



Modification 16 Northern Tailings Storage Facility Buttress Optimisation

Appendix A
Geotechnical Assessment





NTSF Buttress Optimisation

Design Report

17 December 2025

→ The Power of Commitment



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0	Ramiro Pinto	Edgar Salas		Neil MacRae		17/12/2025

GHD Pty Ltd ABN 39 008 488 373
10 Columnar Court,
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | **F** +61 3 8732 7046 | **E** bwtmail@ghd.com | **ghd.com**

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Executive summary

This report outlines the design of the Northern Tailings Storage Facility (NTSF) recovered sand buttress for Area 3 (CH2000 to CH2800), and it is part of the NTSF buttress optimisation study, building on previous investigations and assessments to develop an optimisation strategy for the facility.

The design features a recovered sand buttress constructed over a rockfill platform, with integrated underdrain systems to manage water during sand placement, filter and transition zones to prevent internal erosion. Two stockpiles within the STSF footprint are included to handle daily sand production and material that does not meet specification. Hydraulic behaviour was assessed using seepage modelling, confirming that water movement at the downstream toe remains within expected limits. Slope stability analyses demonstrate that the buttress and stockpiles meet the minimum factors of safety required by the Australian National Committee on Large Dams (ANCOLD) (2019) under both static and seismic loading conditions

ITRB Considerations and Recommendations

Following the 2018 NTSF embankment slump, the Independent Technical Review Board (ITRB) provided several key recommendations to address foundation risks and improve future design and construction practices. These included:

- Undertaking additional site investigations to confirm the extent of weak foundation materials.
- Consolidating all foundation data into a site-wide geological and geotechnical model.
- Implementing instrumentation and monitoring to verify ongoing foundation performance.
- Ensuring future designs explicitly consider and address the presence of weak foundation materials.

Incorporation into the recovered sand Design and Construction:

- Site investigations (boreholes, test pits, seismic surveys, laboratory testing) confirmed the extent of weak foundation materials, which has been considered in the design.
- Foundation data has been consolidated into an updated geological and geotechnical model, which informs design decisions.
- Instrumentation for the recovered sand has been nominated. Trigger levels will be developed specifically for the construction stage to monitor performance and provide early warning of any deviations from expected behaviour.
- The construction phase will be managed by testing materials against the design intent. The quality management process will incorporate a testing regime required to verify that the design intent is met during construction, ensuring that all materials and works comply with the specified requirements.

In conclusion, the geotechnical design and stability assessment for the NTSF Southern Wall Buttress in Area 3 demonstrates that the proposed recovered sand buttress, meets the required Factor of Safety (FoS) and performance criteria set by ANCOLD (2019) and Newmont (2023). The design is grounded in geological, geotechnical and laboratory investigations, which indicate the suitability of recovered sand as the primary construction material.

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1. Introduction

This report outlines the design of the Northern Tailings Storage Facility (NTSF) recovered sand buttress for Area 3 (CH2000 to CH2800), as shown in Figure 1-1. It is part of the NTSF buttress optimisation study, building on previous investigations and assessments to develop an optimisation strategy for the facility.

Cadia Valley Operations (“Cadia”) is located approximately 25 kilometres (km) south-west of Orange, in the Central Tablelands of New South Wales (NSW). Cadia Holdings Pty Limited (CHPL) is a wholly owned subsidiary of Newmont. CHPL is the owner and operator of Cadia. Cadia was approved by the NSW Minister for Planning under Part 3A of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act) on 6 January 2010 under Project Approval 06_0295 (PA 06_0295).

CHPL proposes a modification to PA 06_0295, which would be sought under section 4.55(2) of the EP&A Act. The main elements of the Modification include:

- using recovered sand to buttress the southern wall of the NTSF;
- emplacing/stockpiling excess recovered sand within the approved Southern Tailings Storage Facility (STSF) disturbance footprint; and
- integrating the recovered sand demonstration embankment approved under Modification 15 to PA 06_0295 with the proposed NTSF southern wall recovered sand buttress, with the integrated structure to remain and form part of the final landform.

The design works aim to upgrade the Southern Embankment of the NTSF area 3 (refer to Figure 1-1) by constructing a buttress in stages. This will strengthen the structure and align the facility with current Australian National Committee on Large Dams (ANCOLD) guidelines, resulting in a more resilient NTSF embankment.

The design incorporates recovered sand as the main construction material, supported by a rockfill platform, drainage system, filter zones and rock armouring to manage pore pressures, limit deformation, and control erosion.



Figure 1-1 NTSE Design Areas. Google Earth Image. (Google Earth Image, 2025)

1.1 Purpose of this Report

The purpose of this report is to present the design for the recovered sand buttress along the NTSF southern embankment in Area 3, and associated emplacements/stockpiles. The design combines previous engineering assessments for the NTSF to guide the facility's design strategy. This report contributes to Newmont's NTSF repair process to address NSW prohibition notice #NTCE0008968.

1.2 Scope of Work

The scope of work is to develop a design for the construction of a stabilisation buttress to increase the stability of the NTSF southern embankment in Area 3. The project would use recovered sand as the primary construction material to support Cadia's application for Modification 16 in combination with previous approvals.

1.3 Limitations

This report has been prepared by GHD Group Pty Ltd (GHD) for CHPL and may only be used and relied on by CHPL for the purpose agreed between GHD and CHPL as set out in Section 1 of this report.

GHD otherwise disclaims responsibility to any person other than CHPL arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer Section 10 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

2. Mine Setting

2.1 Study Location

Area 3 of the NTSF southern embankment (which is the subject of this study) is shown in Figure 2-1.

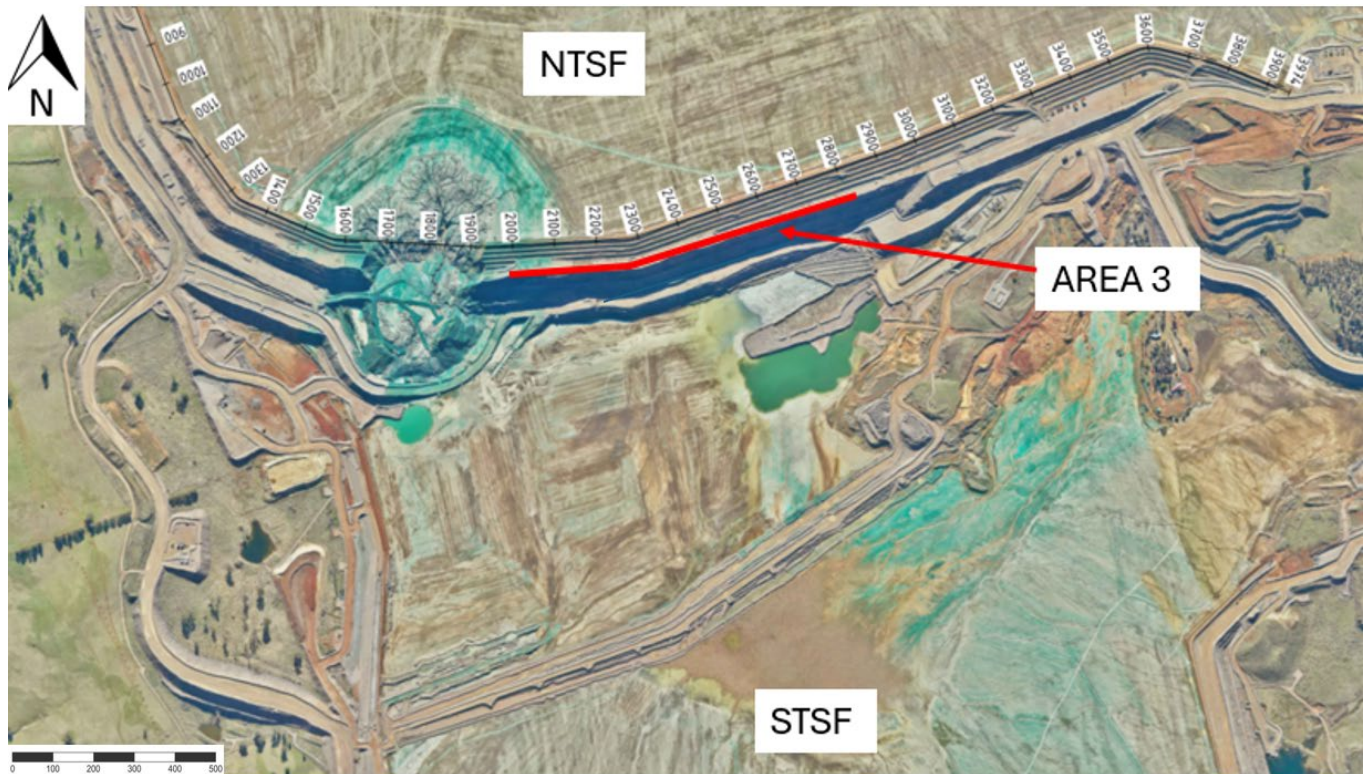


Figure 2-1 NTSF Design Areas Google Earth Image (Google Earth Image, 2025)

2.2 Geological Setting

2.2.1 Regional Geology

Reference to the 1:250,000 Geological Map for Bathurst indicates that Ordovician aged sedimentary and volcanic rocks dominate the surface landscape in the vicinity of the NTSF. These rocks consist of mafic lavas and intrusions and associated volcanoclastic breccia and conglomerate. Silurian aged rocks are present above the NTSF, which consist of felspathic siltstone, mudstone, poorly sorted sandstone and limestone. The much younger Tertiary Volcanics of the Canoblas Volcanic Complex are predominantly basalt overlying the above units in areas where it appears to have followed paleo-channels linked with the ancient fault architecture of the Werribee-Cadiangullong Fault System.

The Werribee – Cadiangullong thrust fault trends in a north-south direction and dips in a westerly direction. It is present beneath the western edges of both the NTSF and STSF and is represented as two to three parallel thrust faults with an influence zone between 200 to 400 m wide (Wilson, 2003).

The geology map, produced during a preliminary geotechnical investigation (Woodward-Clyde, 2000), shows a similar geological environment with an increased level of detail of the extent of the basalt distribution in and around the area of the mine and the associated dams.

Harris et al. (2014) produced an updated version of this map (refer to Figure 2-2. The geological legend is shown in Figure 2-3).

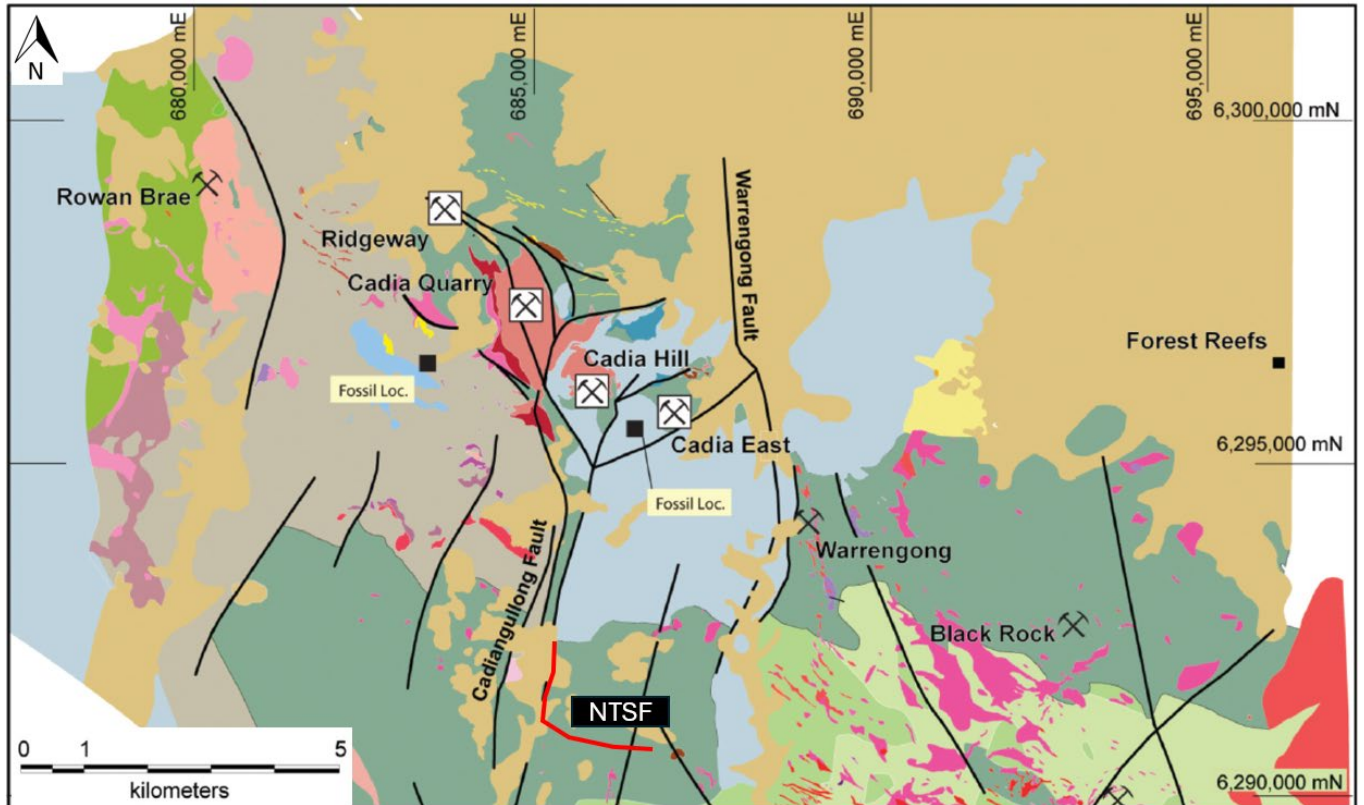


Figure 2-2 General Geology Map of Cadia Valley Operations. The NTSF Area is Circled in Red (Harris et al., 2014)



Figure 2-3 Geological Map Legend (Harris et al., 2014)

2.2.2 Geological Units

The interpreted geological units in the NTSF Area 3 (Figure 2-3) based on the geological model are summarised in Table 2.1 and the longitudinal section is presented in Figure 2-4.

Table 2.1 Summary of Interpreted Geological Units

Interpreted Geological Unit	Sub Unit
Forrest Reef Volcanics (FRV)	Residual Soil to Extremely Weathered (FRV RS/XW)
	Highly Weathered (FRV HW)
	Moderately Weathered to Fresh (FRV MW-FR)

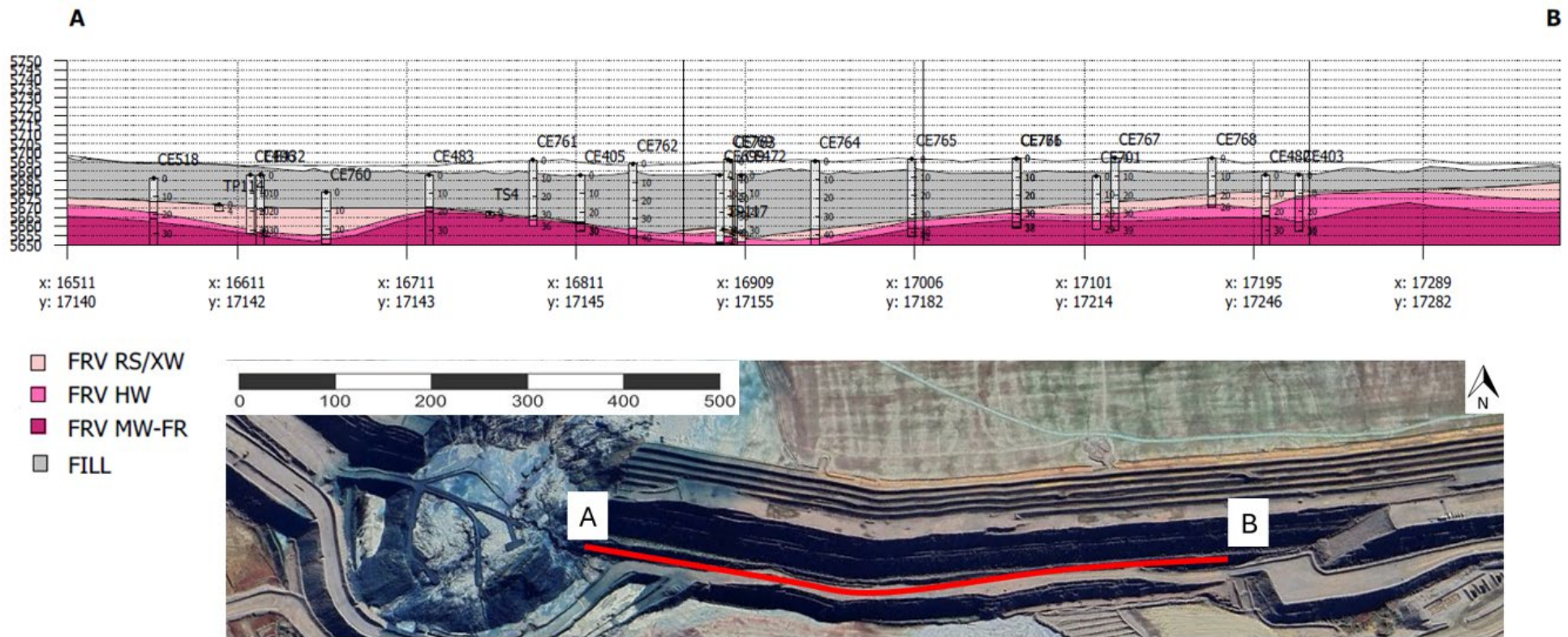


Figure 2-4 NTSF Area 3 Longitudinal Geological Section.

2.3 NTSF Construction and Slump History

The crest of the NTSF embankment currently reaches a maximum height of 94 metres (m). It was initially developed as a conventional earth-core rockfill embankment dam and later transitioned into an upstream construction tailings dam. Dam construction began in August 1997, targeting a height of 50 m. Since then, the dam has been raised in ten stages. Construction of the latest stage (Stage 10) commenced in 2017; however, was interrupted by an embankment slump on 9 March 2018. A summary of the construction stages is provided in Table 2.2 and illustrated in Figure 2-5.

The construction of Stages 1 and 1A of the stabilisation buttress along the NTSF Western Embankment began in June 2023 and the current extent of the buttress reaches CH1080.

In November 2023, construction commenced on an additional section of the stabilisation buttress along the NTSF Southern Wall, between CH3600 and CH2800 (Areas 1 and 2), and it was completed in May 2024.

The existing embankments incorporate a clay core and foundation cut-off beneath the embankment.

Table 2.2 *Summary of Construction Stages*

Stage	Embankment Design	Crest Level (RL m AHD)	Total Height (m)	Construction Accomplished
1	Downstream	5700	50	May 1998
2A		5707	57	Aug 2000
2B/1		5710.5	60.5	May 2002
2B/2		5714	64	June 2003
3	Centreline	5718.5	68.5	Nov 2005
4	Upstream	5723	73	Oct 2008
5		5729	79	Aug 2011
6		5732	82	Dec 2012
7		5735	85	Feb 2014
8		5738	88	Oct 2015
9		5741	91	Dec 2016
10		5744	94	Incomplete
10	Buttress	5744	94	In progress
Note: m AHD = metres on Cadia Mine Height Datum; RL m AHD = 5000 reduced level of metres on Australian Height Datum				

It is noted that CHPL has approval for further raises of the NTSF to 779 m AHD.

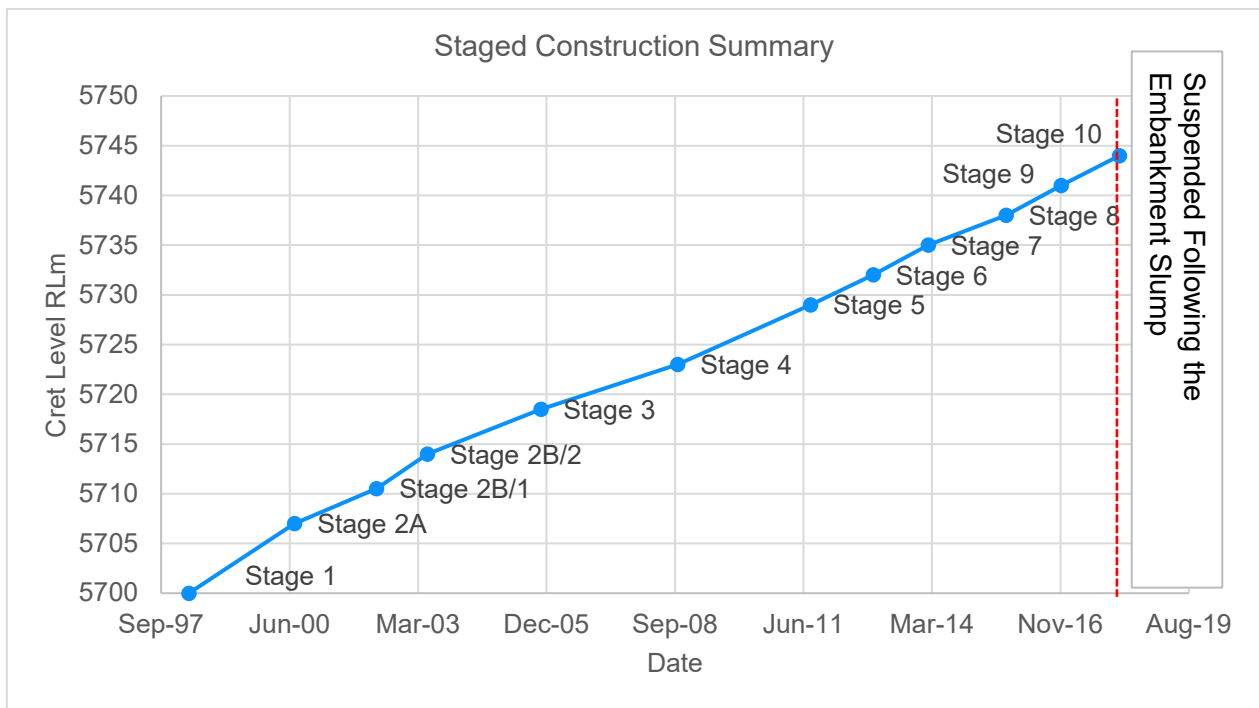


Figure 2-5 **Graphical Summary of Construction Stages**

3. Material Strength Properties

This section provides a summary of historical data up to 2024 on foundation soils, recovered sands, rockfill, and clays within the NTSF perimeter.

The type and number of available test results completed per geological profile and the recovered sand have been summarised Table 3.1.

Table 3.1 *Laboratory Test Summary*

Test Type	Forest Reef Volcanics RS/XW (number of tests)	Recovered Sands (number of tests)
Particle Size Analysis	121	23
Atterberg Limits	147	13
Consolidated Isotropically Triaxial Test	62	11
Consolidated Anisotropic Triaxial Test	14	-
Consolidated Isotropic Triaxial Drained	-	11
Permeability Constant Head Test	-	20
Cyclic Triaxial Test	-	3
Oedometer	10	4
Direct Simple Shear	19	4
Ring Shear	5	-
Dry Density	96	10
Specific Gravity	111	-
In situ Moisture Content	136	-
Pinhole Dispersion Test	-	10
Emerson Class Dispersion	-	9
Soil Water Characteristic Curve	-	1

3.1 Forest Reef Volcanics RS/XW

The stress path from the laboratory tests indicates that the material is dilative at confining pressures below 400 kilopascal (kPa) and contractive at higher confining pressures. The undrained shear strength results show that, for the tested samples, the axial strain required to reach the peak is approximately 2.5%, with strain weakening (brittle behaviour) observed in several tests.

The range of the parameters and the values adopted for design are summarised in Table 3.2.

Table 3.2 Forest Reef Volcanics RS/XW, Adopted Strength Parameters Summary

Stress Range (kPa)	Laboratory test result range				Adopted for Design		
	Mtc	ϕ' (°)	ϕ_{cu} (°)	$\phi'_{residual}$ (°)	ϕ' (°)	ϕ_{cu} (°)	$\phi'_{residual}$ (°)
<400	1.3 to 1.8	32 to 44	-	-	27	-	-
400 to 1000	0.60 to 1.74	16 to 42	13 to 31	11 to 20	25	$\tan (0.475-0.000119\sigma'_v)^*$	11
>1000	-	-	-	11 to 21	25	16	11

Note: (°) varies as S_u/σ'_v equation; Mtc: critical state stress ratio; ϕ' = effective friction angle; ϕ_{cu} = consolidated undrained friction angle; $\phi'_{residual}$ = residual friction angle

3.2 Rockfill

The rockfill material used to build the NTSF was sourced from the open pit mining operation (URS, 2001). In general, this material is comprised of both Monzonite and Silurian Sedimentary rocks.

The Independent Tailings Review Board (ITRB) (ITRB, 2019) assessed the likely strength of this material and undertook a detailed review of the construction methodology. The material strength was estimated using an empirical correlation (shown in Figure 3-1) based on Leps (1970), which has been adopted for the existing and future rockfill. It is noted that the horizontal axis is presented in pounds per square inch, as this is how the author originally developed it. The horizontal axis values have been converted to kPa for the design carried out for this report.

As part of the NTSF embankment wall design, a sensitivity analysis was completed on the strength parameters used for the rockfill, which concluded that variations in the assumed parameters, within anticipated ranges of values only have a minor impact on the stability of the overall embankments.

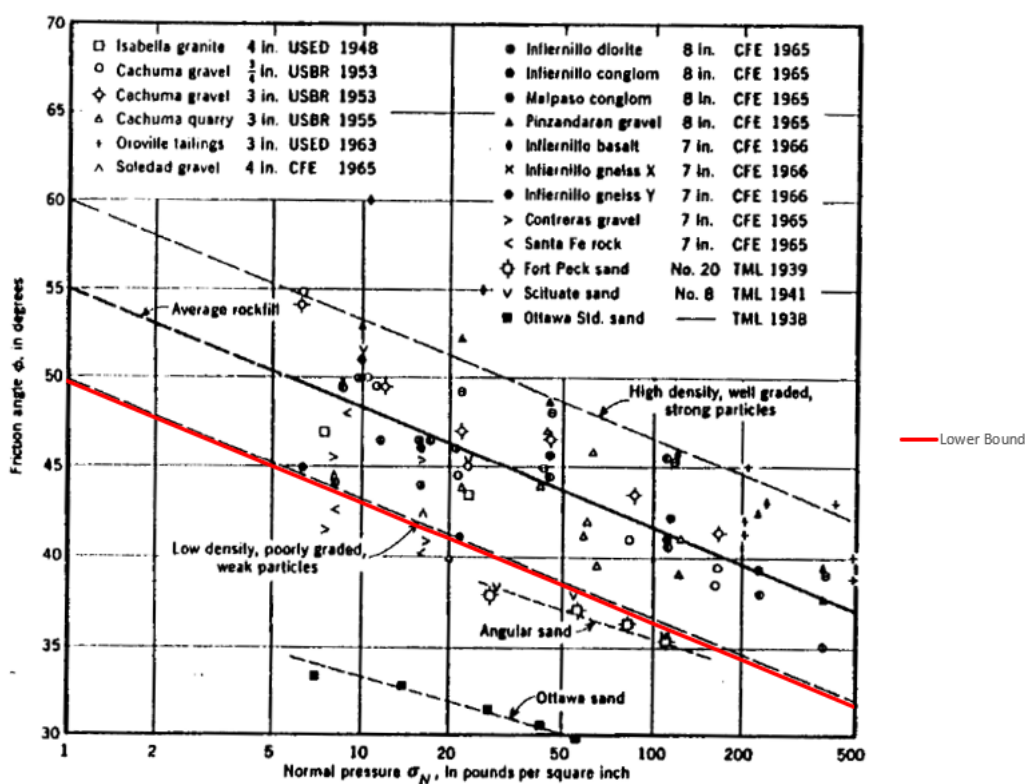


Figure 3-1 Lower Bound Adopted (Leps, 1970)

3.3 Clay Core

The existing clay core material is generally comprised of low to high-plasticity clay sourced from soils within the vicinity of the NTSF. A review of historical triaxial laboratory results on remoulded samples indicates that the material will have dilative responses at lower confining pressures (i.e. less than 500 kPa), and contractive behaviour at high confining pressures, refer to Figure 3-2.

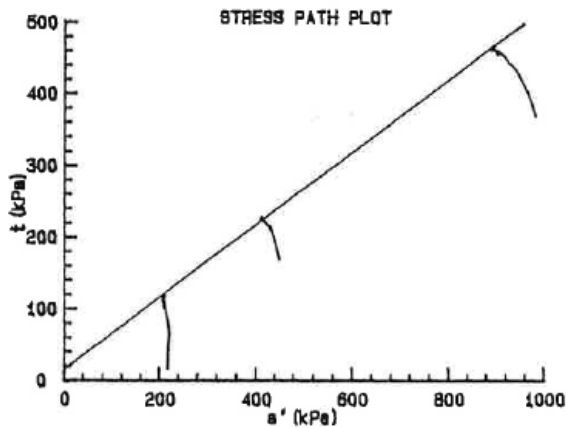


Figure a (Certificate # 503138-6)

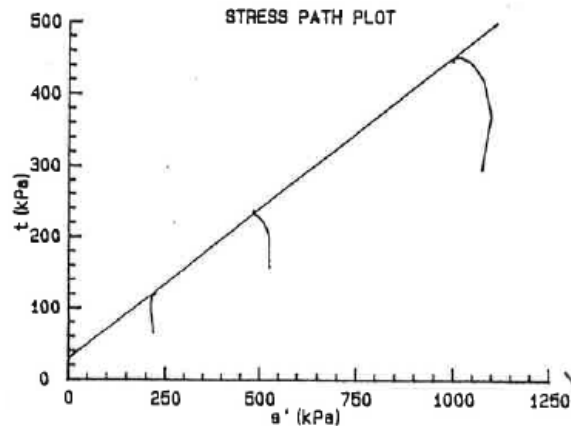


Figure b (Certificate # 503140-2)

Figure 3-2 Stress Path Plots for Triaxial Laboratory Results on Remoulded Clay Samples (Woodward-Clyde, 1995)

As part of the NTSF slump investigation, the ITRB collected two clay core samples and tested them at confining pressures between 600 kPa and 1200 kPa. Results show the material is dilative at effective stresses below 500 kPa and contractive above 500 kPa. Therefore, dilative properties are applied to areas with stresses under 500 kPa, and contractive properties where stresses exceed this threshold.

Figure 3-3 shows historical laboratory results and GHD's interpretation of these results, summarised in Table 3.3.

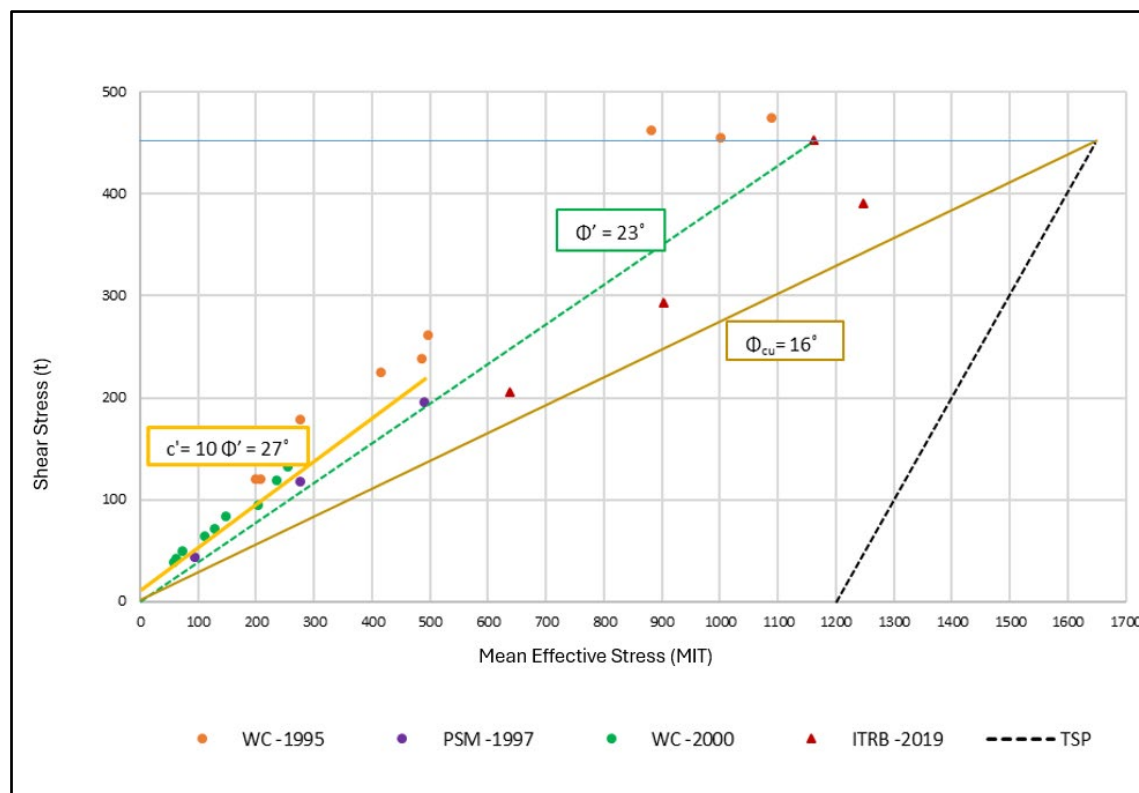


Figure 3-3 Historical Laboratory Data on Remoulded Clay Samples

The strength parameter has been derived based on the effective stress acting on the material,

Table 3.3 Clay Core Adopted Strength Parameters Summary

Stress Range (kPa)	Parameter				
	c' (cohesion)	ϕ' (°)	S_u/σ'_{vf}	ϕ_{cu} (°)	$S_{u(res)}/\sigma'_{vf}$
<500	10	27	-	-	-
>500	0	23	0.29	16	-

Note: S_u = undrained shear strength; σ'_{vf} = fully mobilised

3.4 STSF and NTSF Tailings

The tailings properties for the NTSF and STSF were assessed using the available information. The available Particle Size Distribution (PSD) for the ground investigations carried out for the NTSF and STSF is shown in Figure 3-4. The results indicate that the tailings materials range from Sandy Silt to Silty Sand.

In terms of plasticity, the results of the Plasticity Index values range from 4% to 11%, indicating that the tailings have low plasticity, as presented in Figure 3-5.

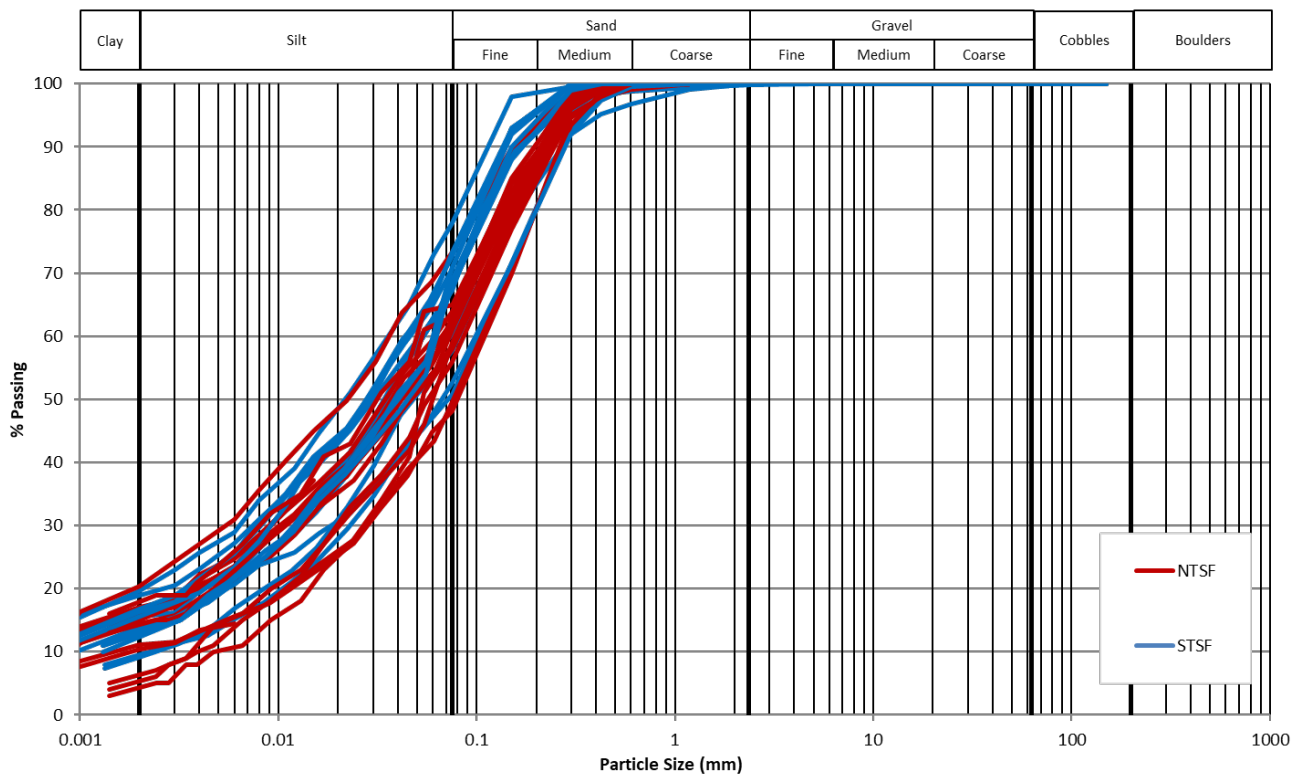


Figure 3-4 Tailings Particle Size Distribution Summary

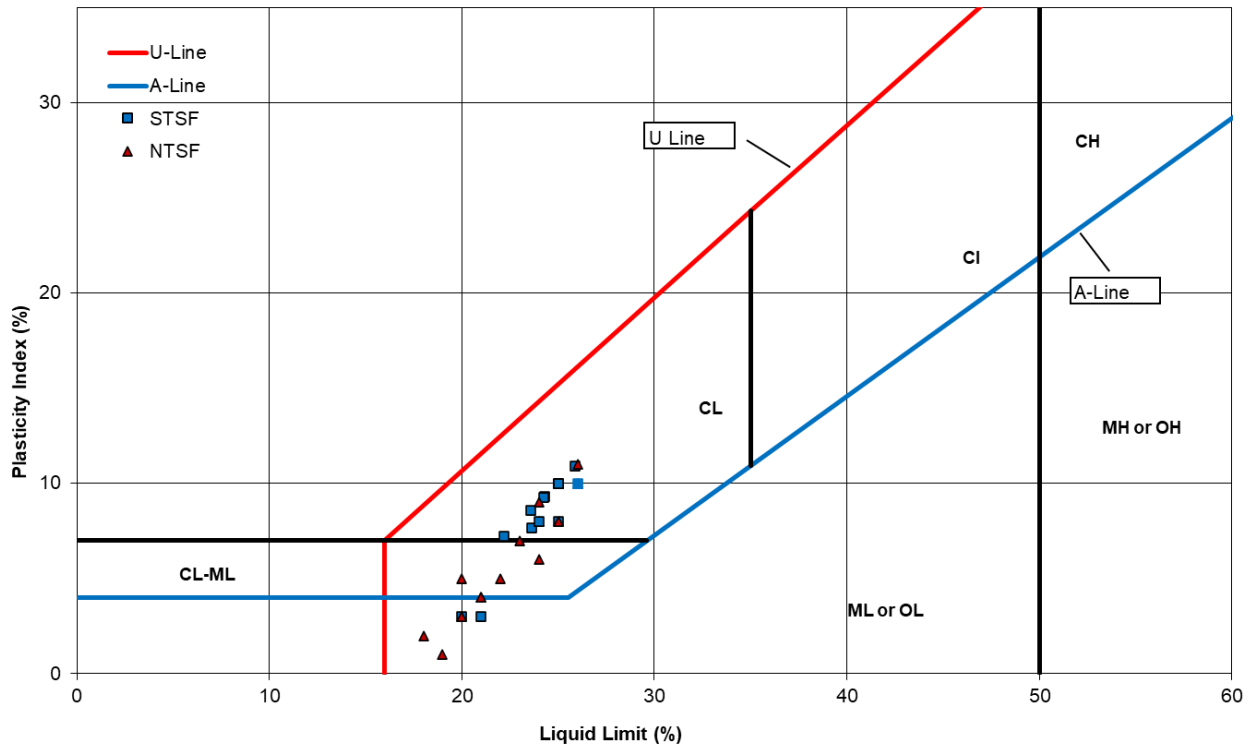


Figure 3-5 Tailings Plasticity Tests Summary

3.4.1 Tailings Shear Strength

The tailings shear strength parameters for the NTSF and the STSF have been selected based on the results of previous investigations.

The interpreted tailings parameters are summarised in Table 3.4.

Table 3.4 NTSF – STSF Tailings Property Summary

Facility	Unit Weight (kN/m ³)		N _{kt}	State Parameter (ψ)	Design Su/σ' _{vf}	Design Sr/σ' _{vo}	Existing Condition Su/σ' _{vo}
	Bulk	Saturated					
NTSF (Slump)	20	20	11	+0.08	0.20	0.08	0.22
NTSF	20	20	11	+0.08	0.20	0.08	0.20
STSF	20	20	11	+0.08	0.20	0.07	0.21

3.5 Recovered Sand Characterisation

The detailed interpretation of the recovered sand is presented in Appendix A. Appendix A presents the testing background for recovered sand completed between 2023 and the most recent 2025 data (KCB, 2025). It is noted that the testing sources include two different streams: the hydrocyclone plant, with fines contents ranging from 12% to 17.5%, and the hydrofloat stream, with an average fines content of 6.3%. Due to the constraints in obtaining samples within this specified range, the testing was completed on available samples from the hydrofloat (KCB, 2025). As such, all interpretations presented here and in Appendix A are based on hydrofloat material.

The summary of the PSD tests performed on the recovered sand in early 2025 (KCB, 2025) is shown in Figure 3-6. The results indicate a predominantly fine to medium sand tailings grain size, with an average fines content of 6.3% and clay particles (<0.002 mm) comprising less than 2%.

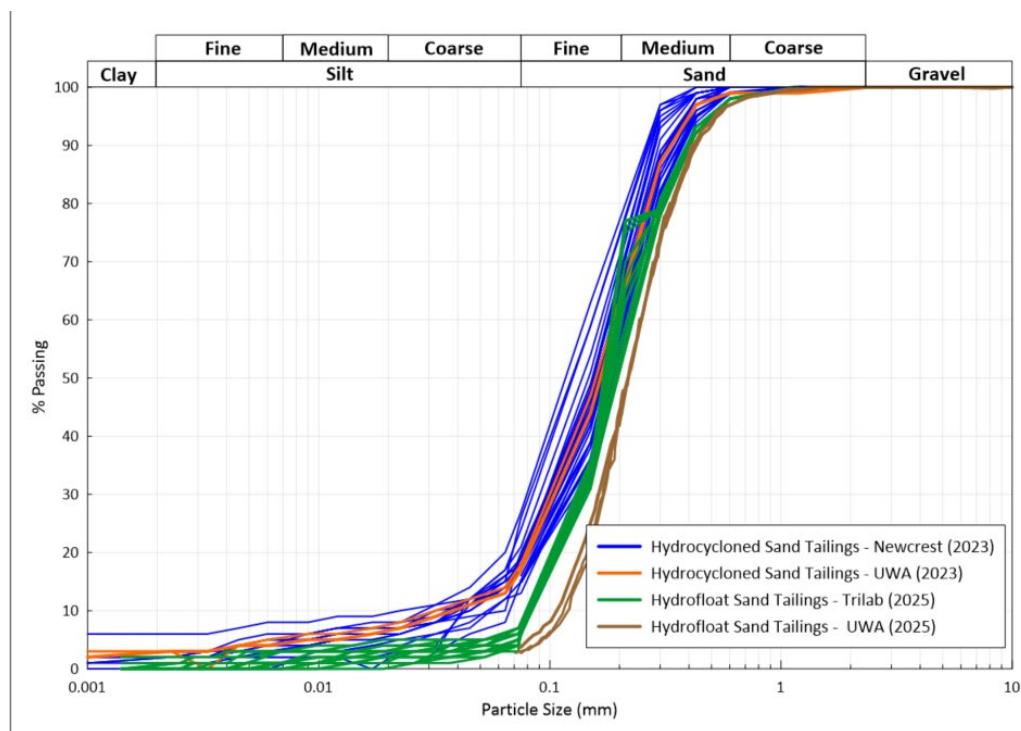


Figure 3-6 Particle Size Distribution for Recovered Sand

Figure 3-7 presents a summary of the available triaxial tests, from which an effective friction angle (ϕ') of 35° with no cohesion has been interpreted, corresponding to a critical state stress ratio (Mtc) of 1.43.

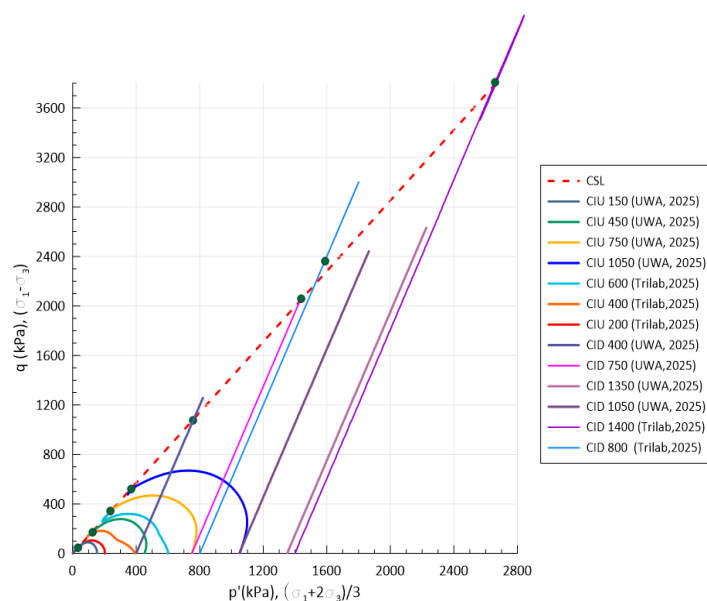


Figure 3-7 Recovered Sand – Single Stage Consolidated Undrained Triaxial Test Results – Stress Path

Figure 3-8 presents a summary of the undrained shear strength ratio indicating a 20th percentile value of 0.23. Notwithstanding these results, the design assumption for the recovered sand buttress will be compacted to a state parameter of -0.22, which is expected to induce dilative response. In such cases, the drained strength is expected to be lower than the peak undrained shear strength and therefore governs the design.

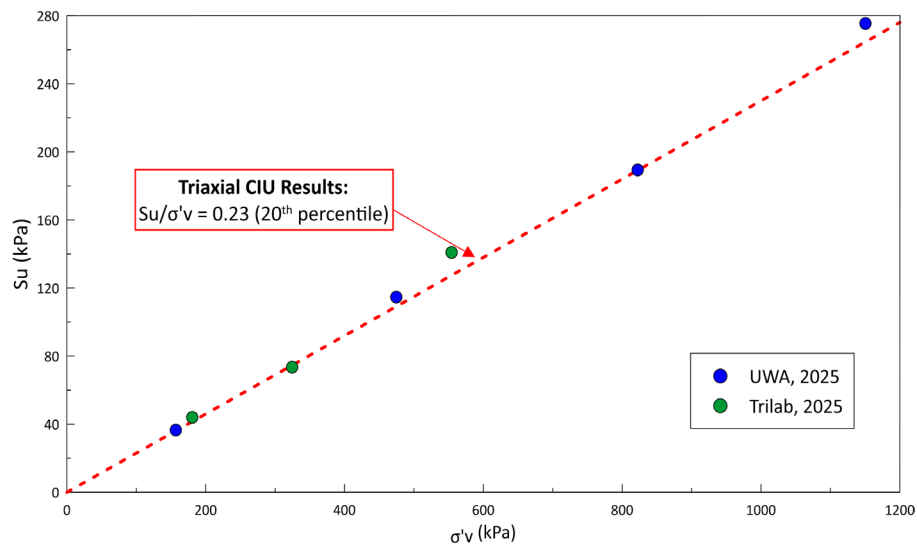


Figure 3-8 Compression Triaxial – Undrained Shear Strength Ratio (S_u/σ'_v)

The Critical State Locus (CSL) for recovered sand was developed based on the available data (KCB, 2025). The interpretation of CSL is shown in Figure 3-9.

The results indicate that the better fit through the results is given by the logarithmic CSL equation, which is defined as follows:

$$e_c = a - b (p'/100)^c$$

Where:

- e_c = critical state void ratio.
- p' = mean effective stress, in kPa.
- a , b and c = CSL parameters.

The parameters for a , b and c adopted for recovered sand are provided in Table 3.5

Table 3.5 Recovered Sand CSL Parameters Summary

Material	CSL Parameter		
	a	b	c
Recovered sand	0.988	0.0688	0.568

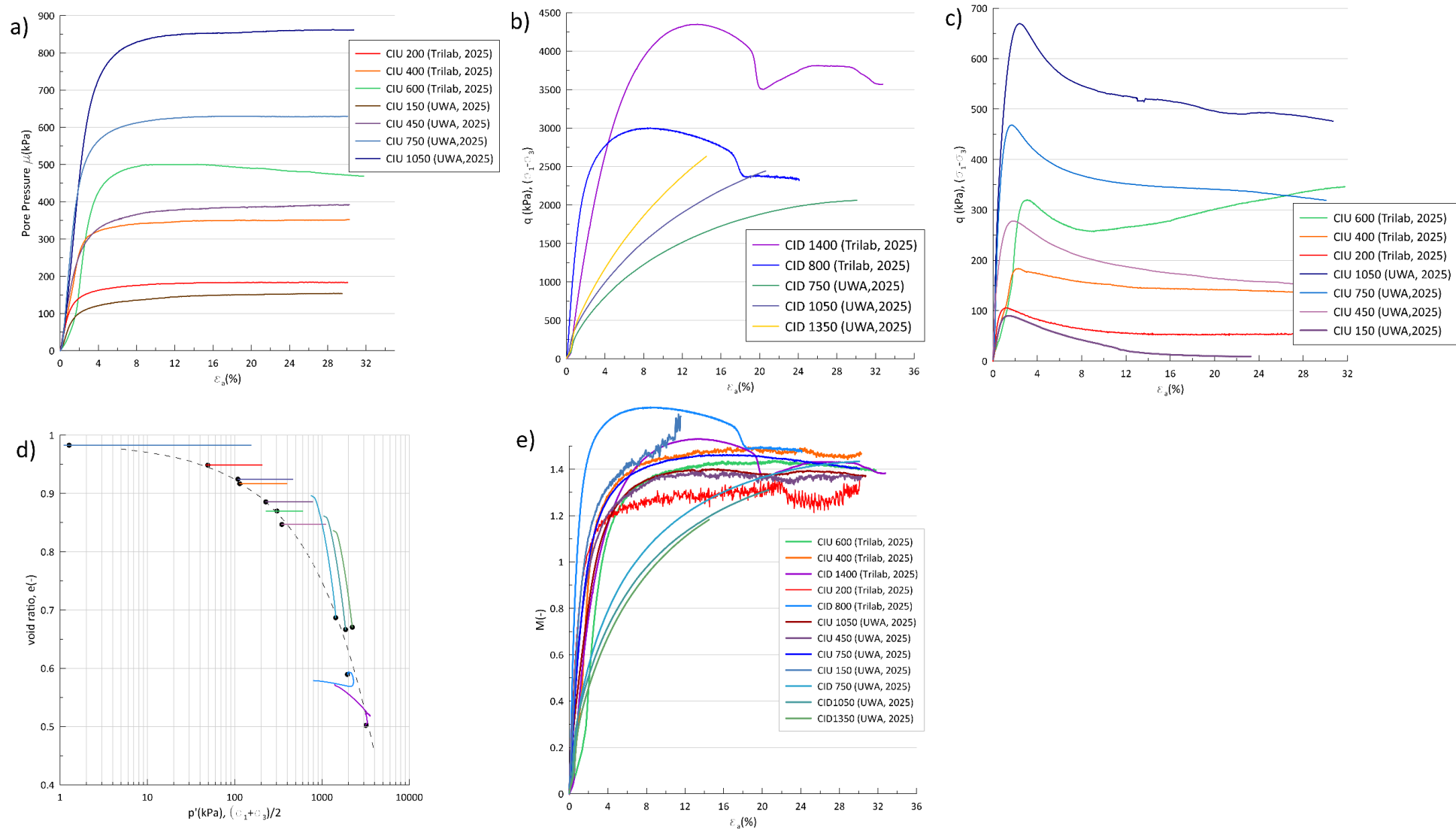


Figure 3-9 Triaxial Test Results – Evaluation Of Behaviour For Recovered Sand

3.6 Terrain Data

3.6.1 Height Datum

Two height datums are currently used at Cadia, the Geocentric Datum of Australia (GDA) 2020 and the Cadia Mine Grid Datum (MGD). The MGD is 5000 m higher than the GDA. In this report, the MGD has been used, unless stated otherwise.

3.6.2 Digital Survey Data

The following digital data has been provided to GHD through the previous project phases. The data has been used to develop the three-dimensional geometric model for the NTSF buttressing. The data is in the mine grid unless otherwise indicated.

- Survey date: August 2025.
- As built: August 2025.

4. Design Acceptance Criteria

The geotechnical design acceptance is presented in Table 4.1.

Table 4.1 *Geotechnical Design Basis Summary*

Item	Design Basis	
Seismic Loading	The NTSF, including the buttress, complies with the ANCOLD Guidelines (ANCOLD, 2019) and therefore considers the long-term (ultimate) configuration with loading from a 1 in 10,000-year event.	
Drainage	The design of the buttress drainage system aims to maintain low phreatic levels in the recovered sand. Monitoring of phreatic levels in the buttress is required. The filter design considers the procedure indicated in Fell (2014) with a focus on preventing internal erosion in the structure and avoiding internal flow of recovered sand from the buttress to the southern TSF.	
Stockpiles	The stockpile should meet zero-release risk criteria and achieve a Factor of Safety (FoS) of 1.3.	
Seismic Loads		
Safety Evaluation Earthquake (SEE)	1:10,000	Source: ANCOLD (2019) (Table 7), Newmont (2025)
1 in 10,000 Annual Exceedance Probability (AEP) Post Closure	1 in 10,000 AEP	Source: GHD (2025) ANCOLD (2019) (Table 7)
Operation Basis Earthquake (OBE, 1 in 5000 AEP, PGA)	0.120 g	Source: GHD (2025) ANCOLD (2019) (Table 7)
SEE 1 in 10,000 AEP (PGA)	0.175 g	Source: GHD (2025) ANCOLD (2019) (Table 7)
Final and long-term stability Design Criteria		
Minimum FoS: long-term drained conditions using effective strength	1.5	Source: ANCOLD (2019) (Table 8)
Minimum FoS: undrained	1.5	Source: ANCOLD (2019) (Table 8)
Minimum FoS: short-term undrained using consolidated undrained strength	1.3 (no risk of tailings release) 1.5 (risk of tailings release)	Source: ANCOLD (2019) (Table 8)
Minimum FoS: post-liquefaction	1.0 (justified through a risk assessment process and demonstrating non-release of tailings during the design seismic event by conducting a deformation analysis, using residual strengths, proving the deformation is acceptable.)	Source: ANCOLD (2019) (Table 8)
Note: g = grams; PGA = Peak		

5. Design

5.1 Recovered Sand Buttress

The Area 3 design involves the construction of a rock armoured recovered sand buttress. This design includes using the approved rock buttress as a platform that will serve as the initial working surface over the STSF tailings. An underdrain system is incorporated above the rock platform to capture excess water from the recovered sand slurry during deposition. The underdrain system is designed to manage excess water and aid in the consolidation of the recovered sand, the underdrain system will be redundant after construction is completed, in addition a layer of general fill will be added on the buttress surface for closure. (Refer to Figure 5-1).

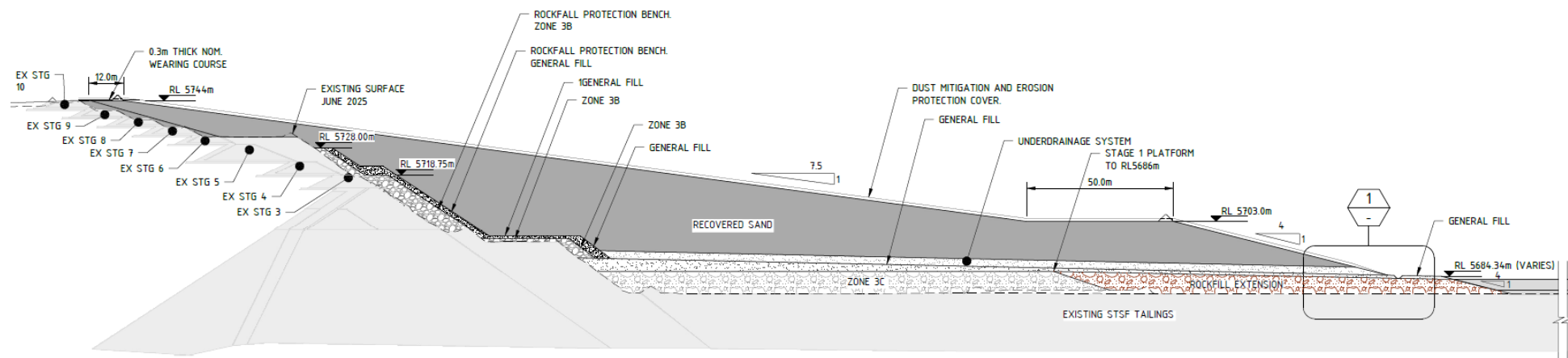


Figure 5-1 Area 3 NTSF Recovered Sand Tailings Buttress Typical Section

5.2 Stockpiles

The production of recovered sand for the proposed buttressing would entirely be created at the ore treatment mill and therefore, is directly dependent on the mill production rate. As the mill typically operates with a consistent throughput a recovered sand production rate of approximately 29,000 tonnes per day is expected. Due to constraints associated with the cell availability for recovered sands placement within the buttress, supporting stockpiling locations are required in the following scenarios:

- Recovered sand produced during NTSF Area 3 works that is in excess of that which can be received each day for the buttress.
- Recovered sand not meeting specifications for buttress construction.

The placement of recovered sand within stockpiles is proposed in two primary zones located within the STSF impoundment (designated as Stockpile 1 and Stockpile 2).

- **Stockpile 1:** Recovered sand that may not meet the specifications for buttress construction and / or excess recovered sand would be placed at the toe of the buttress.
- **Stockpile 2:** Allocated to the north-eastern sector of the STSF impoundment, this zone is not adjacent to buttress structures and is intended to manage recovered sand that may not meet the specifications for buttress construction and / or the excess recovered sand as required during the construction of the buttress.

The final height of the stockpiles will be restricted to the approved height limit for the STSF (RL702m GDA datum, RL5702m MGD), and all materials will remain within the designated area of the STSF. Figure 5-2 illustrates the plan-view layout of the recovered sand stockpiles.

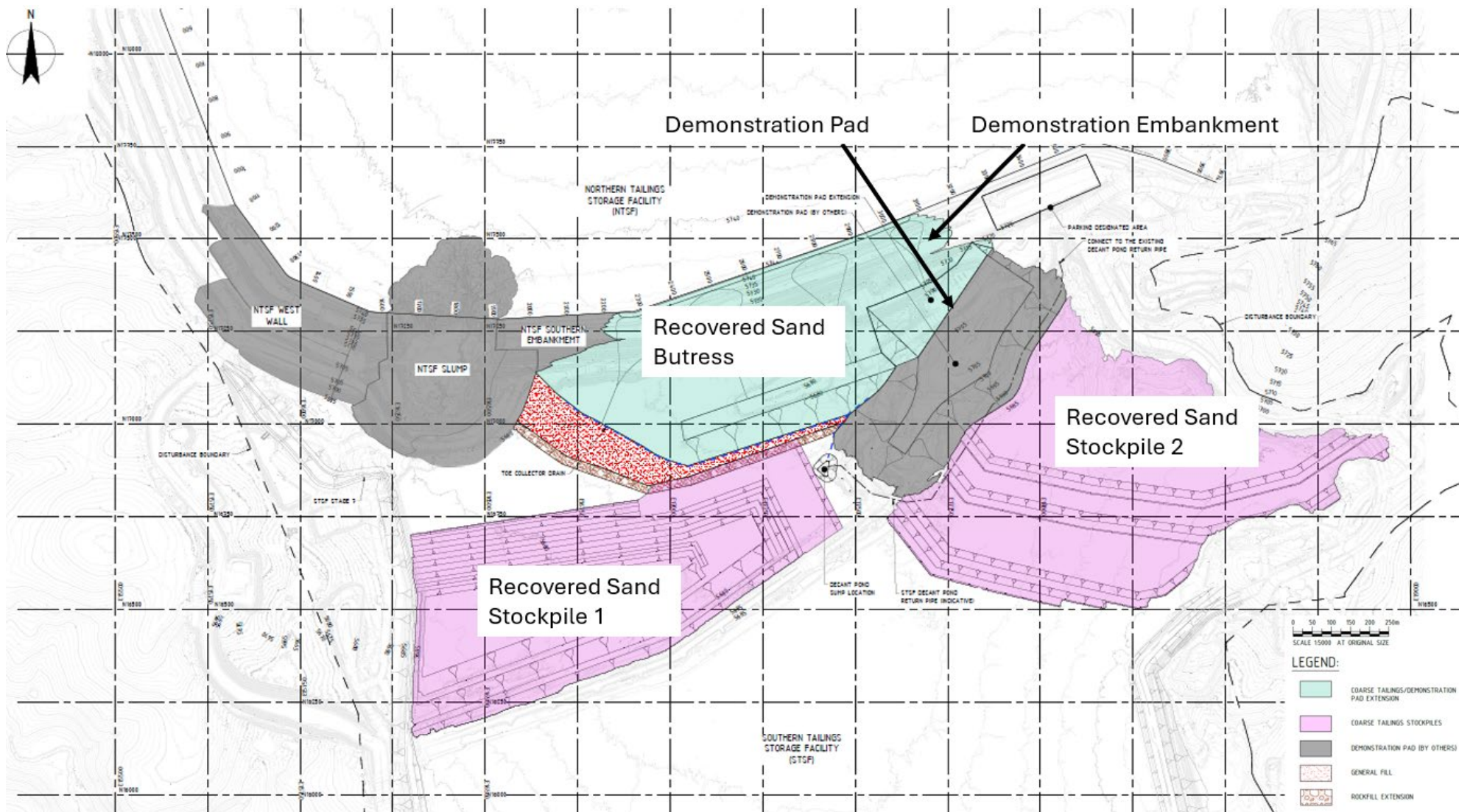


Figure 5-2 Plan Layout of Recovered Sand Stockpiles.

6. Seepage analysis

6.1 General

A two-dimensional seepage analysis was conducted using GeoStudio v2024.1 software through the SEEP/W module. This software uses the finite element method to simulate water flow through soil. Both steady-state and transient conditions were analysed to understand the movement of water within the NTSF, the Recovered Sand buttress and the deposited tailings in the STSF.

The software allows for modelling the materials as saturated or saturated/unsaturated. The former only requires the saturated volumetric water content (θ_s) and the saturated permeability, while the latter accounts for partial saturation, and requires the Soil Water Characteristic Curve (SWCC) and the Hydraulic Conductivity Curve (HCC) of each material.

6.2 Cross sections and geometry

The general Layout plan and cross-section are shown in Figure 6-1. The analysed cross-section is the CH2200, shown in Figure 6-2.

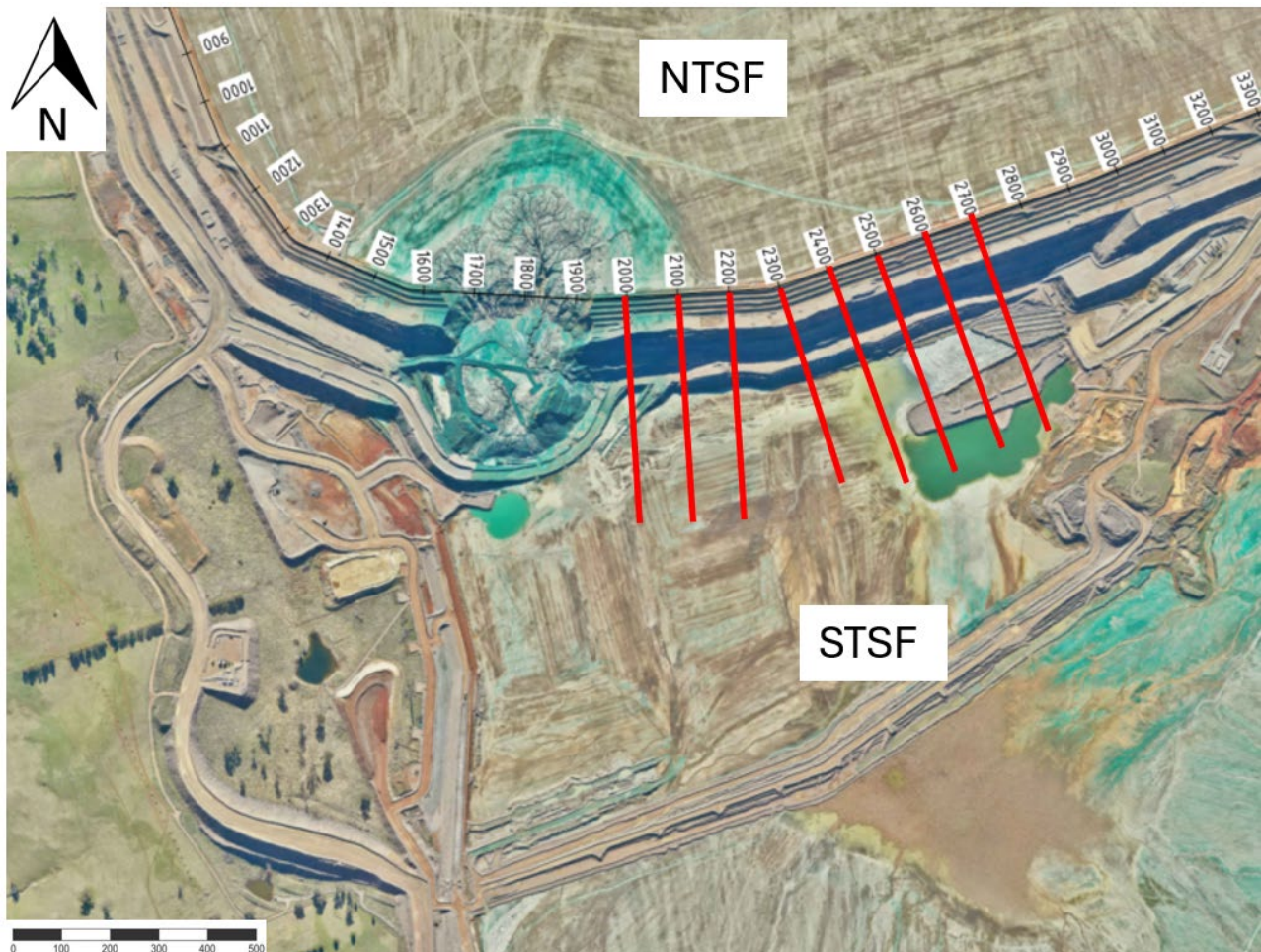


Figure 6-1 NTSF Southern Wall Layout

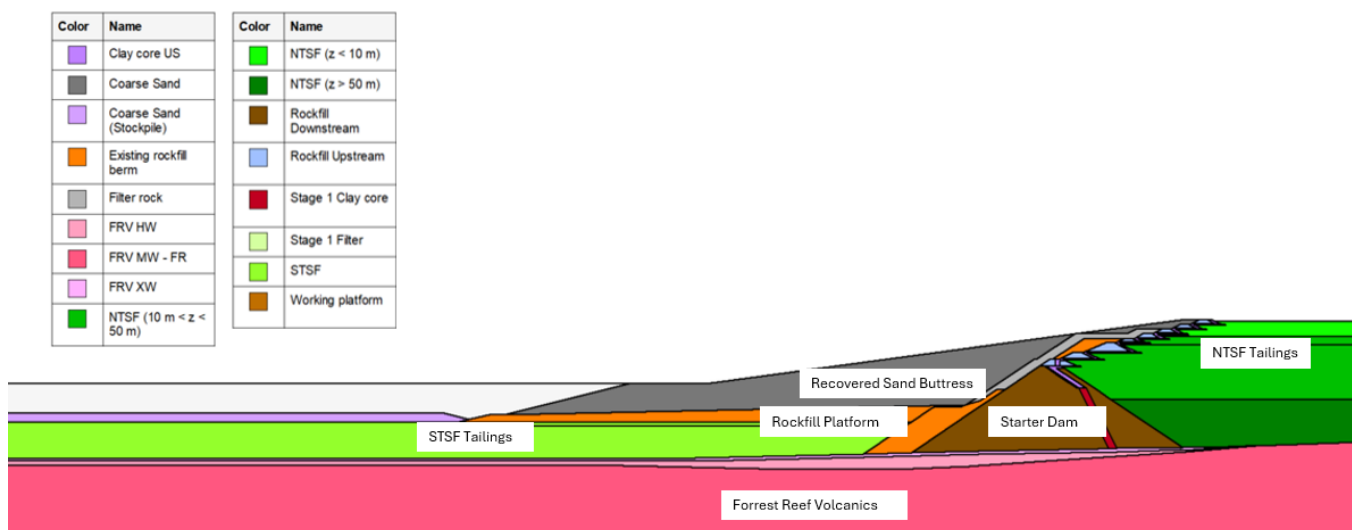


Figure 6-2 GeoStudio Analysed cross-section (CH2200).

6.3 Material properties

The adopted material models' properties are shown in Table 6.1. All material has been modelled as saturated/unsaturated, apart from the foundation rock, corresponding to FRV rock HW and MW.

Table 6.1 Adopted material models and parameters

Material	Material Model	Saturated Permeability (m/s)	K _v /K _h ratio
FRV XW	Saturated/Unsaturated	3×10 ⁻⁷ m/s	0.1
FRV HW	Saturated Only	2×10 ⁻⁷ m/s	0.1
FRV MW	Saturated Only	3.5×10 ⁻⁸ m/s	0.1
NTSF from surface to 10 m depth	Saturated/Unsaturated	2×10 ⁻⁷ m/s	0.1
NTSF 10 m to 50 m depth	Saturated/Unsaturated	1.4×10 ⁻⁷ m/s	0.1
NTSF below 50 m depth	Saturated/Unsaturated	6×10 ⁻⁸ m/s	0.1
STSF tailings	Saturated/Unsaturated	5×10 ⁻⁸ m/s	0.1
Recovered Sand	Saturated/Unsaturated	5×10 ⁻⁶ m/s	1.0
Clay Core	Saturated/Unsaturated	1×10 ⁻⁹ m/s	0.1
Stage 1 Clay Core	Saturated/Unsaturated	1×10 ⁻⁹ m/s	0.1
Stage 1 Filter	Saturated/Unsaturated	1×10 ⁻⁶ m/s	1.0
Rockfill upstream	Saturated/Unsaturated	2×10 ⁻⁵ m/s	1.0
Rockfill Downstream	Saturated/Unsaturated	2×10 ⁻⁵ m/s	1.0
Rockfill berm	Saturated/Unsaturated	2×10 ⁻⁵ m/s	1.0
Filter rock	Saturated/Unsaturated	5×10 ⁻⁴ m/s	1.0
Filter Sand	Saturated/Unsaturated	5×10 ⁻⁵ m/s	1.0

Note: Hydraulic conductivity is expressed in units of metres per second (m/s). The ratio K_v/K_h represents the hydraulic conductivity anisotropy and is defined as the ratio of vertical hydraulic conductivity (K_v) to horizontal hydraulic conductivity (K_h)

6.3.1 Soil Water Characteristic Curves (SWCC)

All material, except the FRV Rock (HW and MW), was modelled as saturated/unsaturated, which means that a SWCC for each material is required as input.

Figure 6-3 shows the SWCC defined for each material. As no specific laboratory tests to determine the SWCC were conducted, the curves were approximated using the available curves provided by GeoStudio, which depend on the PSD of the soil. In addition, the saturated volumetric water content (θ_s) was defined based on the dry unit weight (γ_d) and the specific gravity of each material.

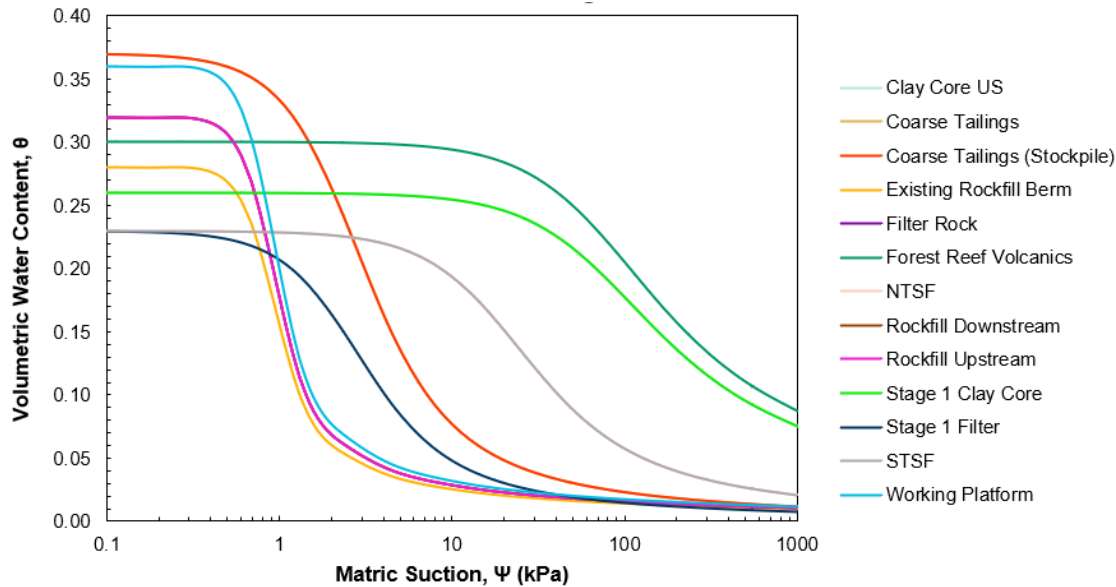


Figure 6-3 Soil Water Characteristic Curve (SWCC)

6.3.2 Hydraulic Conductivity Curves (HCC)

Like the SWCC, the HCC were estimated based on the saturated hydraulic permeability of the material and the SWCC itself, through the Van Genuchten method. The HCC are shown in Figure 6-4.

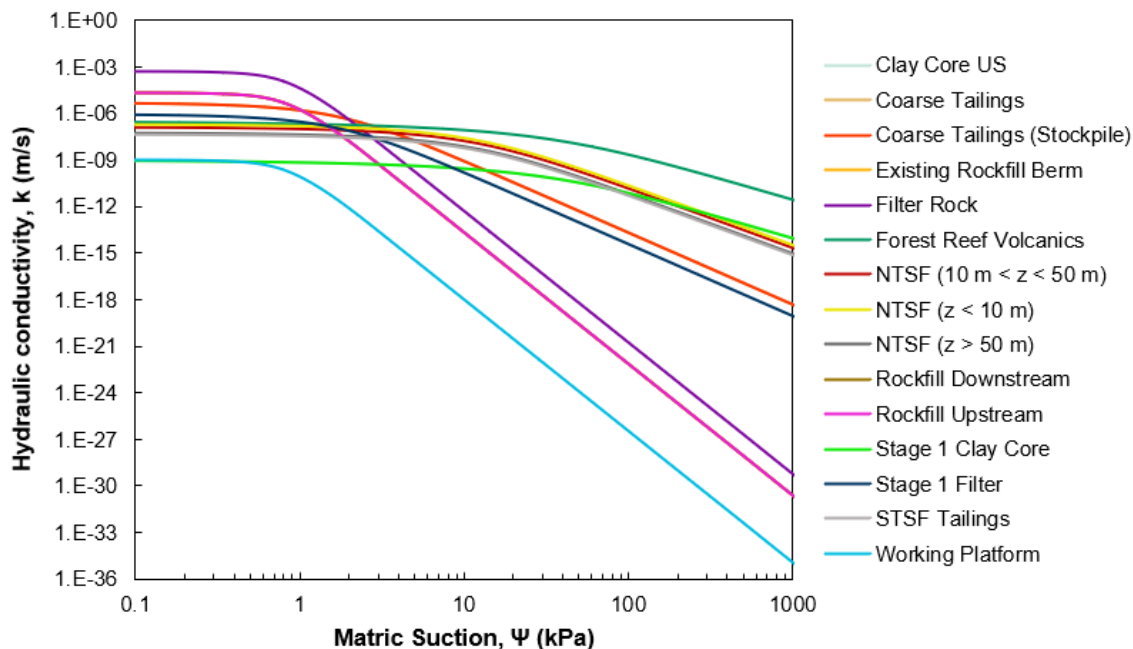


Figure 6-4 Hydraulic Conductivity Curves (HCC)

6.4 Analysis Methodology

6.4.1 Model characteristics

The model was discretised at 1-meter intervals, with mesh refinement applied in key areas such as the embankment. Section CH2200 was identified as the most critical and was considered the representative profile for the seepage analysis. Please note that the elevation for this section is provided using (GDA) 2020. For further details, refer to Section 3.6.1.

Two modelling scenarios were developed. The first considered steady-state conditions with the Recovered Sand buttress in place, to analyse the behaviour of hydraulic gradients during the post-construction phase. The second assumed the recommissioning of the STSF, with tailings placed to RL 703.2 m and RL 730 m. A transient analysis was then carried out to RL 703.2 m to evaluate the potential effects of tailings deposition in the STSF.

6.4.2 Boundary conditions

The boundary conditions for the seepage assessment were defined as follows:

- Water Total Head of RL 737m at the upstream side of the NTSF embankment, based on the normal operating level for design storage events.
- Water Total Head at RL 678 m, RL 703.2 m, or RL 730 m at the downstream side on the embankment, depending on the placement scenario of the STSF tailings.

6.5 Results

6.5.1 Steady state – No STSF tailings deposition

The results of the steady state analysis for the cross-section CH2200 are shown in Figure 6-5 and Figure 6-6. It is observed that the piezometric line enters the upstream side of the embankment and drops down due to the presence of the low-permeability stage 1 clay core, to a level of RL678m, coinciding with the STSF tailings level.

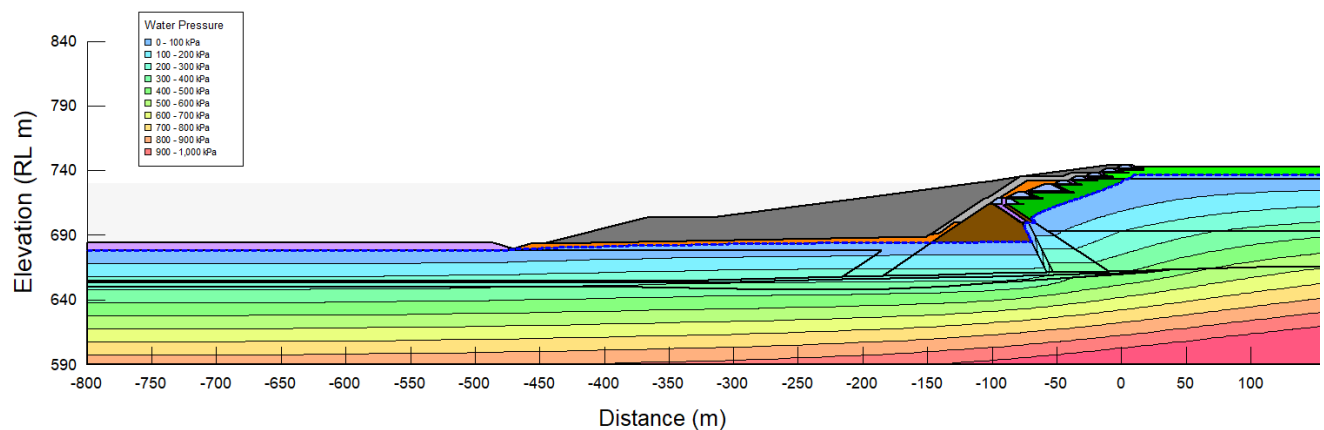


Figure 6-5 Pore water pressure profile – Steady state analysis results (CH2200)

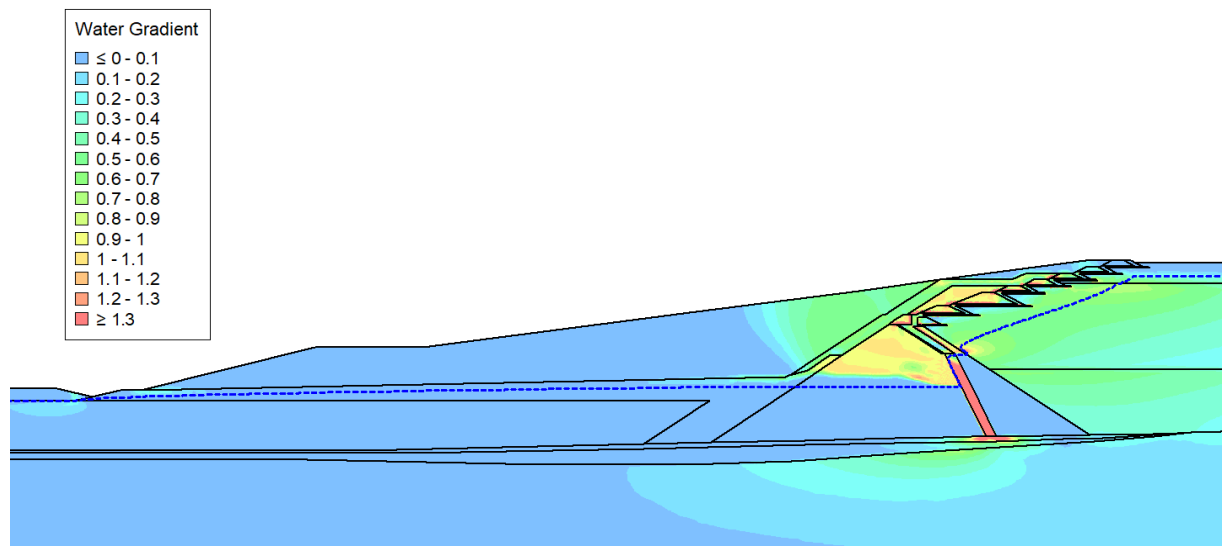


Figure 6-6 Hydraulic Gradients – Steady state analysis (CH2200)

The water flows towards the embankment toe in the existing rockfill berm and reaches a maximum value of $8 \times 10^{-7} \text{ m}^3/\text{s}/\text{m}^2$.

6.5.2 Steady state – STSF tailings deposition

The STSF tailings were deposited at elevations of RL 703.2 m and 730 m, considered in a saturated condition. The resulting piezometric line and the pore water pressure profile for each scenario are shown in Figure 6-7.

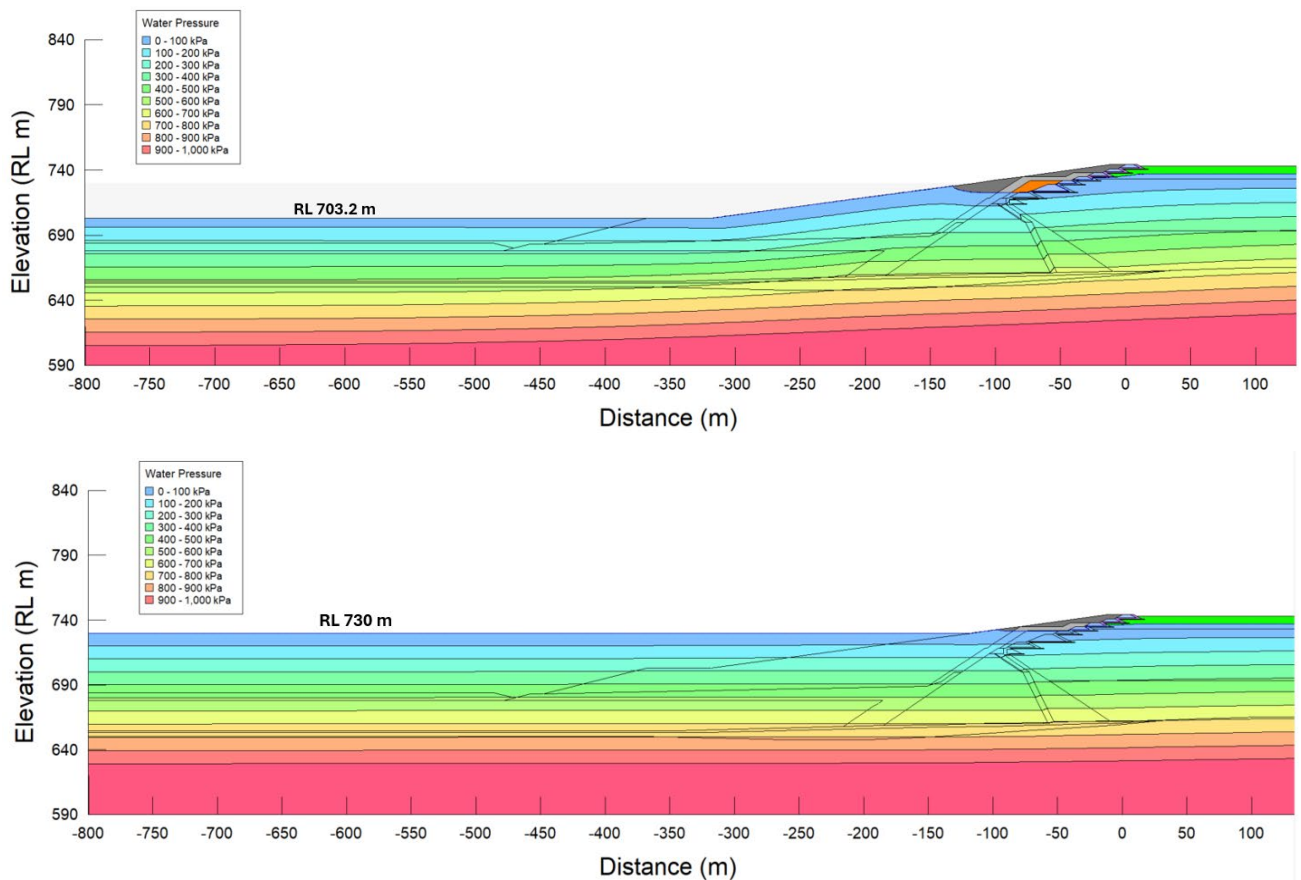


Figure 6-7 Pore water pressure profile – Steady state analysis / STSF tailings deposition (CH2200)

As observed, the piezometric line increases at the downstream part of the embankment, where the STSF tailings are deposited.

6.5.3 Transient – STSF tailings deposition

A transient analysis was performed at an elevation of RL 703.2 m to assess the effect of the STSF tailings deposition on the hydraulic gradients of the dam during the initial stages. The analysis was conducted in five different sections, as shown in Figure 6-8.

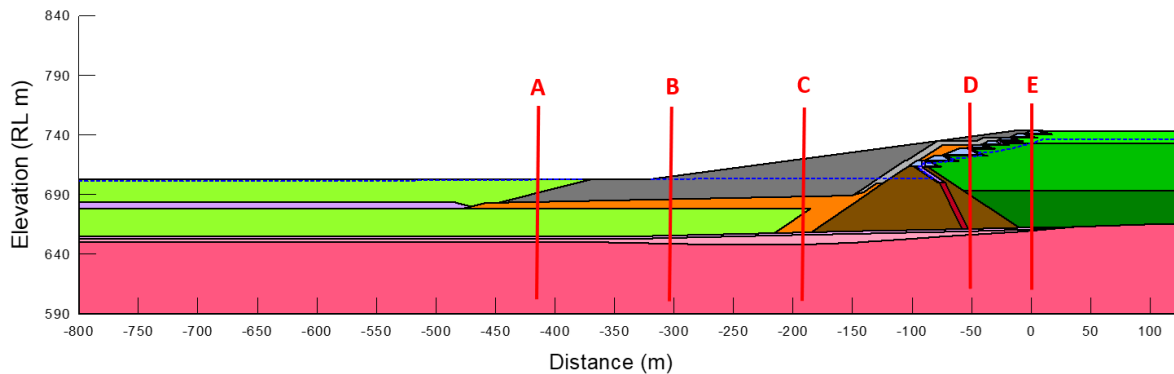


Figure 6-8 *Transient seepage analysis – Analysed cross-sections*

The STSF tailings are deposited in a saturated condition. The timeframe analysed corresponds to 1, 10, 100, 200, 300, 400, 500, and 800 days. The results of the hydraulic gradients for the mentioned time frames and cross sections are shown in Figure 6-9.

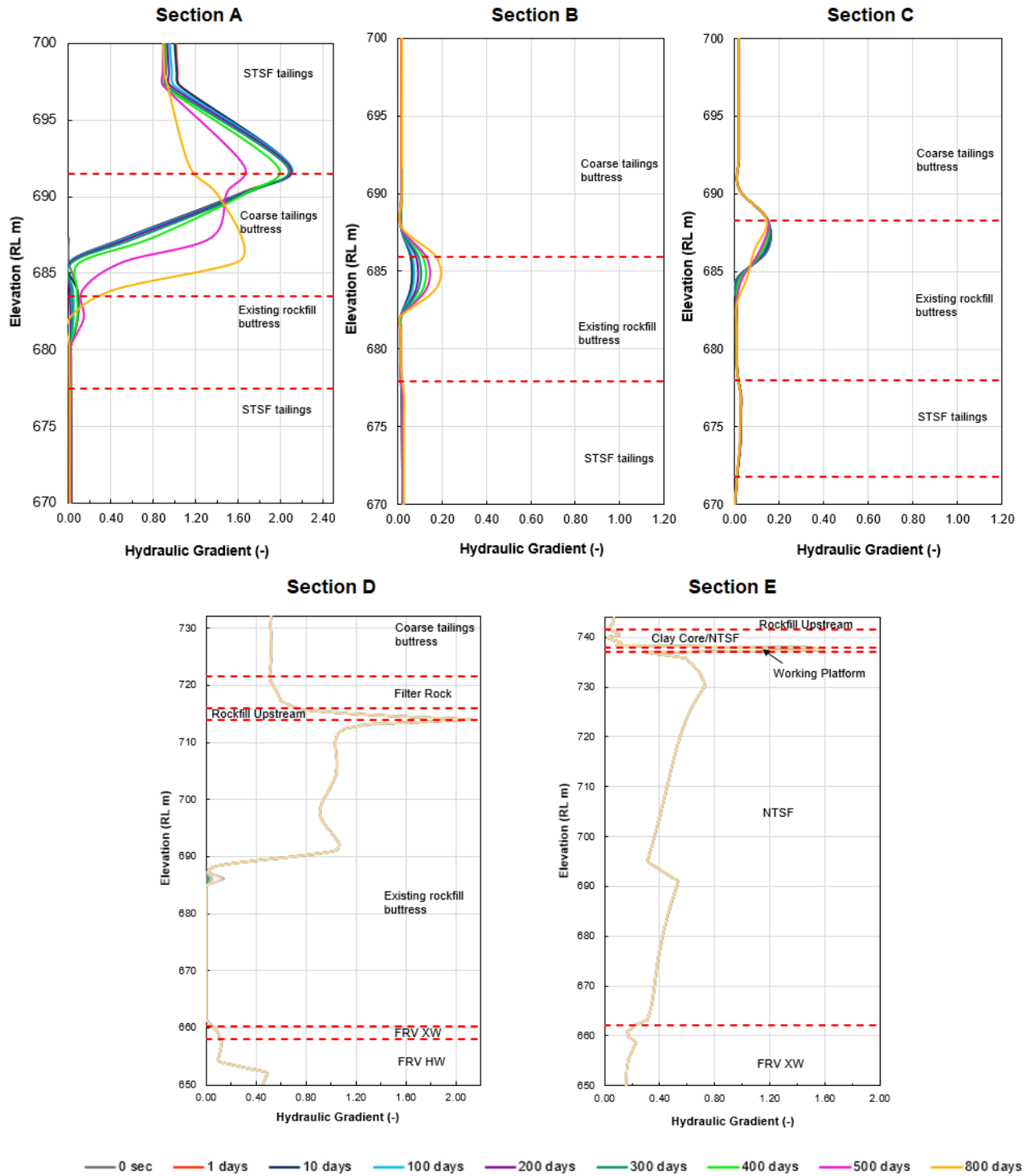


Figure 6-9 Transient seepage analysis results – Hydraulic gradients

The following key findings are obtained from the transient seepage analysis:

- The highest hydraulic gradients are found at the interface between the STSF tailings and the Recovered Sand buttress in Section A. Values exceed 2.0 due to the contrast in water content between the materials. The STSF tailings are fully saturated, while the Recovered Sand remain relatively unsaturated. This difference causes a significant movement of water toward the Recovered Sand buttress. The gradient becomes elevated almost immediately after the placement of the STSF tailings and begins to decrease after approximately 400 days of deposition.
- In section A, after 400 days of the STSF tailings deposition, the location of the maximum hydraulic gradient shifts from the interface to within the Recovered Sand buttress. This change aligns with a rise in the piezometric level inside the buttress material, which indicates increased saturation, when the hydraulic gradient at the interface between the Recovered Sand Buttress and the Existing Rockfill Buttress, and within the Existing Rockfill Buttress itself, reaches values close to 0.10. This indicates a moderate but continuous flow of water toward the downstream structure
- In Sections B and C, the maximum hydraulic gradient reaches approximately 0.20 at the interface between the Recovered Sand buttress and the Existing Rockfill Buttress. The gradient within the other materials in these sections remains negligible.
- In Sections D and E, higher hydraulic gradients (above 2.0) are reached at the interface between the upstream rockfill and Clay Core material, as a result of the sharp contrast in permeability between the two materials.

6.5.4 Discussion

Under baseline conditions (no STSF deposition), the piezometric line enters the upstream face, drops across the Stage 1 clay core, and levels at about RL 678 m; calculated flux at the downstream toe within the rockfill berm is considered small ($\sim 8 \times 10^{-7} \text{ m}^3/\text{s}/\text{m}^2$). With saturated STSF tailings placed to RL 703.2 m, the piezometric line rises to the new tailings surface on the downstream side, as expected from the added head.

The transient response shows a localised peak in Section A at the STSF–Recovered Sand interface immediately after placement, with hydraulic gradients exceeding 2.0 due to the saturation contrast. As the buttress wets up, these peaks decay and after ~ 400 days, the maximum hydraulic gradients shift into the Recovered Sand. In Sections B and C, peak gradients are ~ 0.20 at the Recovered Sand–existing rockfill interface, while gradients elsewhere remain low; within the rockfill itself, they are ~ 0.03 , indicating modest, steady outflow.

These elevated gradients are confined to narrow interface bands where head loss concentrates. With the specified 2E transition and 2D filter spanning these interfaces, particle migration is controlled, and the likelihood of contact erosion or piping is low. The modelling assumes immediate saturated placement; staged deposition in practice should produce lower transient peaks. Instrumentation at the interface band is recommended, and this should confirm the decay and localisation of gradients over time.

7. Slope Stability Analysis

The slope stability analysis of the southern wall buttress at the NTSF area 3 and the proposed stockpiles was conducted using SLOPE/W, a two-dimensional software package developed by Geostudio (Figure 6-1). The software employs the Limit Equilibrium Method (LEM) to evaluate the FoS slopes against failure. The Morgenstern-Price method was selected to determine the FoS of circular and non-circular slide surfaces.

7.1 Cross Sections

Eight sections of the NTSF southern wall, between CH2000 and CH2700 at 100-m intervals have been assessed. Figure 7-1 shows the layout plan and representative cross-sections.

For each stockpile, the critical highest cross-section was assessed, as shown in Figure 7-1. For Stockpile 1, Section A–A' was analysed for stability on both the northern and southern slopes, while for Stockpile 2, the critical Section B–B' was analysed.

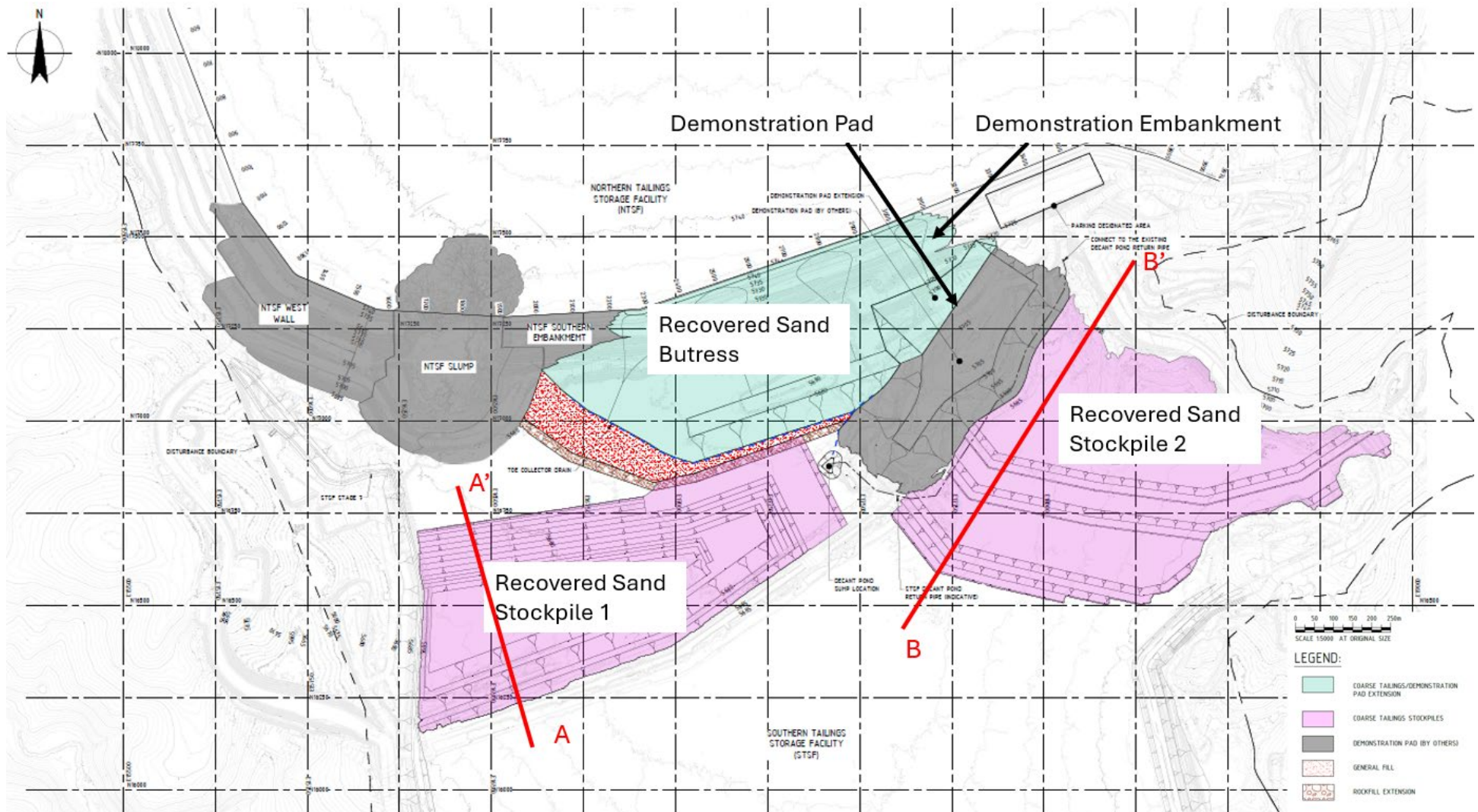


Figure 7-1 Stockpiles Plan View Indicating the location of the sections selected for the analysis.

7.2 Methodology

7.2.1 Loading Conditions

The loading conditions assessed were based on the recommendations provided by ANCOLD guidelines on tailings dams indicated in Table 4.1.

7.2.2 Model Characteristics

The following have been adopted:

- The phreatic line applied in the stability assessment for the buttress reflects the steady-state conditions established through the seepage evaluation.
- The phreatic surface in the stability model for both stockpiles was considered at the stockpile surface to represent a high pore pressure scenario and account for potential adverse hydraulic conditions.
- The stability analysis centred on three main failure mechanisms, as shown in Figure 7-2.
 - Global failure: global failure mechanism passing through the foundation materials below the embankment, (like the NTSF Slump).
 - Upstream connection: failure surfaces initiating upstream of the embankment and propagating through it at mid-height.
 - A local failure surface at the toe of the embankment. The failures under consideration are those that have reached the recovered sand bench.
- A minimum post-seismic FoS of 1.0 has been considered (Table 4.1), which is consistent with the ANCOLD guidelines on tailings dams (ANCOLD, 2019). It should be noted that the adopted post-liquefied strengths are conservative, as is the assumption that all tailings will be fully liquefied.

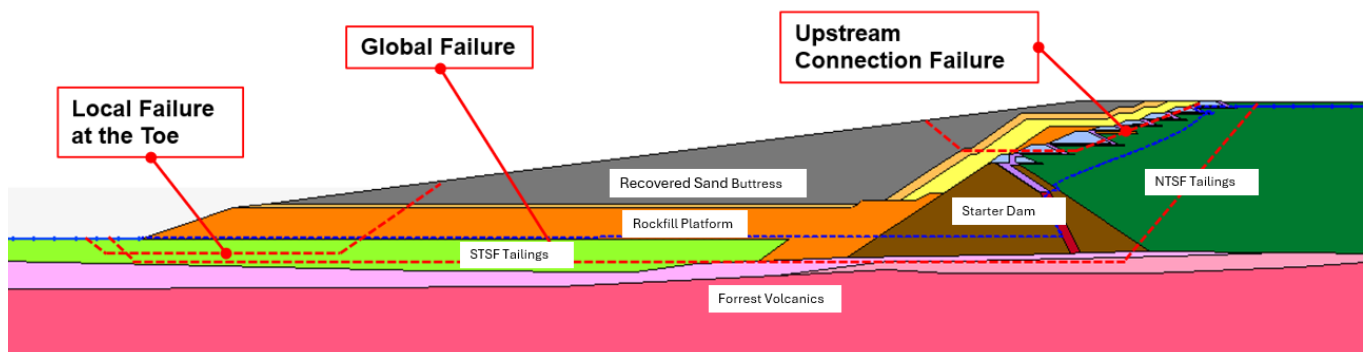


Figure 7-2 Identified Prime Failure Modes From Stability Analysis.(CH2200).

7.2.3 Material Parameters for Limit Equilibrium Analyses

Table 7.1 shows the strength parameters used for stability analyses.

Table 7.1 *Limit Equilibrium Materials Parameters Summary*

Material	Property						
	Drained			Undrained		Residual	
	γ (kN/m ³)	c' (kPa)	ϕ' (°)	S_u/σ'_{vf}	ϕ_{cu} (°)	$S_{u(res)}/\sigma'_{v}$	$\phi'_{residual}$ (°)
Rockfill Upstream	19	0	35	-	-	-	-
Clay Upstream	20	10	27	-	-	-	-
Working Platform	18	0	35	-	-	-	-
Downstream Rockfill	19	0	40	-	-	-	-
Transition Zone	20	0	42	-	-	-	-
Clay Core Zone 1	20	0	23	0.29	16	-	-
FRV (RS/XW) $\sigma'_v < 400\text{kPa}$	19	0	27	-	-	-	-
FRV (RS/XW) for $400 \leq \sigma'_v < 1000\text{kPa}$	19	0	25	$0.475 - 0.00019\sigma'_{vo}$	(*)	-	11
FRV (RS/XW) for σ'_v $\geq 1000\text{kPa}$	19	0	25	0.28	16	-	11
FRV HW	19	140	36	-	-	-	-
FRV MW-FR	19	430	36	-	-	-	-
Buttress / Rockfill	19	-	Leps ^(*)	-	-	-	-
Tailings STSF	20	0	34	0.20	11	0.07	-
Tailings NTSF	20	0	34	0.20	11	0.08	-
Recovered Sand	17	0	35	0.24	-	-	31
Notes: γ : unit weight; FRV: Forest Reef Volcanics; (*) Leps (1970) lower bound adopted.							

8. Slope Stability Results

The results of the Limit Equilibrium (LE) Analyses stability are summarised in Table 8.1, and stability plots are presented in Appendix B, which includes the undrained case, the post-liquefaction case, and the drained case. Note that this table shows the lowest FoS of either the global or the upstream connection slips surfaces.

The results indicate that for all the sections, the required FoS for both drained and undrained conditions, as well as the post-seismic case, meet the guidelines set out by ANCOLD (2019) on Table 8 (refer to Table 4.1)

Figure 8-1 shows a typical FoS for global failure surface.

Table 8.1 Achieved FoS for Buttress Stability Analysis

Section	CH2000	CH2100	CH2200	CH2300	CH2400	CH2500	CH2600	CH2700
Loading condition	Achieved FoS							
Post-seismic	1.4	1.2	1.2	1.4	1.0	1.2	1.5	1.4
Post-seismic shallow toe	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.3
Undrained local	1.9	1.7	2.4	2.5	2.4	2.1	2.1	2.2
Undrained global	2.0	1.9	1.7	1.9	1.9	2.1	2.5	2.4
Undrained shallow toe	1.9	3.1	1.7	1.6	1.8	1.7	1.8	2.4
Drained Local	5.2	3.6	5.6	5.2	5.5	4.9	5.1	4.9
Drained global	4.2	4.7	3.6	3.5	3.5	4.0	3.7	3.7
Drained shallow toe	3.3	5.8	4.2	3.6	4.0	3.4	3.4	2.5

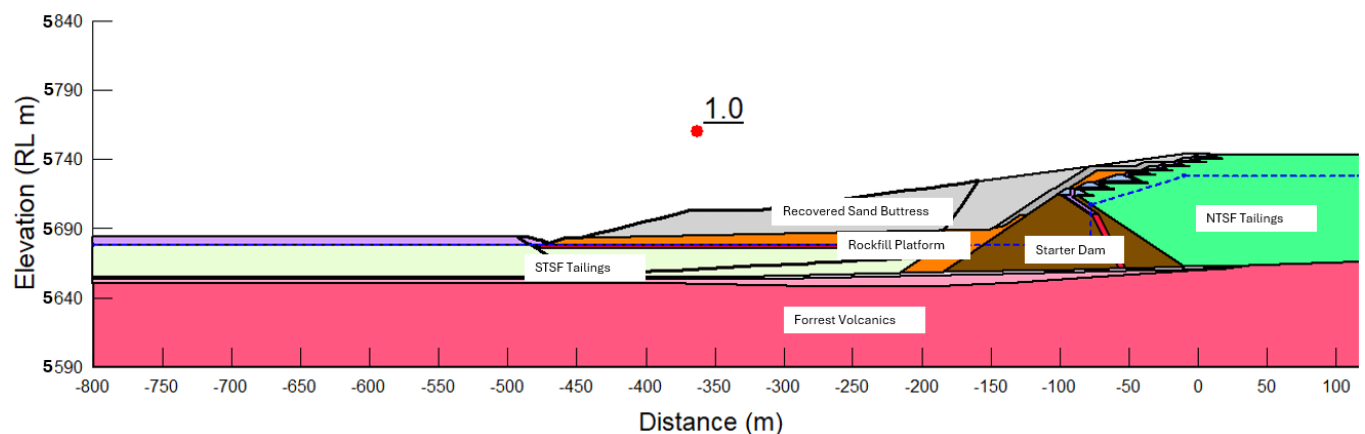


Figure 8-1 Critical Slope Surface, Post-Seismic Loading Condition. (CH2200)

8.1 Stockpiles Stability Analysis

The stability of Stockpiles 1 and 2 was assessed using LE Analyses considering both global slip surfaces and local slip surfaces through individual berms. For Stockpile 1, analyses were carried out on the northern slope, adjacent to the slump area, and the southern slope, which is supported by the existing bund within the STSF footprint. For the southern slope, only the global slip surface was evaluated due to the additional support provided by the bund.

The results are summarised in Table 8-2 and the stability plots are presented in Appendix B.

The results indicate that, for all cases assessed, the required FoS under both drained and undrained conditions satisfies the ANCOLD (2019) minimum criteria of 1.3, indicating no risk of tailings release.

Table 8.2 *Achieved FoS for Stockpiles Stability Analysis*

Stockpile	Failure	Achieved FoS	
		Undrained	Drained
Stockpile 1 - Northern slope	Global	1.3	3.4
Stockpile 1 - Southern slope	Global	1.4	3.6
Stockpile 2	Global	2.6	6.9

9. Mitigation Measures and Monitoring

9.1 Dust Mitigation

Dust-control measures in the buttress design were defined following Newmont's environmental standards (#NEM-SER-GDL-002) and in consideration of Newmont (2023) *Cadia Air Quality and Greenhouse Gas Management Plan* and establish sequence and strategy to mitigate dust and erosion from recovered sand throughout construction and operation.

9.1.1 Dust Source Identification

Two primary dust generation conditions have been identified as part of the design process.

- Dust generation during construction: this is associated with handling and placing recovered sand.
- Dust generation post-construction: this is caused by wind action over exposed recovered sand.

9.1.2 Mitigation Strategy

The dust mitigation strategy considers measures at three key points:

- The source (e.g., surfaces or processes where dust is generated).
- The pathway (e.g., the route dust travels, such as through wind).
- The receptor (e.g., the environment or nearby communities).

Mitigation along the pathway—such as wind fencing—is not feasible due to the open nature of the area. Similarly, receptor-level controls are not considered viable due to permitting constraints.

Based on the dust sources identified in Section 9.1.1 and these limitations, the strategy focuses on controlling erosion at the source. The following approach is proposed:

- The main strategy to reduce dust generation is the active deposition of wet recovered sand over exposed areas. The placement is planned to minimise extended drying periods, limiting exposure to only the time required for drying and consolidation.
- As soon as cell operation is completed, part of the downstream shell will need to be protected to reduce dust emissions and minimise the risk of erosion. To address this, a cover layer is proposed over the exposed downstream embankment, consisting of a 1 m layer of general fill placed over the final recovered sand surface.
- This cover should be placed as early as practical following cell completion, rather than waiting for full buttress construction, to limit dust emissions and provide erosion protection. As its primary function is to suppress dust and reduce erosion risk in the long term.

9.2 Instrumentation Plan

The proposed instrumentation is shown in Figure 9-1, with the typical section in Figure 9-2, and summarised below:

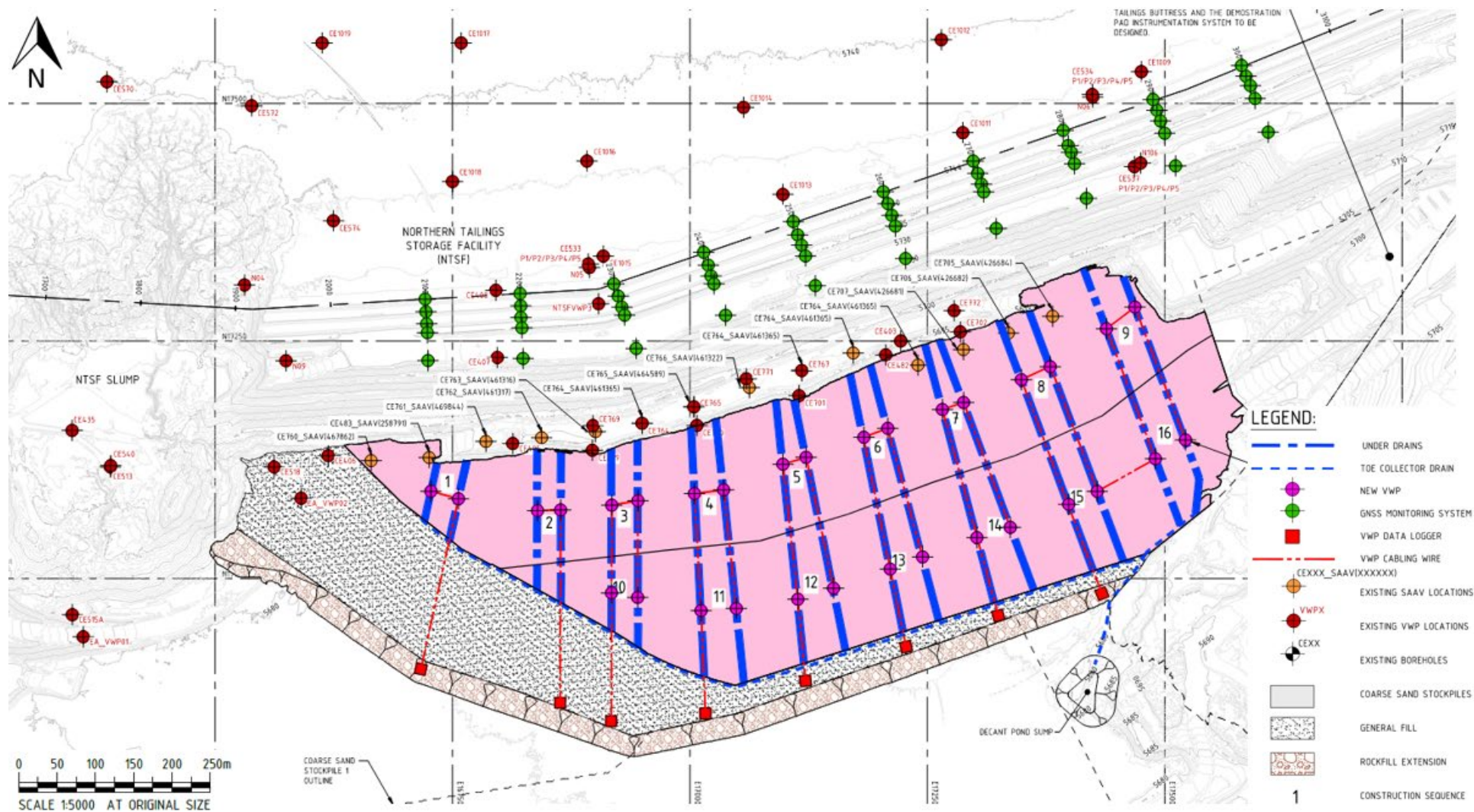
1. Pore Pressure Monitoring (Piezometers):

- Piezometers within the recovered sand buttress to monitor pore pressure variations during construction activities.
- Piezometers within the FRV layer to monitor pore pressure variations during construction activities.
- Piezometers within the underdrain system to monitor pore pressure and assess underdrain outflow rates and turbidity levels.

2. Displacement Monitoring:

- Install instrumentation to monitor displacement trends within the buttress area.

Regarding existing instrumentation: existing piezometers should maintain control of pore pressure in the upstream section of the embankment.



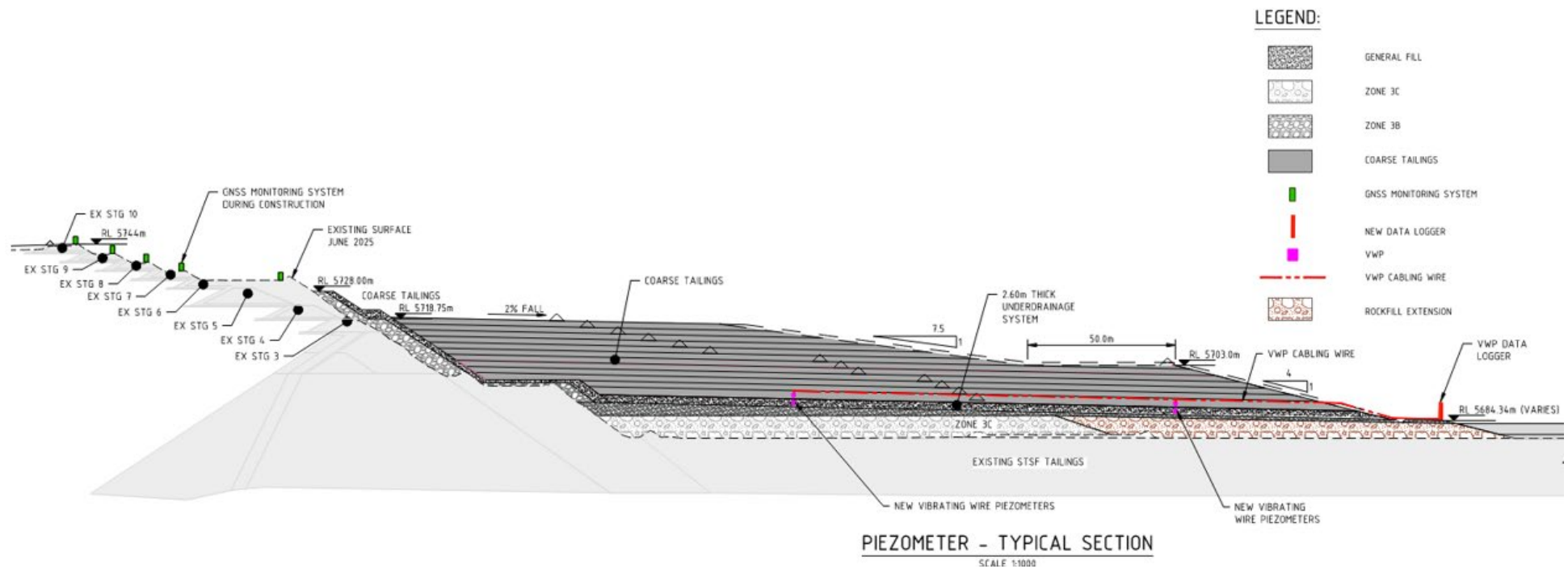


Figure 9-2 Typical section showing proposed instrumentation

10. Conclusion

The geotechnical design and stability assessment for the NTSF Southern Wall Buttness in Area 3 at Cadia demonstrates that the proposed recovered sand buttness, constructed with a measured and progressive sequence of works and supported by a rockfill platform, drainage system and filter zones, meets the required safety and performance criteria set by ANCOLD (2019) and Newmont (2023). The design is grounded in geological, geotechnical and laboratory investigations, which confirm the suitability of recovered sand as the primary construction material.

Slope stability analyses performed using the LE method and validated by multiple cross-sections and loading scenarios, indicate that the buttness and associated stockpiles consistently achieve FoS above the minimum thresholds for both drained and undrained conditions, as well as post-seismic scenarios. The results confirm that the risk of tailings release is mitigated, and the structure is resilient against global, local and upstream connection failure modes.

Mitigation measures for dust and erosion have been integrated into the design, focusing on source control during both operational and post-operational stages. Instrumentation plans including pore pressure monitoring and displacement tracking are in place to assess ongoing performance verification and adaptive management.

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Appendices

Appendix A

Interpretation of Laboratory Testing

1. Forest Reef Volcanics RS/XW

1.1 Index Tests

A total of 147 samples were taken for index testing on this unit and the results are summarised in *Table 1.1*. Atterberg limits and PSD summary are presented graphically in *Figure 1-1* and *Figure 1-2* respectively. The results of the dry density against depth are shown in *Figure 1-3*.

The plasticity index on this material ranges from 9 % to 50 % and dry density ranges from 1.09 t/m³ to 1.97 t/m³.

Table 1.1 Atterberg Limits and Index Tests Summary for RS to XW Forest Reef Volcanics RS/XW

BH ID	Depth (m)		Atterberg Limits (%)			LS (%)	PSD (%)				γ_d (t/m ³)	MC (%)	Gs
	From	To	LL	PL	PI		Gravel	Sand	Silt	Clay			
CE449	41.35	41.5	42	25	17	6	0	22	50	28	-	-	2.74
CE464	19.60	19.73	60	32	28	9.5	0	30	55	15	-	-	2.72
CE415	20.20	20.40	39	25	14	6.5	1	23	76	-	-	17.3	-
CE468	38.93	39.12	-	-	-	-	-	-	-	-	-	-	2.75
CE468	33.87	33.97	65	31	34	11.5	-	-	-	-	-	-	2.75
CE474	6.00	6.14	50	28	22	8.5	15	25	45	15	1.33	34.3	2.75
CE500	0.50	1.00	70	20	50	18.5	0	11	28	61	1.51	29.8	-
CE382	0.45	0.9	37	25	12	9	-	-	-	-	1.80	17.7	-
CE382	1.5	1.95	38	23	15	10	-	-	-	-	-	14.1	-
CE392	2.0	2.45	43	20	23	12	-	-	-	-	1.83	17.2	-
CE392	3.5	3.66	34	18	16	9.5	-	-	-	-	1.97	11.3	-
CE383	1.00	1.45	54	30	24	-	2	33	45	20	1.85	31.8	-
CE383	2.00	2.45	48	34	14	-	0	34	52	14	1.68	37.4	-
CE383	3.00	3.45	50	37	13	-	0	28	57	15	1.78	34.8	-
CE383	4.00	4.41	43	32	11	-	0	44	46	10	1.90	30.5	-
CE383	5.00	5.35	49	33	16	-	2	42	45	11	1.91	28.1	-
CE406	18.40	18.50	71	24	47	19	0	15	85	-	-	27.5	2.70
CE406	19.65	19.95	33	23	10	6	5	42	53	-	1.54	22.3	-
CE406	22.2	22.3	40	20	20	8	5	27	68	-	-	19.8	-
CE406	23.8	23.9	-	-	-	-	-	-	-	-	-	13.6	-
CE415	6.00	6.50	56	31	25	9	0	6	94	1.28	-	2.89	-
CE416	27.00	27.45	67	25	41	13	0	1	99	1.36	-	2.90	-
CE417	24.00	24.3	55	28	27	10.5	1	31	68	1.29	-	2.85	-

BH ID	Depth (m)		Atterberg Limits (%)			LS (%)	PSD (%)				γ_d (t/m ³)	MC (%)	Gs
	From	To	LL	PL	PI		Gravel	Sand	Silt	Clay			
CE482	15.5	15.95	45	27	18	9.0	1	15	65	19	1.55	28.6	2.82
CE482	19.7	19.76	35	23	12	5.5	-	-	-	-	1.55	28.6	-
CE411A	16.5	16.95	53	31	22		10	39	40	11	1.28	-	2.83
CE411A	16.0	16.50	61	31	30	12.5	0	19	53	28	1.28	37.7	2.58
CE412	62.15	62.20	47	22	25	12.5	-	-	-	-	-	23.3	-
CE412	65.5	66.00	50	23	27	11.5	0	41	44	15	-	25.5	-
CE417	25.9	26.00	54	30	24	9	0	40	60	-	-	36	-
CE415	4.12	4.30	52	33	19	8.5	-	-	-	-	-	38.4	-
CE416	25.5	25.95	60	29	31	11	0	24	56	20	1.33	38.7	2.66
CE416	26.5	27.00	64	30	34	14.5	0	3	62	35	1.41	64	2.62
CE432	23.5	24.00	-	-	-	-	-	-	-	-	1.58	26.4	2.70
CE432	19.8	20.30	40	27	13	8	3	39	58	0	-	24.2	-
CE432	20.3	20.80	40	24	16	6.5	2	38	60	-	-	28.2	-
CE433	33.2	33.00	26	17	9	6	-	-	-	-	-	28.2	-
CE509	3.05	3.22	71	25	46	13.5	2	8	23	67	1.38	36	2.77
CE509	3.9	4.12	65	23	42	19	4	15	23	58	1.41	34.5	2.82
CE509	4.6	4.77	41	22	19	11	15	54	24	7	1.9	16.6	2.77
CE510	12.17	12.46	48	22	26	13	0	27	35	38	1.67	23.1	2.76
CE510	14.09	14.25	57	29	28	13	3	51	34	12	1.37	36	2.84
CE513	33.5	33.92	46	27	19	10	0	43	45	12	1.36	38	2.78
CE513	34.04	34.40	51	29	22	11	2	48	41	9	1.43	33	2.79
CE518	14.4	14.66	54	25	29	13	8	57	26	9	1.43	33	2.72
CE508	23.0	23.45	62	24	38	14.5	3	10	36	51	1.66	22.7	2.72
CE508	33.4	33.90	65	40	25	11	-	-	-	-	-	-	-
CE507	25.3	25.36	37	24	13	7	-	-	-	-	1.64	22.1	-
CE508	23.8	24.75	66	22	44	17	2	8	29	61	1.68	23.8	2.75
CE508	28.2	28.37	43	17	26	11.5	0	11	44	45	-	-	2.75
CE508	28.37	28.56	34	16	18	9	0	26	49	25	1.86	16.8	2.73
CE507	14.0	14.17	48	21	27	14	-	-	-	-	1.47	29.3	2.82
CE507	18.1	18.55	54	33	21	10.5	2	23	44	31	1.09	44.9	2.91
CE507	20.45	20.90	52	33	19	9.5	-	-	-	-	1.25	41.8	2.76

BH ID	Depth (m)		Atterberg Limits (%)			LS (%)	PSD (%)				γ_d (t/m ³)	MC (%)	Gs
	From	To	LL	PL	PI		Gravel	Sand	Silt	Clay			
CE677	3.35	3.80	38	24	14	8.11	11	10	50	29	-	-	-
CE708	3.9	4.50	48	31	17	10.79	6	28	33	33	-	-	-
CE708	5.0	5.45	53	37	16	12.99	-	11	44	45	-	-	-
CE708	5.9	6.35	48	34	14	10.79	5	20	42	33	-	-	-
CE709	3.4	3.85	47	33	14	9.09	-	26	45	29	-	-	-
CE709	1.85	2.30	39	23	16	11.01	8	25	43	24	-	-	-
CE709	4.0	4.45	49	34	15	9.21	-	15	47	38	-	-	-
CE585	26.6	27.05	50	39	11	-	-	-	-	-	1.4	31.85	2.82
CE585	28.1	28.55	48	37	11	-	-	-	-	-	1.44	34.1	2.82
CE585	31.1	31.55	50	40	10	-	-	-	-	-	1.39	32.8	2.81
CE585	32.6	33.05	43	33	10	-	-	-	-	-	1.35	31.4	2.74
CE585	35.6	36.05	54	40	14	-	-	-	-	-	1.39	31.5	2.82
CE586	26.7	27.15	62	41	21	-	-	-	-	-	1.46	30.8	2.79
CE586	28.2	28.65	51	36	15	-	-	-	-	-	1.44	29.76	2.80
CE586	29.7	30.15	50	34	16	-	-	-	-	-	1.44	30.6	2.81
CE586	31.2	31.65	48	36	12	-	-	-	-	-	1.41	28.4	2.82
CE587	25.5	25.95	56	31	25	-	-	-	-	-	1.48	30.7	2.69
CE935	12.70	13.07	53	27	26	11.5	0	18	82		1.36	39.1	2.86
STSF-S11-TP045	0	0.4	27	17	10	4	16	38	46		-	14	2.6
STSF-S11-TP045	0.4	2.1	36	14	22	10.5	24	18	58		-	11.2	2.7
STSF-S11-TP050	0	1.5	81	31	50	21.5	0	7	93		1.44	26.6	2.5
STSF-S11-TP053	0.3	2.0	67	22	45	19.5	0	14	86		1.27	26.6	2.4
STSF-S11-TP054	0.5	1.0	75	23	52	21.5	2	24	74		1.71	20.4	2.5
STSF-S11-TP054	1	1.8	47	16	31	14.5	62	19	19		1.48	31.5	2.46
STSF-S11-TP056	0.2	0.7	48	16	32	15.5	28	13	59		1.38	20	2.56

BH ID	Depth (m)		Atterberg Limits (%)			LS (%)	PSD (%)				γ_d (t/m ³)	MC (%)	Gs
	From	To	LL	PL	PI		Gravel	Sand	Silt	Clay			
STSF-S11-TP057	0	0.4	33	19	14	7.5	3	57	40		-	11.8	2.6
STSF-S11-TP058	0	0.4	44	18	26	12.5	0	38	62		1.45	17.1	2.4
STSF-S11-TP059	0	0.4	41	23	18	11.5	0	61	39		1.45	23.5	2.6
STSF-S11-TP059	0.4	1.1	39	24	15	9	0	70	30		-	23.5	2.6
STSF-S11-TP060	0.3	1.1	38	19	19	9	65	24	11		-	11.5	2.49
STSF-S11-TP061	0.4	1.1	45	23	22	12	17	29	54		1.49	15.8	2.57
STSF-S11-TP063	0.3	0.8	32	16	16	10	0	30	70		-	18.6	2.7
STSF-S11-TP063	0.8	1.1	67	29	38	17.5	0	15	85		1.47	25.4	2.6
STSF-S11-TP064	0.2	0.6	44	20	24	17.4	9	16	75		1.46	17.4	2.63
STSF-S11-TP064	0.6	1.7	73	26	47	17.0	83	1	16		1.43	20.4	2.49
STSF-S11-TP067-0.4m	0.4	0.6	47	26	21	12.5	0	23	77		1.37	23.2	2.7
STSF-S11-TP067	0.6	1.0	72	31	41	16.0	0	18	82		1.58	21.3	2.5
STSF-S11-TP067	1	3.0	35	23	12	7.5	1	71	28		-	14.5	2.6
STSF-S11-TP068	0.4	0.7	71	32	39	19.5	71	3	26		1.29	29.2	2.42
STSF-S11-TP068	0.7	1.2	87	28	59	20.0	0	5	95		-	23.5	2.58
STSF-S11-TP068	1.2	3.0	45	26	19	9.5	54	26	20		-	21.5	2.47
STSF-S11-TP069	0.5	0.85	74	29	45	18.5	0	5	95		1.44	28.1	2.5

BH ID	Depth (m)		Atterberg Limits (%)			LS (%)	PSD (%)				γ_d (t/m ³)	MC (%)	Gs
	From	To	LL	PL	PI		Gravel	Sand	Silt	Clay			
STSF-S11-TP069	0.85	1.4	73	25	48	19.0	2	11	87		1.36	24.8	2.4
STSF-S11-TP069	1.4	3.0	62	32	30	16.0	1	17	82		1.46	29.2	2.5
STSF-S11-TP074	0.5	0.7	45	30	15	9.5	30	23	47		1.5	18.1	2.62
STSF-S11-TP074	0.7	0.8	40	22	18	9	73	8	19		1.62	23.5	2.52
STSF-S11-TP074	0.8	2.1	71	27	44	20.5	5	13	82		1.51	20.6	2.6
STSF-S11-TP074	2.1	3.0	59	23	36	17.5	0	14	86		1.2	31.2	2.5
STSF-S11-TP075	0	0.5	68	28	40	13	16	11	73		-	27.8	2.63
STSF-S11-TP076	0	0.6	33	18	15	7.5	27	44	29		-	10.5	2.65
STSF-S11-TP076	0.6	1.5	49	19	30	14.5	0	45	55		1.3	13.6	2.63
STSF-S11-TP077	0.3	0.6	32	19	13	6.0	3	53	44		1.37	12.5	2.72
STSF-S11-TP089	1	1.6	41	16	25	13	1	21	78		1.68	13.7	2.59
STSF-S11-TP089	1.6	3.0	32	16	16	8.5	0	55	45		1.8	7.6	2.62
STSF-S11-TP094	0.7	1.3	77	29	48	21.0	0	4	96		1.32	30.5	2.54
STSF-S11-TP095	0.2	0.6	35	16	19	9	2	30	68		1.98	16.5	2.64
STSF-S11-TP095	0.6	1.1	69	25	44	18.5	3	14	83		1.56	29.6	2.61
STSF-S11-TP095	1.1	3.0	37	22	15	10	2	47	51		1.72	16.5	2.66
STSF-S11-TP097	0.3	0.6	44	19	25	14.5	2	13	85		1.68	16.9	2.54

BH ID	Depth (m)		Atterberg Limits (%)			LS (%)	PSD (%)				γ_d (t/m ³)	MC (%)	Gs
	From	To	LL	PL	PI		Gravel	Sand	Silt	Clay			
STSF-S11-TP097	0.6	1.6	40	15	25	13	1	9	90		1.61	19.5	2.66
STSF-S11-TP097	2.1	3.2	64	22	42	15.0	7	10	83		-	25.2	2.48
STSF-S11-TP098	0.75	1.5	84	24	60	15.5	4	6	90		1.4	20.3	2.62
STSF-S11-TP099	1	1.3	36	16	20	10.5	0	14	86		1.64	12.7	2.55
STSF-S11-TP099	1.3	2.5	75	23	52	14.5	6	6	88		1.66	19.1	2.55
STSF-S11-TP099	2.5	3.0	57	19	38	16.0	9	15	76		1.57	14.3	2.6
STSF-S11-TP100	1	2.8	42	16	26	11.0	1	16	83		1.69	10.5	2.6
STSF-S11-TP100	2.8	3.0	55	17	38	12.5	9	17	74		1.91	12.5	2.51
STSF-S11-TP101	0.2	0.6	80	25	55	20.0	1	8	91		1.45	29.9	2.55
STSF-S11-TP101	0.6	1.6	33	19	14	8.5	2	28	70		1.72	15.6	2.58
STSF-S11-TP101	1.6	3.0	32	22	10	5.5*	1	83	16		-	13.2	2.63
STSF-S11-TP102	0	1.0	58	20	38	20	6	21	73		-	10.9	2.62
STSF-S11-TP103	0.15	1.2	41	21	20	13	0	43	57		1.43	13.7	2.52
STSF-S11-TP105	0.25	0.65	38	19	19	9.5	57	23	10		-	13.3	2.64
STSF-S11-TP107	0	0.5	36	23	13	7	3	30	67		1.48	12.1	2.62
STSF-S11-TP107	0.5	1.15	64	28	36	15.5	0	33	67		1.34	20.6	2.69
STSF-S11-TP109	0.8	1.3	68	28	40	18.5	1	18	61		1.47	18.5	2.53

BH ID	Depth (m)		Atterberg Limits (%)			LS (%)	PSD (%)				γ_d (t/m ³)	MC (%)	Gs
	From	To	LL	PL	PI		Gravel	Sand	Silt	Clay			
STSF-S11-TP110	0.65	1.1	70	24	46	10.5	7	10	83		1.53	20.5	2.61
STSF-S11-TP112	0.65	1.2	59	21	38	17.0	1	13	86		1.33	33.1	2.62
STSF-S11-TP112	1.2	3.2	43	29	14	8.5	0	59	41		1.51	15.9	2.49
STSF-S11-TP114	0.4	1.3	82	38	44	19.5	1	10	89		1.52	21.3	2.61
STSF-S11-TP114	1.3	3.1	47	20	27	6	0	72	28		-	11.2	2.51
STSF-S11-TP115	0.6	0.9	67	26	41	19.0	0	53	47		-	16.8	2.59
STSF-S11-TP117	0.6	1.7	84	26	58	19.5	0	10	90		1.55	24.6	2.66
STSF-S11-TP118	0.7	1.2	66	22	44	18.0	6	10	84		1.68	14.3	2.67
STSF-S11-TP119	0.5	0.85	44	19	25	13.0	1	11	88		1.48	13	2.6
STSF-S11-TP119	0.85	1.1	81	24	57	19.5	15	5	80		-	17.2	2.6
STSF-S11-TP119	1.1	3.0	41	17	24	12.5	1	24	75		-	12	2.62
STSF-S11-TP120	0	0.9	42	18	24	11.5	2	22	76		1.73	10.7	2.57
STSF-S11-TP120	0.9	2.8	43	16	27	14.0	4	27	69		1.55	11.9	2.5
STSF-S11-TP121	0.55	1.2	23	16	7	4	3	33	64		-	4.6	2.62
CE936	15.3	15.75	40	27	13	6.3	0	51	49		-	19.92	-
CE951	1.6	2.05	71	27	44	-	7	9	84		-	30	-
CE951	2	2.45	60	22	38	-	1	7	92		-	29.1	-
CE951	3.25	3.7	42	18	24	-	0	12	88		-	23.1	-
CE951	3.65	4.1	50	20	30	-	1	13	86		-	22	-
CE953	2.85	3.3	60	23	37	-	0	5	95		-	32	2.6

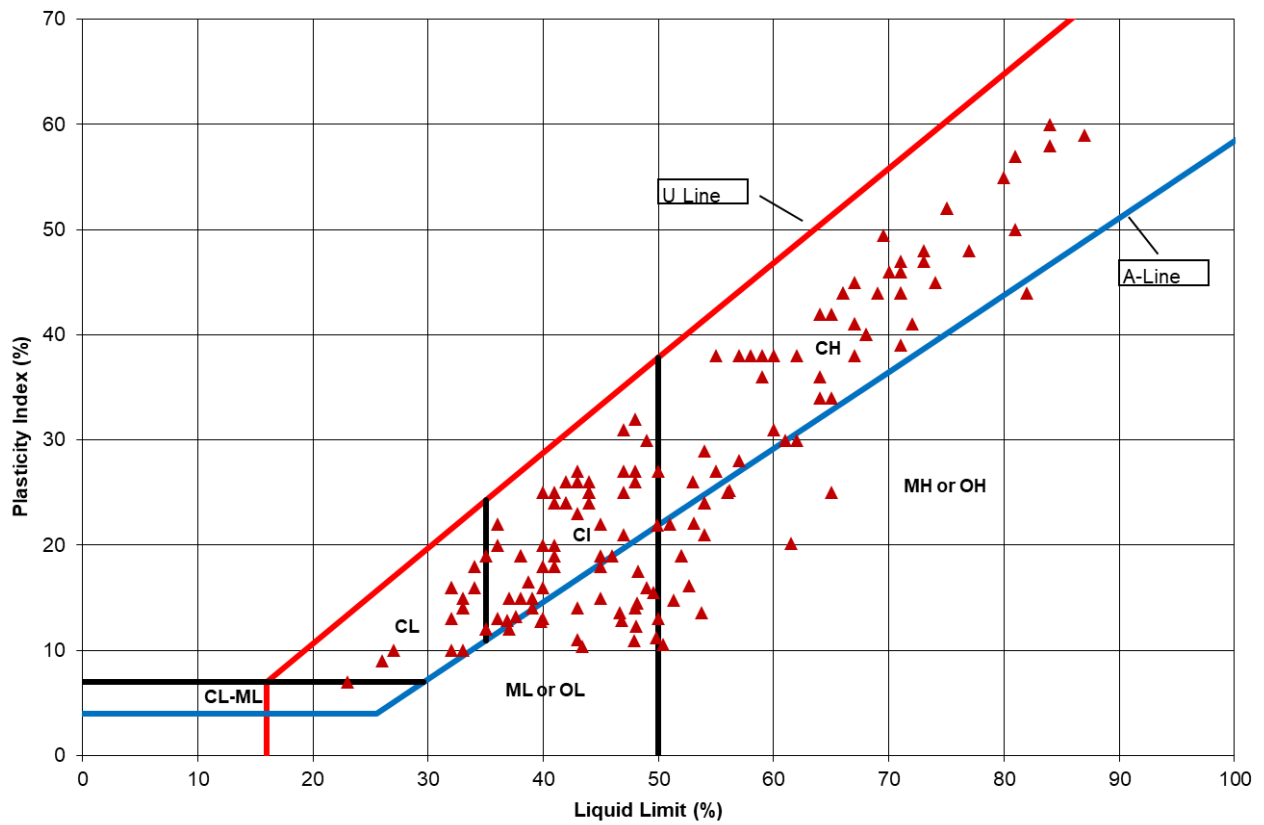


Figure 1-1 FRV RS/XW – Plasticity Chart

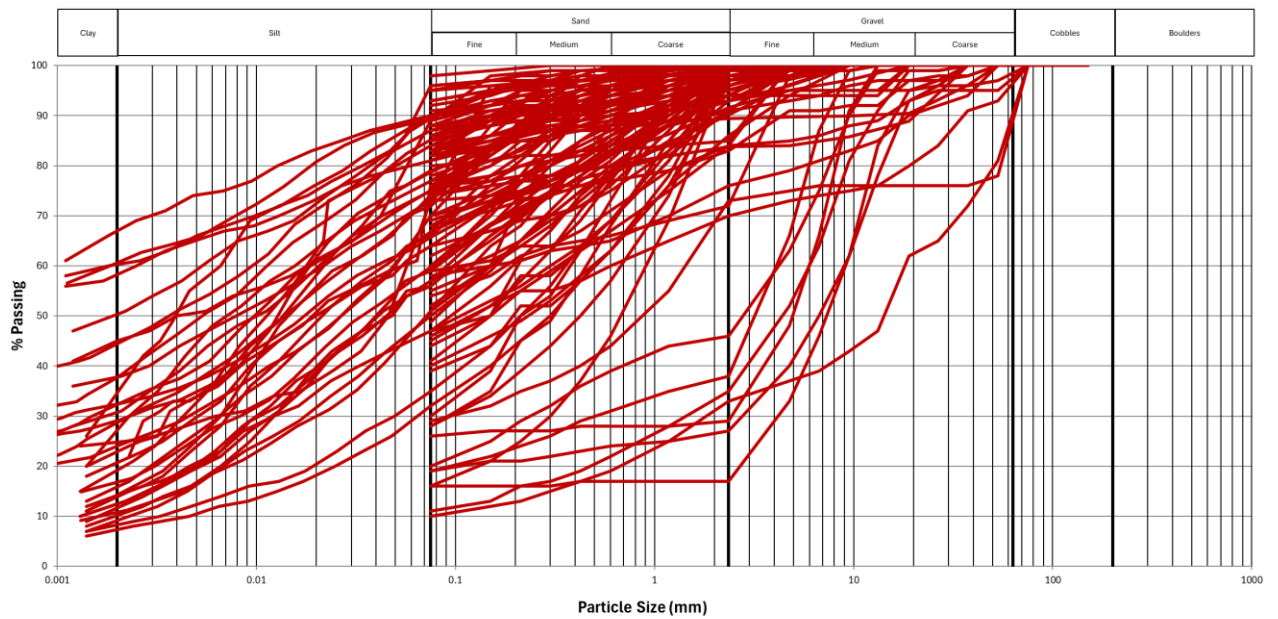


Figure 1-2 FRV RS/XW – Particle Size Distribution

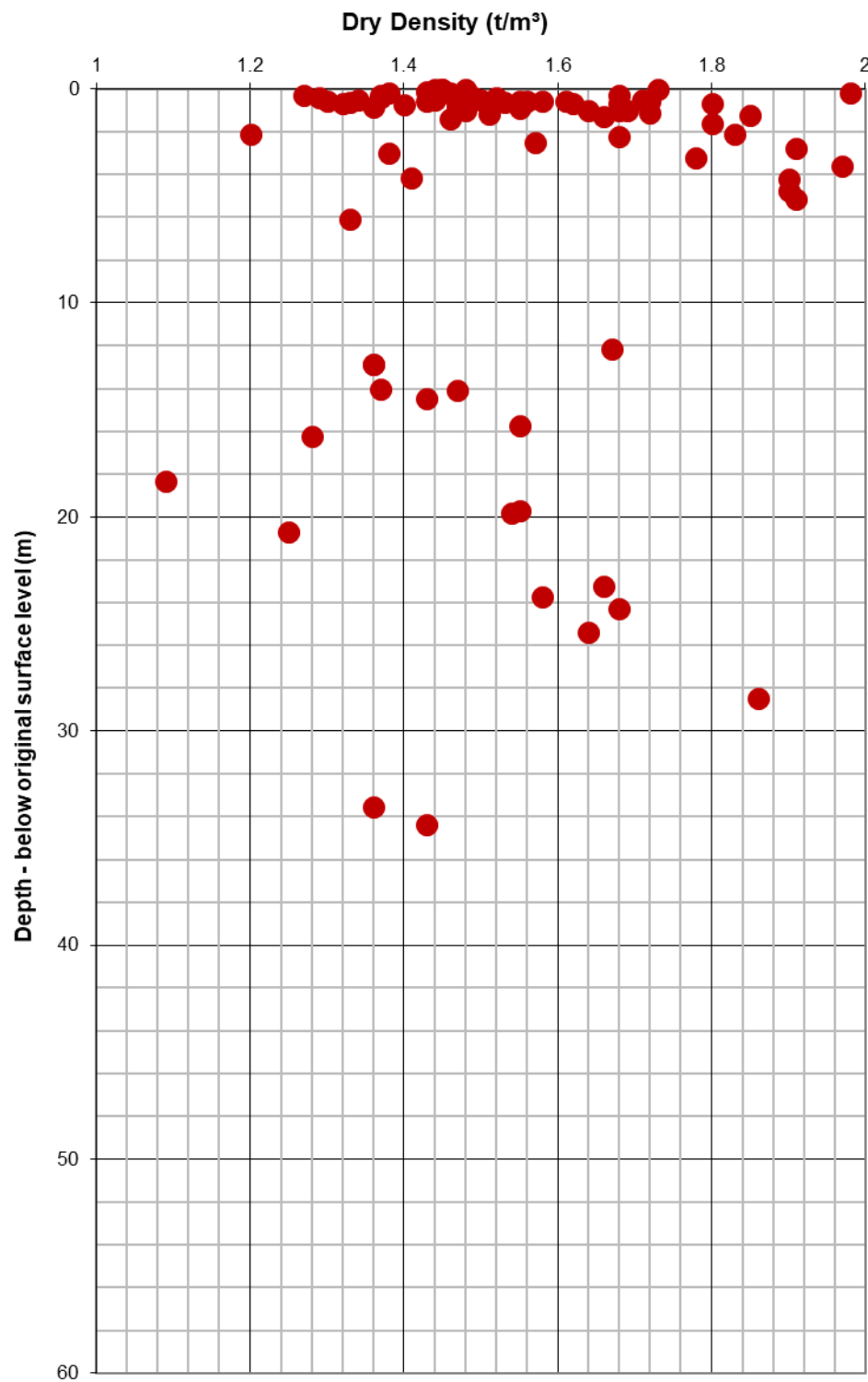


Figure 1-3 FRV RS/XW Dry Density vs Depth

1.2 Triaxial Tests

1.2.1 Isotopically Consolidated

A total of eight 62 CIU triaxial tests were completed on this unit and the results are summarised in Table 1.2.

In terms of stress path, the laboratory results indicate the following:

- a. The material is generally dilative at confining pressures below 400 kPa and contractive at higher confining pressures, the stress path is summarised in Figure 1-4 and *Figure 1-5* for dilative and contracting behaviour respectively.
- b. The peak Mtc ranges from 1.05 to 1.63 for the dilative materials, which is equivalent to a ϕ' range from 27° to 40°.
- c. The peak Mtc of 0.64 to 1.25 for the contractive materials, which is equivalent to:
 - i. An ϕ' of approximately 16° to 31°
 - ii. S_u/p'_f ranging from between 0.26 to 0.30.
 - iii. ϕ_{cu} values ranging from 14° to 16°, which is equivalent to a S_u/σ'_{vf} of 0.24 to 0.29.
- d. The residual friction angle ranges from 12° to 21°.

Figure 1-6 presents the interpretation of the ϕ_{cu} envelope determination for this unit, while *Figure 1-7* indicates that on some tested samples the axial strain required to reach peak is below 3% and marked strength loss after the peak, which is observed at confining pressures above 800 kPa.

Table 1.2 CIU Triaxial Summary Table for FRV RS/XW

BH ID	Depth (m)		p'_c (kPa)	q_{max} (kPa)	σ'_1 (kPa)	σ'_3 (kPa)	S_u/σ'_{vf}	ϕ'_{res} (°)	γ_{di} (t/m ³)	G_s	e
	From	To									
CE464	19.60	19.73	1200	1832	2492	660	0.48	19	1.36	2.72	0.96
CE468	38.93	39.05	1200	3205	3918	713	0.69	20	1.69	2.75	0.59
CE449	41.35	41.50	1200	2067	2755	688	0.52	19	1.64	2.74	0.64
CE432	19.5	20.3	200	468	597	129	0.64	-	1.61	-	0.67 ^(*)
CE432	19.5	20.3	400	780	1066	286	0.56	-	1.61	-	0.67 ^(*)
CE432	19.5	20.3	800	1022	1412	390	0.42	17	1.59	-	0.69 ^(*)
CE432	20.3	20.8	200	406	540	133	0.58	-	1.52	2.63	0.70
CE432	20.3	20.8	400	722	977	255	0.53	-	1.52	2.63	0.70
CE432	22.8	23.2	400	936	1329	392	0.64	-	1.70	-	0.59 ^(*)
CE432	22.8	23.2	800	1437	2072	635	0.53	-	1.70	-	0.59 ^(*)
CE382	0.45	0.9	200	310	469	159	0.49	-	1.80	-	0.50 ^(*)
CE382	0.45	0.9	400	561	897	336	0.45	-	1.80	-	0.50 ^(*)
CE382	0.45	0.9	800	1044	1740	696	0.42	-	1.80	-	0.50 ^(*)
CE392	2.0	2.45	200	343	517	174	0.52	-	1.83	-	0.47 ^(*)
CE392	2.0	2.45	400	530	850	319	0.44	-	1.83	-	0.47 ^(*)
CE392	2.0	2.45	800	951	1616	664	0.40	-	1.83	-	0.47 ^(*)
CE392	3.5	3.66	200	317	418	101	0.49	-	1.97	-	0.37 ^(*)
CE392	3.5	3.66	400	543	791	247	0.44	-	1.97	-	0.37 ^(*)
CE392	3.5	3.66	800	1042	1607	565	0.42	-	1.97	-	0.37 ^(*)
CE474	6.00	6.14	1200	922	1351	429	0.29	-	1.67	-	0.61 ^(*)
CE415	6.0	6.5	1000	790	1346	556	0.29	16	1.28		2.89
CE416	27.00	27.45	1000	694	1266	571	0.27	17	1.36	1.21	2.90
CE416	25.5	26.95	400	519	664	145	0.42	-	1.33	1.21	2.66
CE416	25.5	26.95	800	763	1179	415	0.34	-	1.33	0.96	2.66
CE416	25.5	26.95	1200	982	1699	717	0.30	33	1.33	0.96	2.66
CE416	26.5	27	1200	683	1355	672	0.23	12	1.36	0.96	2.62
CE416	26.5	27	400	481	741	260	0.41	-	1.41	0.89	0.82

BH ID	Depth (m)		p' _c (kPa)	q _{max} (kPa)	σ' ₁ (kPa)	σ' ₃ (kPa)	Su/σ' _{vf}	φ' _{res} (°)	γ _{di} (t/m ³)	G _s	e
	From	To									
CE416	26.5	27	800	760	1336	576	0.34	12	1.41	2.62	0.82
CE482	15.81	15.95	1200	1105	1723	617	0.33	17	1.50	2.82	0.84
CE468	33.72	33.87	1200	2539	3038	498	0.60	22	1.40	-	0.93 ^(*)
CE509	3.05	3.22	400	287	519	231	0.27	-	1.53	2.77	0.77
CE509	4.60	4.77	400	615	923	308	0.48	-	1.82	2.77	0.49
CE510	12.34	12.46	400	620	910	290	0.49	-	1.66	2.76	0.63
CE510	13.90	14.02	800	994	1486	491	0.42	-	1.37	2.84	1.03
CE513	33.62	33.74	800	737	1090	352	0.33	20	1.31	2.78	1.08
CE513	34.13	34.25	800	498	1177	679	0.24	-	1.3	2.79	1.10
CE518	14.50	14.66	400	477	697	220	0.40	-	1.43	2.72	0.86
CE508	23.21	23.33	1200	905	1645	740	0.28	13	1.56	2.72	0.71
CE508	23.33	23.45	800	836	1410	574	0.37	16	1.56	2.72	0.71
CE508	24.13	24.25	1200	862	1781	919	0.29	-	1.61	2.75	0.67
CE508	28.22	28.37	1200	1033	1909	876	0.33	-	1.86	2.75	0.45
CE507	20.60	20.74	800	579	885	305	0.29	17	1.22	2.76	1.22
CE507	18.32	18.43	400	338	527	189	0.31	20	1.33	2.91	1.14
CE507	18.20	18.32	1200	826	1338	512	0.26	17	1.24	2.91	1.30
CE508	28.44	28.56	1200	1687	2759	1072	0.45	-	1.84	2.73	0.45
CE585	26.6	27.05	400	434	668	234	0.38	-	1.40	2.82	2.82
CE585	31.10	31.55	400	552	783	231	0.45	-	1.39	2.81	1.05
CE585	32.6	33.05	400	452	722	270	0.39	-	1.35	2.74	1.03
CE586	26.7	27.15	1200	1064	1794	730	0.32	-	1.46	2.79	0.91
CE586	26.7	27.15	1200	959	1716	757	0.30	-	1.44	2.79	0.94
CE586	26.7	27.15	800	489	1017	528	0.24	-	1.44	2.79	0.94
CE586	29.7	30.15	400	314	498	184	0.29	-	1.43	2.81	0.96
CE586	31.2	31.65	800	874	1224	350	0.38	-	1.40	2.82	0.95
CE586	31.2	31.65	400	567	757	190	0.46	-	1.43	2.82	0.96
CE585	35.6	36.05	800	834	1329	495	0.36	-	1.46	2.82	0.93
CE587	25.5	25.95	1200	1000	2188	1188	0.31	-	1.48	2.69	0.79
CE935	12.70	13.07	800	771	1320	549	0.34	16	1.36	2.86	1.10
CE951	1.6	2.0	400	301	519	218	0.28	18	1.52	-	0.83
CE951	2.0	2.4	600	372	717	345	0.24	14	1.51	-	0.78
CE951	3.25	3.65	800	606	1010	404	0.29	22	1.68	-	0.62
CE951	3.65	4.05	1200	811	1465	654	0.26	18	1.5	-	0.80
CE953	2.85	3.25	600	428	771	343	0.27	13	1.39	-	0.94
Notes: (*): G _s = 2.75 adopted											

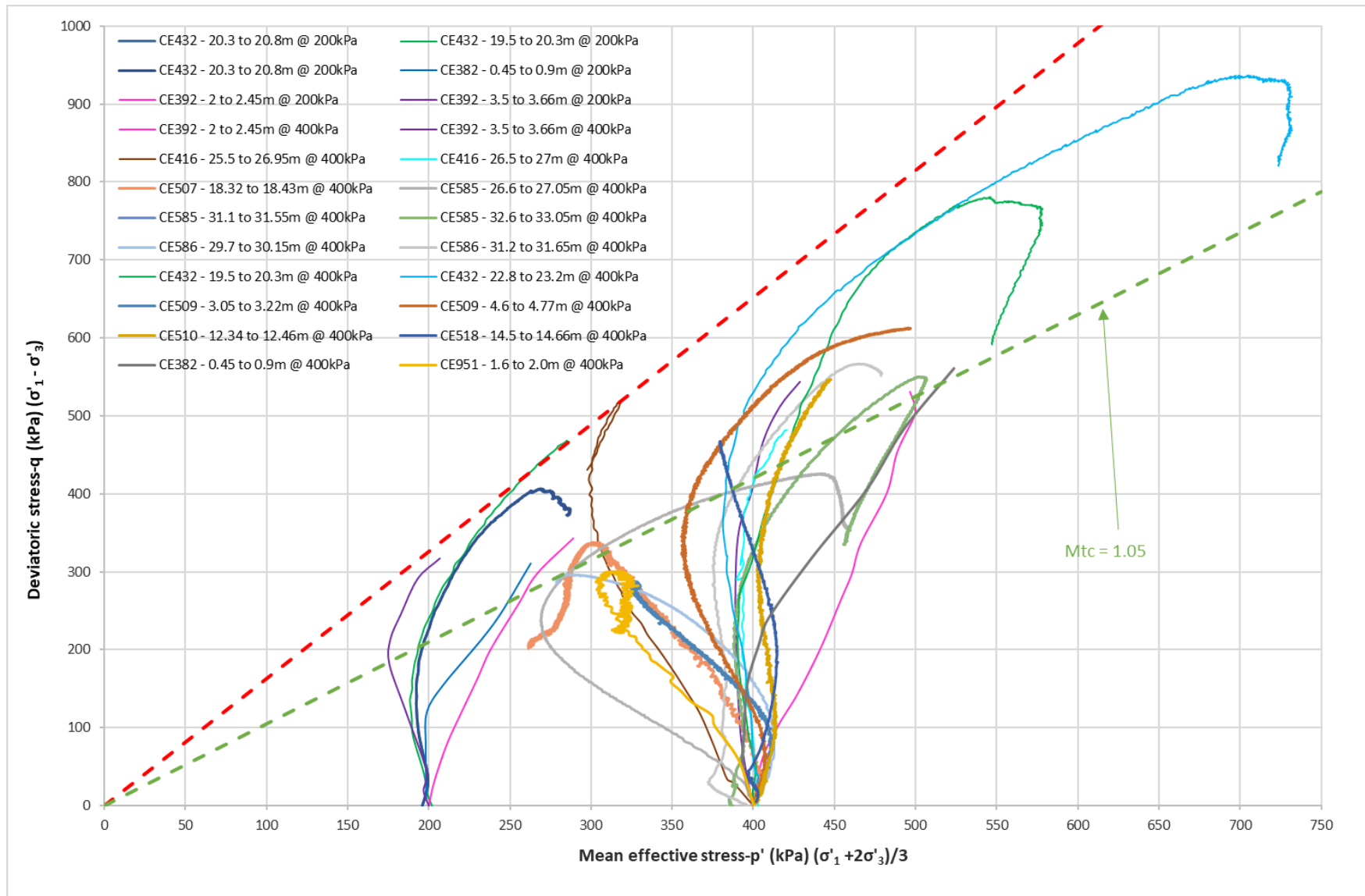


Figure 1-4 Stress paths from CIU on FRV RS/XW for Dilative Behaviour

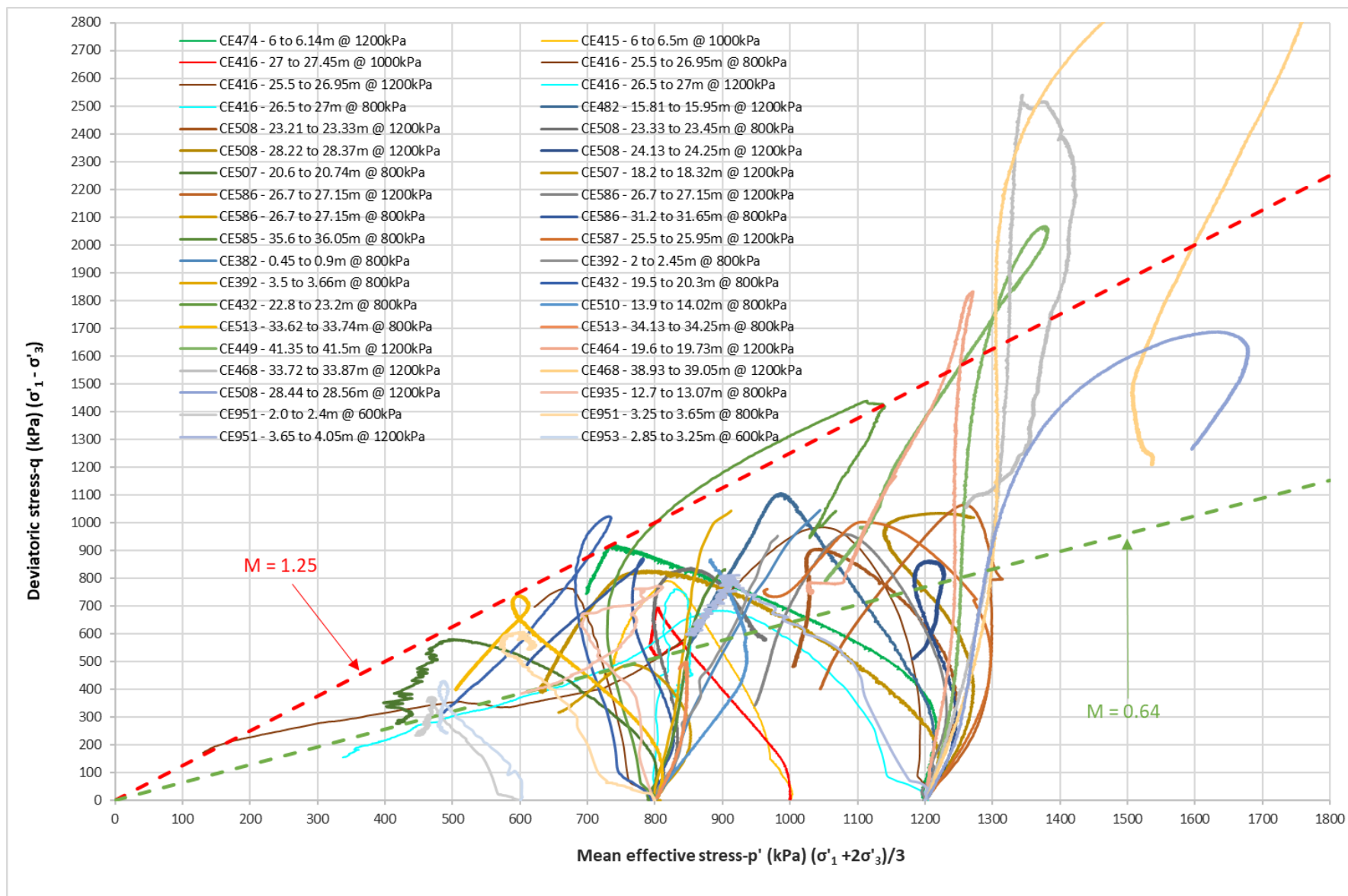


Figure 1-5 Stress Paths from CIU on FRV RS/XW for Contractive Behaviour

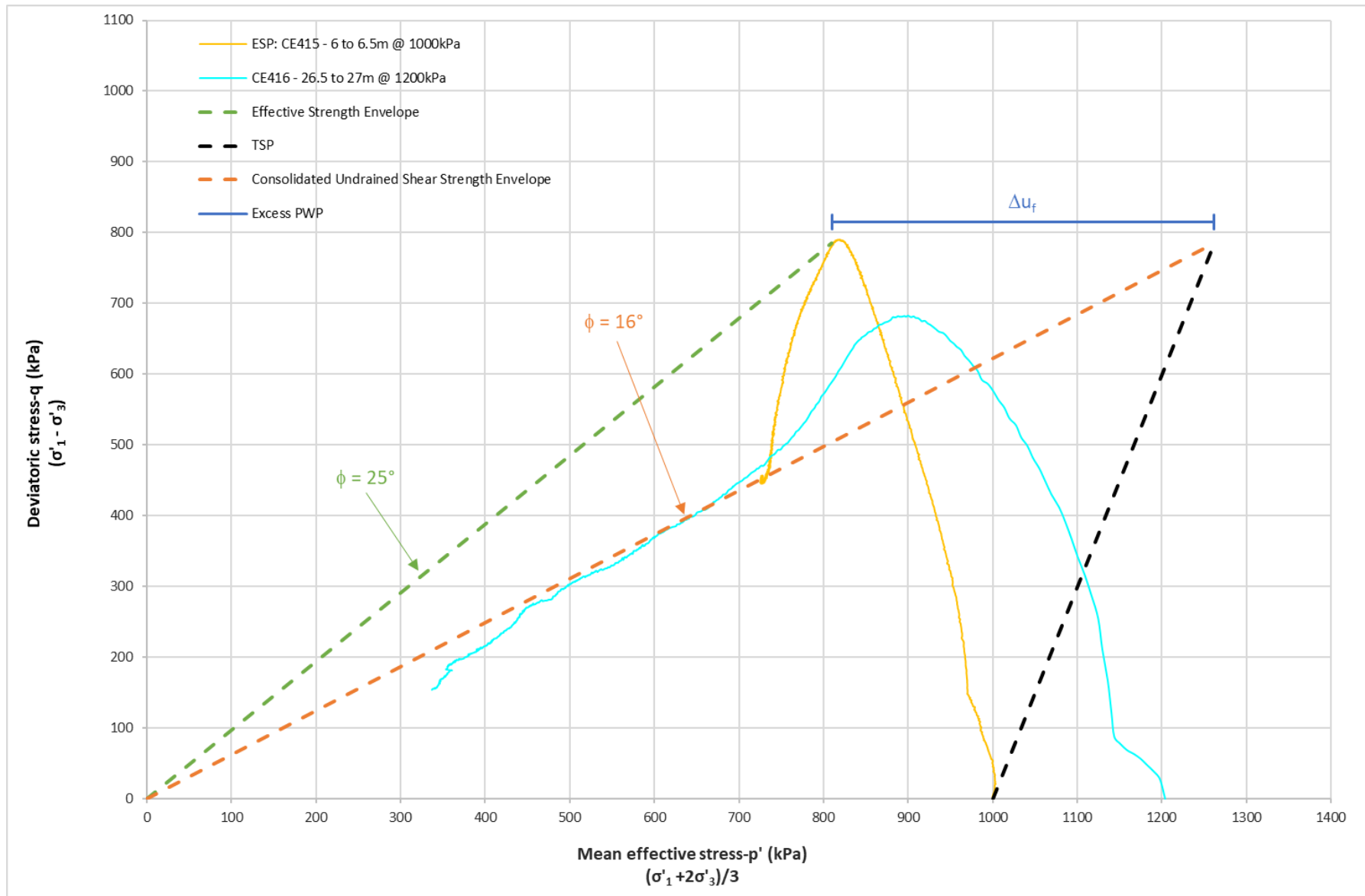


Figure 1-6 Representative Failure Envelopes for FRV RS/XW

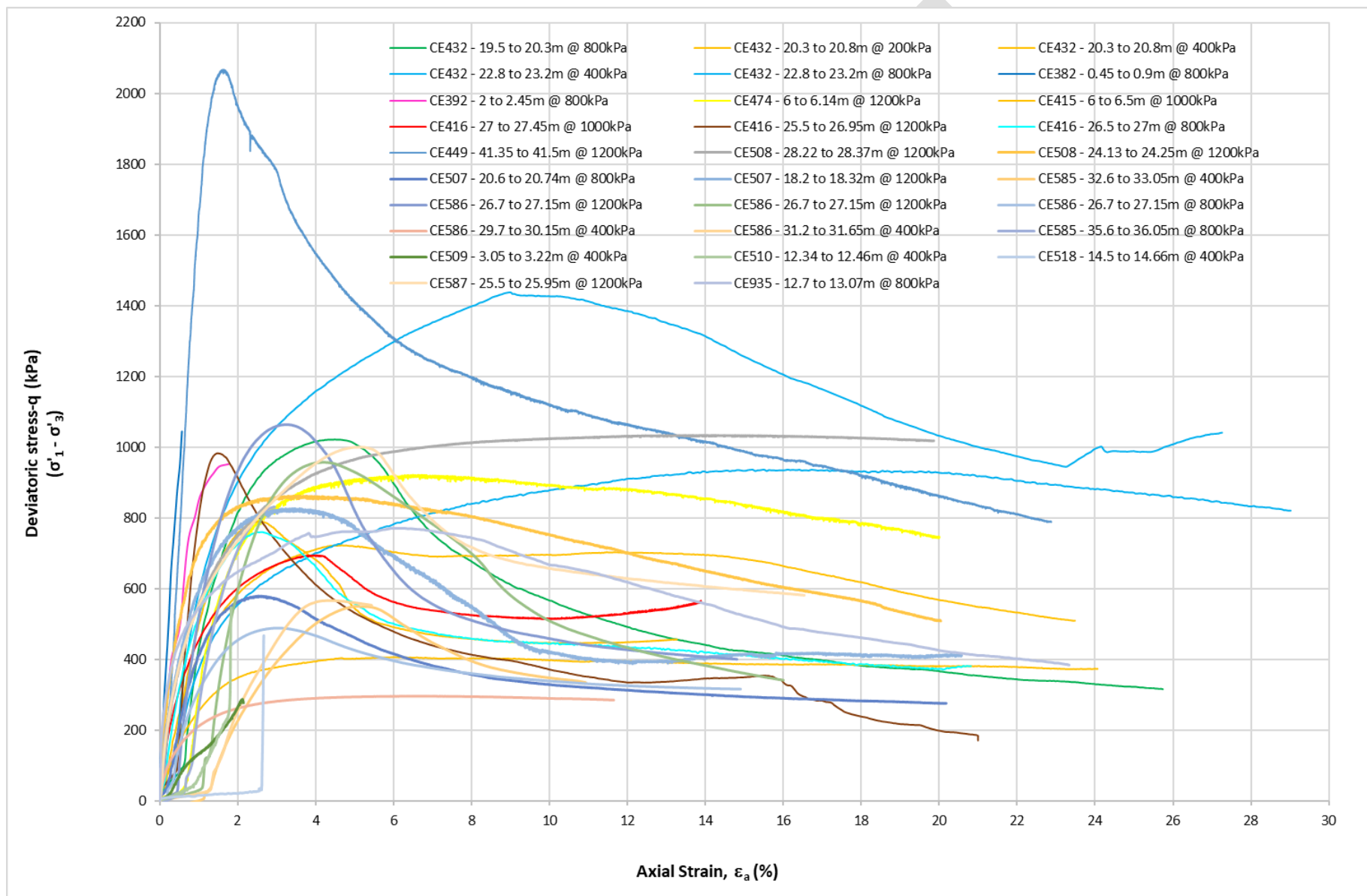


Figure 1-7 Comparison of Selected Stress-Strain Curves for Samples Tested at Different Confining Pressures for FRV RS/XW

1.2.2 Anisotropically Consolidated

It should be noted that the in-situ stresses are currently unknown, making it uncertain whether the confining pressure K_0 is relevant to the actual in-situ conditions. Therefore, this result needs to be treated with caution and is presented herein for comparison purposes only.

A total of 14 CAU triaxial tests were completed with the results summarised in *Table 1.3*. In terms of stress path, the results are shown on *Figure 1-8* on a q versus p' plot. The results indicate the following:

- e. The material is contractive at confining pressures above 700 kPa.
- f. S_u/p'_c ranging from 0.35 to 0.57.

In addition to the above, the undrained shear strength indicates that for some tested samples the axial strain required to reach the peak is small, generally less than 2.5%. A similar response is observed on the stress-strain plot in *Figure 1-7*. This response is associated with strain weakening (brittle behaviour).

Table 1.3 CAU Triaxial Summary Table for FRV RS/XW

BH ID	Depth (m)		p'_c (kPa)	K_0	q_{max} (kPa)	σ'_1 (kPa)	σ'_3 (kPa)	Peak S_u/p'_c	γ_{di} (t/m ³)
	From	To							
CE708	3.90	4.5	467	0.43	374	662	288	0.40	1.27
CE708	5.00	5.45	1067	0.47	1073	1615	542	0.50	1.43
CE708	5.9	6.35	1467	0.55	1290	2229	939	0.44	1.52
CE709	3.4	3.85	1467	0.55	2287	3257	970	0.78	1.73
CE709	1.85	2.3	467	0.43	328	450	122	0.35	1.42
CE709	4.00	4.45	1333	0.30	1466	2127	661	0.55	1.41
CE585	31.1	31.55	740	0.41	827	1278	451	0.56	1.36
CE586	29.7	30.15	709	0.38	1035	1398	363	0.73	1.45
CE586	28.2	28.65	456	0.34	759	1006	247	0.83	1.44
CE586	29.7	30.15	516	0.46	862	1152	290	0.84	1.44
CE586	31.2	31.65	507	0.44	792	1081	289	0.78	1.40
CE585	32.6	33.05	297	0.60	445	612	167	0.75	1.35
CE585	35.6	36.05	261	0.45	642	926	284	1.23	1.39
CE586	28.2	28.65	272	0.51	523	700	177	0.96	1.43

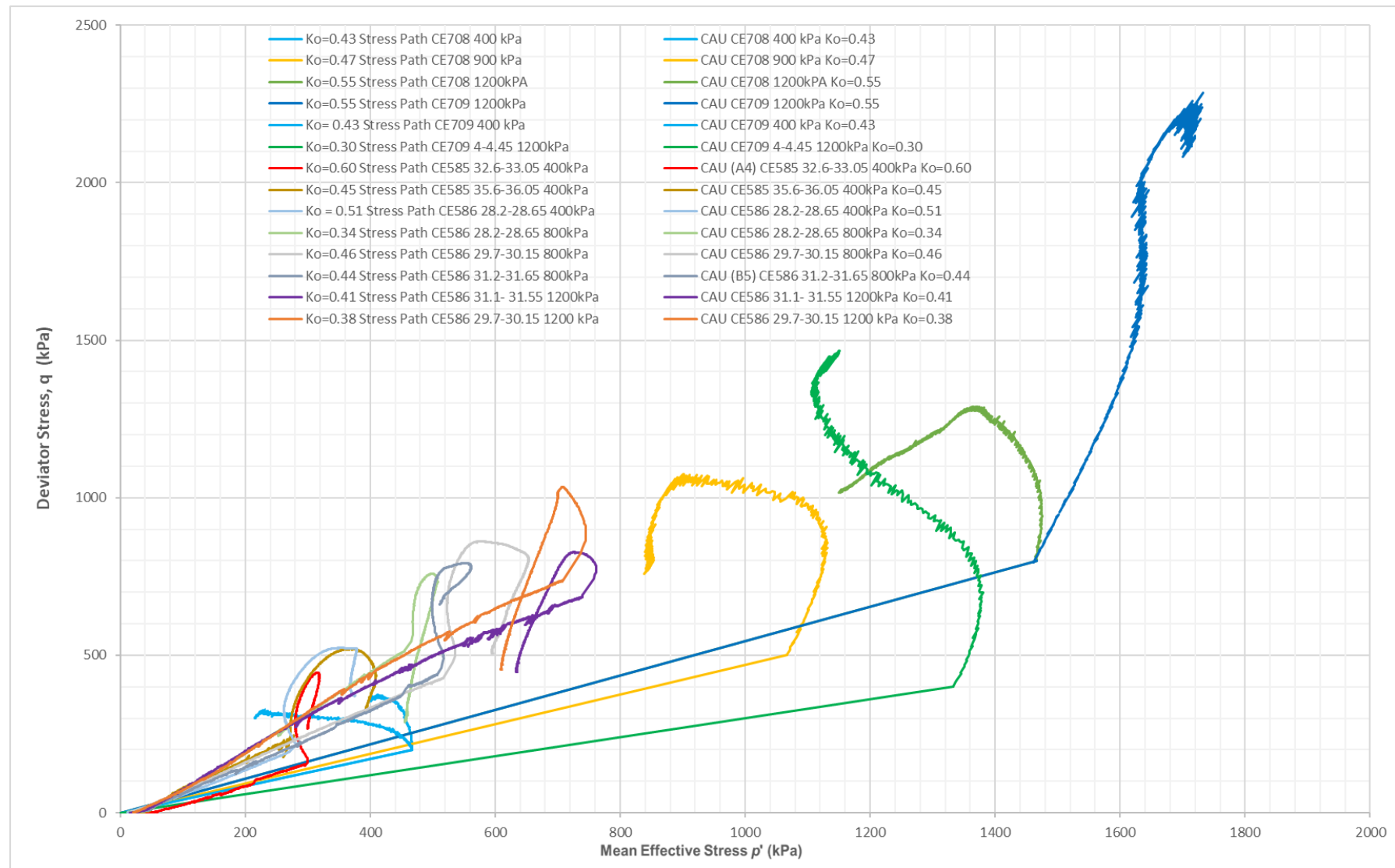


Figure 1-8 Stress Paths from CAU on FRVRS/XW

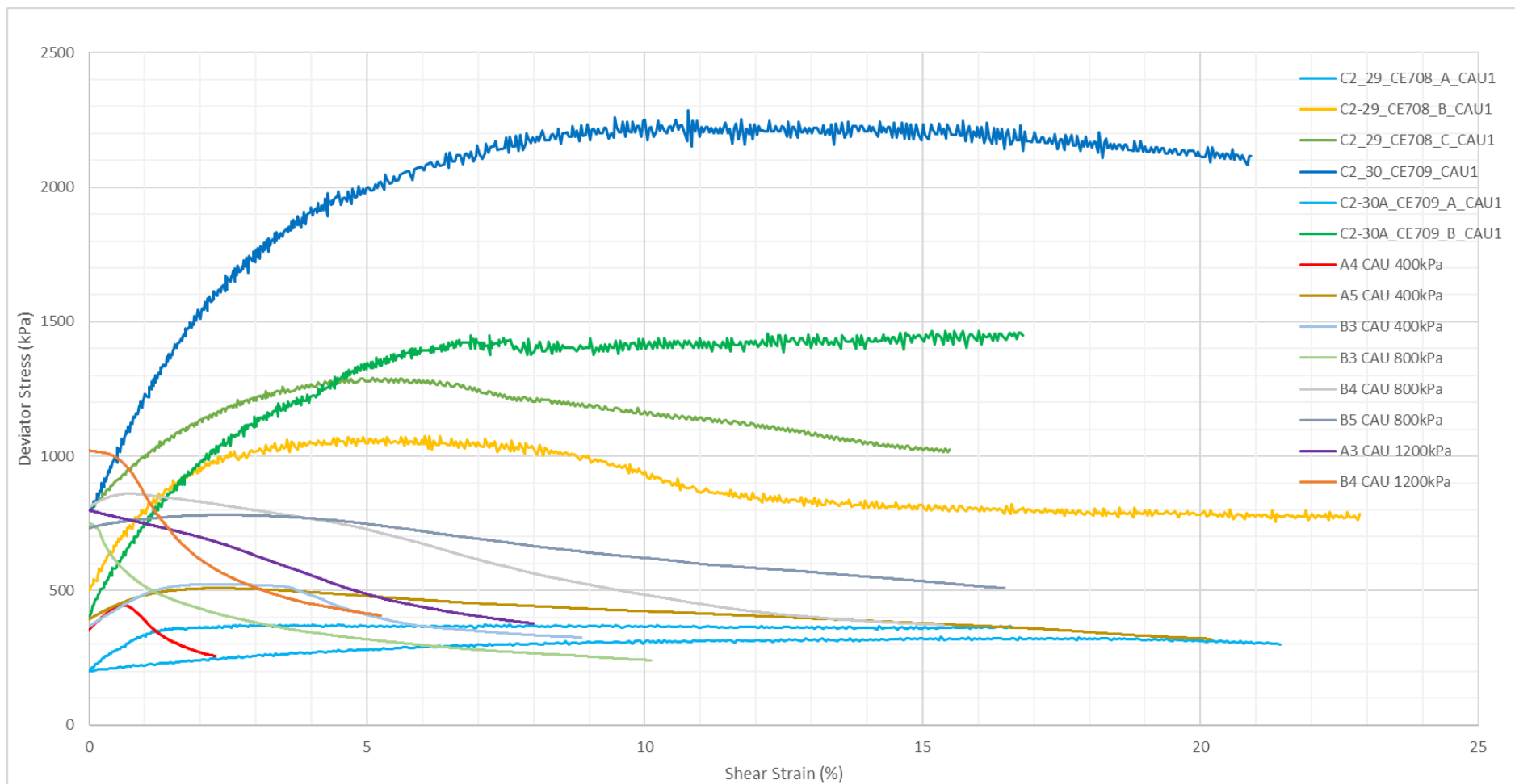


Figure 1-9 Comparison of Stress-Strain Curves from CAU on FRV RS/XW

1.3 Direct Simple Shear Tests

A total of 19 monotonic DSS were completed on selected samples recovered during various geotechnical investigations. All shearing was completed undrained with the samples consolidated to confining pressures of 400 kPa, 600 kPa, 800 kPa, 1000 kPa and 1200 kPa.

A summary of the results is shown in *Table 1.4*. The results indicate a peak S_u/σ'_{vo} ratios range between 0.22 to 0.56, and an effective friction angle ranging between 22° to 41° (refer to *Table 1.4*).

Table 1.4 Direct Simple Shear Test Summary for FRV RS/XW

BH ID	Depth (m)		Confining Pressure (kPa)	Peak S_u (kPa)	Post Peak S_u (kPa)	Peak S_u/σ'_{vo}	Post Peak S_u/σ'_{vo}	γ_{di} (t/m ³)	Gs	e
	From	To								
CE464	19.52	19.92	400	175	172	0.44	-	1.35	-	*1.00
CE464	19.52	19.92	800	291	288	0.36	-	1.38	2.72	0.93
CE464	19.52	19.92	1200	360	355	0.30	-	1.40	-	*0.93
CE411A	16.86	16.9	400	162	162	0.41	-	1.32	-	*1.04
CE411A	16.78	16.82	800	300	298	0.38	-	1.46	-	*0.85
CE411A	16.74	16.78	1200	388	376	0.32	-	1.49	-	*0.81
CE468	33.95	33.97	400	86	60	0.22	0.15	1.32	-	*1.04
CE468	33.88	33.90	800	246	233	0.31	-	1.35	2.75	1.00
CE468	33.92	33.95	1200	333	208	0.28	0.17	1.36		*0.98
CE415	6.00	6.50	600	255	199	0.43	0.33	1.28	2.89	1.21
CE415	6.00	6.50	1000	275	195	0.28	0.20	1.28	2.89	1.21
CE416	27.0	27.45	800	243	181	0.30	0.23	1.36	2.9	1.09
CE416	27.0	27.45	1200	314	252	0.26	0.21	1.36	2.9	1.09
CE417	24.0	24.3	600	334	316	0.56	-	1.29	2.85	1.17
CE417	24.0	24.3	800	384	384	0.48	-	1.29	2.85	1.17
CE417	24.0	24.3	1200	362	287	0.30	-	1.29	2.85	1.00
CE509	4.17	4.22	400	129	122	0.32	0.30	1.52	-	0.77
CE510	12.20	12.25	400	194	192	0.49	0.48	1.63	-	0.65
CE510	14.02	14.05	800	316	307	0.39	0.38	1.46	-	0.85

Notes: (*) Gs = 2.75 adopted; dry densities from triaxial tests

1.4 Ring Shear Tests

Five ring shear tests were carried out in the FRV. The results of these tests are summarised in *Table 1.5* and suggest residual friction angles range from 11° to 36°.

Table 1.5 Ring Shear Test Summary for RS to XW Weemalla Formation

BH ID	Depth (m)		Normal Stress (kPa)	Shear Stress (kPa)	ϕ_{res} (°)
	From	To			
CE935	12.7	13.07	800	160	11
CE936	15.3	15.6	800	574	36
CE951	3.25	3.65	800	210	15
CE951	3.65	4	1200	561	25

BH ID	Depth (m)		Normal Stress (kPa)	Shear Stress (kPa)	ϕ_{res} (°)
	From	To			
CE953	2.85	3.25	600	154	14

1.5 Summary of Results for RS to XW FRV RS/XW

Based on the above results the following are recommended:

- g. For confining pressures below 400 kPa, an $\phi' = 27^\circ$ and zero cohesion.
- h. For confining pressures between 400 kPa and 1000 kPa:
 - i. For drained analyses, $\phi' = 25^\circ$ and zero cohesion.
 - ii. For undrained analyses a peak undrained ratio in accordance with the following relationship $S_u/\sigma'_{vf} = 0.475 - 0.00019\sigma'_v$.
- i. For confining pressures above 1000 kPa:
 - i. For drained analyses, $\phi' = 25^\circ$ and zero cohesion.
 - ii. For undrained analyses, a ϕ_{cu} of 16° , which is equivalent to S_u/σ'_{vf} of 0.28.
- j. A residual friction angle of 11° .

2. Recovered Sand Testings

2.1 Particle size distribution

The summary of the Particle Size Distribution (PSD) tests performed on the Recovered Sand (RS) in early 2025 is shown in Figure 2-1. The results indicate a predominantly fine to medium sand tailings, with an average fines content of 6.3% and clay particles (<0.002 mm) comprising less than 2%. For construction,

The Hydrofloat test results show fines content below the design target, which may lead to compaction difficulties during construction and a performance that may not meet the design intent. It is understood that fines will be added to the Hydrofloat RS to ensure the material meets the design requirements. It is recommended that the final material be re-interpreted to assess potential implications for the expected performance of the material.

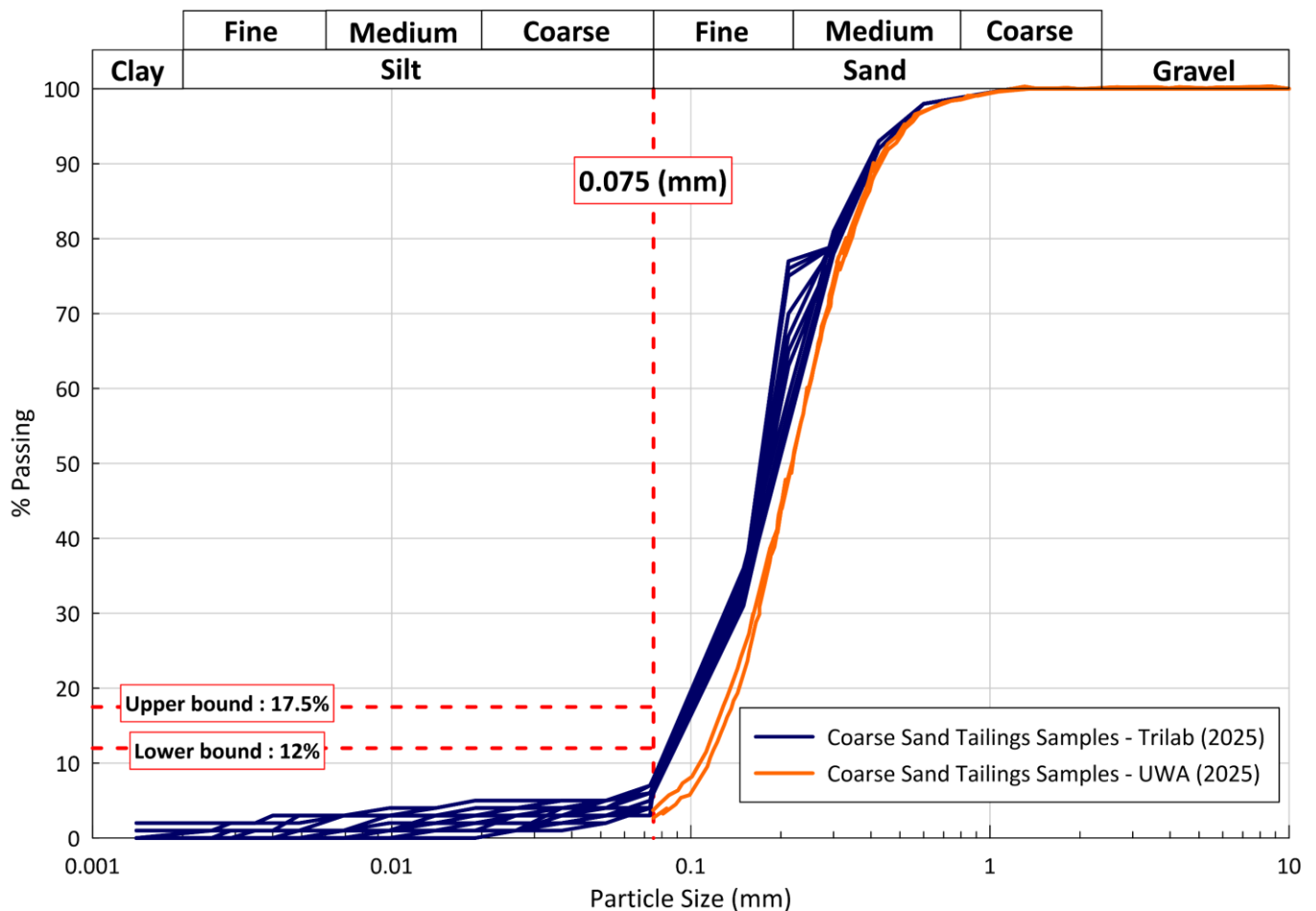


Figure 2-1 Particle Size Distribution for Recovered sand

2.2 Atterberg Limits

Atterberg limits testing was performed on 20 (twenty) RS samples. The low fines content in several samples resulted in non-plastic behaviour, rendering both the liquid limit and plasticity Index (PI) values unobtainable. Samples with sufficient fines content yielded PI values of 8% and 9%, which are characteristic of low-plasticity clays and silts.

The specific gravity (G_s) values for RS samples ranged from 2.7 to 2.79, with an average value of 2.73, as summarised in Table 2.1.

Table 2.1 Atterberg Limits and Specific Gravity Test Results for Recovered sand.

Sample Number	G_s (-)	LL (%)	PL (%)	PI
Recovered sand 1/20	2.73	NA	NA	NA
Recovered sand 2/20	2.70	NA	NA	NA
Recovered sand 3/20	2.74	NA	NA	NA
Recovered sand 4/20	2.70	NA	NA	NA
Recovered sand 5/20	2.76	NA	NA	NA
Recovered sand 6/20	2.73	33	24	9
Recovered sand 7/20	2.79	33	25	8
Recovered sand 8/20	2.74	NA	NA	NA
Recovered sand 9/20	2.75	NA	NA	NA

Sample Number	Gs (-)	LL (%)	PL (%)	PI
Recovered sand 10/20	2.70	NA	NA	NA
Recovered sand 11/20	2.73	NA	NA	NA
Recovered sand 12/20	2.73	NA	NA	NA
Recovered sand 13/20	2.71	NA	NA	NA
Recovered sand 14/20	2.76	NA	NA	NA
Recovered sand 15/20	2.74	NA	NA	NA
Recovered sand 16/20	2.74	NA	NA	NA
Recovered sand 17/20	2.75	NA	NA	NA
Recovered sand 18/20	2.74	NA	NA	NA
Recovered sand 19/20	2.75	NA	NA	NA
Recovered sand 20/20	2.71	NA	NA	NA

2.3 Compaction

A total of 10 (ten) compaction tests were carried out for the Hydrofloat RS. The results indicated an average Standard Maximum Dry Density (SMDD) of 1.60 t/m³, as shown in Table 2.2, with a minimal variation across samples. The Optimum Moisture Content (OMC) ranged between 18.1% to 18.7%.

The unit weight determined at OMC showed little variability, with an average value of 18.5 kN/m³. However, considering that the material in RS buttresses tends to dry over time, a unit weight corresponding to a moisture content of 10% was adopted, resulting in a unit weight value of 17 kN/m³.

Table 2.2 SMDD Test Results

Sample Number	Sample ID	SMDD (t/m ³)	OMC (%)	Dry Unit Weight (kN/m ³)	Unit Weight (kN/m ³)
Recovered sand 1/20	24122021-MDR	1.60	18.1	15.7	18.5
Recovered sand 2/20	24122022-MDR	1.60	18.4	15.7	18.6
Recovered sand 3/20	24122023-MDR	1.59	17.6	15.6	18.3
Recovered sand 4/20	24122024-MDR	1.60	18.7	15.7	18.6
Recovered sand 5/20	24122025-MDR	1.59	17.9	15.6	18.4
Recovered sand 6/20	24122026-MDR	1.60	18.7	15.7	18.6
Recovered sand 7/20	24122027-MDR	1.60	17.5	15.7	18.4
Recovered sand 8/20	24122028-MDR	1.60	17.8	15.7	18.5
Recovered sand 9/20	24122029-MDR	1.59	17.7	15.6	18.4
Recovered sand 10/20	24122030-MDR	1.59	17.8	15.6	18.4
Average value		1.60	18.0	15.7	18.5

2.4 Emerson Class

A total of 10 (ten) Emerson Class tests were conducted for RS, as summarised in Table 2.3. The results indicate a material Emerson Class 4. Based on these findings, it can be expected that the CT will exhibit a non-dispersive behaviour when exposed to standing water.

Table 2.3 *Emerson Class Test Results*

Sample Number	Sample ID	Emerson Class
Recovered sand 2/20	24122022	4
Recovered sand 3/20	24122023	4
Recovered sand 4/20	24122024	4
Recovered sand 5/20	24122025	4
Recovered sand 6/20	24122026	4
Recovered sand 7/20	24122027	4
Recovered sand 8/20	24122028	4
Recovered sand 9/20	24122029	4
Recovered sand 10/20	24122030	4

2.5 Pinhole dispersion test

Table 2.4 presents the results of the pinhole dispersion test conducted on RS samples. The results classify the RS material as dispersive (D2). On this basis, the material is considered susceptible to erosion and piping.

Table 2.4 *Pinhole Dispersion Test Results (Trilab, 2025).*

Test ID	Sample ID	Pinhole Dispersion Classification	Description
Recovered sand Samples 1/20	24122021-PHD	D2	Dispersive
Recovered sand Samples 2/20	24122022-PHD	D2	Dispersive
Recovered sand Samples 3/20	24122023-PHD	D2	Dispersive
Recovered sand Samples 4/20	24122024-PHD	D2	Dispersive
Recovered sand Samples 5/20	24122025-PHD	D2	Dispersive
Recovered sand Samples 6/20	24122026-PHD	D1	Highly Dispersive
Recovered sand Samples 7/20	24122027-PHD	D2	Dispersive
Recovered sand Samples 8/20	24122028-PHD	D2	Dispersive
Recovered sand Samples 9/20	24122029-PHD	D2	Dispersive
Recovered sand Samples 10/20	24122029-PHD	D2	Dispersive

2.6 Constant head permeability

In 2025, Trilab conducted a total of 20 (twenty) constant head permeability tests on remoulded Hydrofloat CT samples, conditioned to an average moisture content of 18.5% (refer to Table 2.5). The results indicated an average permeability of 1.7×10^{-5} m/s, about one order of magnitude higher than the threshold specified by Newcrest.

For the underdrain design, a value of 1.7×10^{-5} m/s was adopted on the basis that it represents the worst-case scenario in terms of water management. It is understood that fines will be added to the Hydrofloat RS to confirm the material meets the design requirements. Additional testing is recommended to ensure that the final product meets the permeability requirements.

Table 2.5 *Permeability Constant Head Test Results (Trilab, 2025).*

Sample ID	Target Dry Density (t/m ³)	Placement Moisture Content (%)	Placement Wet Density (t/m ³)	Permeability k (m/sec)
25050235-CPER	1.71	18.5	2.03	6.7×10^{-6}

Sample ID	Target Dry Density (t/m ³)	Placement Moisture Content (%)	Placement Wet Density (t/m ³)	Permeability k (m/sec)
25050236-CPER	1.68	18.5	1.99	4.6x10 ⁻⁶
25050237-CPER	1.66	18.4	1.97	3.8x10 ⁻⁶
25050238-CPER	1.64	18.6	1.94	5.9x10 ⁻⁶
25050239-CPER	1.63	18.5	1.93	4.4x10 ⁻⁶
25050240-CPER	1.61	18.3	1.91	9.0x10 ⁻⁶
25050241-CPER	1.59	18.7	1.88	8.3x10 ⁻⁶
25050242-CPER	1.57	18.6	1.86	9.4x10 ⁻⁶
25050243-CPER	1.55	18.4	1.84	1.4x10 ⁻⁵
25050244-CPER	1.53	18.3	1.81	2.1x10 ⁻⁵
25050245-CPER	1.52	18.3	1.80	2.0x10 ⁻⁵
25050246-CPER	1.50	18.4	1.78	1.6x10 ⁻⁵
25050247-CPER	1.48	18.8	1.75	1.7x10 ⁻⁵
25050248-CPER	1.47	18.8	1.74	1.2x10 ⁻⁵
25050249-CPER	1.45	18.4	1.72	2.2x10 ⁻⁵
25050250-CPER	1.44	18.4	1.70	2.9x10 ⁻⁵
25050251-CPER	1.42	18.6	1.69	2.4x10 ⁻⁵
25050252-CPER	1.41	18.3	1.67	3.6x10 ⁻⁵
25050253-CPER	1.39	18.2	1.65	4.8x10 ⁻⁵
25050254-CPER	1.38	18.2	1.63	3.0x10 ⁻⁵
Average value	1.53	18.46	1.81	1.7x10 ⁻⁵

2.7 Soil water characteristic curve

One Soil water characteristic curve (SWCC) test was carried out on the Hydrofloat CT. The sample was remoulded to a density of 1.52 t/m³, with a moisture content of 18.0%. The results are presented in Table 2.6, Table 2.7 and illustrated graphically in Figure 2-2.

Table 2.6 Soil Water Characteristic Curve Results (Trilab, 2025).

Sample ID	Dry Density (t/m ³)	Initial Gravimetric Moisture Content (w)	Initial Volumetric Moisture Content (θ)	Final Gravimetric Moisture Content (w)	Final Volumetric Moisture Content (θ)
25030520-SWCC	1.52	30.3%	46.1%	1.1%	1.7%

Table 2.7 Soil Water Characteristic Curves Test Results – RS (KCB, 2025)

Applied Air Pressure (kPa)	Matric Suction (kPa)	Volumetric Water Content (%)
0.1	0.10	46.1%
2	1.06	45.8%
4	2.91	43.7%
8	6.39	36.4%
16	12.19	5.4%
32	28.07	3.7%
64	60.02	3.0%

Applied Air Pressure (kPa)	Matric Suction (kPa)	Volumetric Water Content (%)
128	123.98	2.4%
256	251.96	2.1%
300	295.95	2.0%
400	395.95	1.8%
500	495.93	1.7%

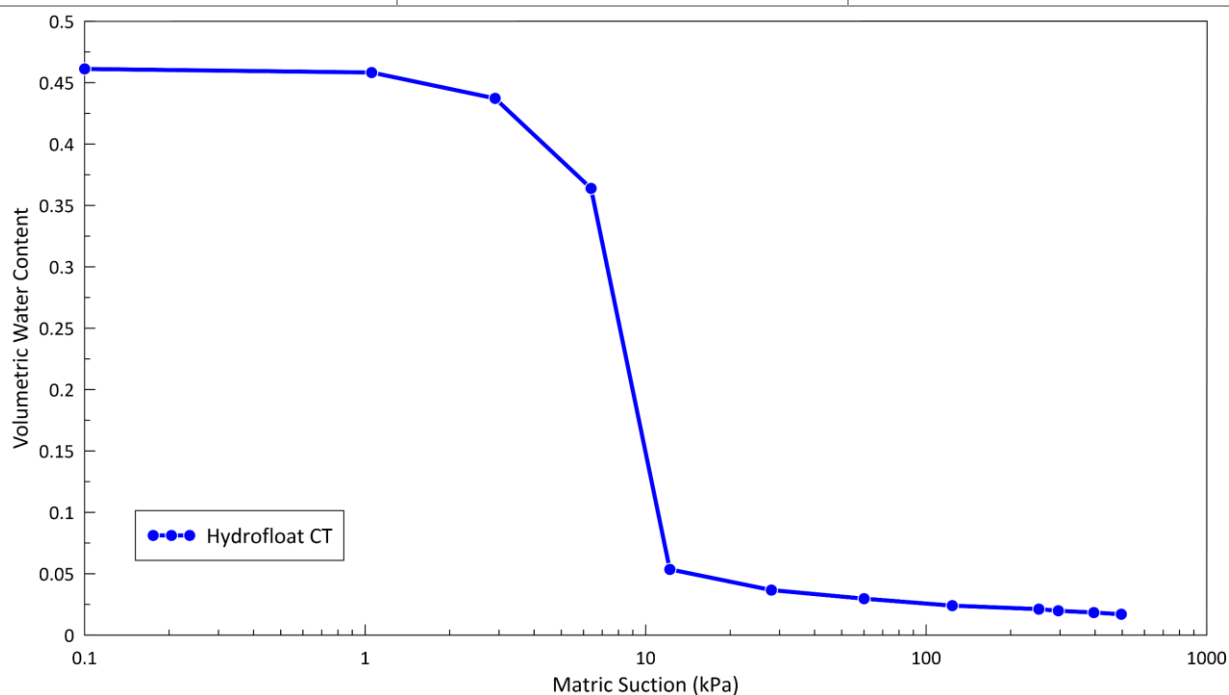


Figure 2-2 Soil Water Characteristic Curve – RS.

2.8 Triaxial

2.8.1 General

Triaxial tests were conducted by Trilab (Trilab, 2025) and the University of Western Australia (2025) on remoulded RS samples, as summarised in Table 2.8.

Table 2.8 Summary of Triaxial Test (CID-CIU) on Recovered Sand.

Sample ID	Test Type	Initial Effective Stress, p'_o (kPa)	Initial Dry Density, γ_{di} (t/m ³)	Initial Void Ratio, e_i	Peak Deviator Stress, q_{max} (kPa)	Reference
CIU 150	CIU	150	1.26	0.983	89.76	(UWA, 2025)
CIU 450	CIU	450	1.27	0.925	277.8	
CIU 750	CIU	750	1.27	0.885	468.2	
CIU 1050	CIU	1050	1.27	0.847	669.36	
CID 400	CID	400	1.48	0.857	1263	
CID 750	CID	750	1.27	0.896	2060	
CID 1050	CID	1050	1.27	0.861	2442	
CID 1350	CID	1350	1.27	0.836	2632	
24122021-SSCU	CIU	200	1.29	0.949	105.6	(Trilab, 2025)
24122022-SSCU	CIU	400	1.32	0.917	183.6	

Sample ID	Test Type	Initial Effective Stress, p'_o (kPa)	Initial Dry Density, γ_{di} (t/m³)	Initial Void Ratio, e_i	Peak Deviator Stress, q_{max} (kPa)	Reference
24122023-SSCU	CIU	600	1.24	0.870	345.9	
24122021-SSCD	CID	800	1.73	0.579	3001	
24122022-SSCD	CID	1400	1.73	0.572	4349	
Notes: ⁽¹⁾ The test was terminated before reaching the Critical State Line (CSL)						

2.8.2 Critical State Line (CSL)

Jefferies and Been (2016) define the state parameter (ψ) as the void ratio difference between the CSL and the in-situ void ratio, as illustrated in Figure 2-3. Dilative soils are defined as those having a $\psi < -0.05$; whilst contractive soils have $\psi \geq -0.05$.

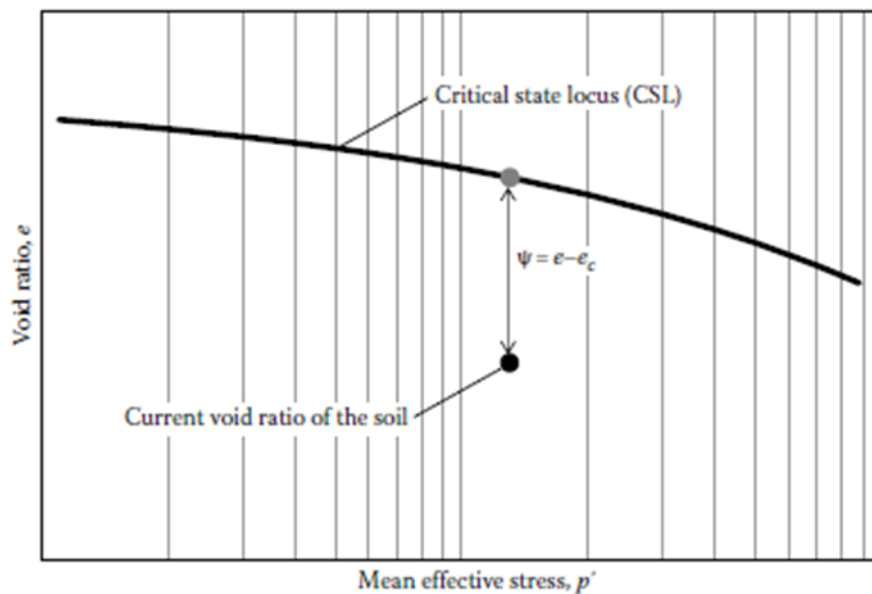


Figure 2-3 State Parameter Definition, after Jefferies and Been (2016)

The CSL for recovered sand was developed based on the available data. The interpretation of CSL is shown in Figure 2-4.

The results indicate that the better fit through the results is given by the logarithmic CSL equation, which is defined as follows:

$$e_c = a - b (p'/100)^c$$

Where:

- e_c = critical state void ratio.
- p' = mean effective stress, in kPa.
- a , b and c = CSL parameters.

The parameters for a , b and c adopted for recovered sand are provided in Table 2.9.

Table 2.9 Recovered sand CSL Parameters Summary

Material	CSL Parameter		
	a	b	c
Recovered sand	0.988	0.0688	0.568

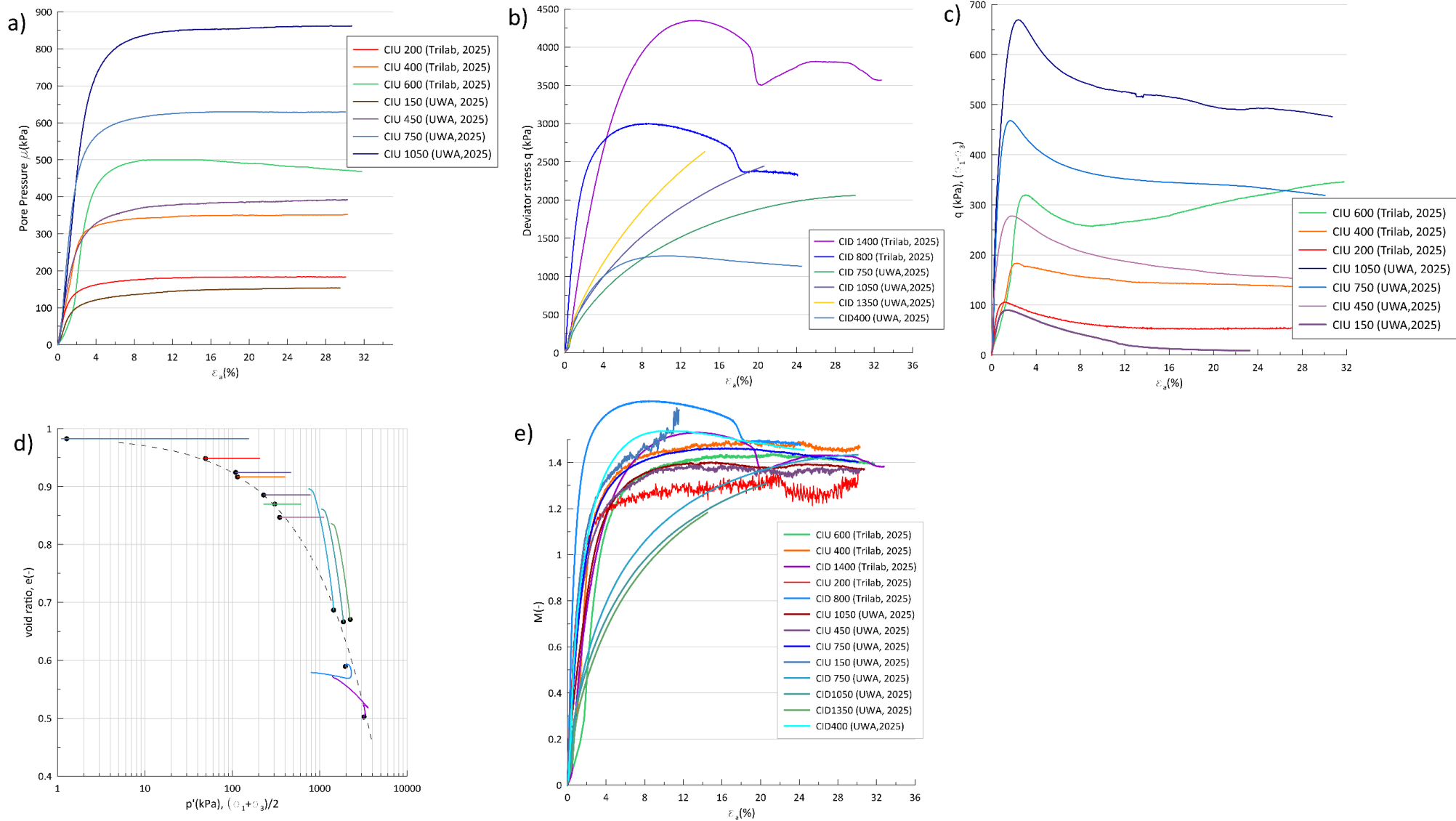


Figure 2-4 Triaxial test results: evaluation of behaviour for recovered sand.

2.8.3 Effective stress parameters

The effective friction angle for recovered sand materials was determined based on the triaxial tests available. It should be noted that some test results are still pending.

Based on the available test results, an effective friction angle (ϕ') of 35° with no cohesion has been interpreted, corresponding to a critical state stress ratio (M_{tc}) of 1.43, as shown in *Figure 12-5*. These results were obtained by analysing the stress path versus axial strain behaviour for each sample, as shown *Figure 2-4*

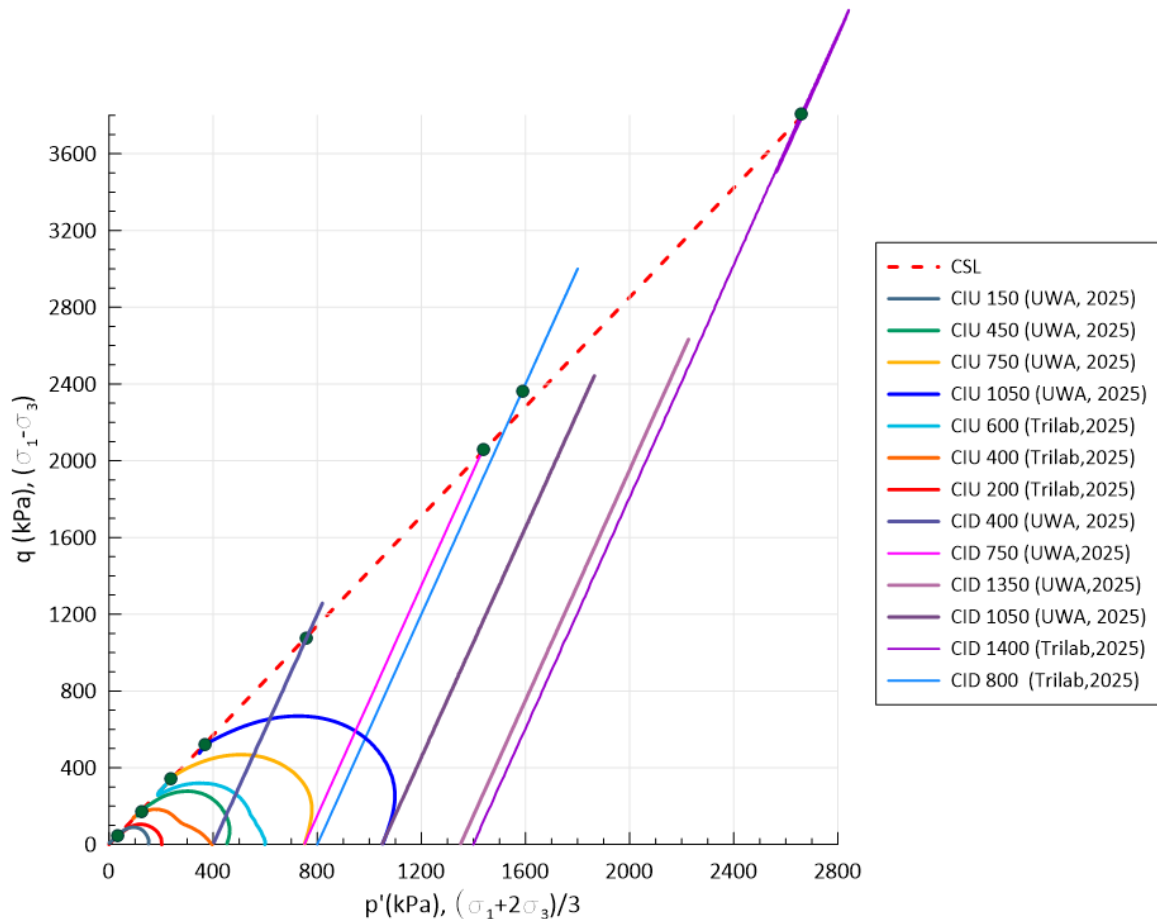


Figure 2-5 Recovered sand – Single Stage CIU Triaxial Test Results – Stress path.

2.8.4 Undrained shear strength

The peak undrained shear strength ratio (S_u/σ'_{v0}) was estimated by considering the geostatic stress ratio (k_0); as follows:

$$\frac{S_u}{\sigma'_{v0}} = \left(\frac{1 + 2k_0}{3} \right) \frac{S_u}{p'_0}$$

Where:

- S_u/σ'_{v0} = undrained shear strength ratio
- k_0 = geostatic stress ratio, estimated as $k_0 = 1 - \sin(\phi)$ (Jaky, 1944)
- S_u/p'_0 = triaxial undrained shear strength ratio.

The undrained shear strength from the triaxial tests was estimated as follows:

$$k. \quad S_u = \frac{q_{max}}{2} \cos(\phi)$$

Where:

- $q_{\max}$ = maximum deviator stress
- ϕ = estimated friction angle

A summary of the results is presented in *Table 2.10* and presented graphically in *Figure 12-5*, indicating a 20th percentile value of 0.23.

Notwithstanding these results, the design assumption for the RS buttress will be compacted to a state parameter of -0.22, which is expected to induce dilative response. In such cases, the drained strength is expected to be lower than the peak undrained shear strength and therefore governs the design.

Table 2.10 Summary of Estimated Undrained Shear Strength Ratio.

Sample ID	Test	Initial Effective Stress, p'_o (kPa)	Peak Deviator Stress, $q_{\max}$ (kPa)	Friction Angle ϕ (°)	Undrained Shear Strength Ratio (S_u/σ'_v)
CIU 150	CIU	150	90	36	0.23
CIU 450	CIU	450	278	34	0.24
CIU 750	CIU	750	468	36	0.23
CIU 1050	CIU	1050	669	35	0.24
24122021-SSCU	CIU	200	106	34	0.24
24122022-SSCU	CIU	400	184	37	0.23
24122023-SSCU	CIU	600	346	35	0.25

Notes: ⁽¹⁾ test was terminated before reaching the Critical State Line (CSL)

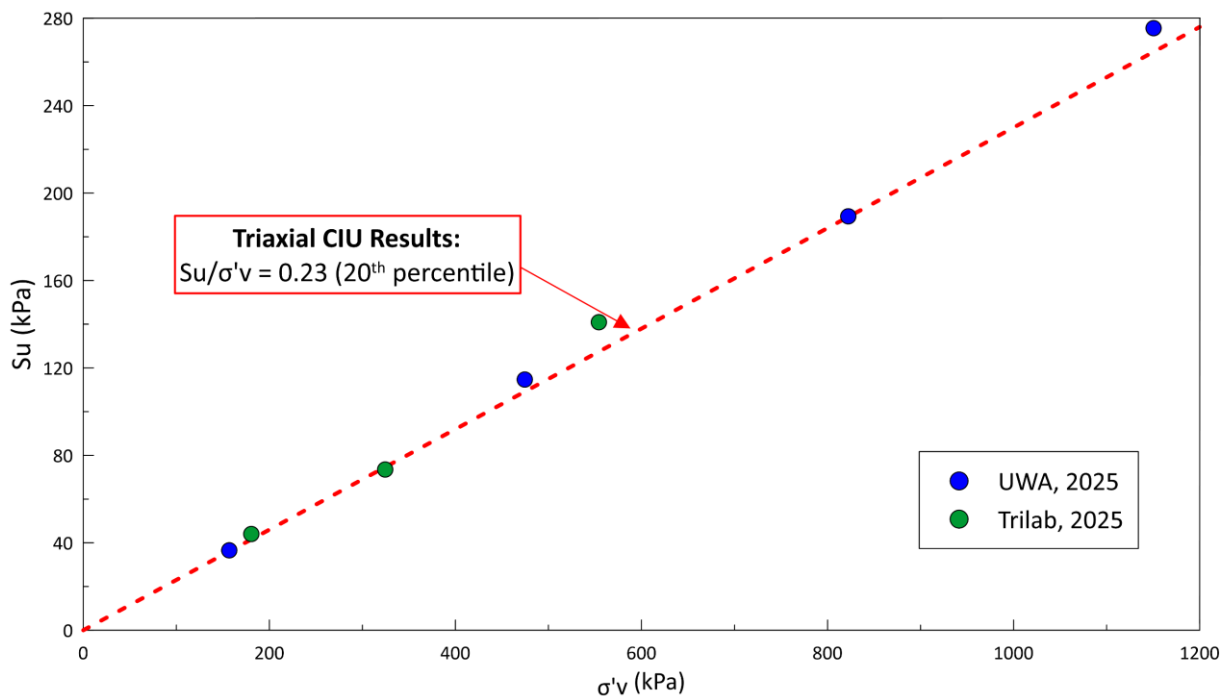


Figure 2-6 Recovered sand – Peak Undrained Shear Strength Ratio (S_u/σ'_v).

2.8.5 Secant Stiffness

The secant stiffness (E_{50}) parameter used for the assessment was determined based on 50% of the peak strength, derived from the drained stress-strain curves, as shown in Figure 2-7. Note that only the samples subjected to confining pressures of 800 and 1400 kPa were considered, as these are closest to the CT design density.

The results indicate a secant stiffness of about 150 MPa and 75 MPa for the test at 800 kPa and 1400 kPa, respectively.

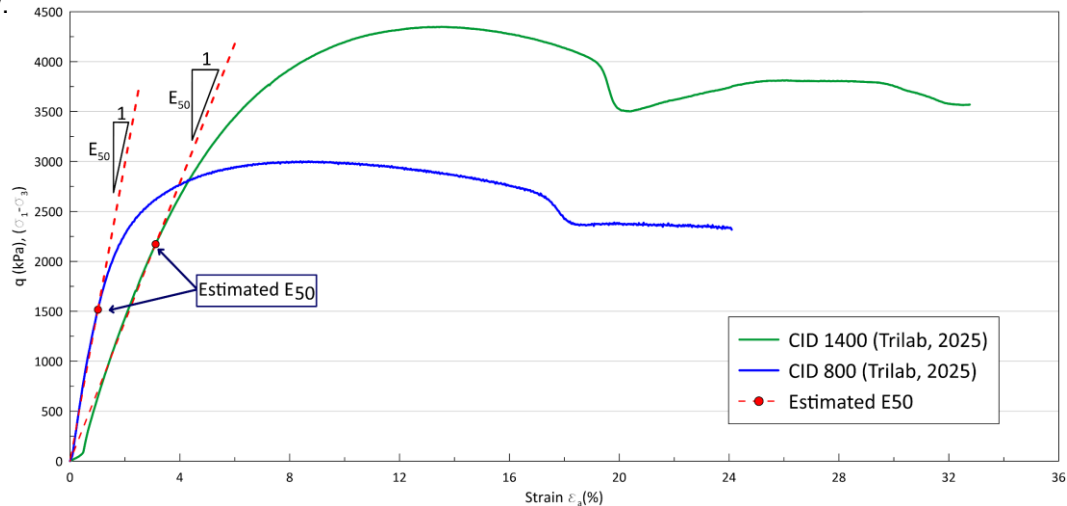


Figure 2-7 Estimated Secant Stiffness for drained CT test results.

2.9 Monotonic direct simple shear

Five Monotonic Direct Simple Shear (DSS) tests were performed for the RS material. The results are presented in Table 2.11 and Figure 2-8, indicating that the undrained peak strength ratios (S_u/σ_v) range from 0.27 to 0.49.

As previously stated, (Section 2.8.4, the design assumption for the CT buttress will be compacted to a state parameter of -0.22, as such, it is expected that the drained shear strength will govern the design.

Table 2.11 Direct Simple Shear Test Summary

Test ID	Initial Vertical Stress (kPa)	Initial Void Ratio	Initial Dry Density (t/m^3)	Shear Rate (mm/min)	Peak Undrained Shear Strength (kPa)	Peak Undrained Shear Strength Ratio
Recovered sand_vd_1650_mono	1650	0.86	1.48	0.2	554	0.34
Recovered sand_d_1100_mono	1100	0.90	1.44	0.2	519	0.47
Recovered sand_d_1650_mono	1650	0.90	1.44	0.2	649	0.39
Recovered sand_1_1100_mono	1100	1.02	1.36	0.2	293	0.27
Recovered sand_d_1100_csr.014cyc	1100	0.93	1.42	-	541	0.49

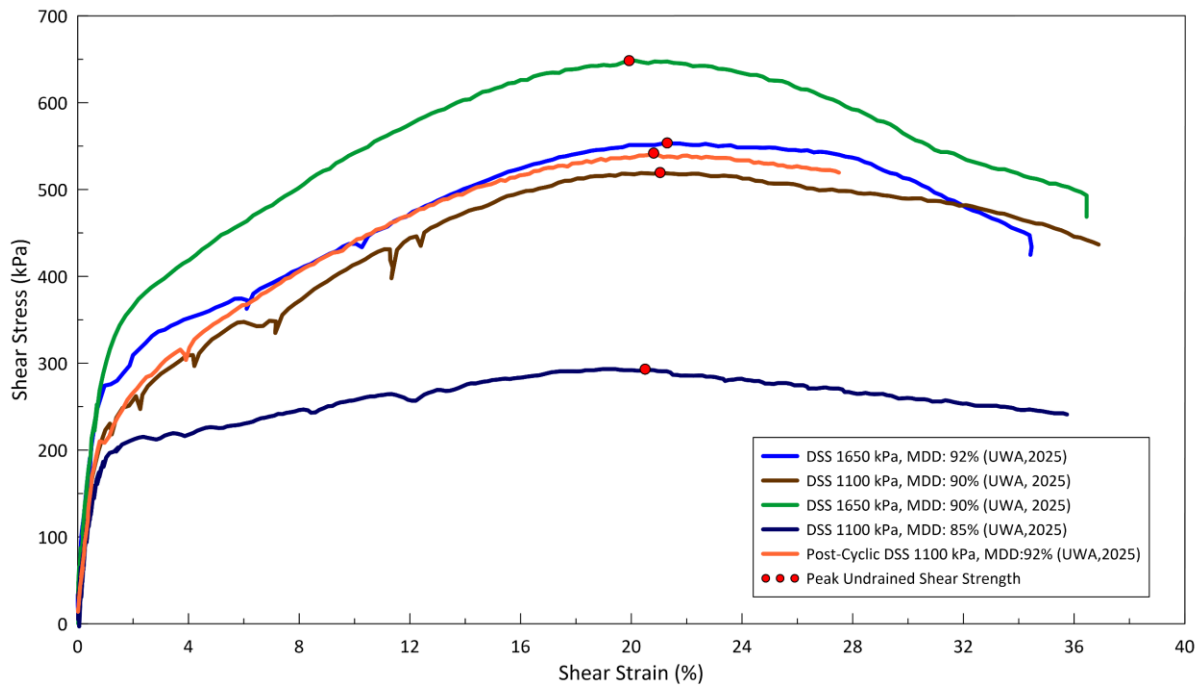


Figure 2-8 MDSS - Shear stress versus shear strain for CT.

2.10 Cyclic direct simple shear

Three Cyclic Direct Simple Shear Test (CDSS) were carried out on reconstituted samples, consolidated at 1100 kPa and under Cyclic Stress Ratios (CSR) of 0.14, 0.16 and 0.20.

The cyclic instability criteria, or liquefaction, for the tests were defined as:

- A pore pressure ratio, $Ru = \Delta u / \sigma_v$ of 0.8; and,
- A cyclic shear strain (γ_{s-cyc}) greater than 3.75%.

The results are summarised in **Table 2.12**, shown in Figure 2-11 through Figure 2-13 and indicate the following:

- The sample subjected to a CSR of 0.16 reached the pore water pressure criterion ($Ru > 0.8$) after 12 cycles and shear strain criterion ($\gamma_{s-cyc} > 3.75\%$) after 15 cycles.
- The sample tested at a CSR of 0.20 reached both failure criteria within 4 cycles.
- The sample tested at a CSR of 0.14 did not exhibit significant pore pressure buildup or deformation and therefore did not reach the cyclic instability criteria.

The above test results and the results of the PSD and Atterberg Limits, indicate a Cyclic Resistance Ratio (CRR) of 0.16 considered appropriate for the material tested. However, it should be noted this material had a state parameter of about +0.20, while the design assumption is that the CT will be compacted to a state parameter of

-0.22. At this denser state, the CRR is expected to increase significantly. For reference, Jefferies and Been (2016) suggest a CRR of about 0.30 for the design state parameter, as shown in **Figure 12-9**.

Should dynamic loads govern the design, it is recommended that further CDSS are carried out to better assess the CRR of the RS under the design assumptions (i.e. state parameter of about -0.22).

Based on the expected improvement in CRR and the fact that in-situ CT will be unsaturated, the likelihood of liquefaction is considered low, and the Factor of Safety (FoS) against liquefaction is expected to be 2.0 or greater. On this basis, the approach by Marcuson et al. (1990, shown in Figure 2-10, has been adopted to estimate the post-liquefaction shear strength.

As shown in Figure 2-10, for a FoS against liquefaction of 2.0, the associated strength reduction factor is approximately 0.1, suggesting the material is relatively stable and exhibits a low potential for liquefaction. Marcuson et al., suggest a residual excess pore pressure ratio (Ru) of about 0.1 is expected for recovered sand in this case, which corresponds to a reduction of approximately 10% from the peak drained parameters.

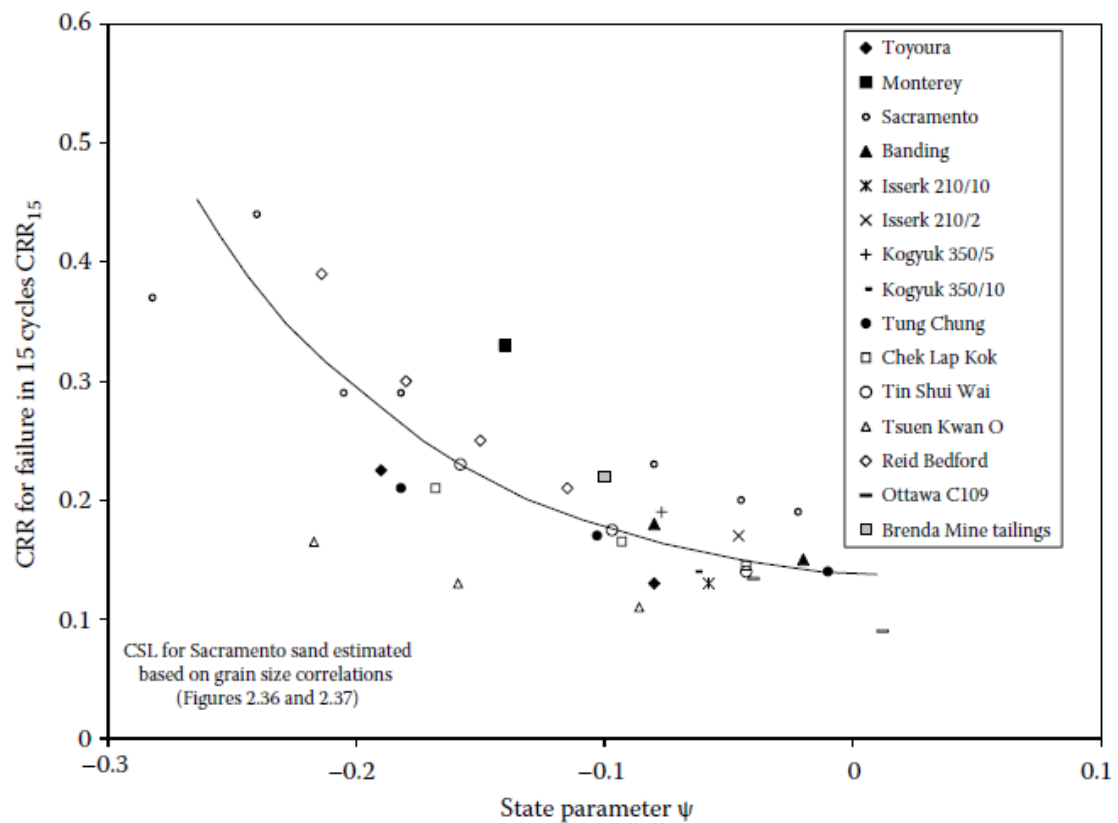


Figure 2-9 CRR at 15 Cycles as a Function of the State Parameter, after Jefferies and Been (2016).

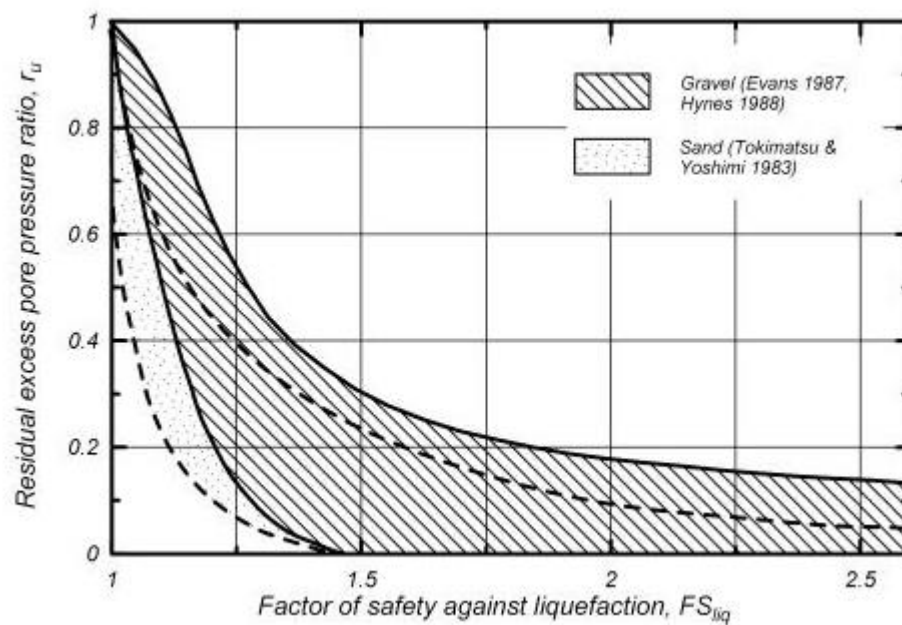


Figure 2-10 Excess pore water pressure ratio vs FS_{liq} under level ground conditions (Marcuson et al., 1990)

Table 2.12 *Cyclic Direct Simple Shear Test Results Summary*

Test ID	Initial vertical stress (kPa)	CSR	Cyclic Stress, τ_{cyc} (kPa)	Cyclic frequency (Hz)	Pore Pressure Ratio (R_u)	Number of Cycles to Reach	
						$\gamma_{s-cyc} > 3.75\%$	$R_u > 0.8$
Recovered sand_d_1100_csr0.14cyc	1100	0.14	154	0.1	0.40	-	-
Recovered sand_d_1100_csr0.16cyc	1100	0.16	176	0.1	0.99	15	12
Recovered sand_d_1100_csr0.2cyc	1100	0.20	220	0.1	0.99	4	4

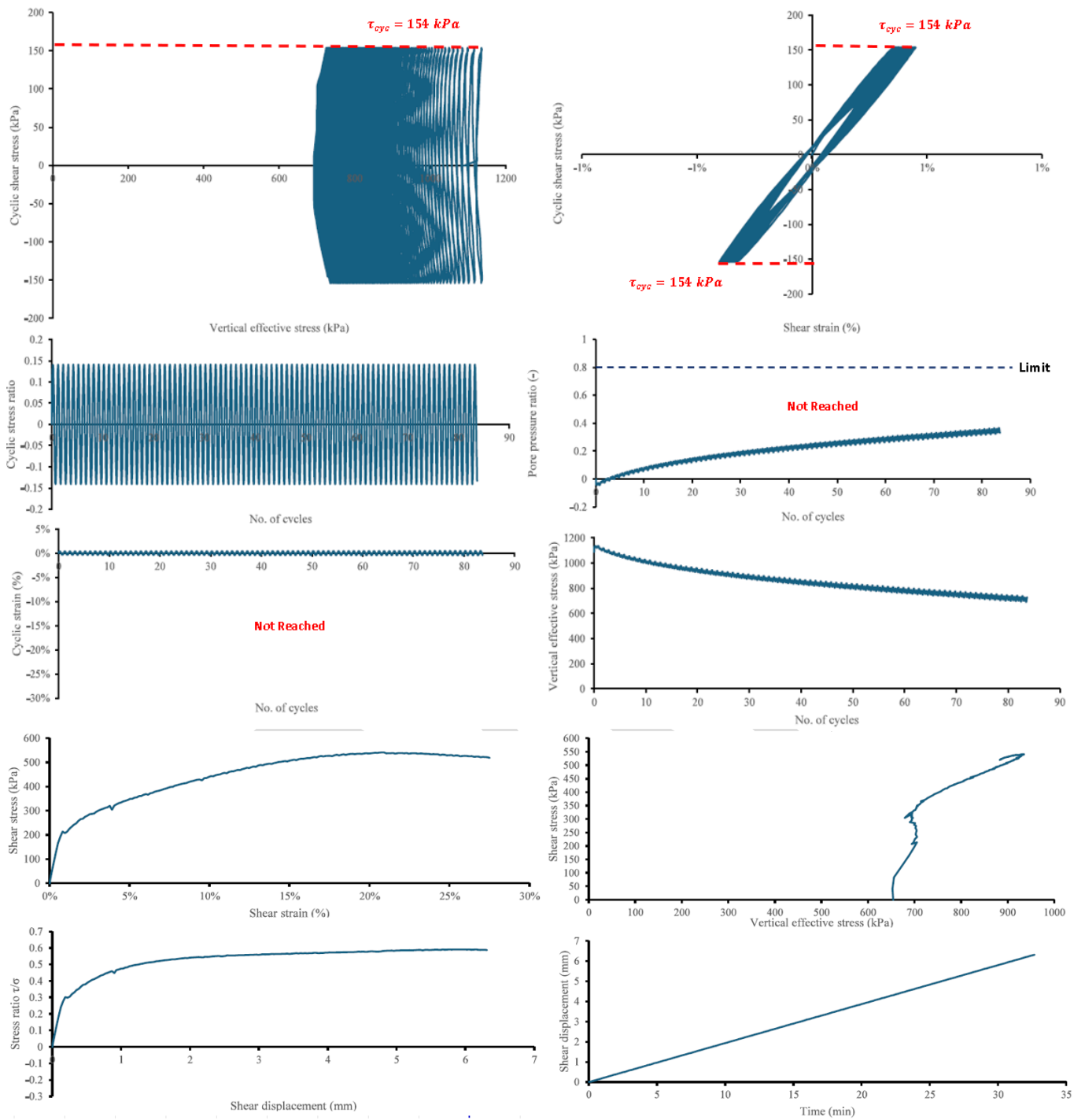


Figure 2-11 Cyclic Direct Simple Shear, CSR=0.14.

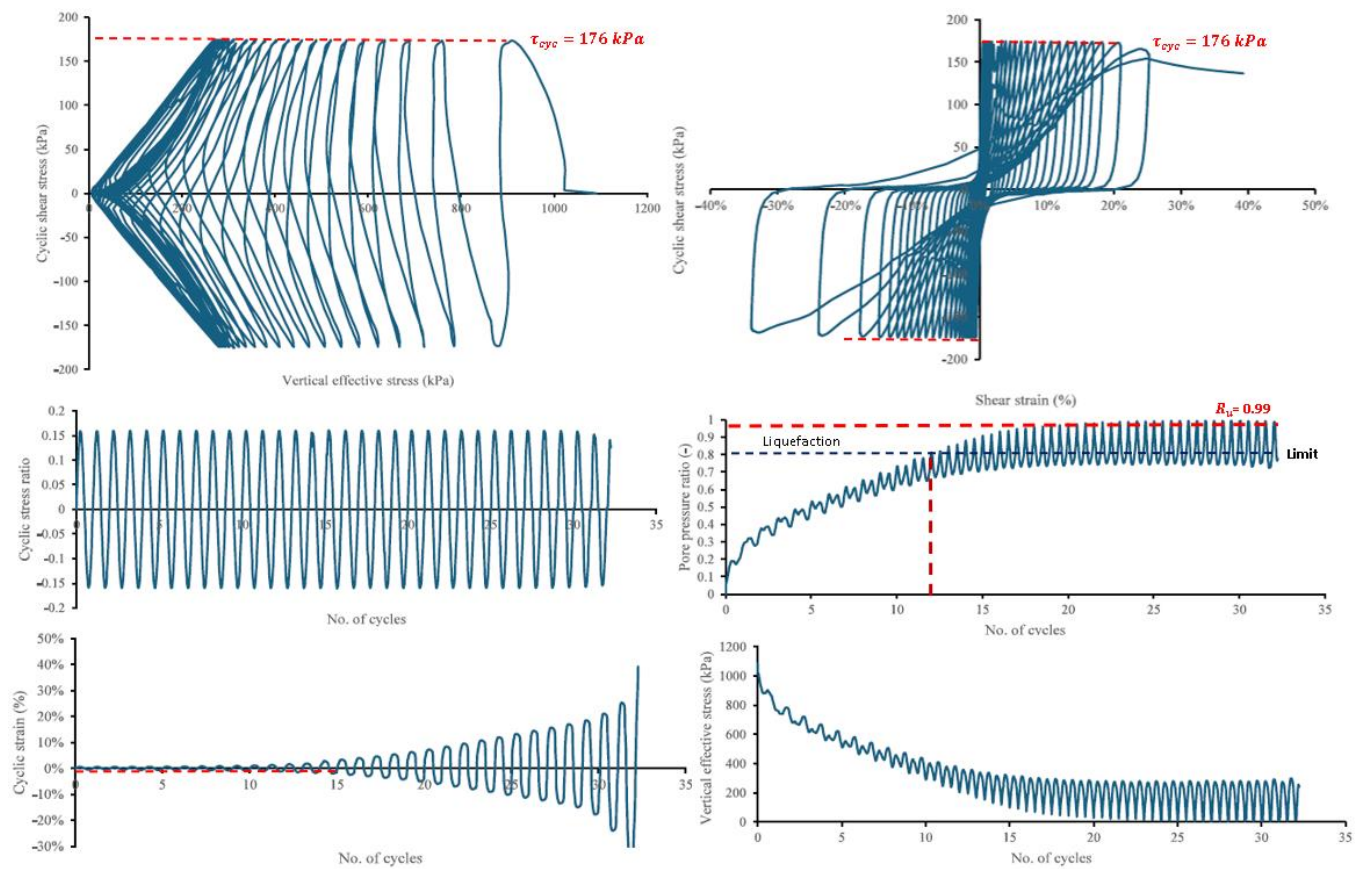


Figure 2-12 Cyclic Direct Simple Shear, $CSR=0.16$.

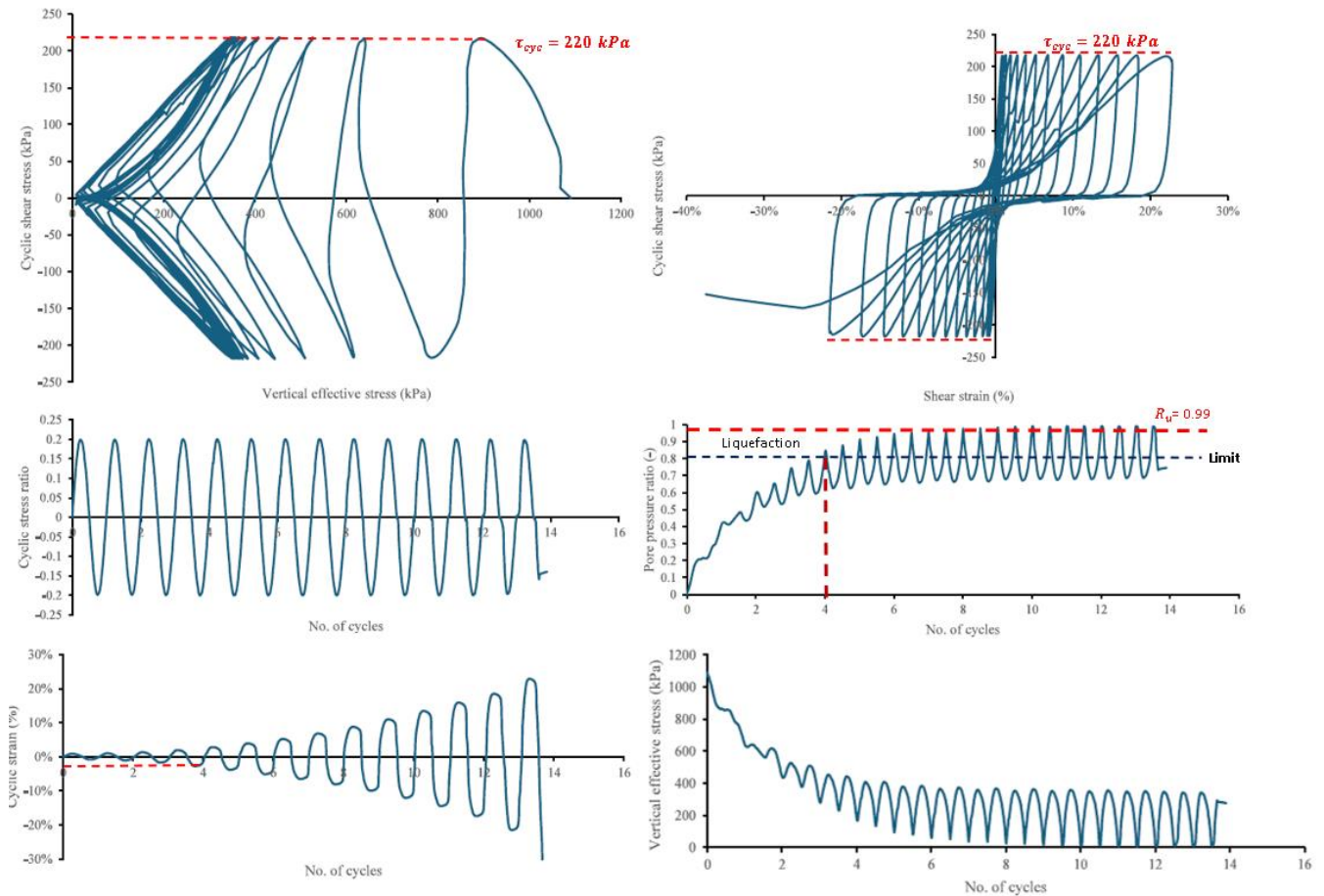


Figure 2-13 Cyclic Direct Simple Shear, CSR=2.0

2.11 Oedometer stiffness

The oedometer stiffness (E_{oed}) have been estimated based on four oedometer tests carried out, as shown in *Figure 2-14*. The samples were remoulded and compacted to densities ranging from 92% to 98%, with a target moisture content of 18.5%. The raw data from these tests is pending; therefore, the tabulated values shown in KCB (KCB, 2025) were used for interpretation, as summarised in *Table 12.13*.

The results show Compression Index (C_c) values ranging from 0.01 to 0.25 for vertical loads increasing from 50 kPa to 3200 kPa. The following relationship is recommended based on the results of these tests:

$$E_{\text{oed}} = 13.5 (\sigma_v / 100)^{0.5} \text{ (MPa)}$$

It should be noted that the relationship between E_{oed} and the vertical stress may vary depending on the constitutive soil model selected for analyses.

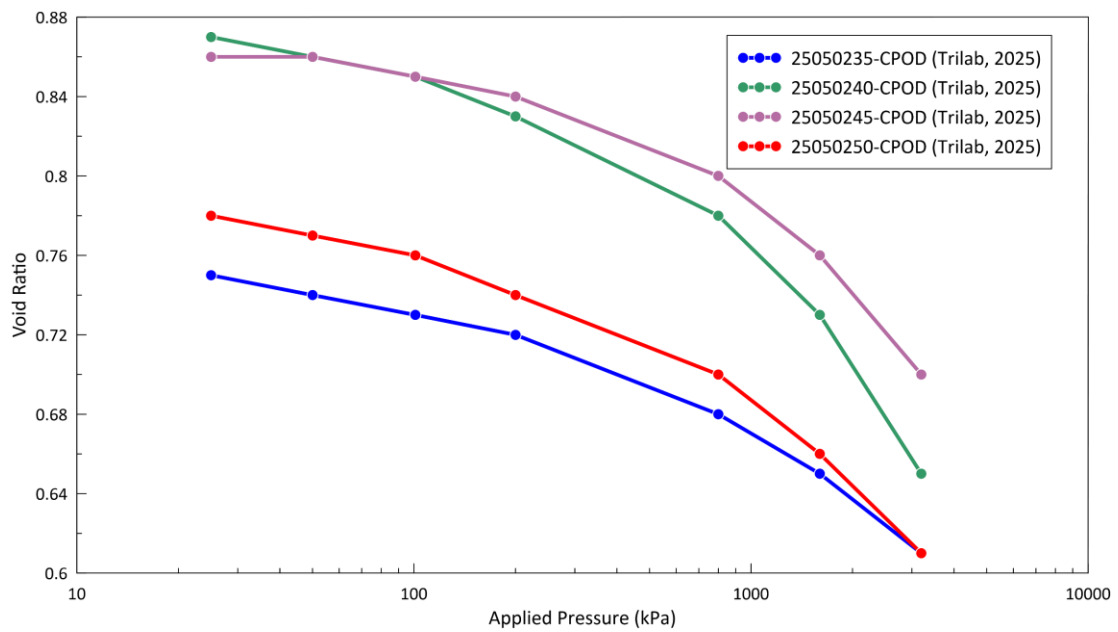


Figure 2-14 Oedometer Rest Results

Table 2.13 Oedometer test results – RS Sample ID: 25050245-CPOD.

Test ID	Vertical Load (kPa)	Void Ratio, e	Dry density (t/m ³)	Compression Index, Cc
25050245-CPOD	25	0.86	1.47	-
	50	0.86	1.47	0.01
	101	0.85	1.48	0.02
	200	0.84	1.49	0.03
	800	0.80	1.52	0.06
	1600	0.76	1.55	0.13
	800	0.77	1.55	-
	1601	0.76	1.56	-
	3200	0.70	1.61	0.20
25050250-CPOD	25	0.78	1.54	-
	50	0.77	1.55	0.04
	101	0.76	1.56	0.04
	200	0.74	1.57	0.05
	800	0.70	1.62	0.08
	1600	0.66	1.65	0.10
	800	0.67	1.64	-
	1601	0.66	1.65	-
	3200	0.61	1.70	0.16
25050240-CPOD	25	0.87	1.46	-
	50	0.86	1.47	0.03
	101	0.85	1.48	0.05
	200	0.83	1.50	0.06
	800	0.78	1.54	0.08
	1600	0.73	1.58	0.16

Test ID	Vertical Load (kPa)	Void Ratio, e	Dry density (t/m ³)	Compression Index, Cc
	800	0.74	1.57	-
	1601	0.73	1.58	-
	3200	0.65	1.66	0.25
25050235-CPOD	25	0.75	1.57	-
	50	0.74	1.57	0.02
	101	0.73	1.58	0.03
	200	0.72	1.59	0.04
	800	0.68	1.63	0.07
	1600	0.65	1.66	0.08
	800	0.66	1.65	-
	1601	0.65	1.66	-
	3200	0.61	1.70	0.14

2.12 Triaxial bender elements

The results of the triaxial bender element test conducted on RS material are summarised in *Table 2.14*. Two sample preparation methods were adopted:

- Air-dried method: where a dense slurry is poured into a container and allowed to dry under ambient conditions until the material becomes self-supported.
- Wet pluviation method: where the dry material is deposited onto a moist medium, to obtain a specimen with a controlled density.

The results of the small strain shear modulus (G_0) and shear wave velocity (V_s) versus effective vertical stress are graphically shown in *Figure 12-15*, with the following relationships recommended:

$$G_0 = 63 \left(\sigma_v' / 100 \right)^{0.6} \text{ (MPa)}$$

$$V_s = 44.01 (\sigma_v')^{0.3} \text{ (m/s)}$$

It should be noted that the form of the above correlations may vary depending on the constitutive soil model selected for analyses.

Table 2.14 *Triaxial Bender Elements Results Summary*

Sample Method	Effective Vertical Stress (kPa)	V_s (m/s)	G_0 (MPa)
Air-dried	200	202.9	81.1
Air-dried	400	272.0	146.3
Air-dried	800	330.8	217.8
Air-dried	1000	347.3	240.5
Air-dried	1200	365.4	266.7
Air-dried	1600	391.7	307.8
Wet-pluviation	200	216.0	93.6
Wet pluviation	400	277.8	155.5
Wet pluviation	800	349.1	246.8
Wet pluviation	1000	365.6	271.4
Wet pluviation	1200	377.2	289.3

Sample Method	Effective Vertical Stress (kPa)	V _s (m/s)	G ₀ (MPa)
Wet pluviation	1600	404.5	333.9

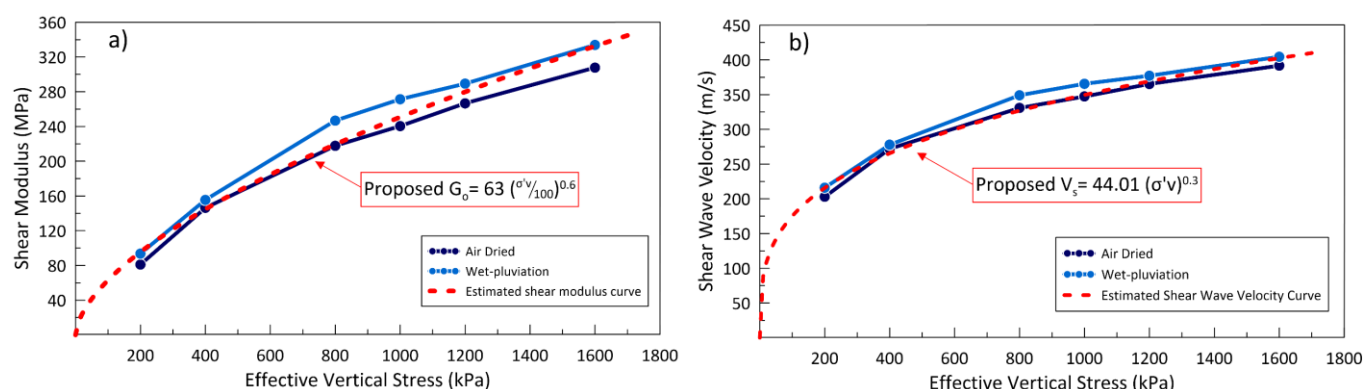


Figure 2-15 Shear Modulus and Shear Wave Velocity vs Effective Vertical Stress

2.13 Triaxial cell permeability

The results of the triaxial cell permeability carried out are summarised in *Table 2.15*, with the results suggesting an average permeability of 2.99×10^{-4} m/s. This value is two orders of magnitude higher than the value defined in the Feasibility Study (1.0×10^{-6} m/s) and one order of magnitude greater than that obtained from the constant head permeameter test (1.2×10^{-5} m/s), as shown in *Figure 12-16*.

Table 2.15 Triaxial Bender Element/ Cell Permeability results.

Sample Method	Effective Vertical Stress (kPa)	Permeability k (m/s)
Air-dried	200	3.85×10^{-4}
Air-dried	400	3.74×10^{-4}
Air-dried	800	3.29×10^{-4}
Air-dried	1000	3.09×10^{-4}
Air-dried	1200	3.03×10^{-4}
Air-dried	1600	2.89×10^{-4}
Wet-pluviated	200	3.10×10^{-4}
Wet pluviated	400	2.90×10^{-4}
Wet pluviated	800	2.61×10^{-4}
Wet pluviated	1000	2.47×10^{-4}
Wet pluviated	1200	2.52×10^{-4}
Wet pluviated	1600	2.36×10^{-4}
Average permeability (m/s)		2.99×10^{-4}

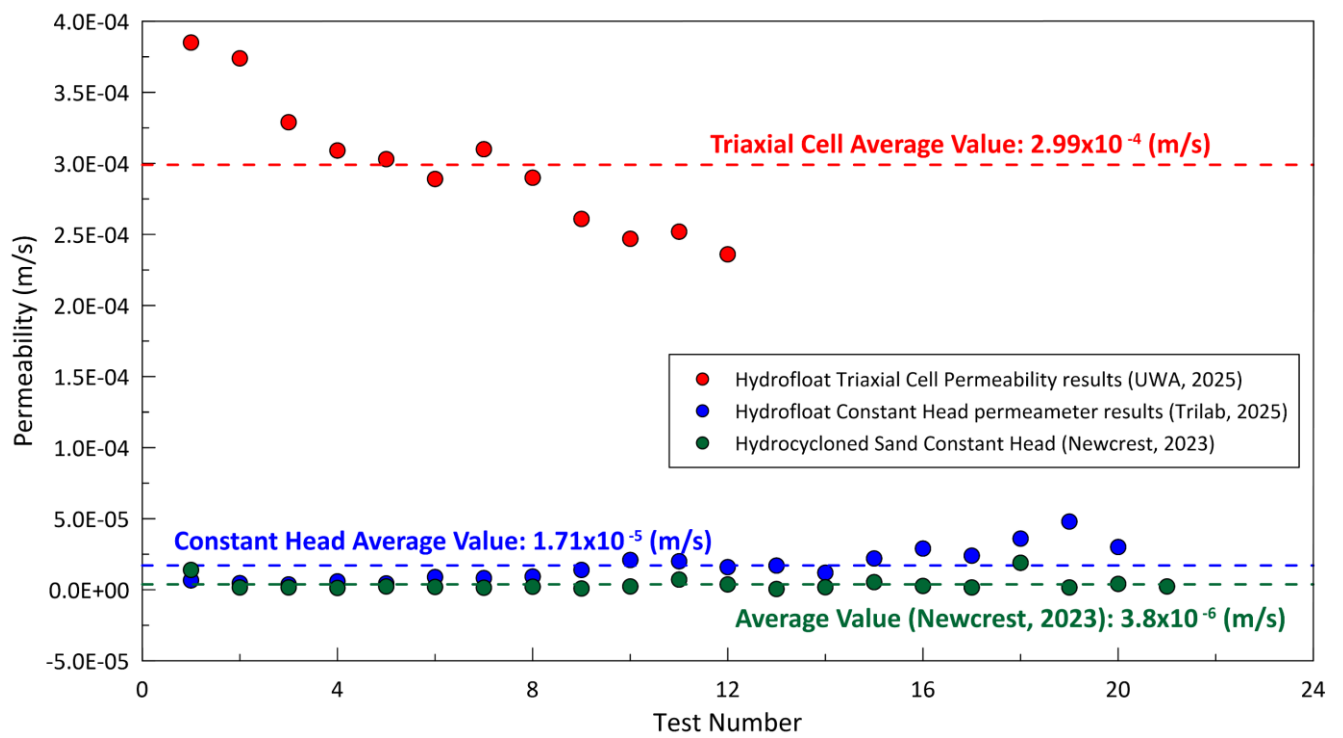


Figure 2-16 Comparison of Hydraulic Conductivity between Constant Head tests and Triaxial Cell results.

3. Summary

GHD conducted the geotechnical interpretation of the Hydrofloat RS. The interpreted engineering parameters are summarised in *Table 3.1*.

Table 3.1 Summary of RS properties.

Parameter	Value	Commentary
Gradation	Average recovered sand content: 93.7% Average fine content: 6.3% ⁽¹⁾ .	From Particle Size Distribution (PSD) tests
Plasticity	Non-Plastic	From Atterberg Limits tests
Specific Gravity, G _s	2.73	From Soil particle density tests
Dispersion	D2 – dispersive	Susceptible to erosion and piping based on pinhole tests. Emerson Class tests indicates non-dispersive.
Permeability	Average Falling Head: 1.71x10 ⁻⁵ m/s ⁽²⁾ Average triaxial cell: 2.99 x10 ⁻⁴ m/s ⁽²⁾	Based on falling head tests and triaxial cell permeability tests
SMMD	1.6 t/m ³	From compaction tests
OMC	18%	From compaction tests
Design unit weight	17 kN/m ³	Adopted assuming 10% moisture of CT after compaction
Cohesion, c'	0 kPa	From triaxial tests
Friction angle, φ'	35°	From triaxial tests
Undrained shear strength ratio, S _u /σ' _v	0.23	From 20 th percentile of triaxial tests.
Post Seismic Strength	c' = 0 kPa φ' = 31°	Assuming FoS _{liq} > 2, refer to Section 12.10
Secant stiffness, E ₅₀	$E_{50} = 35(\sigma'_v/100)^{0.5} \text{ (MPa)}^{(3)}$	From triaxial tests
Oedometer stiffness, E _{oed}	$E_{oed} = 13.5(\sigma'_v/100)^{0.5} \text{ (MPa)}^{(3)}$	From oedometer tests
Small strain shear modulus, G ₀	$G_o = 63 \left(\sigma'_v / 100 \right)^{0.6} \text{ (MPa)}^{(3)}$	From bender element tests

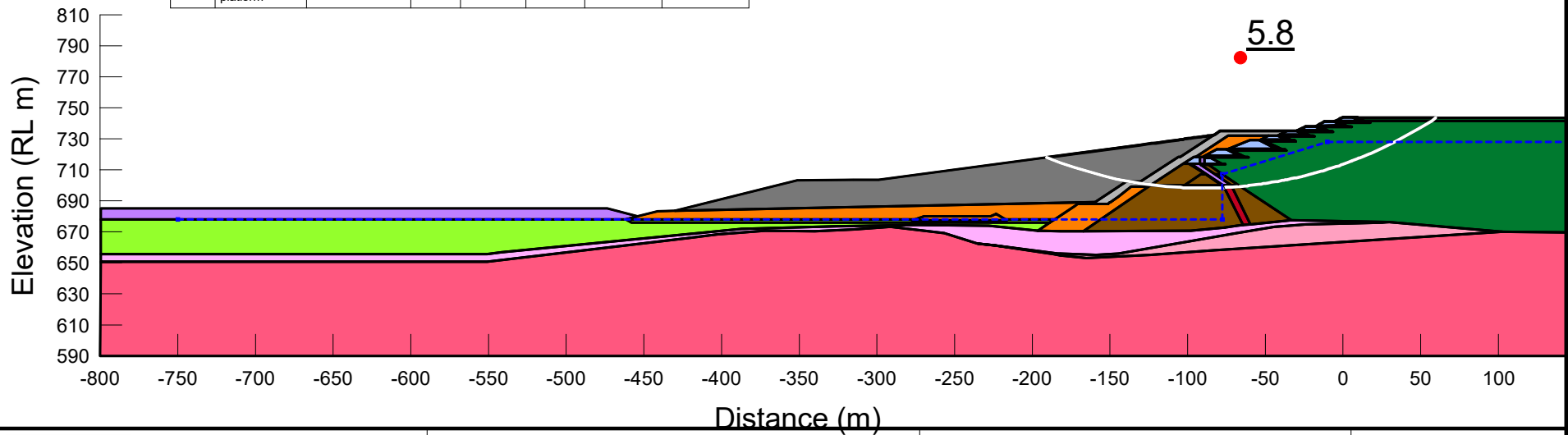
Notes: (1) Design basis fine content is 12% to 17.5%, (2) Design basis permeability 1x10⁻⁶; (3) Form of relationship could differ depending on constitutive model used for analyses.

Appendix B

Stability Analysis

CH - 2000: 1.1 Drained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 1.1 Drained Circular Local

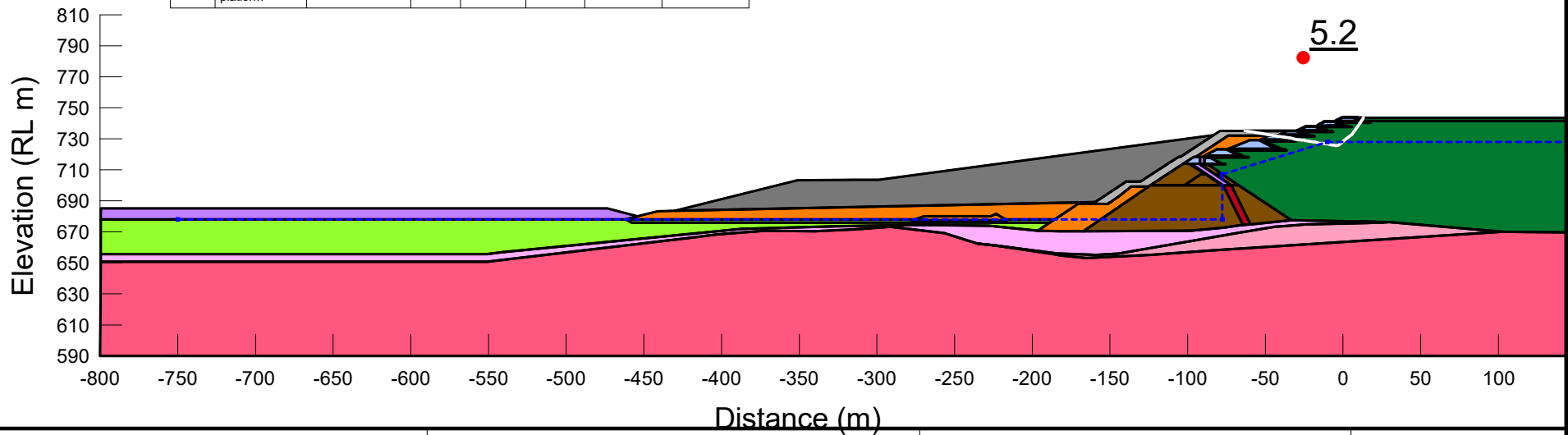
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 1.2 Drained Non-Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 1.2 Drained Non-Circular Local

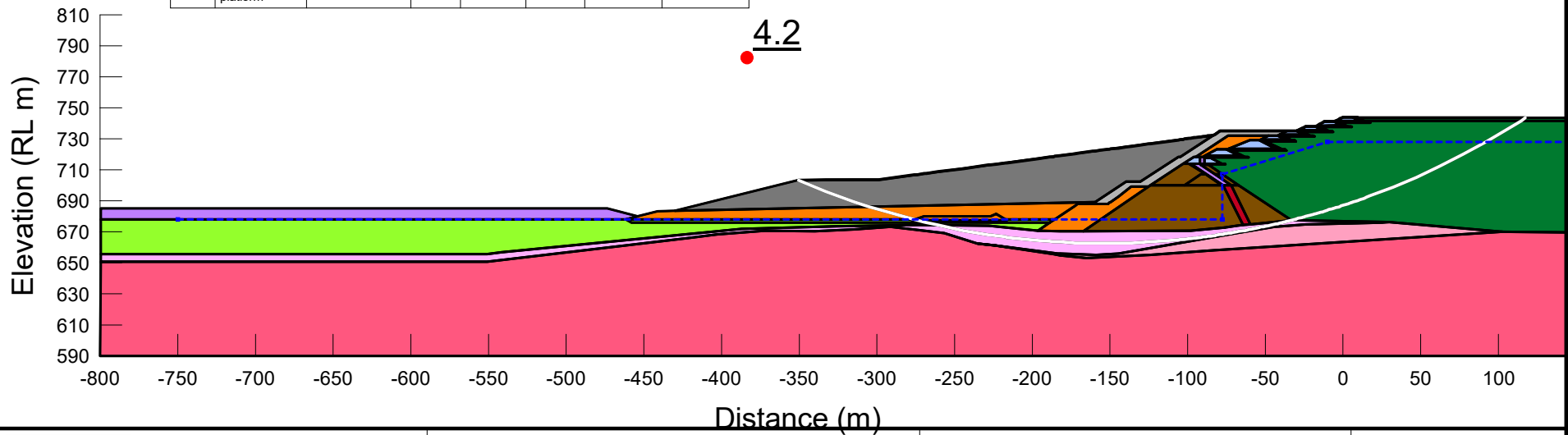
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 1.3 Drained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 1.3 Drained Circular Global

Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

4.2

4.2



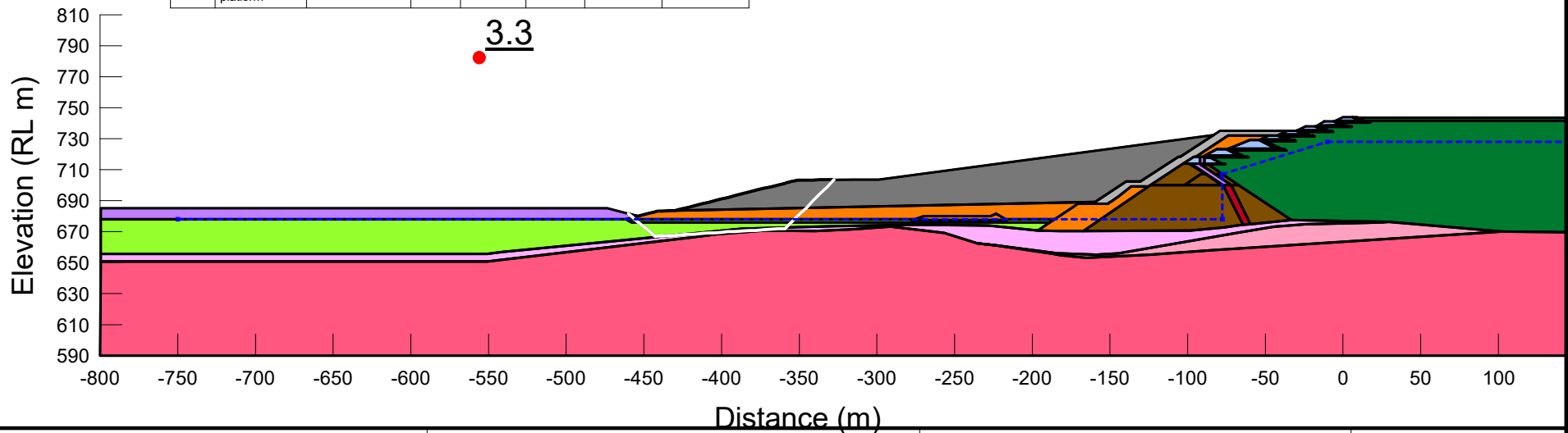
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Case: 1.4 Drained Non-Circular Global

Scale: 1:4,000

CH - 2000: 1.5 Drained Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 1.5 Drained Non-Circular Shallow Toe

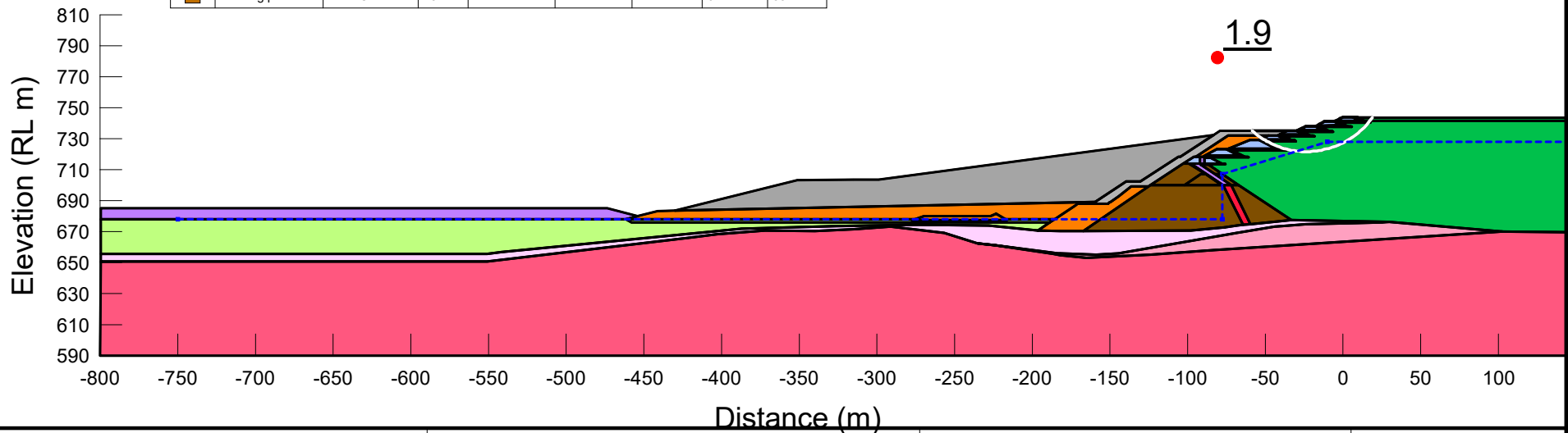
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 2.1 Undrained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Funton FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 2.1 Undrained Circular Local

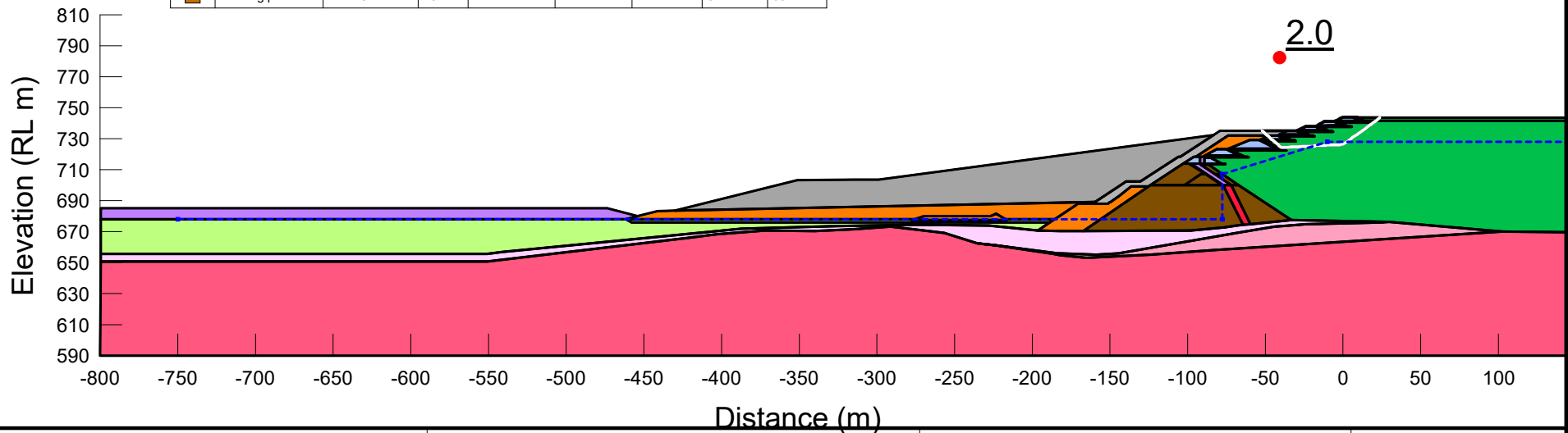
Project No. **12664089**
Date **11/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 2.2 Undrained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Funton FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 2.2 Undrained Non Circular Local

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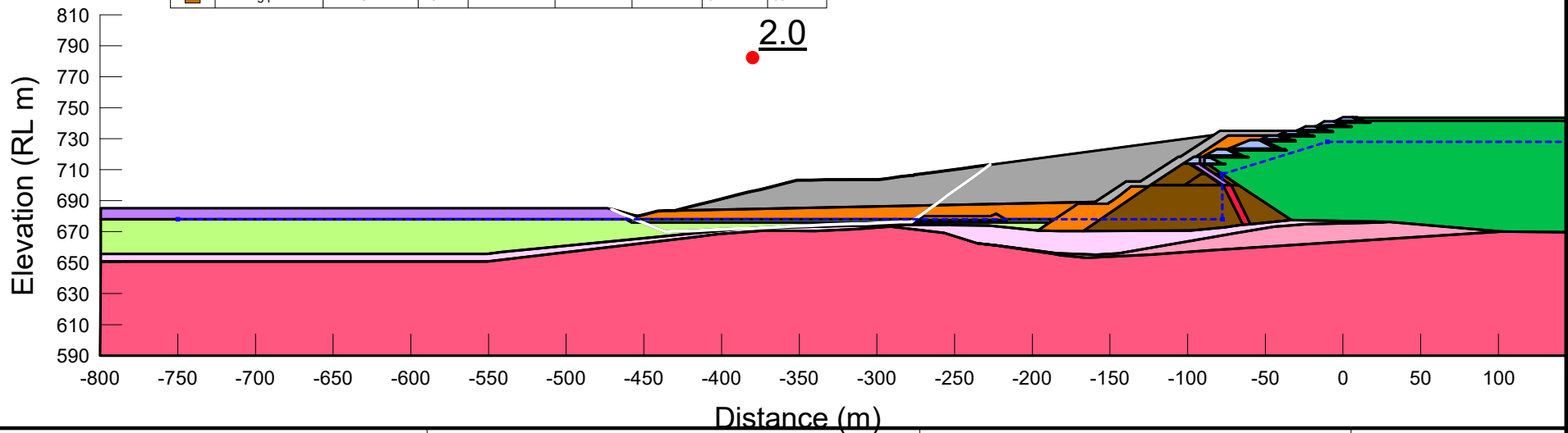
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Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 2.4 Undrained Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Funton FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 2.4 Undrained Non-Circular Global

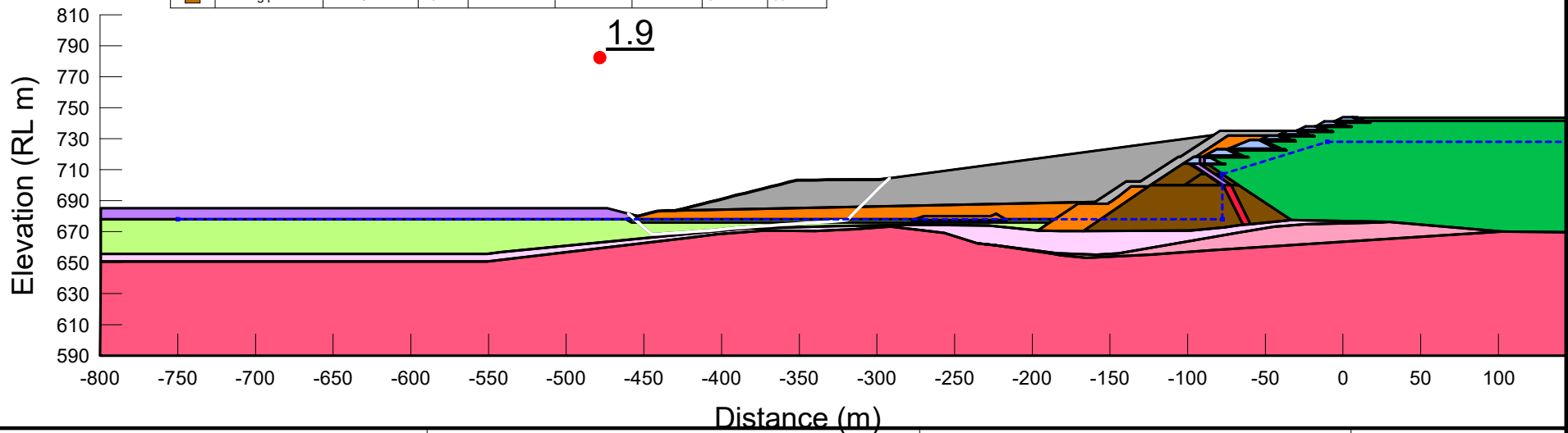
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Date **11/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 2.5 Undrained Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Funton FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 2.5 Undrained Non-Circular Shallow Toe

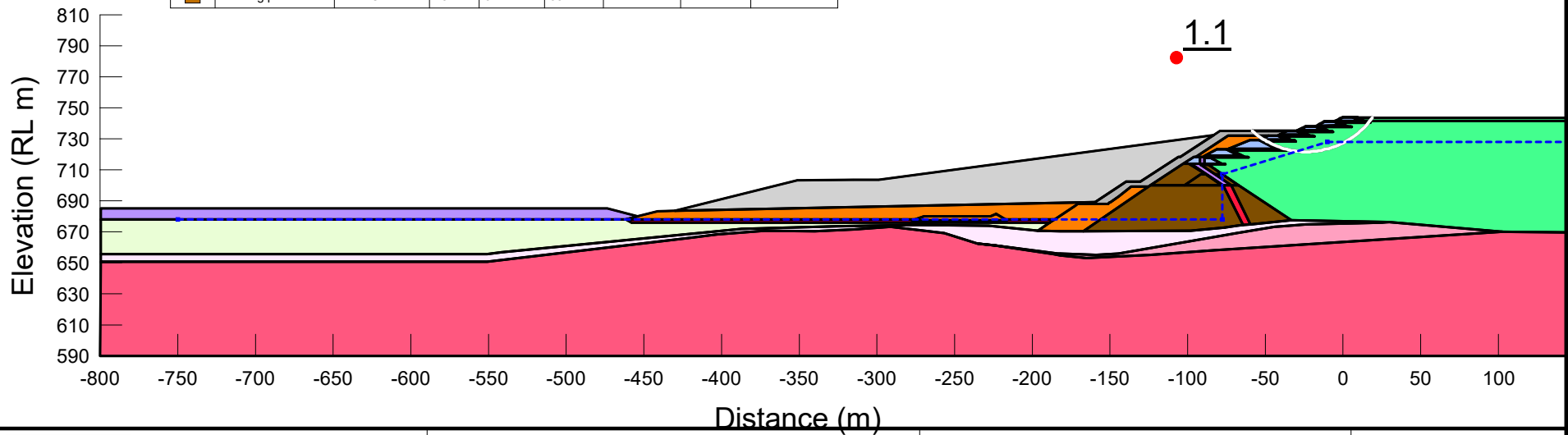
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Date **11/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 3.1 Post Seismic Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kNm ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post Seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post Seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 3.1 Post Seismic Circular Local

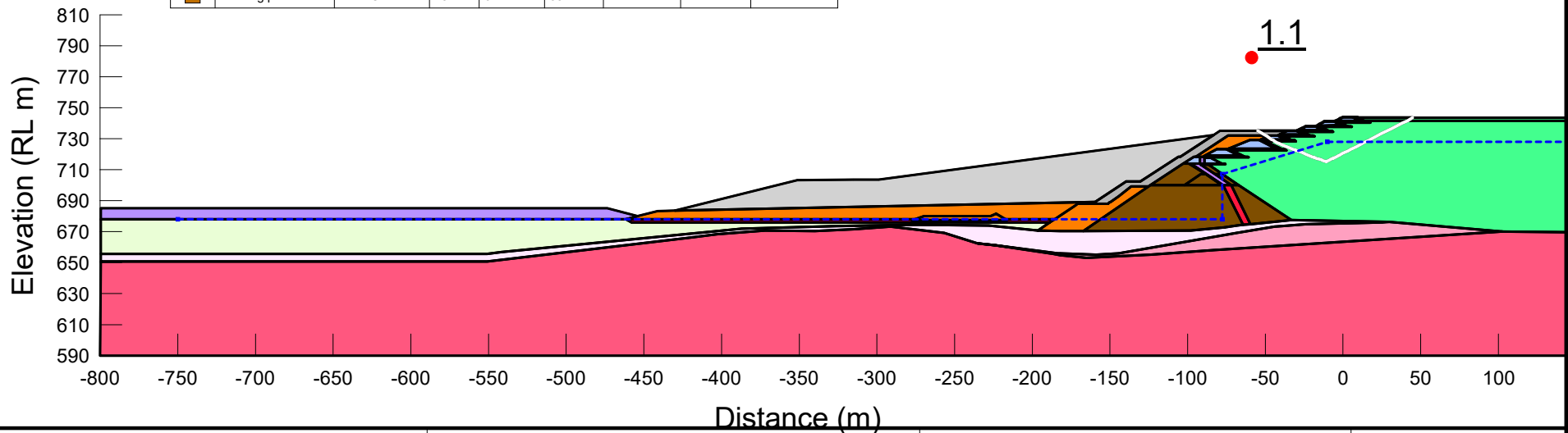
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 3.2 Post Seismic Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post Seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post Seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwmailto@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 3.2 Post Seismic Non Circular Local

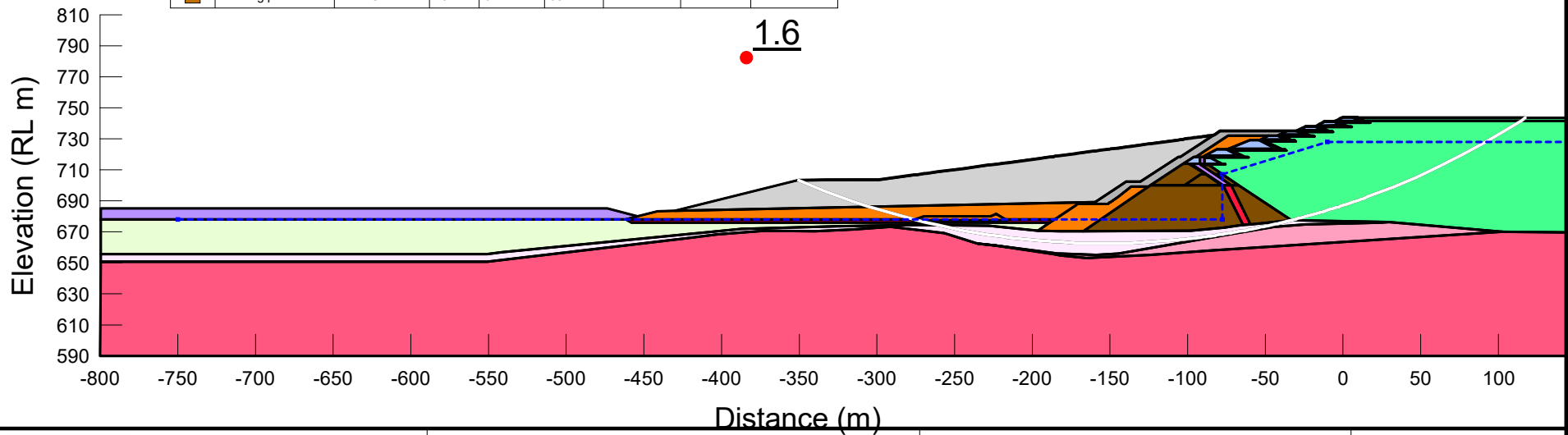
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 3.3 Post Seismic Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kNm ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post Seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post Seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2000

Case: 3.3 Post Seismic Circular Global

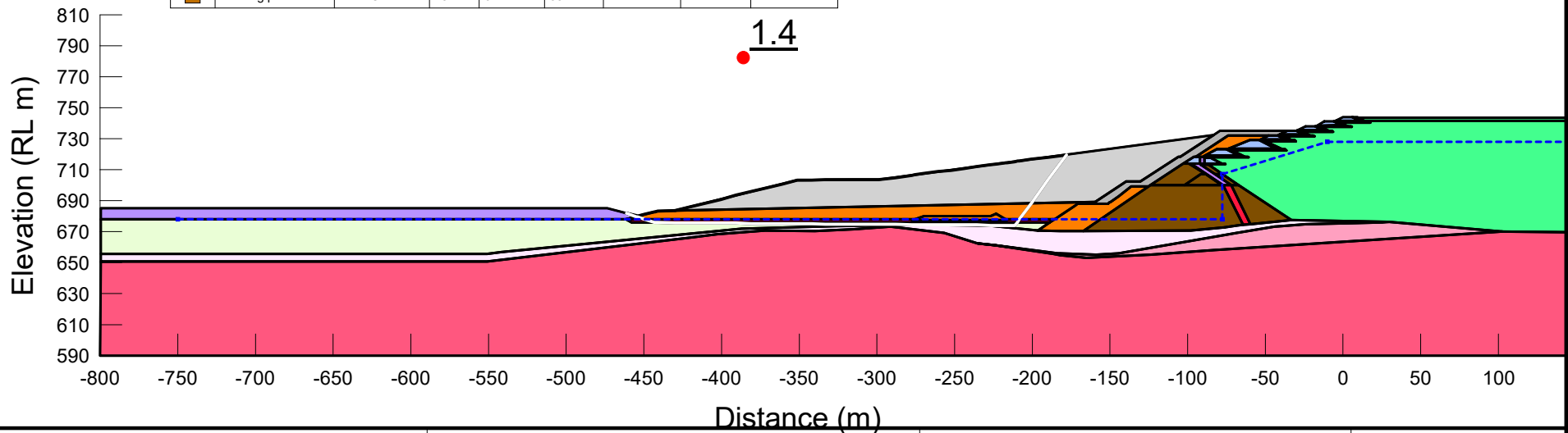
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Date **01/09/2025**

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Checked by: **CC**

Scale: 1:4,000

CH - 2000: 3.4 Post Seismic Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post Seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post Seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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Project: Cadia NTSF Southern Embankment
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Section : Buttress Coarse Sand Ch 2000

Case: 3.4 Post Seismic Non-Circular Global

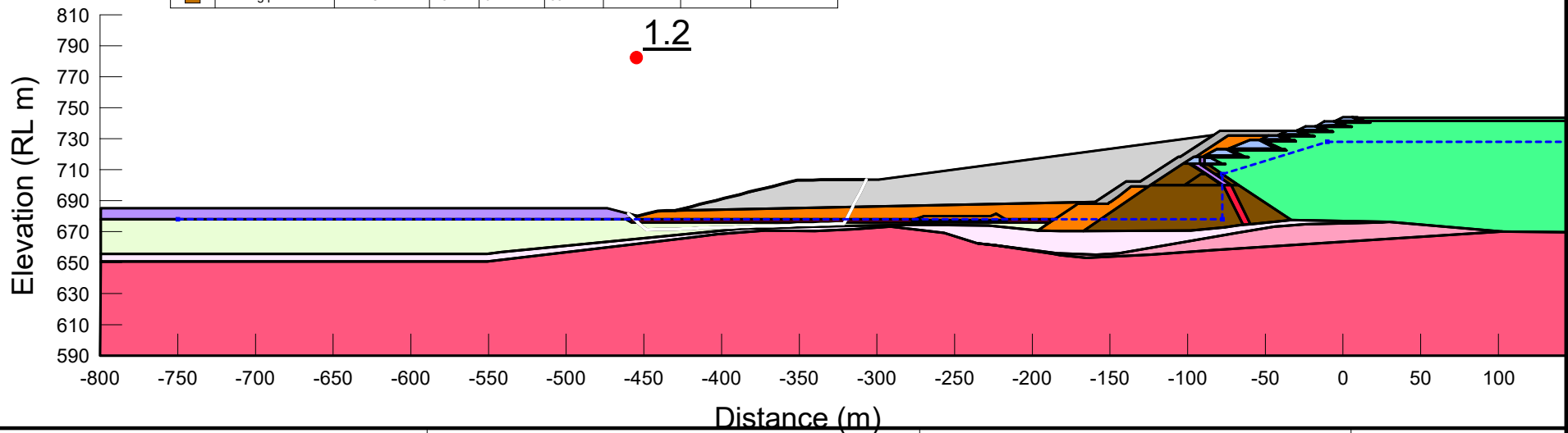
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2000: 3.5 Post Seismic Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kNm ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post Seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post Seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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Project: Cadia NTSF Southern Embankment
Slope stability Basis

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Case: 3.5 Post Seismic Non Circular Shallow Toe

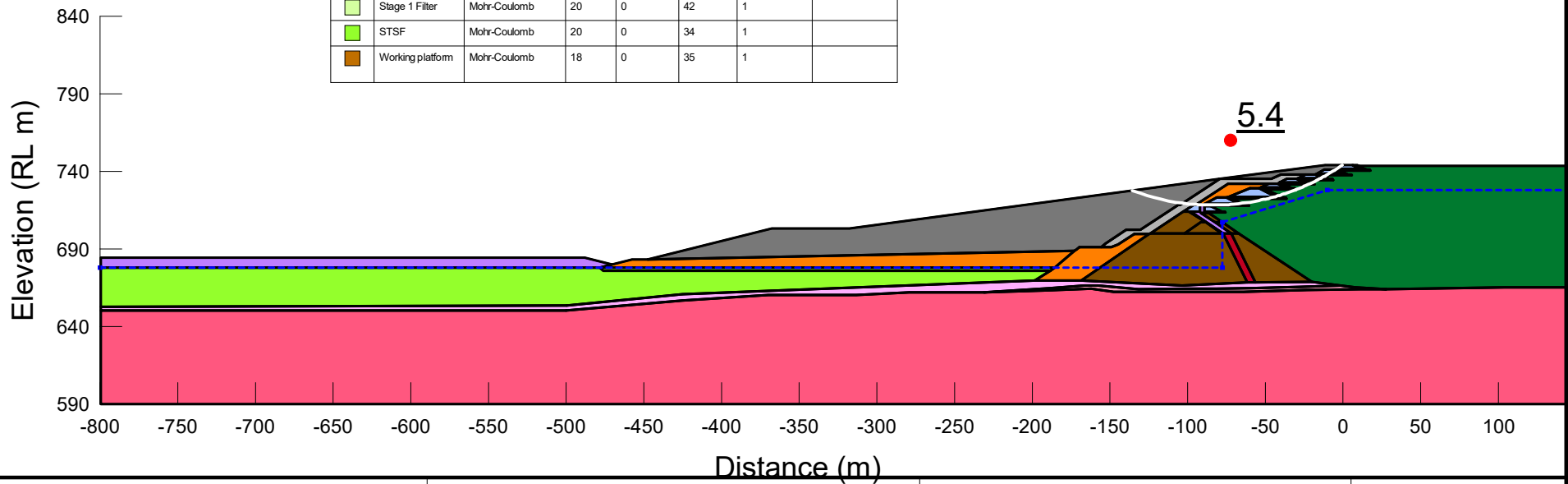
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 1.1 Drained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 1.1 Drained Circular Local

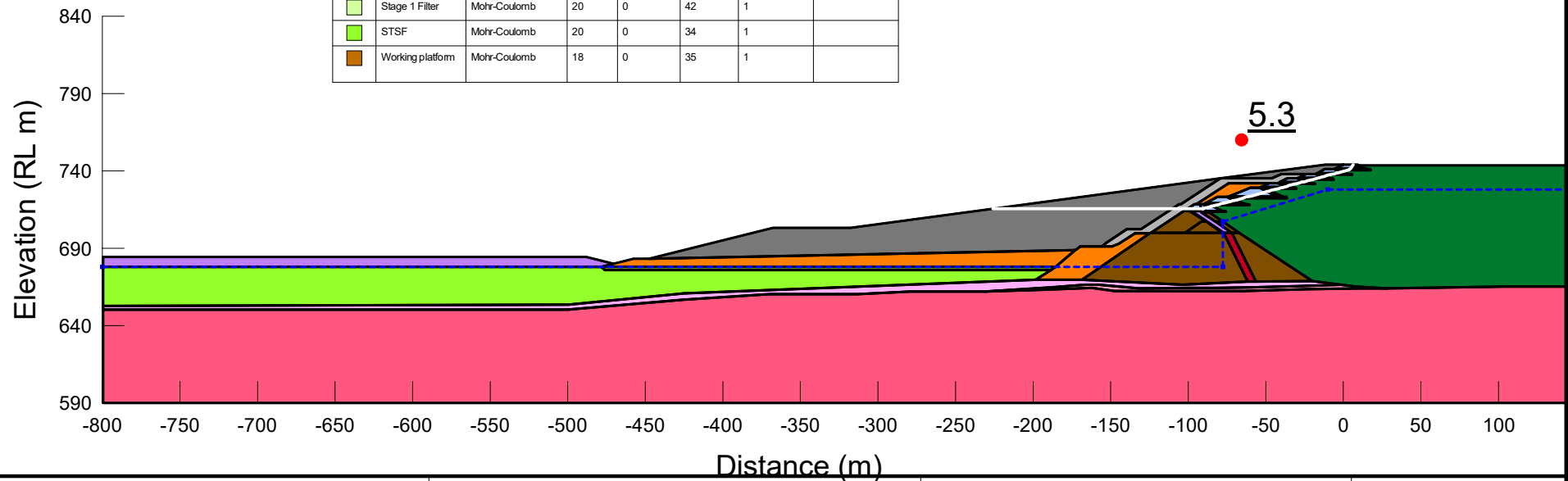
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 1.2 Drained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 1.2 Drained Non Circular Local

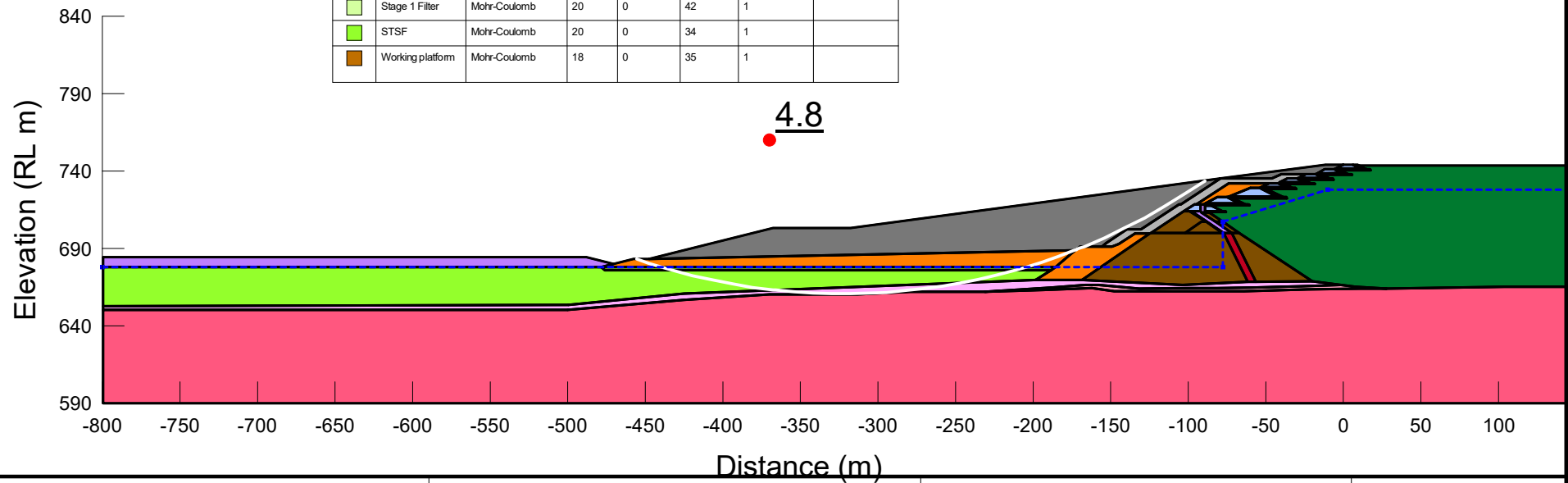
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 1.3 Drained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 1.3 Drained Circular Global

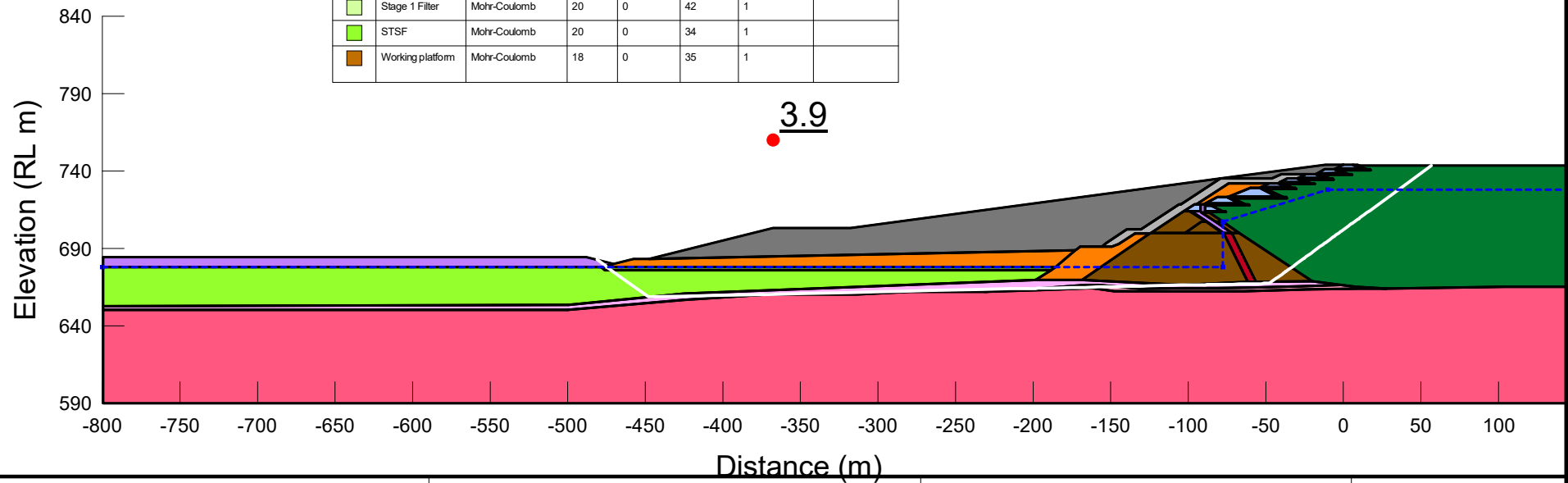
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 1.4 Drained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 1.4 Drained Non Circular Global

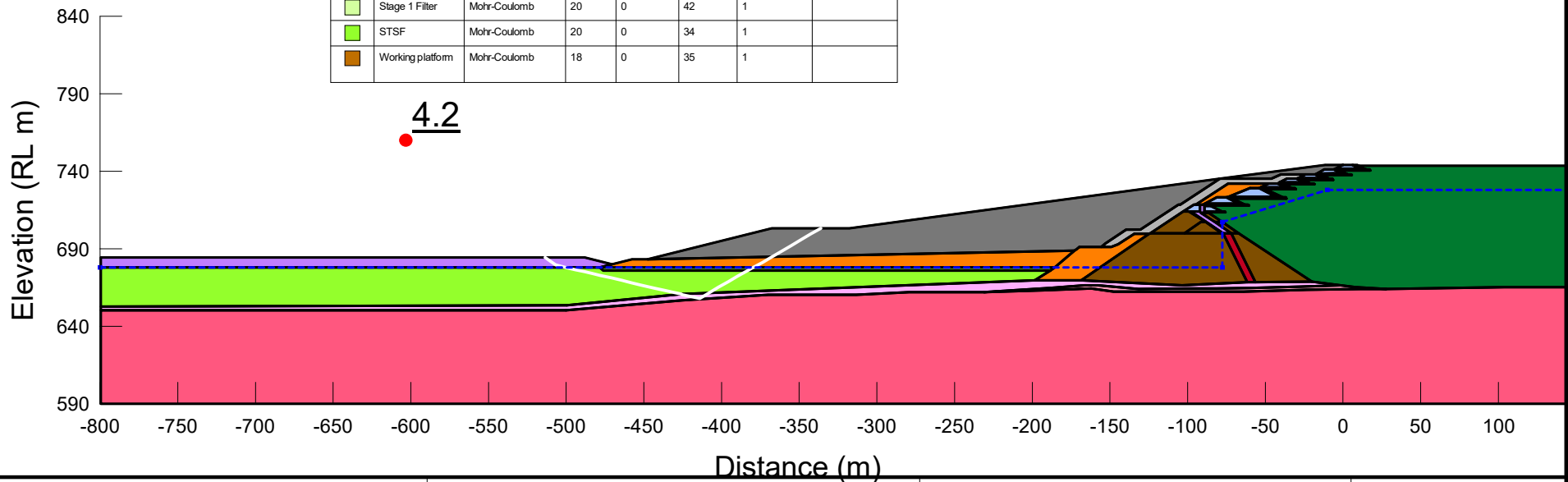
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 1.5 Drained Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 1.5 Drained Non Circular Shallow Toe

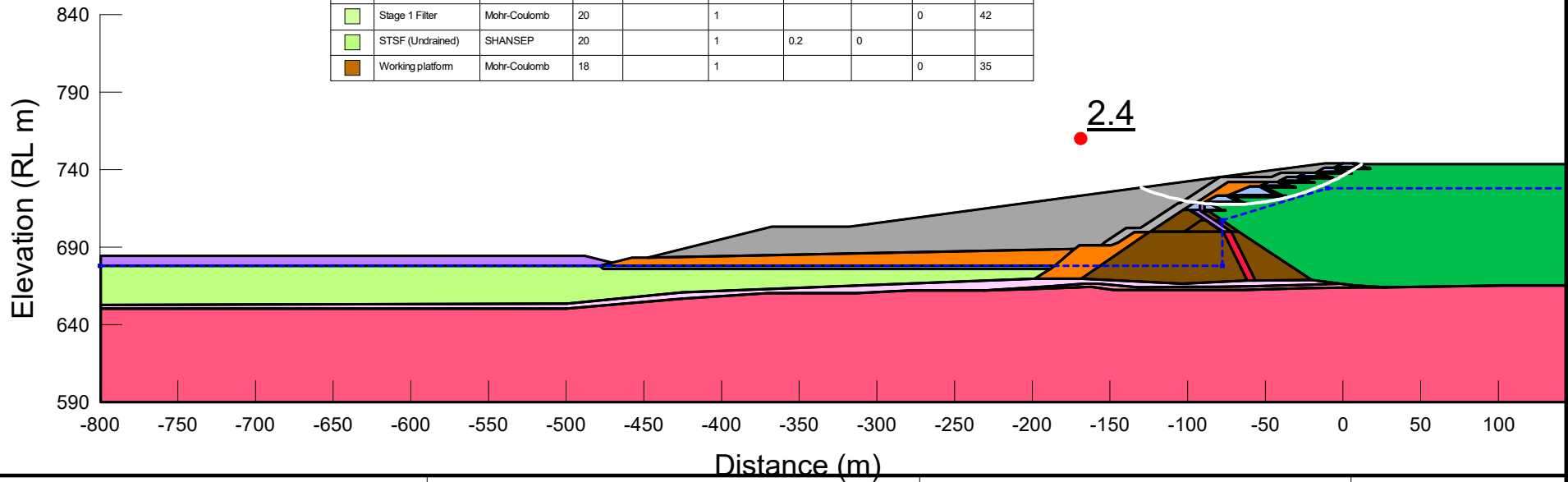
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 2.1 Undrained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	TauSigma Ratio	Minimum Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1			10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24	0		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19	0		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1				
	Filter rock	Mohr-Coulomb	19		1			0	38
	FRV HW	Mohr-Coulomb	19		1			140	36
	FRV MW - FR	Mohr-Coulomb	19		1			430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1				
	NTSF (Undrained)	SHANSEP	20		1	0.2	0		
	Rockfill Downstream	Mohr-Coulomb	19		1			0	40
	Rockfill Upstream	Mohr-Coulomb	19		1			0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29	50		
	Stage 1 Filter	Mohr-Coulomb	20		1			0	42
	STSF (Undrained)	SHANSEP	20		1	0.2	0		
	Working platform	Mohr-Coulomb	18		1			0	35



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10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 2.1 Undrained Circular Local

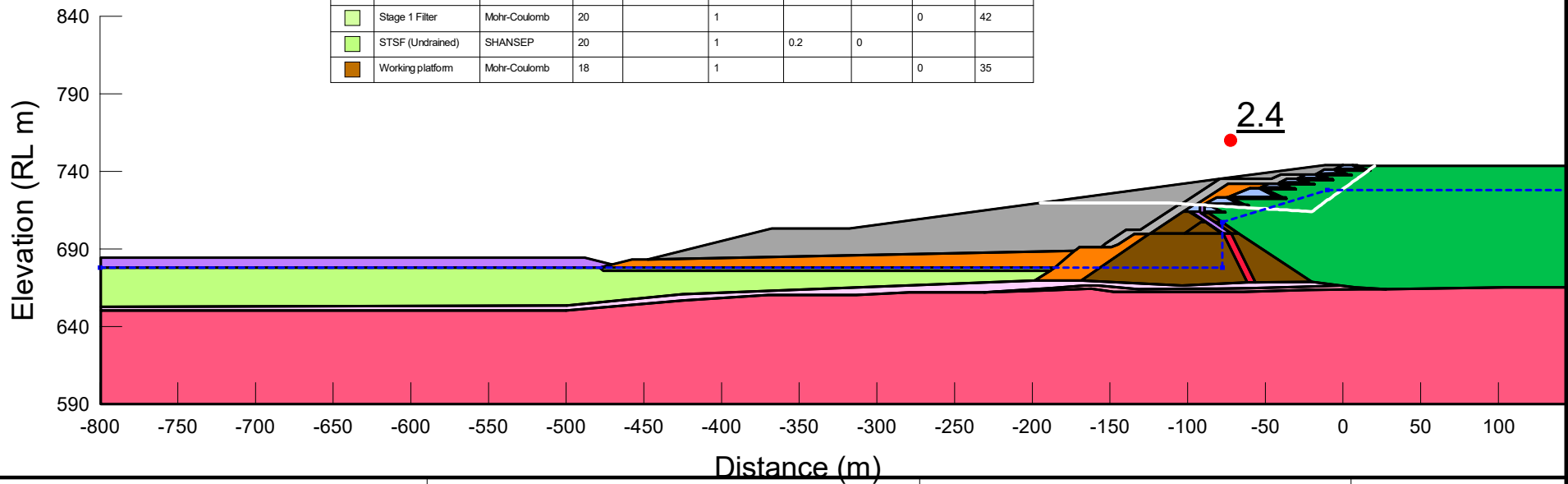
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 2.2 Undrained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	TauSigma Ratio	Minimum Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1			10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24	0		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19	0		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1				
	Filter rock	Mohr-Coulomb	19		1			0	38
	FRV HW	Mohr-Coulomb	19		1			140	36
	FRV MW - FR	Mohr-Coulomb	19		1			430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1				
	NTSF (Undrained)	SHANSEP	20		1	0.2	0		
	Rockfill Downstream	Mohr-Coulomb	19		1			0	40
	Rockfill Upstream	Mohr-Coulomb	19		1			0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29	50		
	Stage 1 Filter	Mohr-Coulomb	20		1			0	42
	STSF (Undrained)	SHANSEP	20		1	0.2	0		
	Working platform	Mohr-Coulomb	18		1			0	35



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 2.2 Undrained Non Circular Local

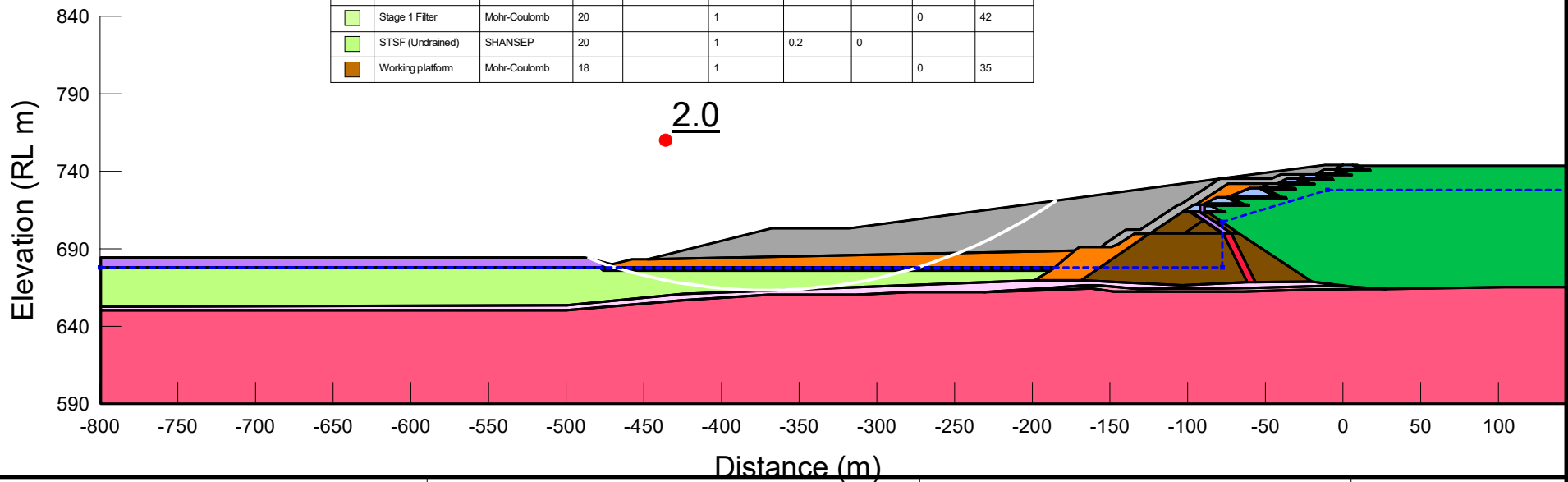
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 2.3 Undrained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	TauSigma Ratio	Minimum Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1			10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24	0		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19	0		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1				
	Filter rock	Mohr-Coulomb	19		1			0	38
	FRV HW	Mohr-Coulomb	19		1			140	36
	FRV MW - FR	Mohr-Coulomb	19		1			430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1				
	NTSF (Undrained)	SHANSEP	20		1	0.2	0		
	Rockfill Downstream	Mohr-Coulomb	19		1			0	40
	Rockfill Upstream	Mohr-Coulomb	19		1			0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29	50		
	Stage 1 Filter	Mohr-Coulomb	20		1			0	42
	STSF (Undrained)	SHANSEP	20		1	0.2	0		
	Working platform	Mohr-Coulomb	18		1			0	35



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 2.3 Undrained Circular Global

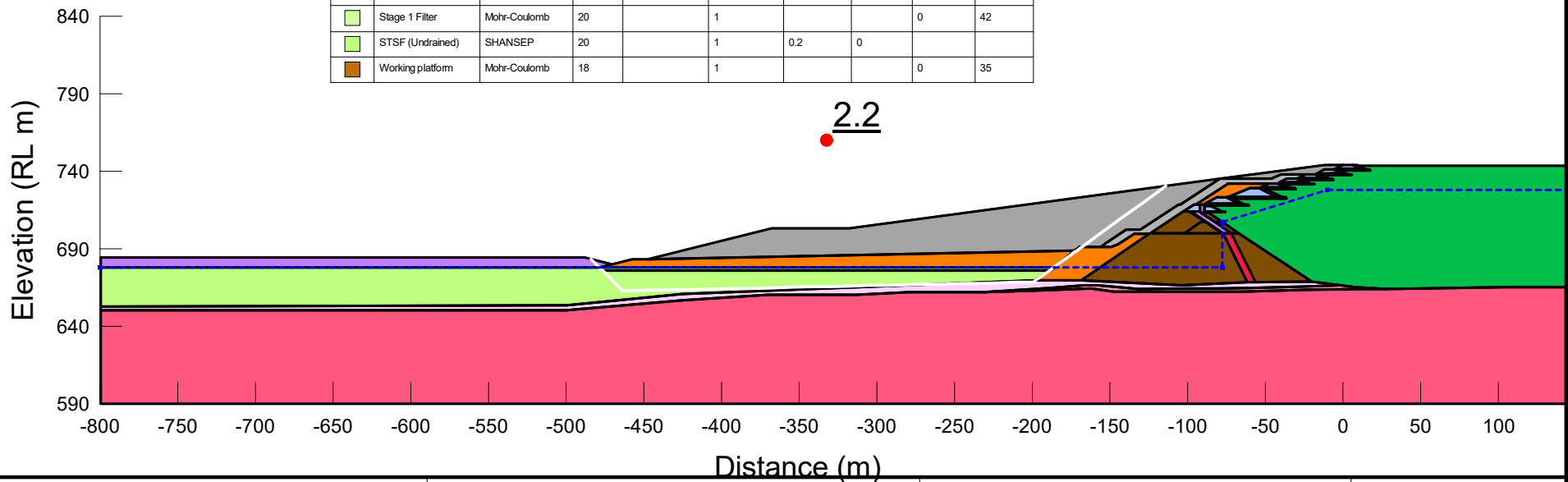
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 2.4 Undrained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	TauSigma Ratio	Minimum Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1			10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24	0		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19	0		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1				
	Filter rock	Mohr-Coulomb	19		1			0	38
	FRV HW	Mohr-Coulomb	19		1			140	36
	FRV MW - FR	Mohr-Coulomb	19		1			430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1				
	NTSF (Undrained)	SHANSEP	20		1	0.2	0		
	Rockfill Downstream	Mohr-Coulomb	19		1			0	40
	Rockfill Upstream	Mohr-Coulomb	19		1			0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29	50		
	Stage 1 Filter	Mohr-Coulomb	20		1			0	42
	STSF (Undrained)	SHANSEP	20		1	0.2	0		
	Working platform	Mohr-Coulomb	18		1			0	35



GHD Pty Ltd ABN 39 008 488 373
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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 2.4 Undrained Non Circular Global

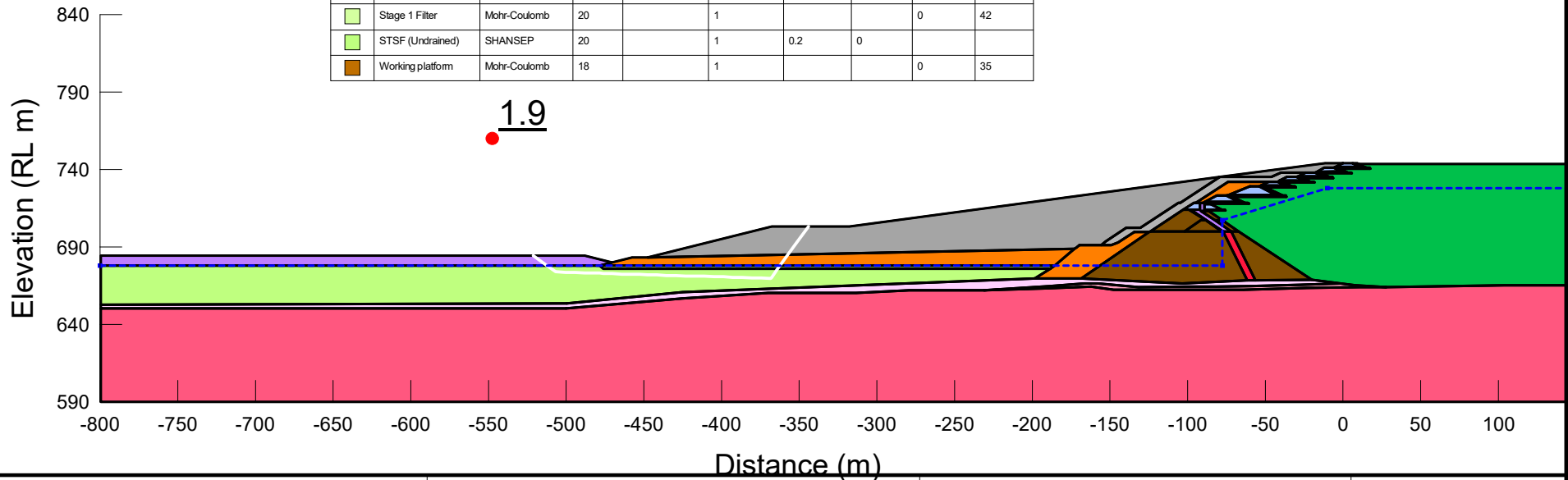
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 2.5 Undrained Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	TauSigma Ratio	Minimum Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1			10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24	0		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19	0		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1				
	Filter rock	Mohr-Coulomb	19		1			0	38
	FRV HW	Mohr-Coulomb	19		1			140	36
	FRV MW - FR	Mohr-Coulomb	19		1			430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1				
	NTSF (Undrained)	SHANSEP	20		1	0.2	0		
	Rockfill Downstream	Mohr-Coulomb	19		1			0	40
	Rockfill Upstream	Mohr-Coulomb	19		1			0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29	50		
	Stage 1 Filter	Mohr-Coulomb	20		1			0	42
	STSF (Undrained)	SHANSEP	20		1	0.2	0		
	Working platform	Mohr-Coulomb	18		1			0	35



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 2.5 Undrained Non Circular Shallow Toe

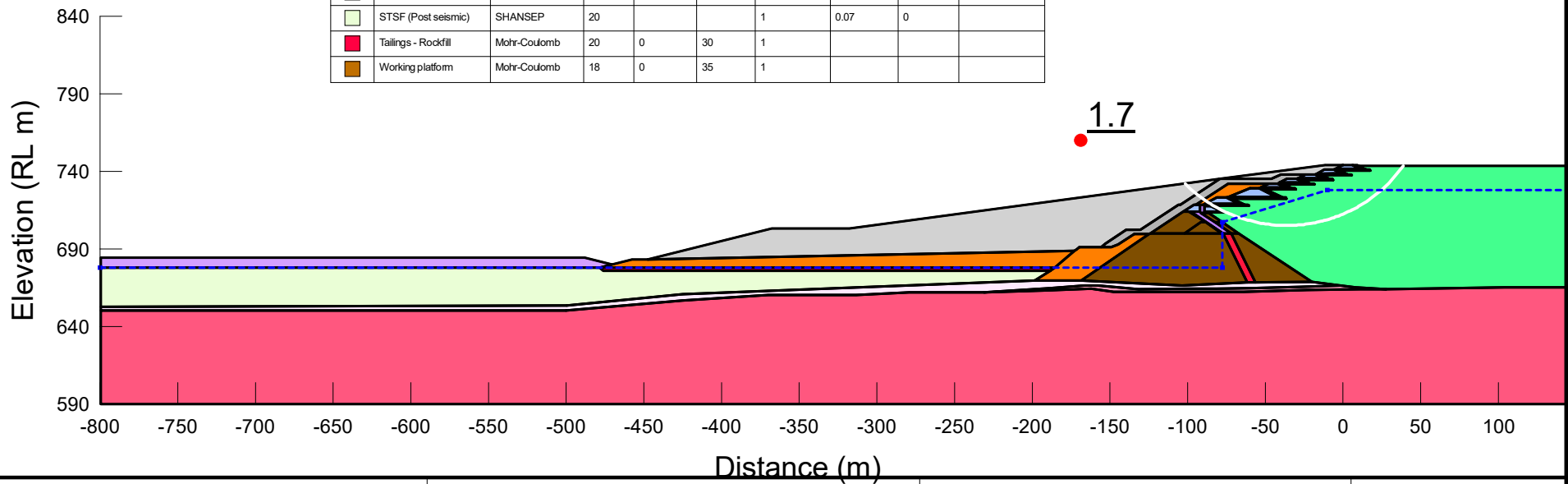
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 3.1 Post Seismic Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1			
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1			
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1			
	Existing rockfill berm	Shear/Normal Fn.	20			1			Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1			
	FRV HW	Mohr-Coulomb	19	140	36	1			
	FRV MW - FR	Mohr-Coulomb	19	430	36	1			
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1			
	NTSF (Post seismic)	SHANSEP	20			1	0.08	0	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1			
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1			
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	50	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1			
	STS (Post seismic)	SHANSEP	20			1	0.07	0	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1			
	Working platform	Mohr-Coulomb	18	0	35	1			



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10 Columar Court
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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 3.1 Post Seismic Circular Local

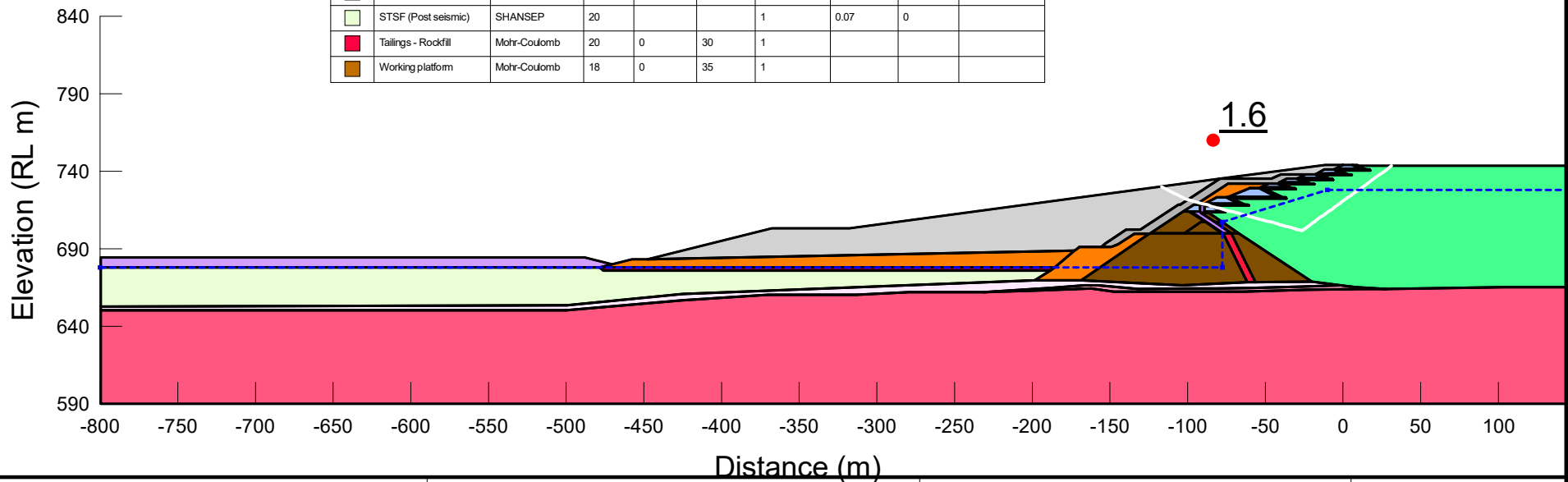
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 3.2 Post Seismic Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1			
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1			
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1			
	Existing rockfill berm	Shear/Normal Fn.	20			1			Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1			
	FRV HW	Mohr-Coulomb	19	140	36	1			
	FRV MW - FR	Mohr-Coulomb	19	430	36	1			
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1			
	NTSF (Post seismic)	SHANSEP	20			1	0.08	0	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1			
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1			
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	50	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1			
	STSF (Post seismic)	SHANSEP	20			1	0.07	0	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1			
	Working platform	Mohr-Coulomb	18	0	35	1			



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 3.2 Post Seismic Non Circular Local

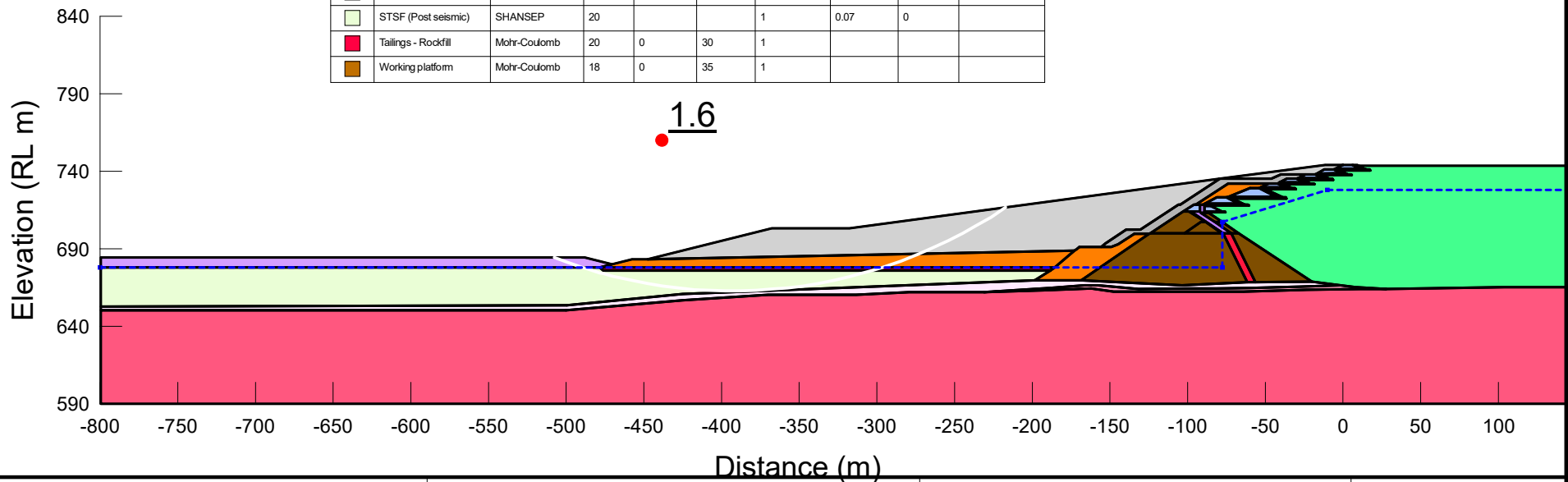
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 3.3 Post Seismic Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1			
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1			
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1			
	Existing rockfill berm	Shear/Normal Fn.	20			1			Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1			
	FRV HW	Mohr-Coulomb	19	140	36	1			
	FRV MW - FR	Mohr-Coulomb	19	430	36	1			
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1			
	NTSF (Post seismic)	SHANSEP	20			1	0.08	0	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1			
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1			
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	50	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1			
	STSF (Post seismic)	SHANSEP	20			1	0.07	0	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1			
	Working platform	Mohr-Coulomb	18	0	35	1			



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 3.3 Post Seismic Circular Global

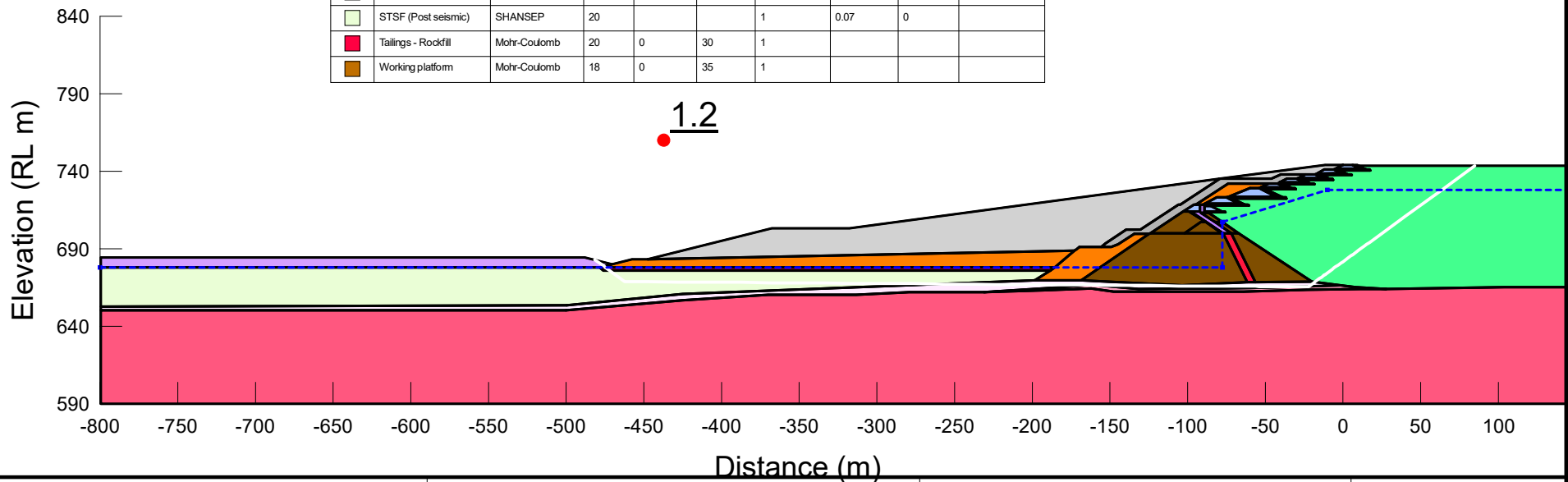
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 3.4 Post Seismic Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1			
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1			
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1			
	Existing rockfill berm	Shear/Normal Fn.	20			1			Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1			
	FRV HW	Mohr-Coulomb	19	140	36	1			
	FRV MW - FR	Mohr-Coulomb	19	430	36	1			
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1			
	NTSF (Post seismic)	SHANSEP	20			1	0.08	0	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1			
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1			
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	50	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1			
	STSF (Post seismic)	SHANSEP	20			1	0.07	0	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1			
	Working platform	Mohr-Coulomb	18	0	35	1			



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Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 3.4 Post Seismic Non Circular Global

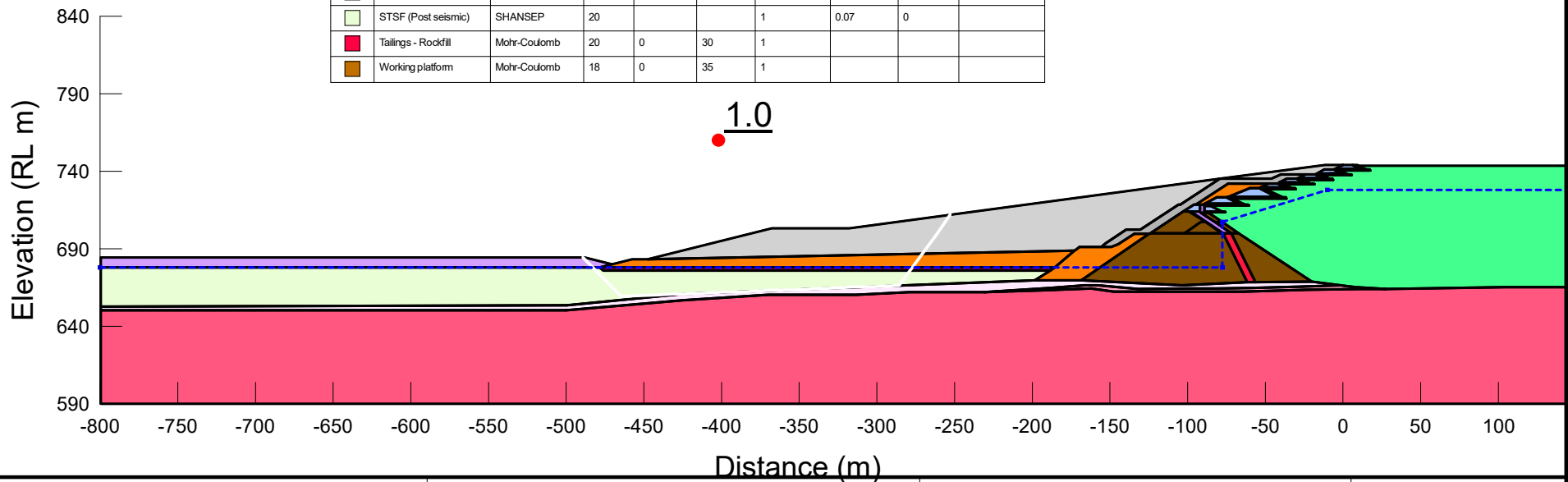
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2100: 3.5 Post Seismic Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1			
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1			
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1			
	Existing rockfill berm	Shear/Normal Fn.	20			1			Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1			
	FRV HW	Mohr-Coulomb	19	140	36	1			
	FRV MW - FR	Mohr-Coulomb	19	430	36	1			
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1			
	NTSF (Post seismic)	SHANSEP	20			1	0.08	0	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1			
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1			
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	50	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1			
	STSF (Post seismic)	SHANSEP	20			1	0.07	0	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1			
	Working platform	Mohr-Coulomb	18	0	35	1			



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10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2100

Case: 3.5 Post Seismic Non Circular Shallow Toe

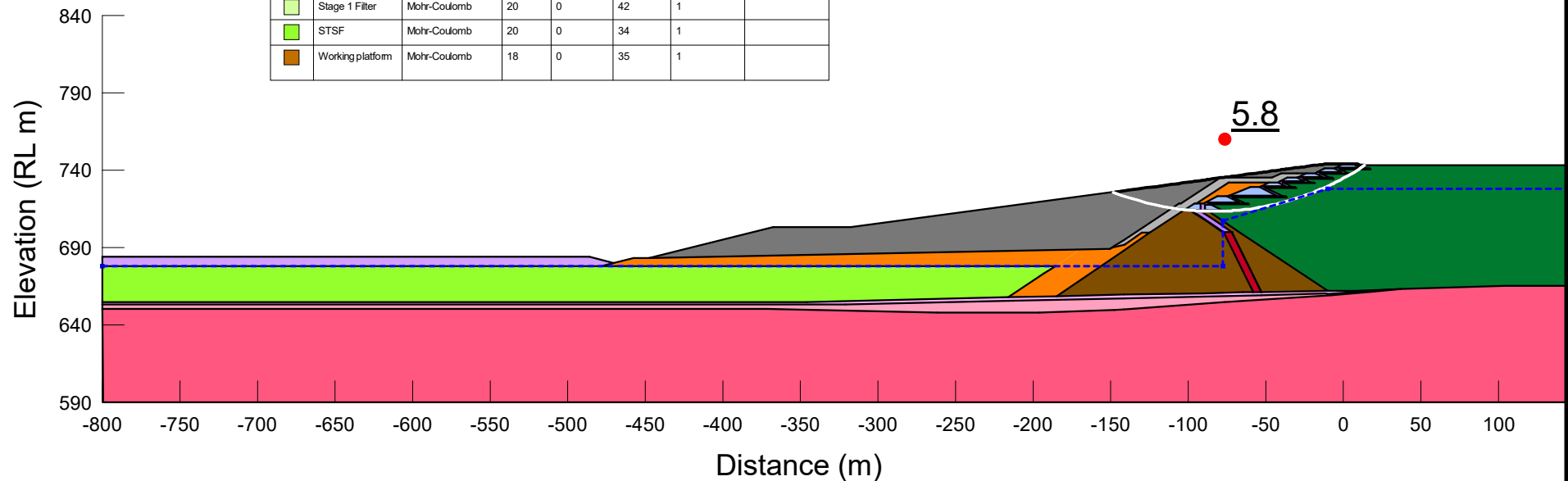
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2200: 1.1 Drained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fr.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fr.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columnar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 1.1 Drained Circular Local

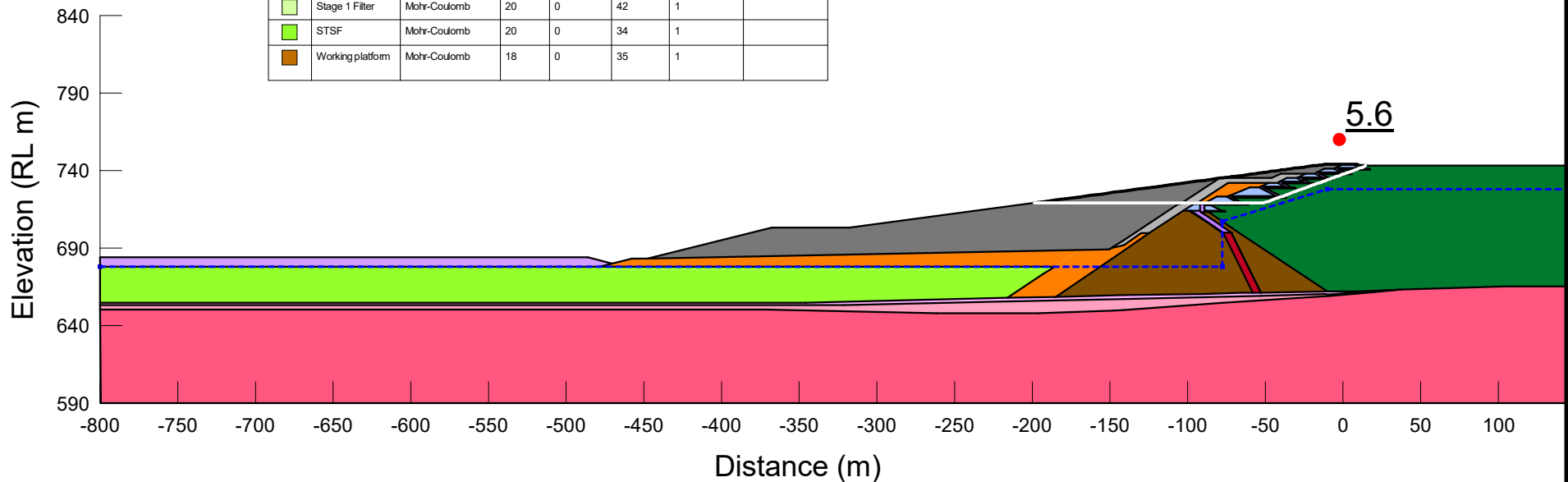
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2200: 1.2 Drained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fr.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fr.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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10 Columnar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 1.2 Drained Non Circular Local

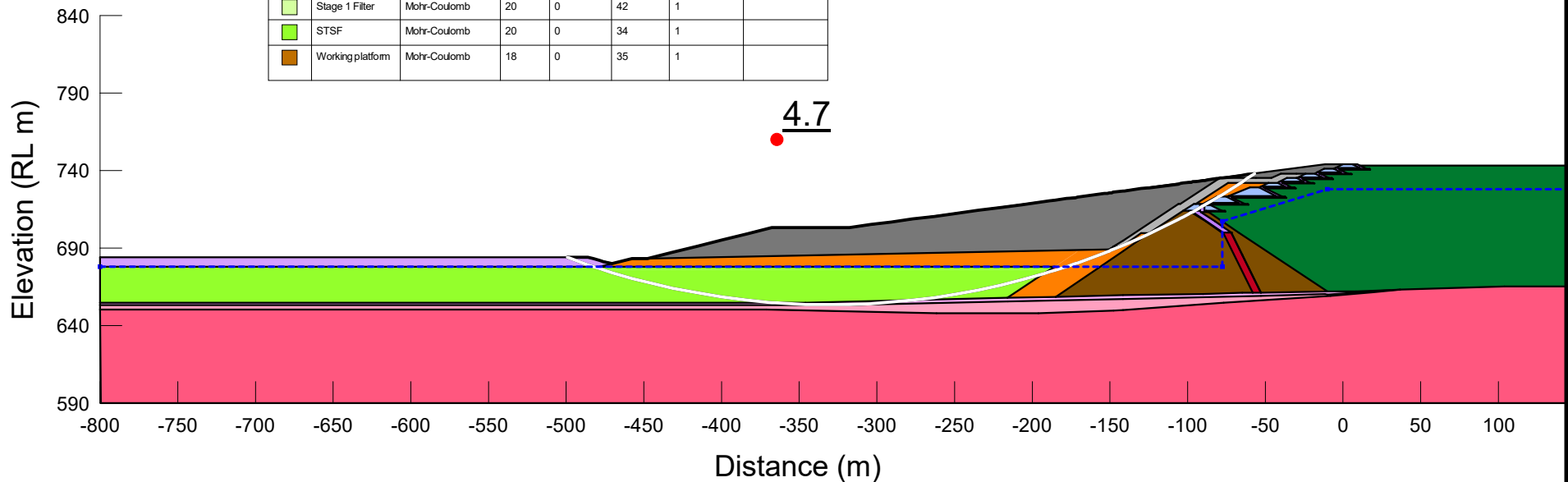
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2200: 1.3 Drained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fr.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fr.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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10 Columnar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 1.3 Drained Circular Global

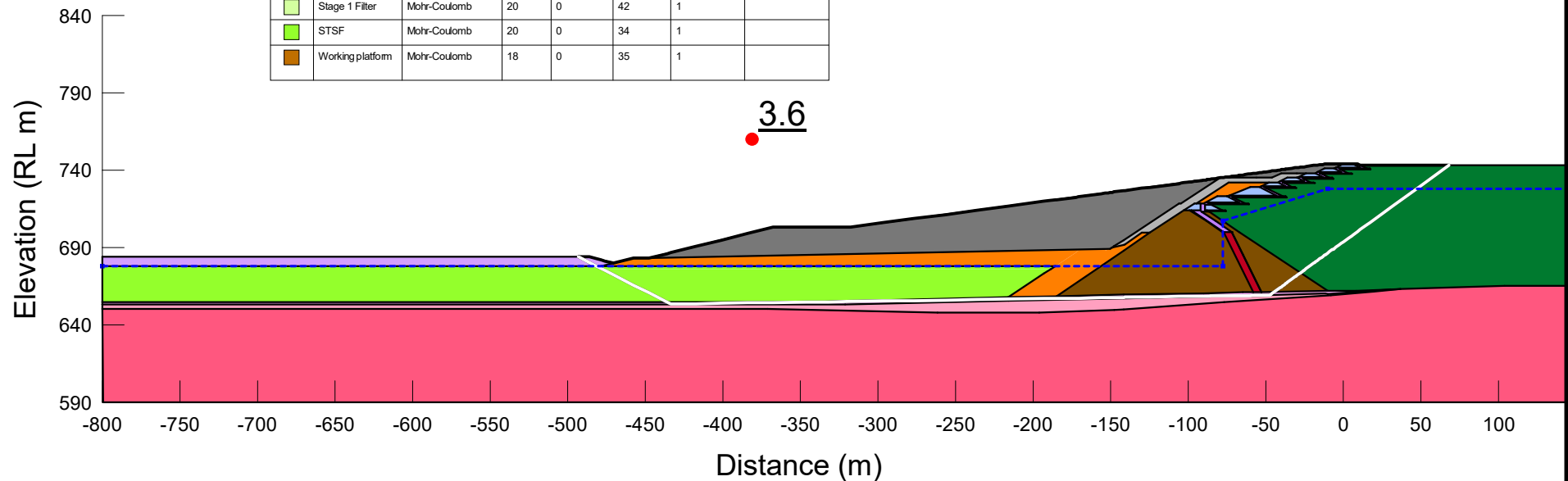
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2200: 1.4 Drained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fr.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fr.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columnar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 1.4 Drained Non Circular Global

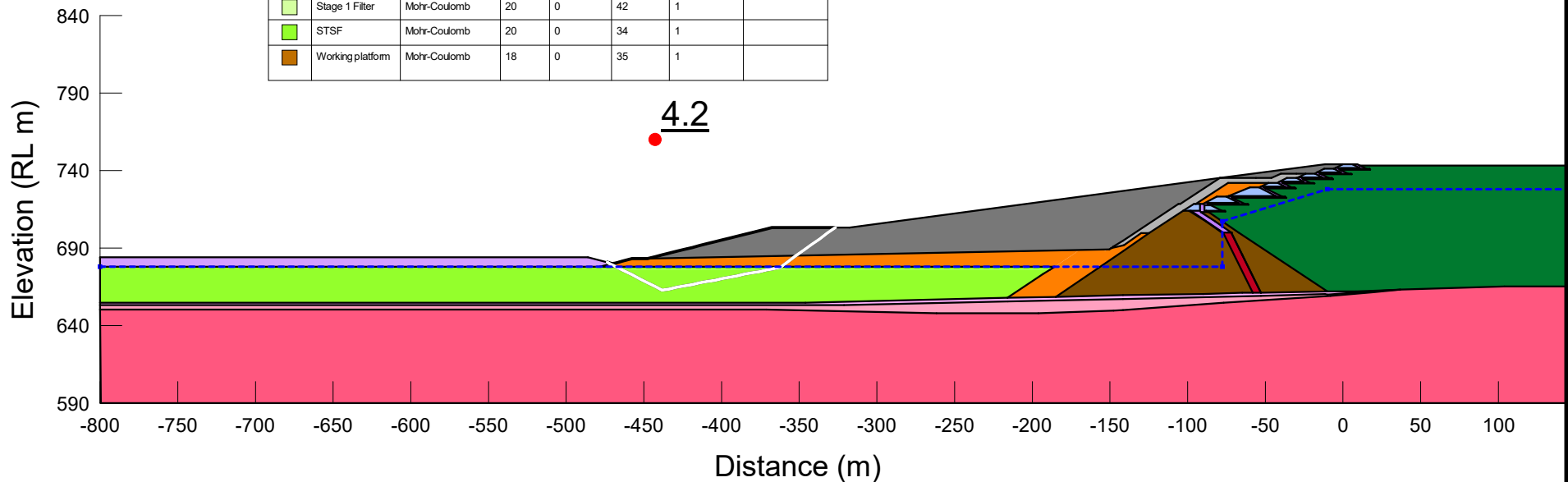
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2200: 1.5 Drained Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fr.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fr.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columnar Court
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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 1.5 Drained Non Circular Shallow Toe

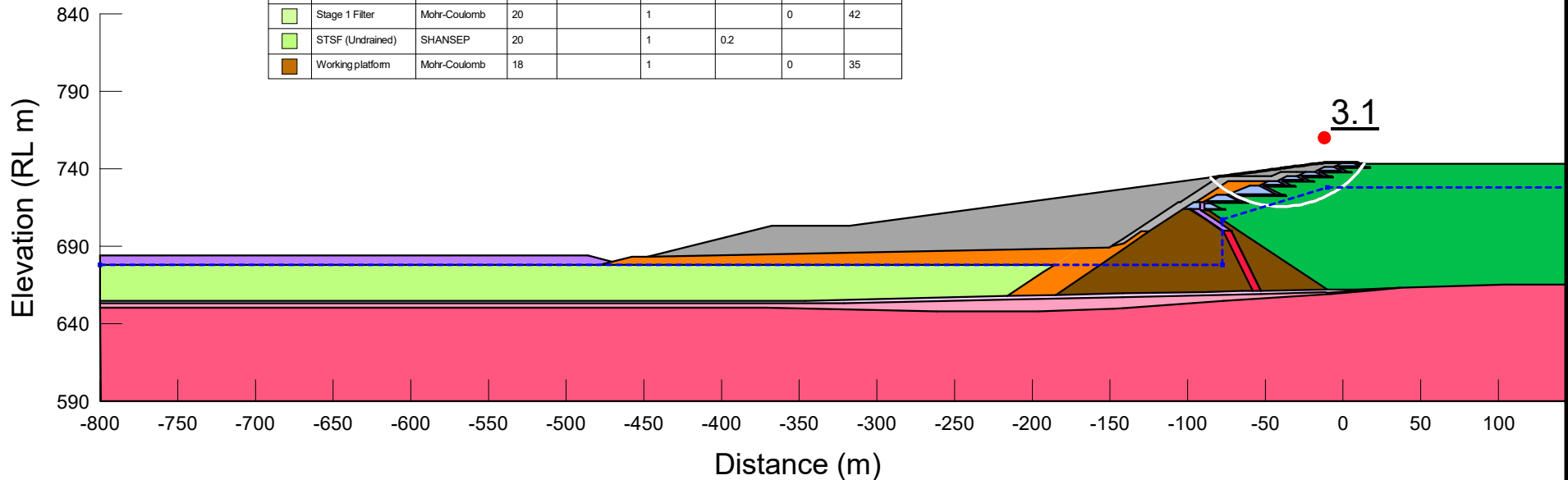
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2200: 2.1 Undrained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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 T +61 3 6432 7900 | F+61 3 8732 7046
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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 2.1 Undrained Circular Local

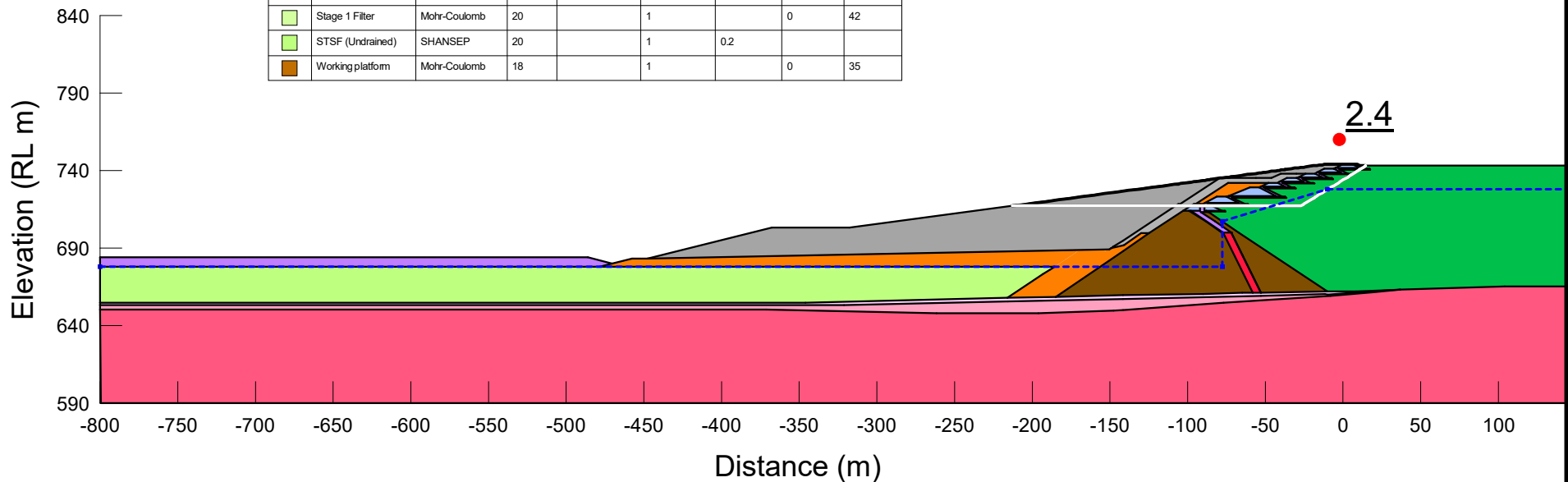
Project No. **12664089**
 Date **01/09/2025**

Prepared by: **HL**
 Checked by: **CC**

Scale: 1:4,000

CH - 2200: 2.2 Undrained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 2.2 Undrained Non Circular Local

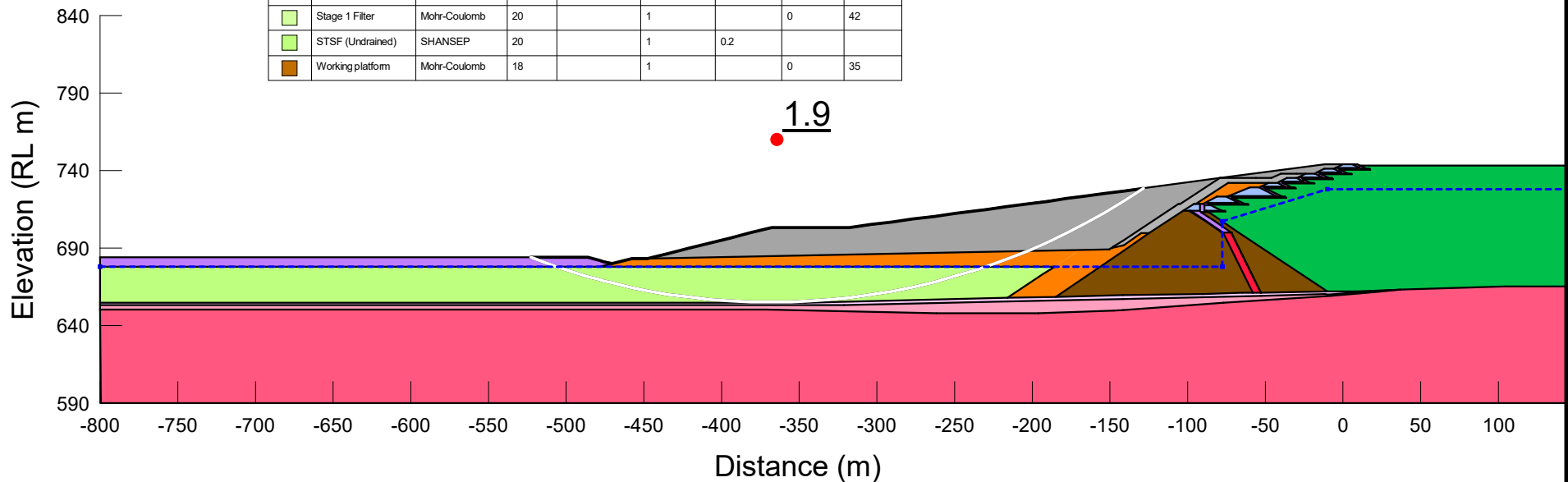
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2200: 2.3 Undrained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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 T +61 3 6432 7900 | F+61 3 8732 7046
 E: bwtmail@ghd.com | www.ghd.com

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Section : Buttress Coarse Sand Ch 2200

Case: 2.3 Undrained Circular Global

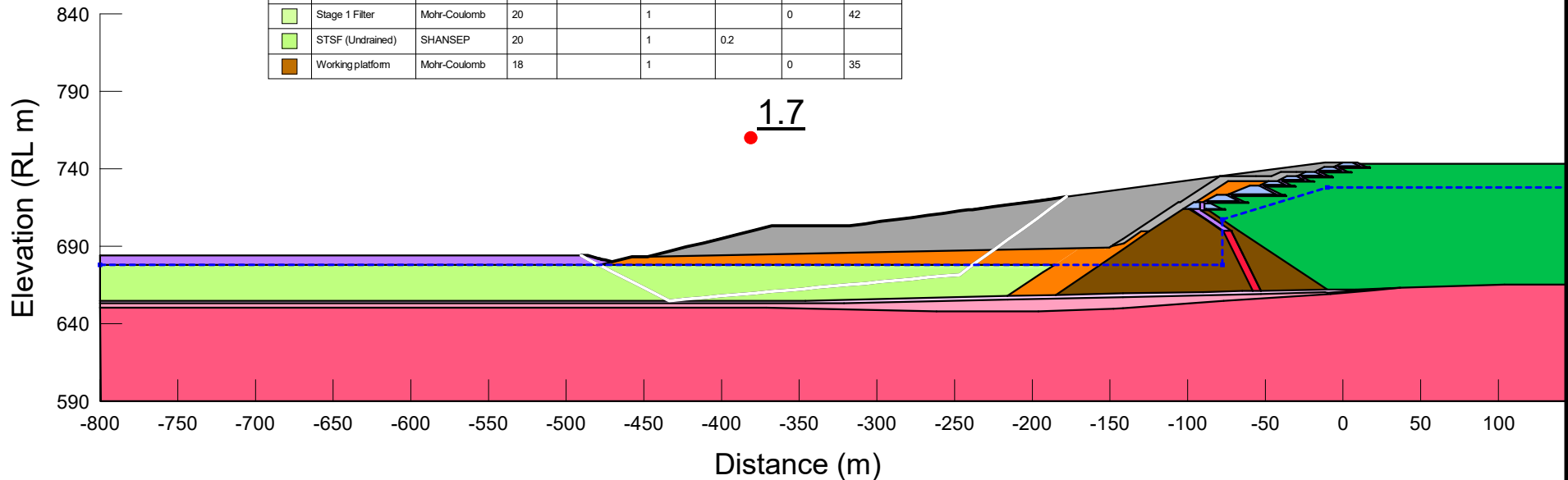
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 Date **01/09/2025**

Prepared by: **HL**
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Scale: 1:4,000

CH - 2200: 2.4 Undrained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columnar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 2.4 Undrained Non Circular Global

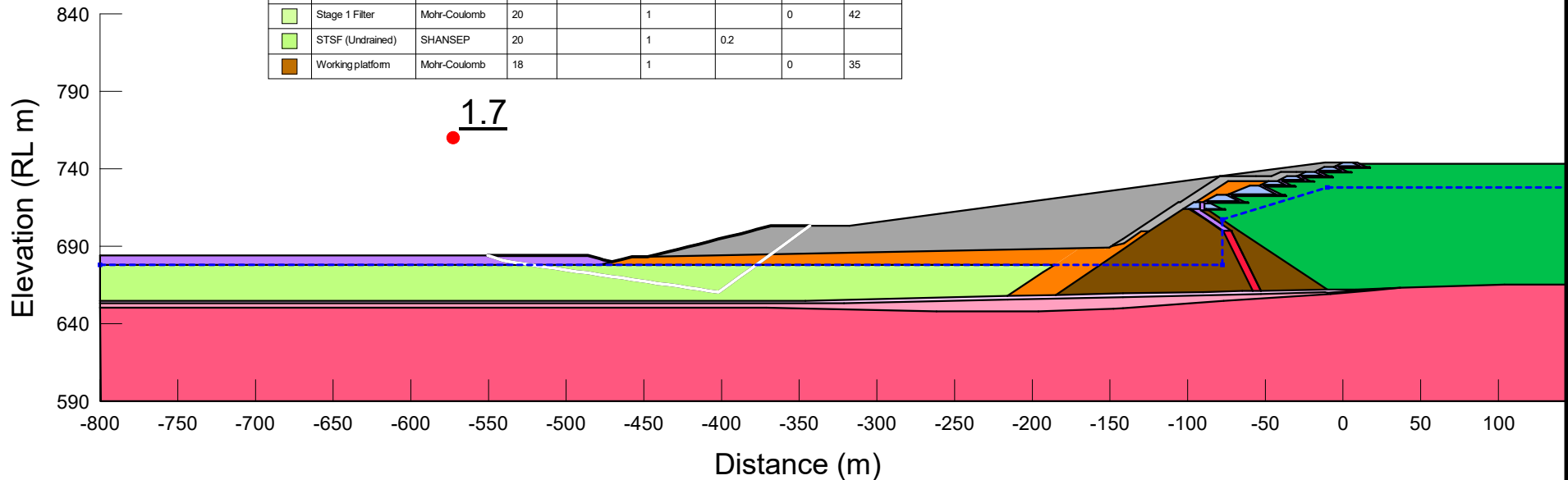
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2200: 2.5 Undrained Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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 Burnie, Tasmania 7320, Australia
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 E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
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Section : Buttress Coarse Sand Ch 2200

Case: 2.5 Undrained Non Circular Shallow Toe

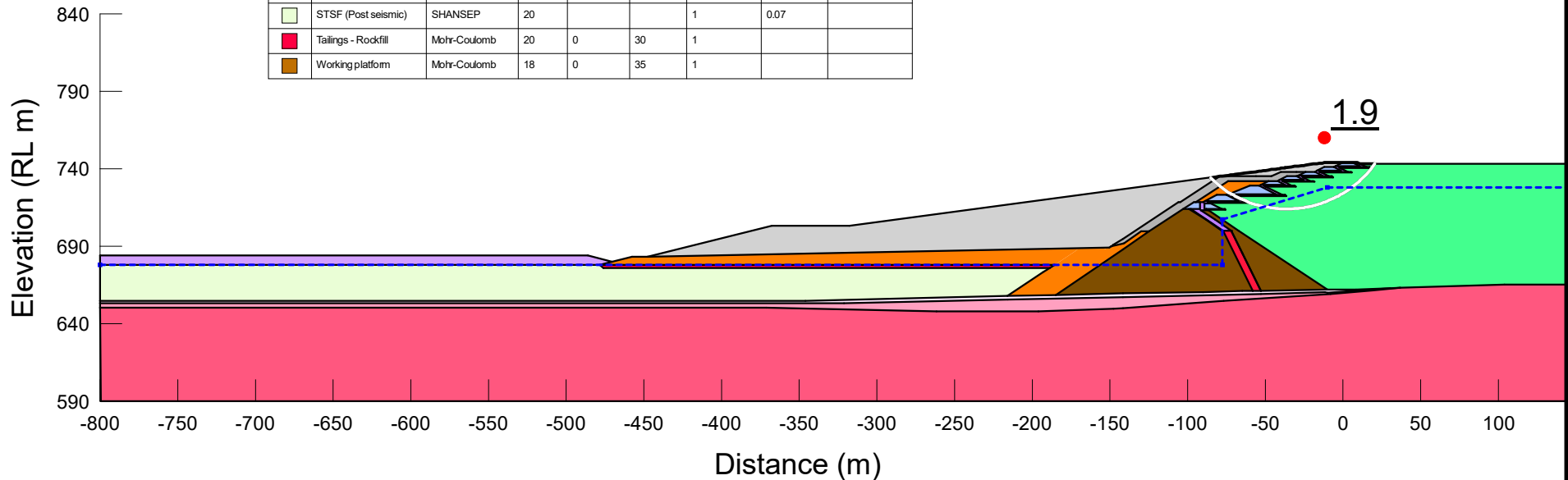
Project No. **12664089**
 Date **01/09/2025**

Prepared by: **HL**
 Checked by: **CC**

Scale: 1:4,000

CH - 2200: 3.1 Post seismic Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 3.1 Post seismic Circular Local

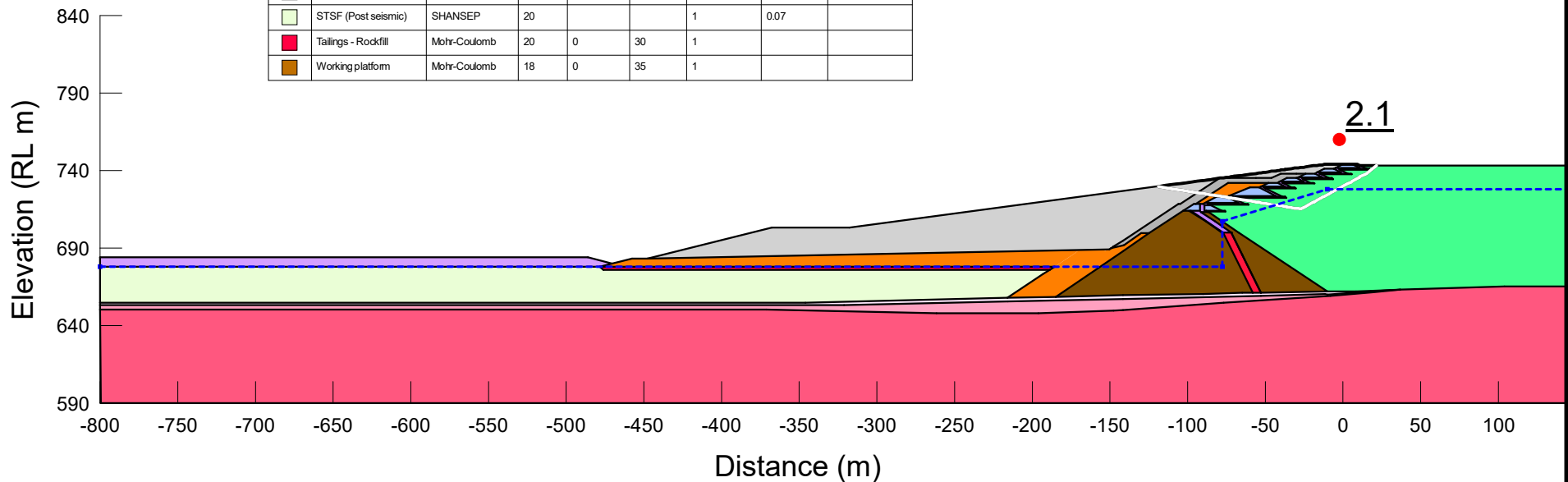
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 Date **01/09/2025**

Prepared by: **HL**
 Checked by: **CC**

Scale: 1:4,000

CH - 2200: 3.2 Post seismic Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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 10 Columnar Court
 Burnie, Tasmania 7320, Australia
 T +61 3 6432 7900 | F+61 3 8732 7046
 E: bwtdmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
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Section : Buttress Coarse Sand Ch 2200

Case: 3.2 Post seismic Non Circular Local

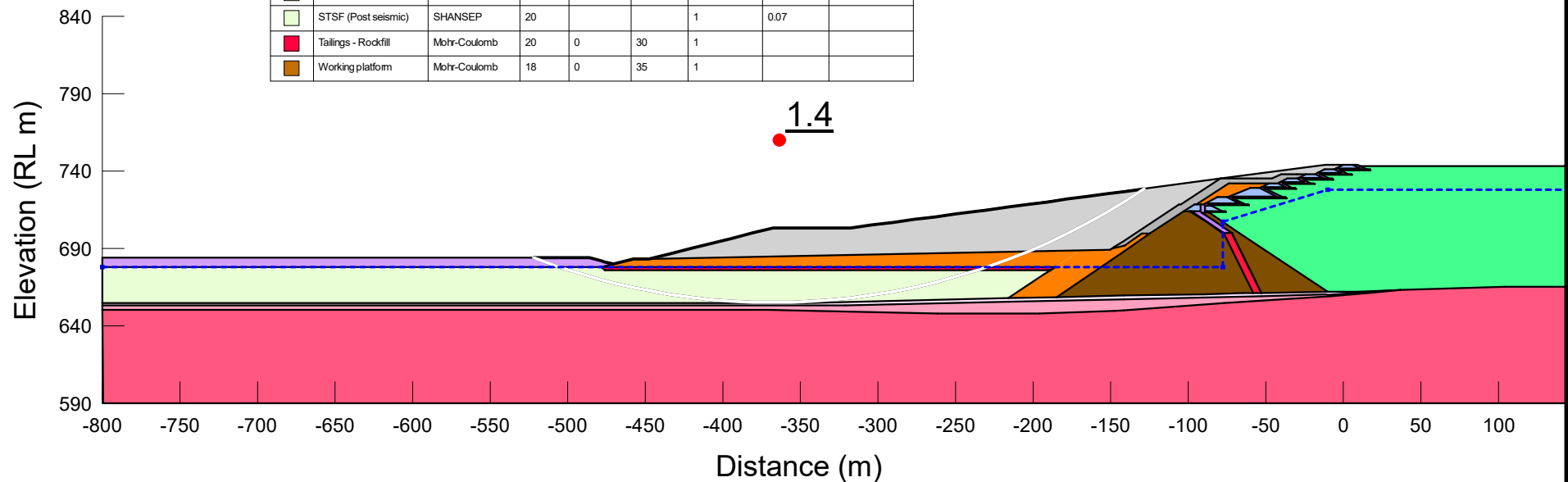
Project No. **12664089**
 Date **01/09/2025**

Prepared by: **HL**
 Checked by: **CC**

Scale: 1:4,000

CH - 2200: 3.3 Post seismic Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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 10 Columnar Court
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 T +61 3 6432 7900 | F+61 3 8732 7046
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Section : Buttress Coarse Sand Ch 2200

Case: 3.3 Post seismic Circular Global

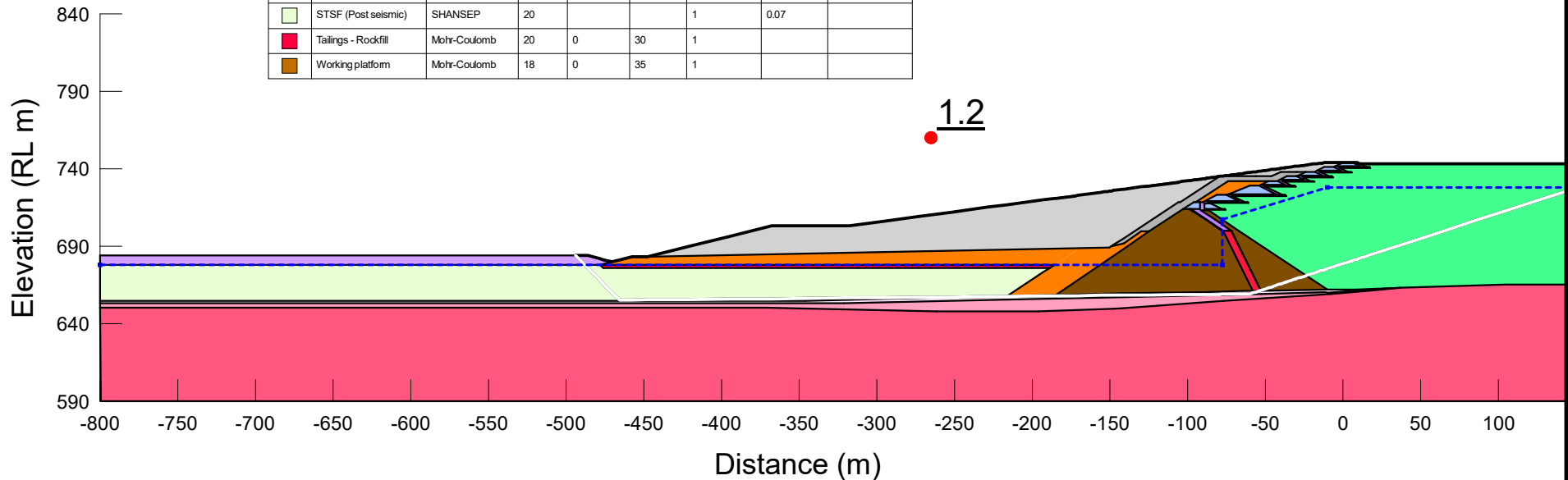
Project No. **12664089**
 Date **01/09/2025**

Prepared by: **HL**
 Checked by: **CC**

Scale: 1:4,000

CH - 2200: 3.4 Post seismic Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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 Burnie, Tasmania 7320, Australia
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 E: bwtdmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 3.4 Post seismic Non Circular Global

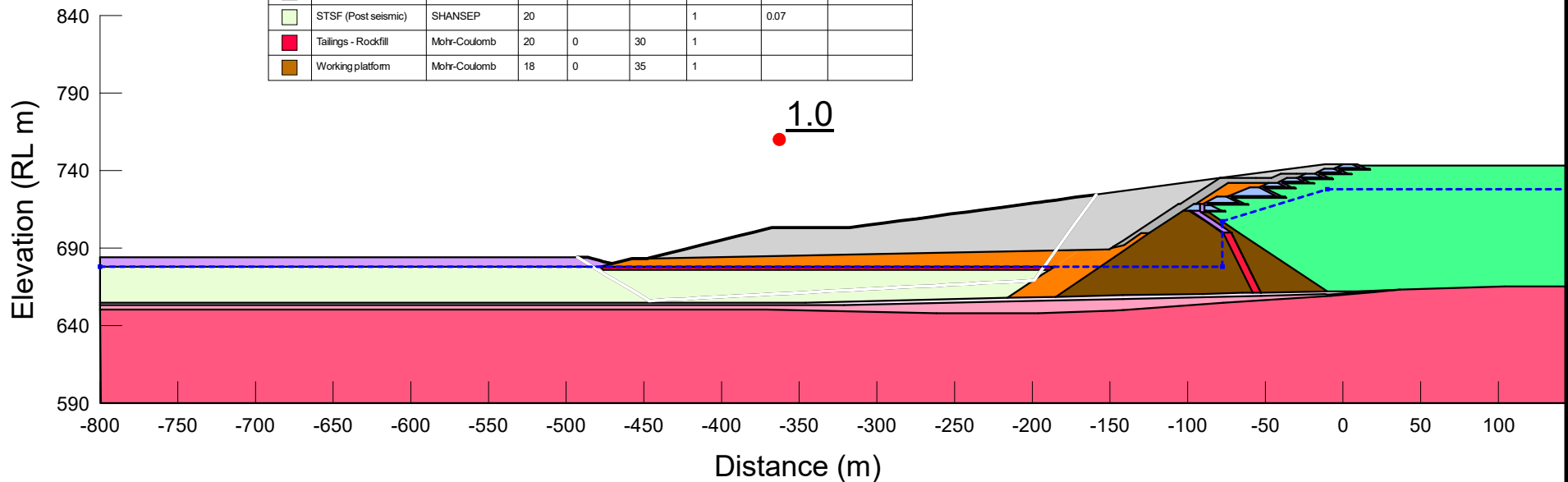
Project No. **12664089**
 Date **01/09/2025**

Prepared by: **HL**
 Checked by: **CC**

Scale: 1:4,000

CH - 2200: 3.5 Post seismic Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columnar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtdmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2200

Case: 3.5 Post seismic Non Circular Shallow Toe

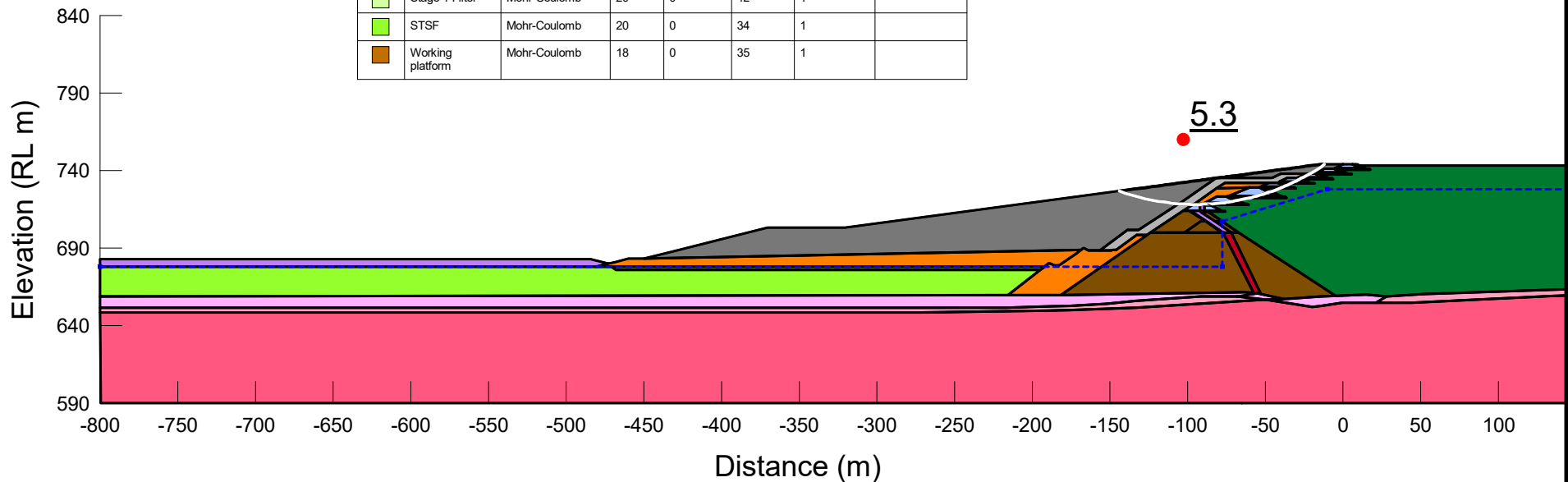
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 1.1 Drained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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10 Columar Court
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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwmailto@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 1.1 Drained Circular Local

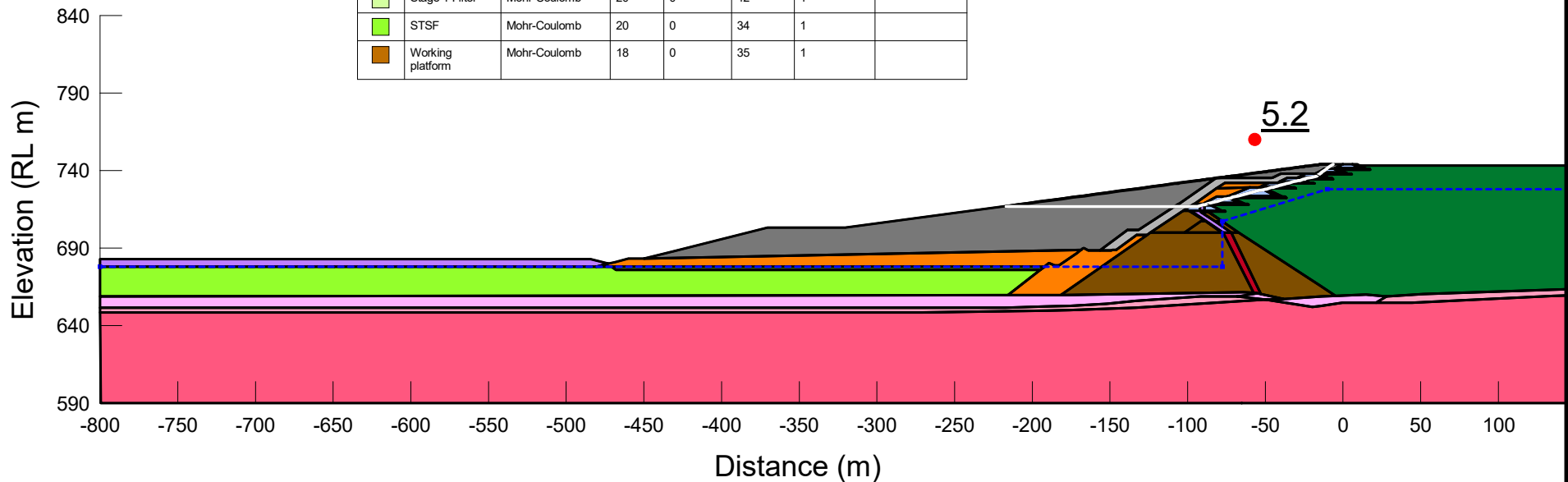
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 1.2 Drained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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E: bwtdmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 1.2 Drained Non Circular Local

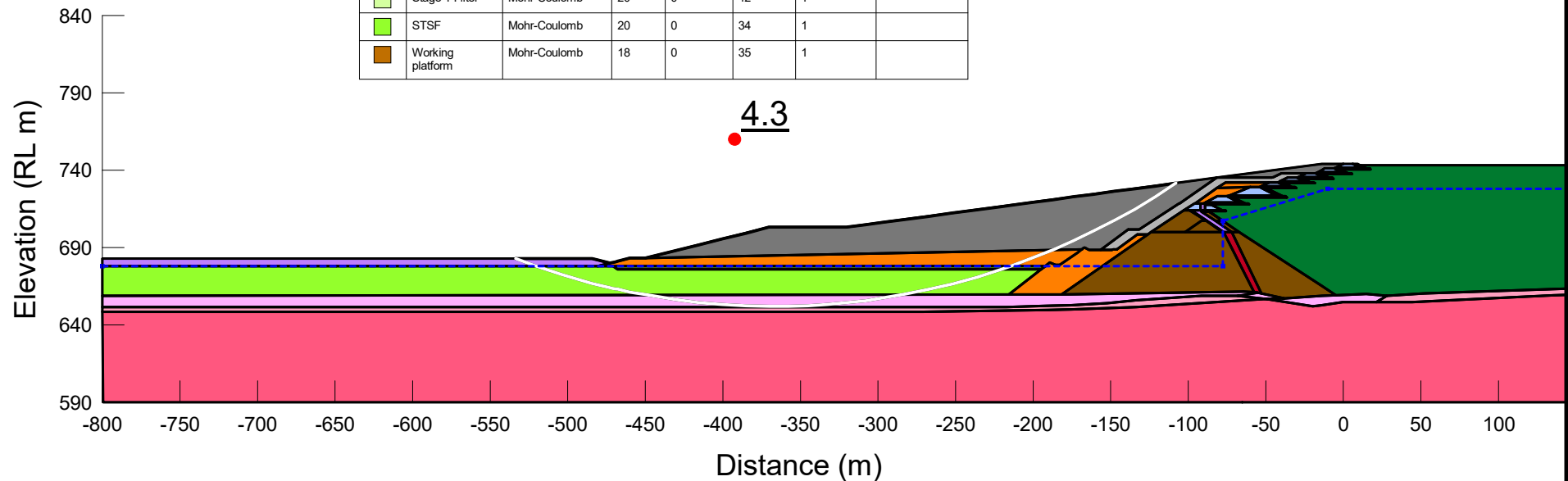
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 1.3 Drained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 1.3 Drained Circular Global

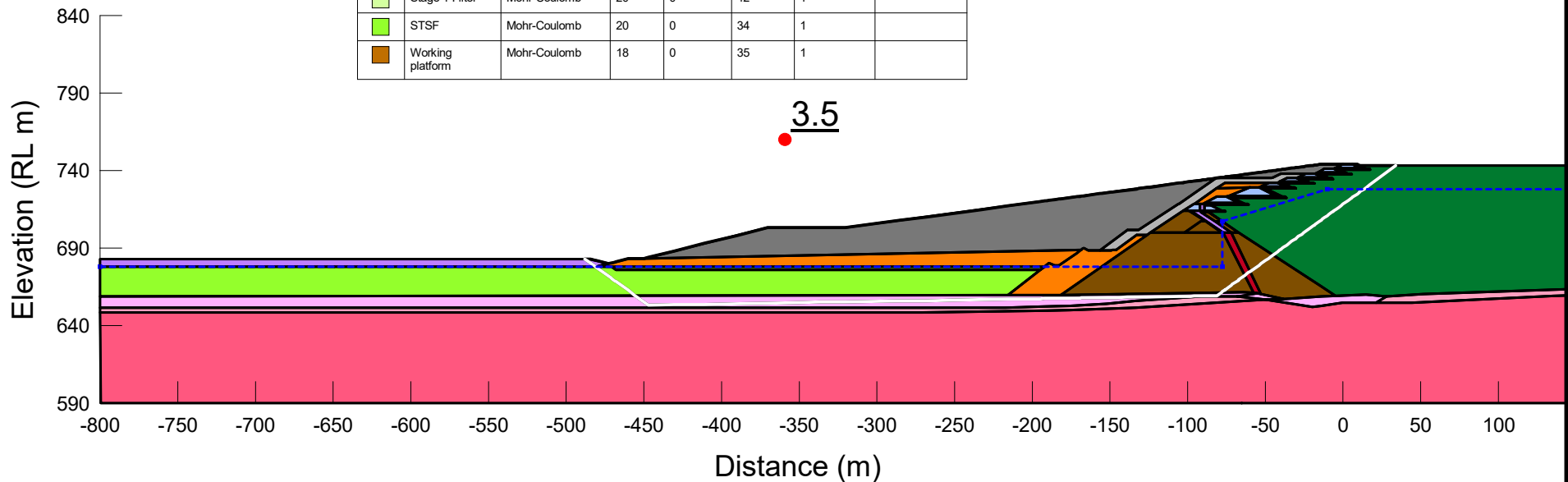
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 1.4 Drained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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E: bwtdmail@ghd.com | www.ghd.com

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Section : Buttress Coarse Sand Ch 2300

Case: 1.4 Drained Non Circular Global

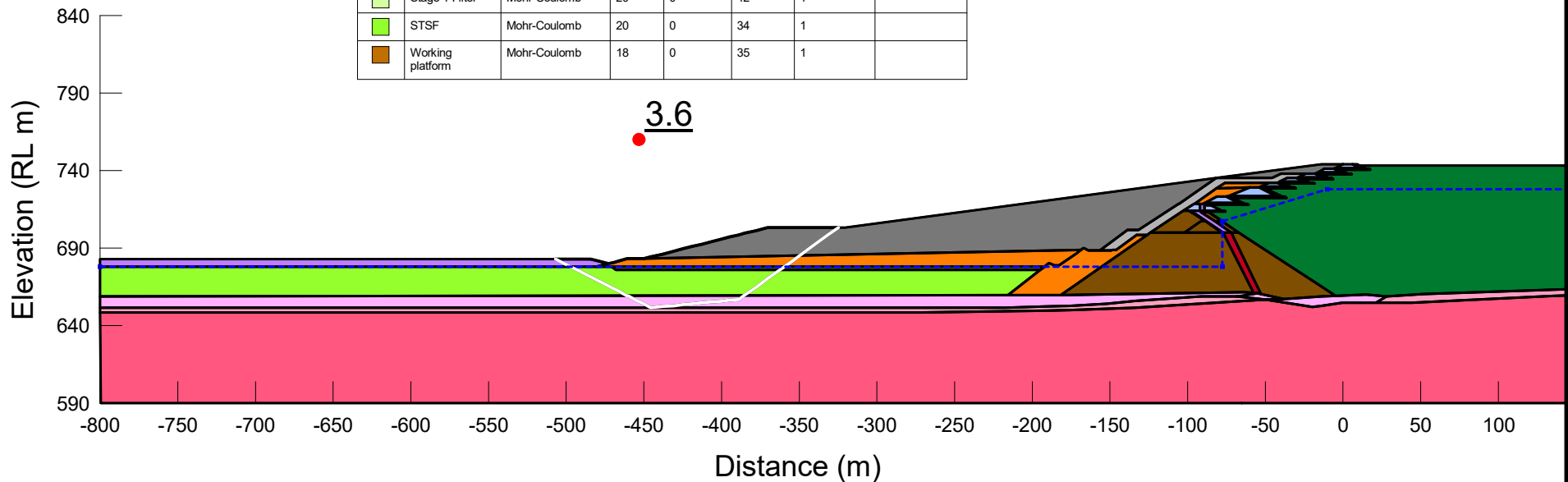
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 1.5 Drained Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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Section : Buttress Coarse Sand Ch 2300

Case: 1.5 Drained Non Circular Shallow Toe

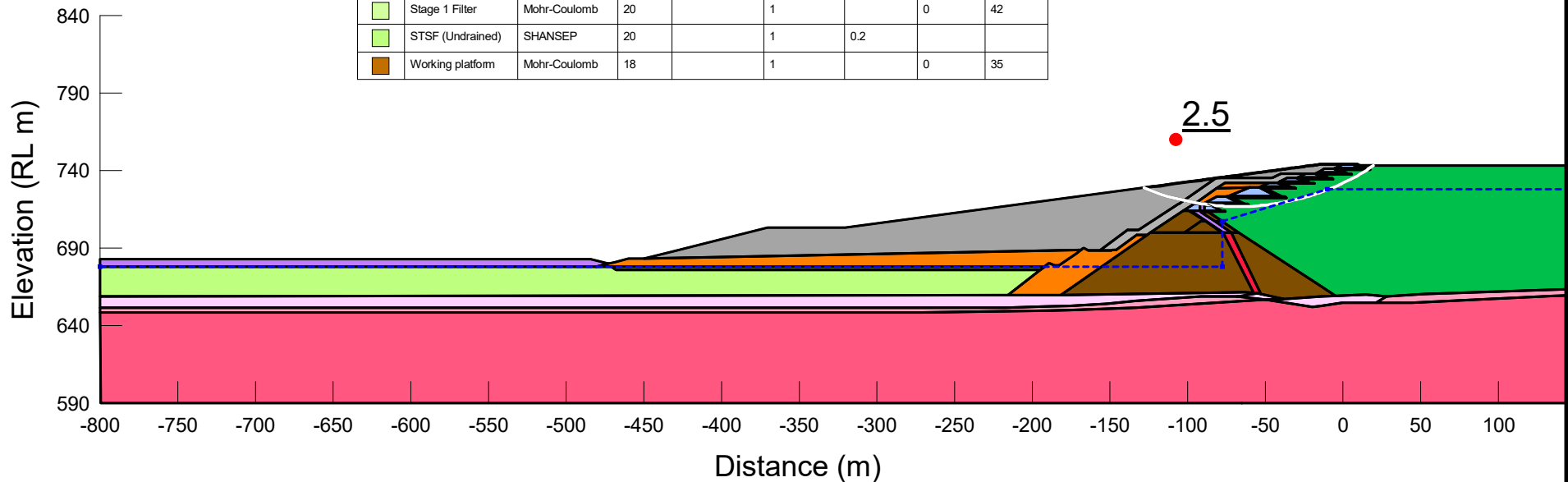
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 2.1 Undrained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 2.1 Undrained Circular Local

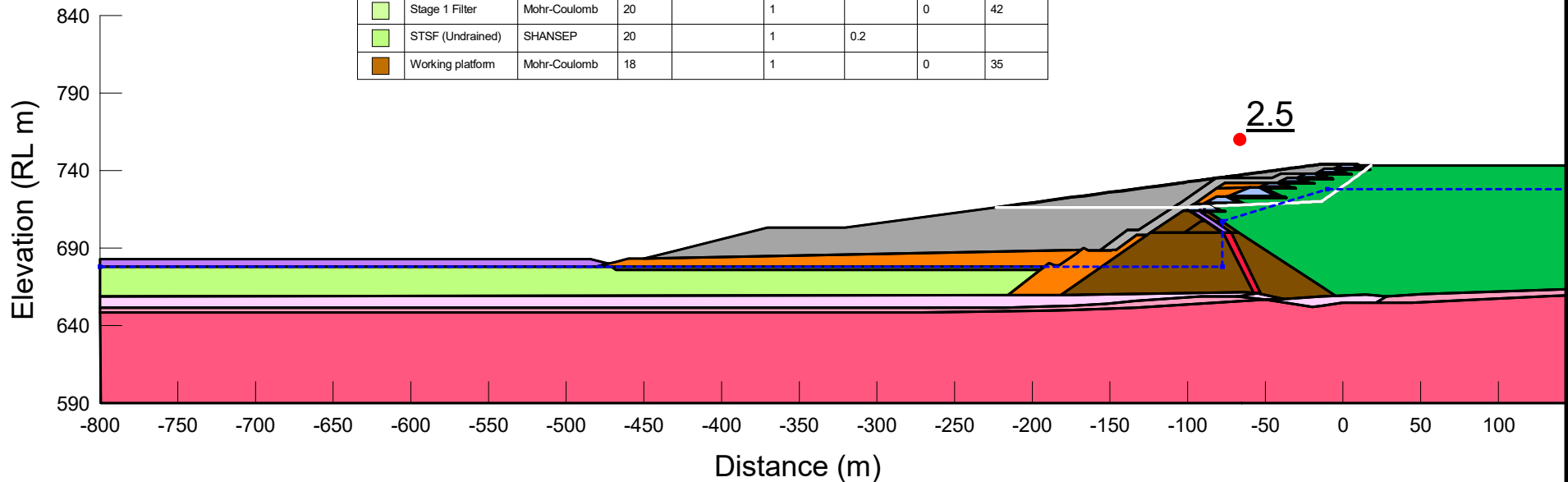
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 2.2 Undrained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 2.2 Undrained Non Circular Local

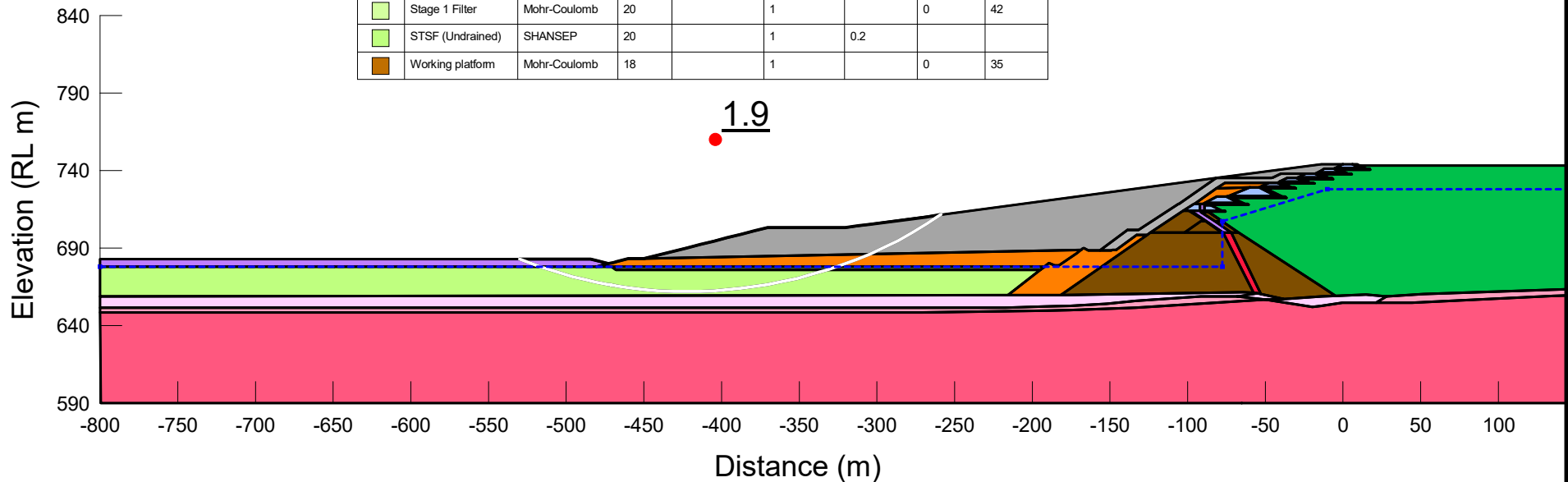
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 2.3 Undrained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 2.3 Undrained Circular Global

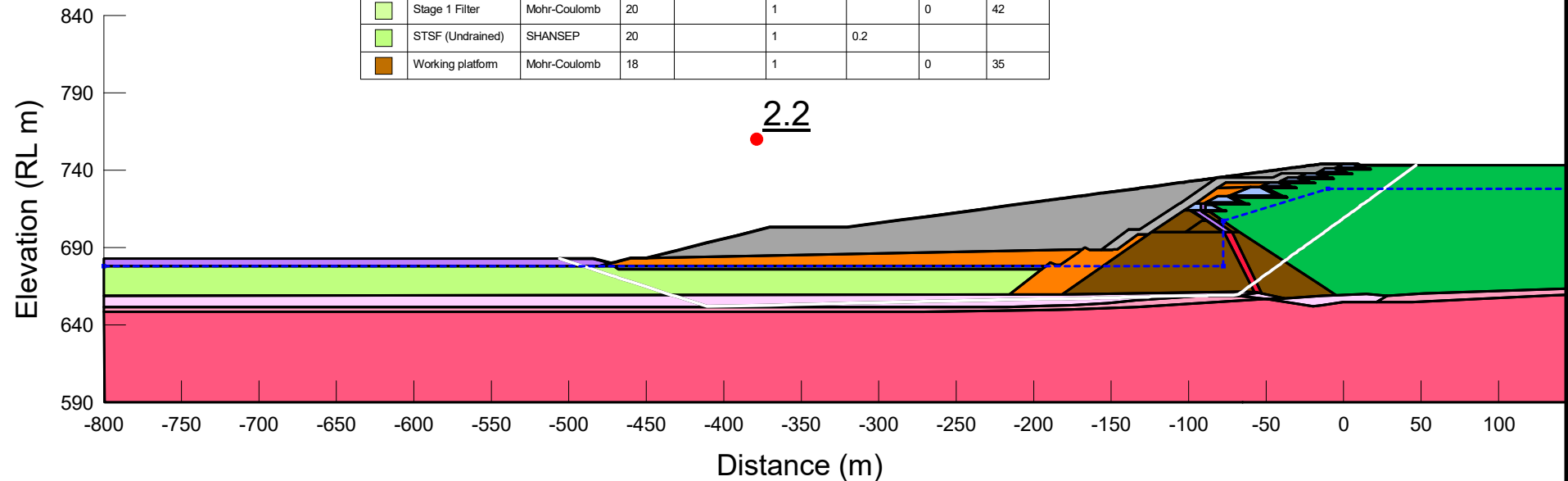
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 2.4 Undrained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Section : Buttress Coarse Sand Ch 2300

Case: 2.4 Undrained Non Circular Global

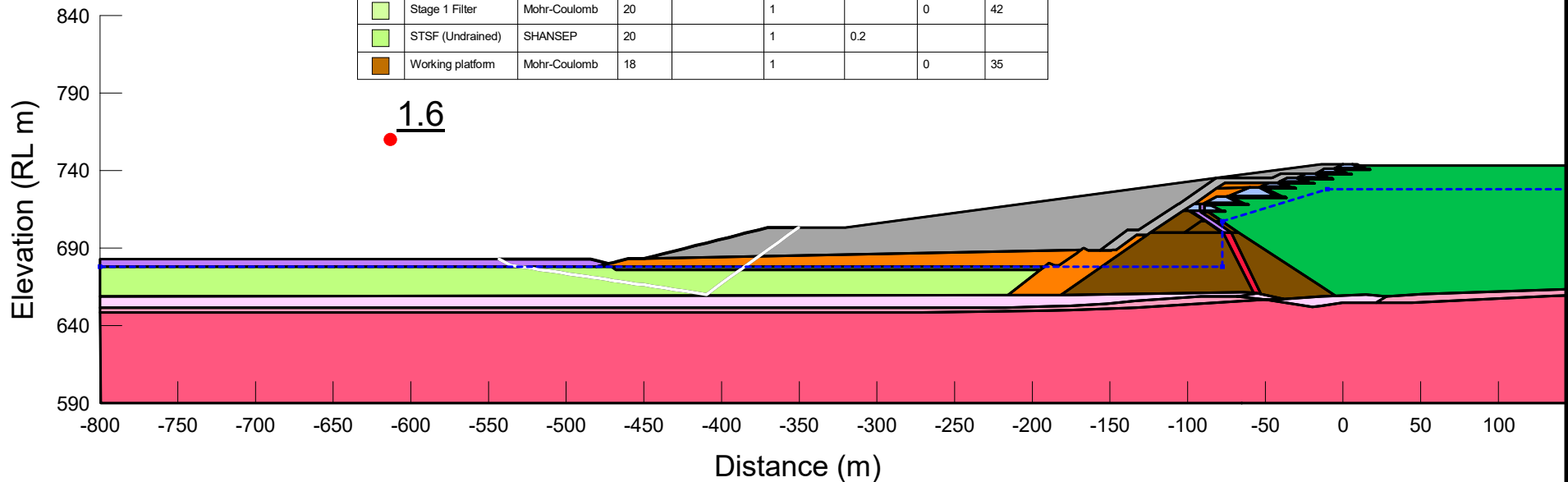
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 2.5 Undrained Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Coarse Sand (Undrained) (Stockpile)	SHANSEP	17		1	0.19		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
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E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 2.5 Undrained Non Circular Shallow Toe

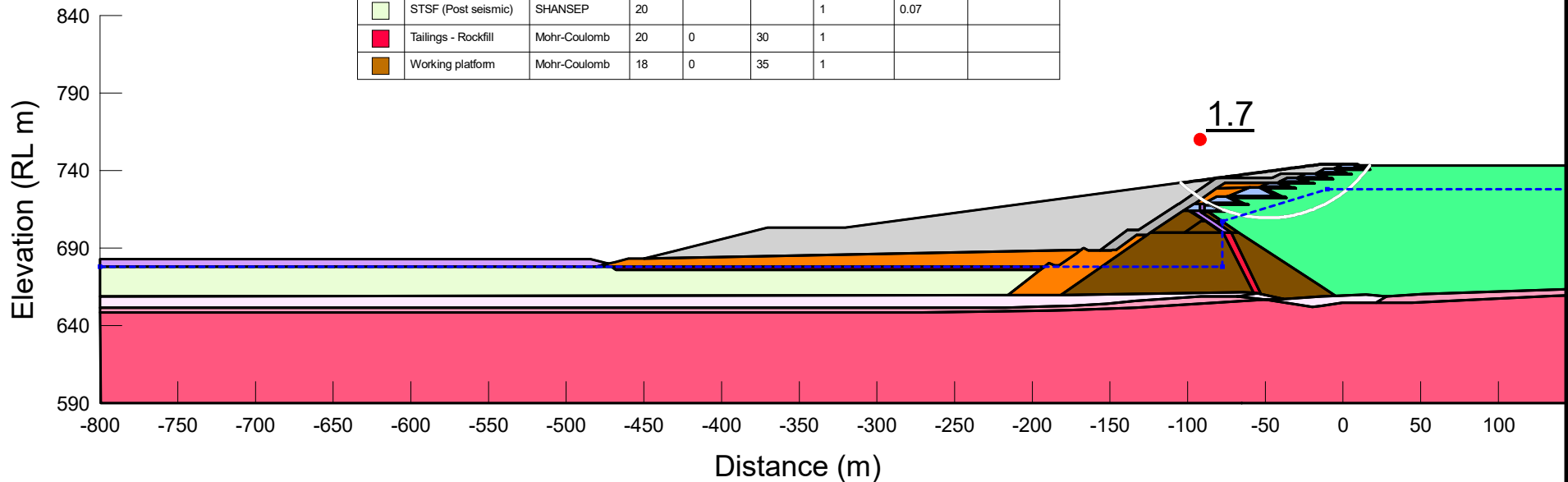
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 3.1 Post Seismic Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 3.1 Post Seismic Circular Local

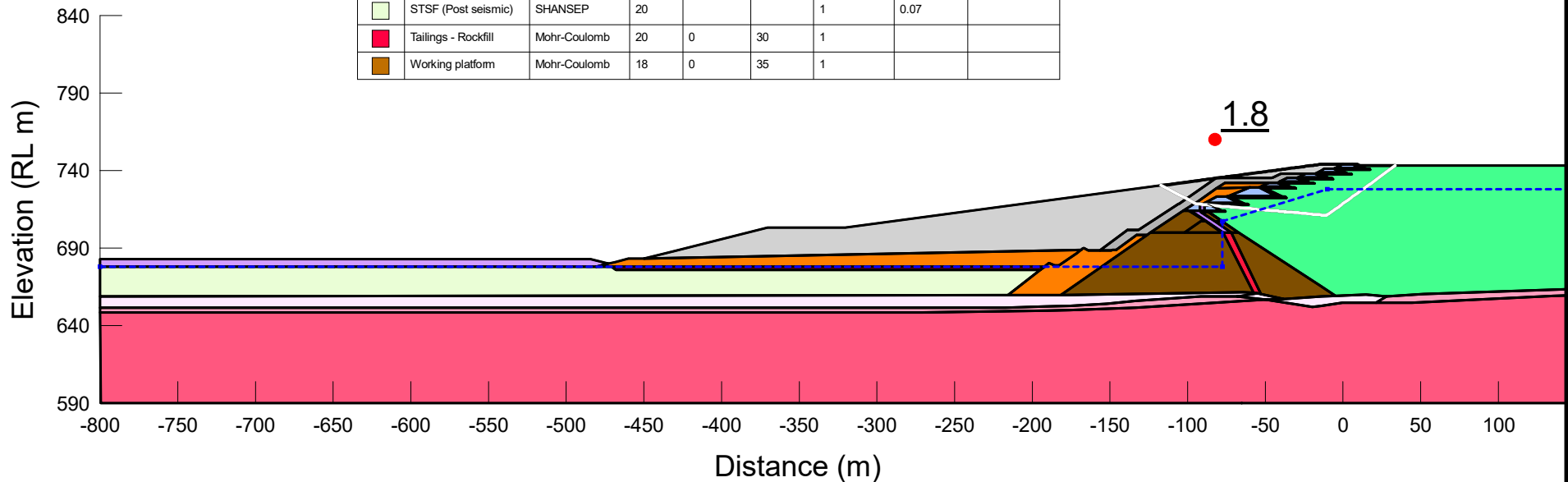
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 3.2 Post Seismic Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 3.2 Post Seismic Non Circular Local

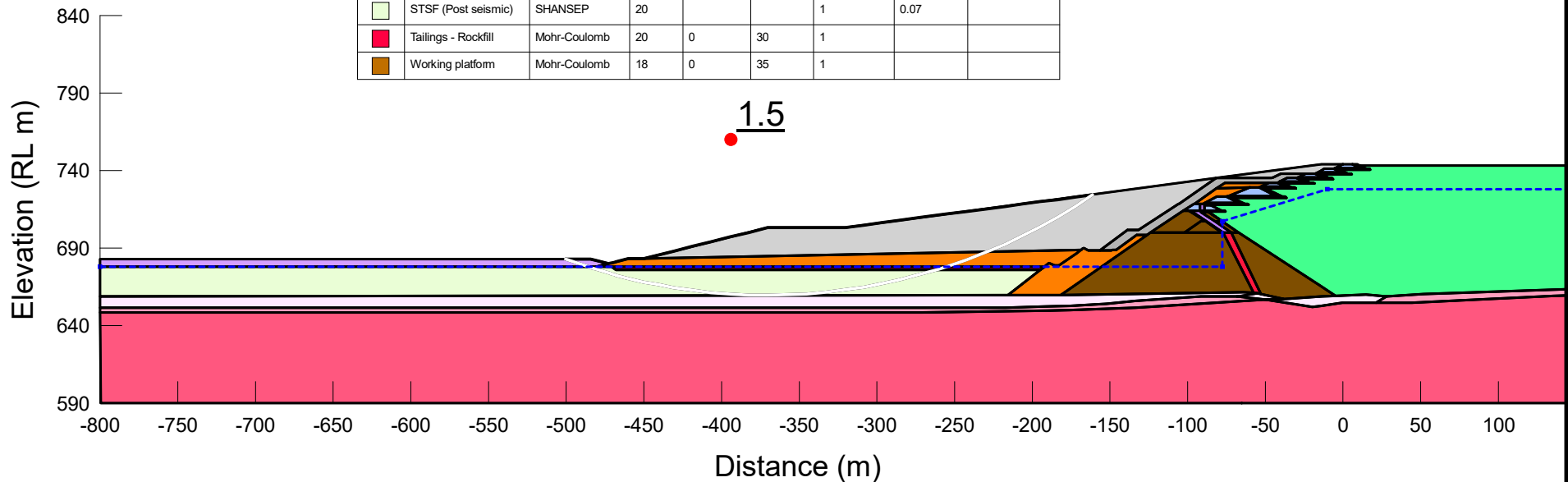
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Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 3.3 Post Seismic Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 3.3 Post Seismic Circular Global

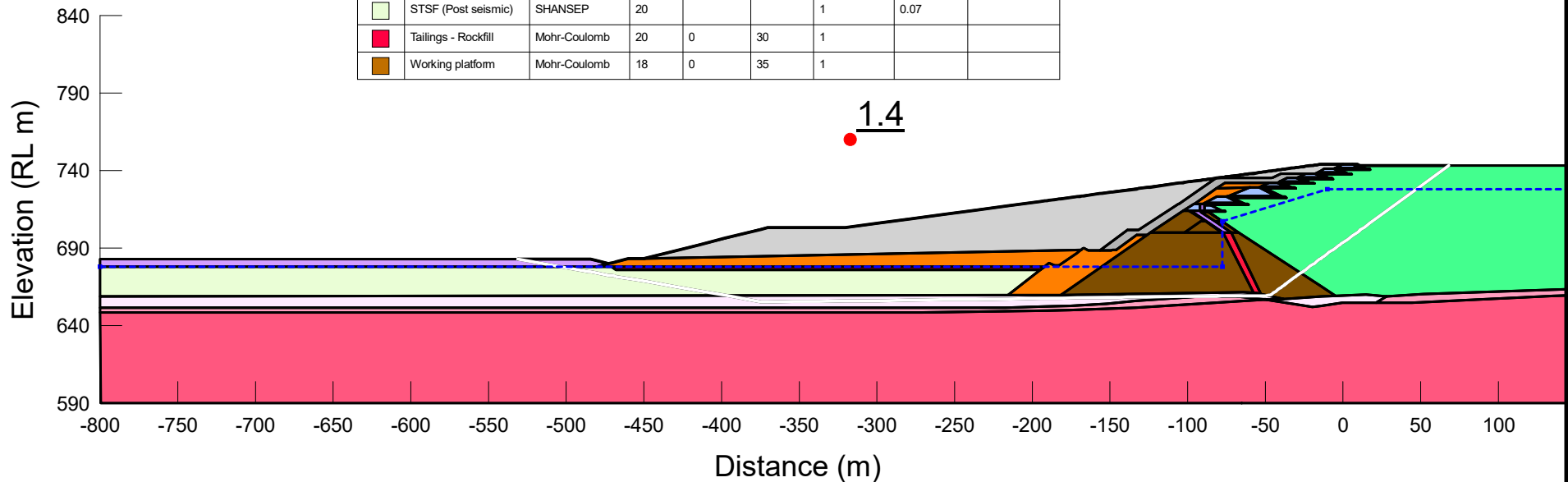
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 3.4 Post Seismic Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 3.4 Post Seismic Non Circular Global

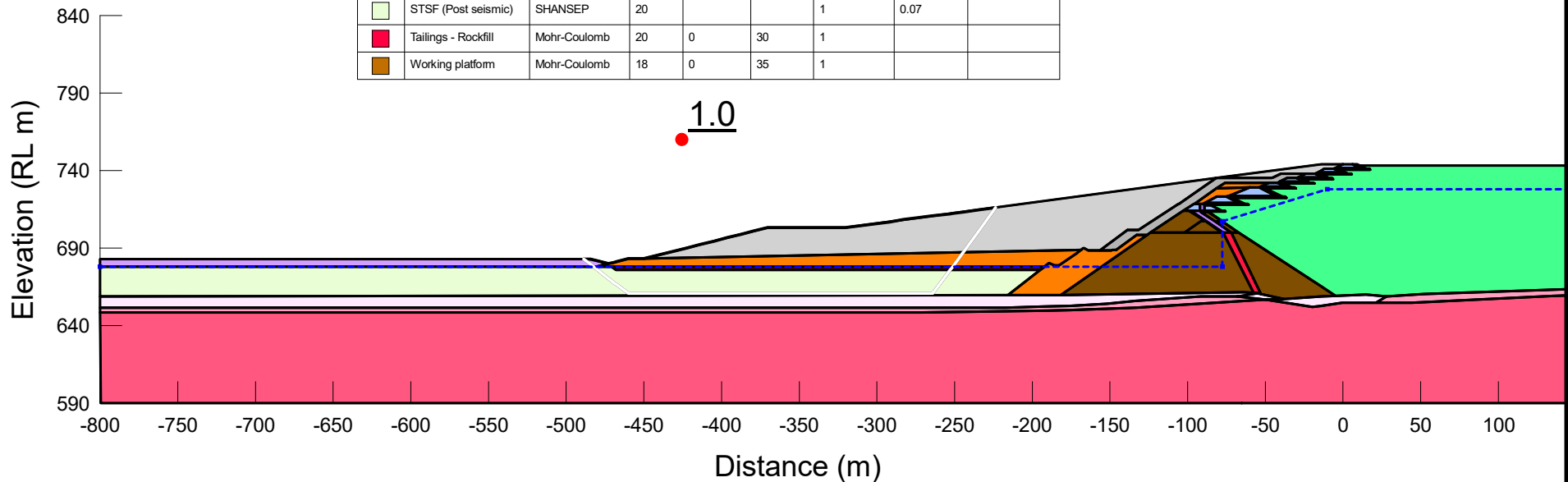
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2300: 3.5 Post Seismic Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Post seismic) (Stockpile)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2300

Case: 3.5 Post Seismic Non Circular Shallow Toe

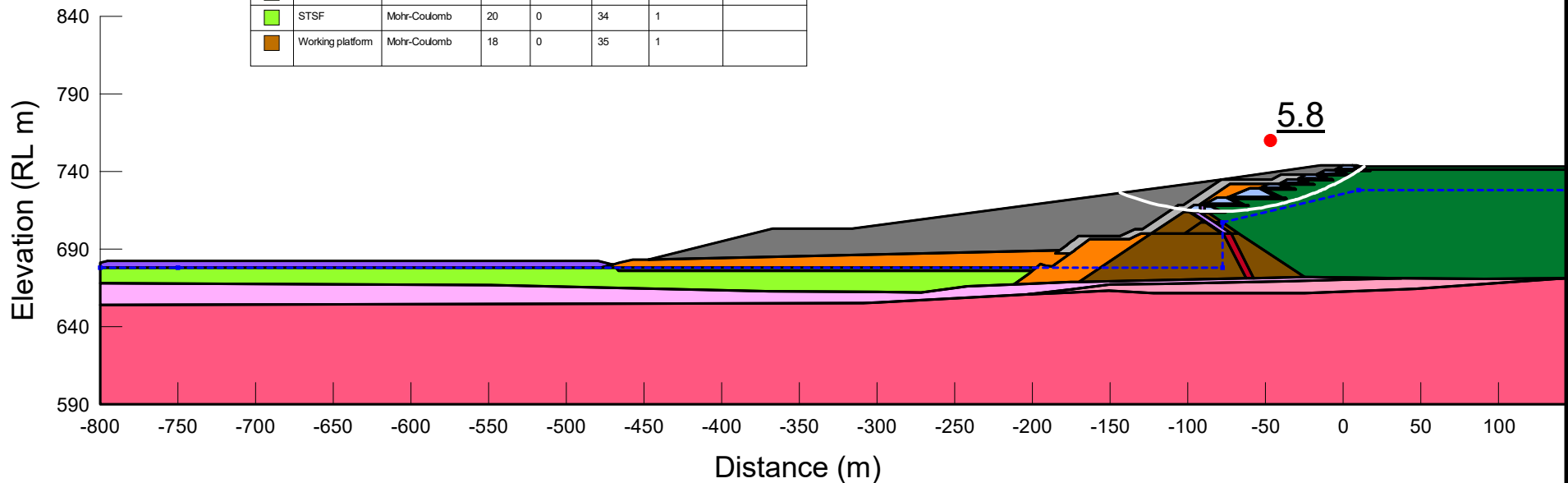
Project No. **12664089**
Date **01/09/2025**

Prepared by: **HL**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 1.1 Drained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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 10 Columar Court
 Burnie, Tasmania 7320, Australia
 T +61 3 6432 7900 | F+61 3 8732 7046
 E: bwtmail@ghd.com | www.ghd.com

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Section : Buttress Coarse Sand Ch 2400

Case: 1.1 Drained Circular Local

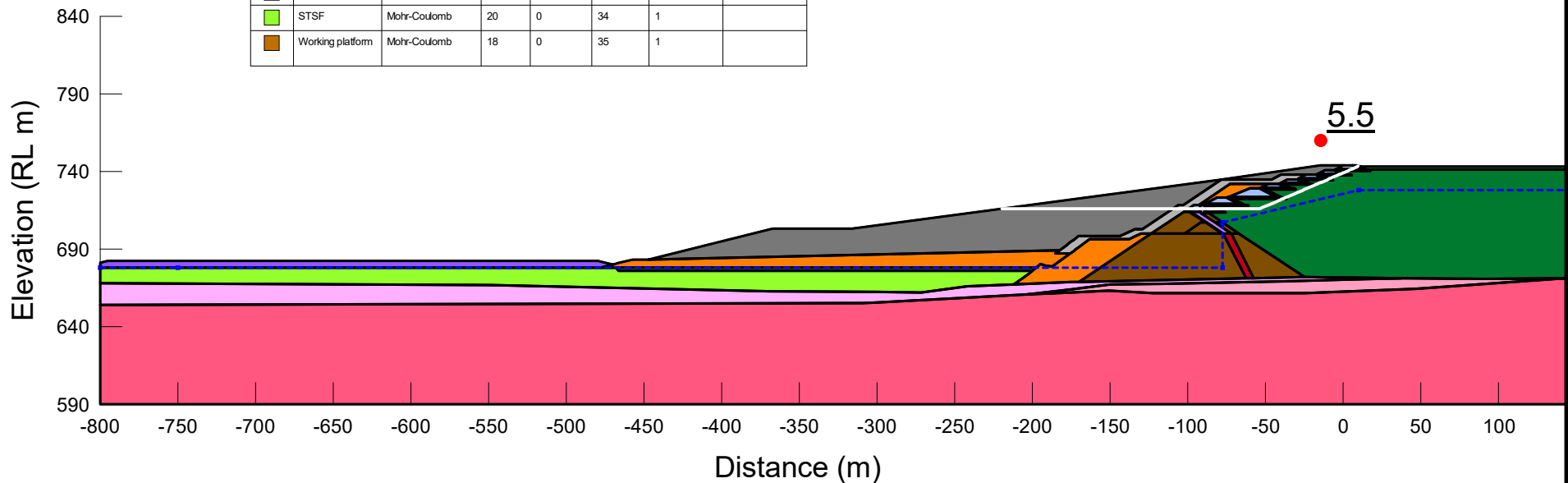
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 Date **01/09/2025**

Prepared by: **NH**
 Checked by: **CC**

Scale: 1:4,000

CH - 2400: 1.2 Drained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 1.2 Drained Non Circular Local

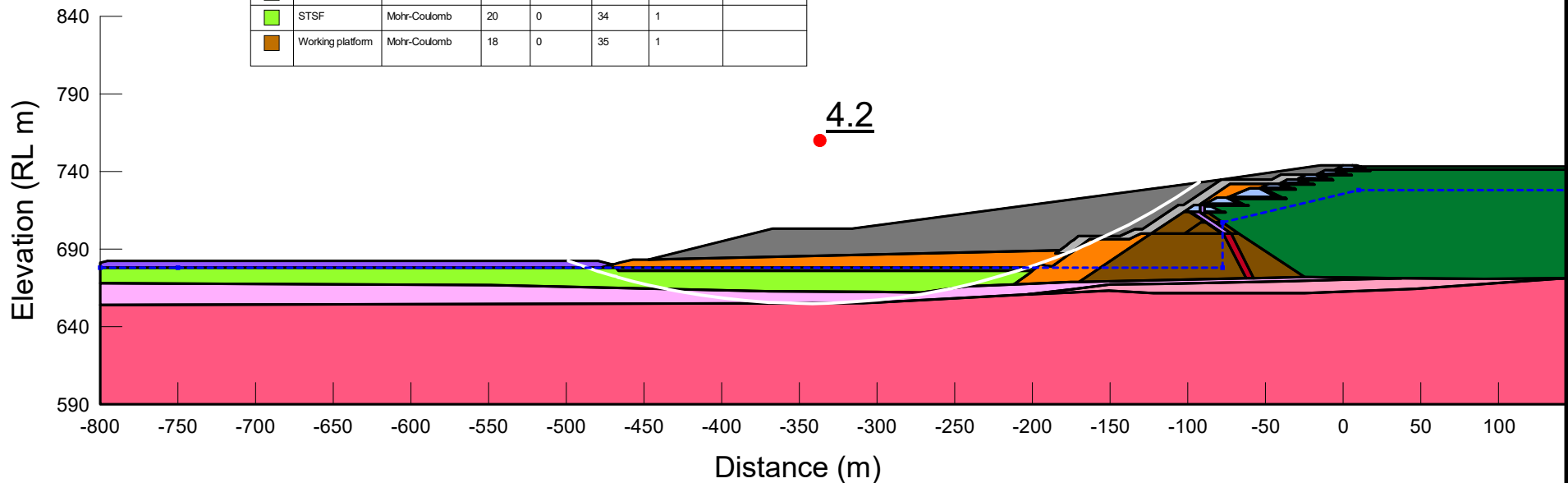
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 1.3 Drained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 1.3 Drained Circular Global

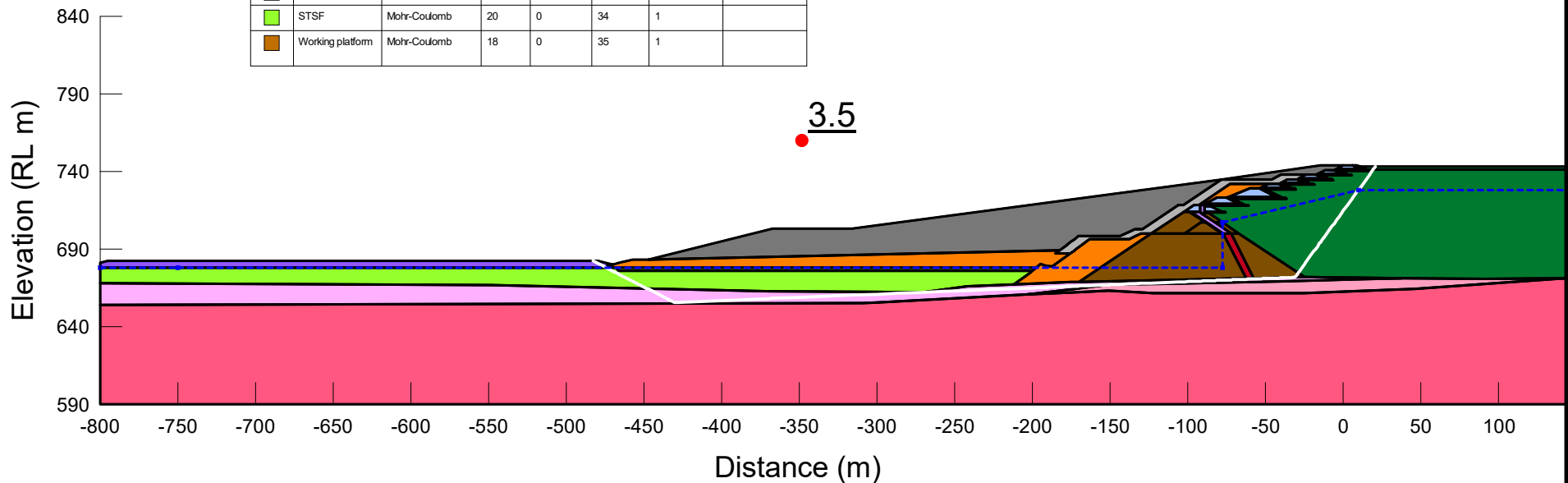
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 1.4 Drained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 1.4 Drained Non Circular Global

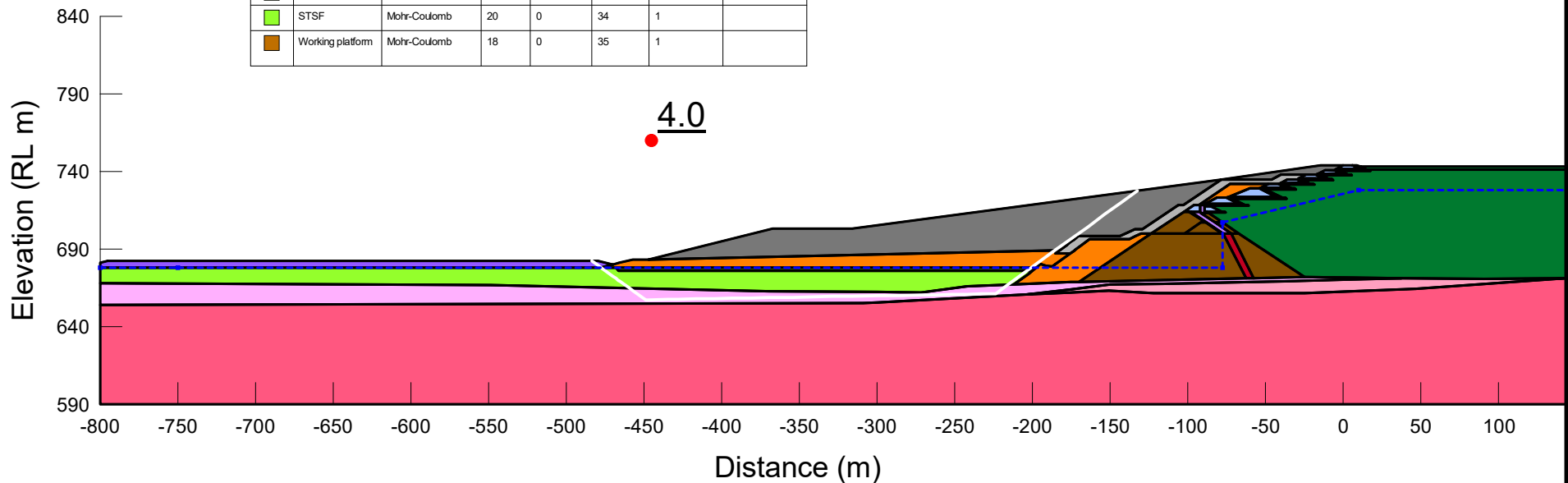
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 1.5 Drained Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
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Case: 1.5 Drained Non Circular Shallow Toe

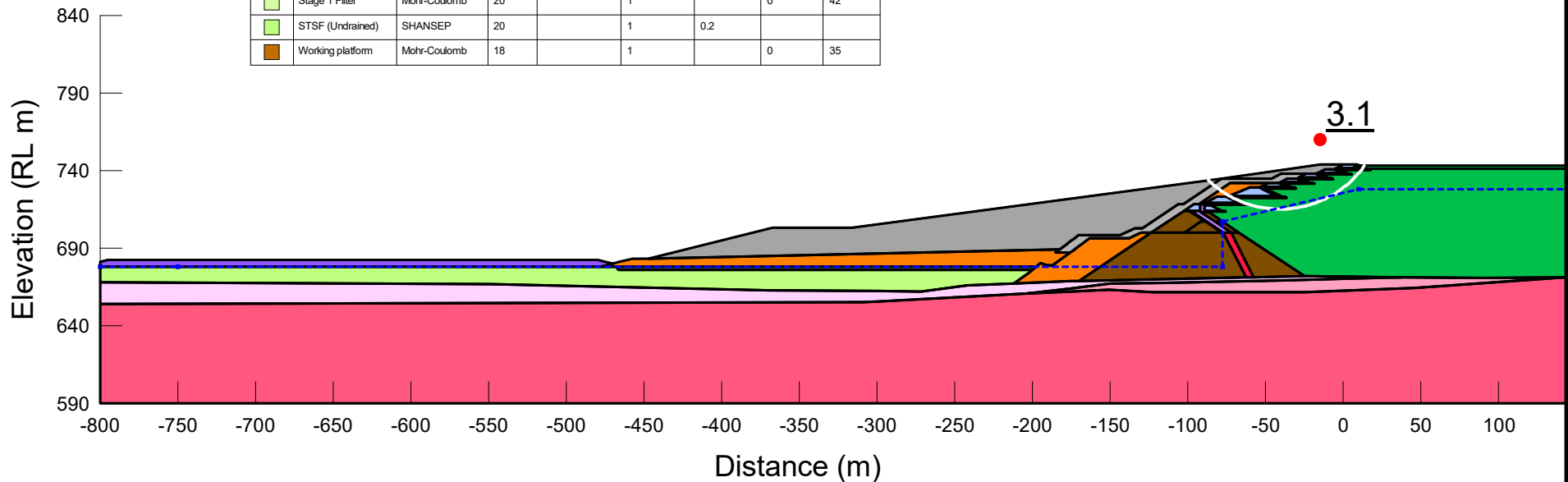
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 2.1 Undrained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
 10 Columar Court
 Burnie, Tasmania 7320, Australia
 T +61 3 6432 7900 | F+61 3 8732 7046
 E: bwtmail@ghd.com | www.ghd.com

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Section : Buttress Coarse Sand Ch 2400

Case: 2.1 Undrained Circular Local

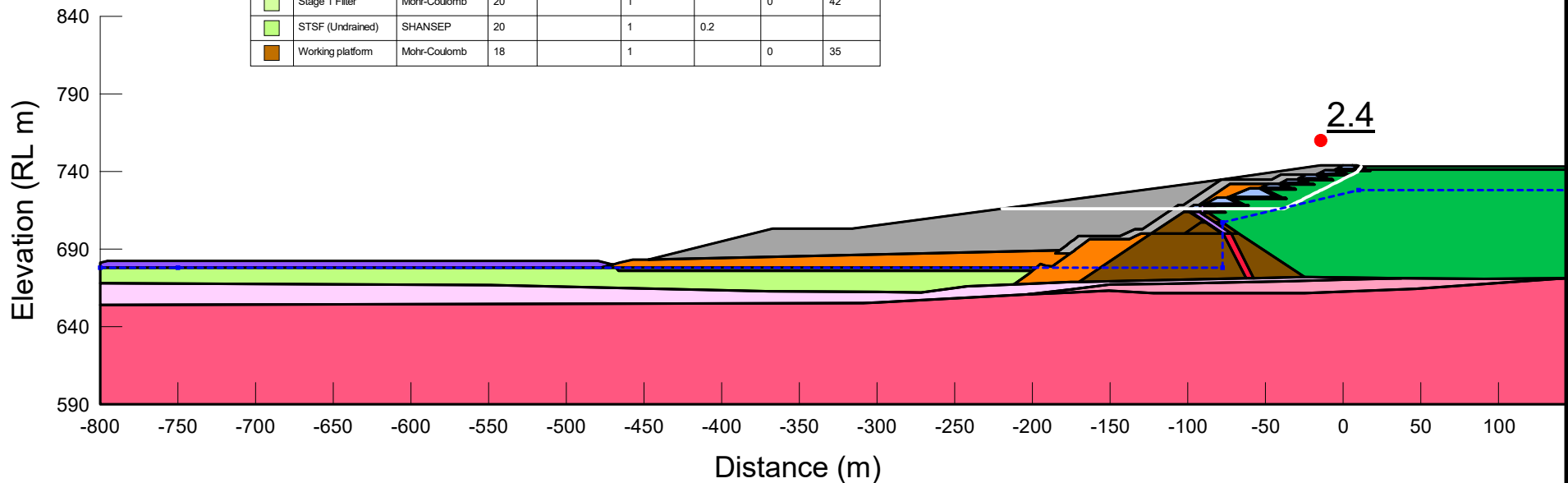
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 Date **01/09/2025**

Prepared by: **NH**
 Checked by: **CC**

Scale: 1:4,000

CH - 2400: 2.2 Undrained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 2.2 Undrained Non Circular Local

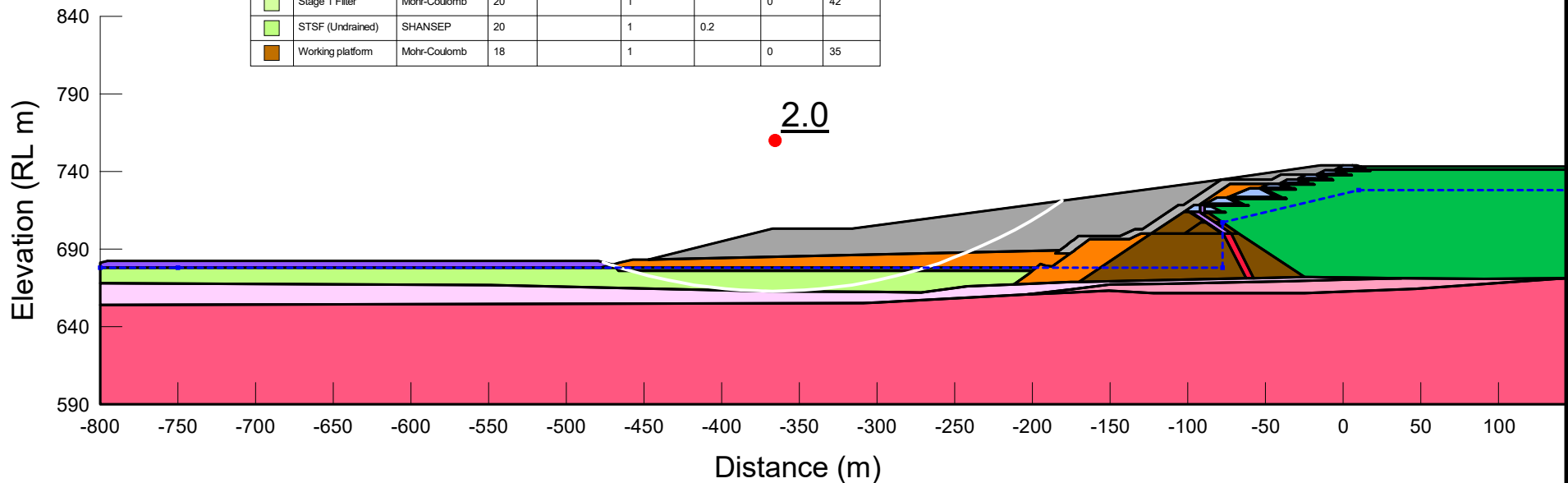
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 2.3 Undrained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
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Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 2.3 Undrained Circular Global

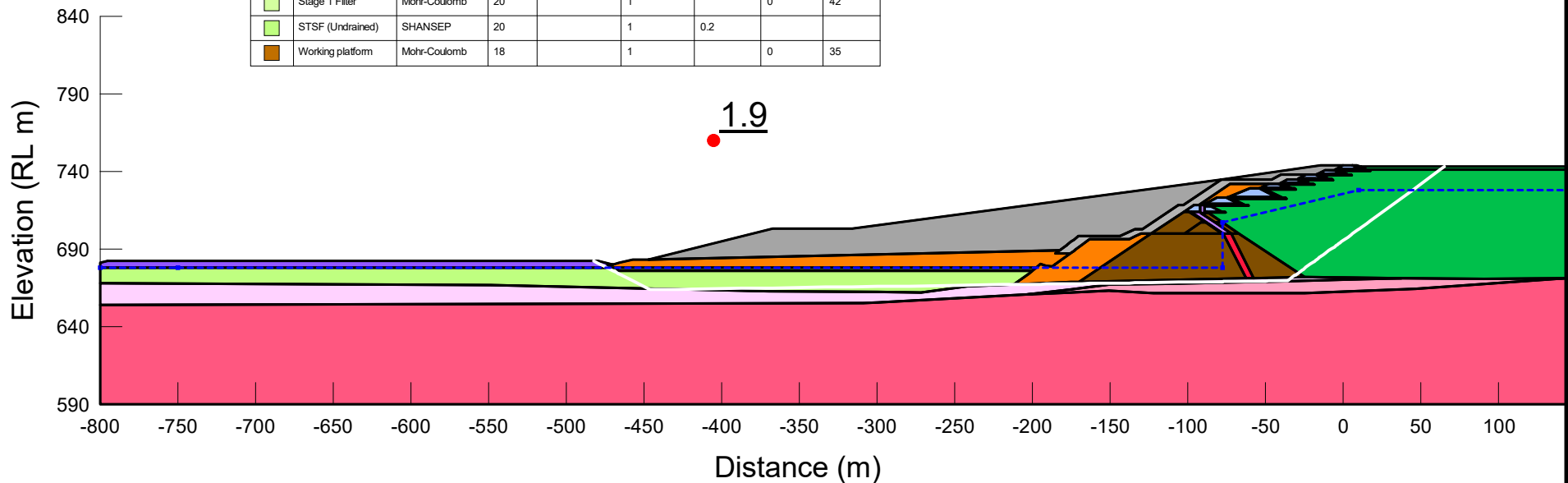
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 2.4 Undrained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Furction FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
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Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 2.4 Undrained Non Circular Global

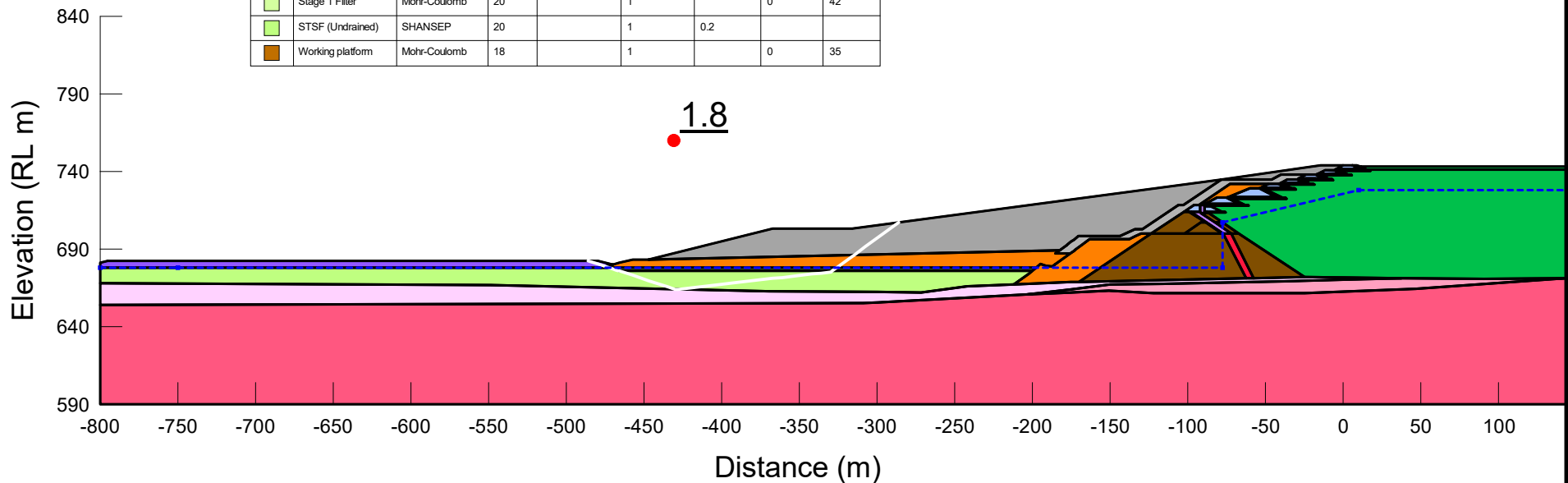
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 2.5 Undrained Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 2.5 Undrained Non Circular Shallow Toe

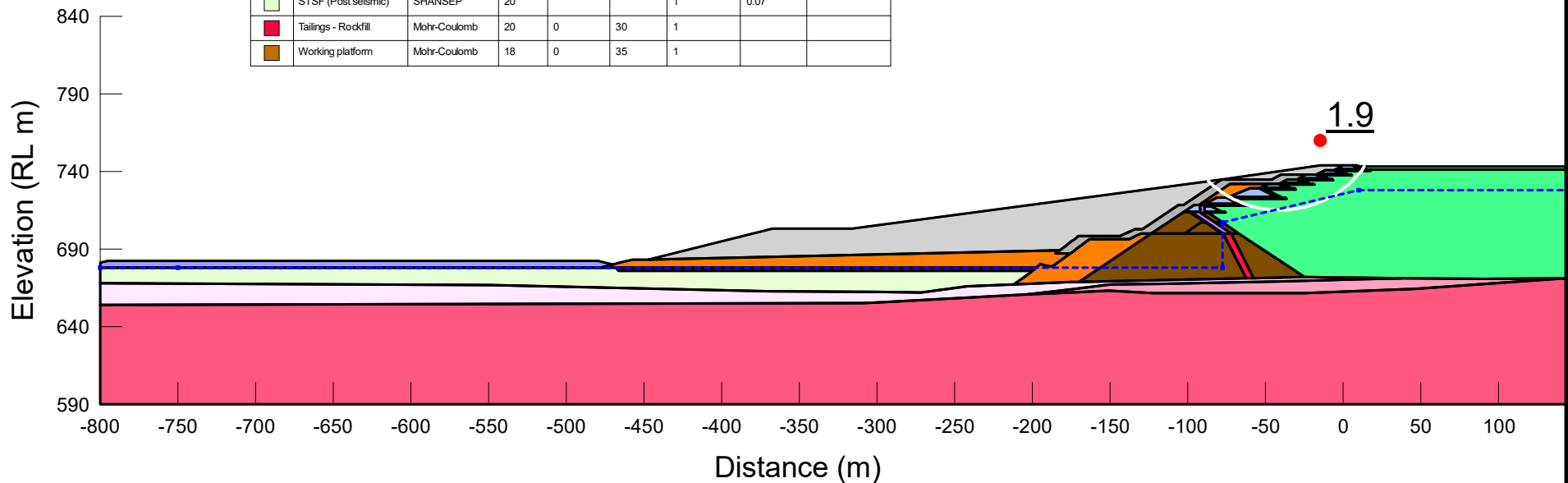
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: **1:4,000**

CH - 2400: 3.1 Post seismic Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 3.1 Post seismic Circular Local

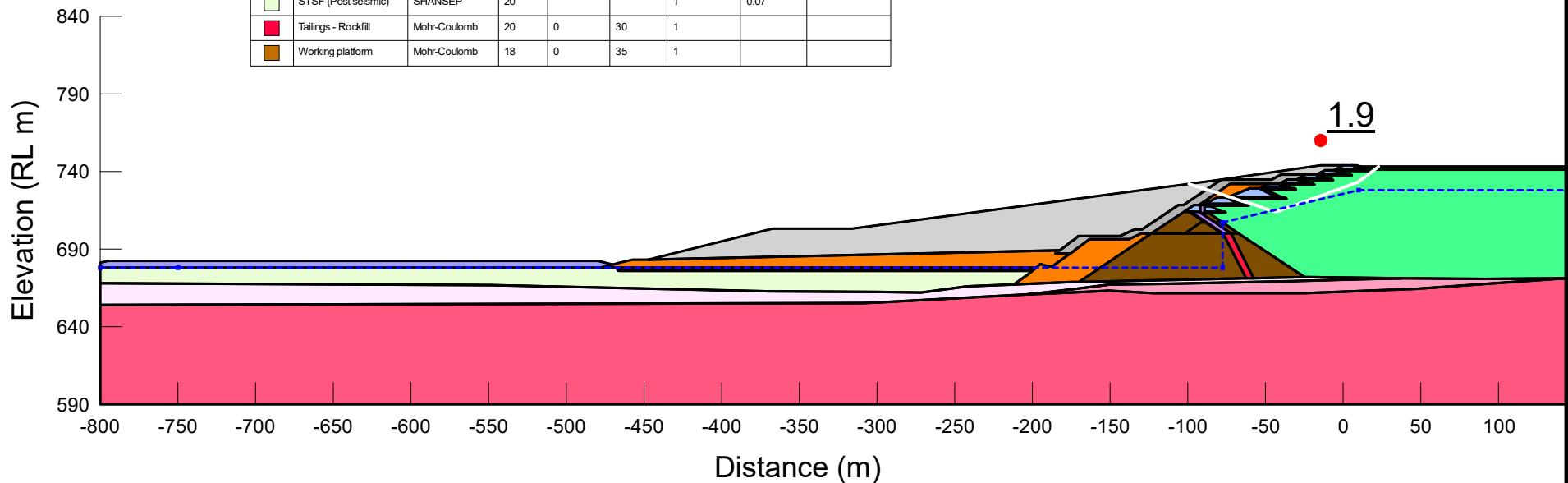
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 3.2 Post seismic Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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 Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 3.2 Post seismic Non Circular Local

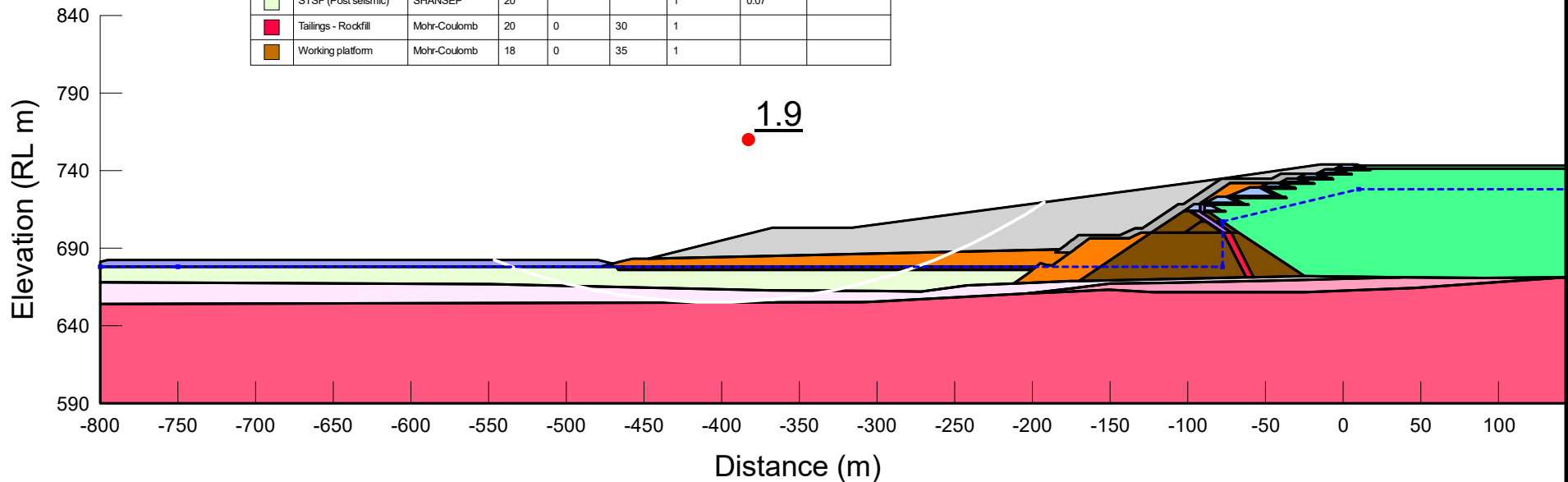
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 Date **01/09/2025**

Prepared by: **NH**
 Checked by: **CC**

Scale: 1:4,000

CH - 2400: 3.3 Post seismic Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 3.3 Post seismic Circular Global

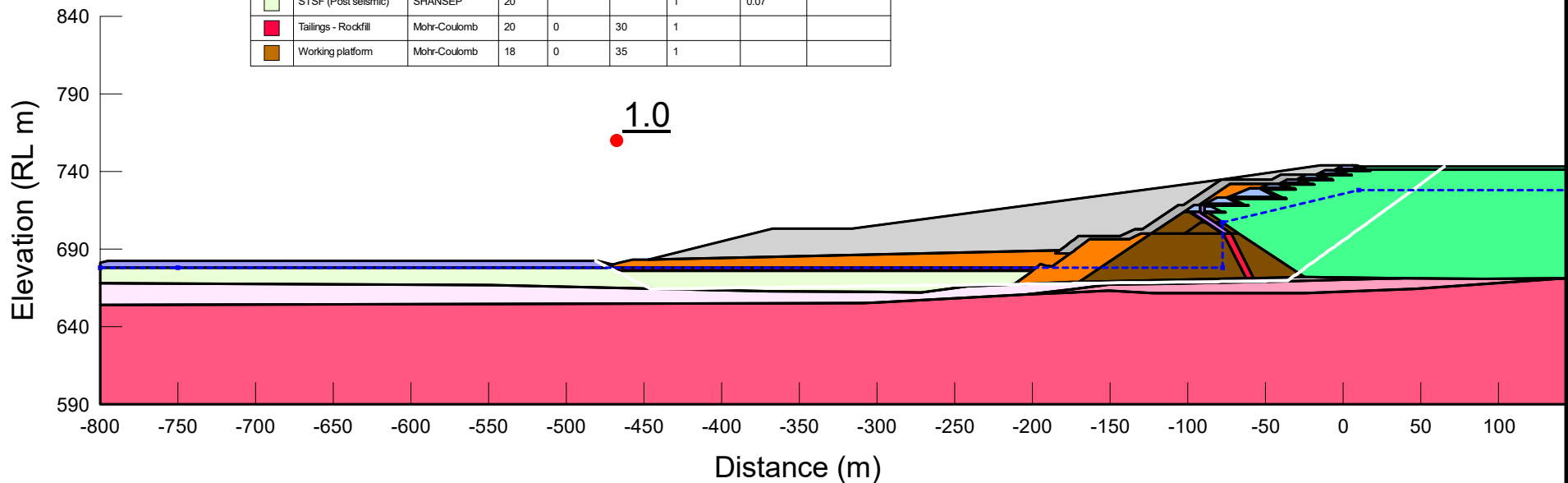
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Scale: 1:4,000

CH - 2400: 3.4 Post seismic Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columnar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 3.4 Post seismic Non Circular Global

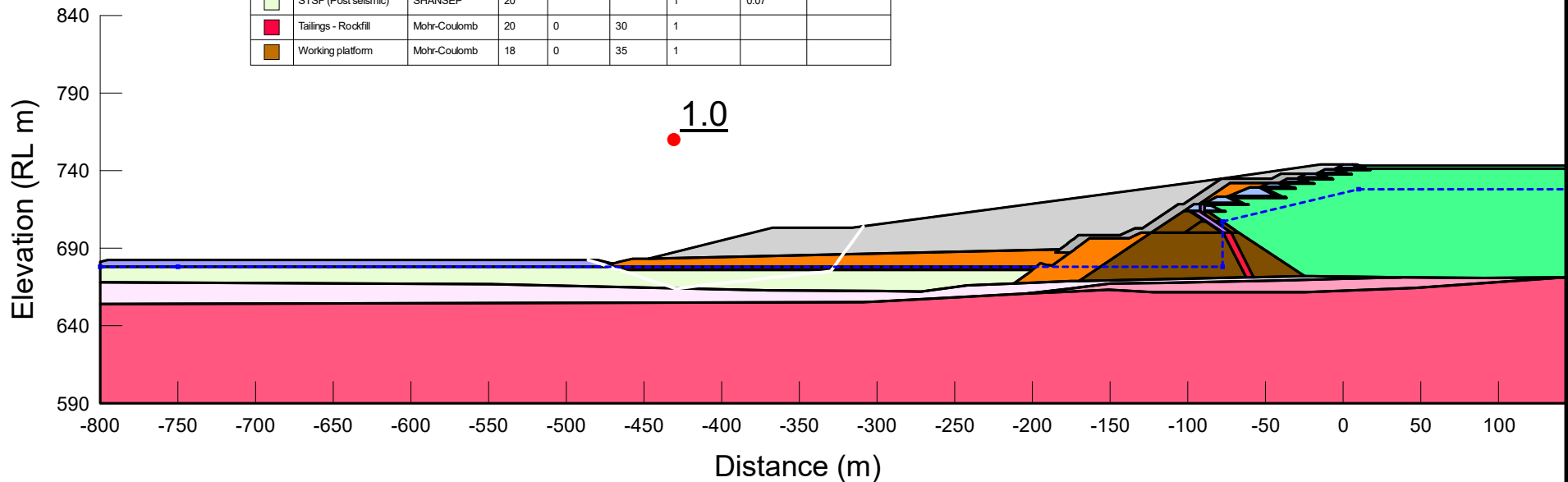
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2400: 3.5 Post seismic Non Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2400

Case: 3.5 Post seismic Non Circular Shallow Toe

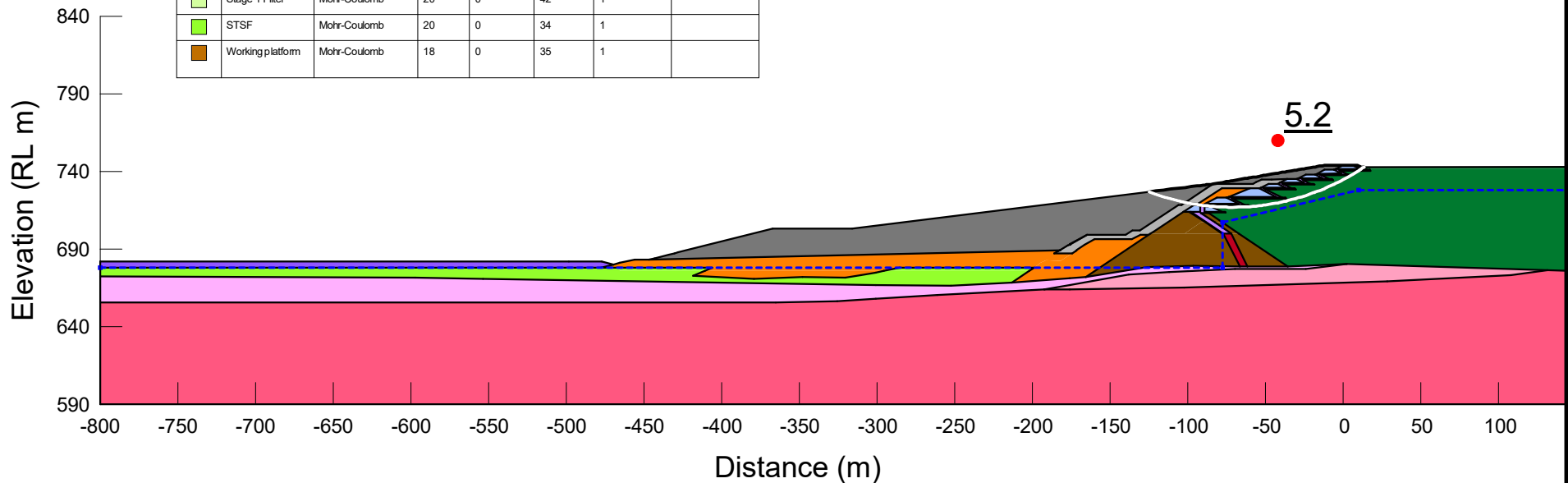
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 1.1 Drained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 1.1 Drained Circular Local

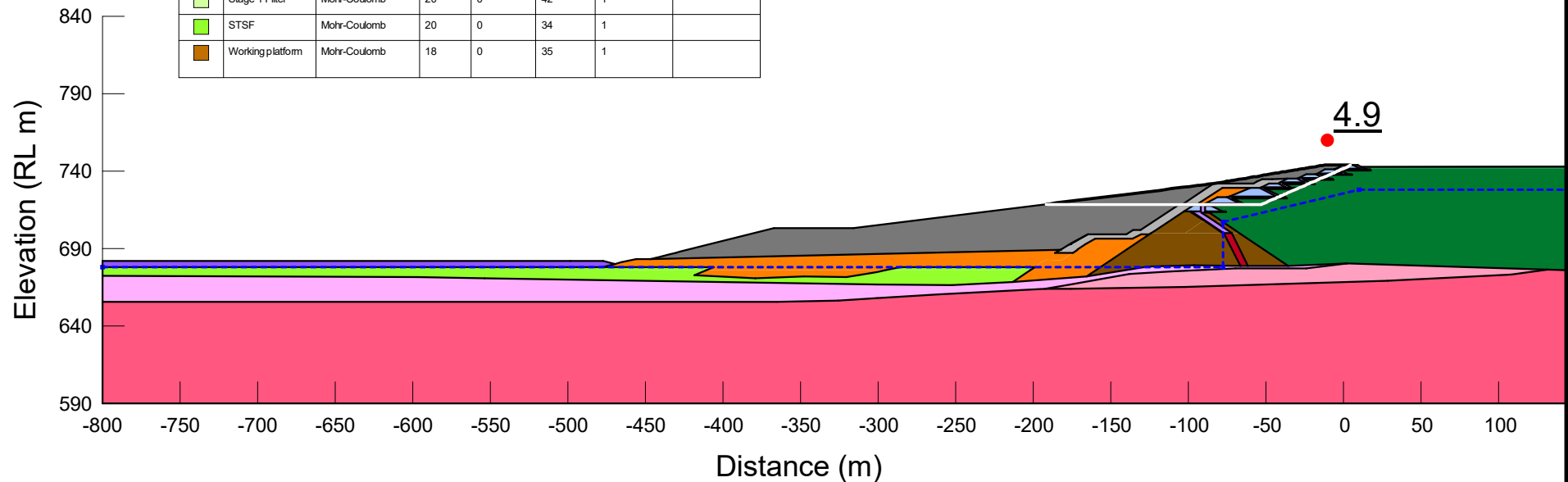
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Date **01/09/2025**

Prepared by: **NH**
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Scale: 1:4,000

CH - 2500: 1.2 Drained Non-Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
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Section : Buttress Coarse Sand Ch 2500

Case: 1.2 Drained Non-Circular Local

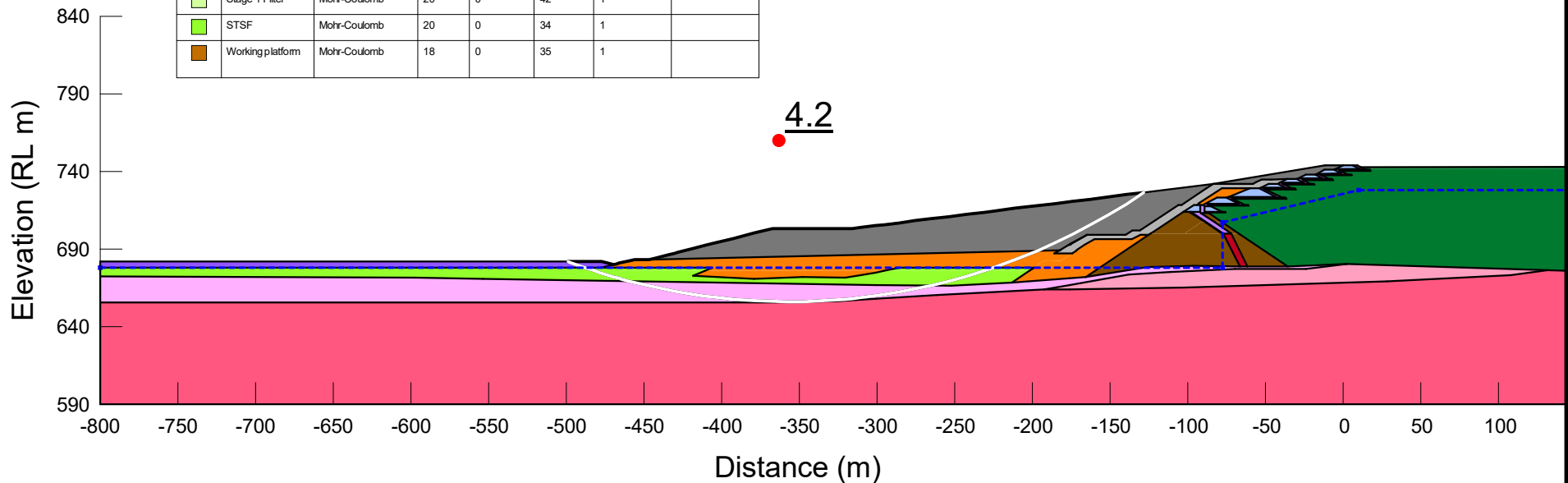
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 1.3 Drained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 1.3 Drained Circular Global

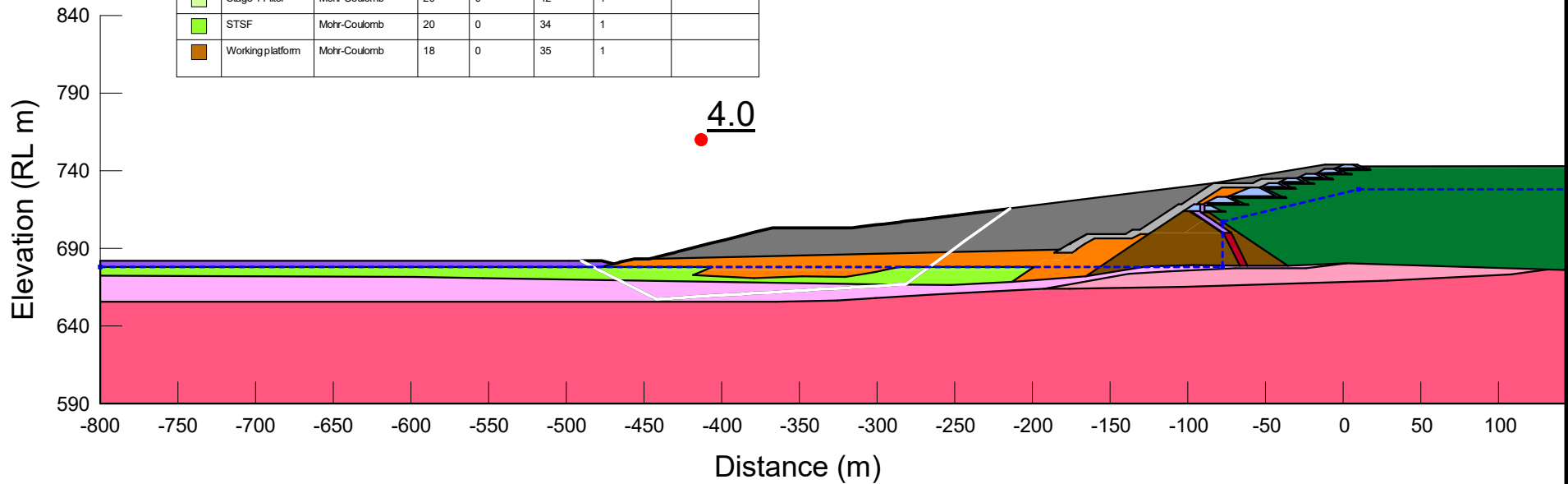
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 1.4 Drained Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 1.4 Drained Non-Circular Global

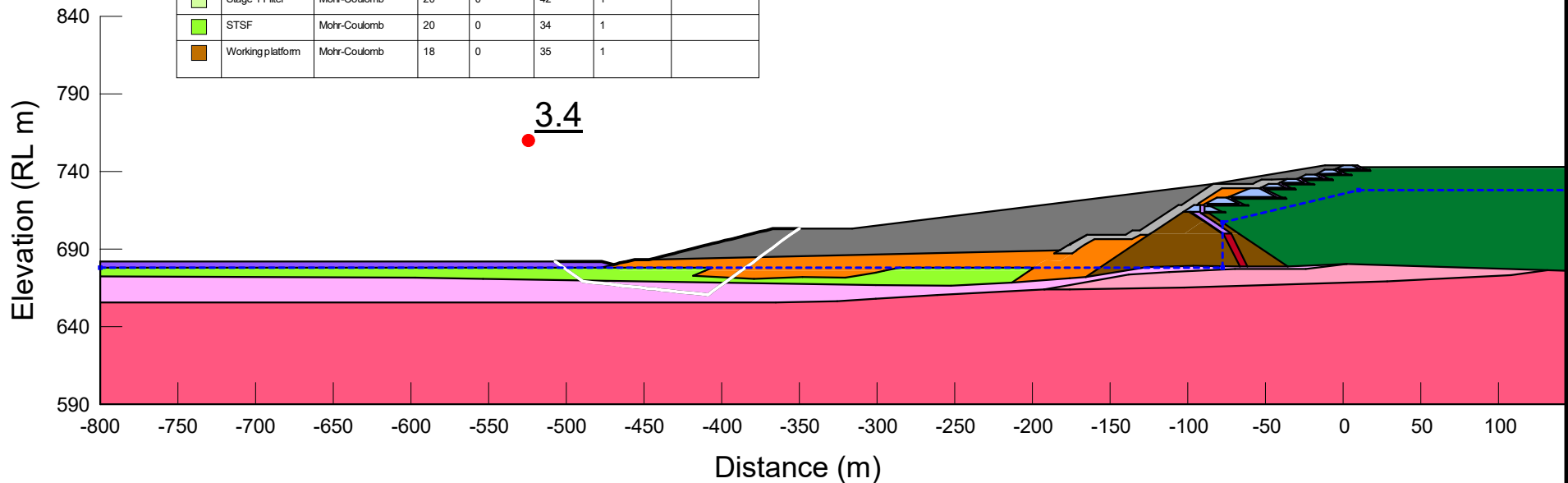
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 1.5 Drained Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 1.5 Drained Non-Circular Shallow Toe

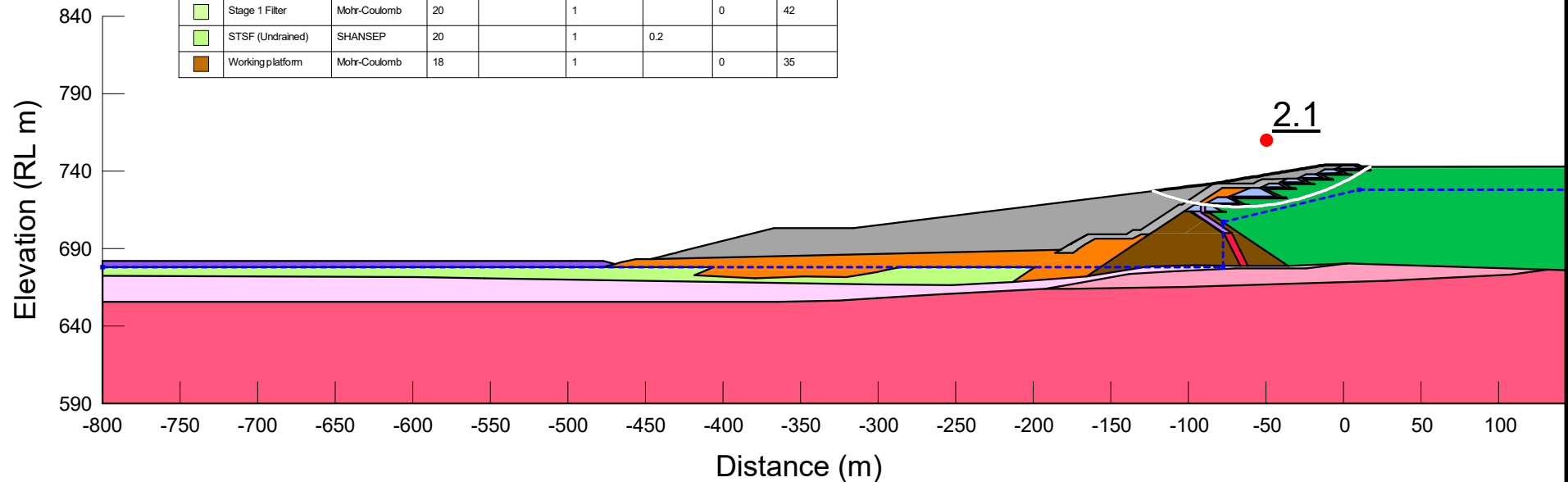
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 2.1 Undrained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 2.1 Undrained Circular Local

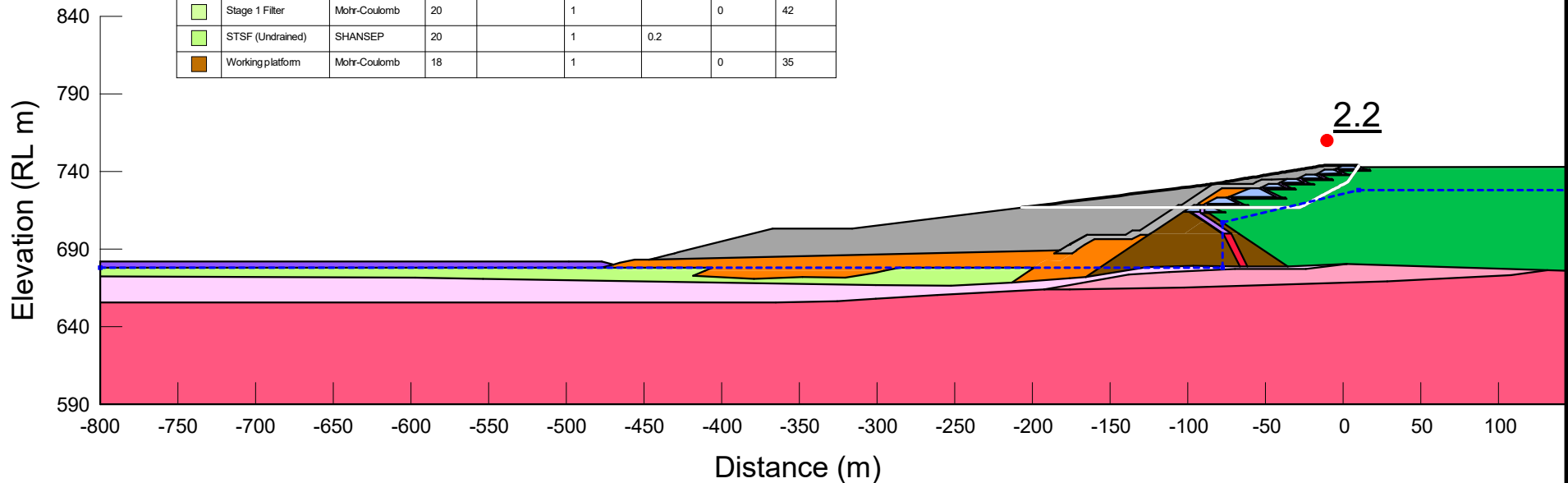
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 2.2 Undrained Non-Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 2.2 Undrained Non-Circular Local

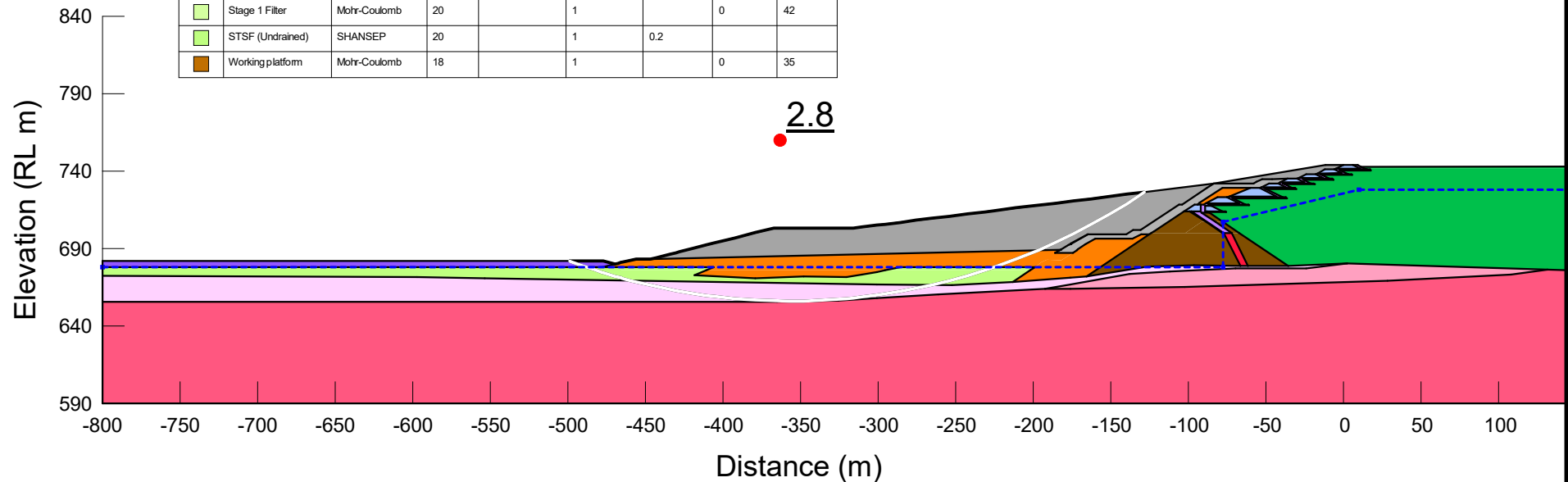
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 2.3 Undrained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 2.3 Undrained Circular Global

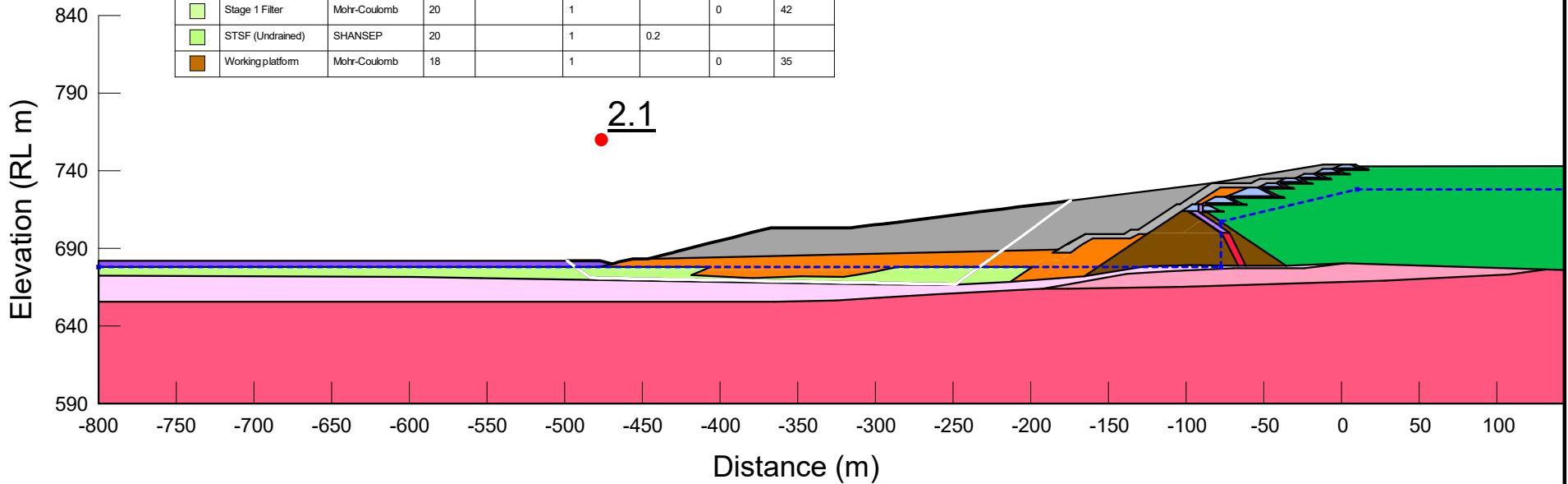
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CH - 2500: 2.4 Undrained Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Funtion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
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Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 2.4 Undrained Non-Circular Global

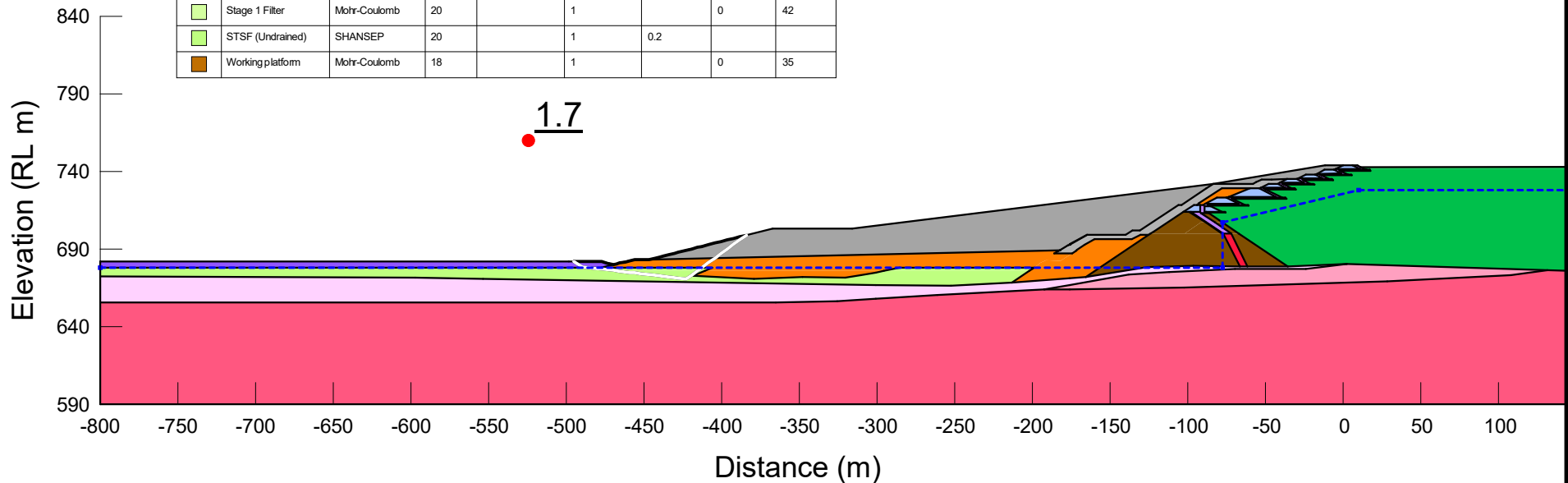
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Date	01/09/2025

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 2.5 Undrained Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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E: bwtmail@ghd.com | www.ghd.com

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Section : Buttress Coarse Sand Ch 2500

Case: 2.5 Undrained Non-Circular Shallow Toe

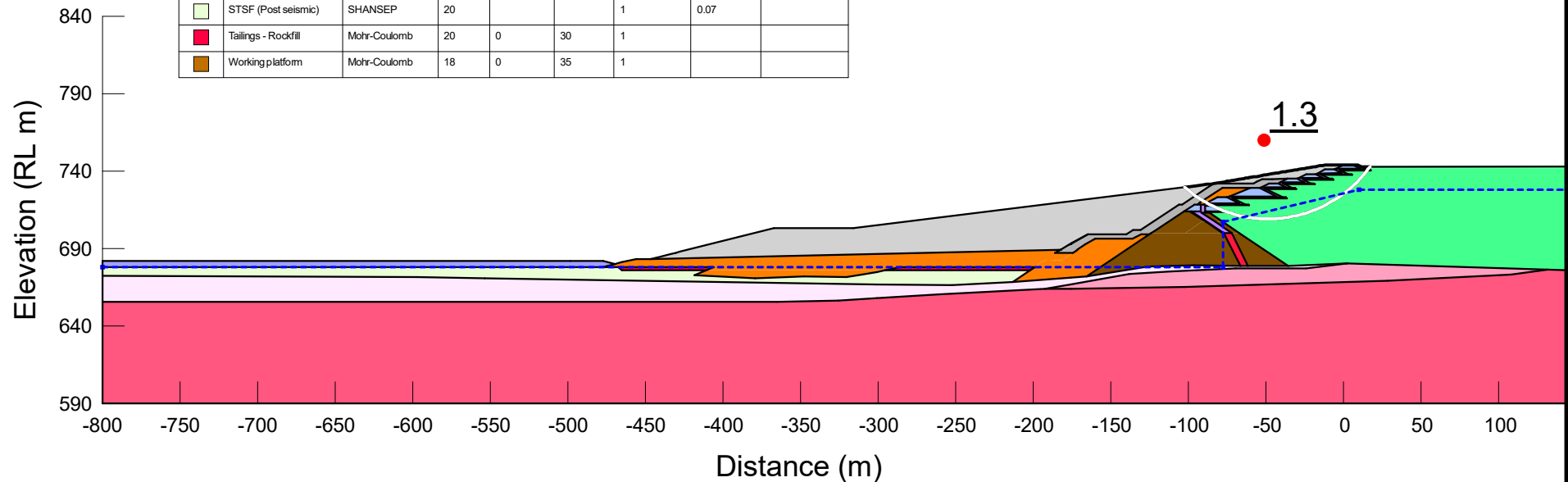
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 3.1 Post Seismic Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
 10 Columar Court
 Burnie, Tasmania 7320, Australia
 T +61 3 6432 7900 | F+61 3 8732 7046
 E: bwtmail@ghd.com | www.ghd.com

Notes:

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Project: Cadia NTSF Southern Embankment
 Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 3.1 Post Seismic Circular Local

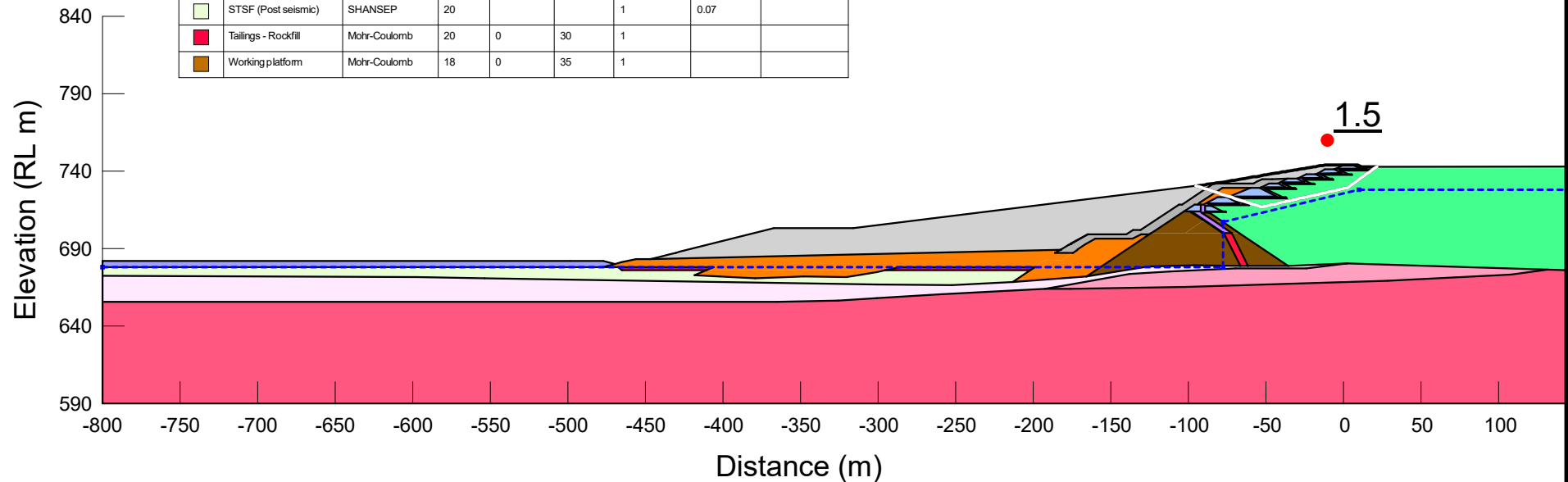
Project No. **12664089**
 Date **01/09/2025**

Prepared by: **NH**
 Checked by: **CC**

Scale: 1:4,000

CH - 2500: 3.2 Post Seismic Non-Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 3.2 Post Seismic Non-Circular Local

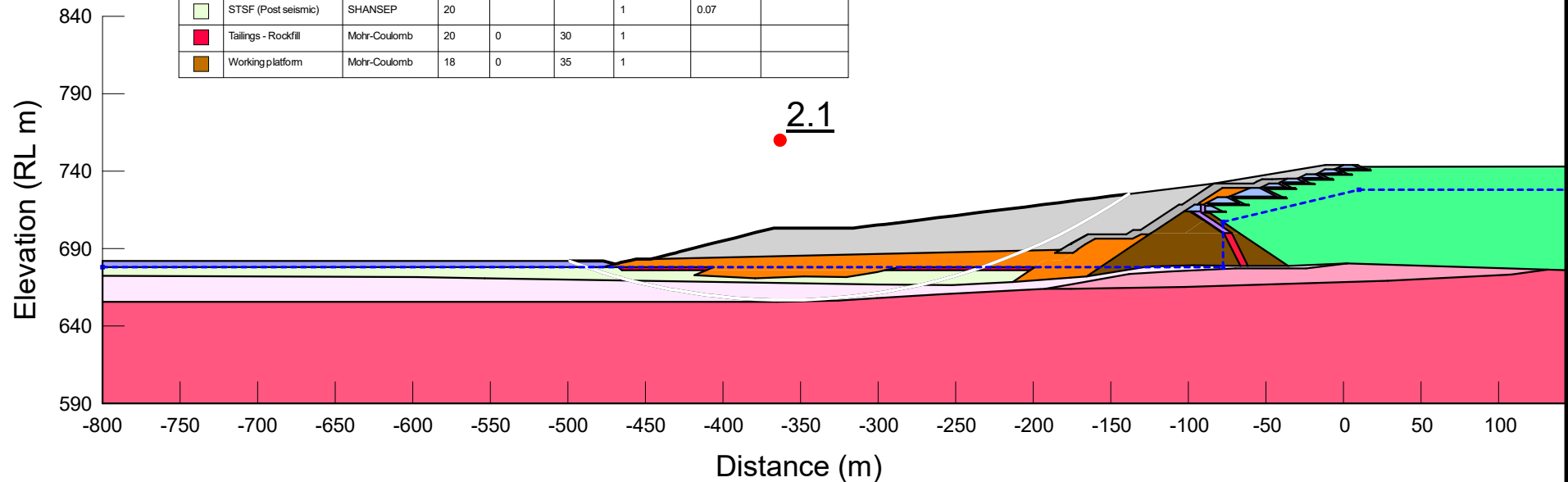
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 3.3 Post Seismic Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 3.3 Post Seismic Circular Global

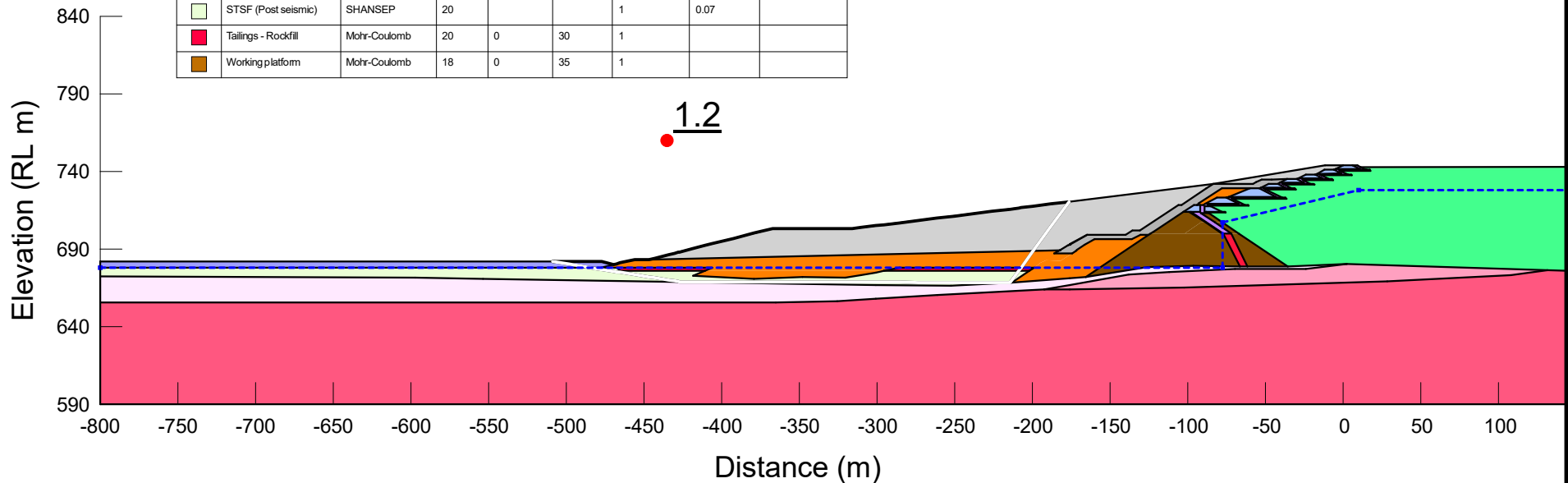
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2500: 3.4 Post Seismic Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 3.4 Post Seismic Non-Circular Global

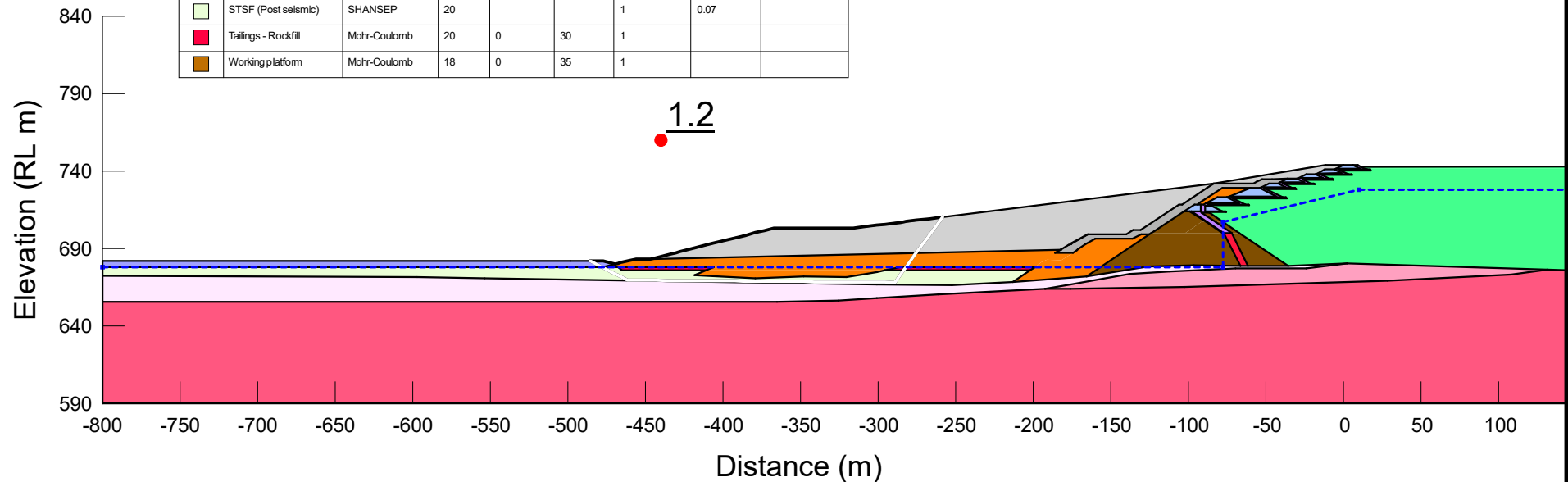
Project No. **12664089**
Date **01/09/2025**

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Checked by: **CC**

Scale: 1:4,000

CH - 2500: 3.5 Post Seismic Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2500

Case: 3.5 Post Seismic Non-Circular Shallow Toe

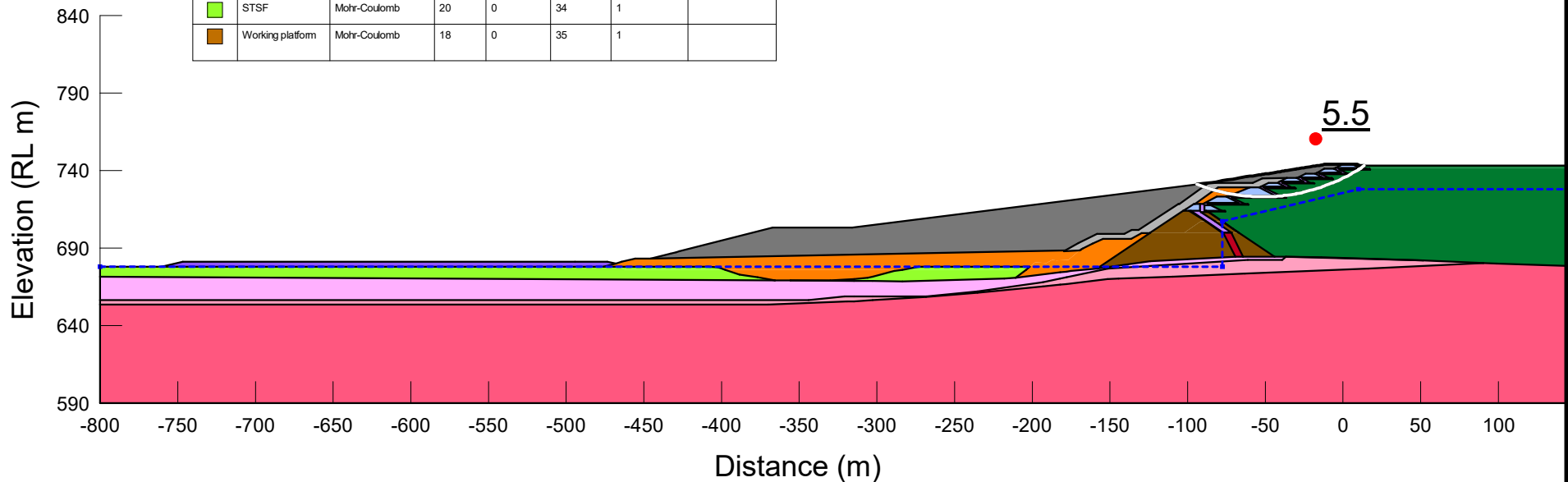
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 1.1 Drained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 1.1 Drained Circular Local

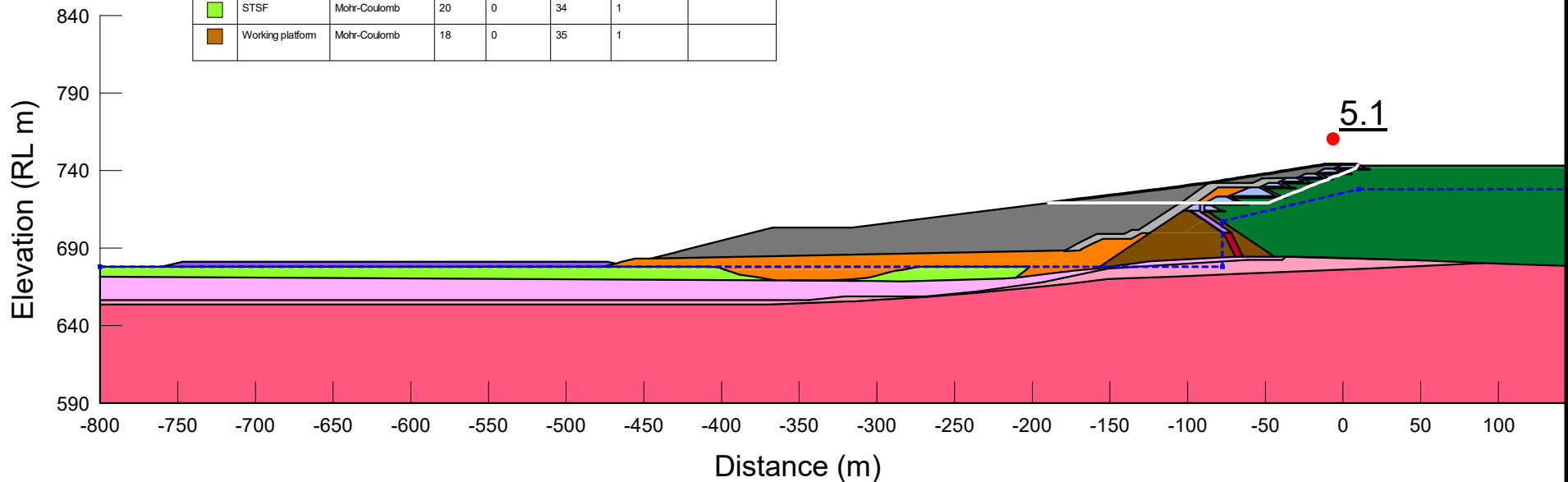
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 1.2 Drained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 1.2 Drained Non Circular Local

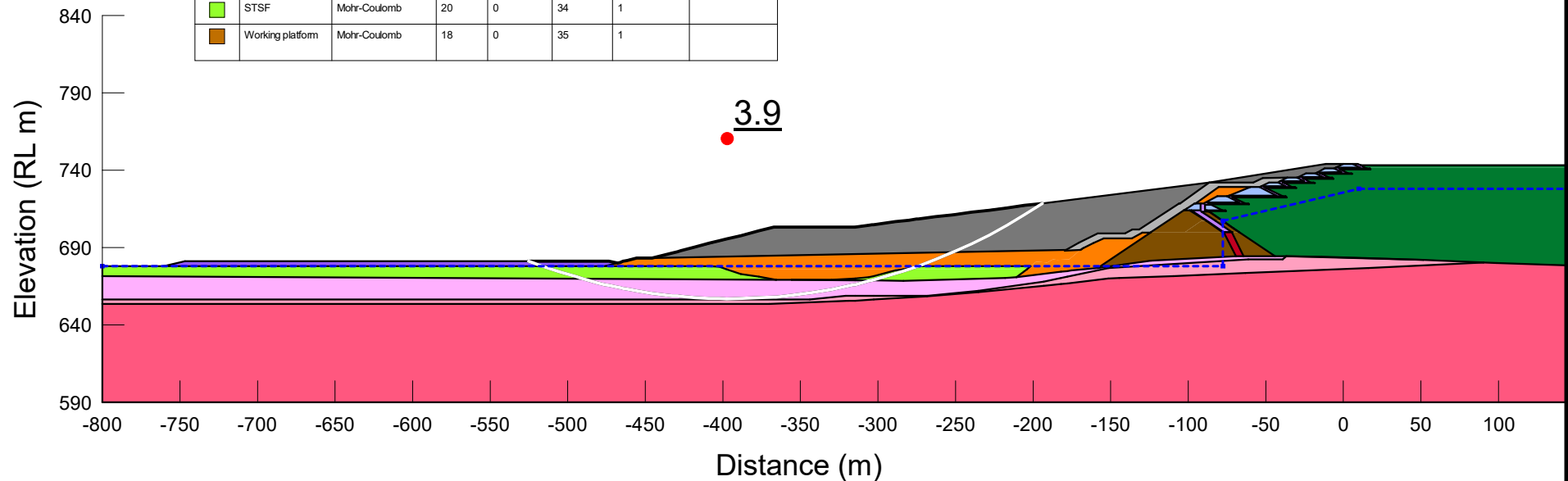
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 1.3 Drained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 1.3 Drained Circular Global

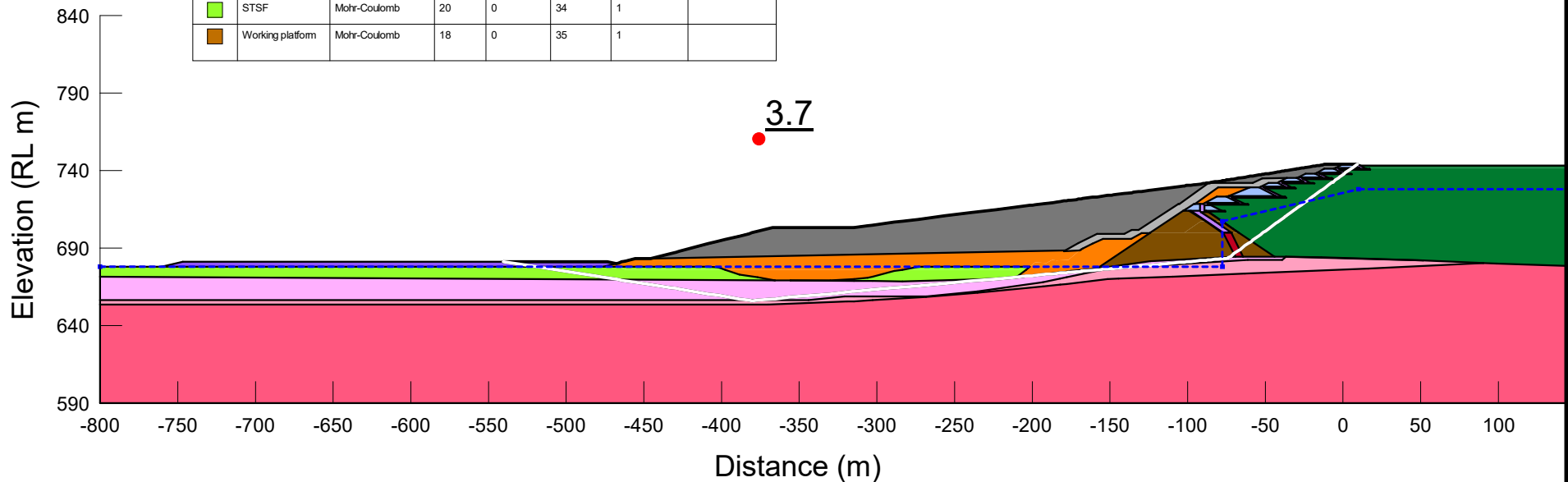
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 1.4 Drained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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10 Columar Court
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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 1.4 Drained Non Circular Global

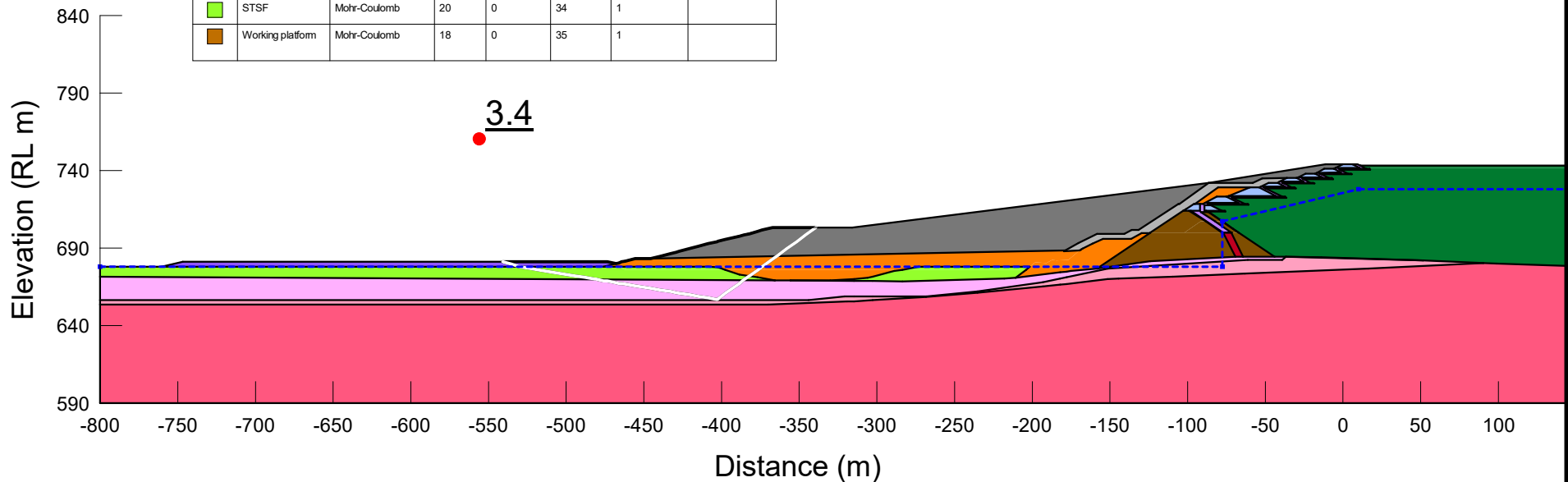
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 1.5 Drained Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Coarse Sand (Stockpile)	Mohr-Coulomb	17	0	28	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 1.5 Drained Non-Circular Shallow Toe

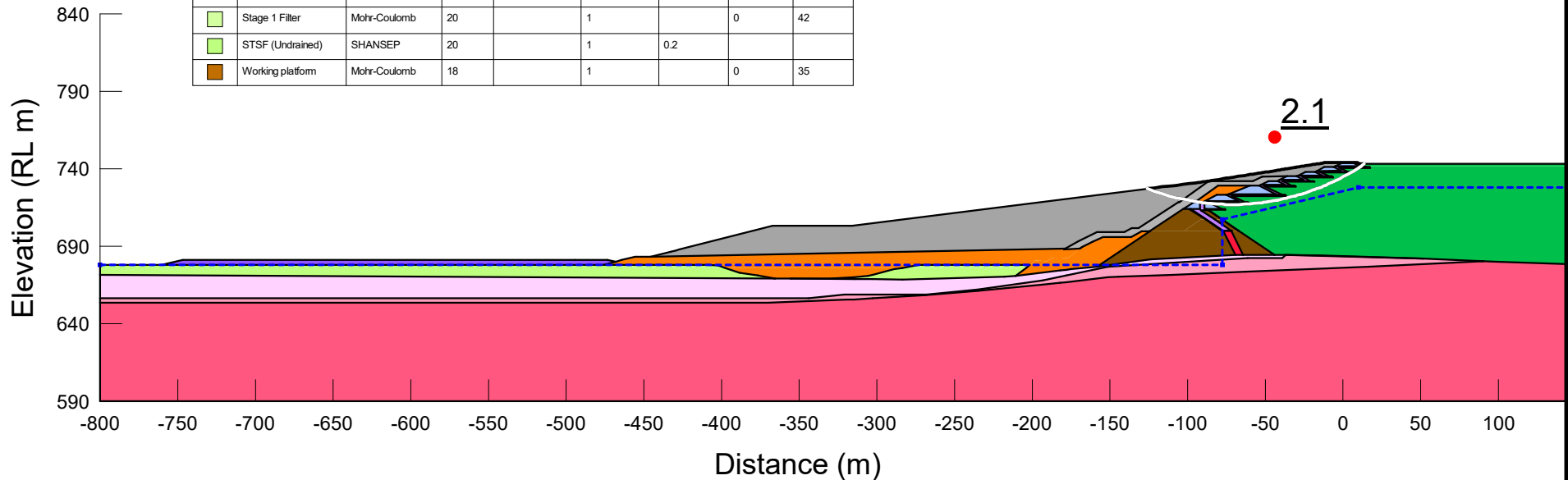
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 2.1 Undrained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 2.1 Undrained Circular Local

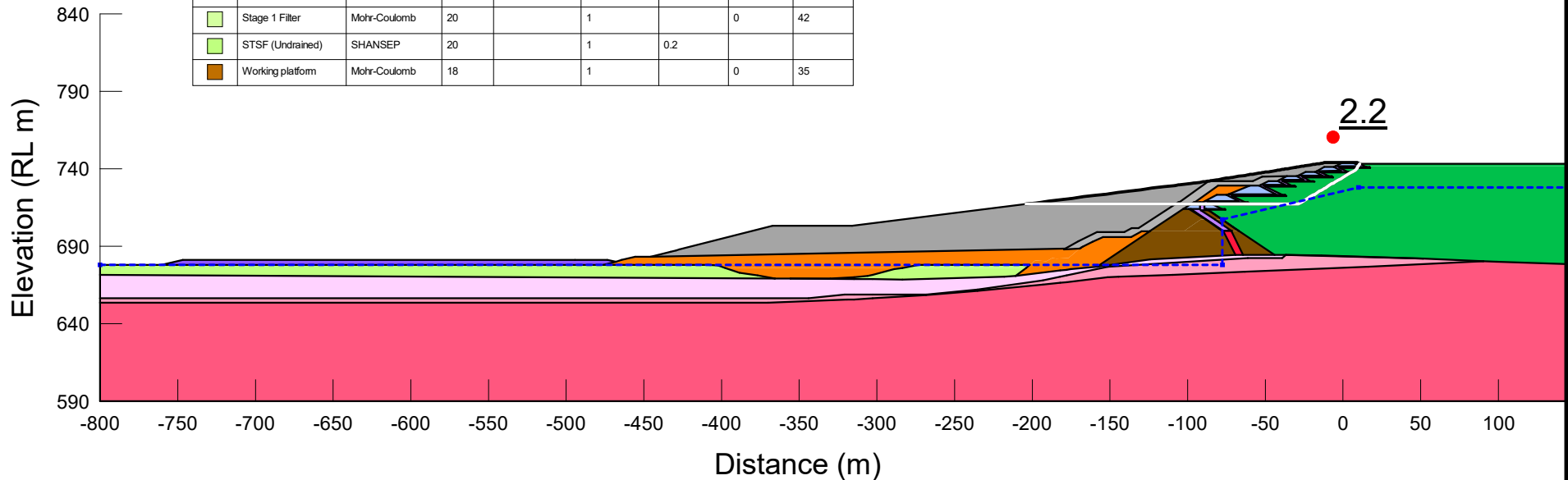
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 2.2 Undrained Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Funtion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 2.2 Undrained Non Circular Local

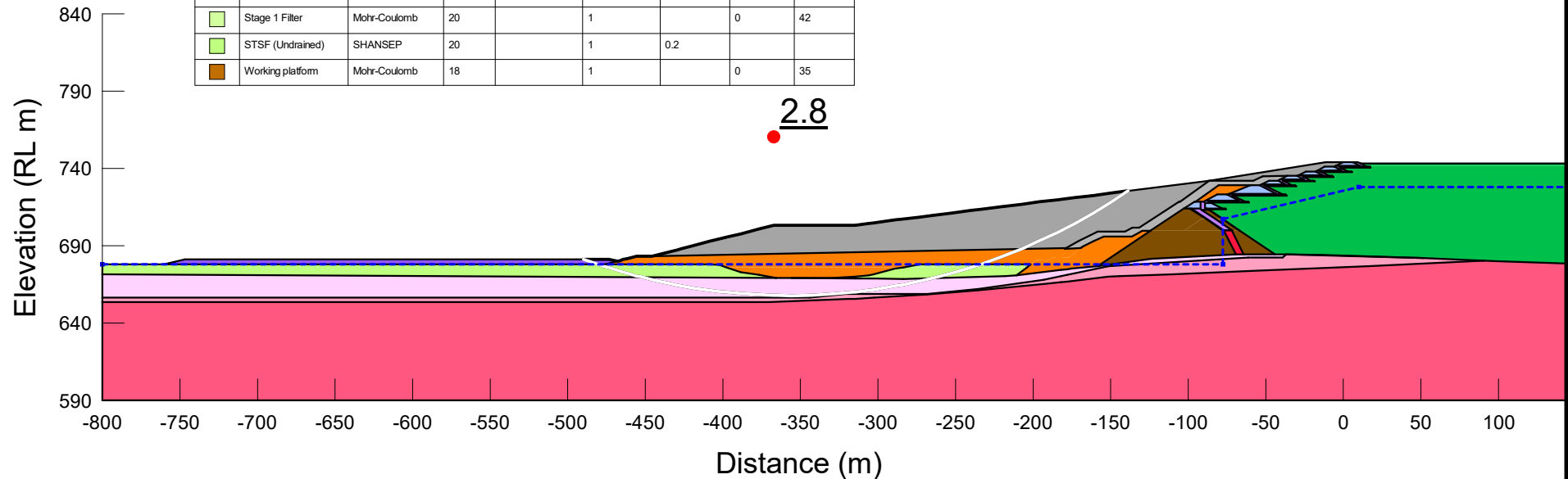
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 2.3 Undrained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Funtion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 2.3 Undrained Circular Global

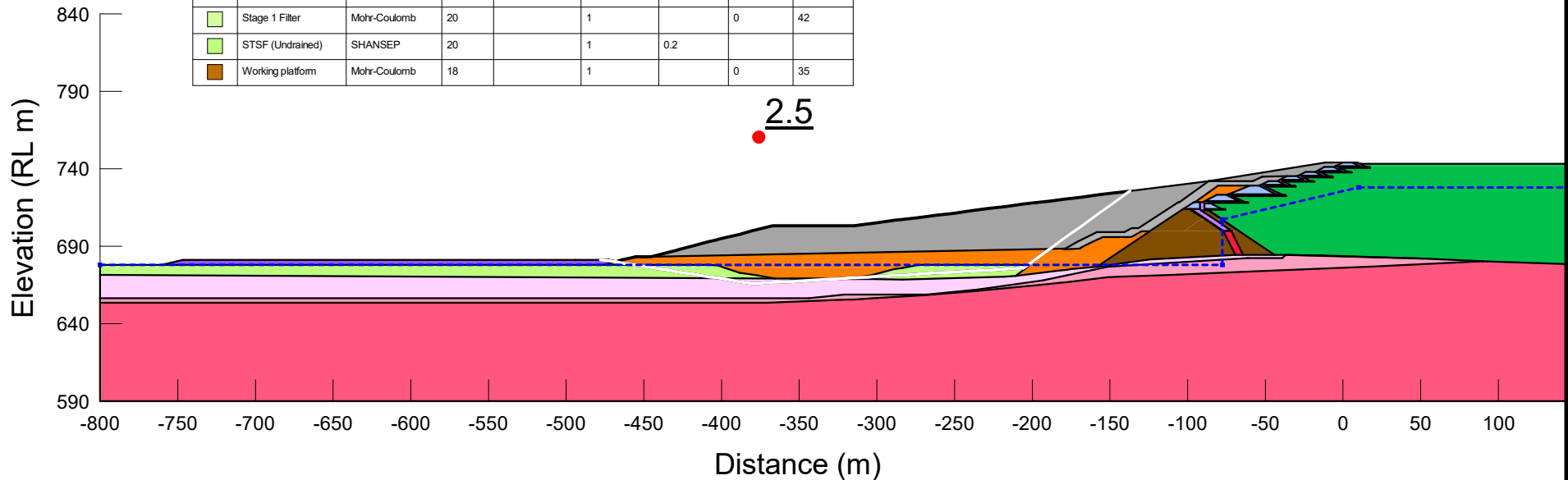
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 2.4 Undrained Non Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Funtion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



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E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 2.4 Undrained Non Circular Global

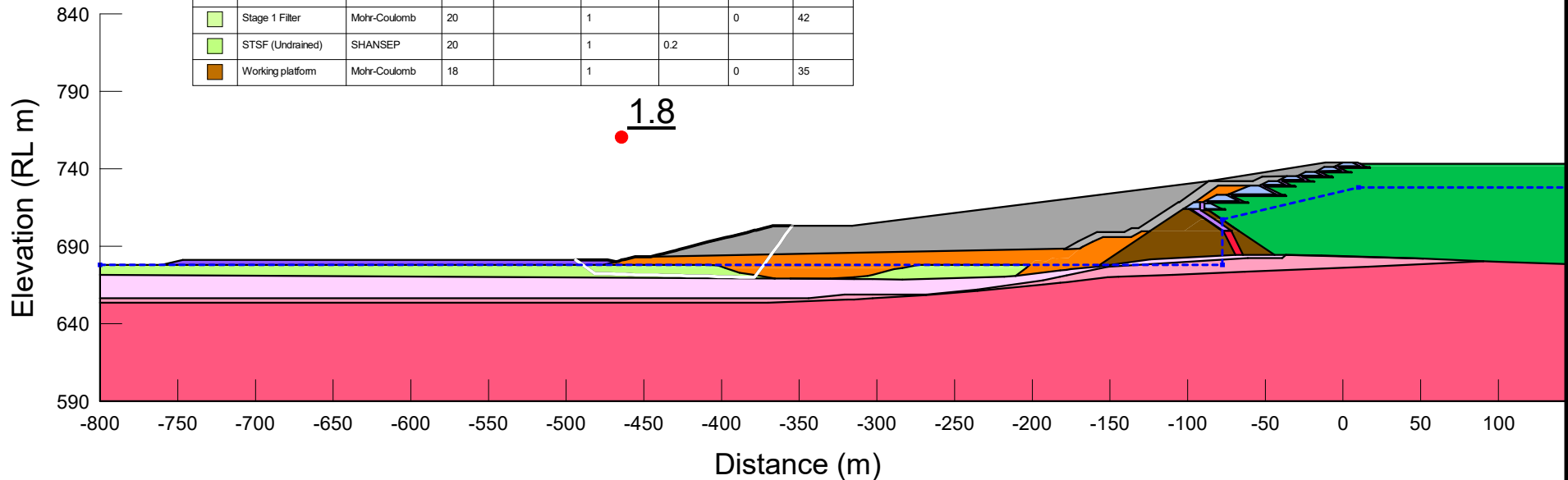
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 2.5 Undrained Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Stockpile) (Undrained)	SHANSEP	17		1	0.19		
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Function FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 2.5 Undrained Non-Circular Shallow Toe

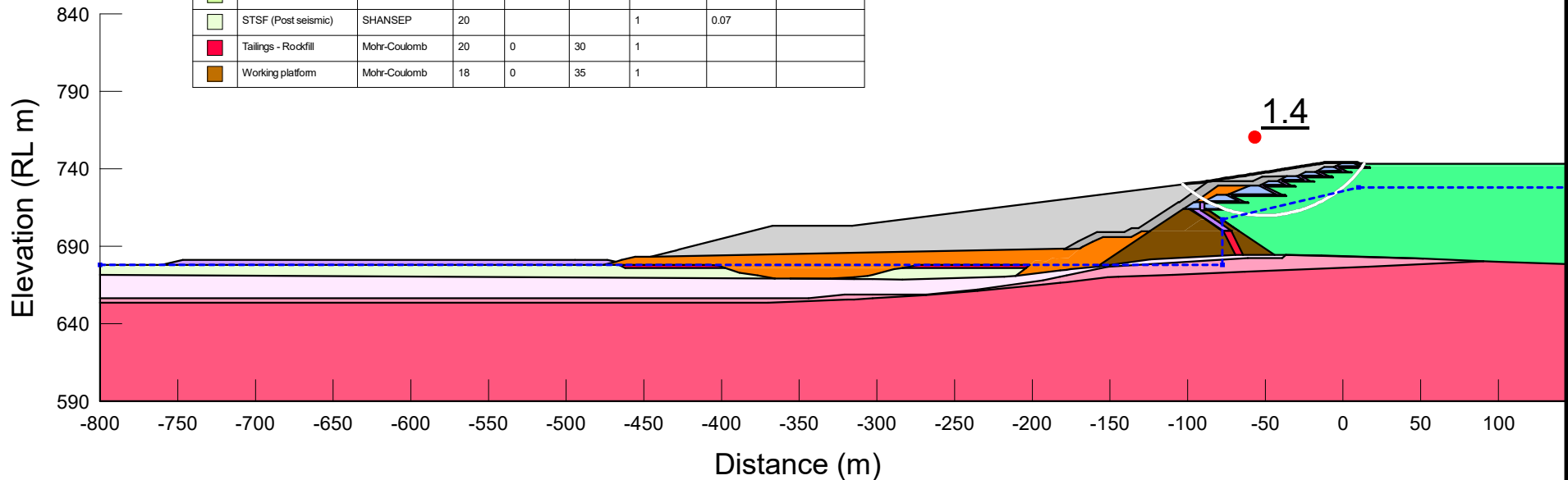
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 3.1 Post Seismic Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Section : Buttress Coarse Sand Ch 2600

Case: 3.1 Post Seismic Circular Local

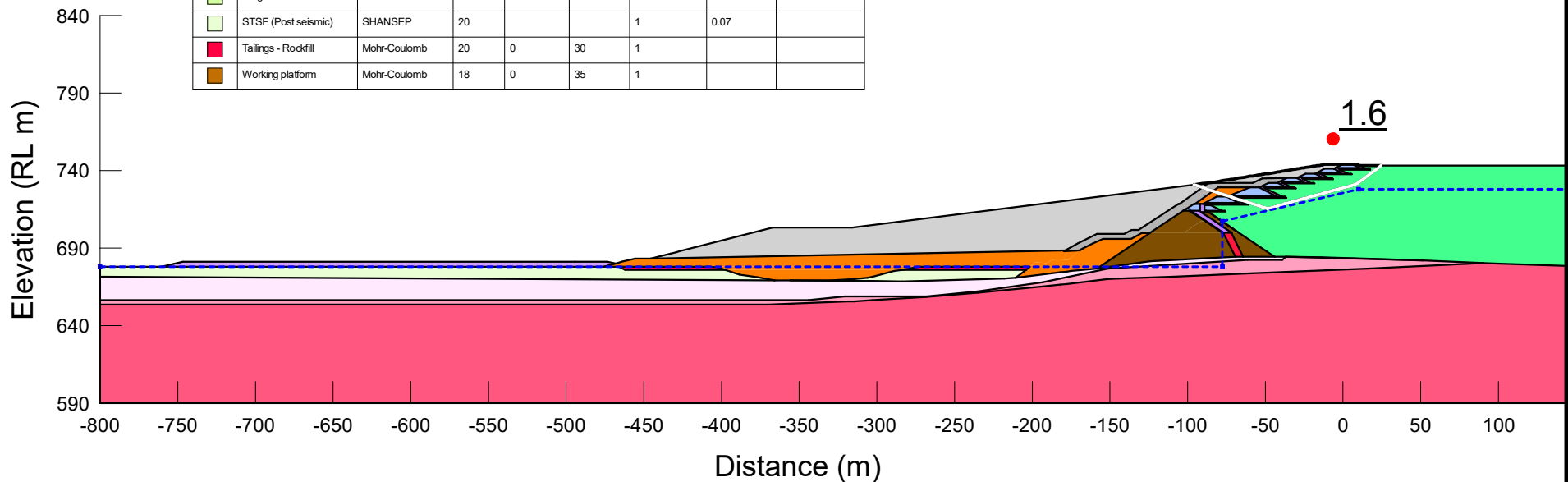
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 3.2 Post Seismic Non Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 3.2 Post Seismic Non Circular Local

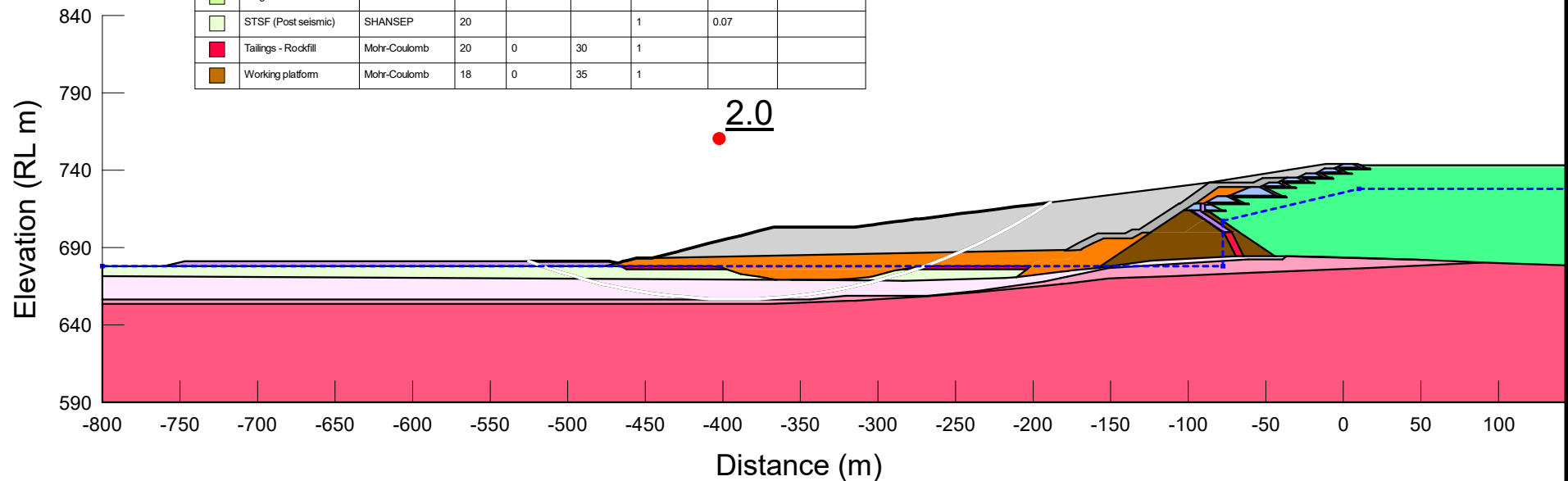
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 3.3 Post Seismic Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 3.3 Post Seismic Circular Global

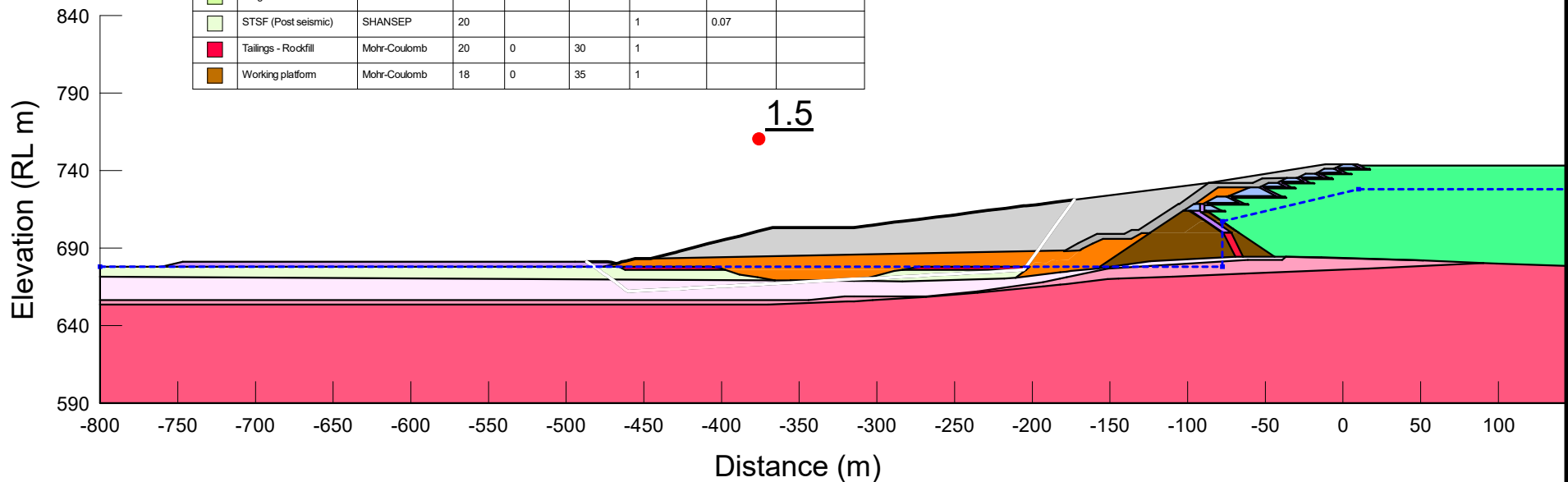
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2600: 3.4 Post Seismic Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
 10 Columar Court
 Burnie, Tasmania 7320, Australia
 T +61 3 6432 7900 | F+61 3 8732 7046
 E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
 Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 3.4 Post Seismic Non-Circular Global

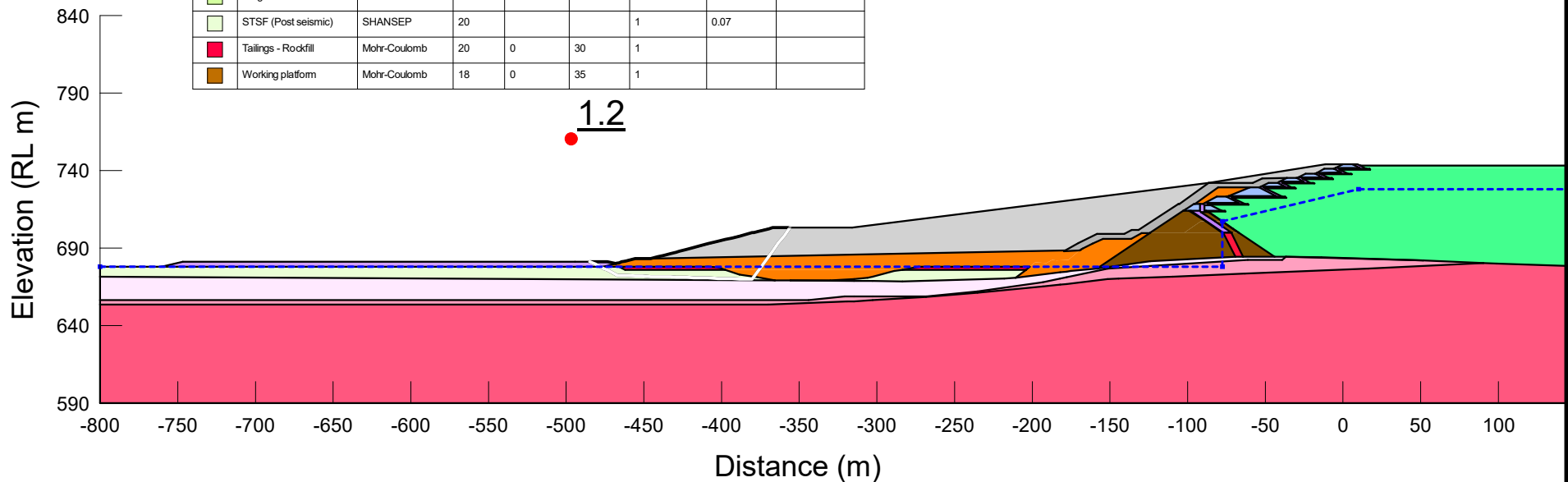
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 Date **01/09/2025**

Prepared by: **NH**
 Checked by: **CC**

Scale: 1:4,000

CH - 2600: 3.5 Post Seismic Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Coarse Sand (Stockpile) (Post seismic)	Mohr-Coulomb	17	0	25	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Tailings - Rockfill	Mohr-Coulomb	20	0	30	1		
	Working platform	Mohr-Coulomb	18	0	35	1		



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E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2600

Case: 3.5 Post Seismic Non-Circular Shallow Toe

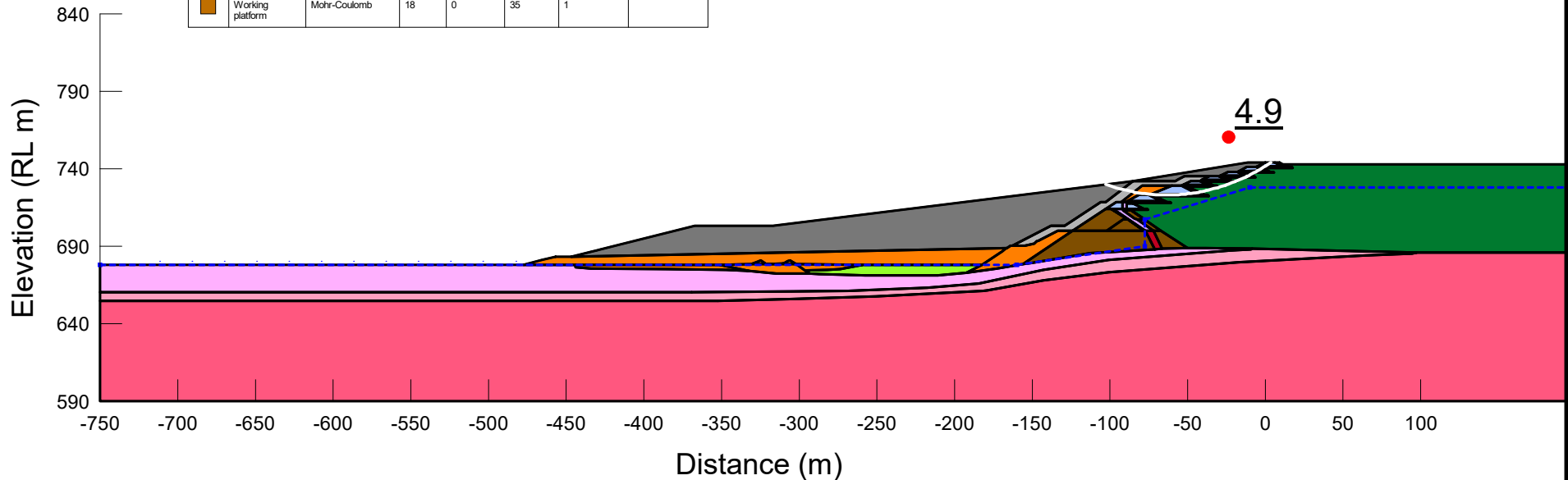
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 1.1 Drained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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 T +61 3 6432 7900 | F+61 3 8732 7046
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Project: Cadia NTSF Southern Embankment
 Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 1.1 Drained Circular Local

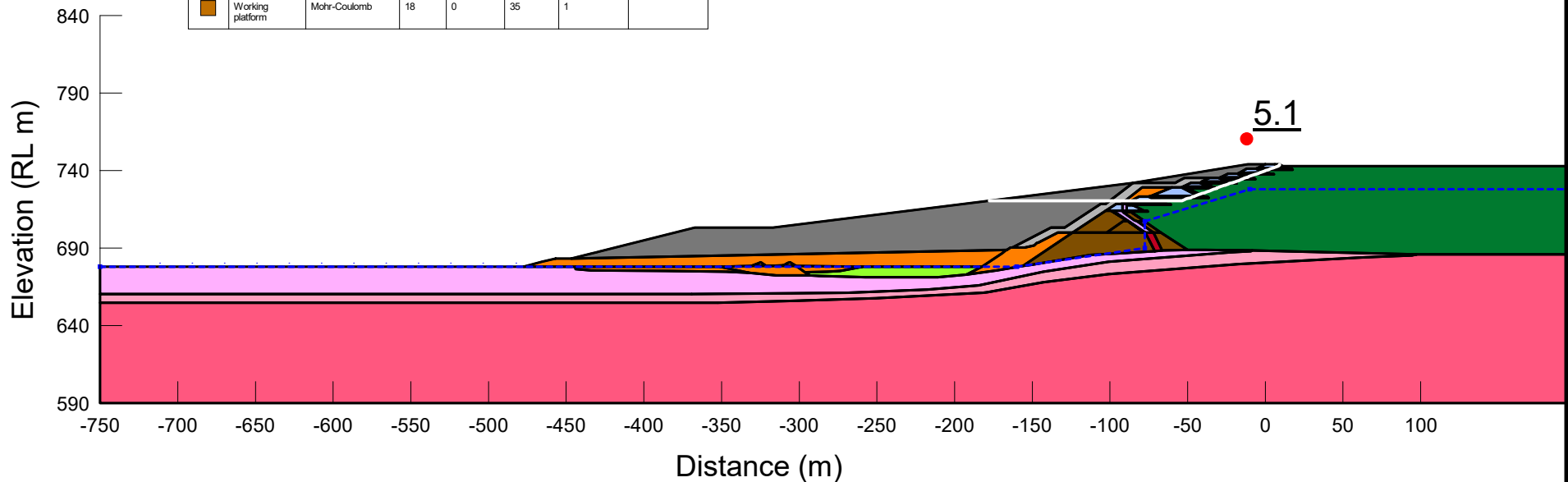
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 Date **01/09/2025**

Prepared by: **NH**
 Checked by: **CC**

Scale: 1:4,000

CH - 2700: 1.2 Drained Non-Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 1.2 Drained Non-Circular Local

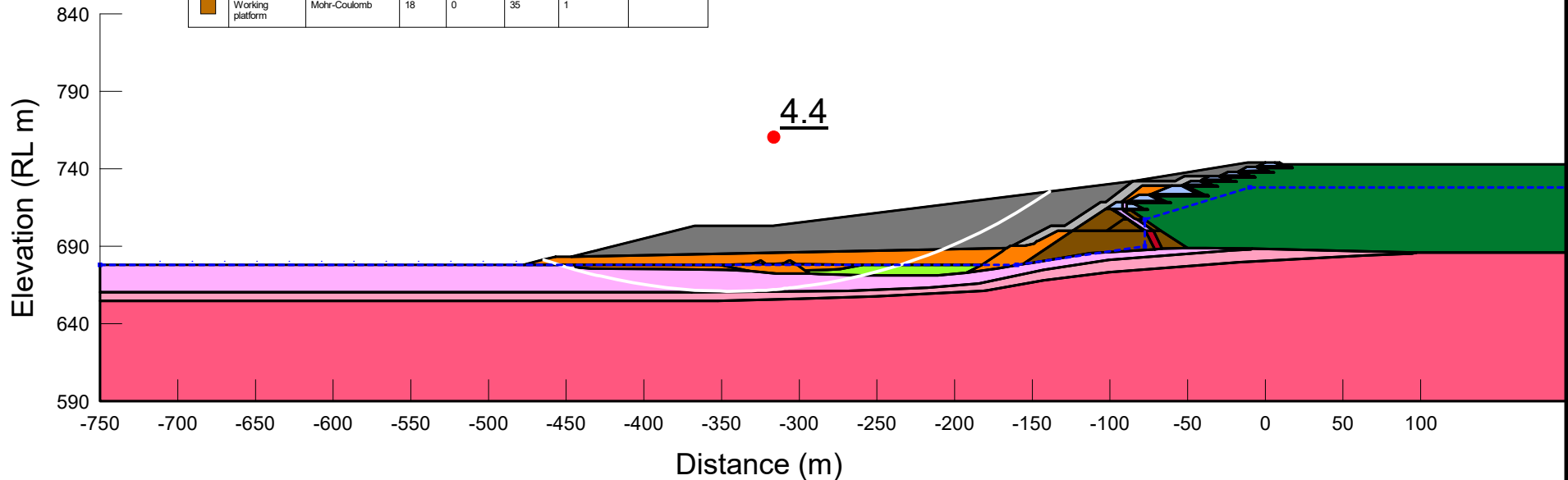
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 1.3 Drained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 1.3 Drained Circular Global

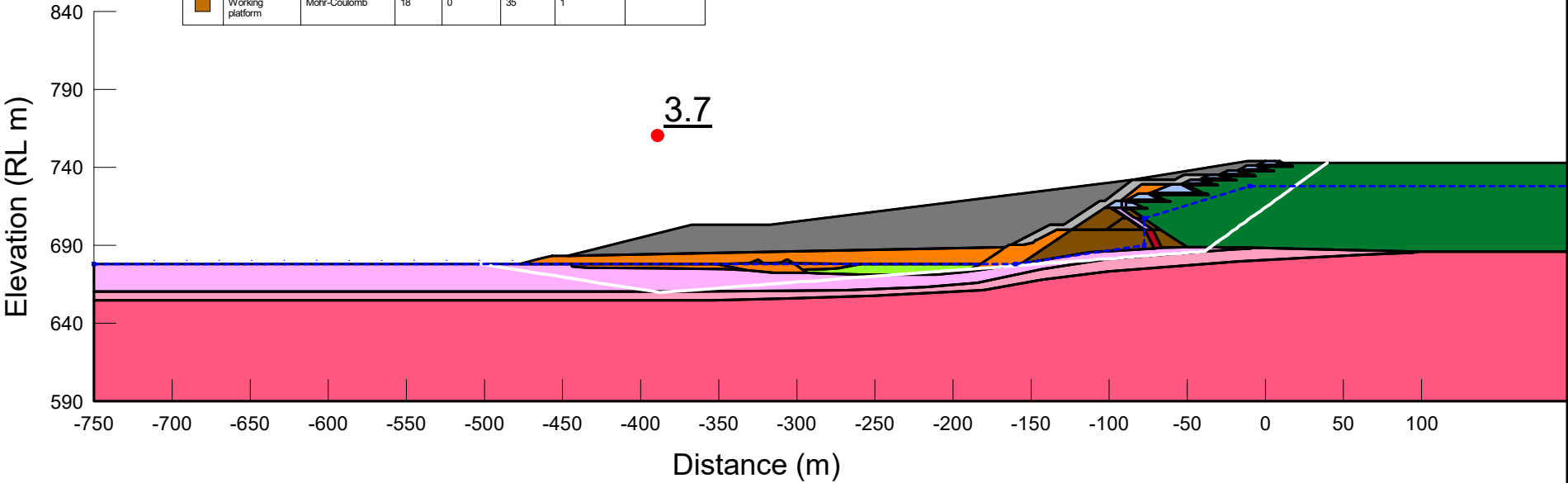
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 1.4 Drained Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

Notes:

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 1.4 Drained Non-Circular Global

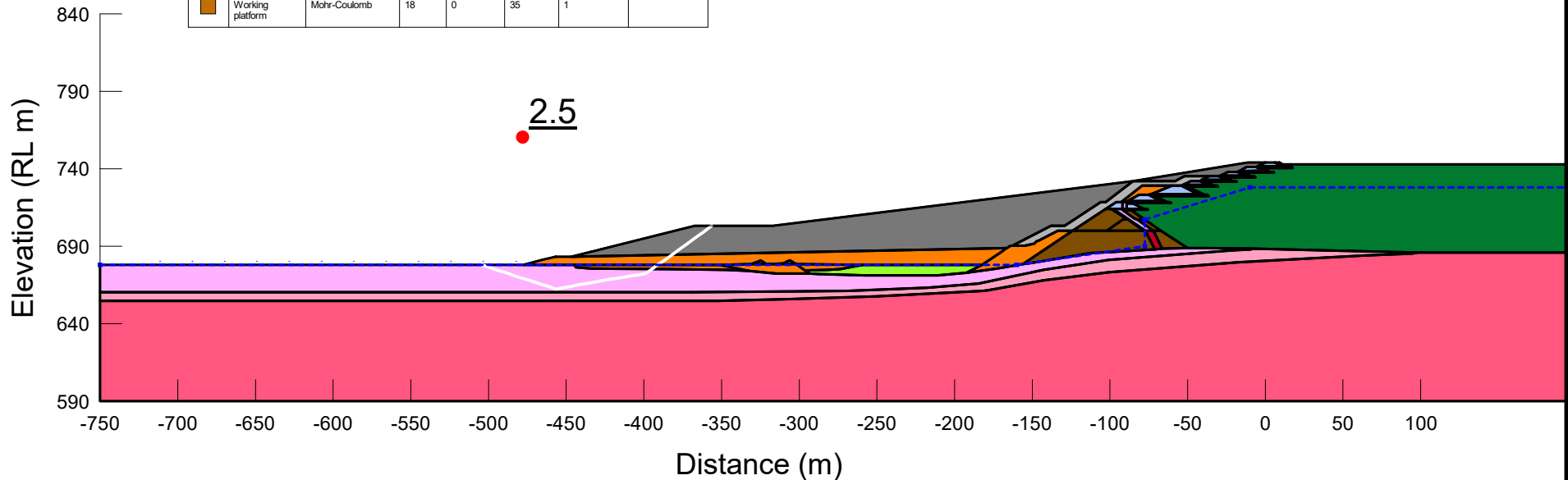
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 1.5 Drained Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1	
	Coarse Sand	Mohr-Coulomb	17	0	35	1	
	Existing rockfill berm	Shear/Normal Fn.	20			1	Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1	
	FRV HW	Mohr-Coulomb	19	140	36	1	
	FRV MW - FR	Mohr-Coulomb	19	430	36	1	
	FRV XW	Mohr-Coulomb	19	0	25	1	
	NTSF	Mohr-Coulomb	20	0	34	1	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1	
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1	
	Stage 1 Clay core	Mohr-Coulomb	20	0	23	1	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1	
	STSF	Mohr-Coulomb	20	0	34	1	
	Working platform	Mohr-Coulomb	18	0	35	1	



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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 1.5 Drained Non-Circular Shallow Toe

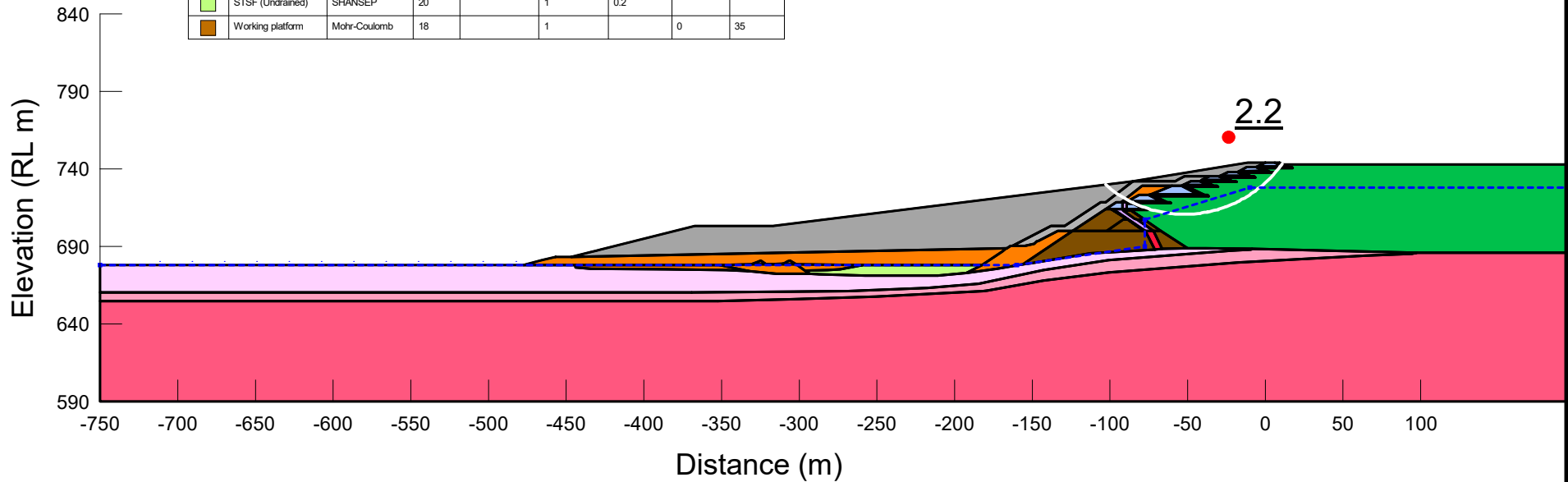
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 2.1 Undrained Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Furion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 2.1 Undrained Circular Local

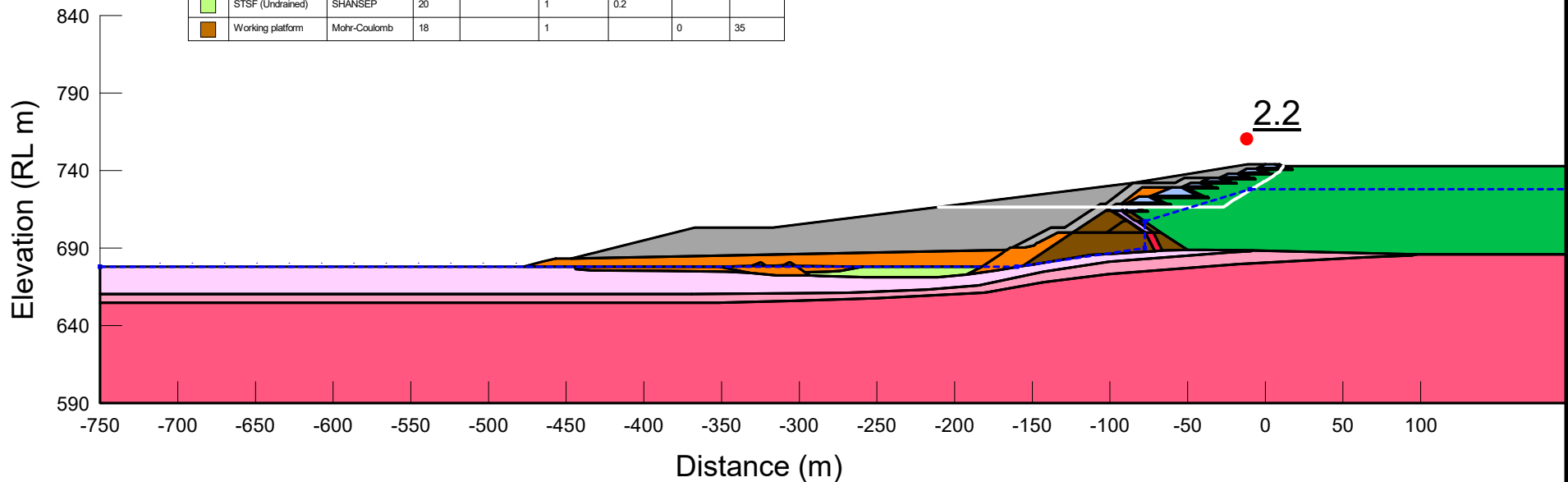
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 2.2 Undrained Non-Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Furion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 2.2 Undrained Non-Circular Local

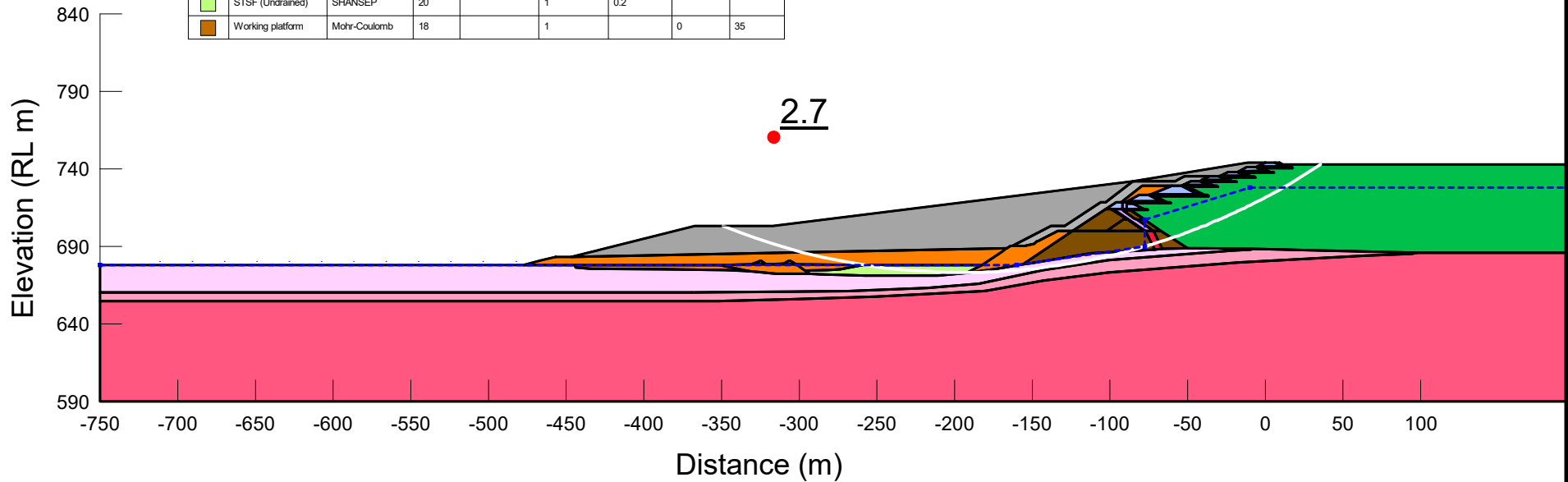
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 2.3 Undrained Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Furion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 2.3 Undrained Circular Global

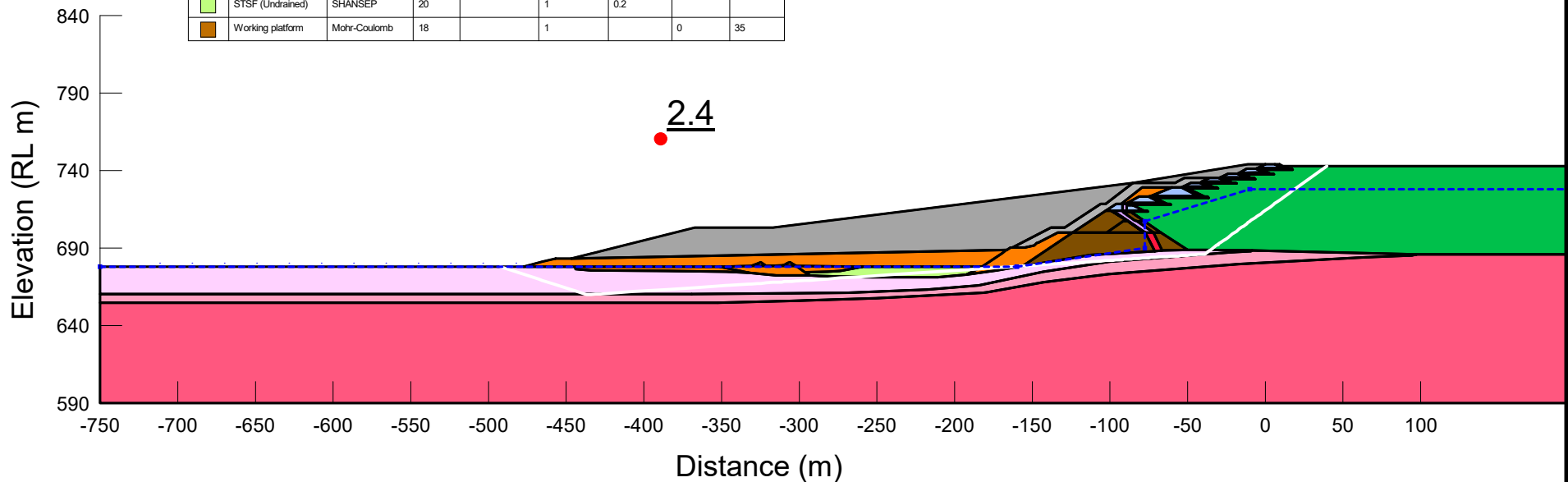
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 2.4 Undrained Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Furion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 2.4 Undrained Non-Circular Global

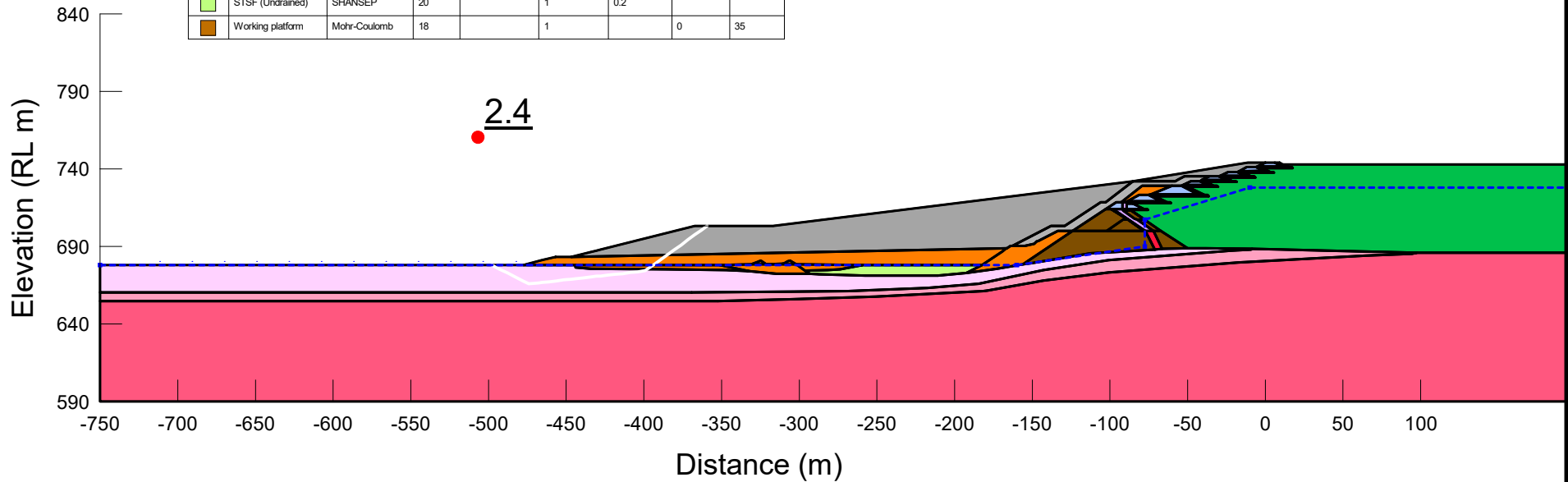
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Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 2.5 Undrained Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Shear/Normal Strength Fn.	Piezometric Surface	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)
	Clay core US	Mohr-Coulomb	20		1		10	27
	Coarse Sand (Undrained)	SHANSEP	17		1	0.24		
	Existing rockfill berm	Shear/Normal Fn.	20	Existing berm	1			
	Filter rock	Mohr-Coulomb	19		1		0	38
	FRV HW	Mohr-Coulomb	19		1		140	36
	FRV MW - FR	Mohr-Coulomb	19		1		430	36
	FRV XW (Undrained)	Shear/Normal Fn.	19	Furion FRV XW	1			
	NTSF (Undrained)	SHANSEP	20		1	0.2		
	Rockfill Downstream	Mohr-Coulomb	19		1		0	40
	Rockfill Upstream	Mohr-Coulomb	19		1		0	35
	Stage 1 Clay core (Undrained)	SHANSEP	20		1	0.29		
	Stage 1 Filter	Mohr-Coulomb	20		1		0	42
	STSF (Undrained)	SHANSEP	20		1	0.2		
	Working platform	Mohr-Coulomb	18		1		0	35



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bw@mail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 2.5 Undrained Non-Circular Shallow Toe

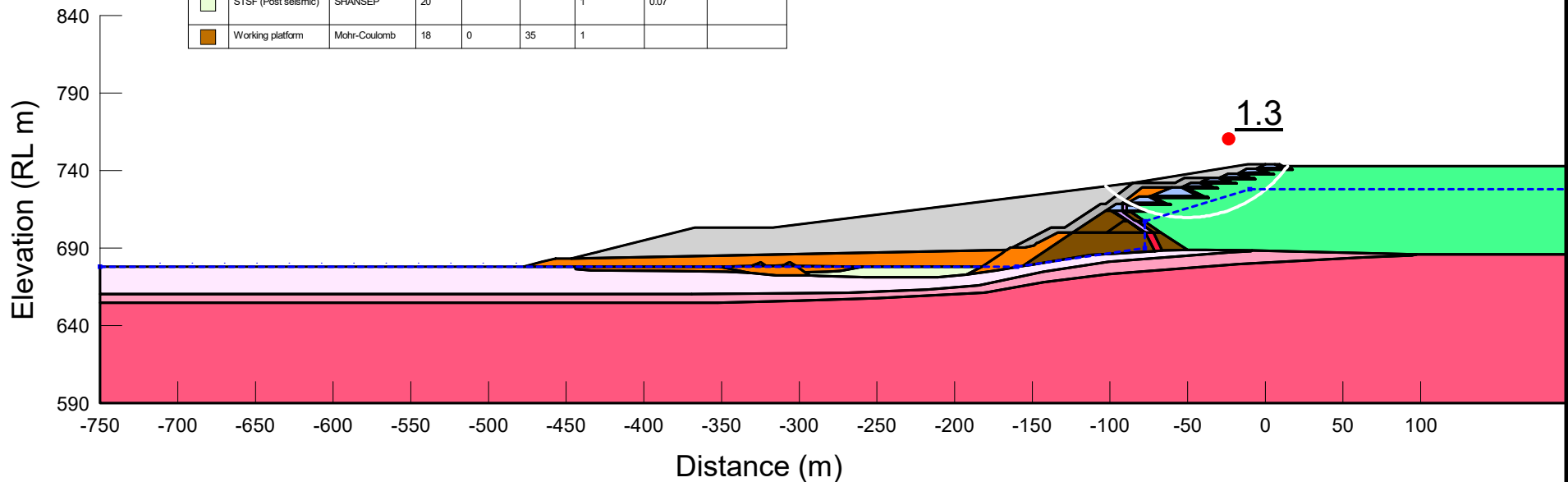
Project No. **12664089**
Date **01/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 3.1 Post Seismic Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filler rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columnar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 3.1 Post Seismic Circular Local

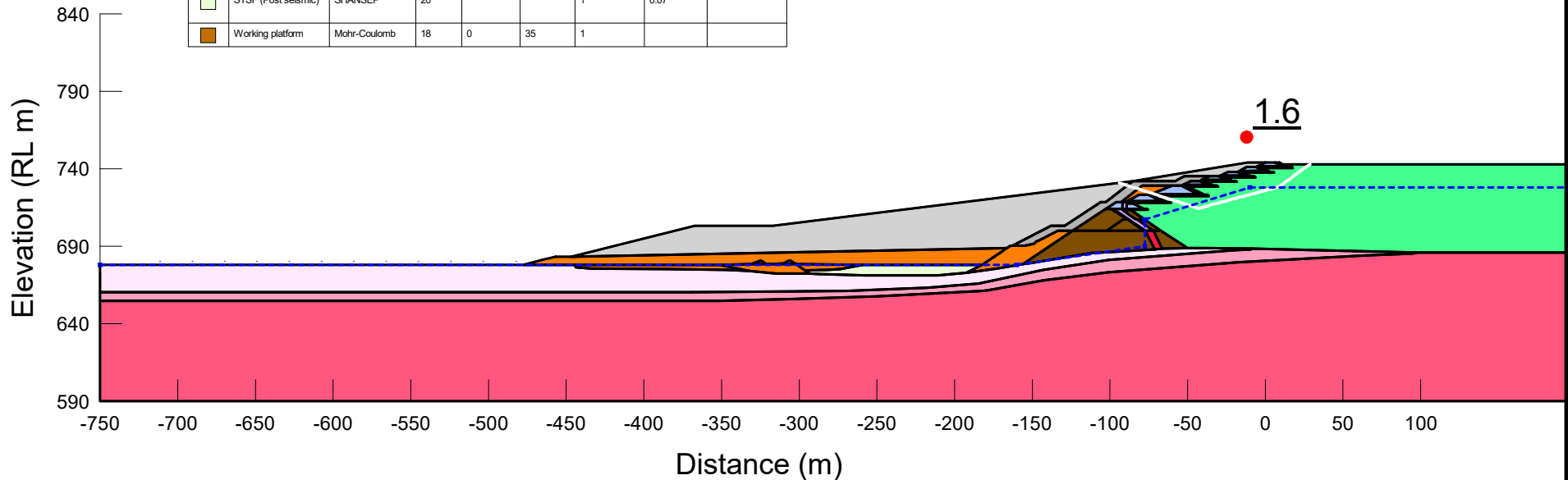
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Date	11/09/2025

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 3.2 Post Seismic Non-Circular Local

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 3.2 Post Seismic Non-Circular Local

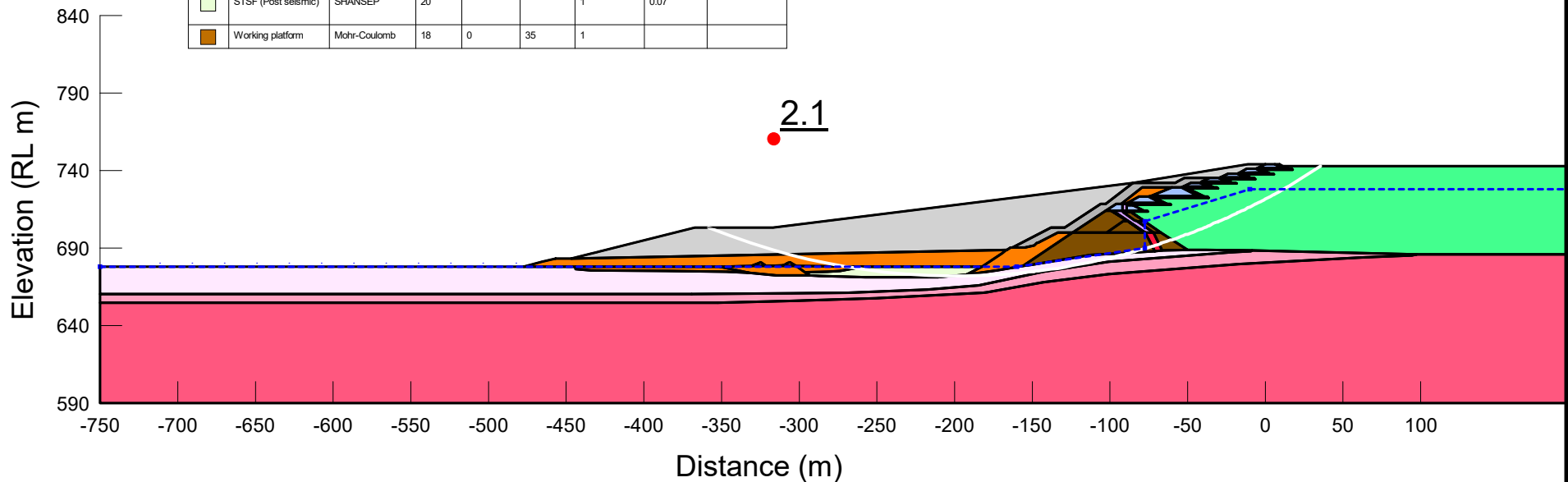
Project No. **12664089**
Date **11/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 3.3 Post Seismic Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
Burnie, Tasmania 7320, Australia
T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 3.3 Post Seismic Circular Global

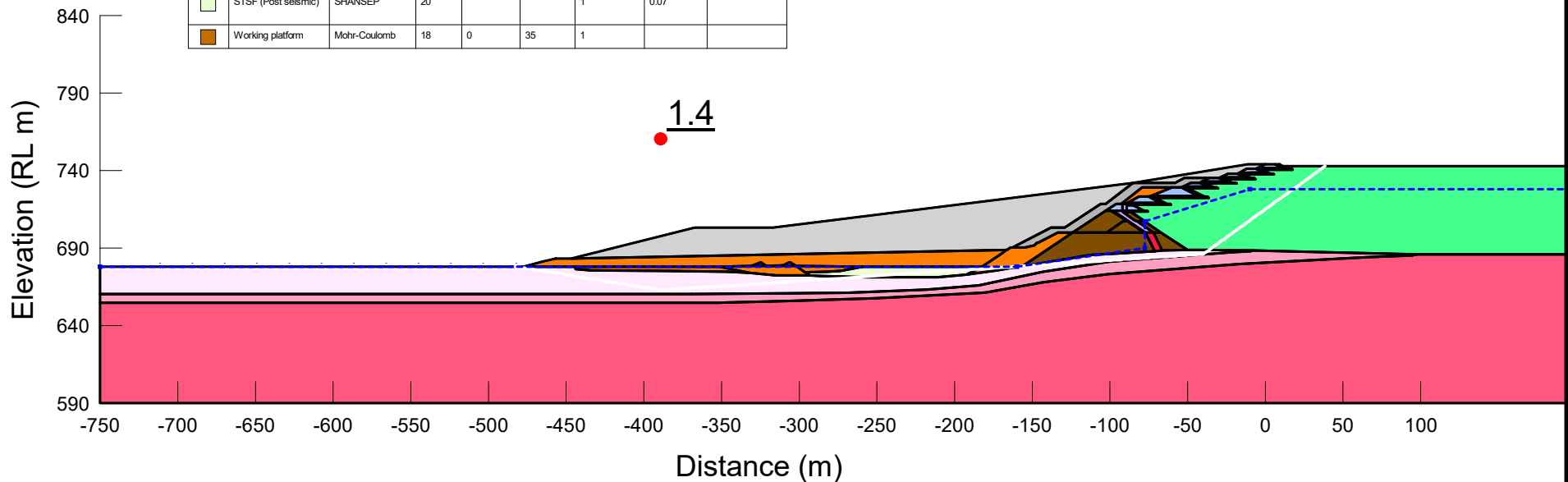
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Date **11/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 3.4 Post Seismic Non-Circular Global

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Working platform	Mohr-Coulomb	18	0	35	1		



GHD Pty Ltd ABN 39 008 488 373
10 Columar Court
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T +61 3 6432 7900 | F+61 3 8732 7046
E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 3.4 Post Seismic Non-Circular Global

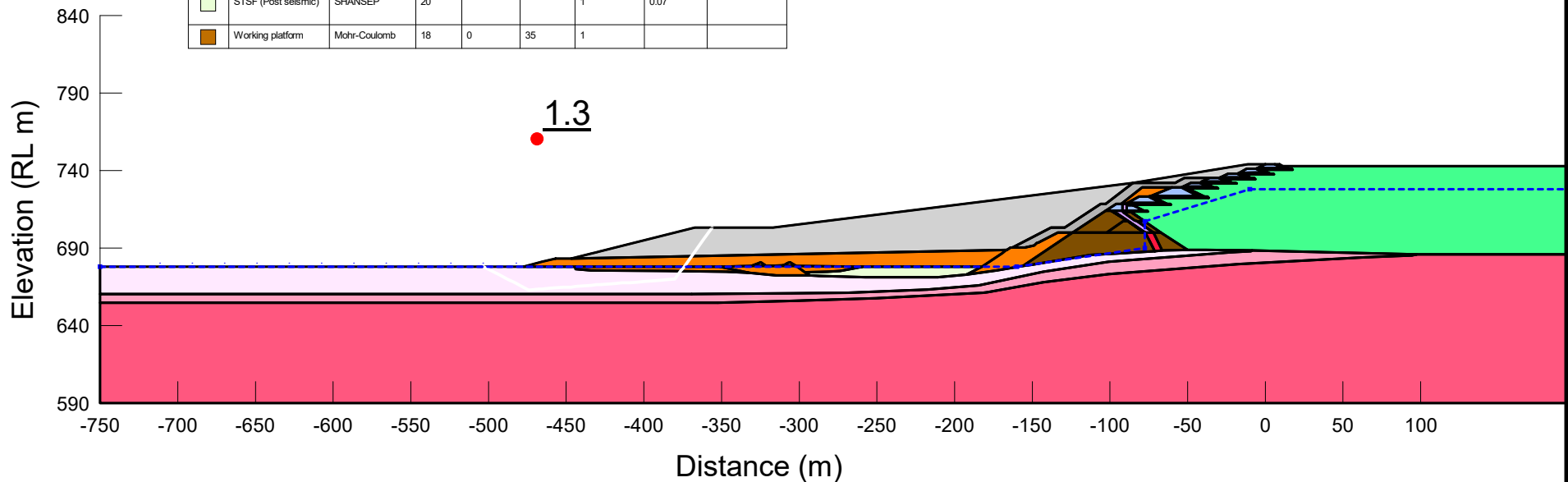
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Date **11/09/2025**

Prepared by: **NH**
Checked by: **CC**

Scale: 1:4,000

CH - 2700: 3.5 Post Seismic Non-Circular Shallow Toe

Color	Name	Slope Stability Material Model	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Piezometric Surface	Tau/Sigma Ratio	Shear/Normal Strength Fn.
	Clay core US	Mohr-Coulomb	20	10	27	1		
	Coarse Sand (Post seismic)	Mohr-Coulomb	17	0	31	1		
	Existing rockfill berm	Shear/Normal Fn.	20			1		Existing berm
	Filter rock	Mohr-Coulomb	19	0	38	1		
	FRV HW	Mohr-Coulomb	19	140	36	1		
	FRV MW - FR	Mohr-Coulomb	19	430	36	1		
	FRV XW (Post seismic)	Mohr-Coulomb	19	0	11	1		
	NTSF (Post seismic)	SHANSEP	20			1	0.08	
	Rockfill Downstream	Mohr-Coulomb	19	0	40	1		
	Rockfill Upstream	Mohr-Coulomb	19	0	35	1		
	Stage 1 Clay core (Undrained)	SHANSEP	20			1	0.29	
	Stage 1 Filter	Mohr-Coulomb	20	0	42	1		
	STSF (Post seismic)	SHANSEP	20			1	0.07	
	Working platform	Mohr-Coulomb	18	0	35	1		



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E: bwtmail@ghd.com | www.ghd.com

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Project: Cadia NTSF Southern Embankment
Slope stability Basis

Section : Buttress Coarse Sand Ch 2700

Case: 3.5 Post Seismic Non-Circular Shallow Toe

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