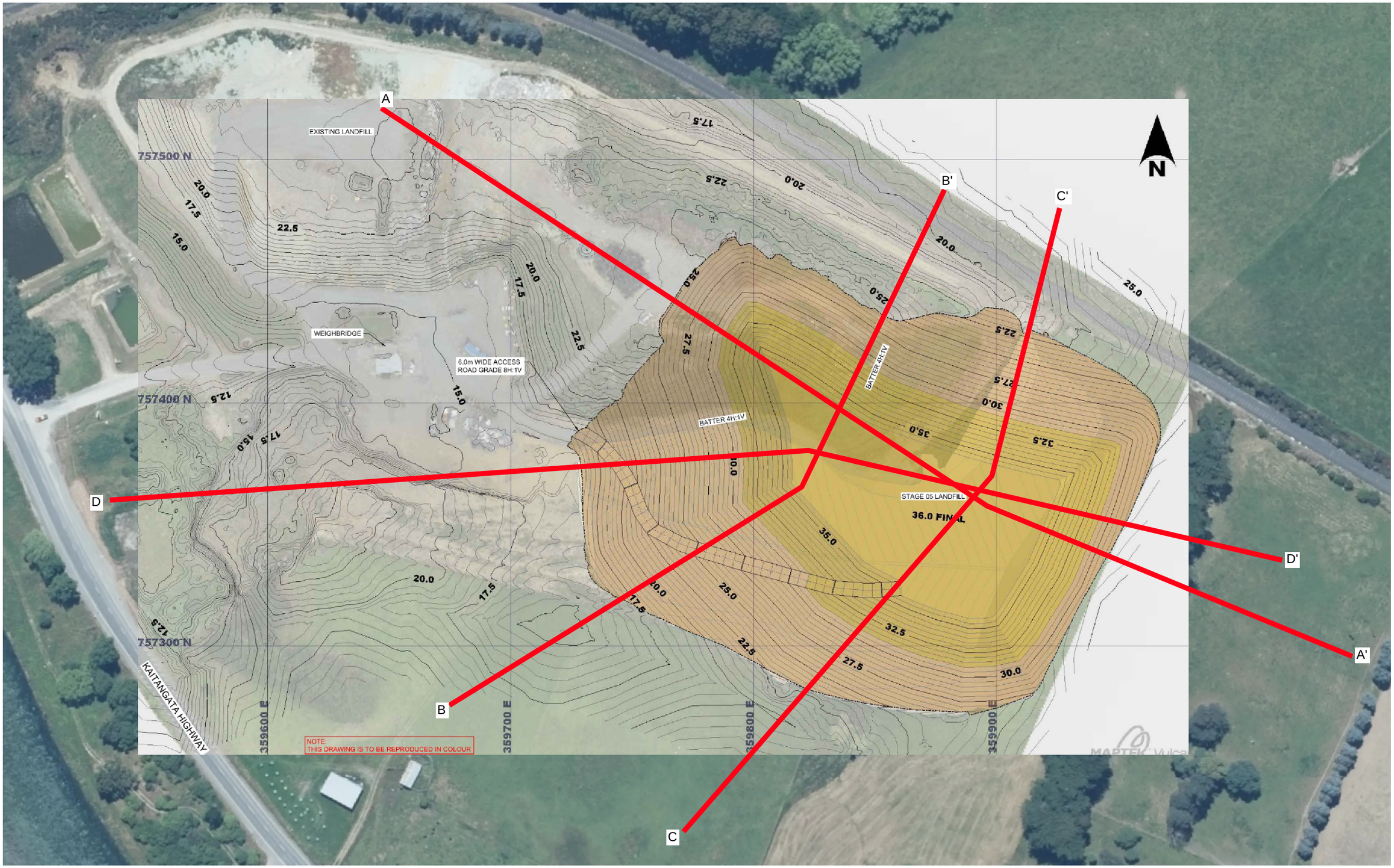
Appendix B

Section Plan



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REVISION	AMENDMENT	APPROVED	DATE

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Invercargill 9840
New Zealand

CIVIL

SCALES

ORIGINAL SIZE A1

DRAWN | DESIGNED | APPROVED

DRAWING VERIFIED | DESIGN VERIFIED | APPROVED DATE

PRELIMINARY

PROJECT
CLUTHA DISTRICT COUNCIL
KAITANGATA HIGHWAY BALCLUTHA
MT COOEE LANDFILL DEVELOPMENT

TITLE
LANDFILL EXPANSION

WSP PROJECT NO. (SUB-PROJECT) 6-CO082.00

SHEET NO.

REVISION A

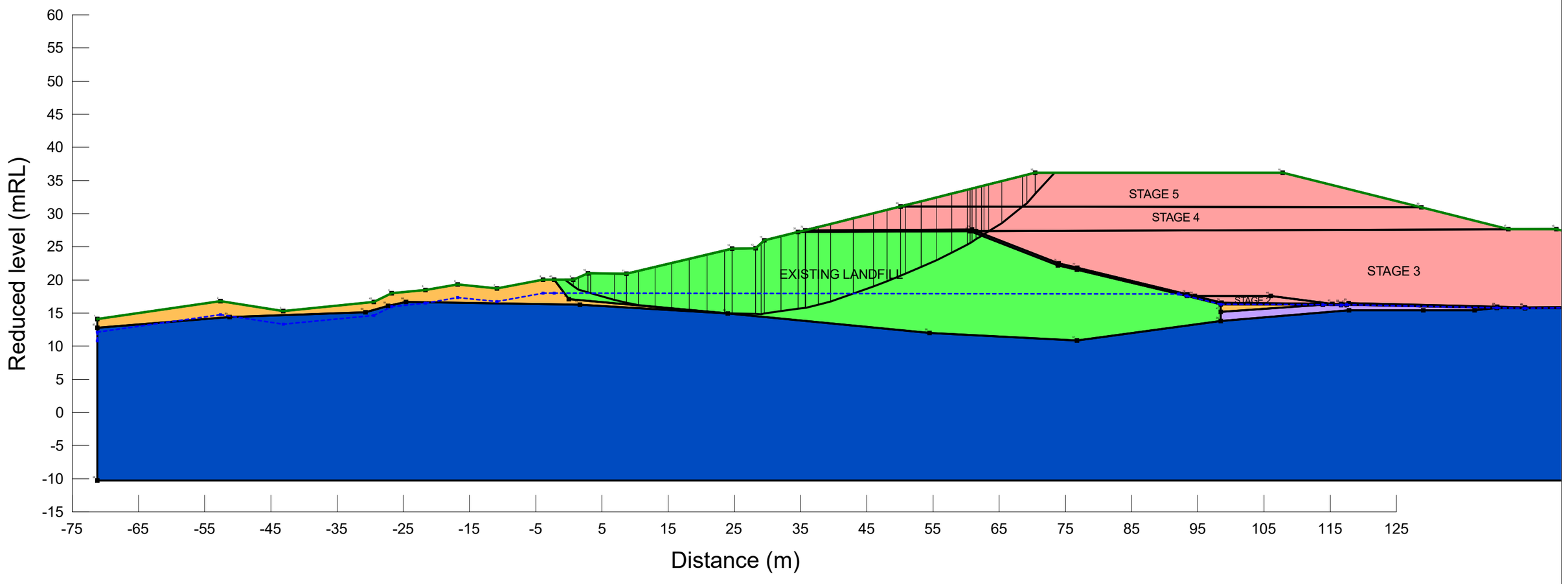
Appendix C

Global Stability Outputs

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



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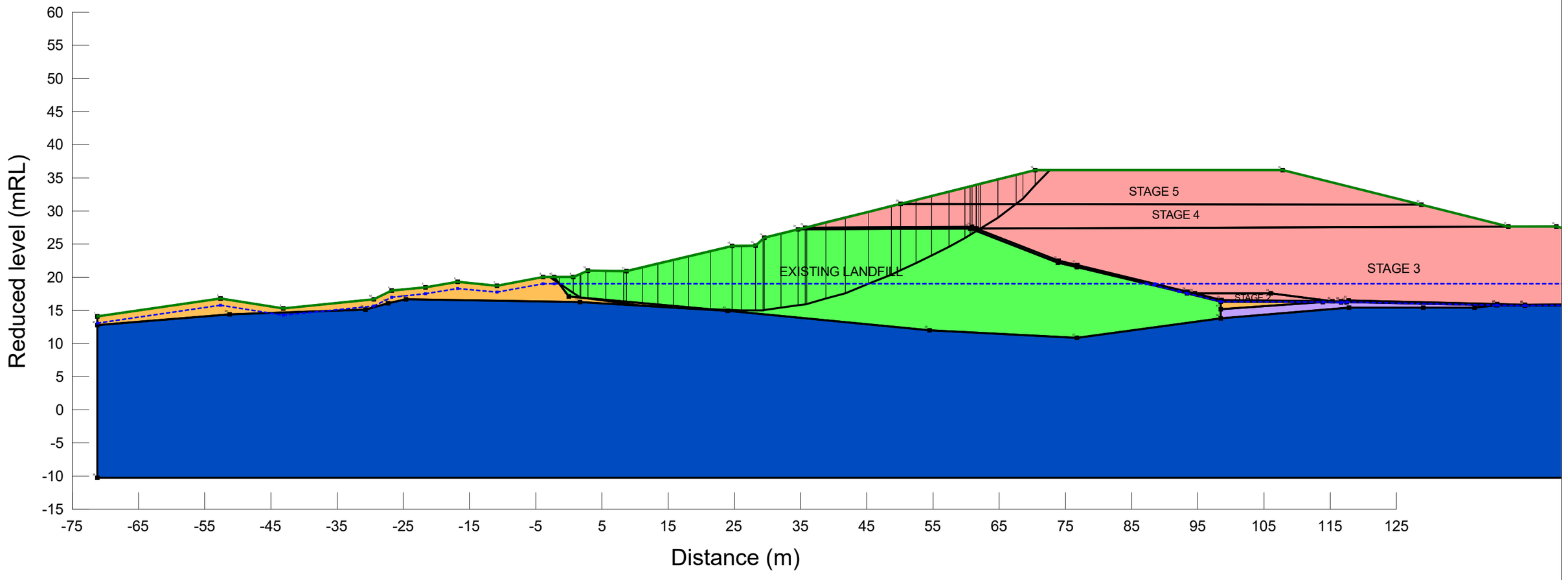
Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

2.1



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Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
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	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
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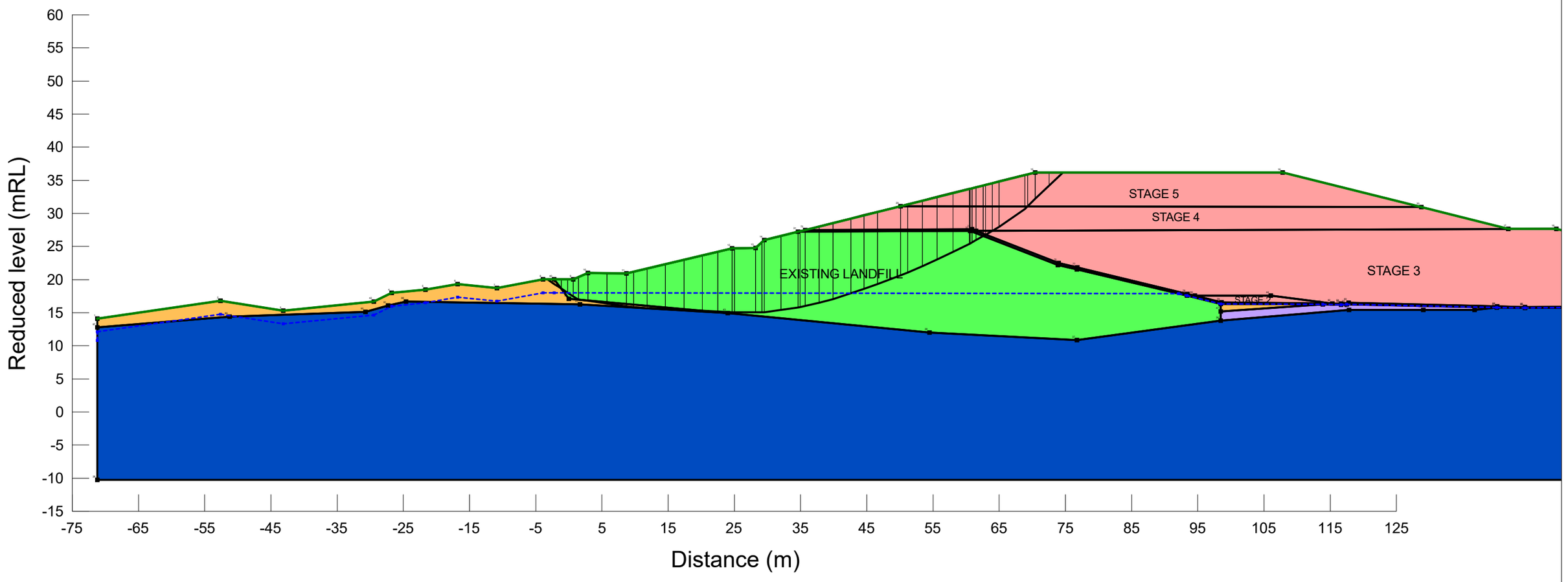

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Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

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	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
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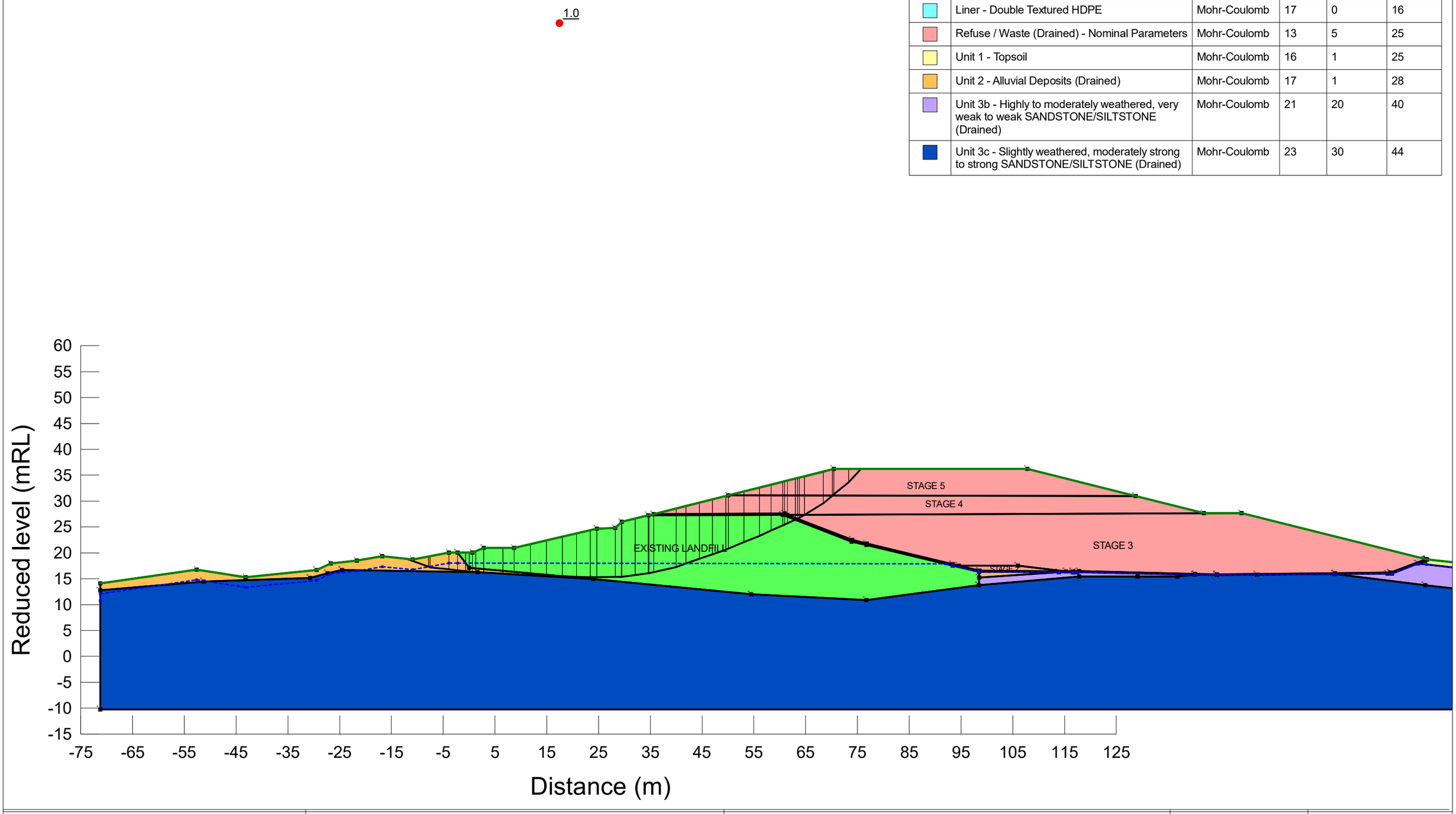
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



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			Scale: 1:700	By: B. HARRISON

Horz Seismic Coef.: 0.27

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
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	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
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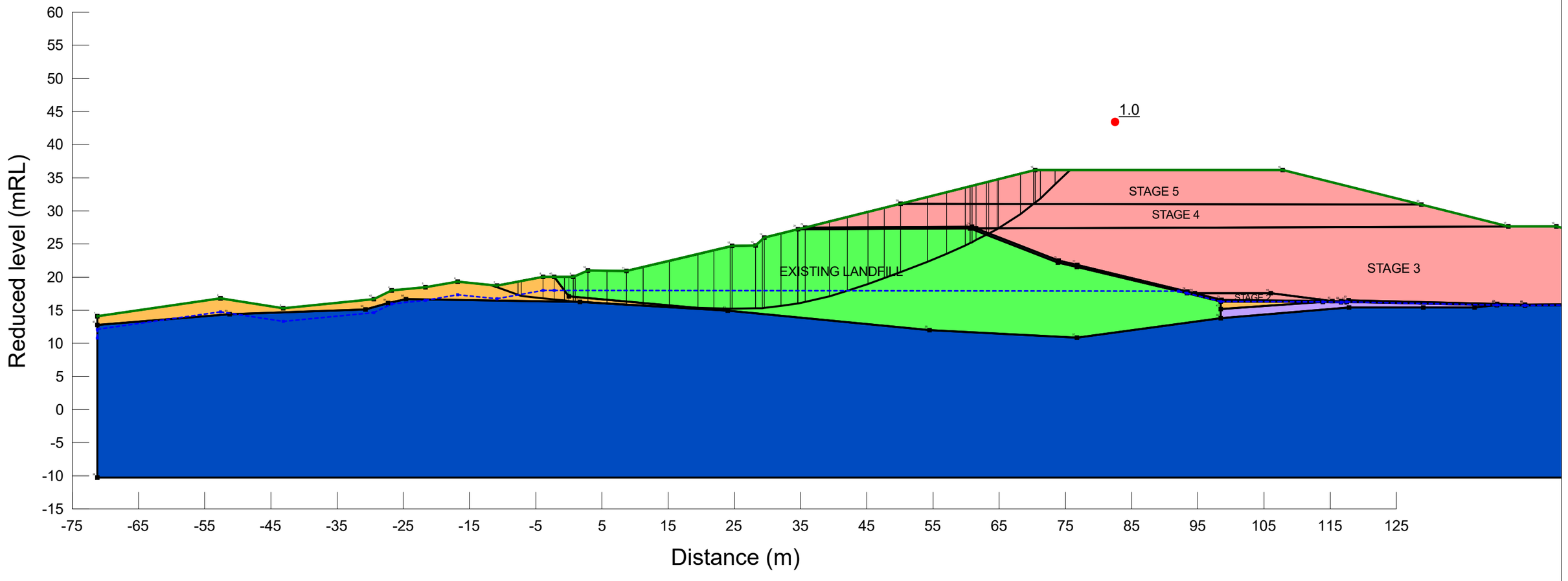

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			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
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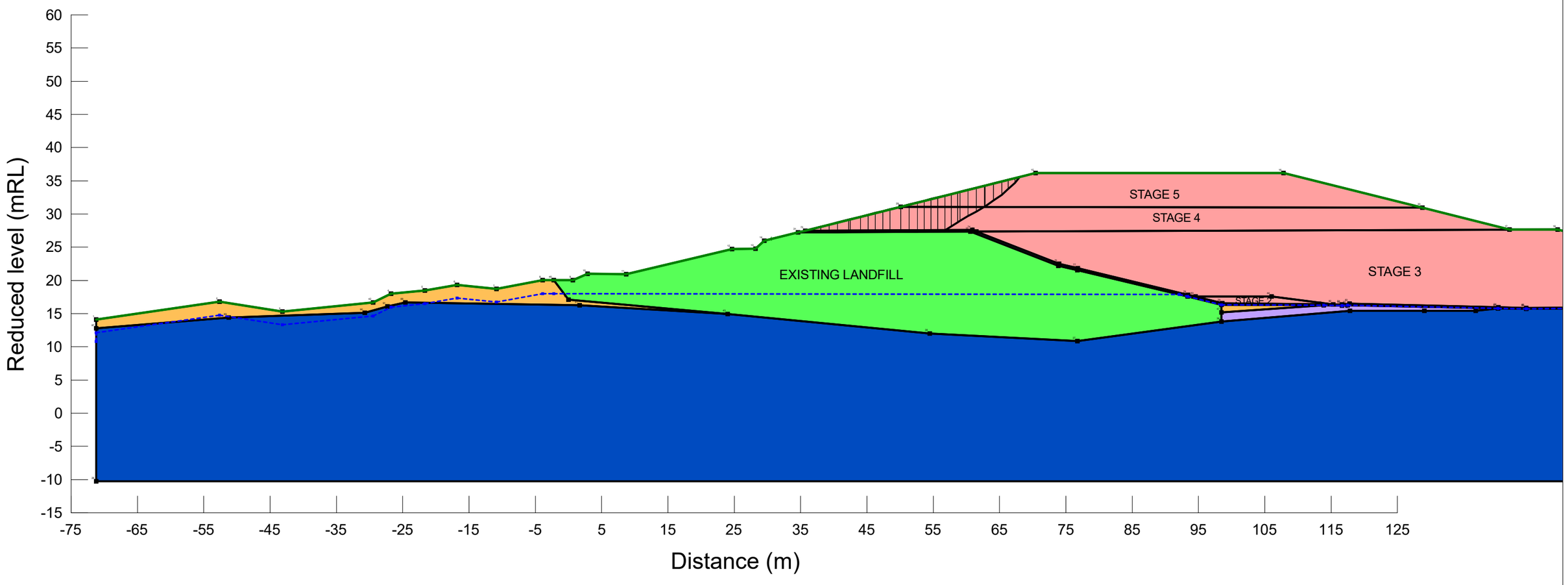
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

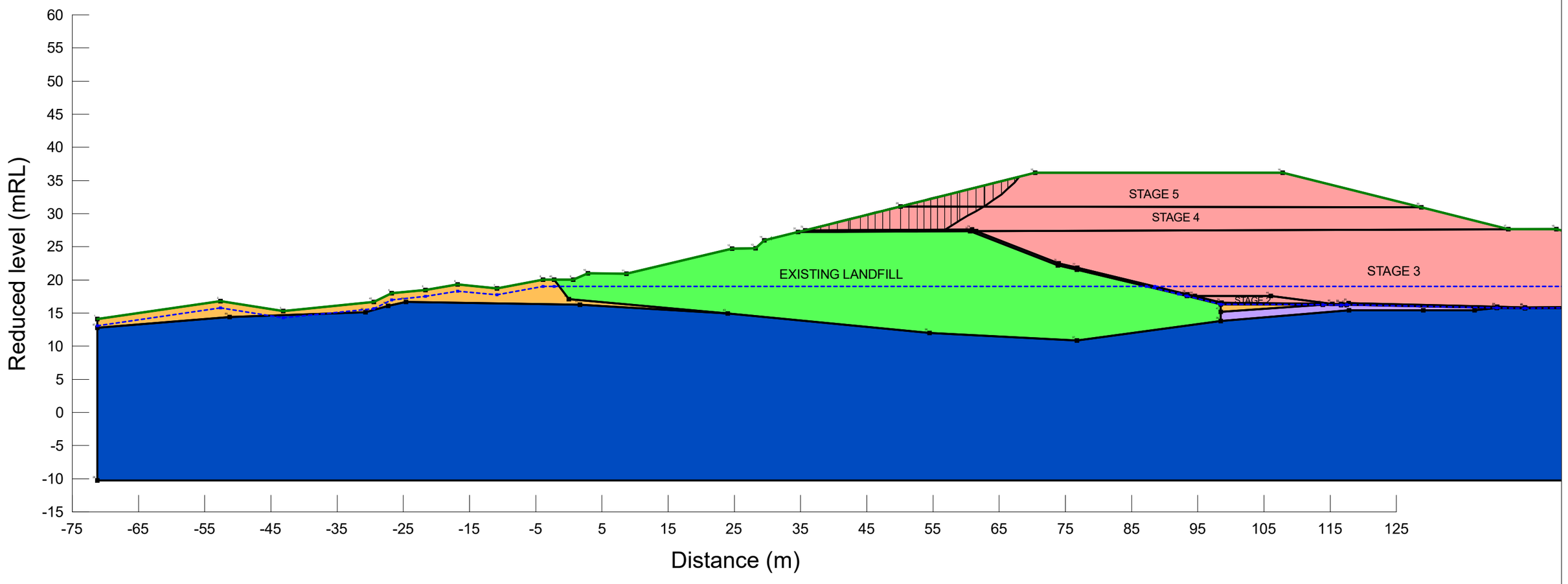


wsp	Mt Cooee Landfill Development Plan	1.0 Section B-B' (Constrained) 1.0.1 Static - Long term (Constrained)	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

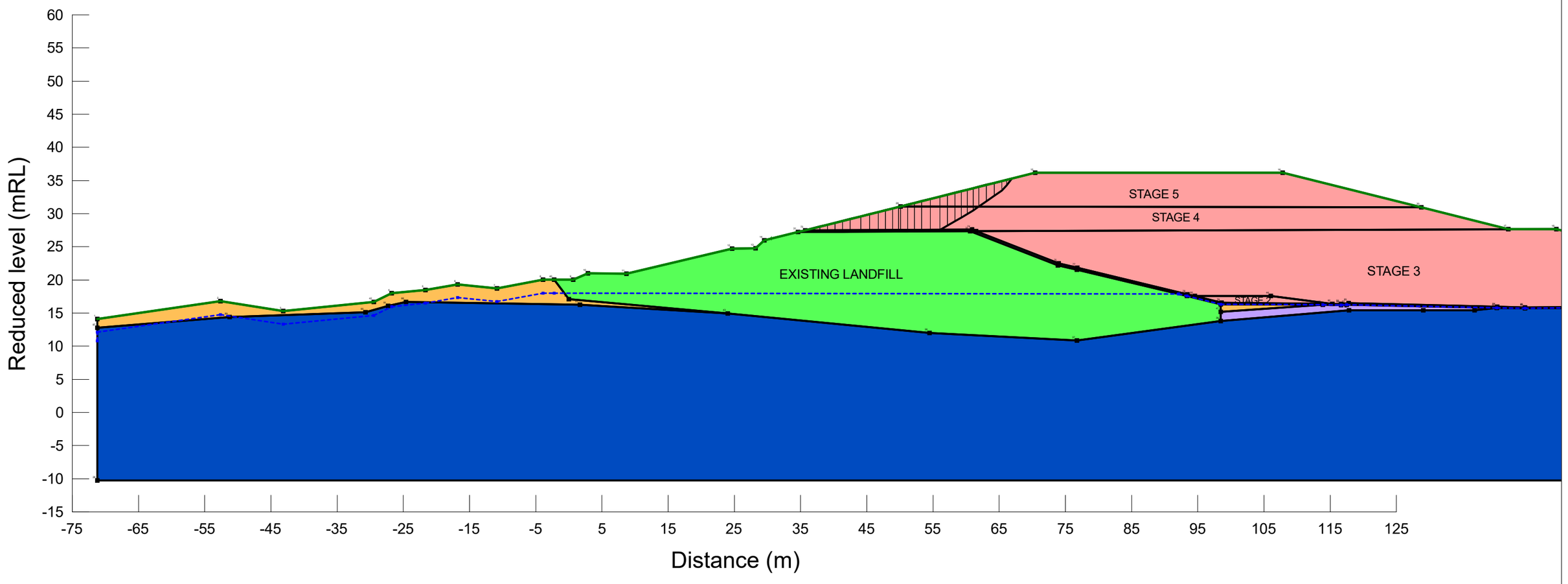


wsp	Mt Cooee Landfill Development Plan	1.0 Section B-B' (Constrained) 1.0.2 Static - HGWL+ Elevated Leachate (Constrained)	6-CO082.00 / Date: 10/05/2024 Scale: 1:600 / By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

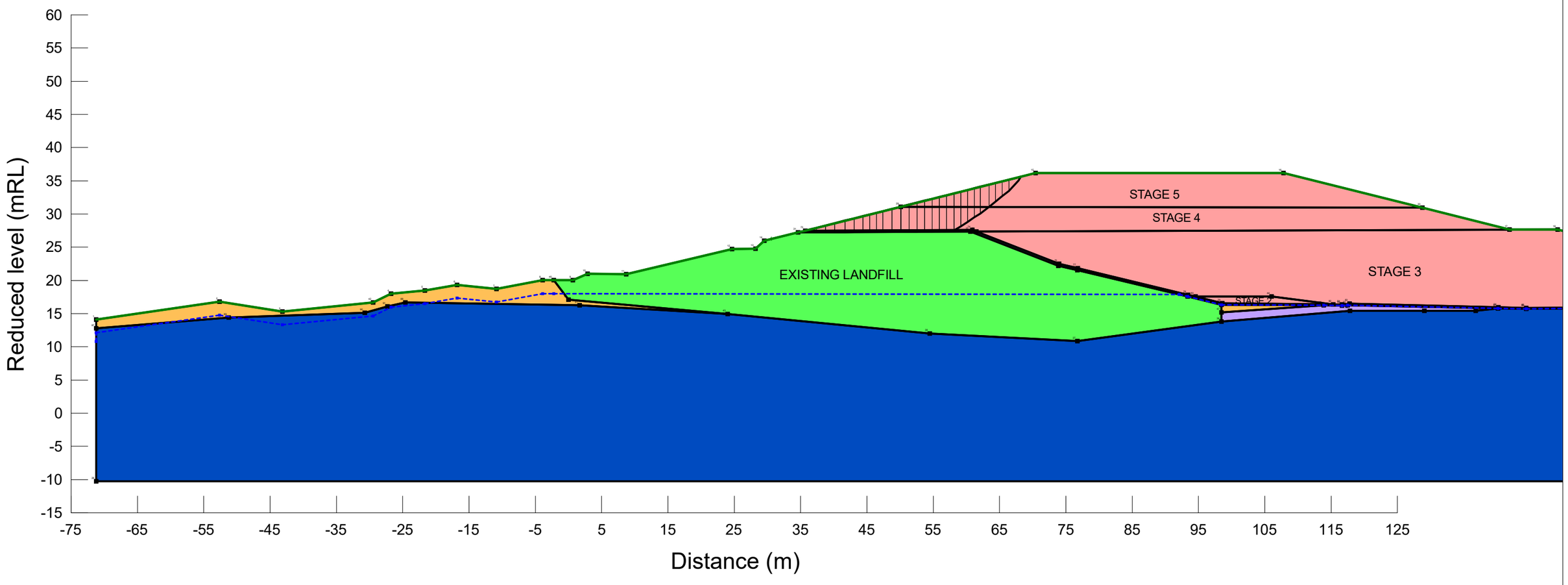


wsp	Mt Cooee Landfill Development Plan	1.0 Section B-B' (Constrained) 1.0.3 Seismic - SLS (1/50yr) MBIE (Constrained)	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

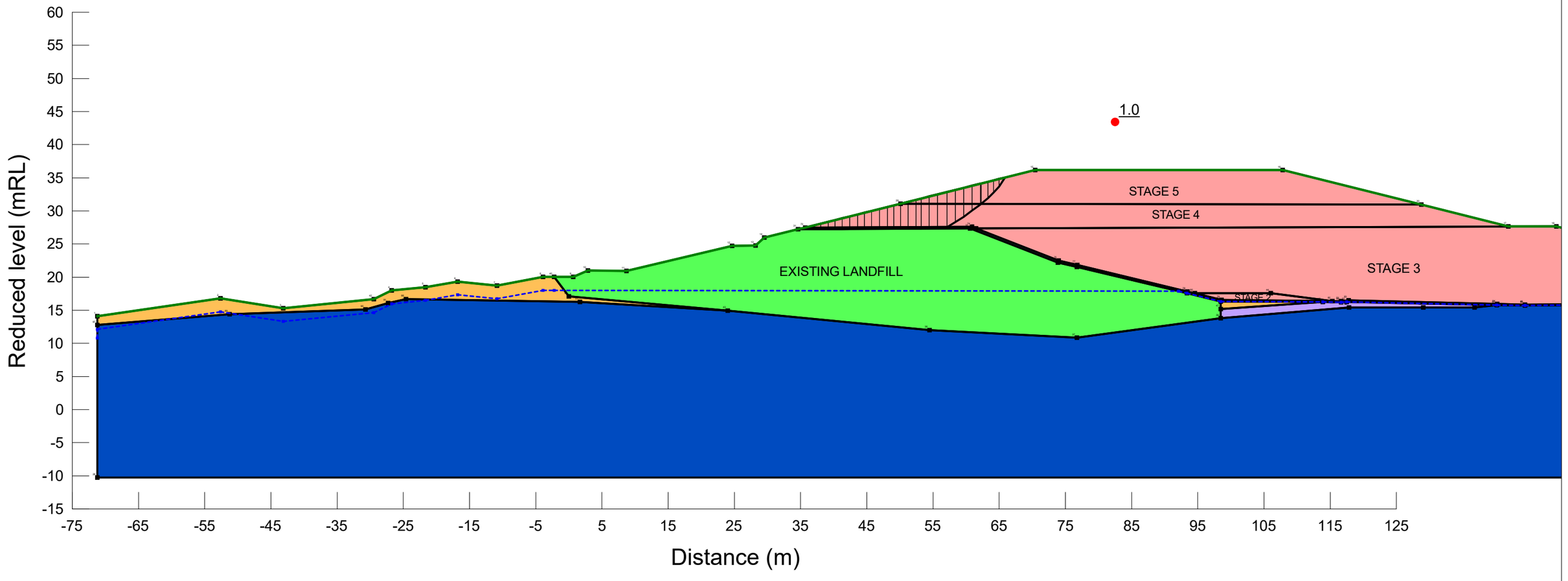


wsp	Mt Cooee Landfill Development Plan	1.0 Section B-B' (Constrained) 1.0.4 Seismic - ULS (1/1000yr) MBIE (Constrained)	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.18

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



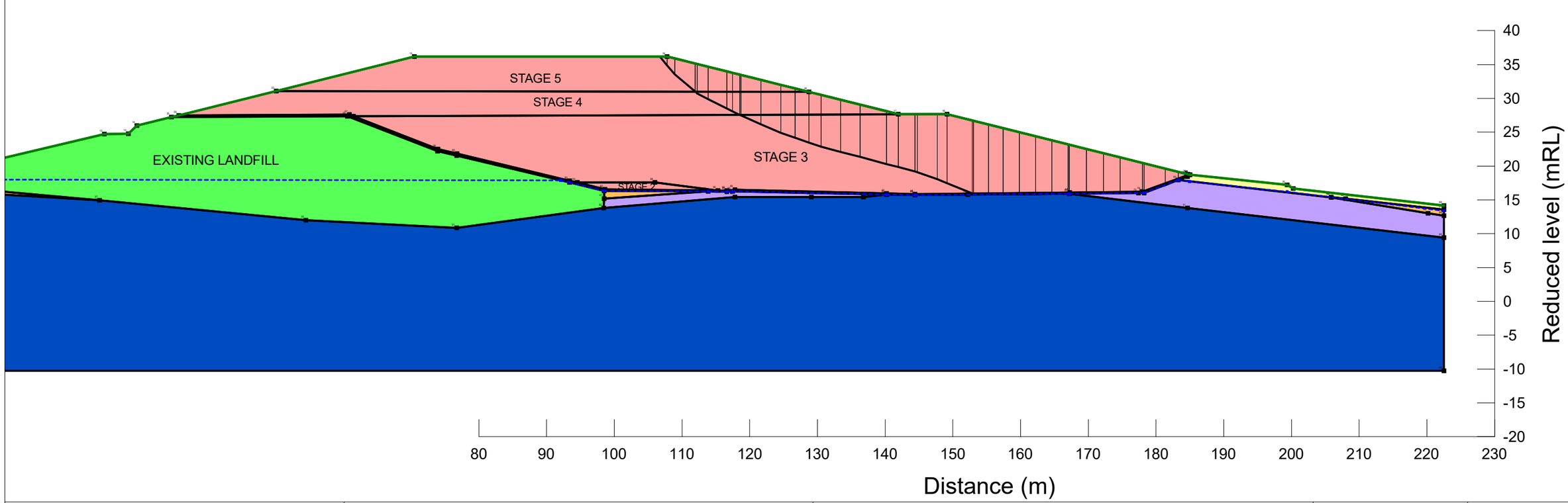
wsp	Mt Cooee Landfill Development Plan	1.0 Section B-B' (Constrained) 1.0.5 Seismic - Yield Acceleration (Constrained)	6-CO082.00 / Date: 10/05/2024 Scale: 1:600 / By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

2.1

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

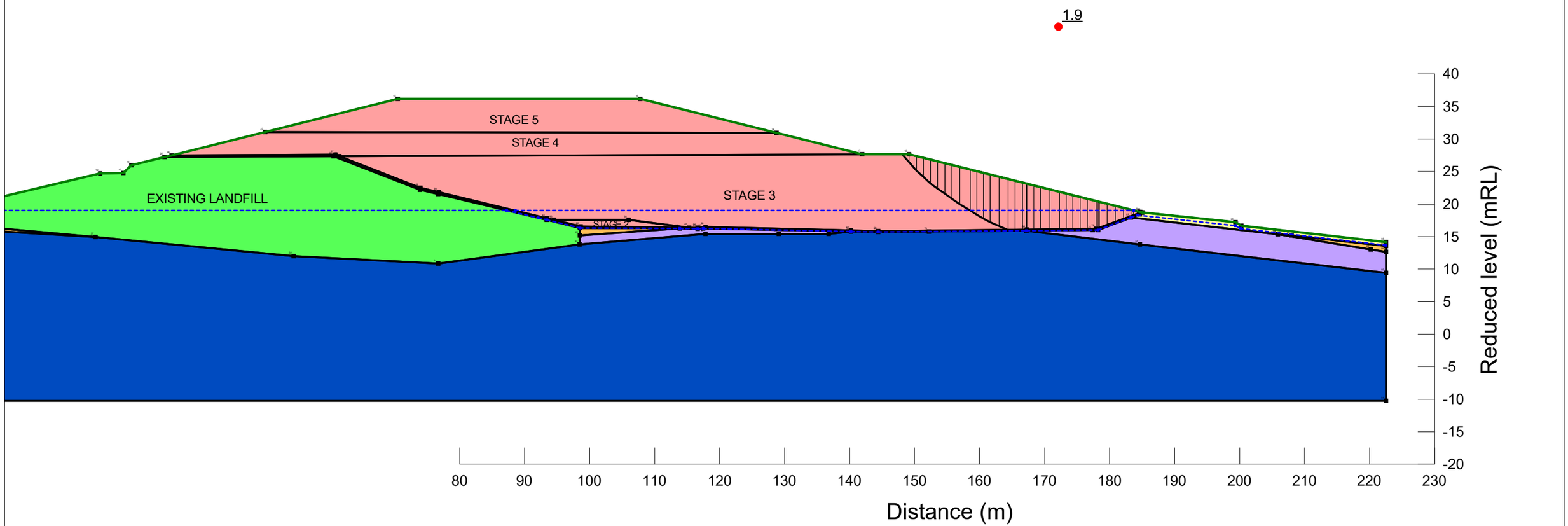


wsp	Mt Cooee Landfill Development Plan	1.1 Section B-B' 1.1.1 Static - Long term	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

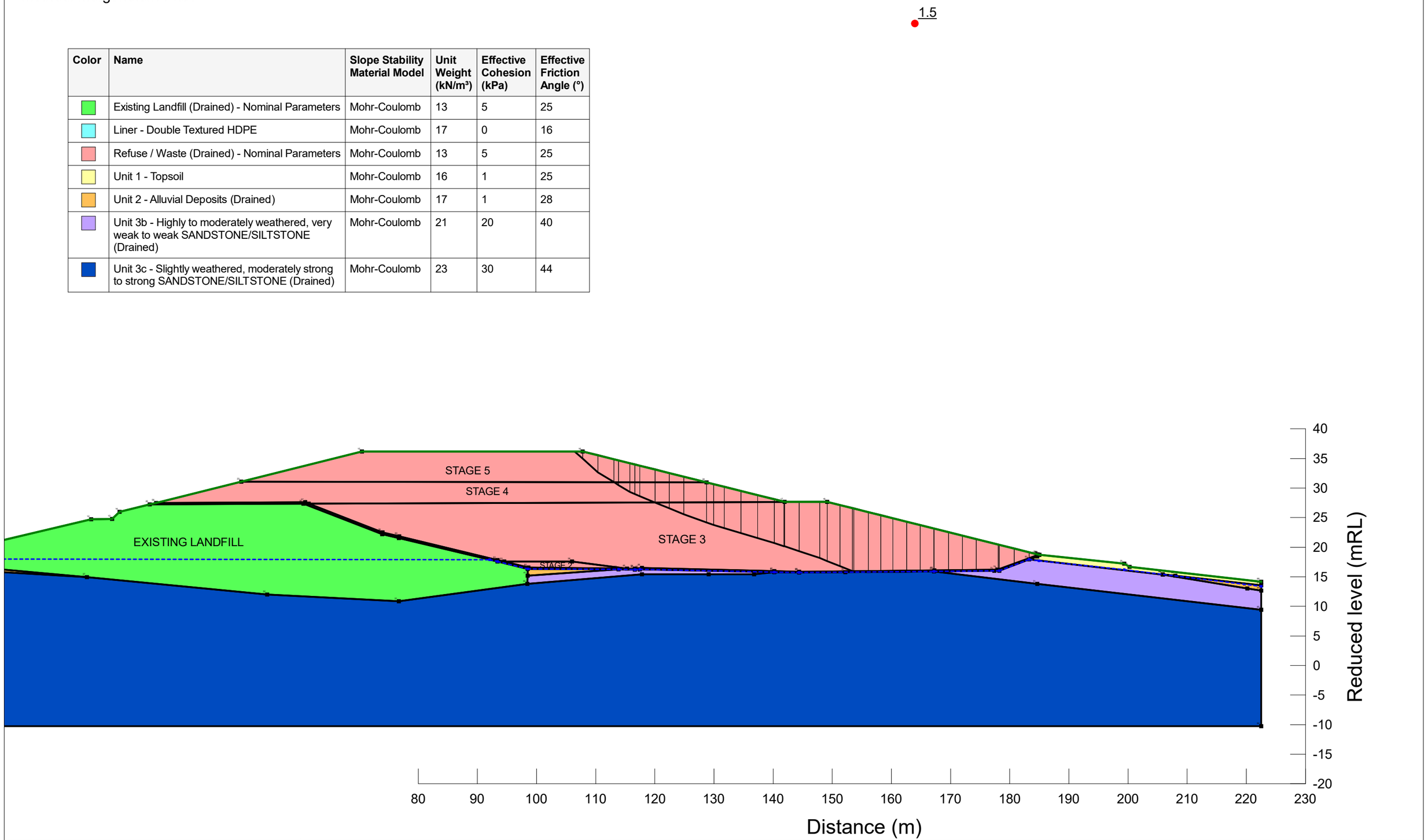


wsp	Mt Cooee Landfill Development Plan	1.1 Section B-B' 1.1.2 Static - HGWL+ Elevated Leachate	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



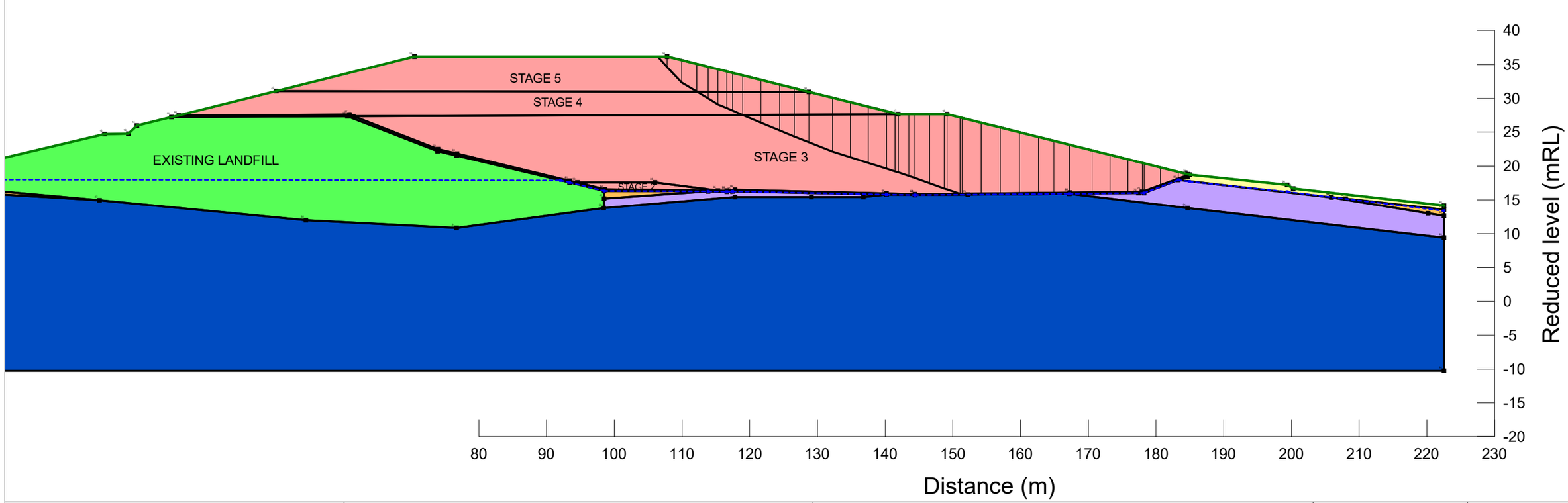
wsp	Mt Cooee Landfill Development Plan	1.1 Section B-B' 1.1.3 Seismic - SLS (1/50yr) MBIE	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

0.8

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

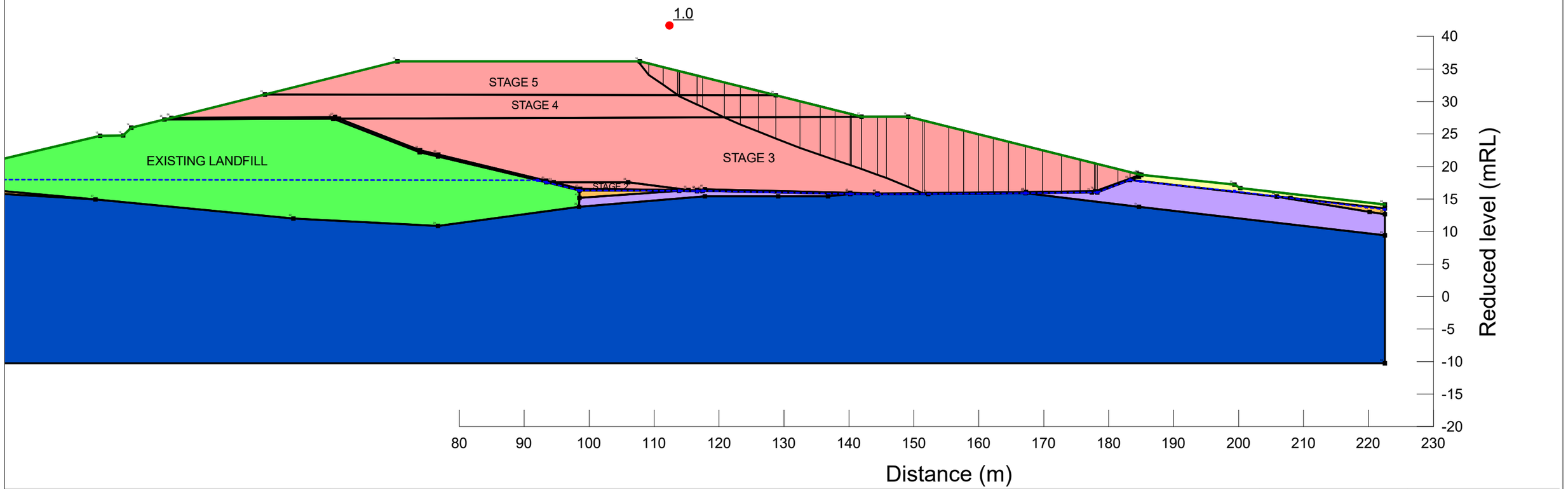


wsp	Mt Cooee Landfill Development Plan	1.1 Section B-B' 1.1.4 Seismic - ULS (1/1000yr) MBIE	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.21

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



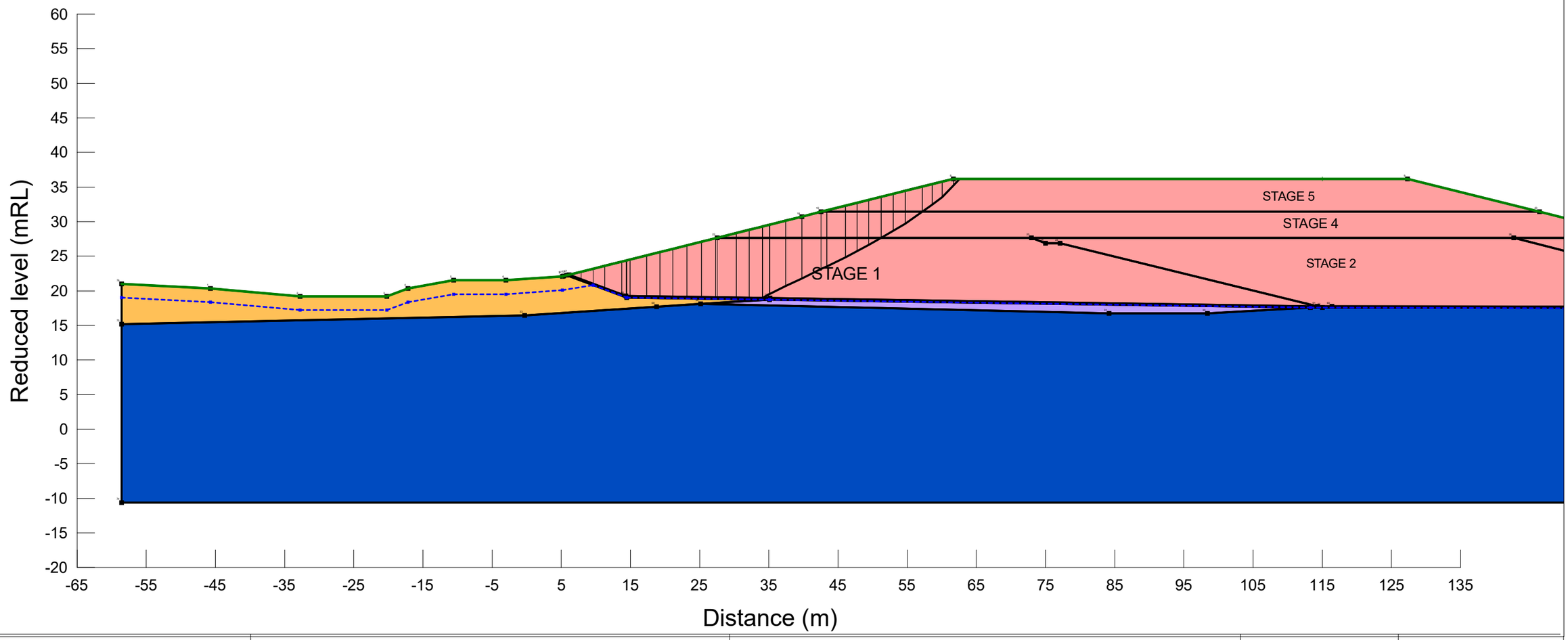
wsp	Mt Cooee Landfill Development Plan	1.1 Section B-B' 1.1.5 Seismic - Yield Acceleration	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.9



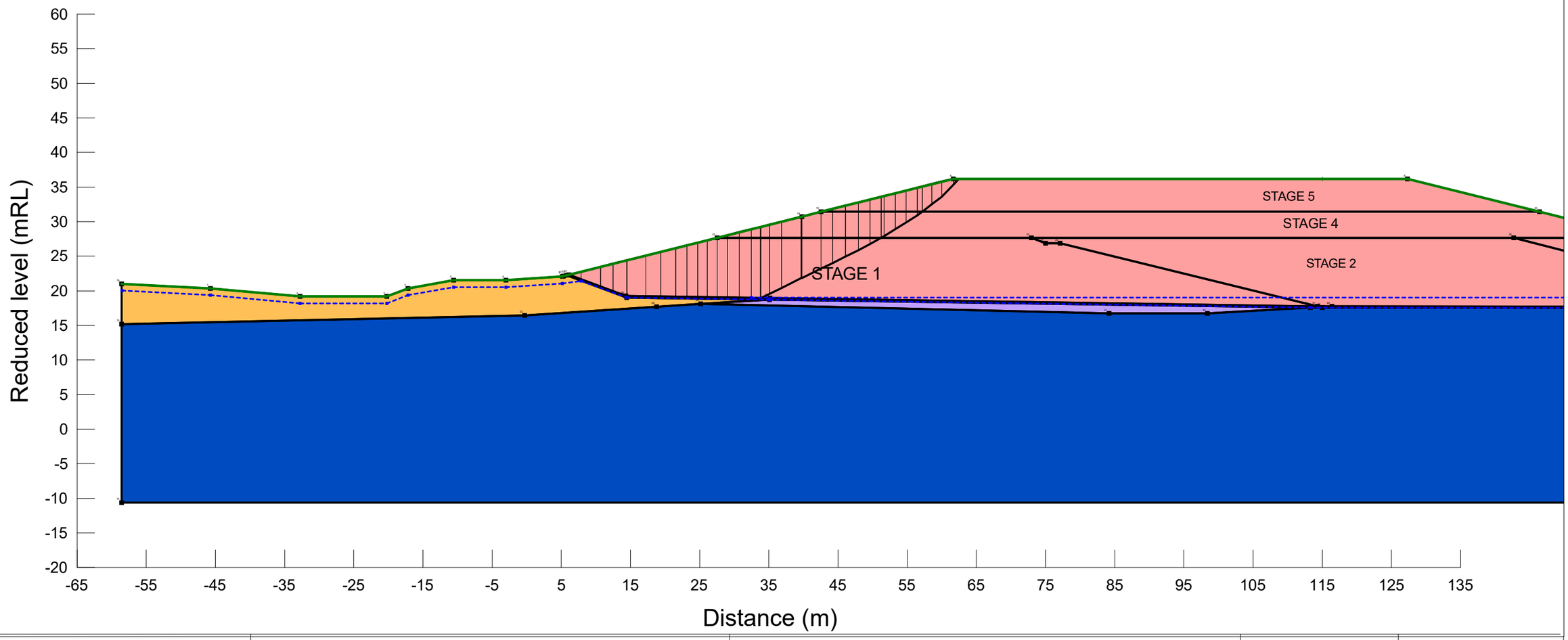
wsp	Mt Cooee Landfill Development Plan	2.0 Section C-C' 2.0.1 Static - Long term	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.9

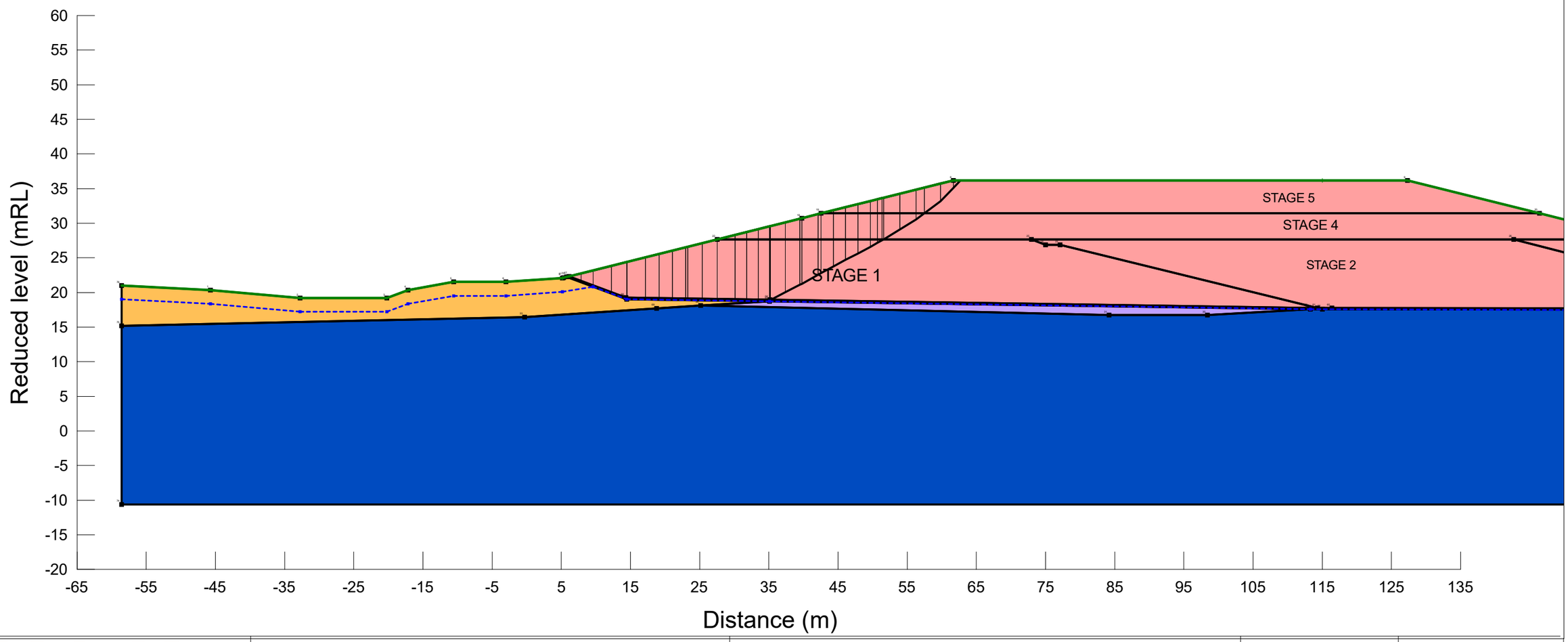


wsp	Mt Cooee Landfill Development Plan	2.0 Section C-C' 2.0.2 Static - HGWL + Elevated Leachate	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



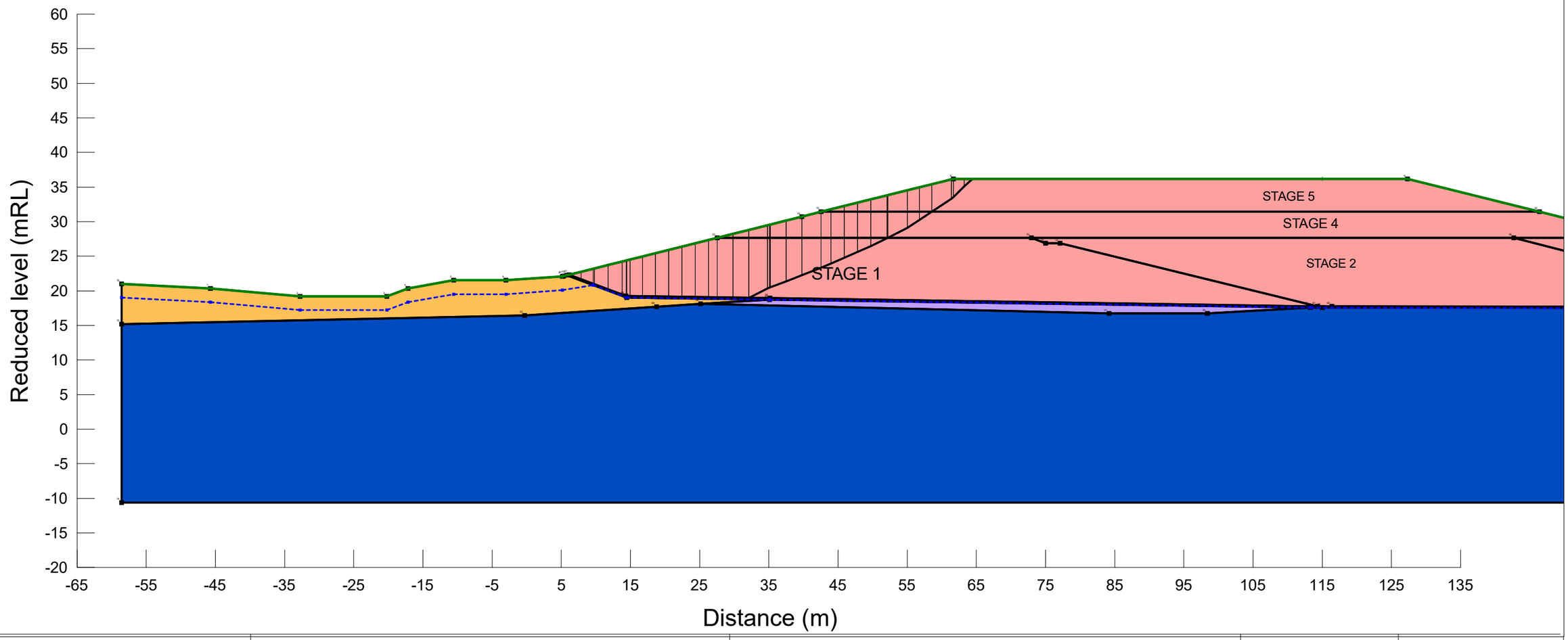
wsp	Mt Cooee Landfill Development Plan	2.0 Section C-C' 2.0.3 Seismic - SLS (1/50yr) MBIE	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

0.8

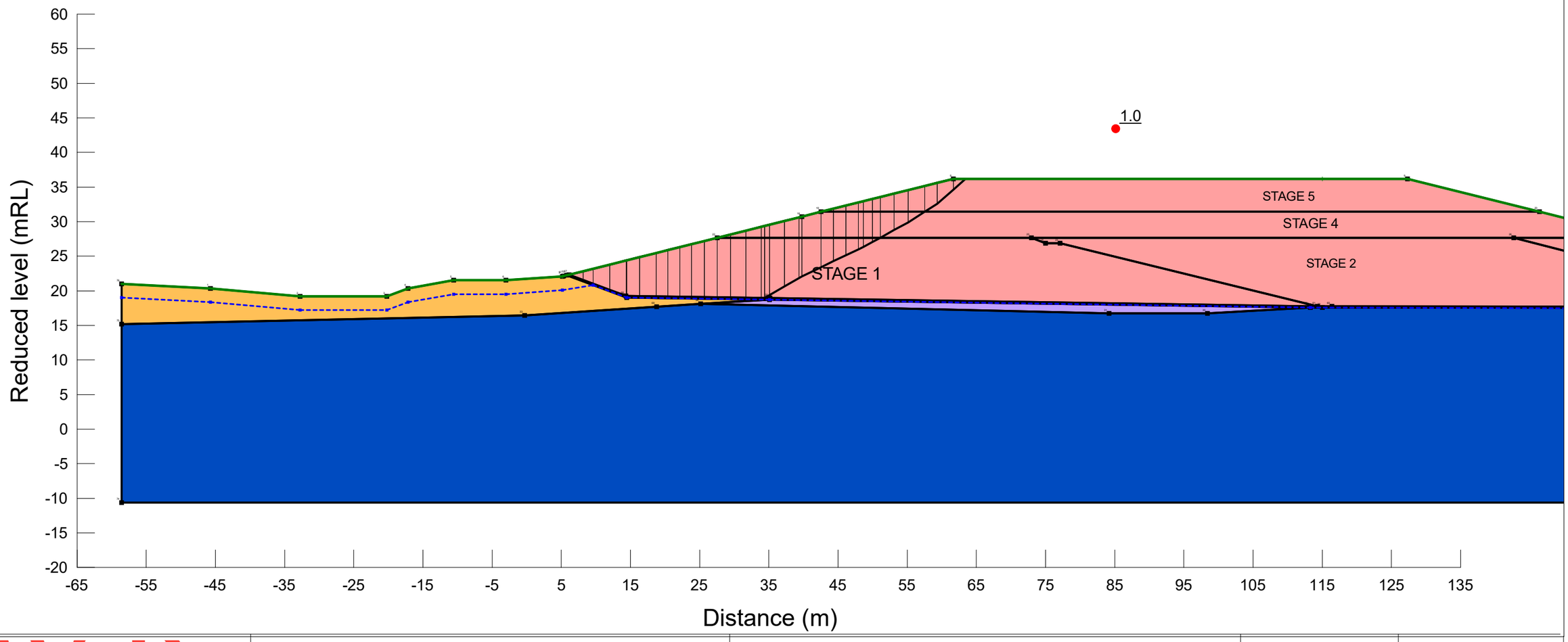


wsp	Mt Cooee Landfill Development Plan	2.0 Section C-C' 2.0.4 Seismic - ULS (1/1000yr) MBIE	6-CO082.00 / Date: 10/05/2024 Scale: 1:600 / By: B. HARRISON

Horz Seismic Coef.: 0.2

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



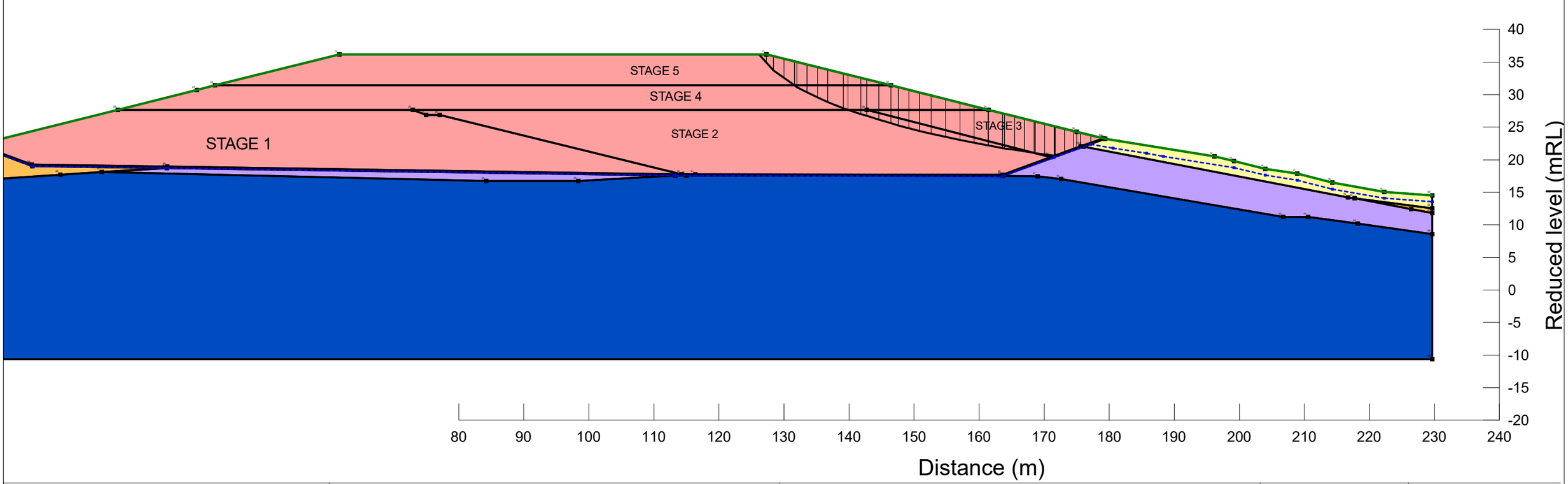
wsp	Mt Cooee Landfill Development Plan	2.0 Section C-C' 2.0.5 Seismic - Yield Acceleration	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

2.3



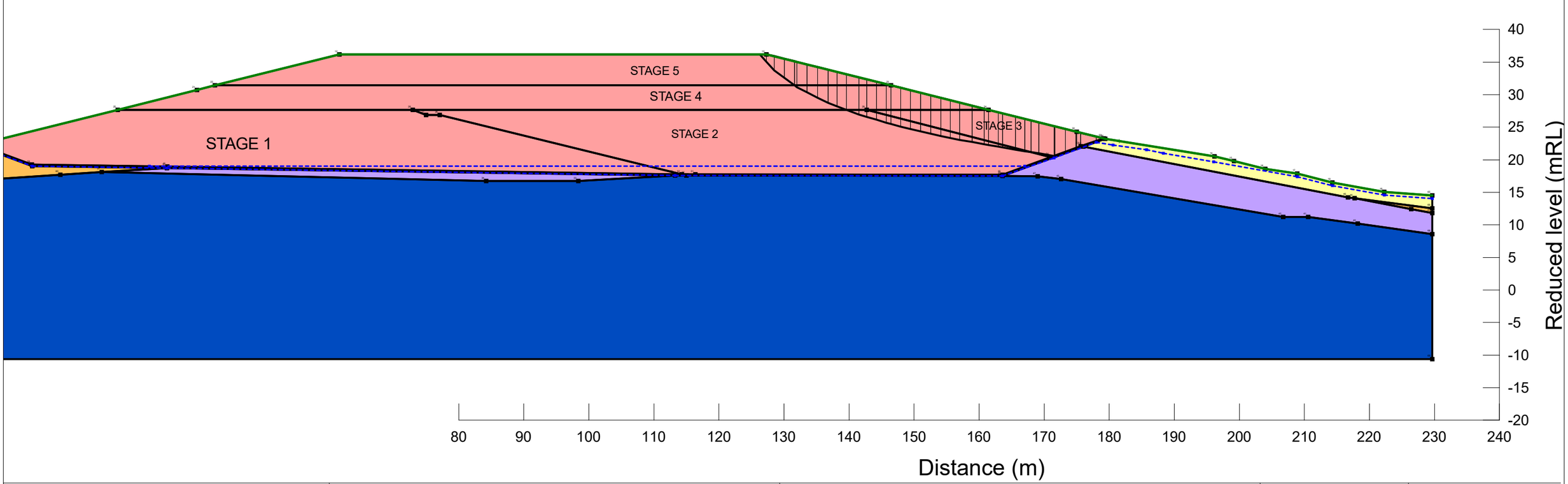
wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' 2.1.1 Static - Long term	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

2.3



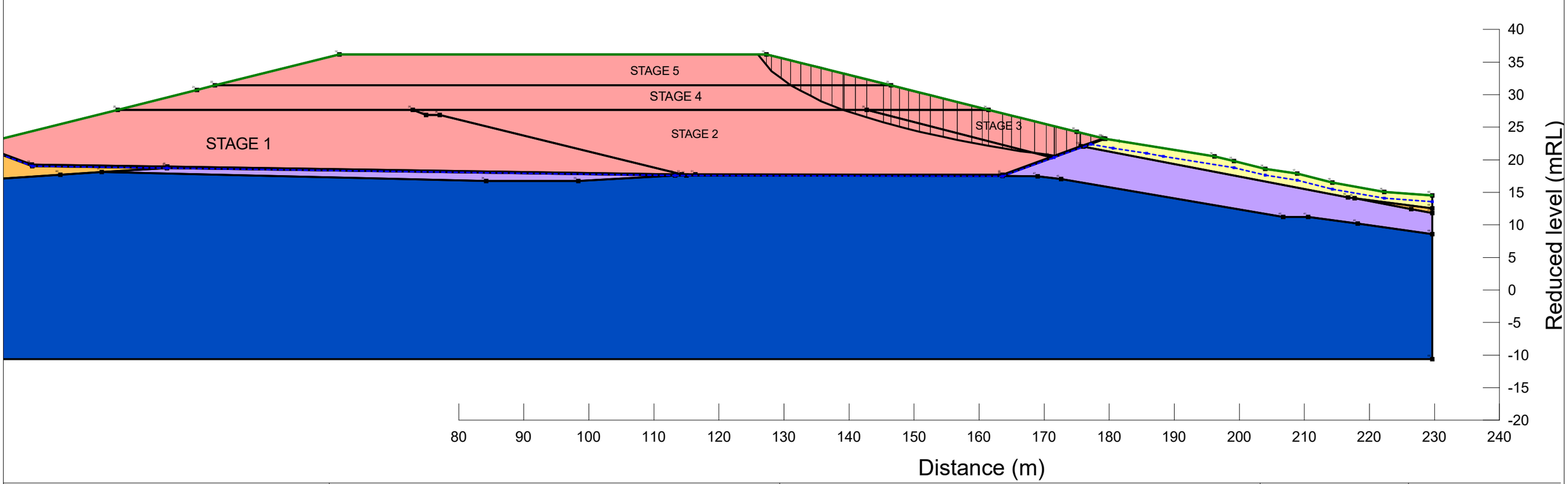
wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' 2.1.2 Static - HGWL + Elevated Leachate	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.7



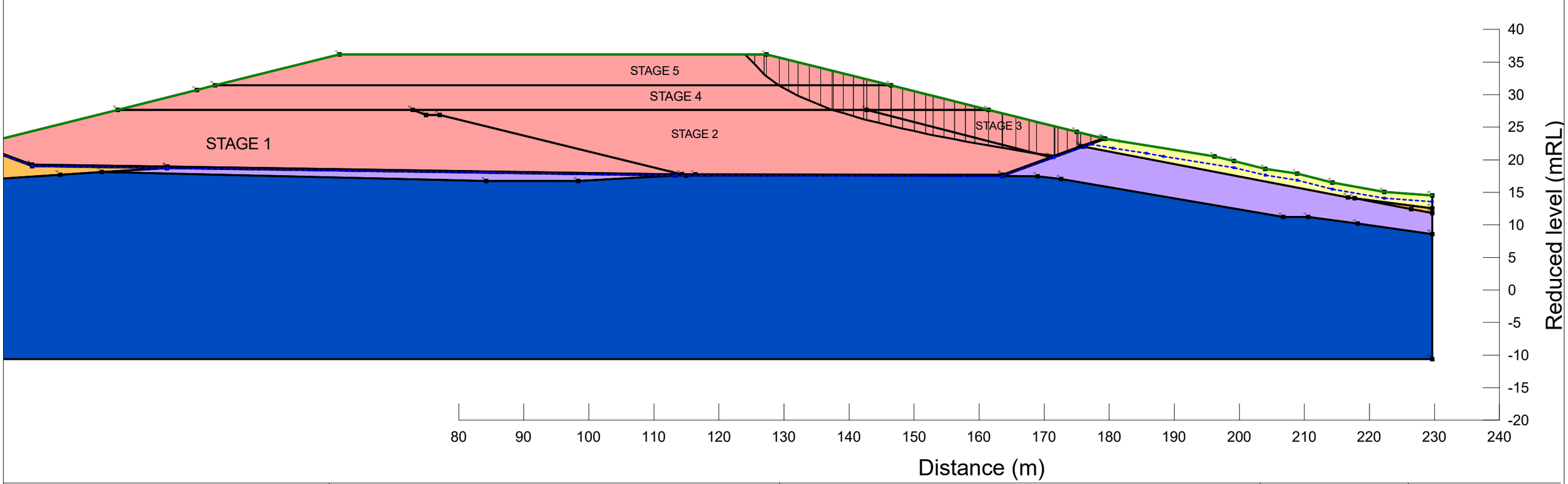
wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' 2.1.3 Seismic - SLS (1/50yr) MBIE	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.0

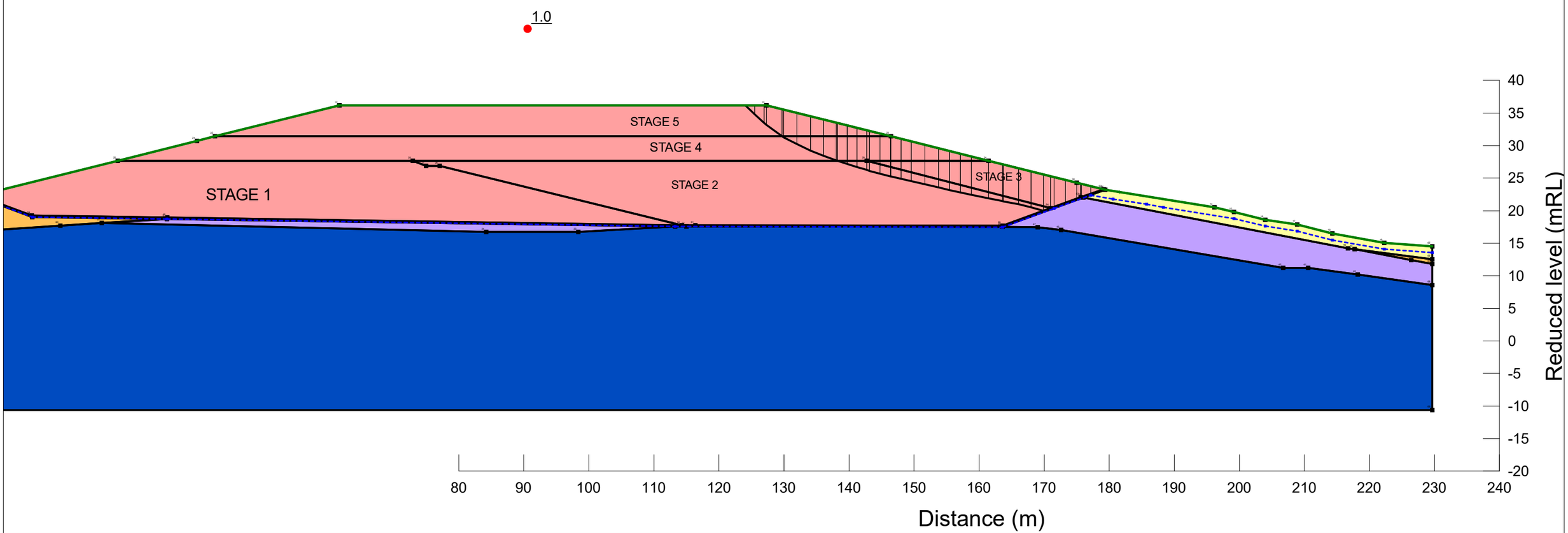


wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' 2.1.4 Seismic - ULS (1/1000yr) MBIE	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.3

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



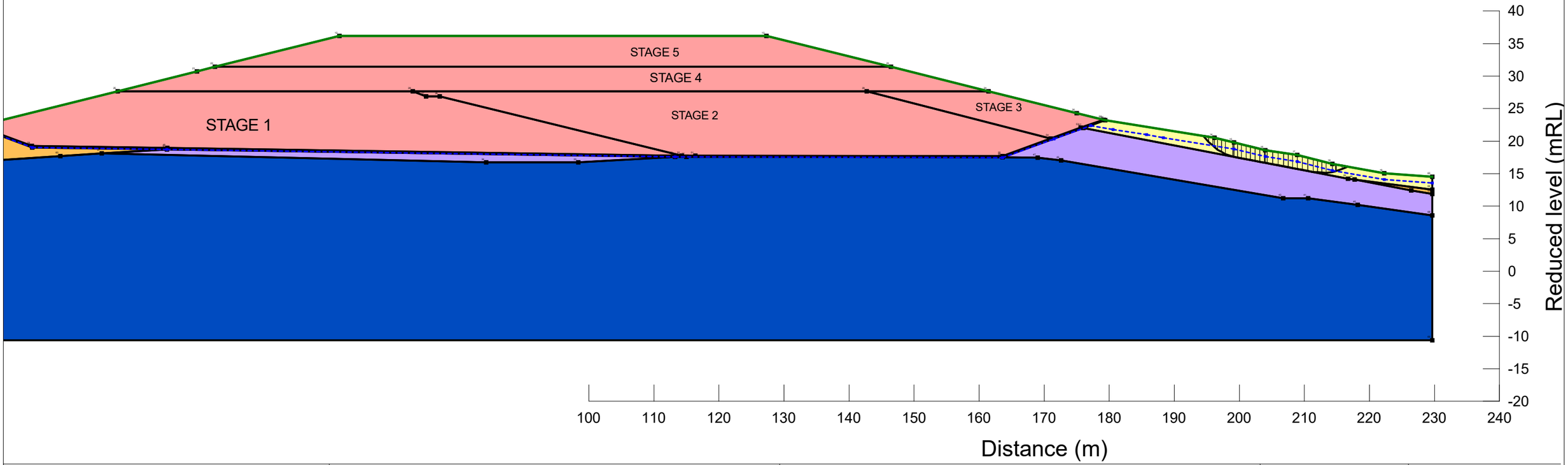
wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' 2.1.5 Seismic - Yield Acceleration	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.9



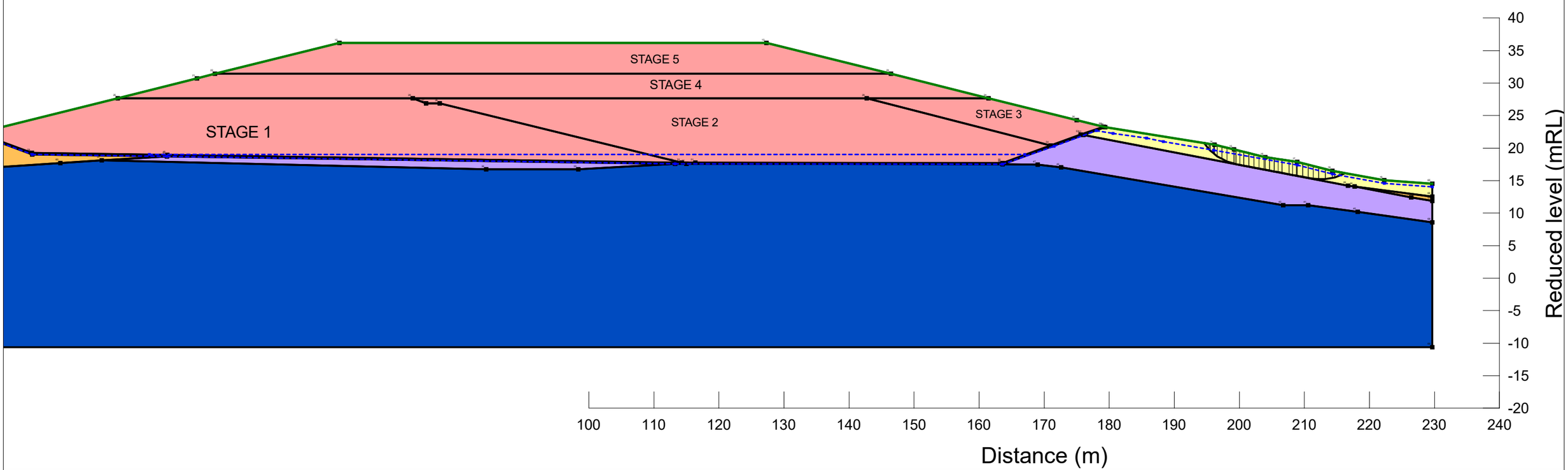
wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' (Lower Slope) 2.1.1 Static - Long term (Lower Slope)	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.5



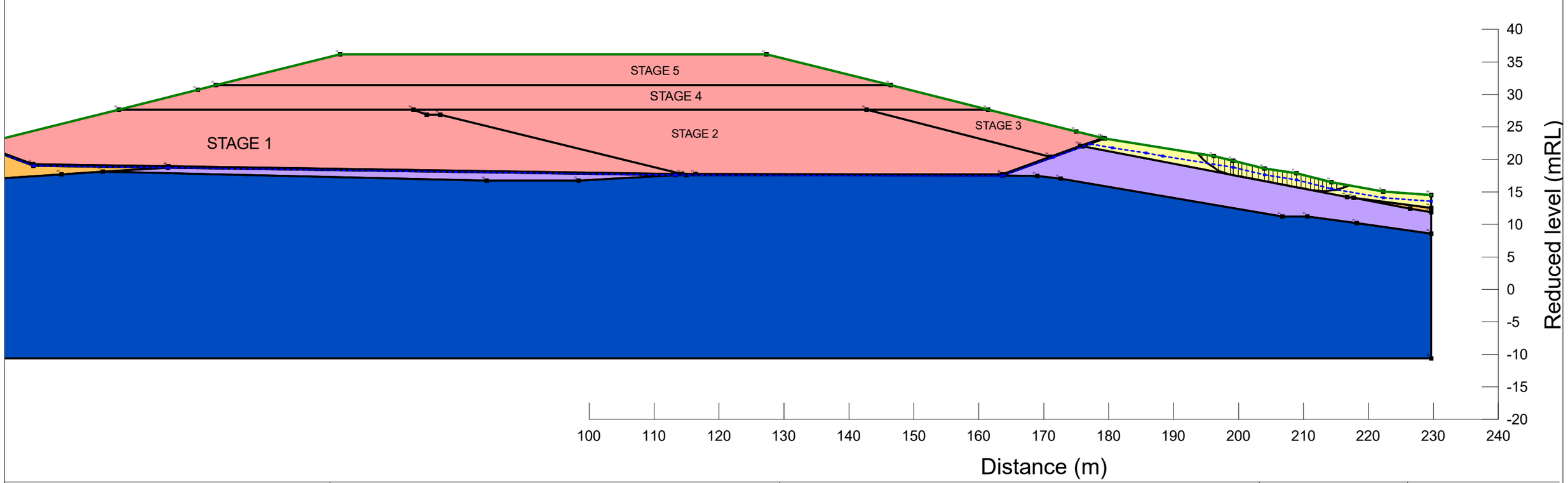
wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' (Lower Slope) 2.1.2 Static - HGWL + Elevated Leachate (Lower Slope)	6-CO082.00 Scale: 1:600	Date: 10/05/2024 By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.3



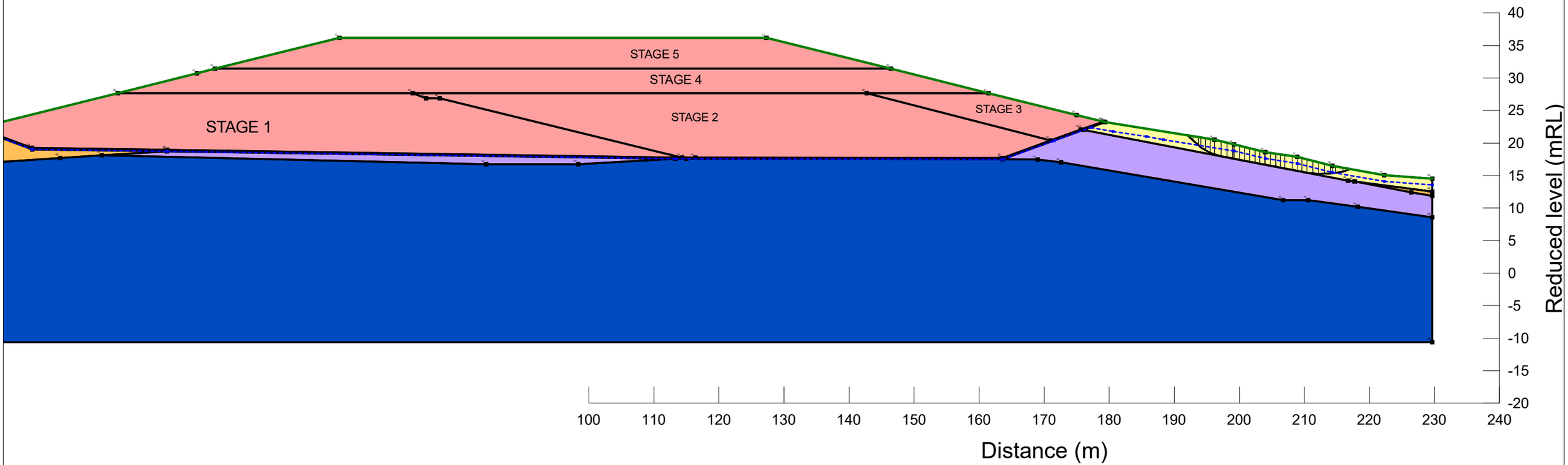
wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' (Lower Slope) 2.1.3 Seismic - SLS (1/50yr) MBIE (Lower Slope)	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

0.7

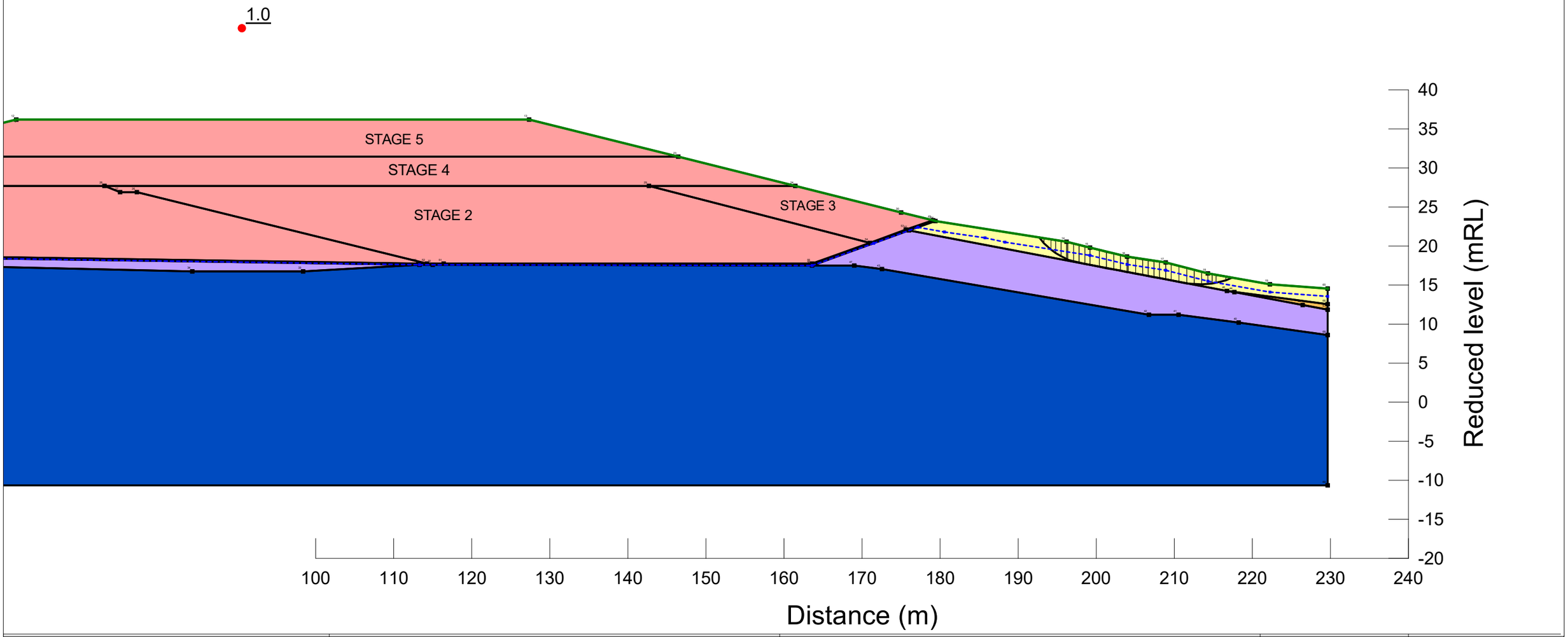


wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' (Lower Slope) 2.1.4 Seismic - ULS (1/1000yr) MBIE (Lower Slope)	6-CO082.00	Date: 10/05/2024
			Scale: 1:600	By: B. HARRISON

Horz Seismic Coef.: 0.16

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



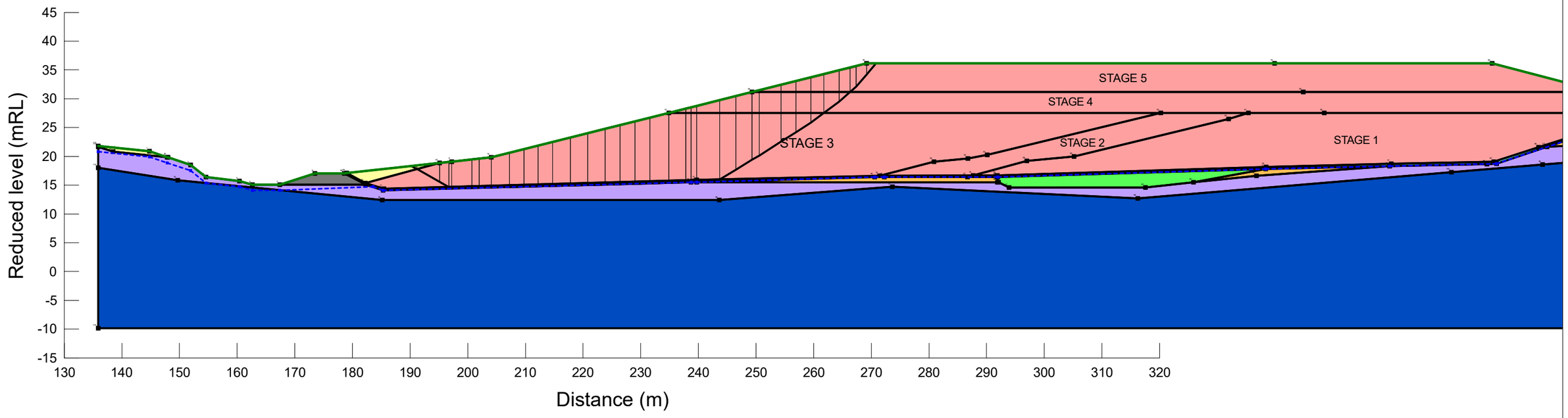
wsp	Mt Cooee Landfill Development Plan	2.1 Section C-C' (Lower Slope) 2.1.5 Seismic - Yield Acceleration (Lower Slope)	6-CO082.00	Date: 10/05/2024
			Scale: 1:500	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Structural Fill	Mohr-Coulomb	19	0	36
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.9



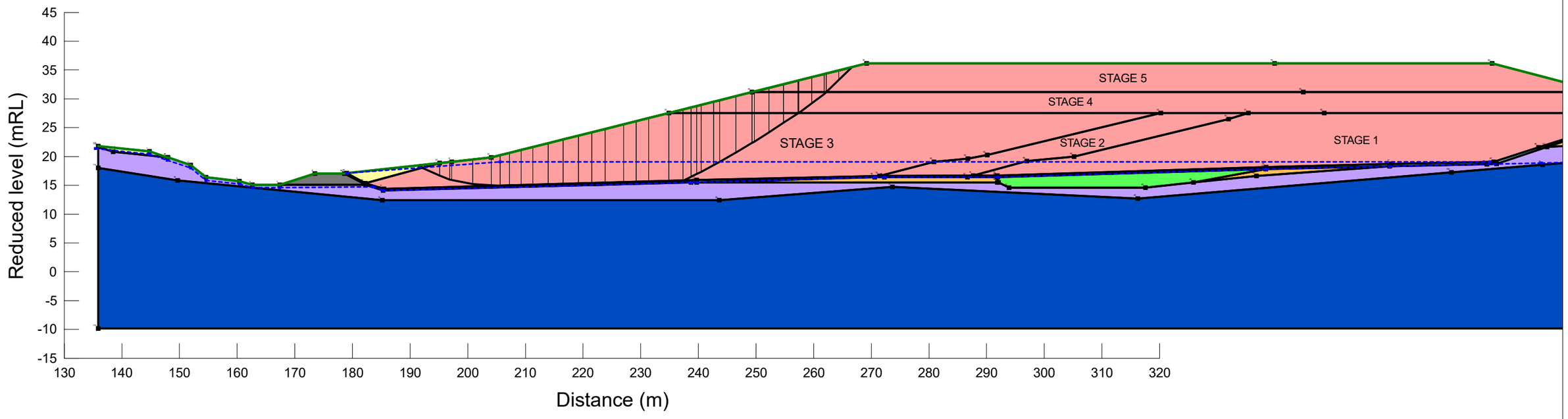
wsp	Mt Cooee Landfill Development Plan	3.0 Section D-D' 3.0.1 Static - Long term	6-CO082.00	Date: 10/05/2024
			Scale: 1:700	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Structural Fill	Mohr-Coulomb	19	0	36
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.8



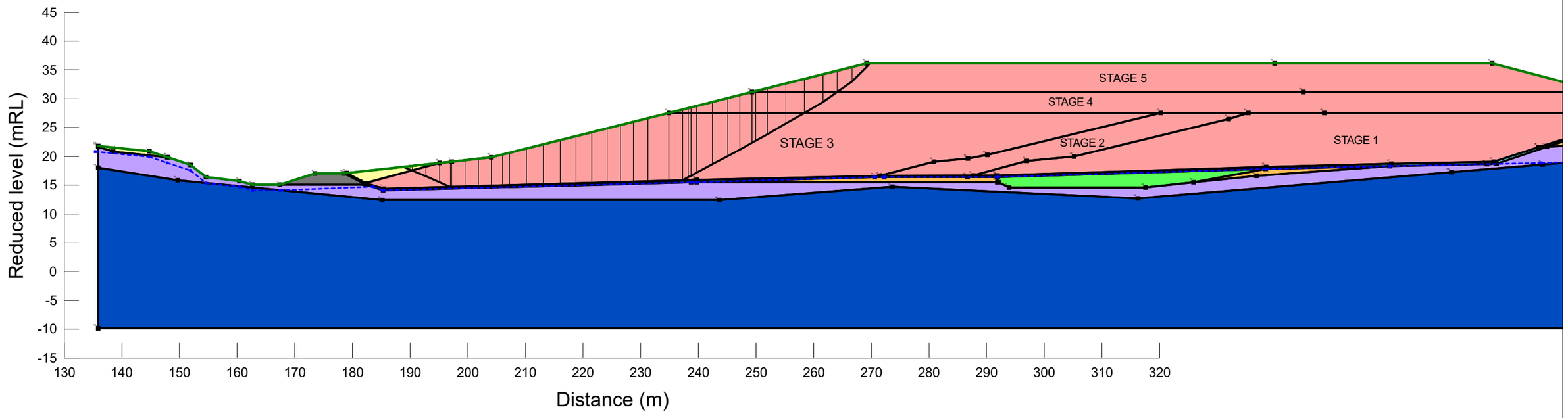
wsp	Mt Cooee Landfill Development Plan	3.0 Section D-D' 3.0.2 Static - HGWL + Elevated Leachate	6-CO082.00	Date: 10/05/2024
			Scale: 1:700	By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Structural Fill	Mohr-Coulomb	19	0	36
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.4



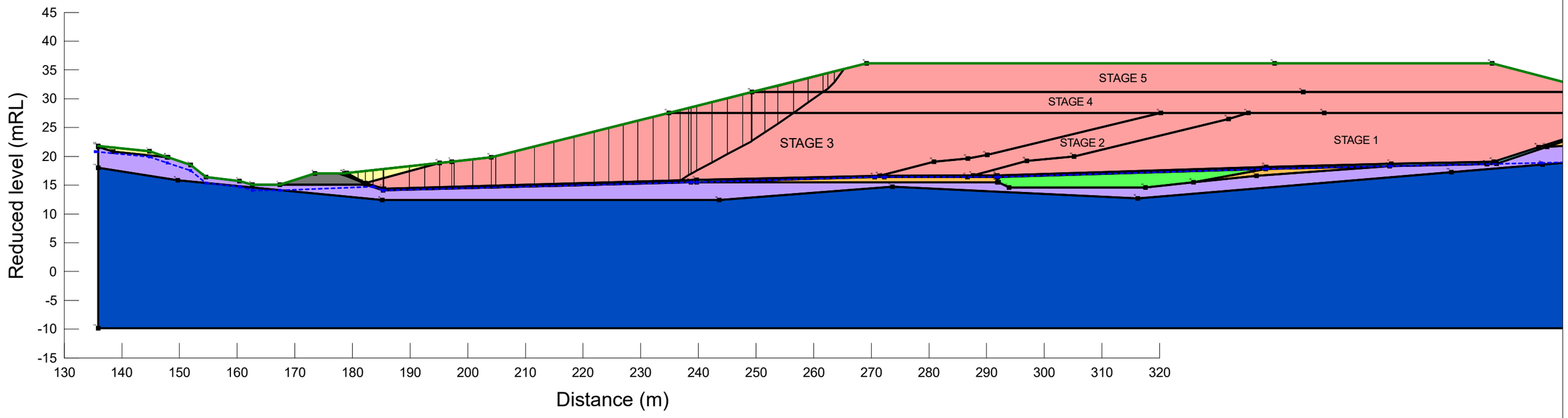
wsp	Mt Cooee Landfill Development Plan	3.0 Section D-D' 3.0.3 Seismic - SLS (1/50yr)	6-CO082.00	Date: 10/05/2024
			Scale: 1:700	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

0.8

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Structural Fill	Mohr-Coulomb	19	0	36
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

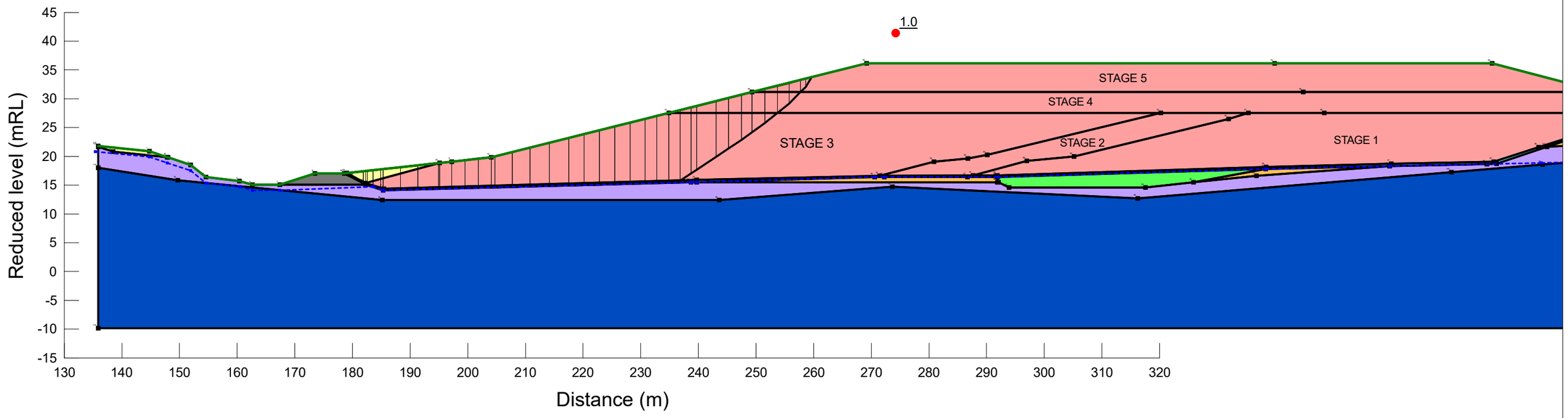


wsp	Mt Cooee Landfill Development Plan	3.0 Section D-D' 3.0.4 Seismic - ULS (1/1000yr)	6-CO082.00	Date: 10/05/2024
			Scale: 1:700	By: B. HARRISON

Horz Seismic Coef.: 0.17

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Structural Fill	Mohr-Coulomb	19	0	36
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



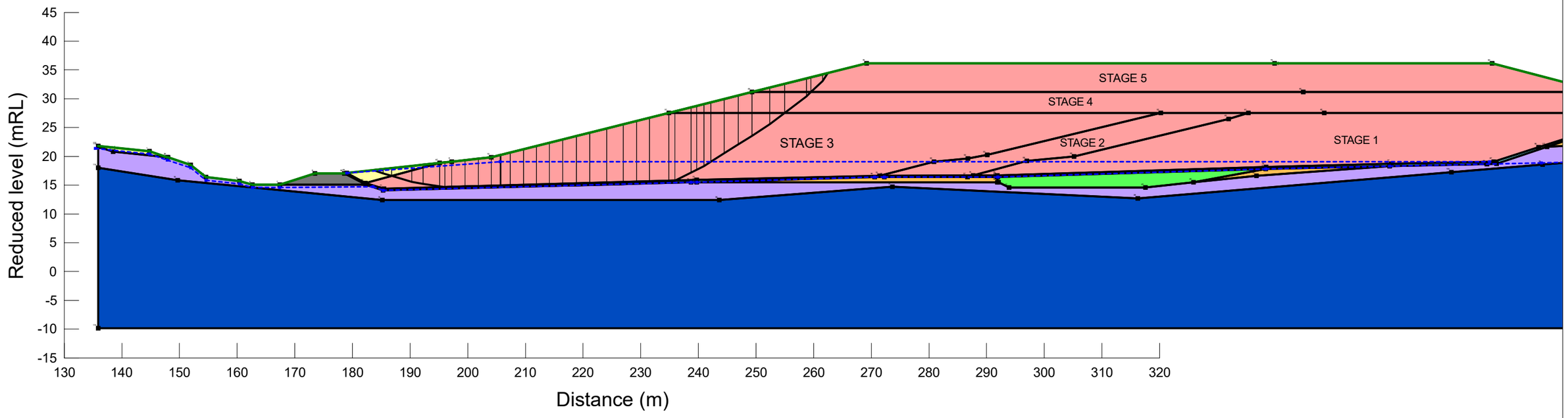
wsp	Mt Cooee Landfill Development Plan	3.0 Section D-D' 3.0.5 Seismic - Yield Acceleration	6-CO082.00	Date: 10/05/2024
			Scale: 1:700	By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Structural Fill	Mohr-Coulomb	19	0	36
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

1.3

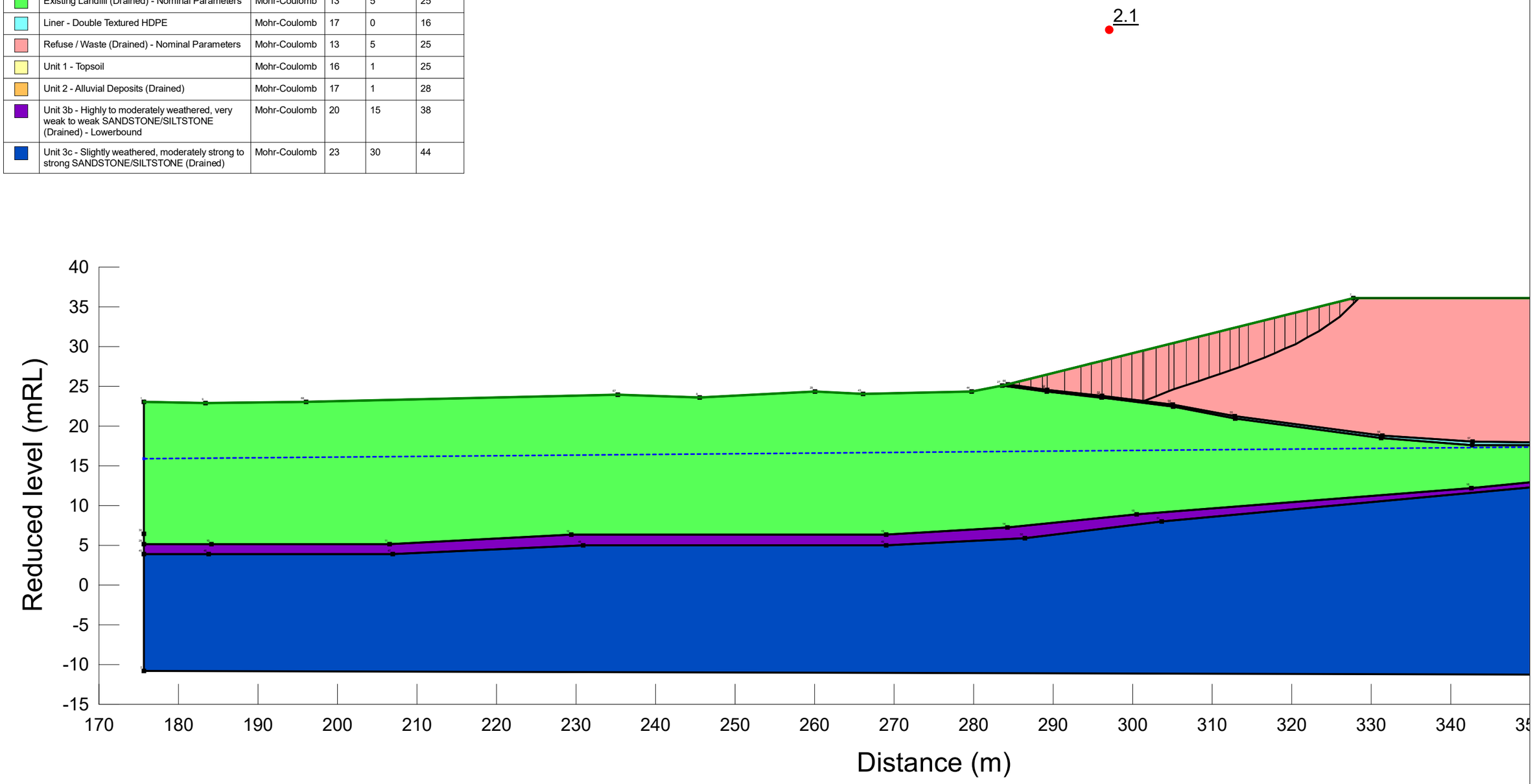


wsp	Mt Cooee Landfill Development Plan	3.0 Section D-D' 3.0.6 Seismic - SLS (1/50yr) + HGWL + Elevated Leachate	6-CO082.00 Scale: 1:700	Date: 10/05/2024 By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

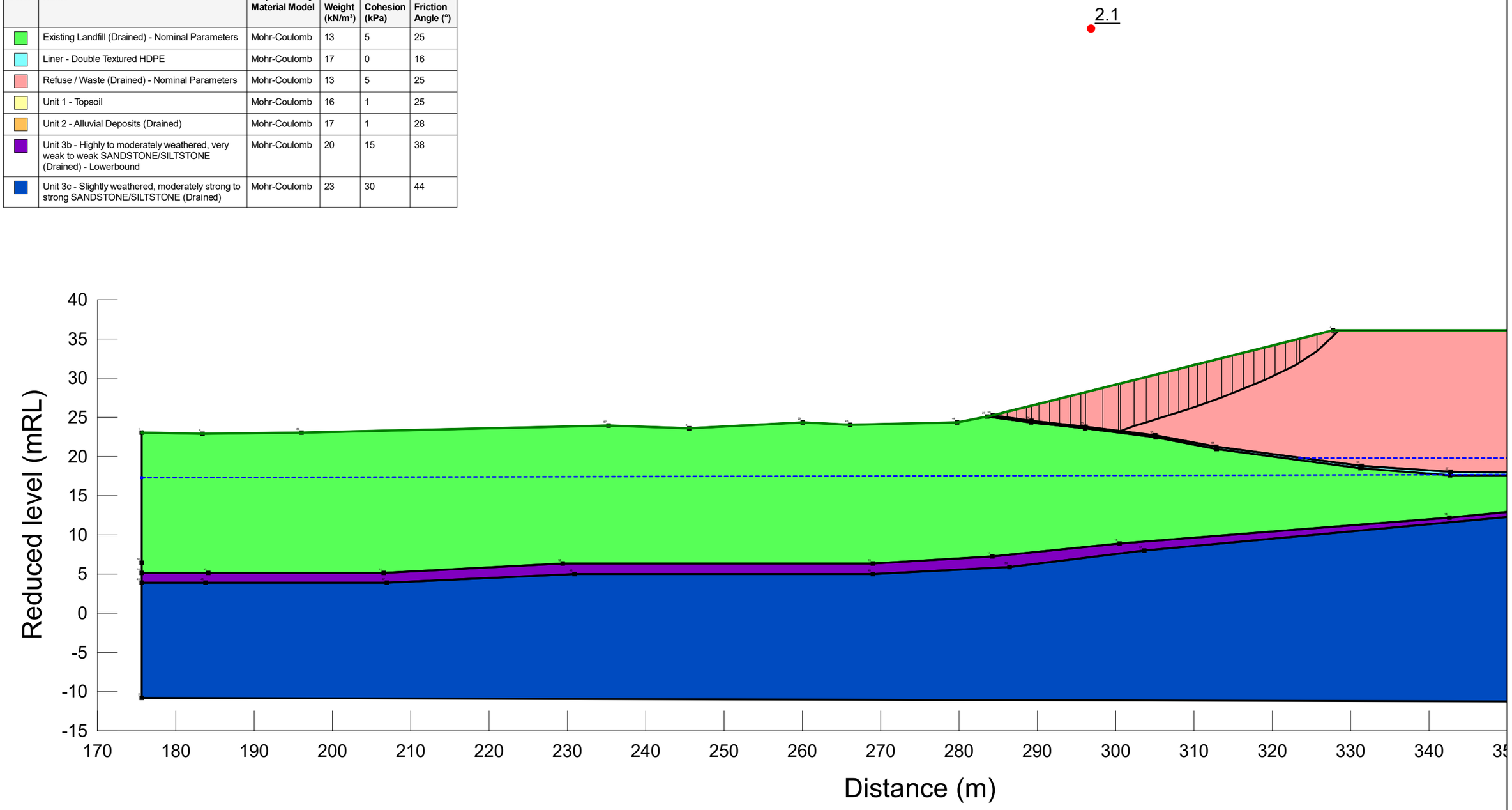


wsp	Mt Cooee Landfill Development Plan	4.0 Section A-A' 4.0.1 Static - Long term	6-CO082.00 / Date: 10/05/2024 Scale: 1:500 / By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

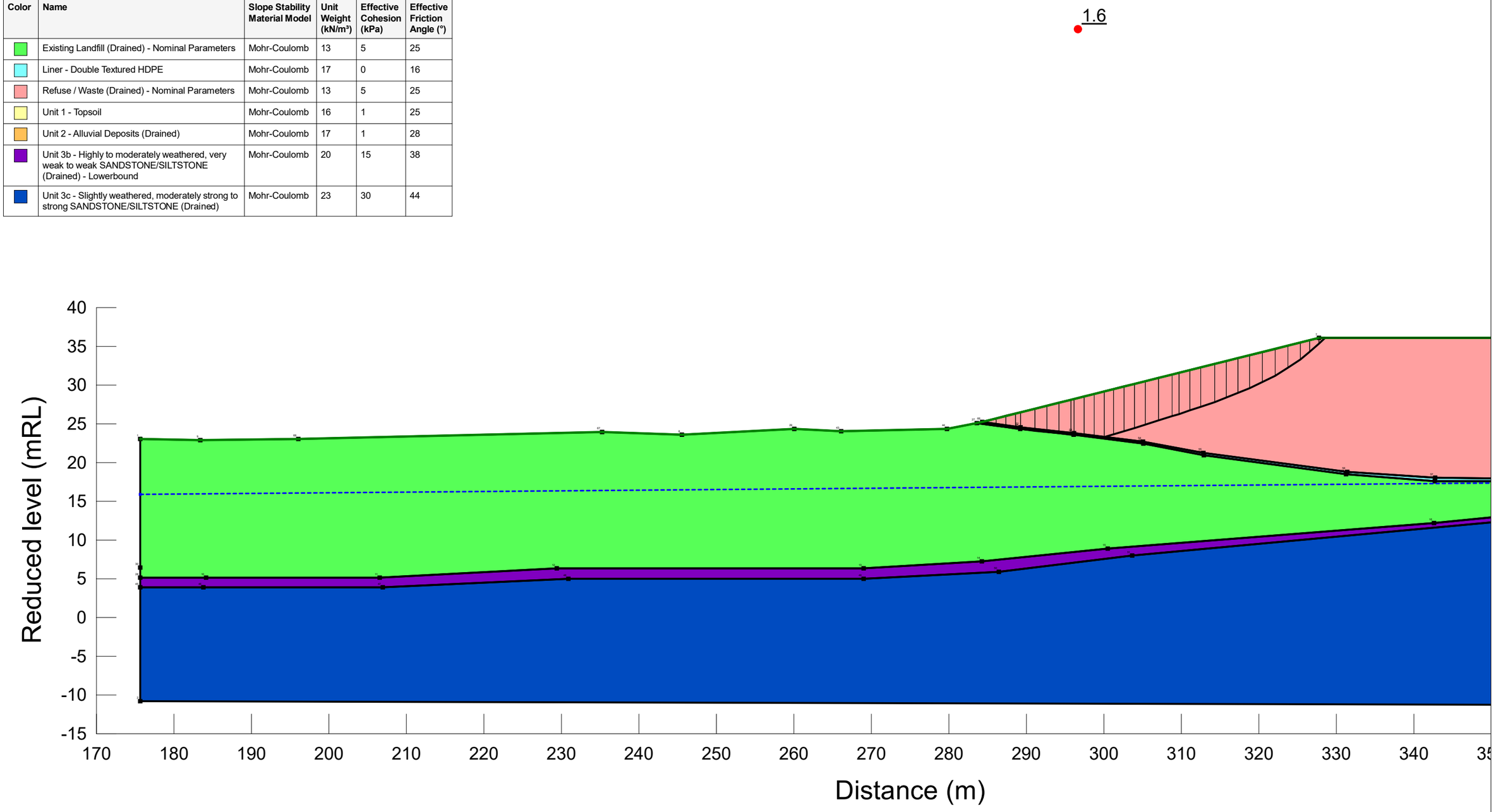


wsp	Mt Cooee Landfill Development Plan	4.0 Section A-A' 4.0.2 Static - HGWL + Elevated Leachate	6-CO082.00 / Date: 10/05/2024 Scale: 1:500 / By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

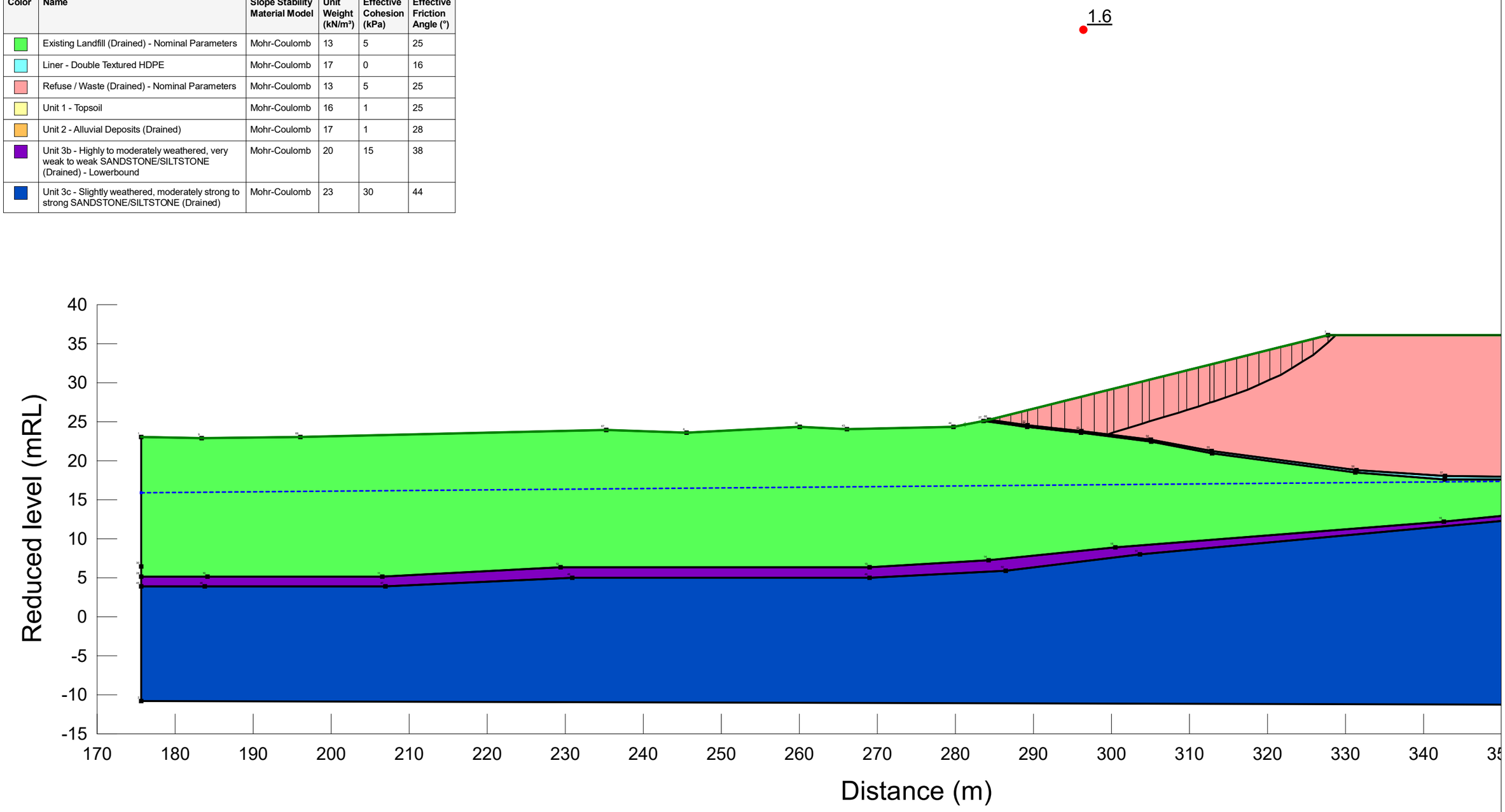


wsp	Mt Cooee Landfill Development Plan	4.0 Section A-A' 4.0.3 Seismic SLS (1/50yr) MBIE	6-CO082.00 / Date: 10/05/2024 Scale: 1:500 / By: B. HARRISON

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



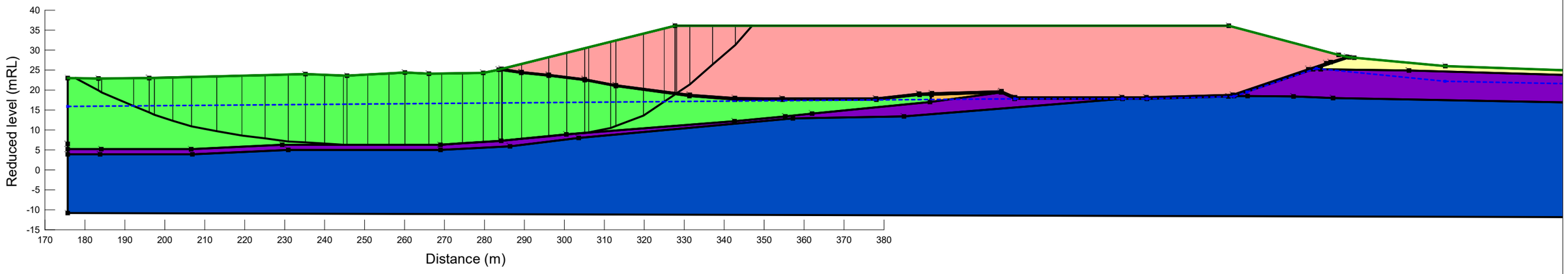
wsp	Mt Cooee Landfill Development Plan	4.0 Section A-A' 4.0.3 Seismic SLS (1/50yr) MBIE (Constrained)	6-CO082.00 / Date: 10/05/2024 Scale: 1:500 / By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

1.0

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



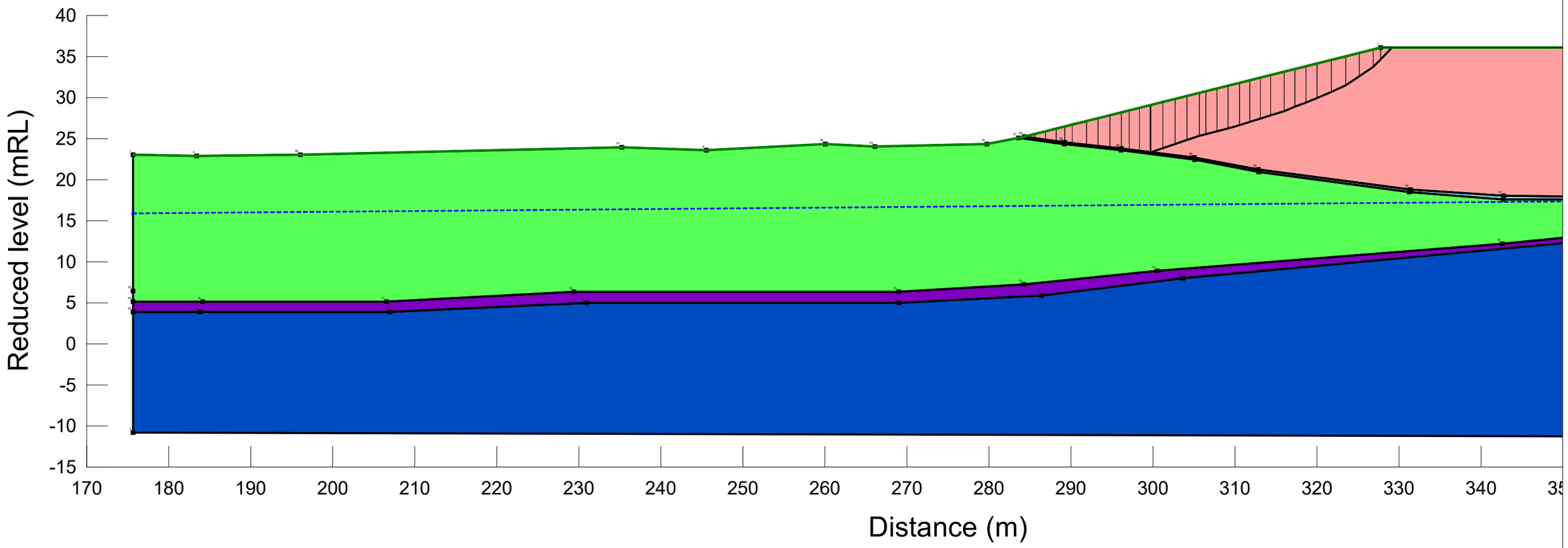
wsp	Mt Cooee Landfill Development Plan	4.0 Section A-A' 4.0.4 Seismic - ULS (1/1000yr) MBIE	6-CO082.00	Date: 10/05/2024
			Scale: 1:1,000	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

0.9

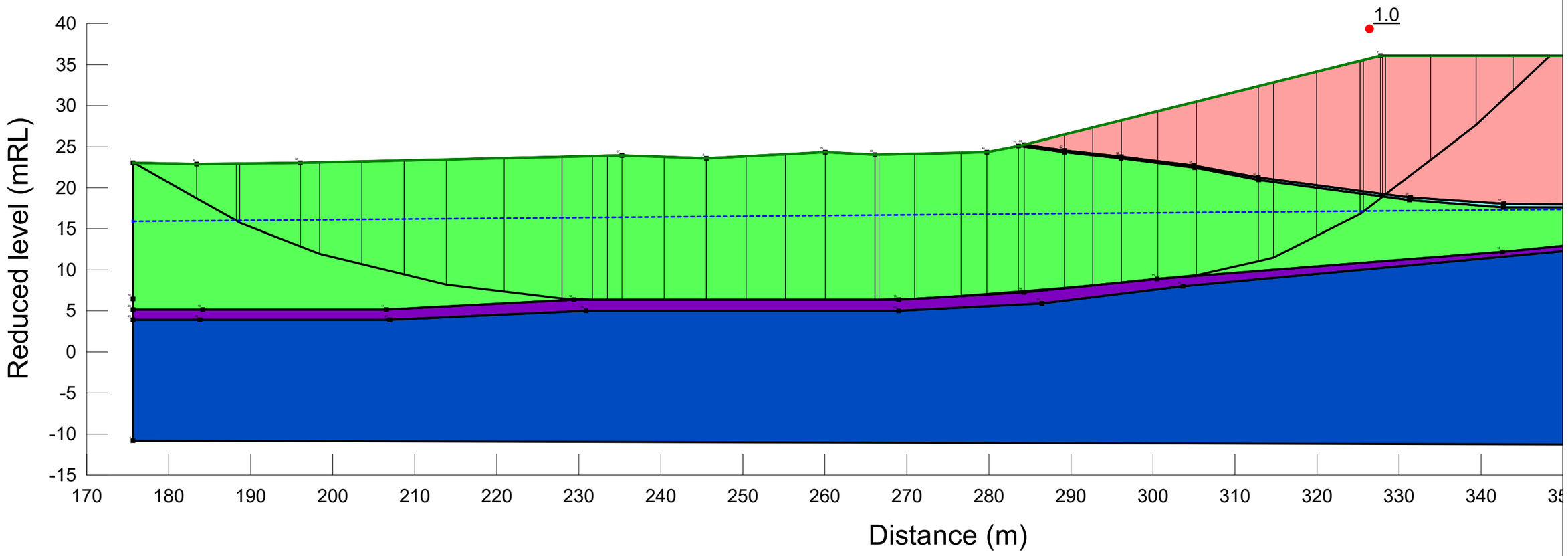


wsp	Mt Cooee Landfill Development Plan	4.0 Section A-A' 4.0.4 Seismic - ULS (1/1000yr) MBIE (Constrained)	6-CO082.00	Date: 10/05/2024
			Scale: 1:500	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

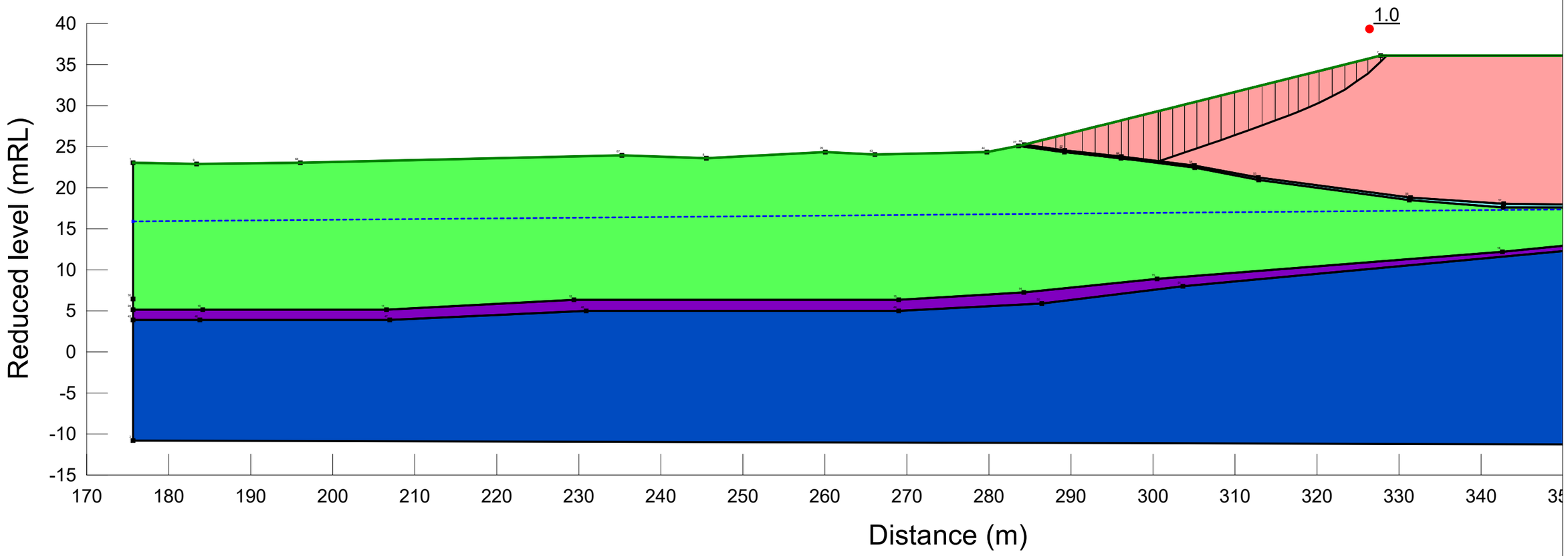


wsp	Mt Cooee Landfill Development Plan	4.0 Section A-A' 4.0.5 Seismic - Yield Acceleration	6-CO082.00 / Date: 10/05/2024 Scale: 1:500 / By: B. HARRISON

Horz Seismic Coef.: 0.24

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

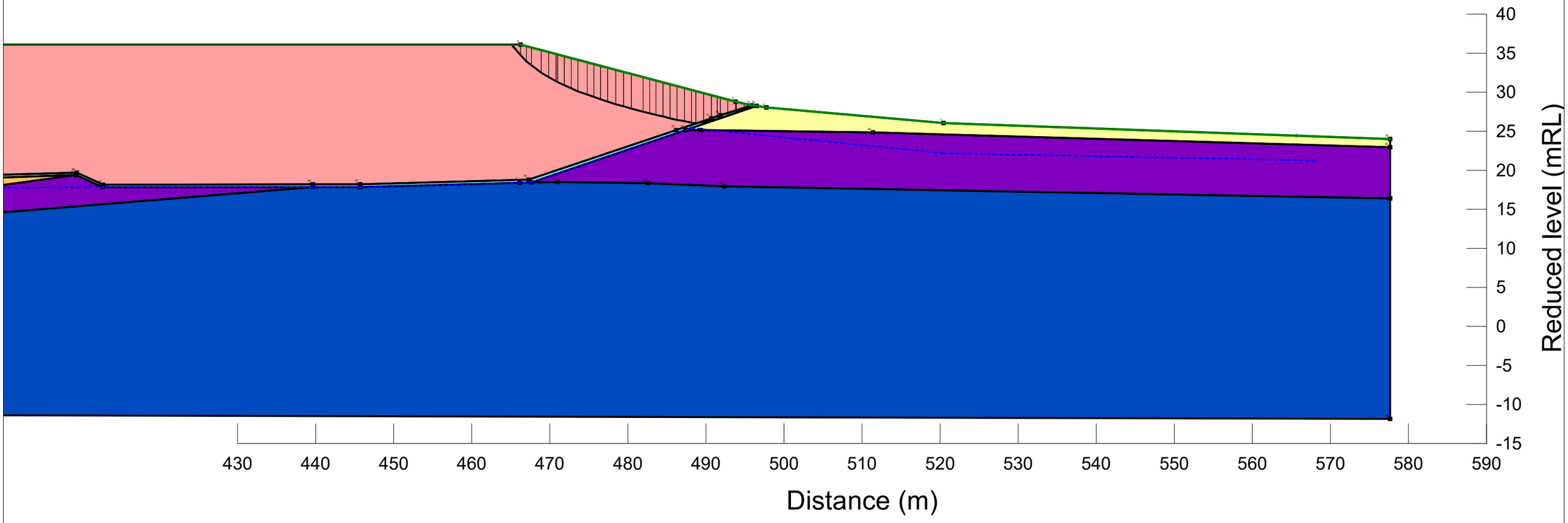


wsp	Mt Cooee Landfill Development Plan	4.0 Section A-A' 4.0.5 Seismic - Yield Acceleration (Constrained)	6-CO082.00	Date: 10/05/2024
			Scale: 1:500	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

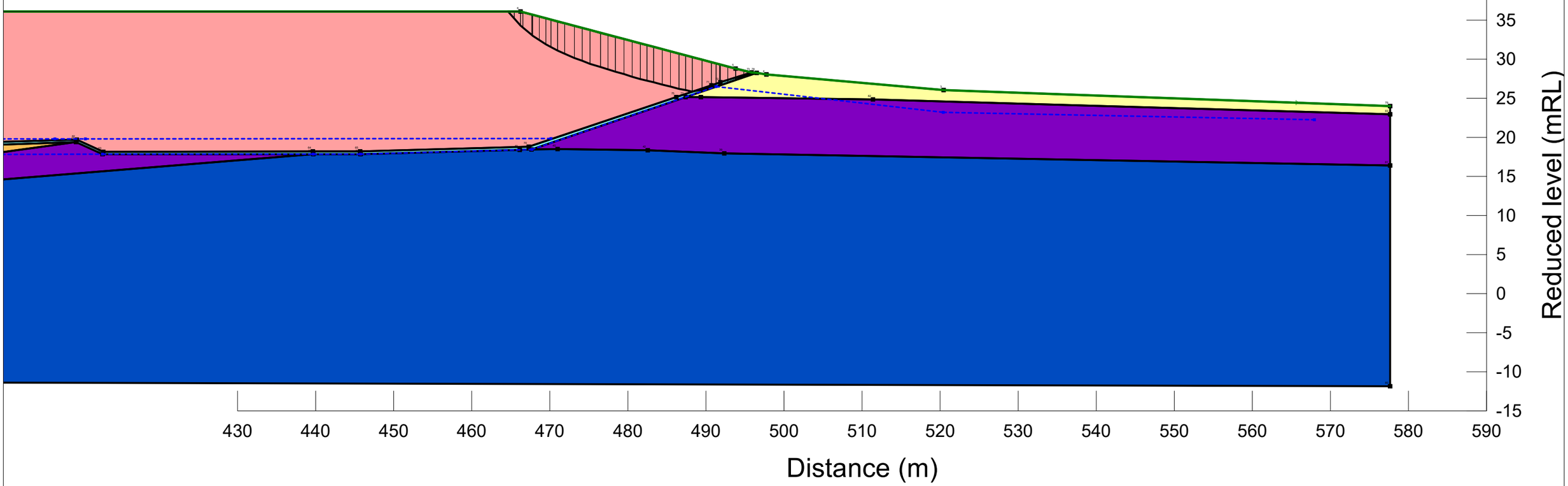


wsp	Mt Cooee Landfill Development Plan	4.1 Section A-A' 4.1.1 Static - Long term	6-CO082.00	Date: 10/05/2024
			Scale: 1:500	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



wsp	Mt Cooee Landfill Development Plan	4.1 Section A-A' 4.1.2 Static - HGWL + Elevated Leachate	6-CO082.00	Date: 10/05/2024
			Scale: 1:500	By: B. HARRISON

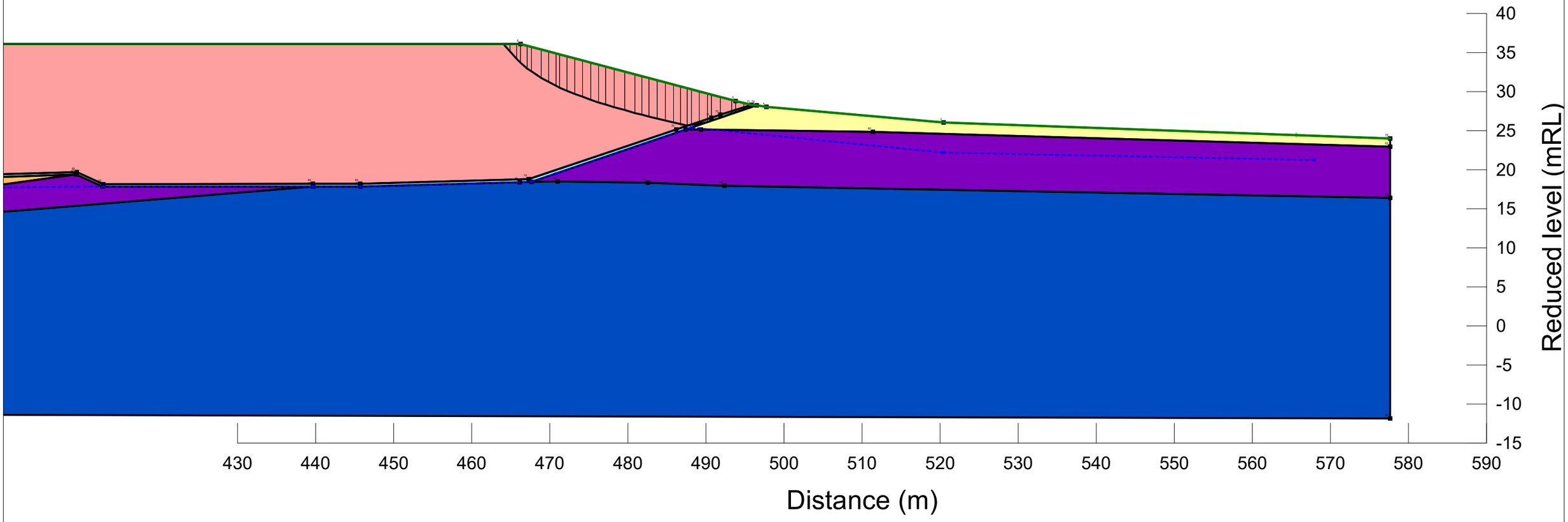
\\corp.pbwan.net\ANZ\ProjectsNZ\6c\6-CO082.00 Mt Cooee Landfill - Development Plan & R\Home\Stage 2 - Geotech Interpretation\10 Peer Review Analyses\01 Slope Stability\.20240510 Mount Cooee Landfill - WIP 2 - Copy.gsz, Harrison, Bryce, 10/05/2024,02:19:19 pm

DO NOT SCALE

Horz Seismic Coef.: 0.08

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



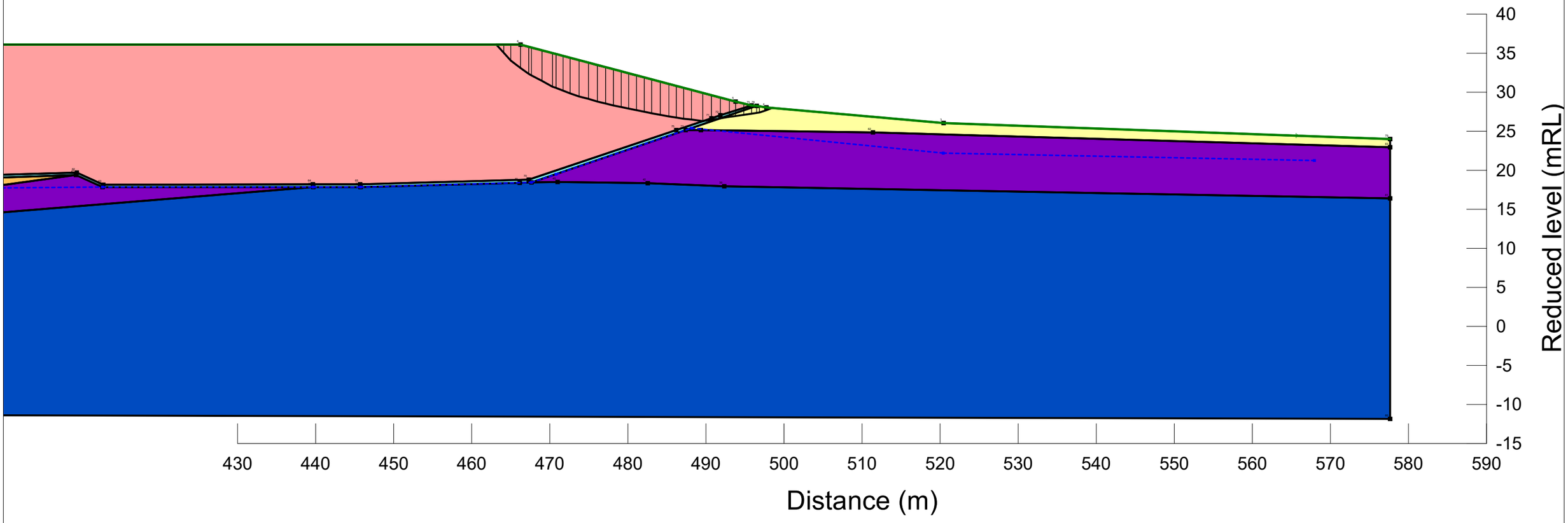
wsp	Mt Cooee Landfill Development Plan	4.1 Section A-A' 4.1.3 Seismic SLS (1/50yr) MBIE	6-CO082.00	Date: 10/05/2024
			Scale: 1:500	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

1.1

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

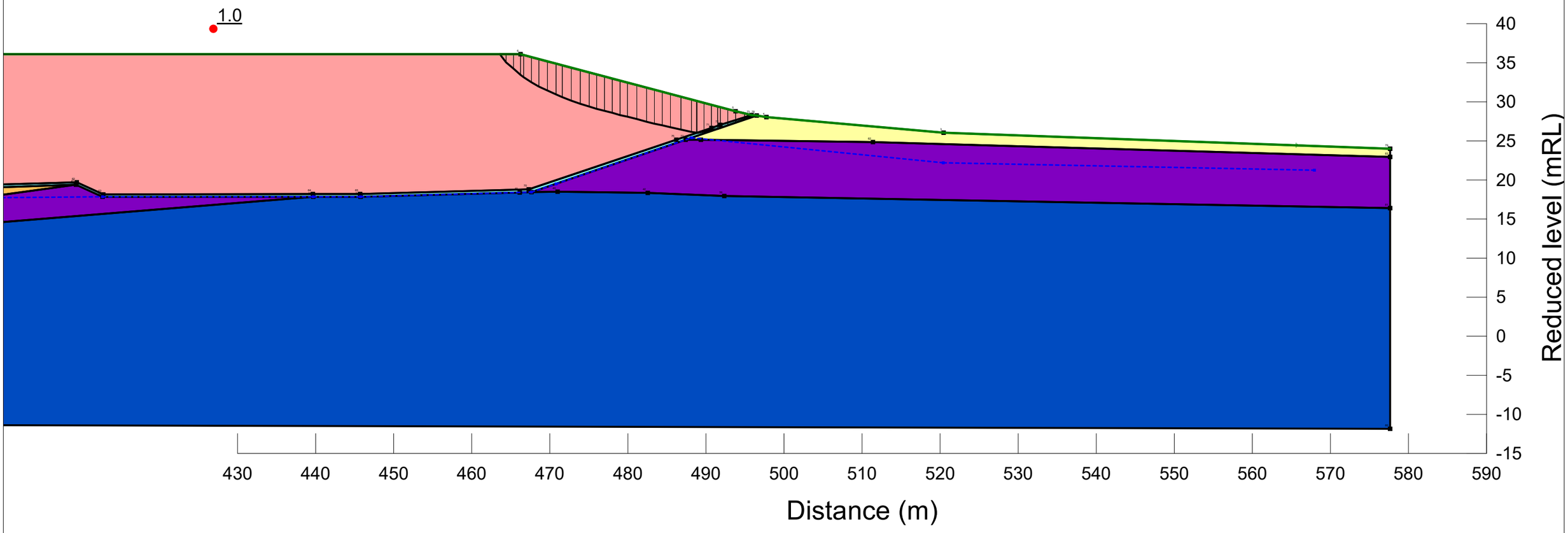


wsp	Mt Cooee Landfill Development Plan	4.1 Section A-A' 4.1.4 Seismic - ULS (1/1000yr) MBIE	6-CO082.00	Date: 10/05/2024
			Scale: 1:500	By: B. HARRISON

Horz Seismic Coef.: 0.29

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained) - Lowerbound	Mohr-Coulomb	20	15	38
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



wsp	Mt Cooee Landfill Development Plan	4.1 Section A-A' 4.1.5 Seismic - Yield Acceleration	6-CO082.00	Date: 10/05/2024
			Scale: 1:500	By: B. HARRISON

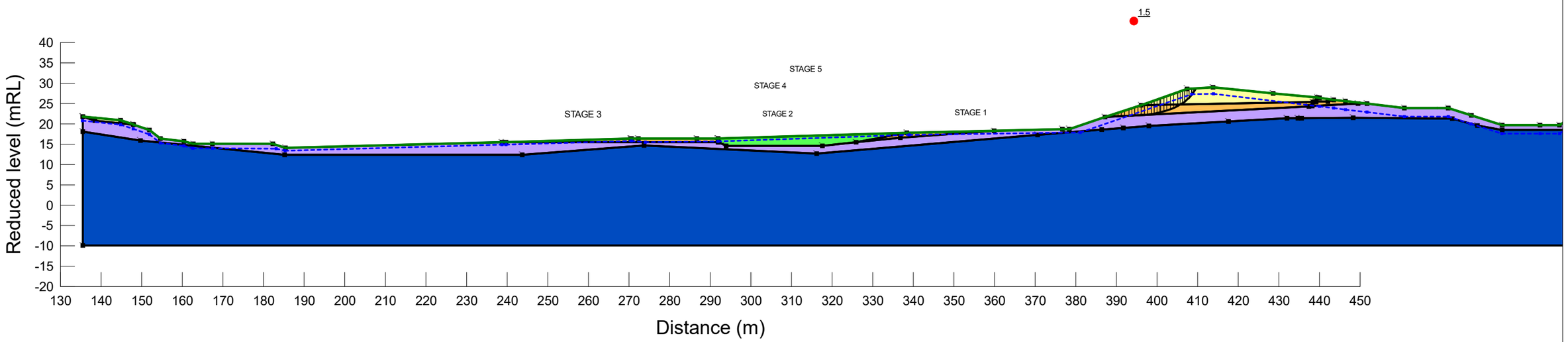
Appendix D

Temporary Stability

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

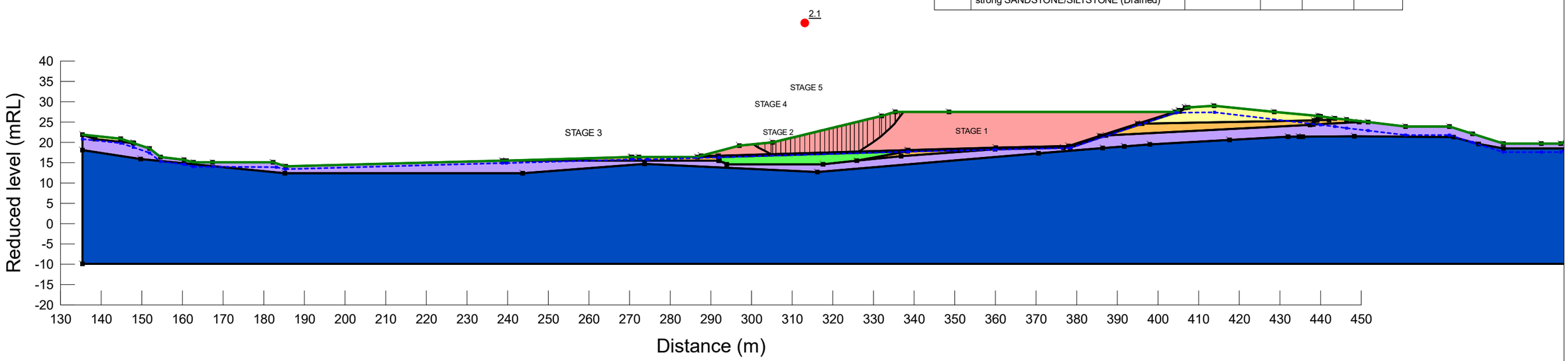


wsp	Mt Cooee Landfill Development Plan	Stage 1 Excavation Stage 1 (Excavation) Static	6-CO082.00	Date: 10/05/2024
			Scale: 1:1,000	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

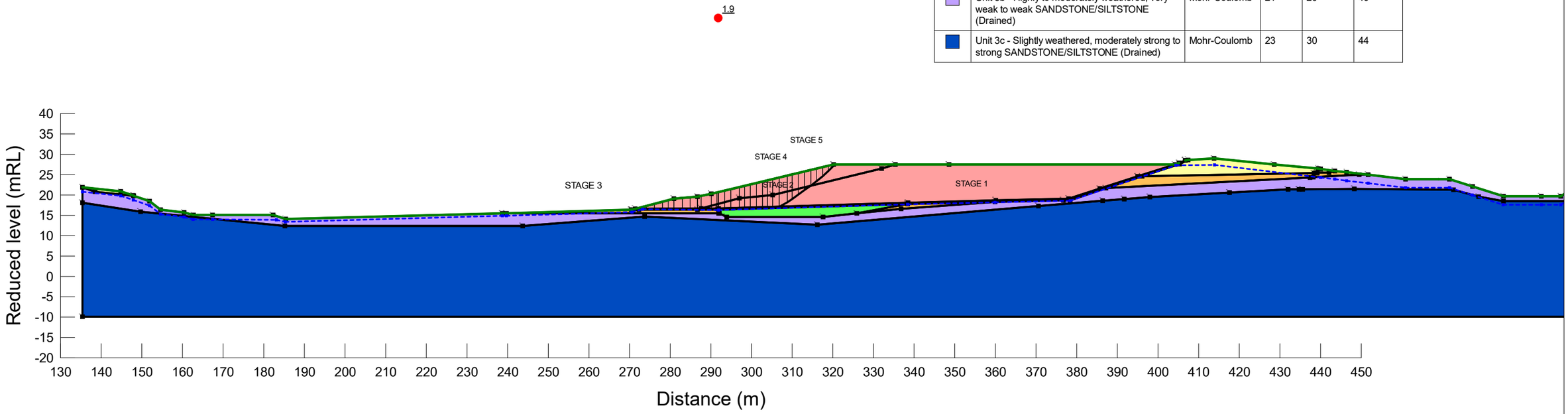


wsp	Mt Cooee Landfill Development Plan	Stage 1 Fill Section D-D' Stage 1 Static	6-CO082.00	Date: 10/05/2024
			Scale: 1:1,000	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

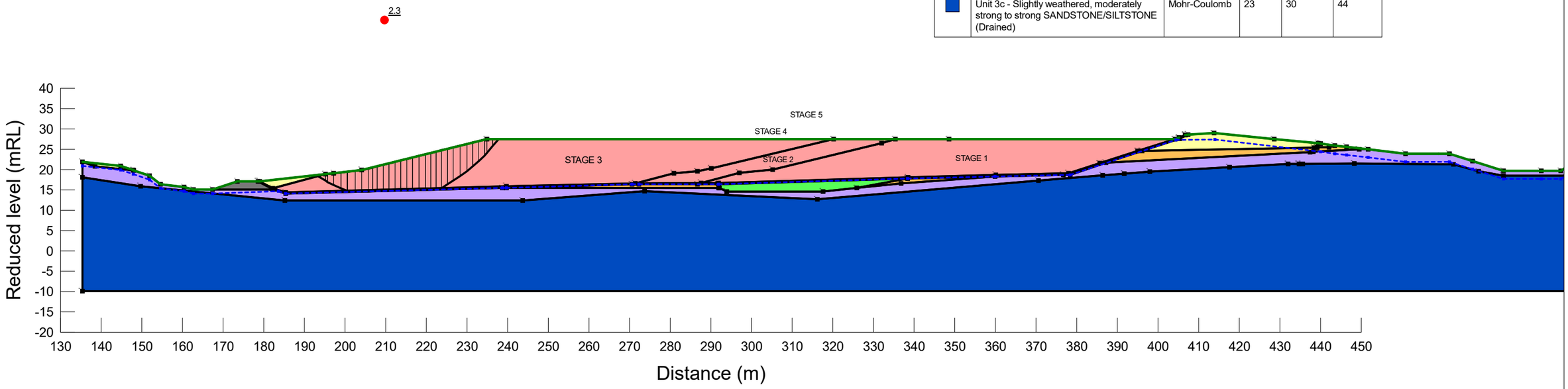


wsp	Mt Cooee Landfill Development Plan	Stage 2 Fill Section D-D' Stage 2 Static	6-CO082.00	Date: 10/05/2024
			Scale: 1:1,000	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Structural Fill	Mohr-Coulomb	19	0	36
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44

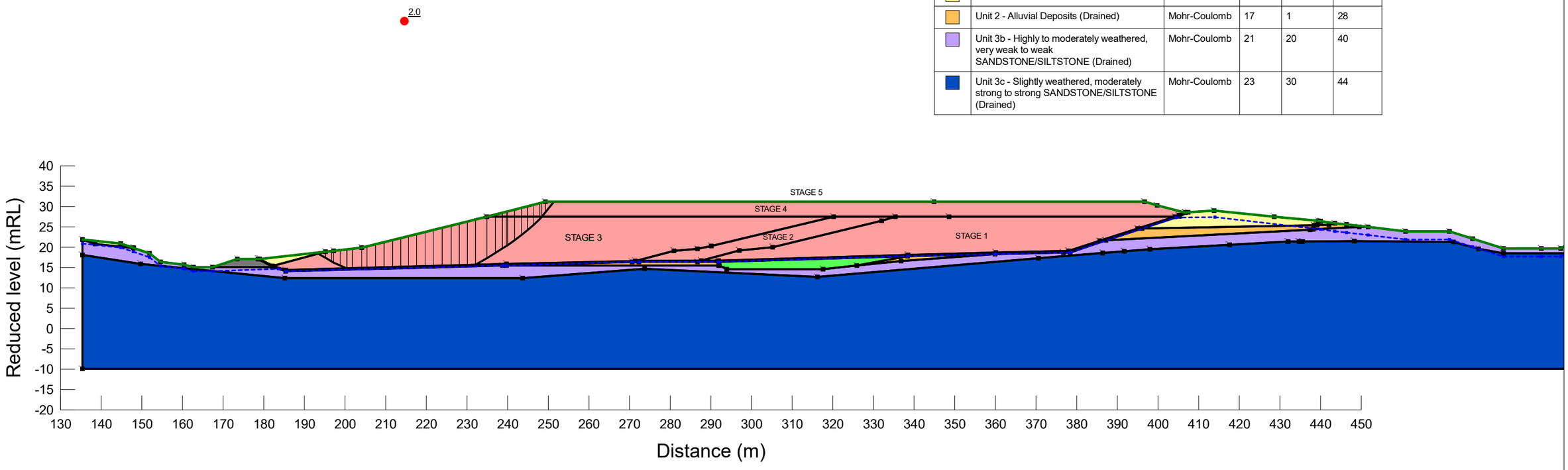


wsp	Mt Cooee Landfill Development Plan	Stage 3 Section D-D' Stage 3 Static	6-CO082.00	Date: 10/05/2024
			Scale: 1:1,000	By: B. HARRISON

Horz Seismic Coef.:

Method: Morgenstern-Price

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Existing Landfill (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Liner - Double Textured HDPE	Mohr-Coulomb	17	0	16
	Refuse / Waste (Drained) - Nominal Parameters	Mohr-Coulomb	13	5	25
	Structural Fill	Mohr-Coulomb	19	0	36
	Unit 1 - Topsoil	Mohr-Coulomb	16	1	25
	Unit 2 - Alluvial Deposits (Drained)	Mohr-Coulomb	17	1	28
	Unit 3b - Highly to moderately weathered, very weak to weak SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	21	20	40
	Unit 3c - Slightly weathered, moderately strong to strong SANDSTONE/SILTSTONE (Drained)	Mohr-Coulomb	23	30	44



wsp	Mt Cooee Landfill Development Plan	Stage 4 Section D-D' Stage 4 Static	6-CO082.00	Date: 10/05/2024
			Scale: 1:1,000	By: B. HARRISON