CARTLEDGE
MINING AND GEOTECHNICS

Coppabella Moorvale Joint Venture

Coppabella PRCP Final Void Assessment

Report No.: PEA040013-AA_Rev0
January 2024

PEABODY ENERGY AUSTRALIA

COPPABELLA PRCP FINAL VOID ASSESSMENT

Cartledge Mining and Geotechnics
Report No.: PEA040013-AA_Rev0
Date: January 2024

Rev	Date	Author	RPEQ No.	Reviewer	RPEQ No.	Description
0	30/01/2024	B. Ryan	N/A	T. Cartledge	16952	Issued for Use

Contents

1 Introduction 1
2 Purpose 1
2.1 Scope of work 1
2.2 About Coppabella Moorvale Joint Venture Coal Mine 1
2.3 Information Provided 3
2.4 Geometry Provided 4
3 Geotechnical Model 6
3.1 Geology 6
3.2 Structure 7
3.3 Rock Mass 8
3.4 Hydrogeology 8
3.5 Geotechnical Model 8
4 Final Void Stability Assessment 10
4.1 Analysis 10
4.2 Design Assessment Criteria 10
4.3 Modelling Assumptions 11
4.4 Results 11
5 Discussion 12
5.1 Behaviour of Mine Waste 12
5.2 Geological Structures 12
5.3 Pavement Material 13
5.3.1 Lowwall Pavement Failure 13
5.3.2 Waste Dump Instability 13
5.3.3 Floor Treatment 13
5.4 Surface Water Management 13
6 Conclusion 14
7 References 15
Appendix A: Plan View of Coppabella Final Landform and Cross-Section Locations ....
Appendix B: Results of Stability Analyses ....

Figures

Figure 1: Site Location Plan 2
Figure 2: Aerial view of Coppabella Mine (June 2023) 3
Figure 3: Geometry of the final landform estimate lowwall 4
Figure 4: Geometry of the final landform estimate highwall. 5
Figure 5: Coal stratigraphy of the Coppabella area. 6
Figure 6 :Distribution of mapped major faults in Coppabella West (left) and Coppabella East (right) (2019). 7

Tables

Table 1: Provided geometries of the final landform estimate. 4
Table 2: Rockmass properties adopted for Coppabella Mine. 8
Table 3: Spoil categories and attributes for structure control ranking. 9
Table 4: Results of the spoil category determination for long-term spoil Category type. 9
Table 5: Summary of spoil shear strength parameters and types 9
Table 6: Typical FoS and PoF acceptance criteria values (Read & Stacey, 2009) 11

1 Introduction

Cartledge Mining and Geotechnics (CM&G) has undertaken geotechnical assessments of the Coppabella Mine as part of the Progressive Rehabilitation and Closure Plan (PRCP) Guideline, which is a critical component of the rehabilitation policy under the Queensland Government's Mine Land Rehabilitation Policy (D.E.S., 2021).

The geotechnical assessments followed individual studies for all the infrastructures that were analysed. Geotechnical stability was assessed for post-closure and long-term stability as indicated by the landform modelling results.

According to the PRCP Guidelines, the "geotechnical report should focus on how the void will achieve post-closure slopes that will exhibit stability characteristics consistent with the planning and design of the post-closure mine void". The requirement of the Guidelines has been undertaken in this report in the analysis of the provided post-closure final void slopes.

2 Purpose

The purpose of this report is to provide guidance to Peabody Energy Pty Ltd (Peabody) for geotechnical closure requirements for the Coppabella Mine as part of the PRCP process.

2.1 Scope of work

The scope of work involved in this assessment was to address the PRCP Guideline requirements for mine site voids post-closure. From this, the detailed scope of work is outlined below:

- Address the PRCP Guideline requirements and feedback from the Department of Environment & Science (D.E.S.), which requires the following to be captured within a high-level geotechnical report:
  - Geotechnical modelling predicting the pit void's long-term stability (factor of safety, etc.).
  - The description of how the void will achieve post-closure slopes that will exhibit stability characteristics consistent with the planning and design of the post-closure mine void. Mechanisms for achieving acceptable geotechnical stability must be detailed in the plan. These mechanisms include any void filling, partial void filling, reshaping and void configuration through earthwork methods such as backfilling, regrading, buttressing, and benching. Where applicable, methods and techniques for achieving safe slopes must be detailed.

2.2 About Coppabella Moorvale Joint Venture Coal Mine

Coppabella Moorvale Joint Venture Coal Mine (CMJV) is owned by Peabody Energy (Peabody) (73.3%), CITIC Australia Coppabella (14.0%), Marubeni Corporation (7.0%), KC Resources (3.7%), NS Coal (2.0%). Peabody operates the mine on behalf of the owners.

CMJV is an open-cut coal mining operation in Queensland's Bowen Basin coalfield, approximately 43 km northeast of Moranbah, and approximately 115 km southwest of Mackay; refer to Figure 1.

The mine operates three pits: Coppabella (consisting of Johnson, South, and East Pits), Moorvale, and Moorvale South (consisting of Y and Z Pits). Peabody operate the open-cut mining at the three locations.

CMJV is accessible via the Peak Downs Highway and the Goonyella Rail Corridor.

Commencing operations in 2002, CMJV produces approximately four and a half million tonnes per annum (4.5 mtpa) of coal using Dragline, Dozer/Casting, and Truck/Shovel methodologies.

The joint venture comprises nine individual mine leases, namely:

- Coppabella
  - ML 70161
  - ML 70164
  - ML 70236
  - ML 70237
- Moorvale
  - ML 70290
  - ML 70291
  - ML 70319
- Moorvale South
  - ML 70354
  - ML 70355

Figure 1: Site Location Plan

Coppabella mine, see Figure 2, produces coal from the Leichardt seam in the Rangal Coal Measures using conventional open-cut mining methods such as cast and dozer push operations. Coal is trucked via internal haul roads to the Coal Handling and Preparation Plant (CHPP), where the coal is crushed and washed, then transported by rail approximately 130 km to the Dalrymple Bay Coal Terminal for seaborne customers.

CMJV produces various products, including pulverised coal injection (PCI), coking, and thermal coal. (Peabody Energy Corporation, 2022).

Figure 2: Aerial view of Coppabella Mine (June 2023)

2.3 Information Provided

The following information was provided as part of this study:

- Coppabella Mine Geotechnical Hazard Management Plan (GHMP) – Peabody, April 2020,
- Technical Report Summary Coppabella-Moorvale Joint Venture (CMJV) – Peabody, February 2022,
- 231122_RESHAPED_ALL_100.dxf (Final Landform Estimate, December 2023),
- ASCON_231020_250MM.dwg.dxf (Topography of the mine, October 2023), and,
- Life of Mine Coal Grids:
  - Copabhwe.sfg
  - Copalcl1.sfg
  - Copalcl1.srg
  - Copalcl2.sfg
  - Copalcl2.srg
  - Copalcl3.sfg
  - Copalcl3.srg
  - Copalcl4.sfr
  - Copalcl4.srg
  - Copalctl.sfg
  - Copalctl.srg
  - Copalctu.sfg
  - Copalctu.srg
  - Copalcu1.sfg
  - Copalcu1.srg
  - Copalcu2.sfg
  - Copalcu2.srg
  - Copall1a.sfg
  - Copall1a.srg
  - Copall1b.sfg
  - Copall1b.srg
  - Copamc.sfg
  - Copamc.srg
  - Copaml.sfg
  - Copaml.srg
  - Copamu.sfg
  - Copamu.srg
  - Copate.sfg
  - Copate.srg

2.4 Geometry Provided

Geometry of the highwalls and lowwalls of the final landform assessment provided to CM&G are presented in Table 1 and illustrated in Figure 3 and Figure 4.

Table 1: Provided geometries of the final landform estimate.

Landform Type	Material	Geometry
Highwalls (intact slopes)	Weathered Permian	45° cut slopes with 10 m wide berms every 15 m vertically
	Fresh Permian	65° pre-split slopes with 45 m wide berms every 50 m vertically
Spoil slopes	Spoil	15° overall slope angle with no berms up to ~RL275 m

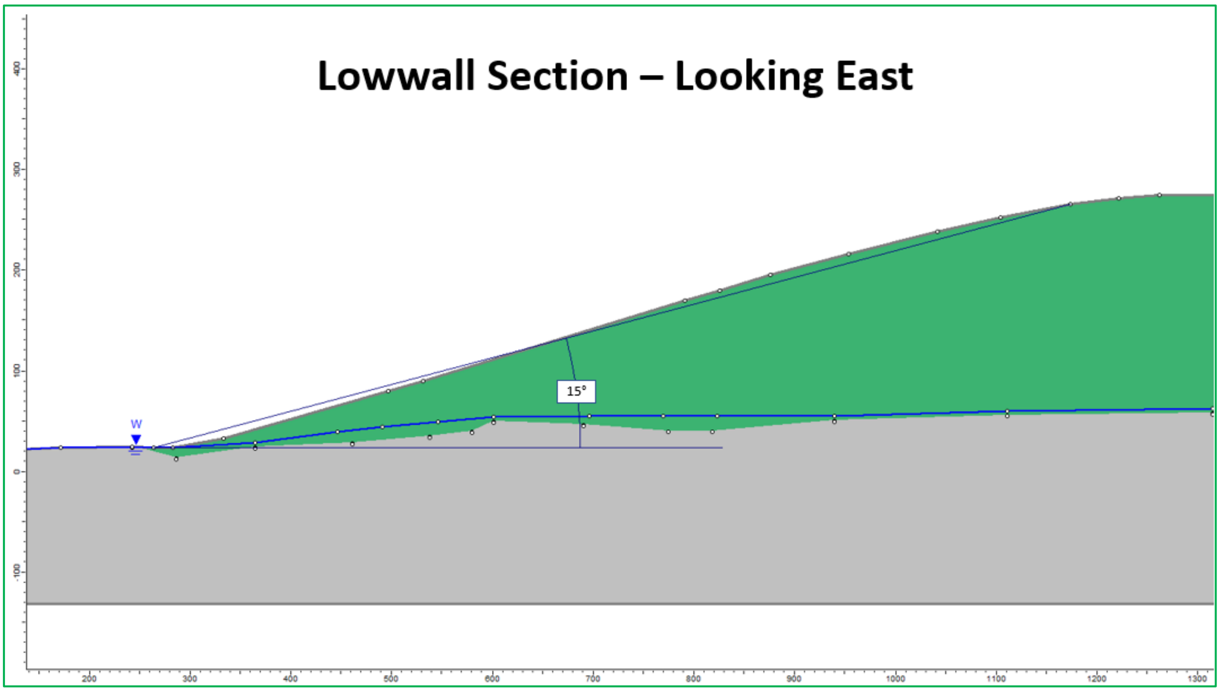


Figure 3: Geometry of the final landform estimate lowwall.

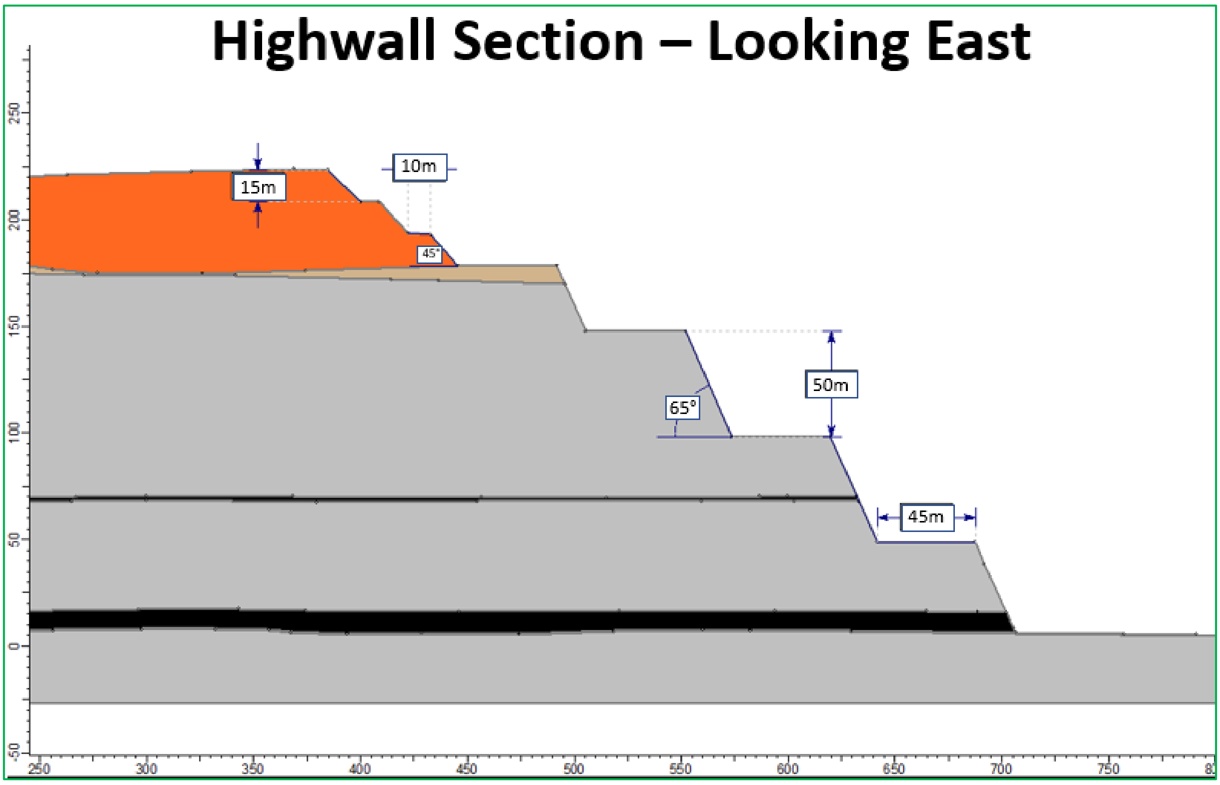


Figure 4: Geometry of the final landform estimate highwall.

3 Geotechnical Model

The geotechnical analysis is comprised of four constituent models, these are:

- Geology
- Geological Structure
- Rockmass
- Hydrogeology

The Geotechnical Model is formed from the outputs of these models, considering their influence on the geotechnical behaviour of the rock mass.

The geotechnical model used in this study was taken from the Peabody (2020) GHMP.

3.1 Geology

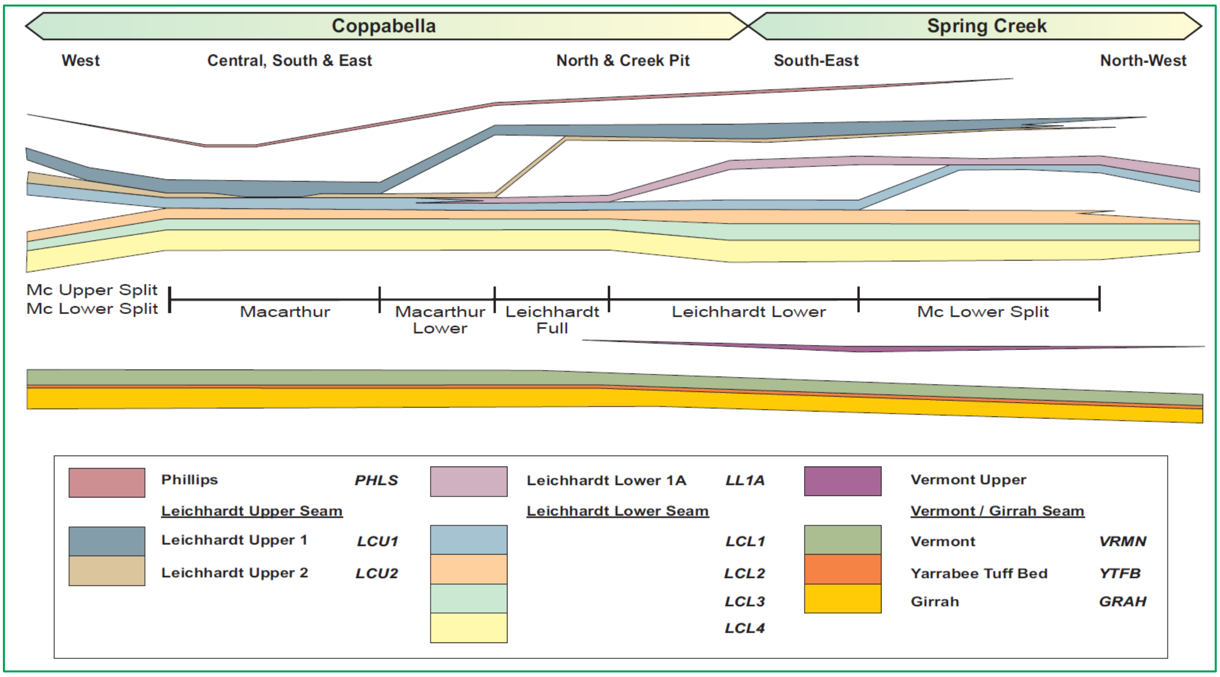


Figure 5: Coal stratigraphy of the Coppabella area.

Figure 5 details the coal stratigraphy of the Coppabella project area. The most economical coal seam intersected at Coppabella is contained within the Rangal Coal Measures from the Upper Permian Period. The Rangal Coal Measure comprises lithic labile sandstone with banded siltstone, mudstone, minor carbonaceous shale, and coal.

As the uppermost coal-bearing unit, the depositional environment is conceived as a basin-wide "Everglades" style peat swamp with less rapid subsidence than underlying coal sequences and little marine influence. Associated terrigenous sediment is associated with meandering and inter-fingering distributary channels.

The Leichhardt Seam (previously called Macarthur Seam) is the principal target of mining activities and occurs towards the middle of the Rangal Coal Measures. The seam comprises predominantly dull coal with bright bands, particularly towards the base, and is generally devoid of stone bands. The seam has been observed to be up to 11 m thick in some areas.

The Coppabella Project area is located close to major igneous intrusions, forming the major topographic highs to the east of the project area. The Rangal Coal Measures appear to have been largely insulated from the bulk of the intrusive activity by the underlying Fort Cooper and Moranbah Coal Measures, both of which have been heavily intruded, silicified, and heat-affected.

3.2 Structure

Coppabella Mine is located along the sub-crop of the Rangal Coal Measures towards the Nebo Syncline's western limits on the Carborough Syncline's southwestern flank. It produces soft coking coal from the Leichhardt seam. Uplift from the Cretaceous Bundarra Granodiorite intrusion and offshoots have slightly distorted the pre-existing structure of the area.

The Coppabella deposit strata dips N.N.E. at 5 to 10°. The seam structure and dip direction at Coppabella Mine varies from east to northwest around the axial surface of a syncline, which plunges generally northward.

This region of the Bowen Basin is affected by westward-rising thrusting associated with late-stage basin evolution and by post-depositional igneous activity ranging from granitic stocks to large-scale dyke and sill intrusions. The Leichhardt seam at the mine is typically associated with sill development concentrated at or near roof and floor level, and another sill is typically associated with the Phillips seam interval.

Overburden is also characterised by a deep layer of water-bearing Palaeogene alluvium.

The principal interpreted fault trend is NNW-SSE. A major fault system separates the Johnson Pit from the South Pit area. The faulting in this system appears to be principally normal, as indicated by seams that are faulted out and thinning of partings between the Girrah and Macarthur Seams. Drilling density is insufficient to detail the style of the other NNW-SSE trending faults, but it appears that they are normal or transcurrent faults. Several modelled faults have throws in the order of 15-20 m. Evidence of faulting is from missing sections in seams and inconsistencies in the seam position relative to adjacent holes.

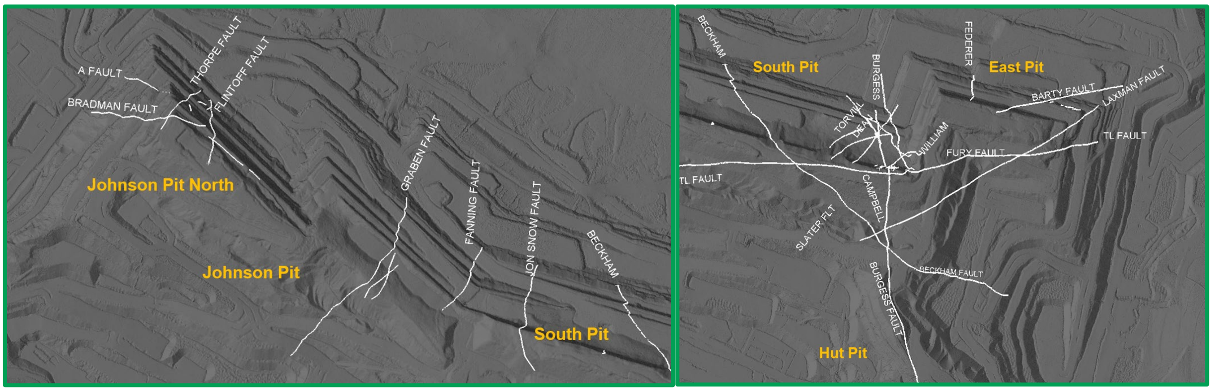


Figure 6 :Distribution of mapped major faults in Coppabella West (left) and Coppabella East (right) (2019).

South Pit faults change eastwards in orientation from northeast to northwest. The TL fault is a major trending east-northeast structure. It intersects most of the northwest trending faults. Closely spaced sub-vertical conjugate joint sets are most persistent throughout the siltstone East Pit wall.

Only two boreholes show seam thickening, which can be interpreted as a result of thrust faulting (CP164 and CQ024).

Apart from some coal loss, the principal impact of faulting in the pit to date is on highwall stability. The intersection of the Beckham and T.L. faults in South Pit caused pit wall scale failure. Joint-fault intersections have formed wedge block crest failures, particularly in South Pit, e.g., Jon Snow, Beckham, and William Faults. Highwall failures have also occurred due to weakening due to fracturing in the Permian overburden during coal mining and involving complex tectonic structures.

A major feature of the area is the Cretaceous Bundarra Granodiorite intrusion to the southeast of the deposit. This intrusion has pushed up the formations significantly to the south. In the current pit, thin sub-vertical dykes in the order of 0.5 m thick occur. A sill also occurs at the seam floor in the current pit, which has decomposed to clay, leading to potential floor stability problems.

On the southeast side of East Pit, intrusions become more intense as multiple sill horizons (presumably feeder dykes) occur within the seam. The heat-affected coal is thicker in this area. There are strong indications that the sills appear to stay within particular horizons (floor, roof and top third), and the floor and roof sills have the potential to cause instability along the coal seams.

3.3 Rock Mass

According to the Coppabella Mine Geotechnical Hazard Management Plan, an exploration diamond drilling program was carried out in 2019 with the aim of using the core to develop site-specific rock mass properties. These properties have not been provided as a part of this assessment.

3.4 Hydrogeology

The Coppabella project is located within the Fitzroy Basin. The major drainage line through the Coppabella Mine is Thirty Mile Creek, which flows into Harrybrandt Creek. Humbug Gully drains the northern section of the Coppabella East lease. Harrybrandt Creek flows outside the southern boundary of the Coppabella South lease. The primary receiving waters for the site constitute Harrybrandt Creek.

According to the Peabody Energy Australia Geotechnical Assessment of Coppabella Coal Mine Final Voids for Rehabilitation Purposes (2016), pre-mining investigations measured groundwater levels at depths typically 19 to 34 metres below ground level (mbgl), at about 180 mAHD (metres above Australian Height Datum). The basal sections of the unconsolidated overburden were generally saturated. In addition, pockets of high volumes of water were encountered at higher elevations within the Cenozoic alluvium which required advanced pre-stripping in order to drain it sufficiently to allow efficient mining.

3.5 Geotechnical Model

Rock mass parameters adopted from the 2020 GHMP have been applied in this analysis. Mohr-Coulomb parameters are summarised below in Table 2.

Table 2: Rockmass properties adopted for Coppabella Mine

Material	Unit Weight (kN/m3)	Cohesion (kPa)	Friction Angle (°)	Calculated U.C.S. (MPa)
CAT2 Spoil - Unsaturated	18	30	28	0.10
CAT2 Spoil - Saturated	20	15	23	0.05
CAT3 Spoil – Unsaturated	18	50	30	0.17
CAT3 Spoil – Saturated	20	20	25	0.06
Tertiary – Unsaturated	20	50	30	0.17
Tertiary – Saturated	20	15	30	0.05
FR Sedimentary Rock	24	450	42	2.02
Friable Coal	15	30	35	0.12
Ripped / Dozed Floor	22	23	25	0.07

Simmon's and McManus provides a matrix for the determination of the spoil category. Based on this methodology CAT2 material is encountered at Coppabella. However, this material will experience time-dependent changes in characteristics. Therefore, long-term shear strength parameters were developed using the methodology. Table 3 presents the attributes and weighting applied (Simmon's & McManus, 2004) and

Table 4 provides the results of the determination of the long-term shear strength parameters presented in Table 5.

Table 3: Spoil categories and attributes for structure control ranking.

Spoil Category		1	2	3	4
Description Attributes	Weighting (excl. Age)	Fine-grained clay rich high plasticity	Fine grained low plasticity with larger clasts	Larger clasts with fine matrix low plasticity	Large blocks, minor fines, minor slaking
Predominant Particle Size	3/31=9.7% (11.6%)	Clay	Sand	Gravel	Cobbles
Consistency Cohesive Cohesionless	7/31=22.6% (26.9%)	Soft to Firm loose	Stiff Med. Dense	Hard Dense	Extremely low strength or higher rock, very dense
Structure	7/31=22.6% (26.9%)	Matrix only	Matrix supported	Framework supported	Framework only
Liquid Limit	9/31=29.0% (34.6%)	High (>50)	Intermediate (35 – 50)	Low (20 – 35)	Not Plastic (,20)
Age	5/31=16.1%	0 -2y	2- 10y	10 -30y	>30y

Table 4: Results of the spoil category determination for long-term spoil Category type.

Category		Spoil Material – Final landform	Weighted Value
Predominant Particle Size	3/31=9.7% (11.6%)	3	7.275
Consistency Cohesive Cohesionless	7/31=22.6% (26.9%)	2	11.3
Structure	7/31=22.6% (26.9%)	2	11.3
Liquid Limit	9/31=29.0% (34.6%)	3	21.75
Age	5/31=16.1%	3	12.075
Category		2.5	63.7

Table 5: Summary of spoil shear strength parameters and types

Lithotype	Unit Weight (kN/m^3)	Cohesion (kPa)	Friction Angle (°)
CAT2.5 Saturated Spoil	20	17.5	24
CAT2.5 Unsaturated Spoil	18	40	29

Table 5 summarises the long-term spoil category (CAT2.5) used for all spoil within the model for this analysis.

4 Final Void Stability Assessment

The PRCP Guideline (D.E.S.,2021) requires that the assessment of voids for closure planning must include the following:

- Pit wall geotechnical stability considering the effects of long-term erosion and weathering of pit walls and the effects of significant hydrological events,
- Proposed final slope angles of highwalls of each void,
- A geotechnical report focussing on how the voids will achieve post-closure slopes that will exhibit stability characteristics consistent with planning and design of post-closure mine voids, and
- Mechanisms for achieving acceptable geotechnical stability must be detailed in the plan. This includes void filling, partial void filling, reshaping and void configuration through earthwork methods such as backfilling, regrading, buttressing, and benching. Where applicable, methods and techniques for achieving safe slopes must be detailed.

Rocscience software Slide2 (Version 9.025) was used to analyse the factor of safety (FoS) of the final void conditions. Deswik.CAD 2023.2.762 was used to create the cross sections for the analysis.

Four cross sections for analysis were chosen from the final landform estimate provided by Peabody Australia's Environment and Approvals team. These include two sections along the highwall in areas that have different geometries, and two along the lowwall also with different geometries (Appendix A).

Four analysis methods were applied: Spencer, Morgenstern-Price Global Limit Equilibrium (G.L.E.), Janbu Simplified and Sarma. The first three are vertical slice methods used with a non-circular cuckoo search method, while Sarma is a non-vertical method using a non-circular block search. FoS searches were conducted on each cross section on a global scale, as well as on individual benches. All searches were also conducted under each of the following water scenarios:

- Short term - No water in the pit (water table at the pit floor)
- Medium term - Water at roughly 1/3rd the height of the slope (when the slope is weakest)
- Long term - Water at RL180m (excluding section D-D' as this did not reach RL180m)

4.1 Analysis

The analyses evaluated multiple trials showing a failure surface, with the location of the critical (lowest FOS) failure surface being presented. The Factor of Safety (FOS) against failure is defined as the proportion of restoring forces versus the destabilising forces of the analysed slope to bring the materials into a state of limiting equilibrium.

During the review of the analyses, the Base Normal Stresses (when using Sarma method) or Line of Thrust (all other methods) were plotted (where applicable) to verify the validity of the results. Where the Stresses were determined to be non-valid due to the development of tensile stresses, a 'tension cracking zone' was included within the model towards the crest of the batter. This allows "Slide" to effectively resolve the forces generated during the analysis and provide a valid failure shear surface and FOS result. Where this did not resolve the non-valid stresses, the Janbu simplified method was applied.

4.2 Design Assessment Criteria

The adopted assessment criteria for the slope stability analysis are based on the overall slope scale and the high consequence of failure, as listed in Read and Stacey, 2009 (Table 6). A minimum Factor of Safety (FoS) of 1.5 has been adopted for static analyses.

Table 6: Typical FoS and PoF acceptance criteria values (Read & Stacey, 2009)

Slope scale	Consequences of failure	Acceptance criteria[a] FoS (min) (static)	FoS (min) (dynamic)	PoF (max) P[FoS ≤ 1]
Bench	Low–high[b]	1.1	NA	25–50%
Inter-ramp	Low	1.15–1.2	1.0	25%
	Moderate	1.2	1.0	20%
	High	1.2–1.3	1.1	10%
Overall	Low	1.2–1.3	1.0	15–20%
	Moderate	1.3	1.05	10%
	High	1.3–1.5	1.1	5%

a: Needs to meet all acceptance criteria
b: Semi-quantitatively evaluated

4.3 Modelling Assumptions

The following design assumptions were adopted to analyse the final void for the open pit:

- All deleterious and weak materials are removed from the pavement, e.g. mudstone, sheared floor strata, etc.
- Erosion of the pit slope crests is completed by others.
- No seismic loading was included as Coppabella is not considered a high seismic risk area.
- Faulting was not considered as a part of the assessment.
- Back scarp angle of between 56° and 64° (59° +/- 4°) was adopted for the CAT2.5 dump material based on Equation 1 (Duran, 2012), using material parameters of Table 2; and,
- A maximum tension crack depth of 5 m was adopted for the CAT2.5 material based on Equation 2 (Baker, 1981), using material parameters of Table 2.

Equation 1: $\boldsymbol{Backscarp\ Angle = 45° + \frac{\phi}{2}}$

Equation 2: $\boldsymbol{Tension\ Crack\ Depth = \frac{2c}{\Upsilon}\tan(45 + \frac{\phi}{2})}$

Where:

ϕ = friction angle (°)
Υ = unit weight (kN/m³)
c = cohesion (kPa)

Erosion and weathering modelling of pit walls has not been considered in this geotechnical assessment. Rather, recommendations for preventing uncontrolled and significant erosion through proper drainage practices and operational compliance will be provided. While the void walls are expected to deteriorate through erosion and weathering mechanisms, adequate drainage is aimed to ensure that the deterioration is isolated to the pit void and does not extend beyond the void limit.

A copy of select analysis results outputs are provided in Appendix B.

4.4 Results

All the scenarios analysed met or exceeded the minimum Factor of Safety of 1.5. Therefore, the provided geometry and model assumptions provided herein, is considered appropriate for mine closure.

5 Discussion

The results of the analysis indicate the intact pit slope will return an FoS of >1.5. However, there are several considerations and/or limitations to this study that need to be addressed during the mining life to ensure the design provided herein is suitable. These considerations are discussed further below.

5.1 Behaviour of Mine Waste

- The slope angle for spoil that was provided was already reduced from the natural angle of repose due to the influence of inundation and time-dependent changes to the geomechanical behaviour of the waste rock. It is expected that consolidation of the spoil material will occur due to aging (creep consolidation) and inundation (crushing and particle re-orientation). This could result in the surficial presentation of this, such as tension cracking and deformation. This is a natural phenomenon and will not influence the long-term stability of the structure.

- Inundation of the spoil material will have a significant influence on the geomechanical behaviour of the waste material. Progressive inundation of the spoil material will result in the slope experiencing a variable FoS as the in-pit water level increases. The lowest FoS typically occurs when the water level is slightly higher than the toe of the slope, i.e. the toe is inundated. As the water level continues to rise, the water load provides passive support to the slope, resulting in an increase in the slope FoS.

- As spoil material is inundated, the particles (rock fragments) will become saturated and weaken. This will result in the edges of these particles breaking and densification of the waste material will occur. However, frequent wetting and drying of this material are likely to result in further degradation to its constituent materials, e.g. clay, silt, sand, etc. Saturation combined with oxygenation will result in weathering (slaking due to wetting and drying of clay-rich materials) of the fragments resulting in further degradation of the constituent materials of the rock. As the rock at Coppabella is predominantly siltstone, the rock will weather to clay and silt. This phenomenon is only expected to affect part of the spoil profile and have a relatively minor influence on long-term stability.

- As described above, inundation will have multiple effects on the mine spoil. This will result in changes in the volume of the spoil and the geomechanical behaviour. As the spoil is inundated, the combination of these phenomena is likely to result in surface expressions such as tension cracking and changes in slope profile due to the uncontrolled backfilling of the waste material, i.e. siltstone will breakdown more than sandstone and will therefore result in greater volume changes and potential slope deformation.

5.2 Geological Structures

- The long-term strength of the in-situ rock mass is sufficient to retain the design slope geometry. However, no consideration of potential geological structures (i.e. faults and persistent joints) was considered in this analysis due to the lack of confidence in the data available for the final void. The influence of structure on the wall geometry will have to be assessed as mining approached the final void and sufficient data is available.

- There was insufficient information to assess the potential for geological structure to present a risk to geotechnical stability. Further assessment will be required as mining approaches the final void.

5.3 Pavement Material

5.3.1 Lowwall Pavement Failure

A common stability issue for steeply dipping (i.e. >15°) lowwall pavements is detachment and sliding of weak carbonaceous material. These types of material commonly detach due to:

- Relaxation due to unloading,
- Sliding due to floor dip and/or shearing within the pavement,
- Detachment due to ingress of surface water (e.g. rainfall).

The lowwall floor forming the base of the waste dump final landform is relatively shallow dipping (>4°) suggesting that lowwall failures as described above are unlikely. Current procedures at Coppabella Mine require floor treatment, generally in the form if cross-ripping) to be carried out to disrupt shears that may exist in the floor pavement. These procedures should be maintained for the pit floor to reduce the likelihood of lowwall instability.

5.3.2 Waste Dump Instability

The presence of the deleterious materials (i.e. coal, carbonaceous siltstones and mudstones) and structure (i.e. pavement shears) can present varying risks during coal mining, with risk of failure increasing over time due to deterioration of these materials. Time-dependent deterioration can result in slaking of mudstones, positive pore-pressures resulting in critical reduction in normal stresses, crushing of coal causing a strength reduction. Due to these potential factors, waste dump instability can occur sometime after mining is complete.

To reduce the risk of waste dump instability due to the processes described above, data collection is recommended to quantify the durability of the waste materials, the propensity of the materials to deteriorate and slake (reducing the material strength), and the time-dependant consolidation of the materials (increasing the material strength).

5.3.3 Floor Treatment

Due to the factors described above, floor treatment to remove any deleterious materials from below the waste dump and exposed lowwall is required to ensure long-term stability.

5.4 Surface Water Management

Erosion and slaking of soils, weathered material, and intact material can influence the long-term stability of mine voids. To reduce this impact, surface water drainage is recommended around the pit crest to prevent water ponding behind and/or flowing directly over pit crests.

6 Conclusion

Based on the available information, the final void will be stable at the end of the mine-life. While the long-term stability requirement is achieved, the interim FoS may be lower due to changes in the in-pit and subsurface water conditions and this may present as surficial expressions of instability, such as tension cracking and volume change. These phenomena are due to transient conditions and are not expected to affect the long-term stability FoS.

7 References

GeoTek Solutions Pty Ltd. (2016). *Peabody Energy Australia Geotechincal Assessment of Coppabella Coal Mine Final Void for Rehabilitation Purposes.* Brisbane: Peabody Energy.

Peabody Energy. (2020). *Coppabella Mine Geotechnical Hazard Management Plan.* Brisbane: Peabody Energy.

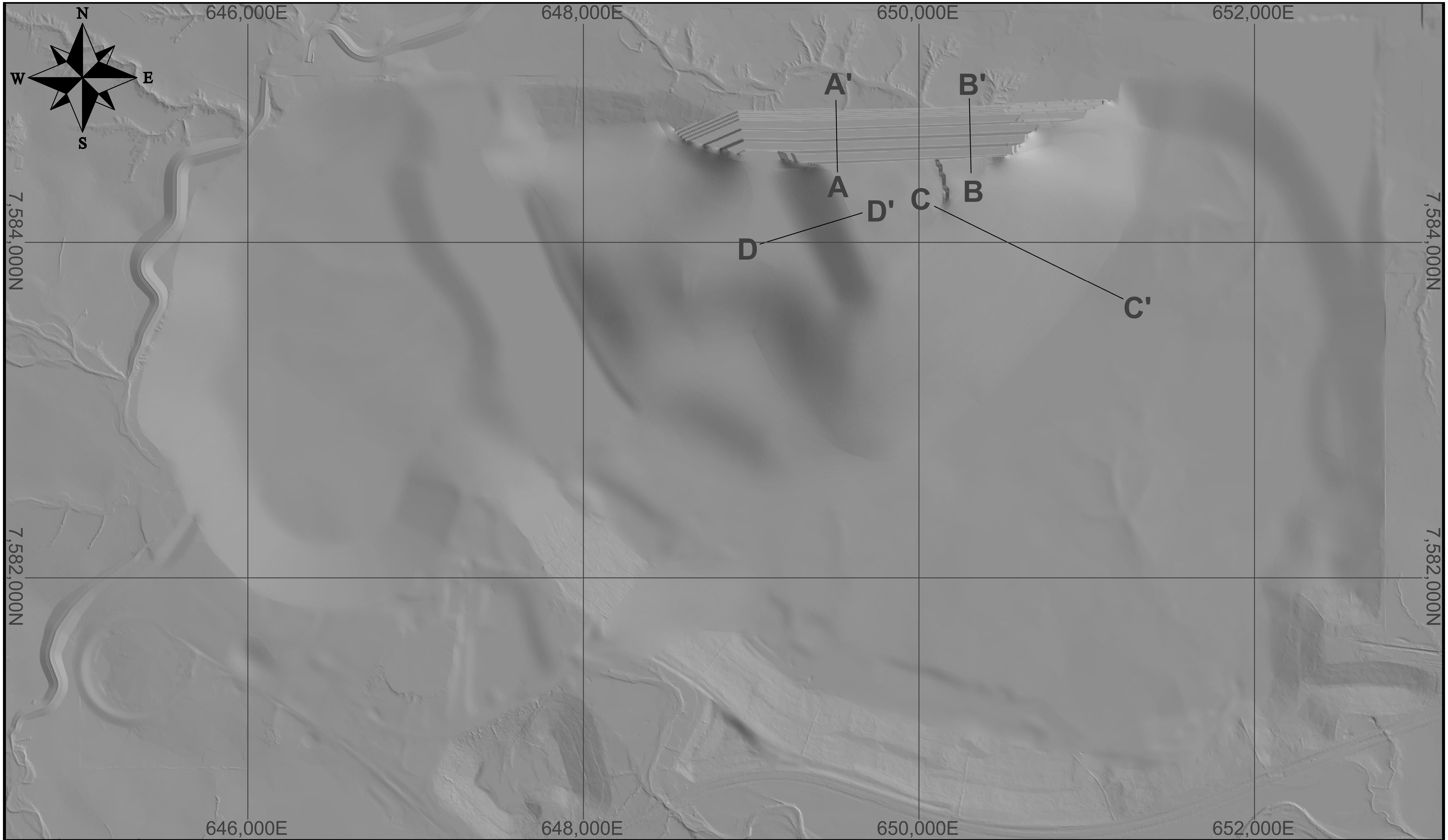
Peabody Energy Corporation. (2022). *Form 10K - Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.* Washing D.C.: Peabody Energy.

Read, J., & Stacey, P. (2009). *Guidelines for Open Pit Slope Design.* Melbourne: CSIRO.

Sarma, S. (1973). Stability Analysis of Embankments and Slopes. *Geotechnique*, 23:3, 423-433.

Simmons, J. V., & McManus, D. A. (2004). Shear Strength Framework for Design of Dumped Spoil Slopes for Open Pit Coal Mines. *Advances in geotechnical engineering: The Skempton conference: Proceedings of a three day conference on advances in geotechnical engineering* (pp. 981-991). London: Institution of Civil Engineers.

Appendix A: Plan View of Coppabella Final Landform and Cross-Section Locations



Rev:	Rev. Date:	Description	Approver
Rev0	30/01/2024	Plan View of Final Landform	TC

Scale 0 1043 2085

1:20850 @ A3

CARTLEDGE MINING AND GEOTECHNICS

Peabody

Coppabella - CMJV

Project Title: Coppabella PRCP

Project Code: PEA040013

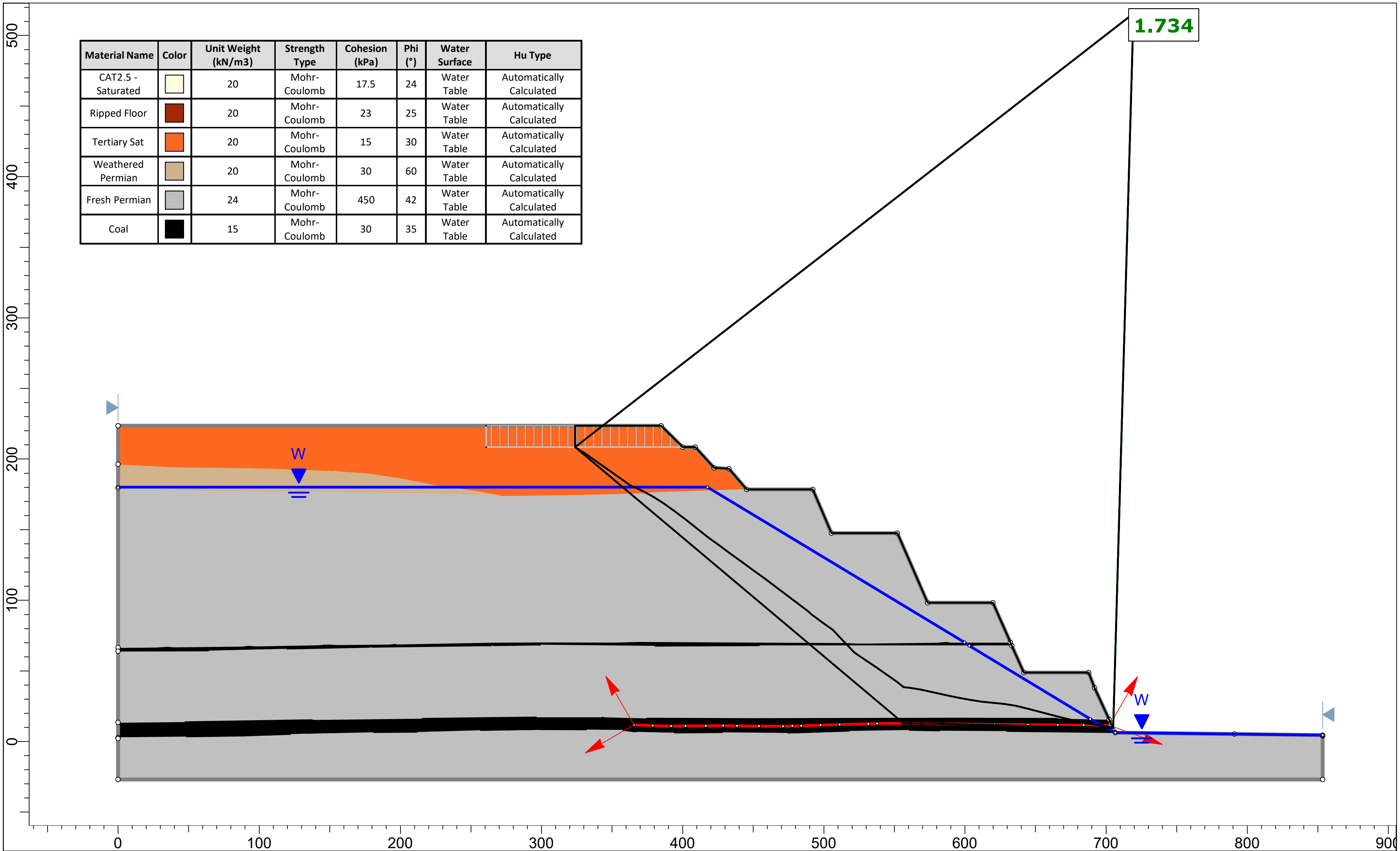
Drawing Title:

Coppabella Final Landform Showing Cross Sections

Drawn By:	Benjamin Ryan	Datum:	AHD
Date Drawn:	30/01/2024	Map Grid:	MGA2020
Version:	Rev0		

Drawing Name: COP_PRCP_Appendix A

Appendix B: Results of Stability Analyses



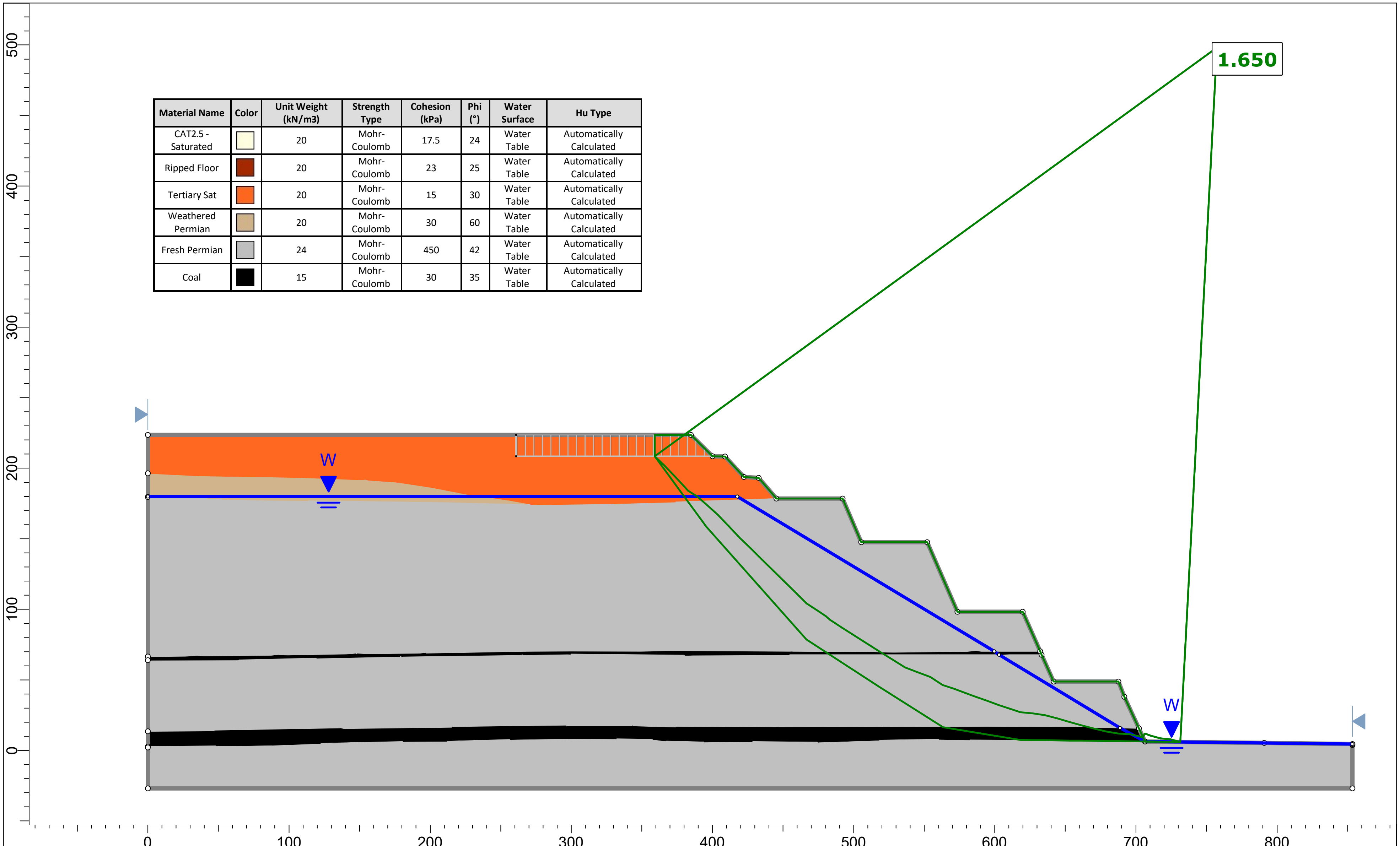
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Spencer - Global Block Search	*Scenario*	A-A' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031



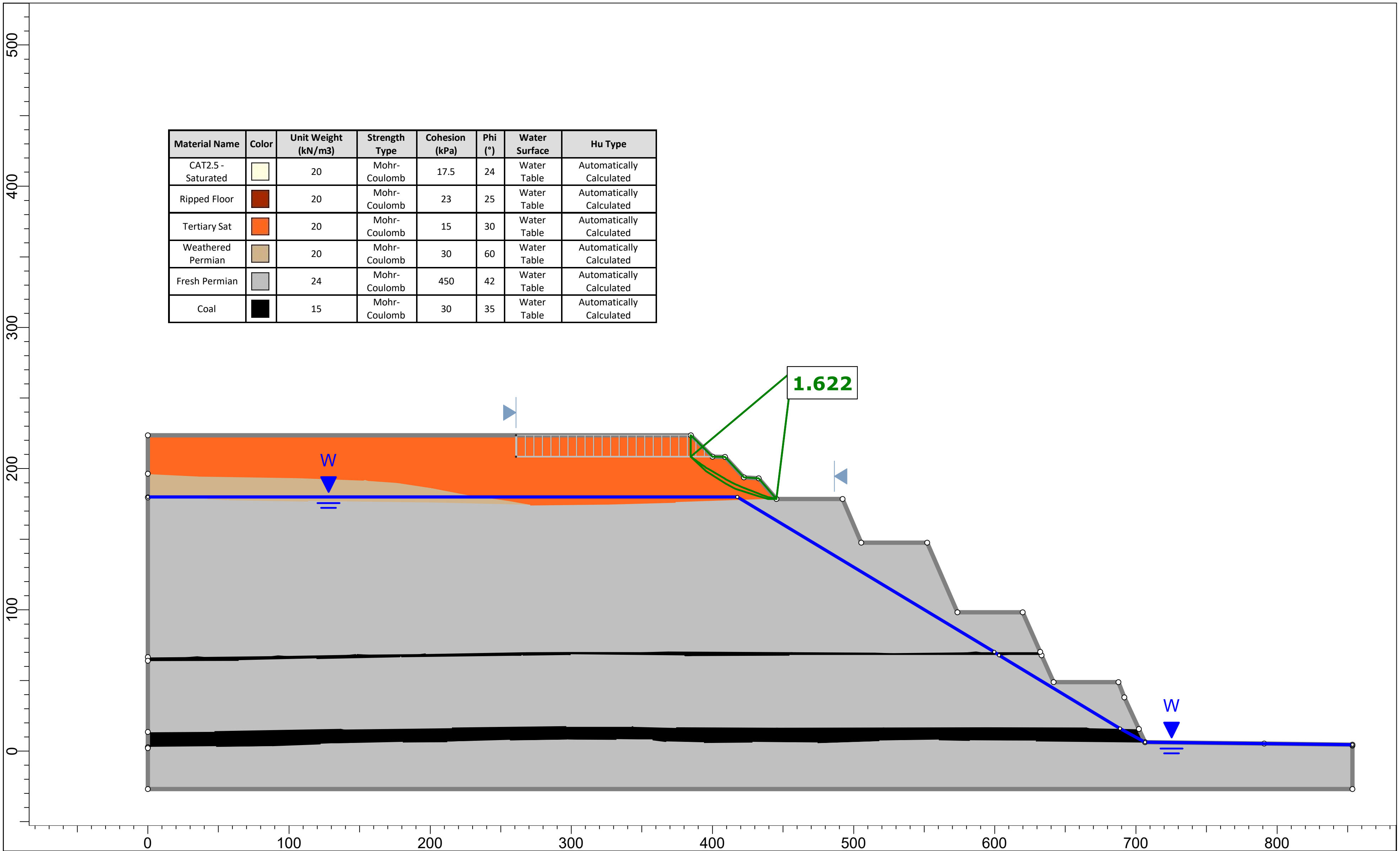
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Spencer - Global Cuckoo Search	*Scenario*	A-A' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

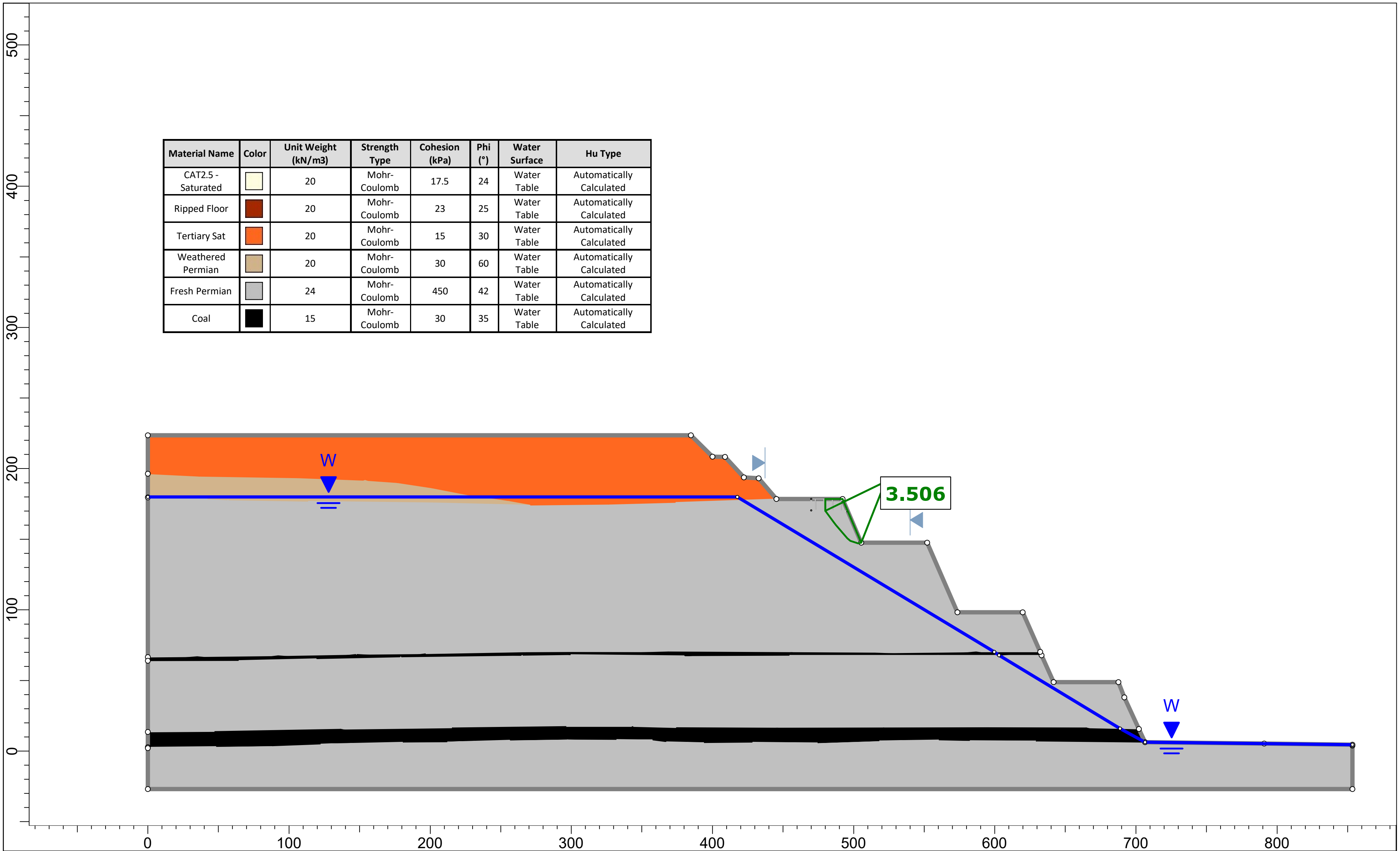
CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

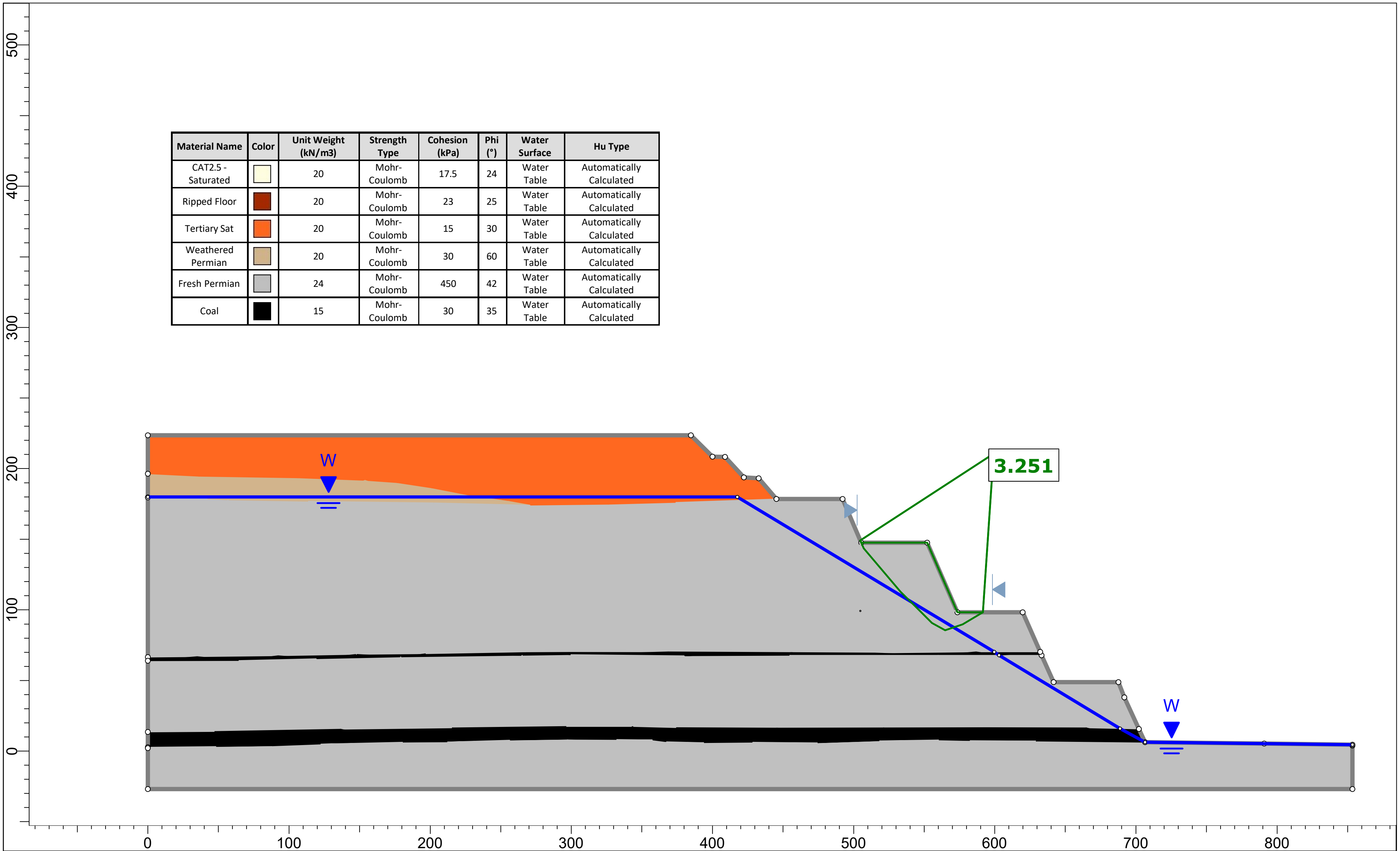
Coppabella PRCP Final Void Assessment

Search Method	Spencer - Overburden Cuckoo Search	*Scenario*	A-A' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Janbu - Bench 1 Cuckoo Search	*Scenario* A-A' - No Water in Pit	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

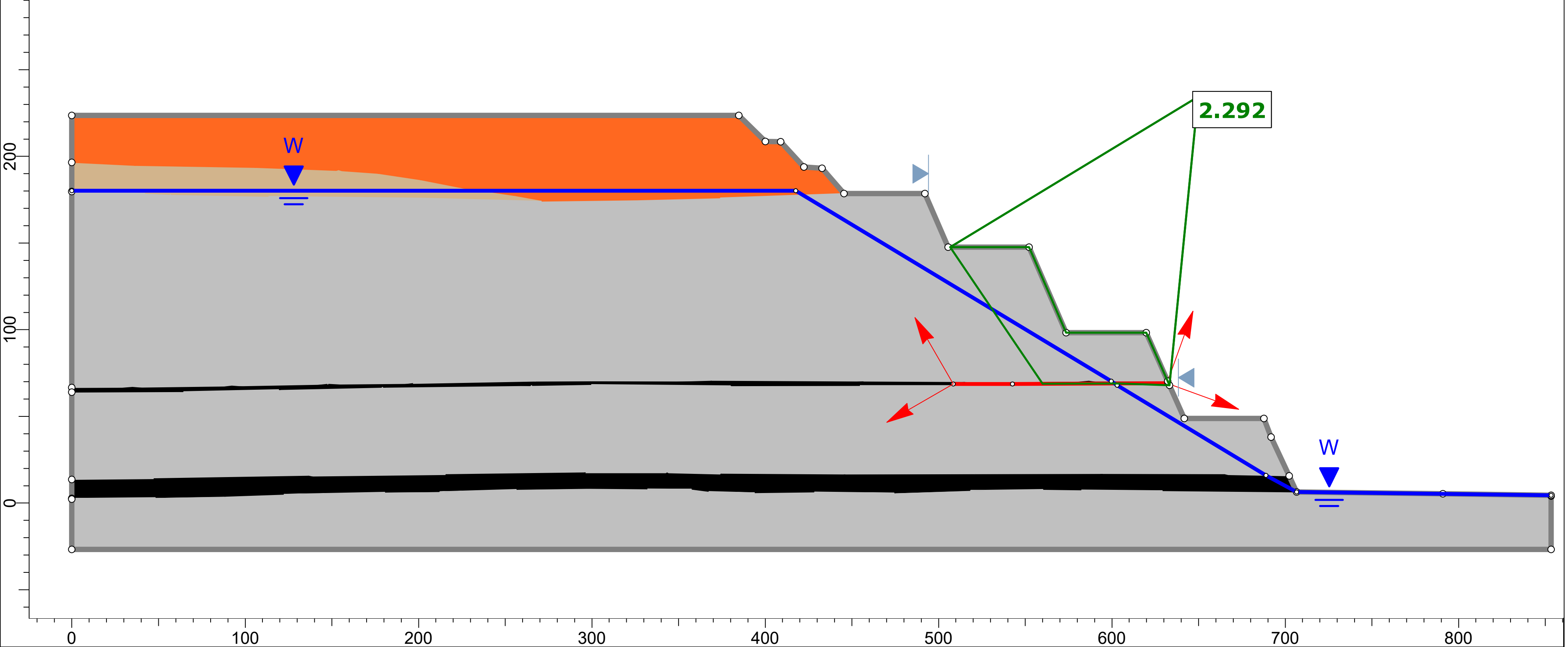
CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

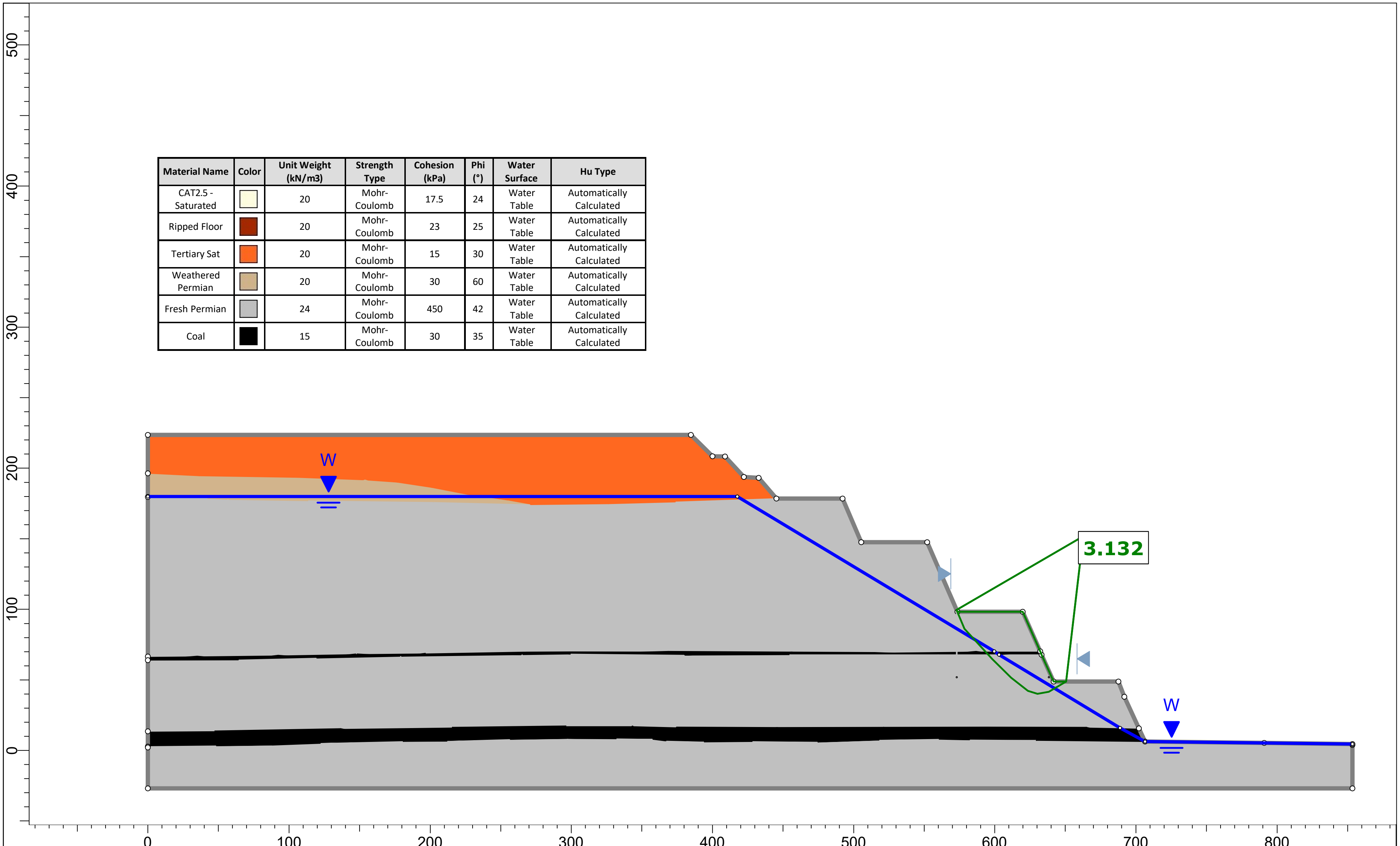
Search Method	Janbu - Bench 2 Cuckoo Search	*Scenario*	A-A' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Search Method	Janbu - Benches 2-3 Block Search	*Scenario*	A-A' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

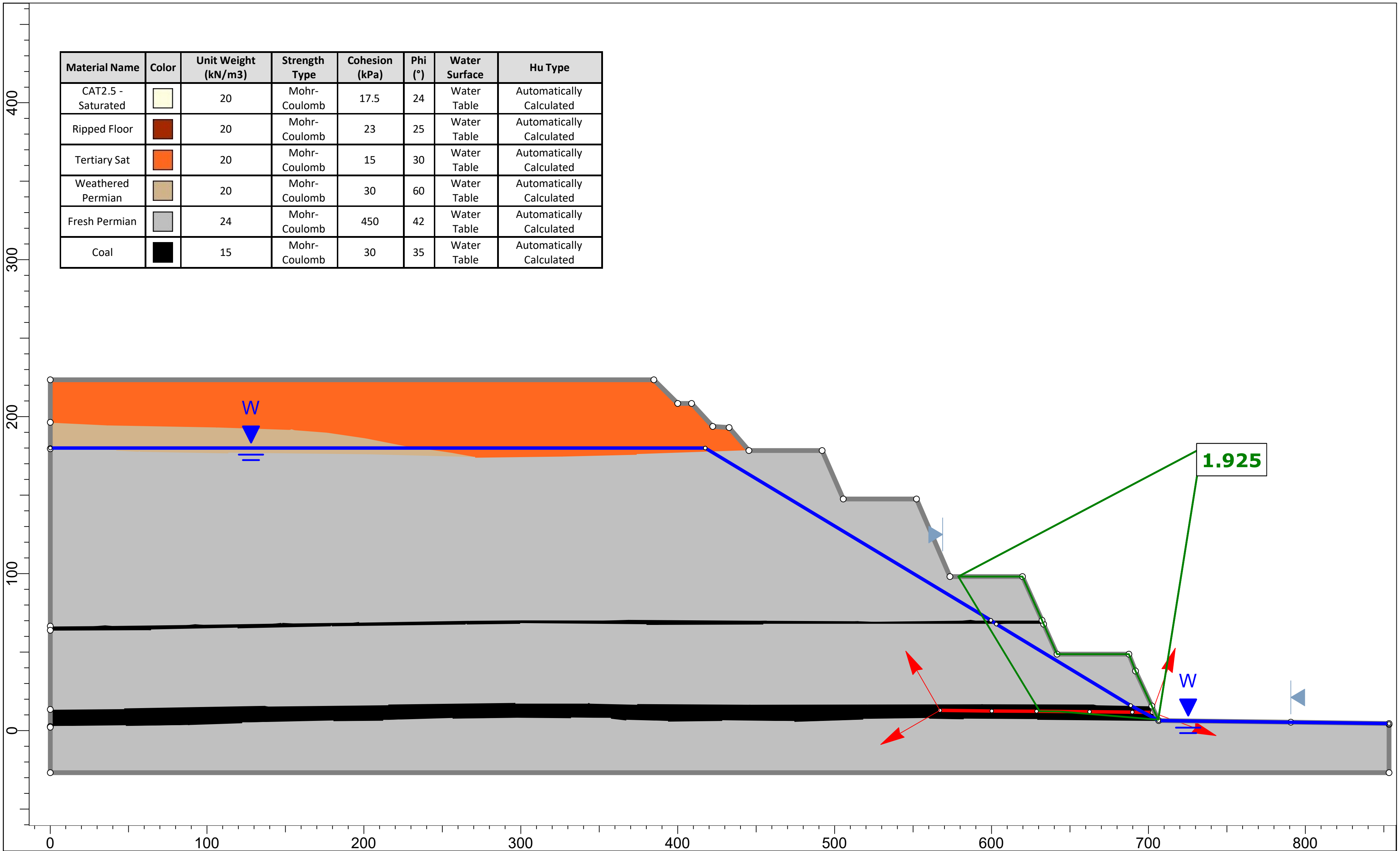
CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 3 Cuckoo Search	*Scenario*	A-A' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

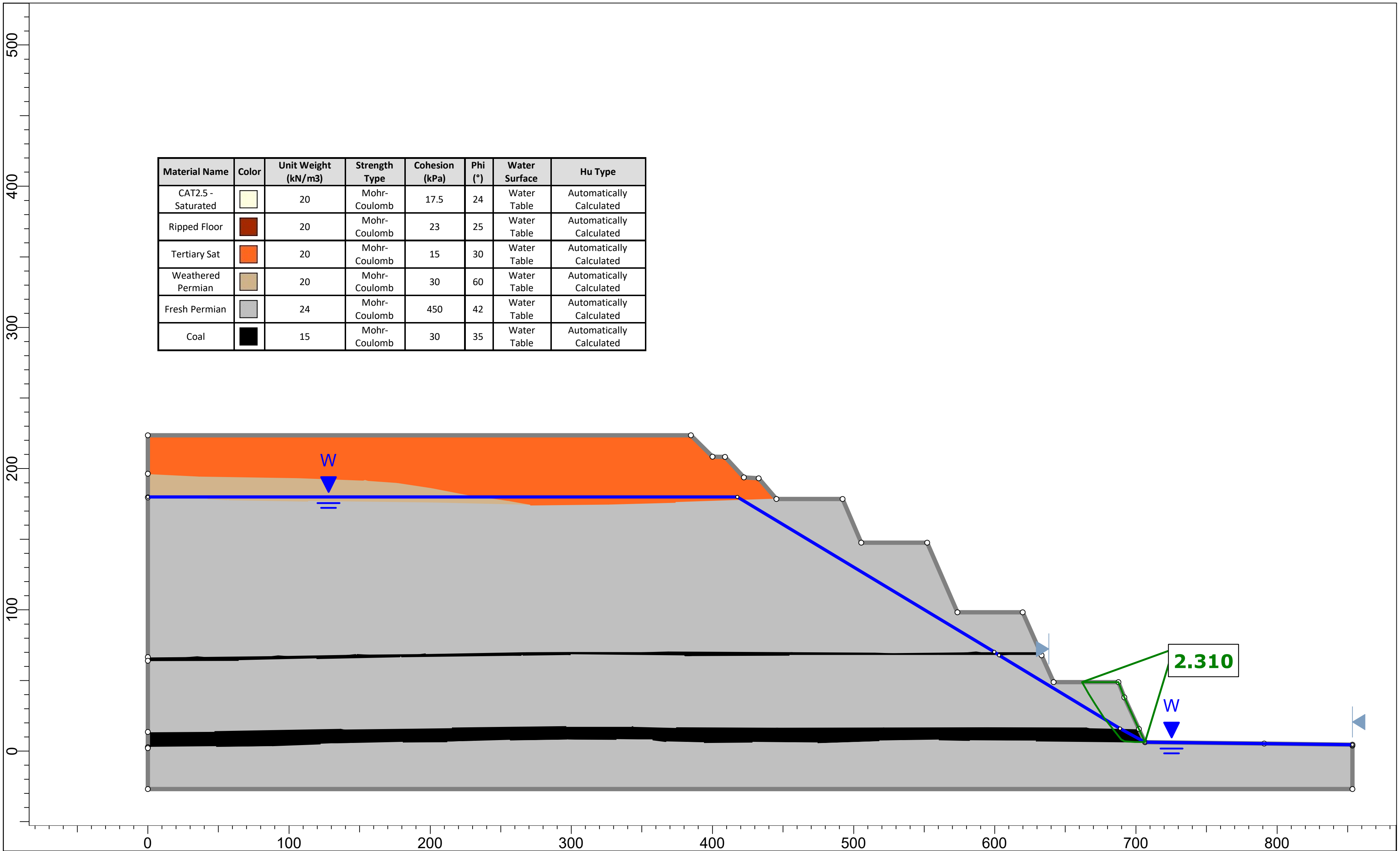


CARTLEDGE MINING AND GEOTECHNICS

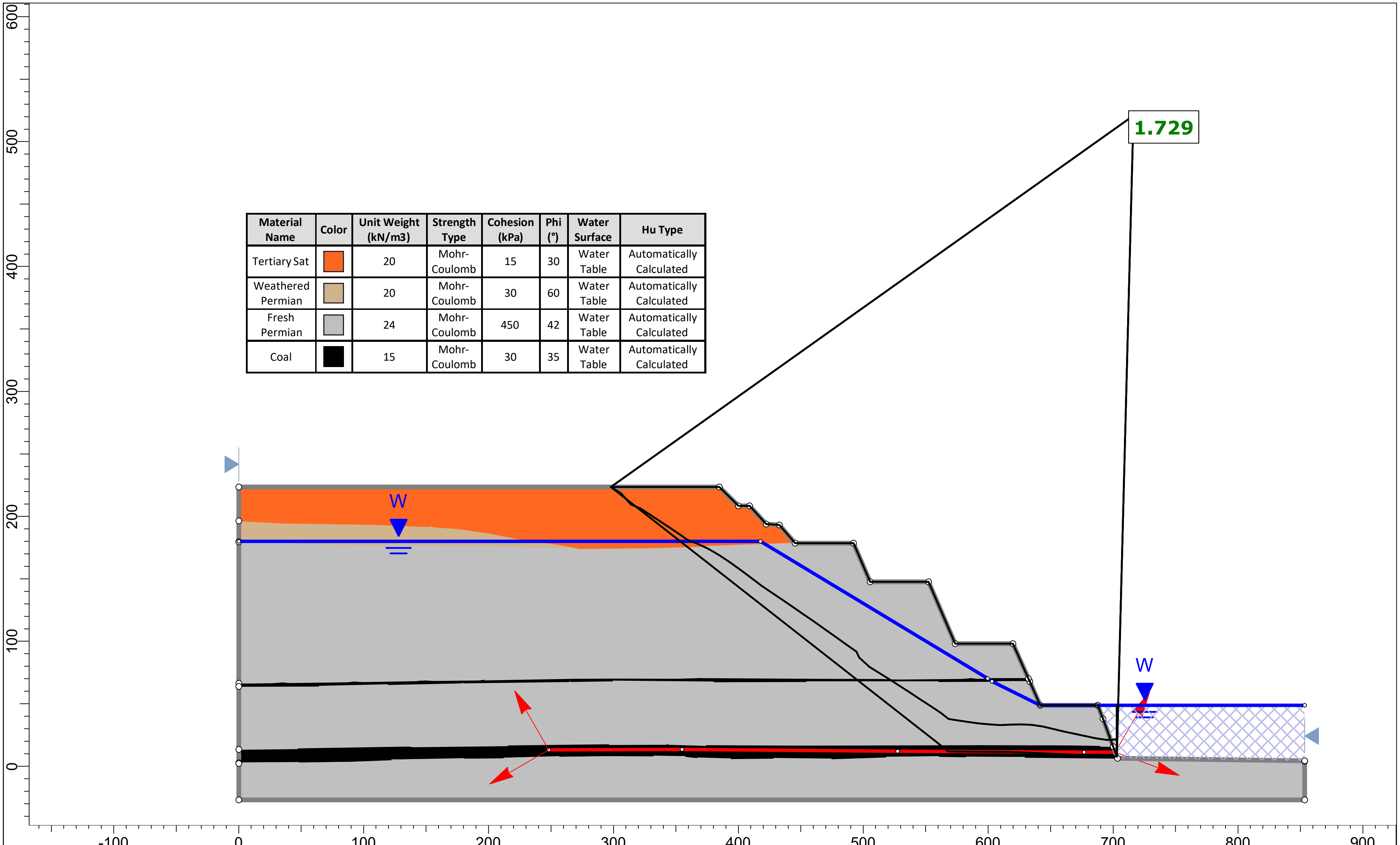
SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Search Method	Janbu - Benches 3-4 Block Search	*Scenario*	A-A' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Janbu - Bench 4 Cuckoo Search	*Scenario* A-A' - No Water in Pit	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

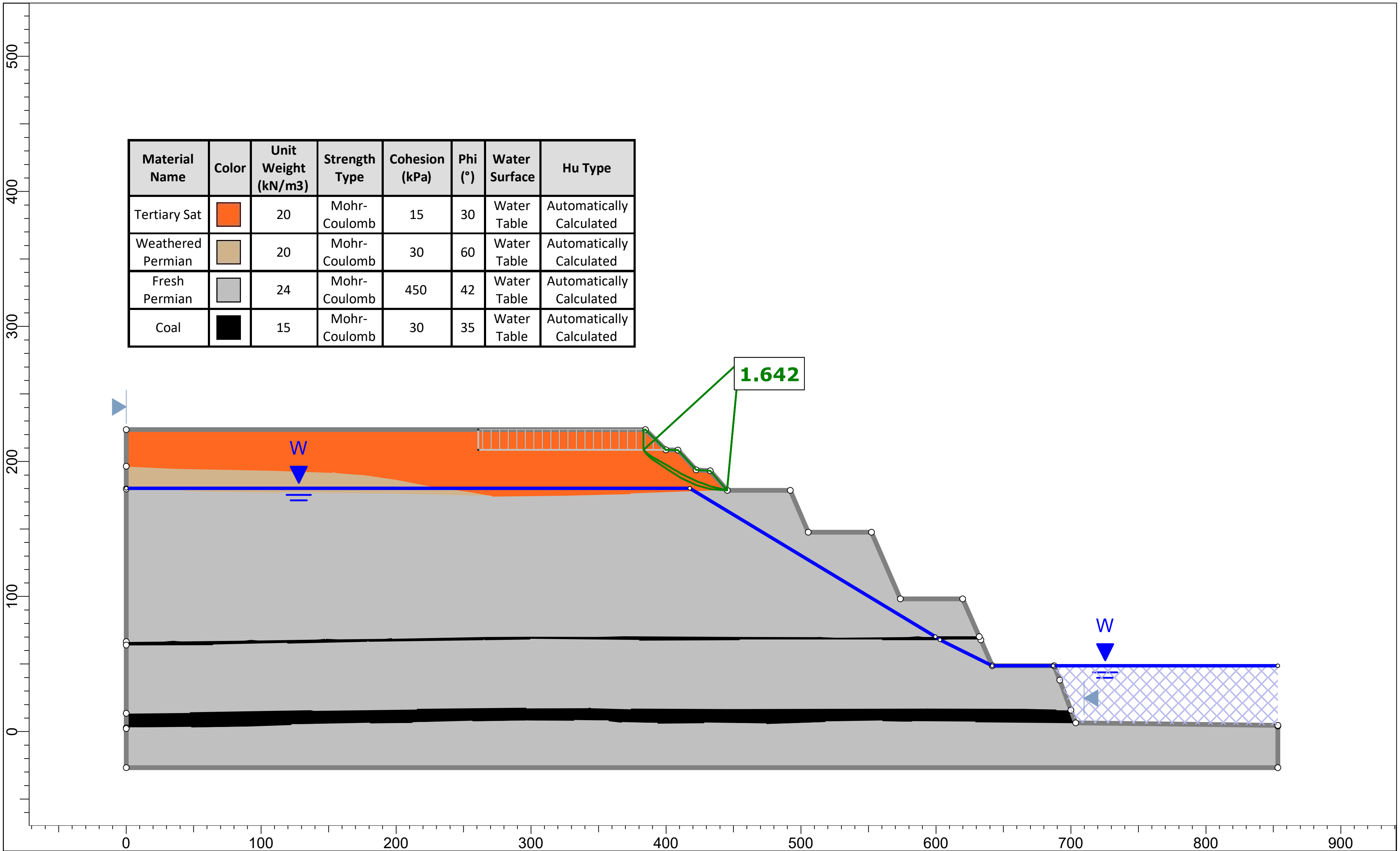
CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Spencer - Global Block Search	*Scenario*	A-A' - Water 1/3rd Height of slope
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

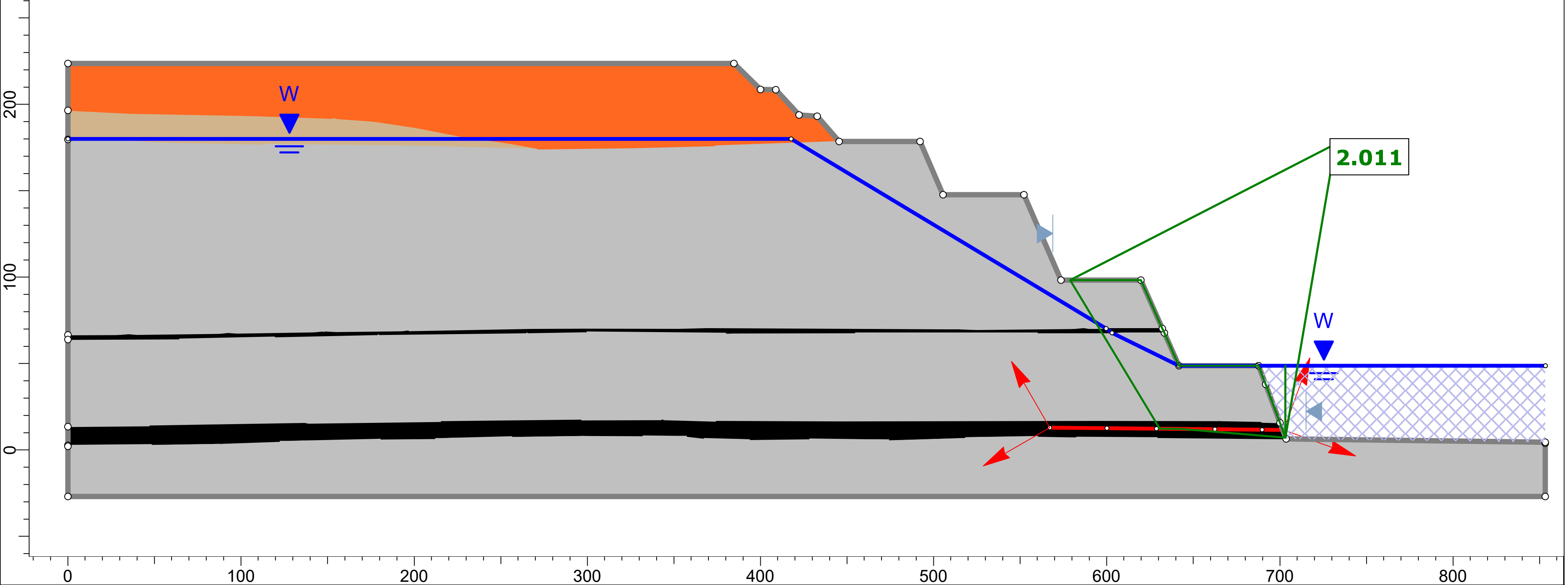


CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment			
Search Method	Spencer - Global Cuckoo Search	*Scenario*	A-A' - Water 1/3rd Height of slope
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

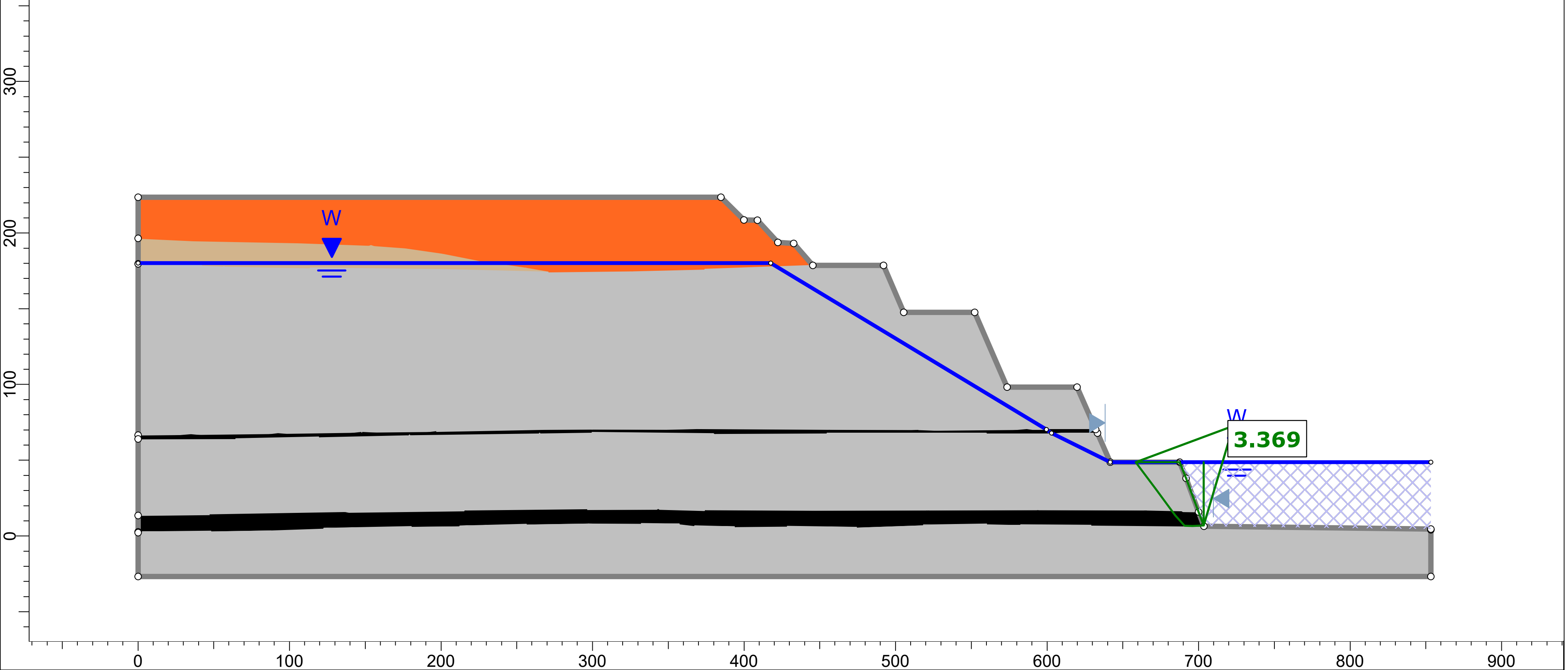
SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

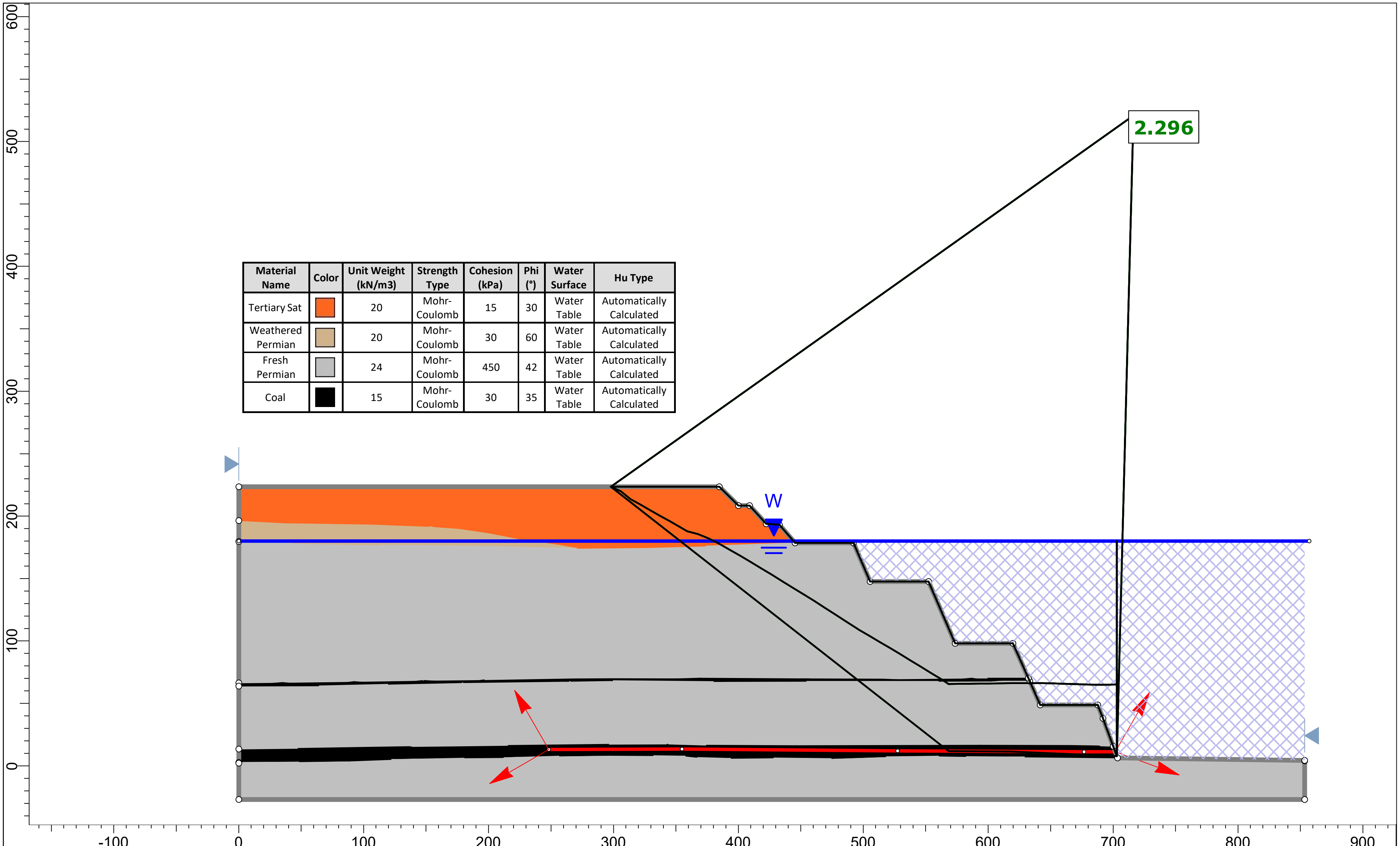


CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Janbu - Benches 3-4 Block Search	*Scenario* A-A' - Water 1/3rd Height of slope	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Spencer - Bench 4 Cuckoo Search	*Scenario* A-A' - Water 1/3rd Height of slope	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

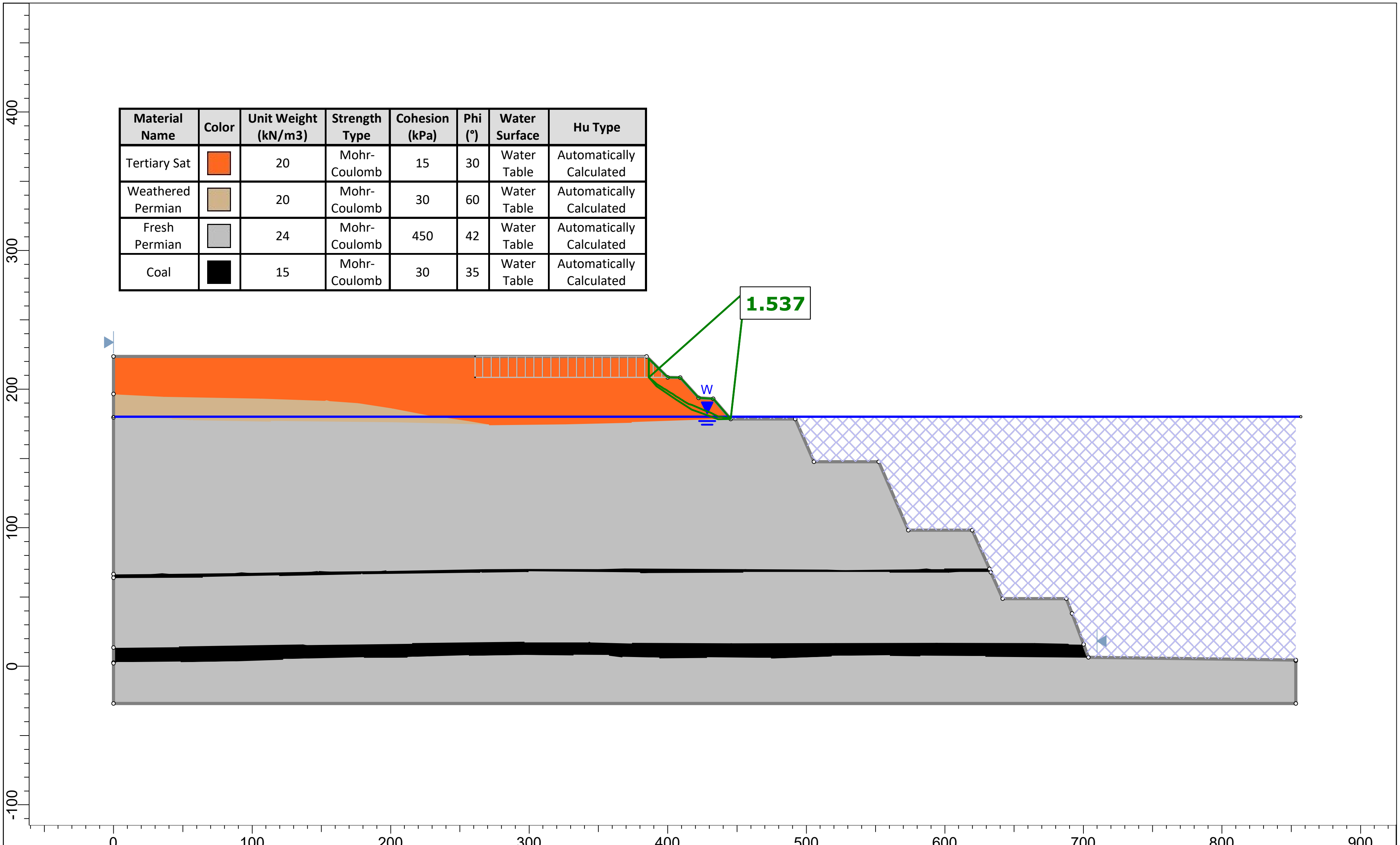
CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Spencer - Global Block Search	*Scenario*	A-A' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



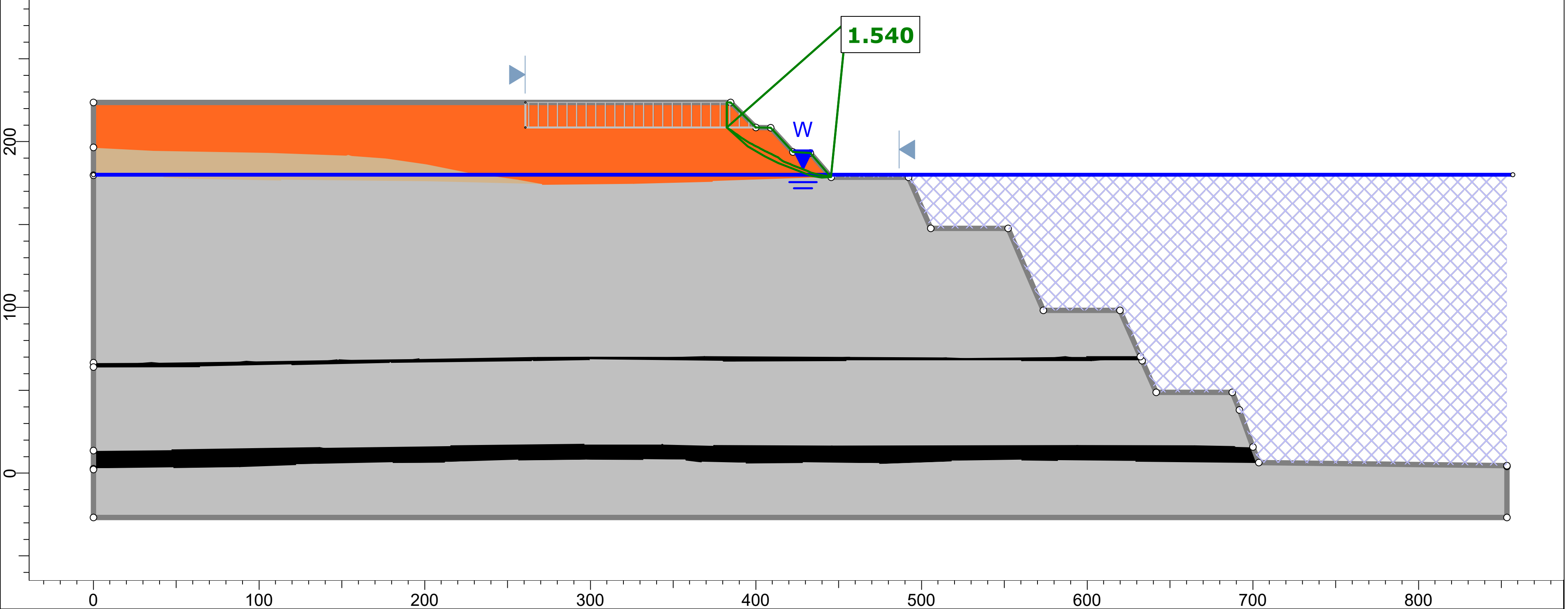
Coppabella PRCP Final Void Assessment

Search Method	Spencer - Global Cuckoo Search	*Scenario*	A-A' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

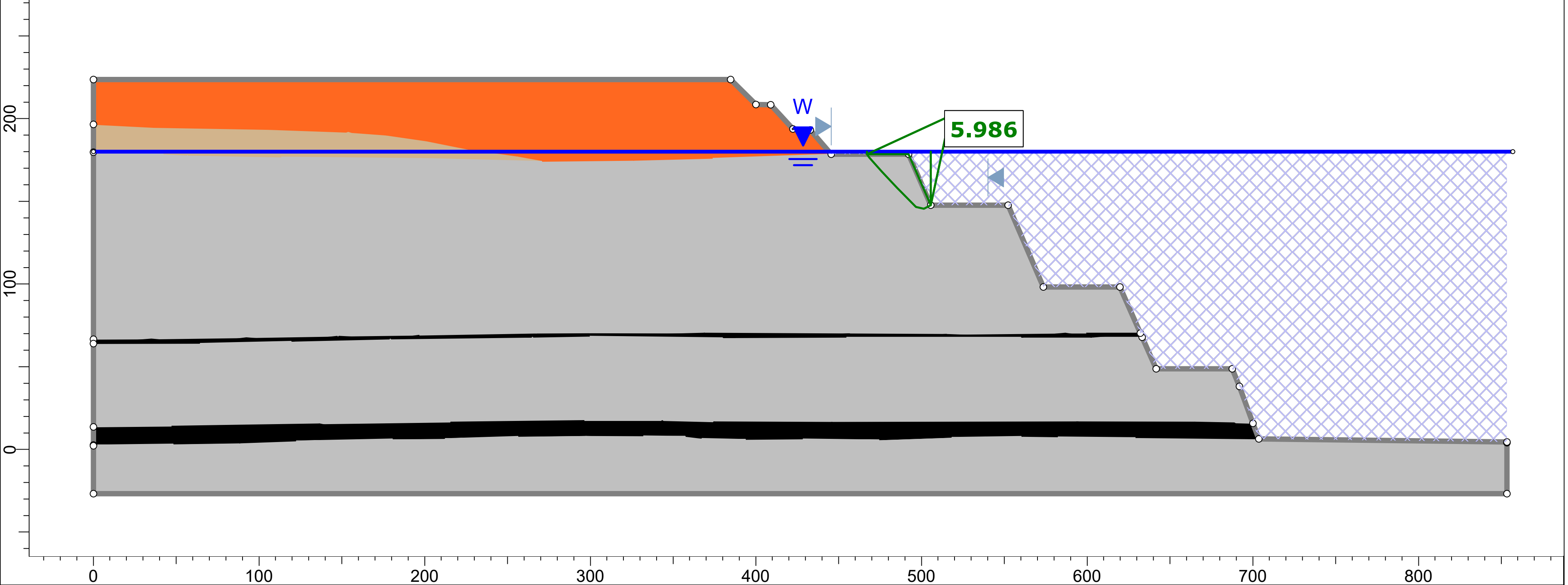


	Coppabella PRCP Final Void Assessment		
Search Method	Spencer - Overburden Cuckoo Search	*Scenario*	A-A' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

CARTLEDGE MINING AND GEOTECHNICS

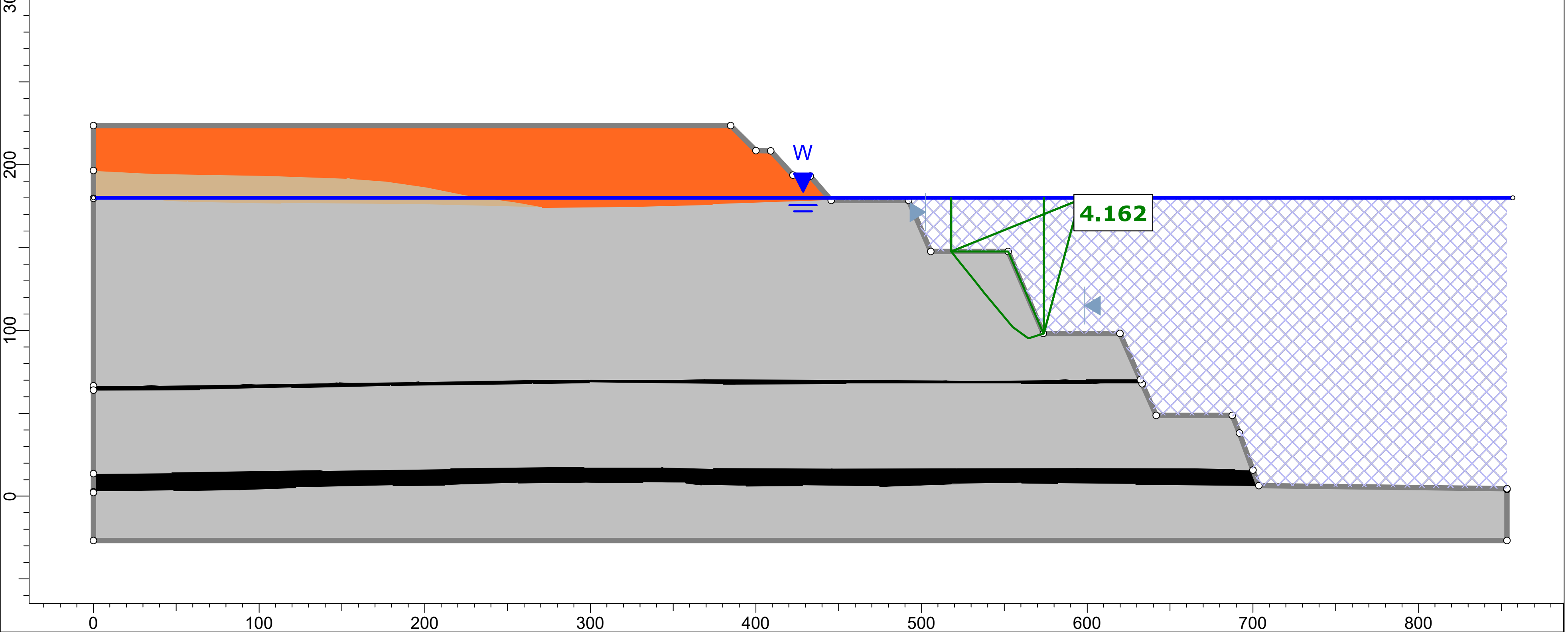
SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



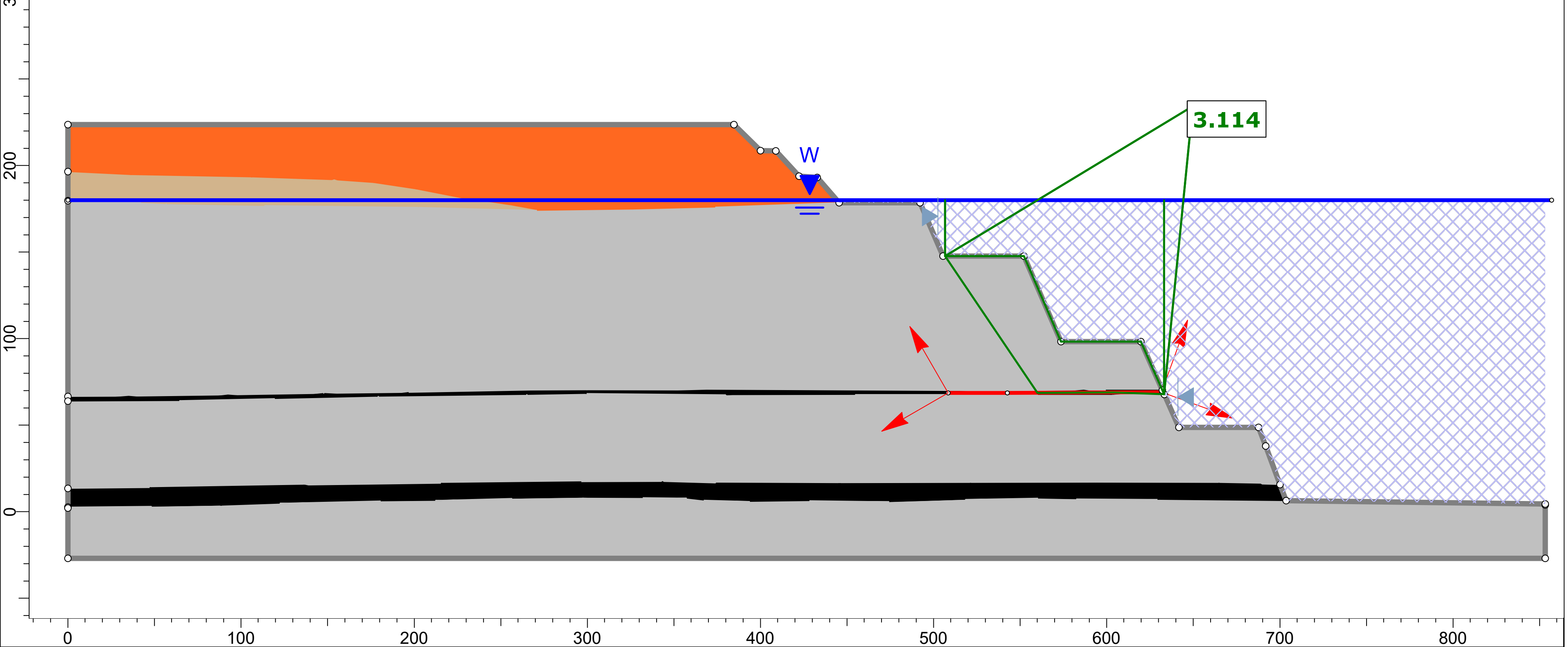
CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Janbu - Bench 1 Cuckoo Search	*Scenario* A-A' - Water at RL180m	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Janbu - Bench 2 Cuckoo Search	*Scenario* A-A' - Water at RL180m	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



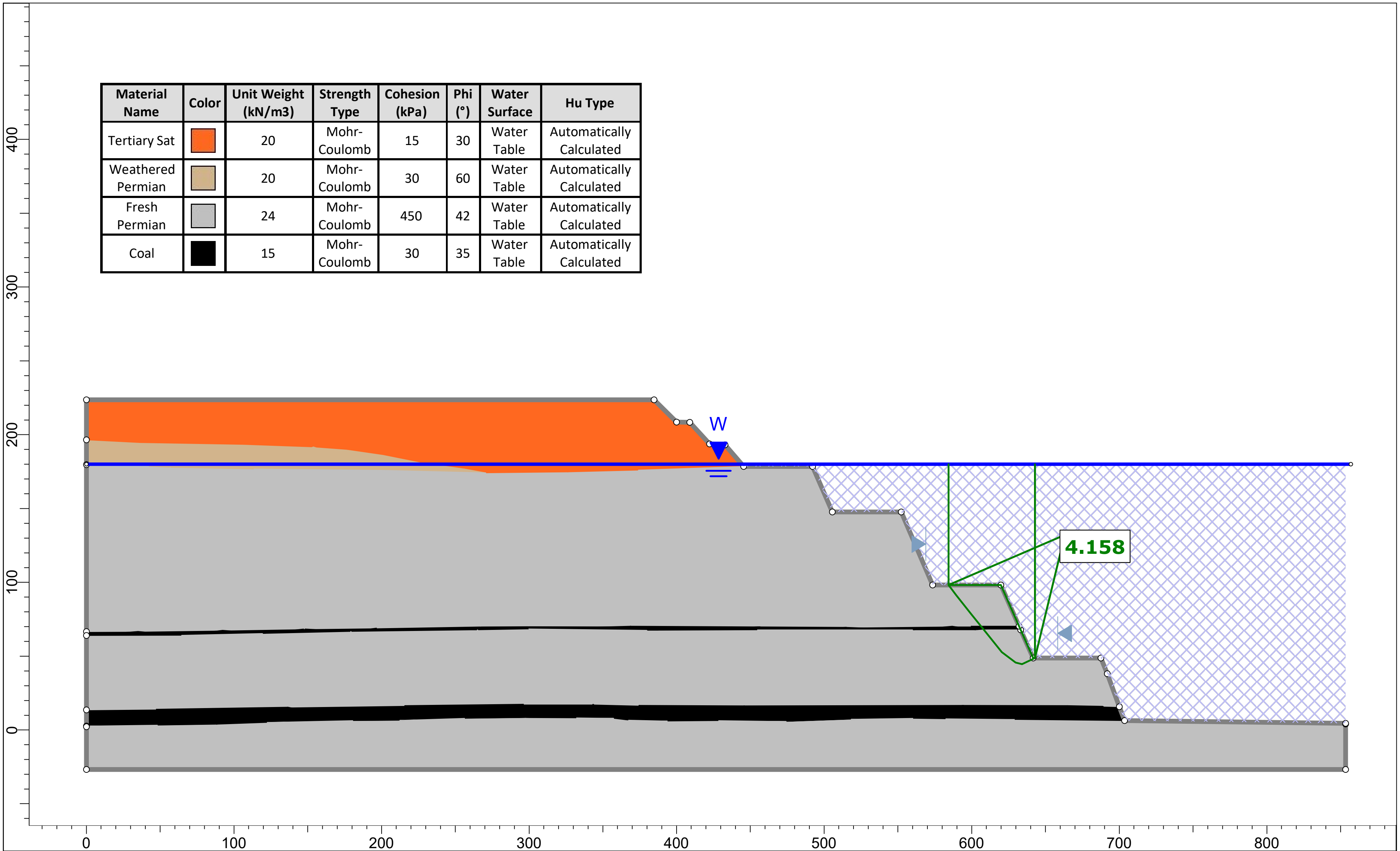
Coppabella PRCP Final Void Assessment

Search Method	Janbu - Benches 2-3 Block Search	*Scenario*	A-A' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



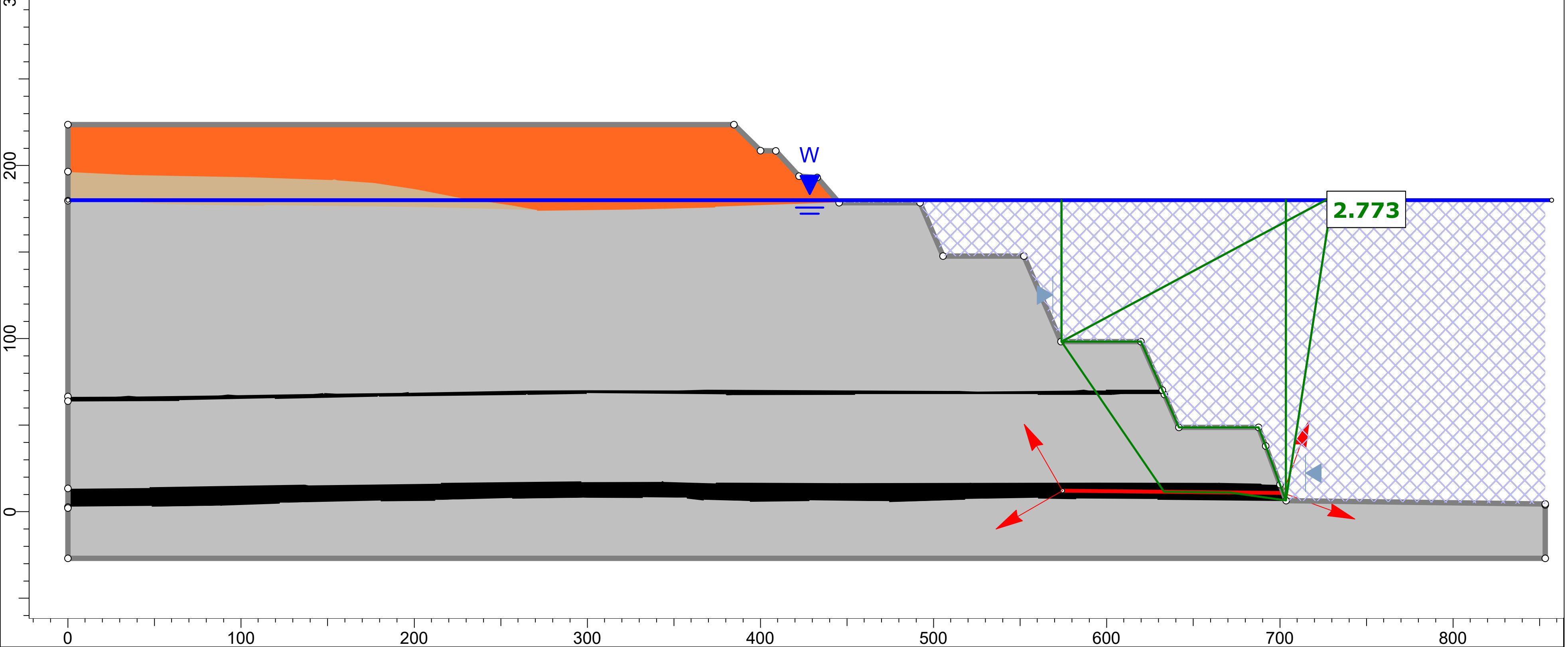
CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 3 Cuckoo Search	*Scenario*	A-A' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



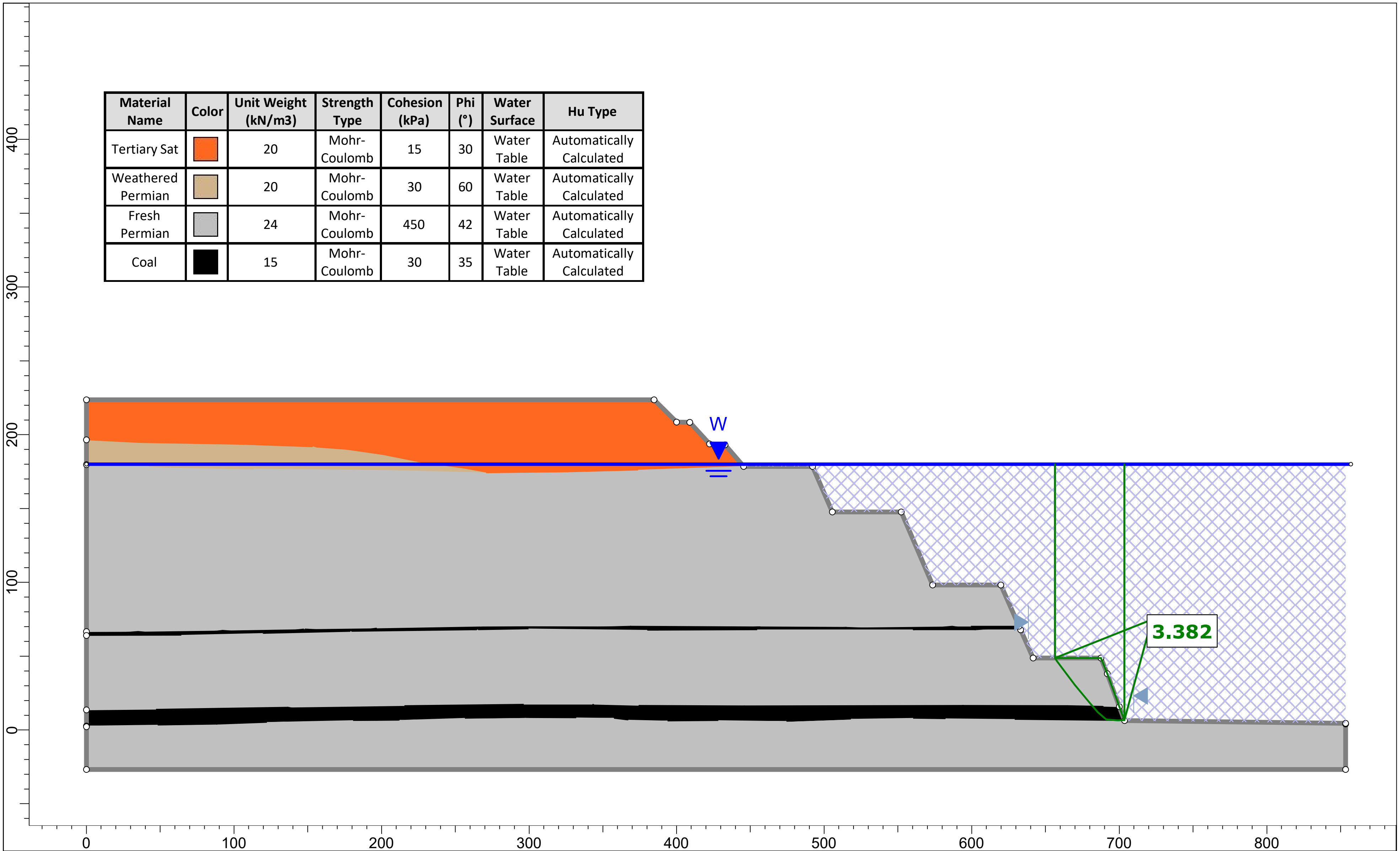
Coppabella PRCP Final Void Assessment

Search Method	Janbu - Benches 3-4 Block Search	*Scenario*	A-A' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



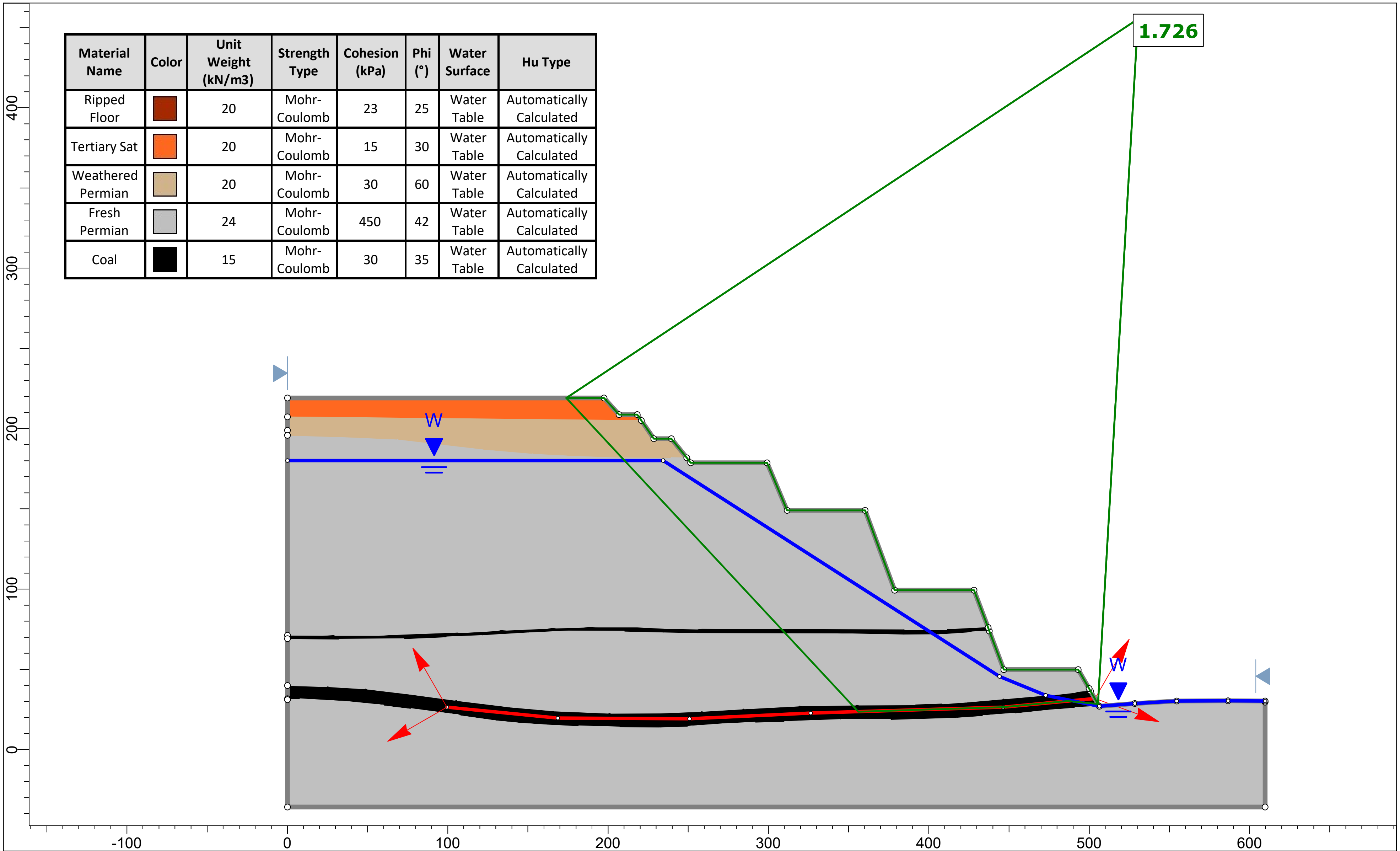
CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 4 Cuckoo Search	*Scenario*	A-A' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

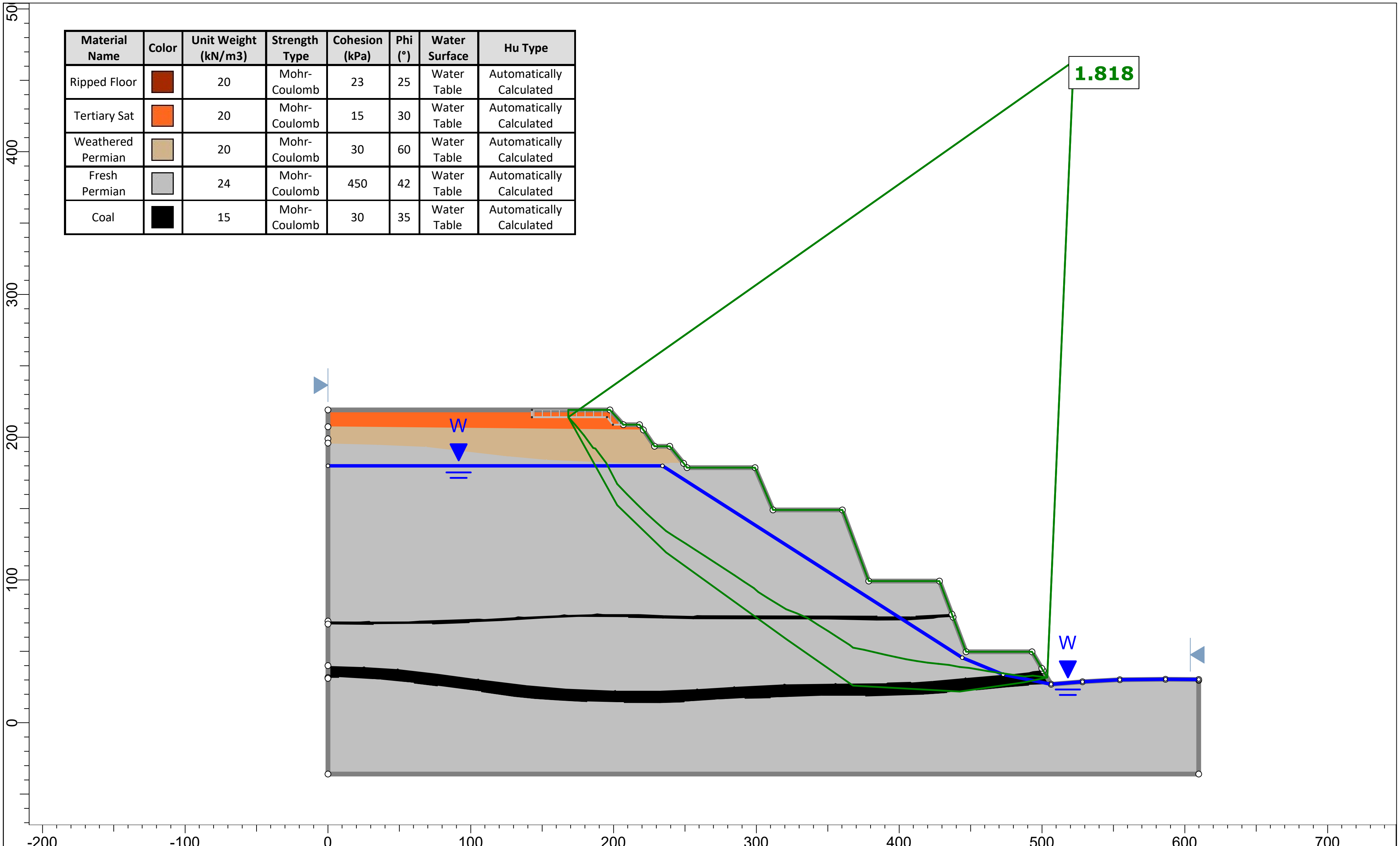


Coppabella PRCP Final Void Assessment

Search Method	Janbu - Global Block Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

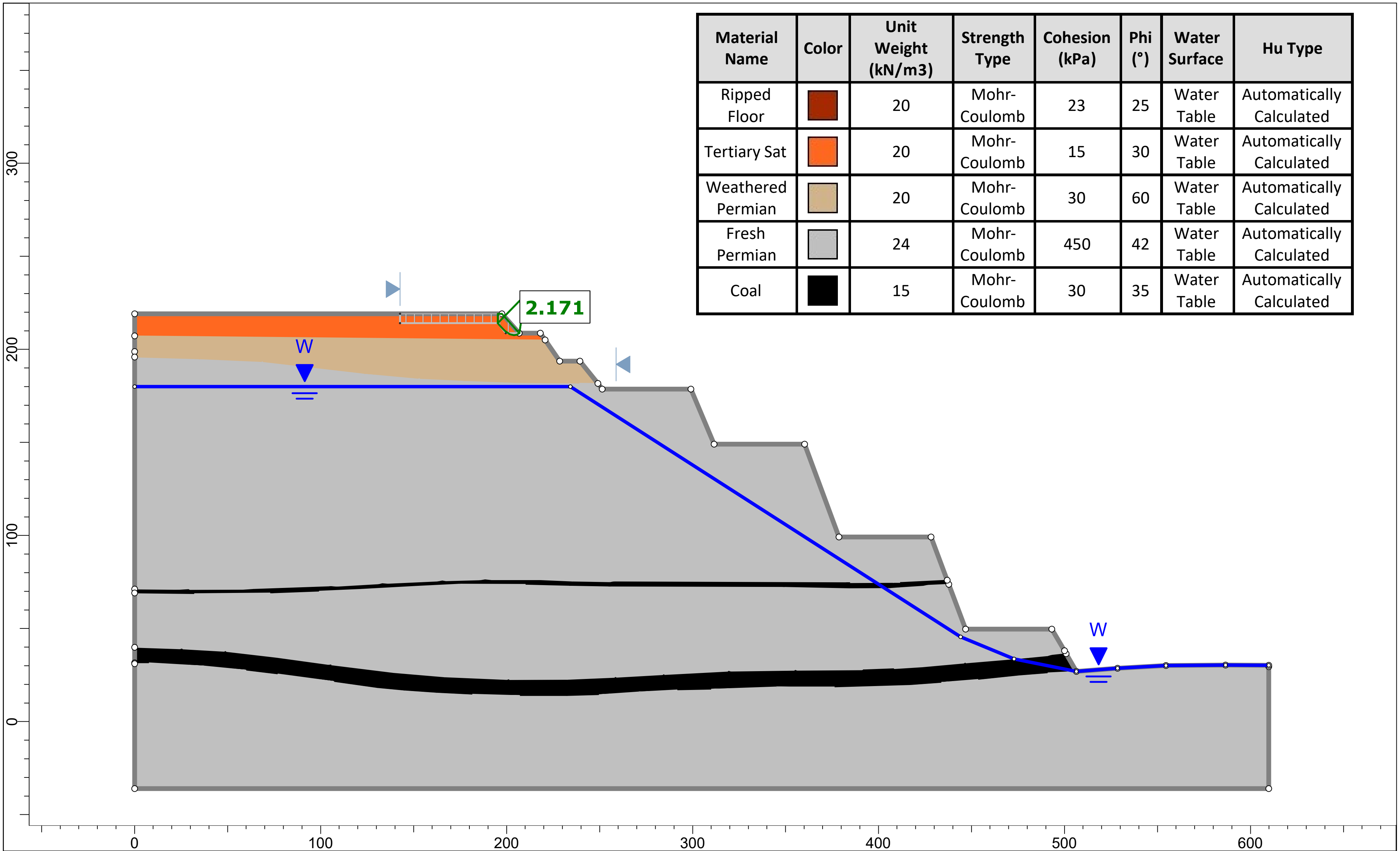


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Search Method	Spencer - Global Cuckoo Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

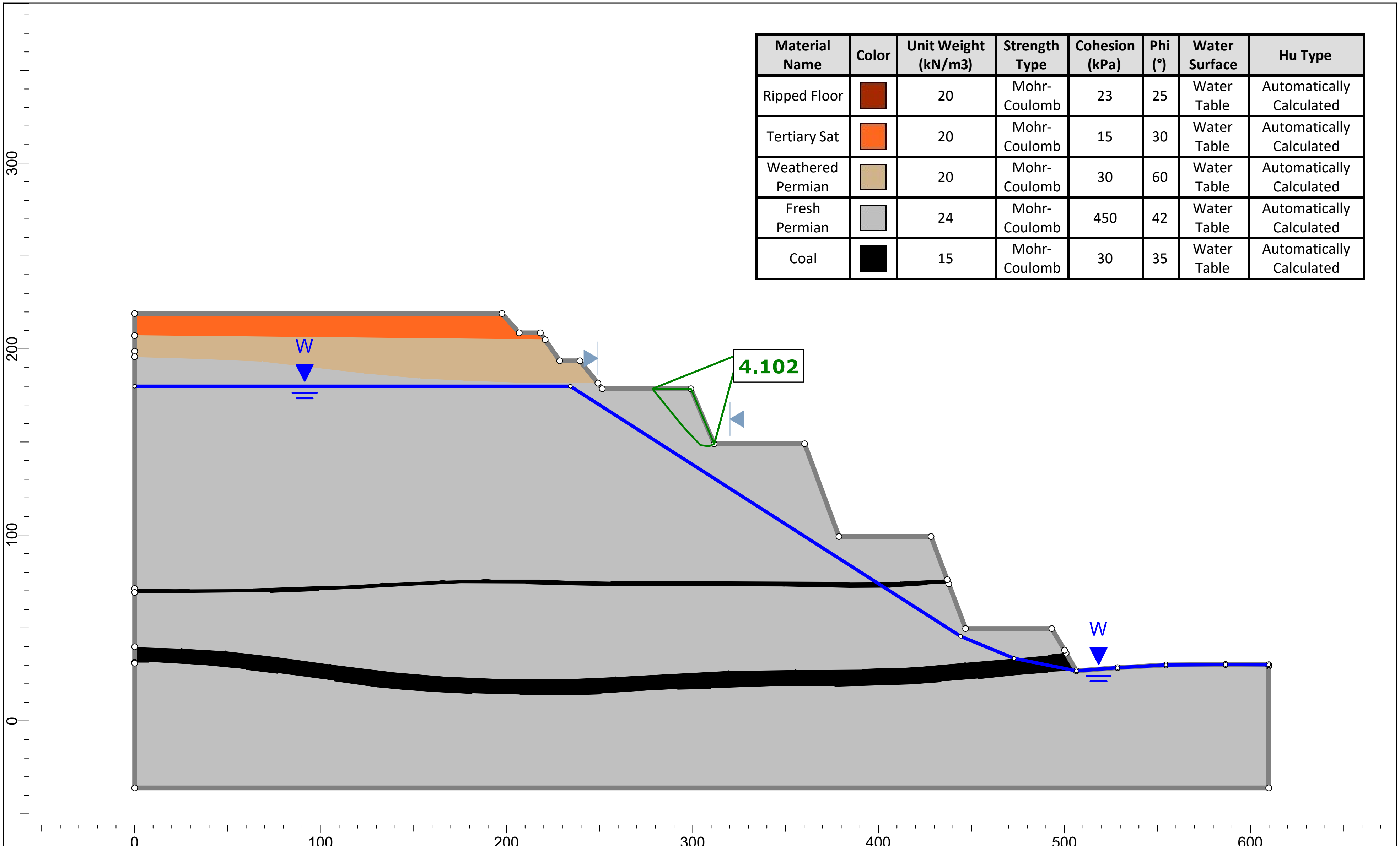


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Search Method	Spencer - Overburden Cuckoo Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



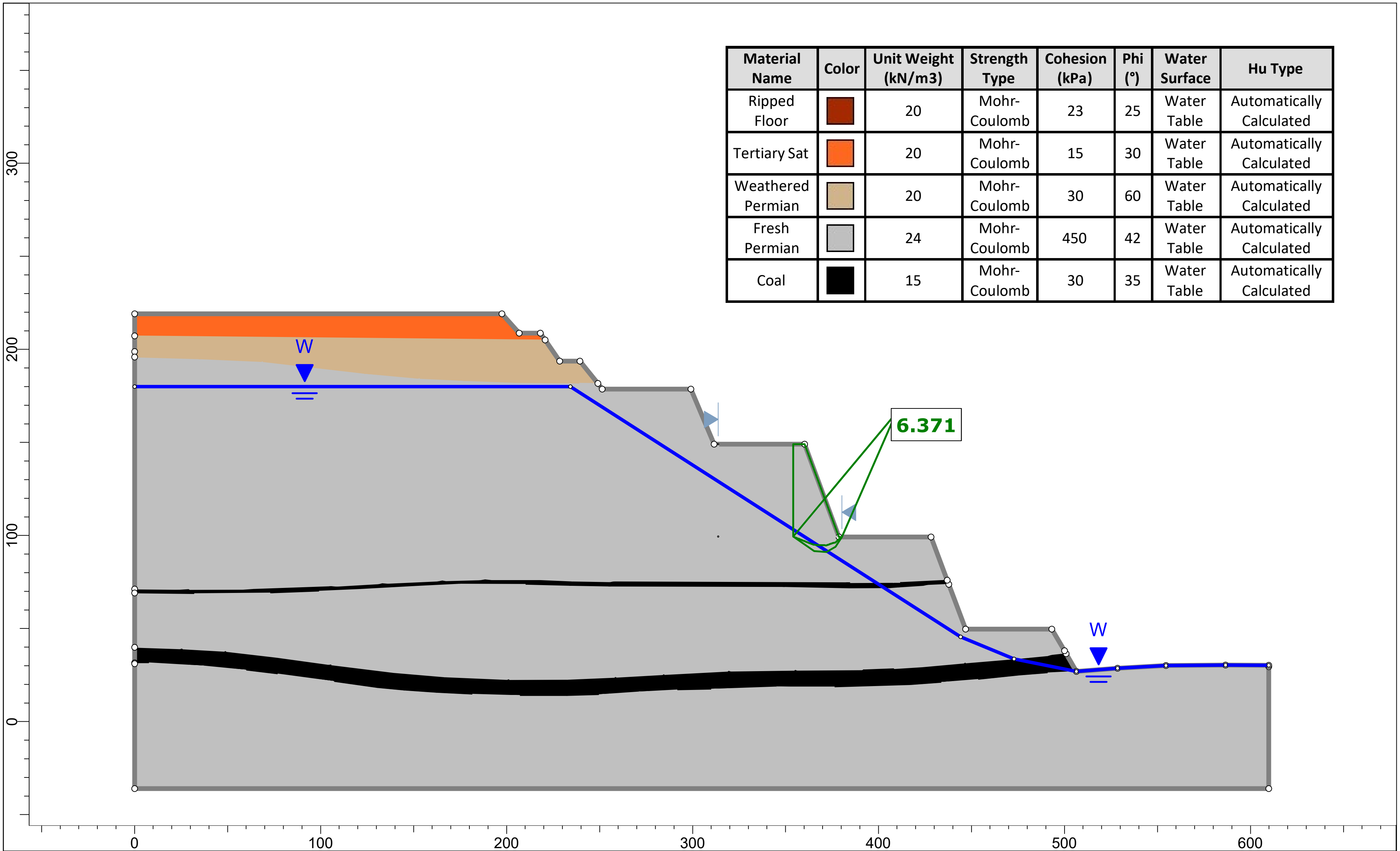
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 1 Cuckoo Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031



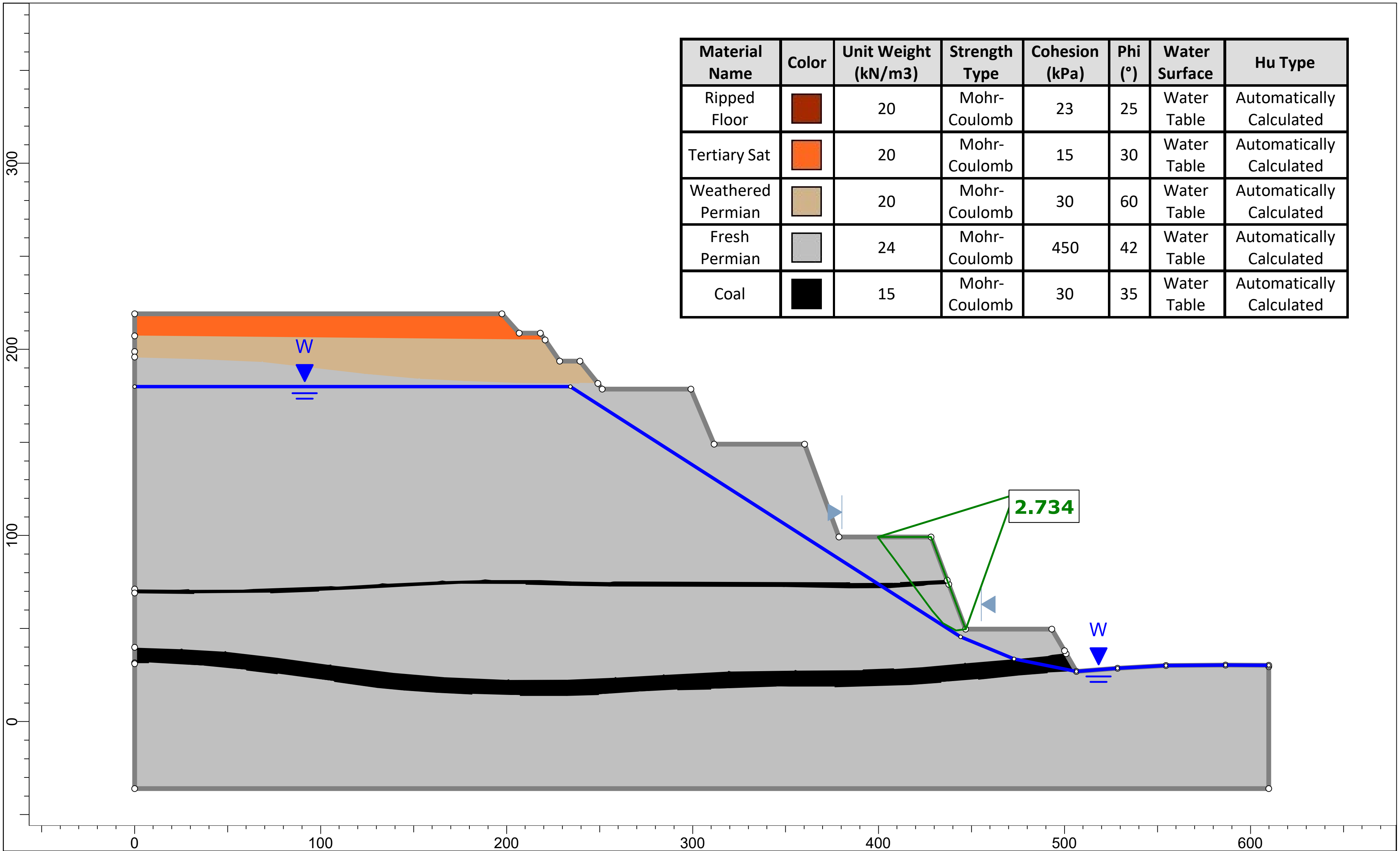
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 2 Cuckoo Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



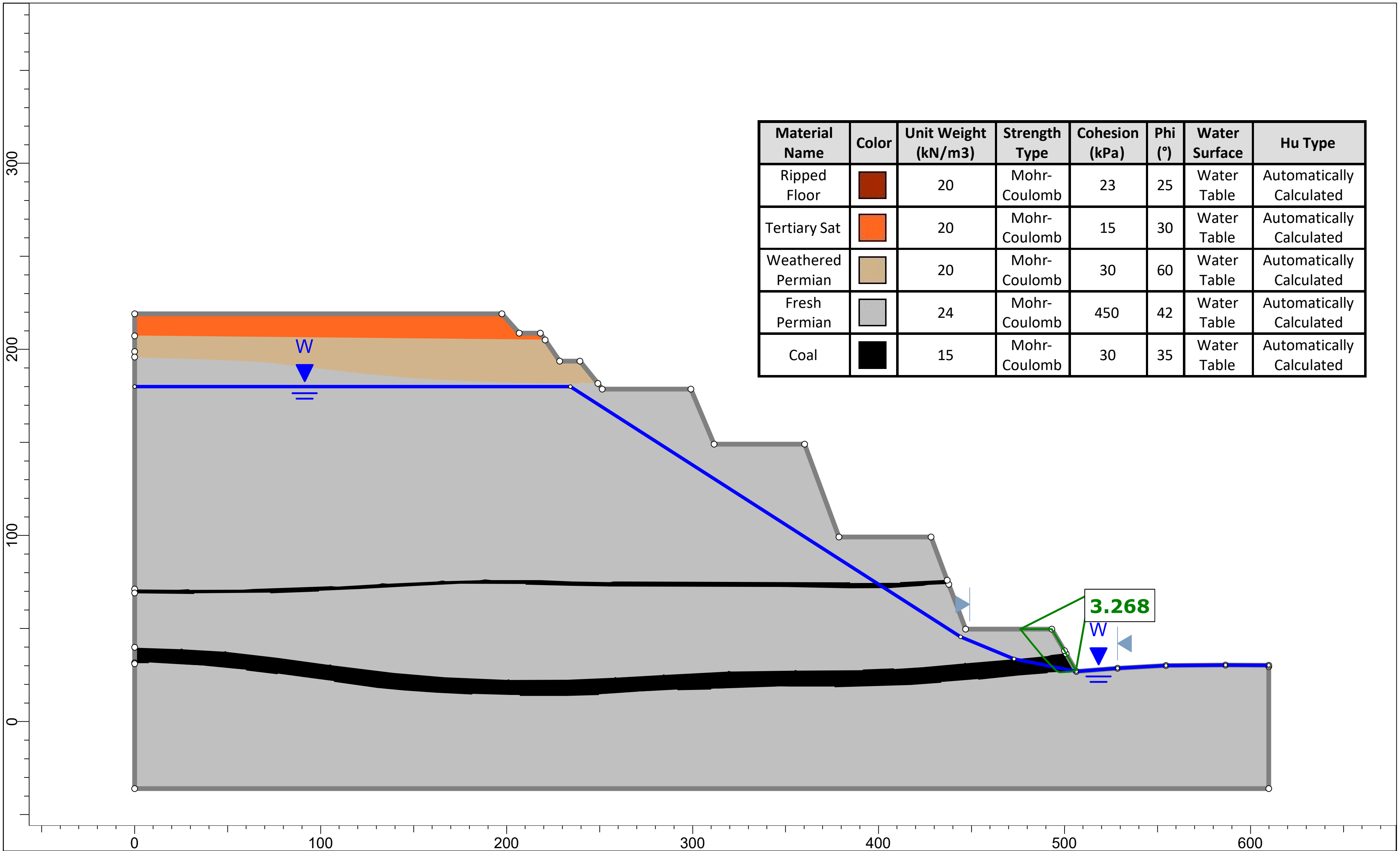
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 3 Cuckoo Search	Scenario	B-B' - No Water in Pit
Drawn By	B.Ryan	Company	CMJV - Peabody Energy
Date	24/01/2024	File Name	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

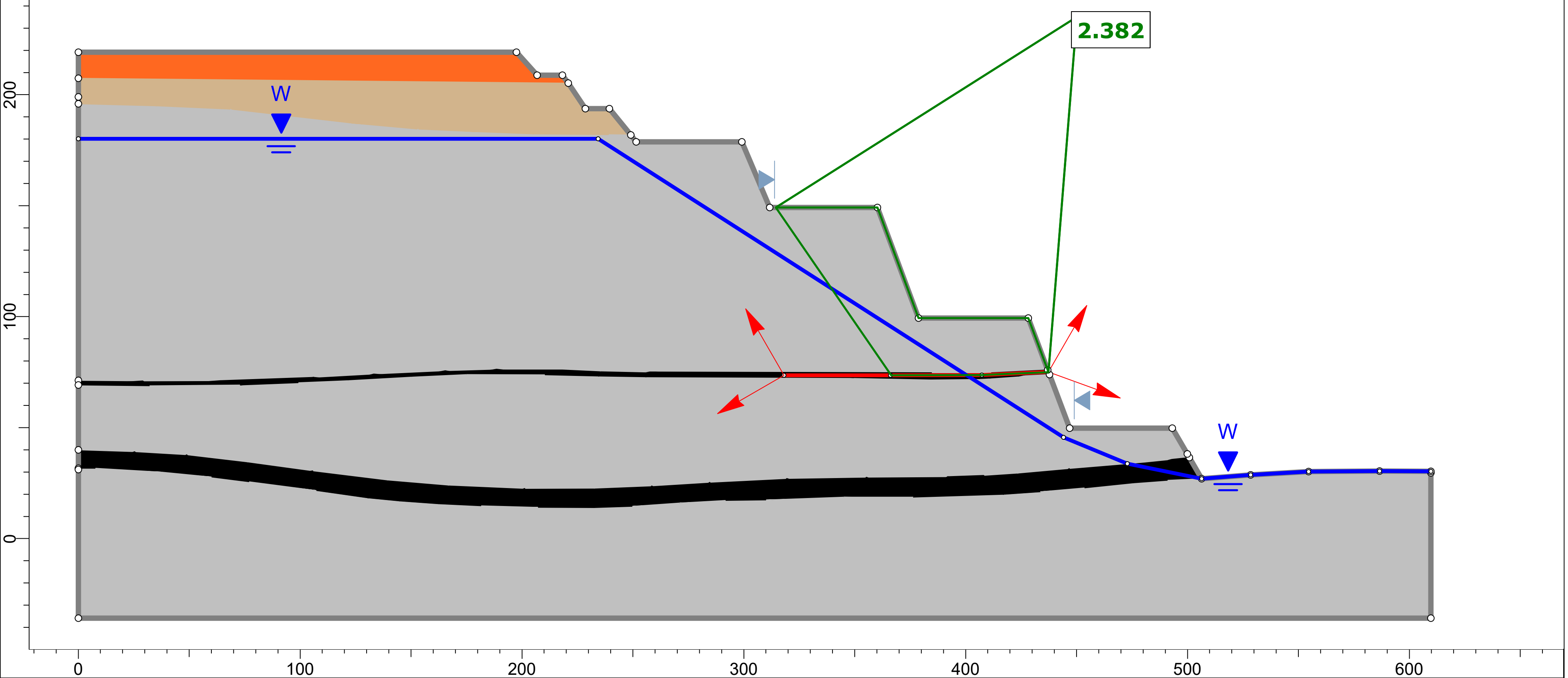
CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

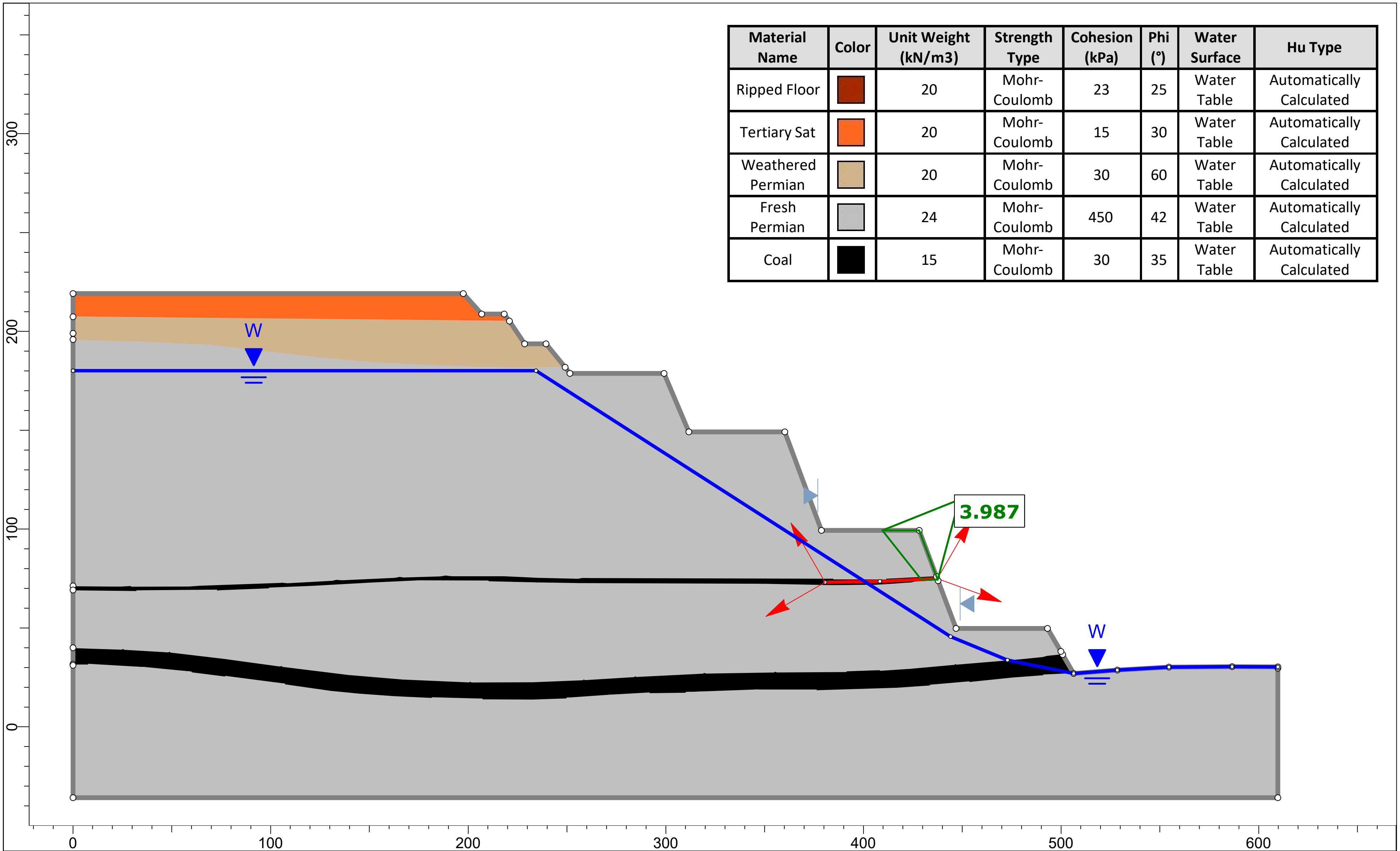
Search Method	Janbu - Bench 4 Cuckoo Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Janbu - Benches 2-3 Block Search	*Scenario* B-B' - No Water in Pit	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	

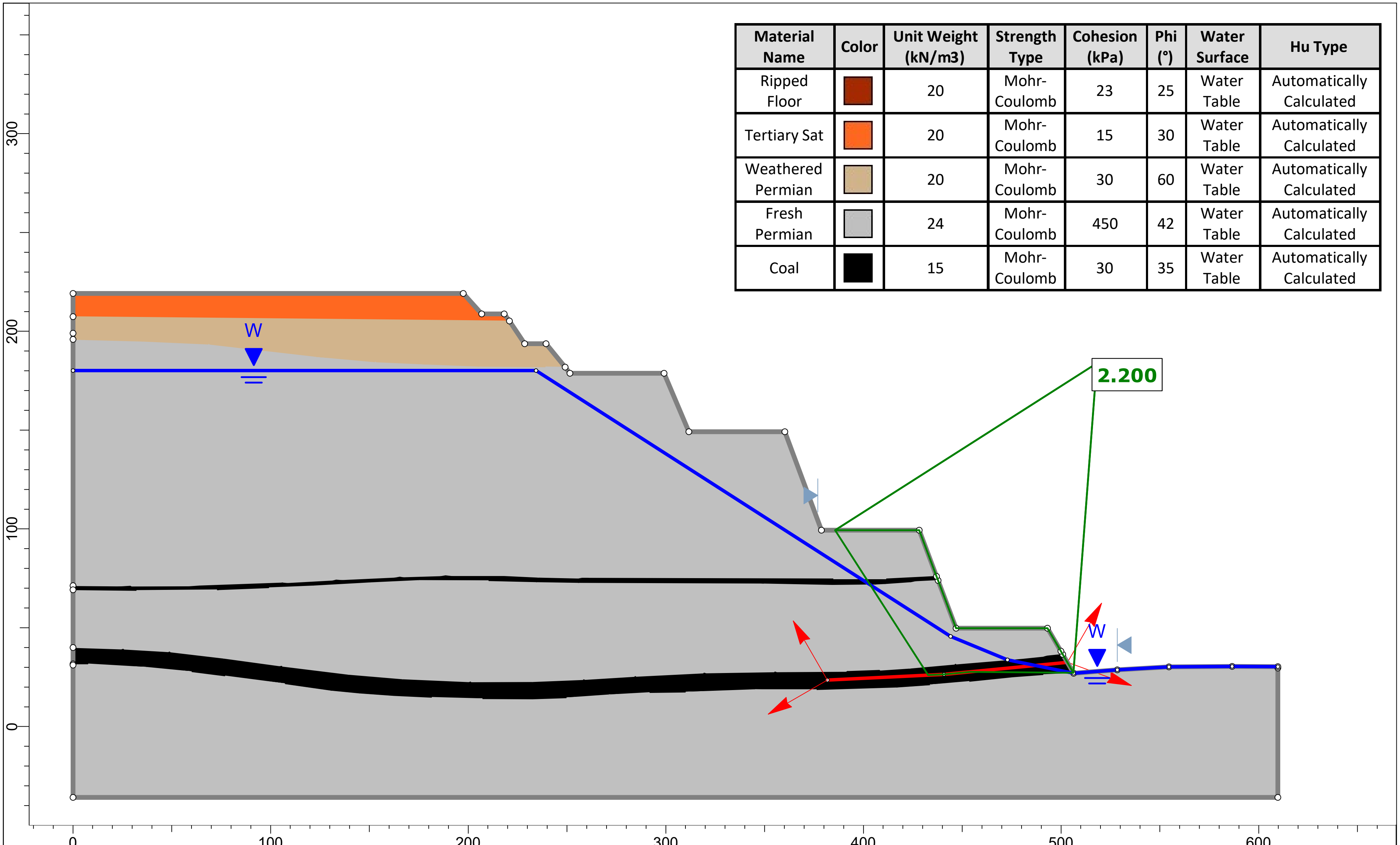


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Search Method	Janbu - Bench 3 Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

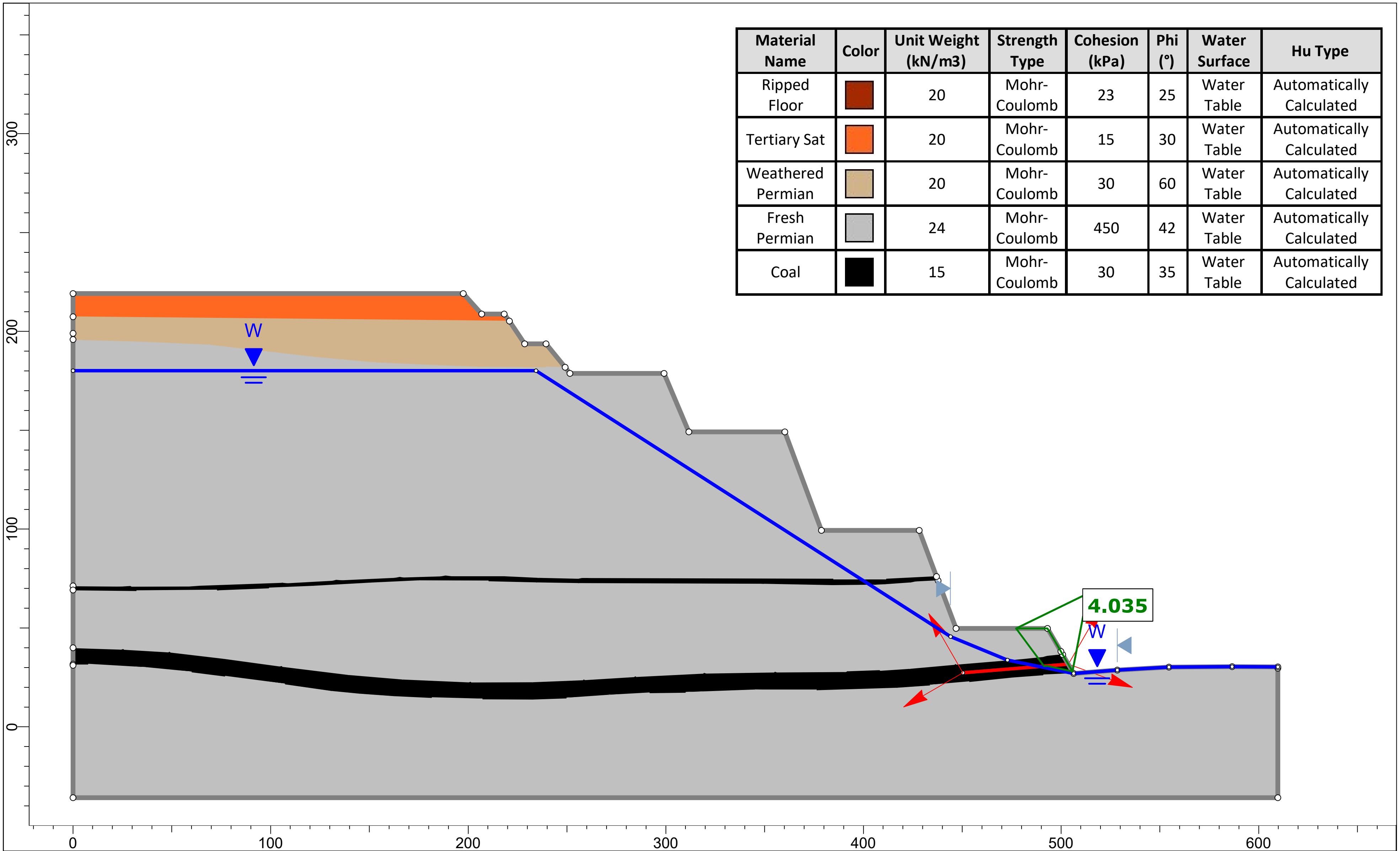
CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Benches 3-4 Block Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

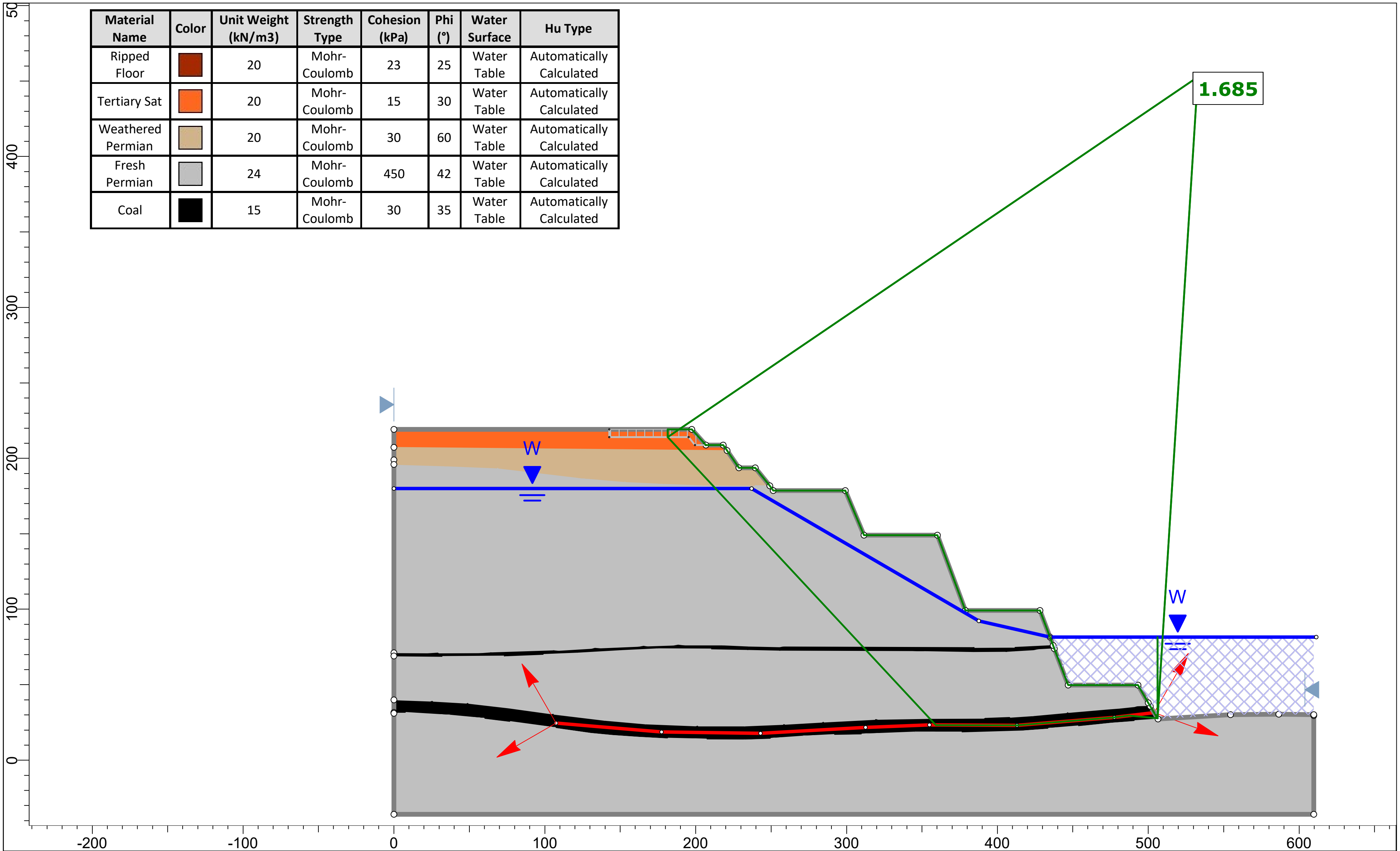


CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 4 Block Search	*Scenario*	B-B' - No Water in Pit
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



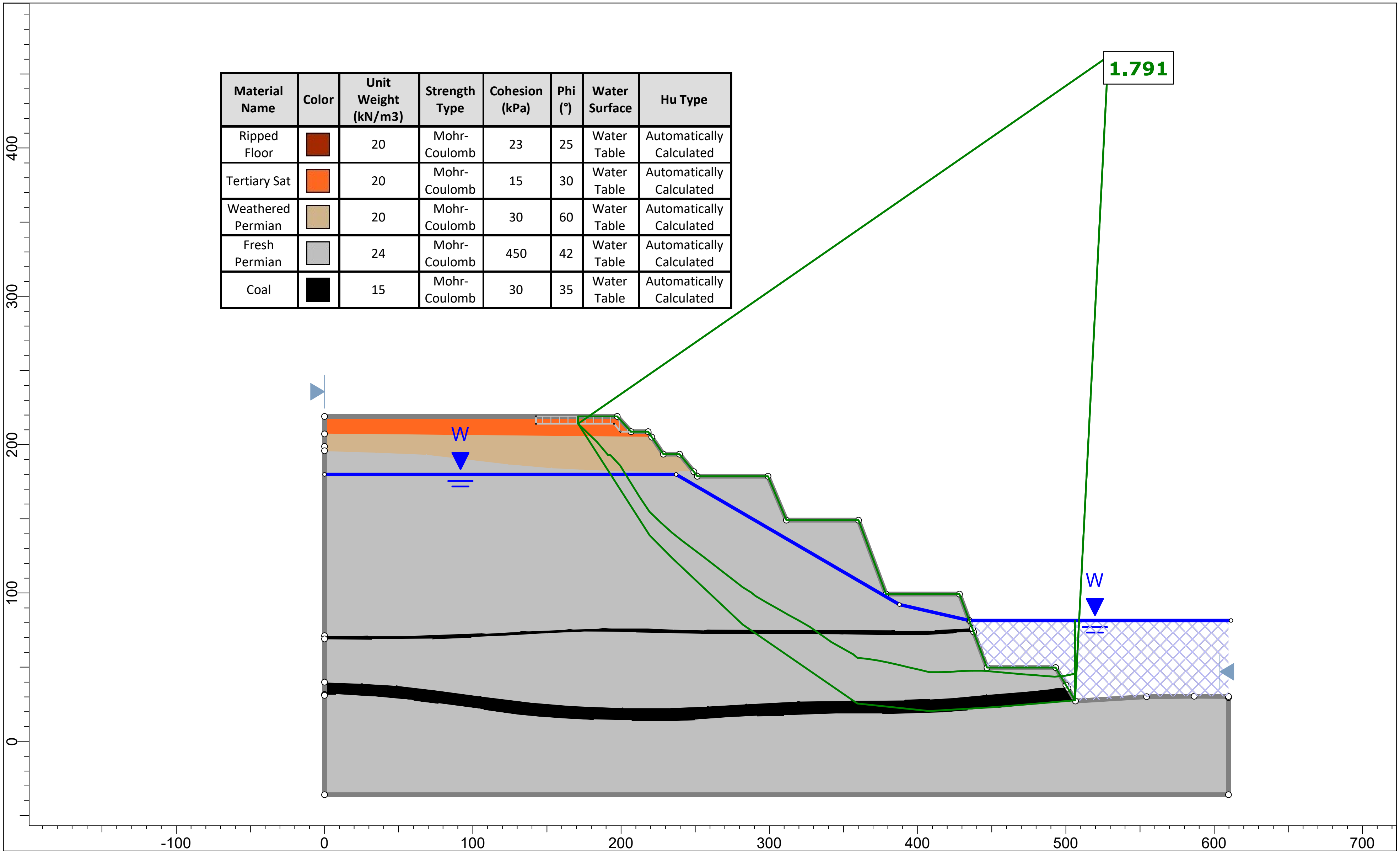
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Global Block Search	*Scenario*	B-B' - Water 1/3rd Height of Highwall
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



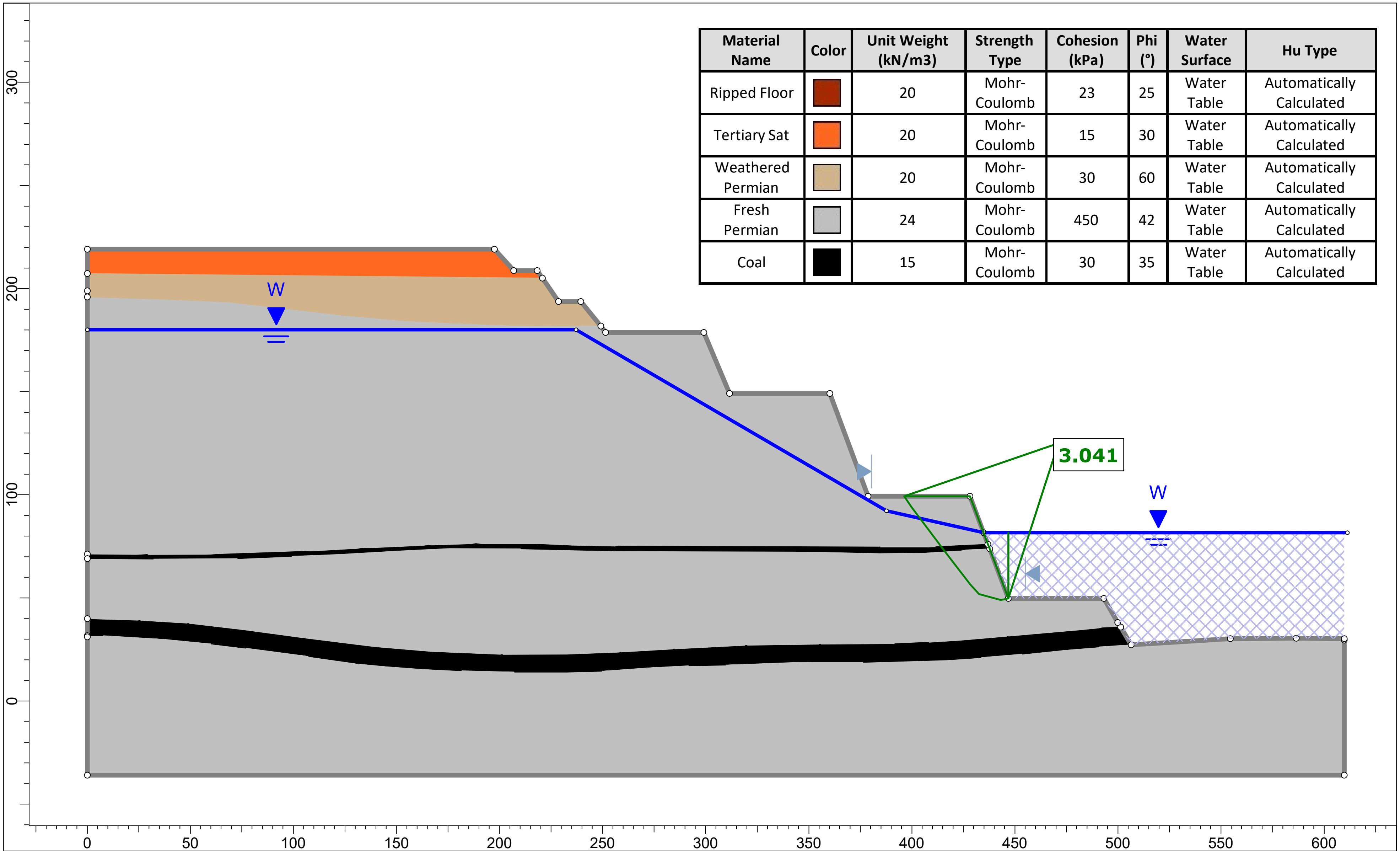
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Spencer - Global Cuckoo Search	*Scenario*	B-B' - Water 1/3rd Height of Highwall
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



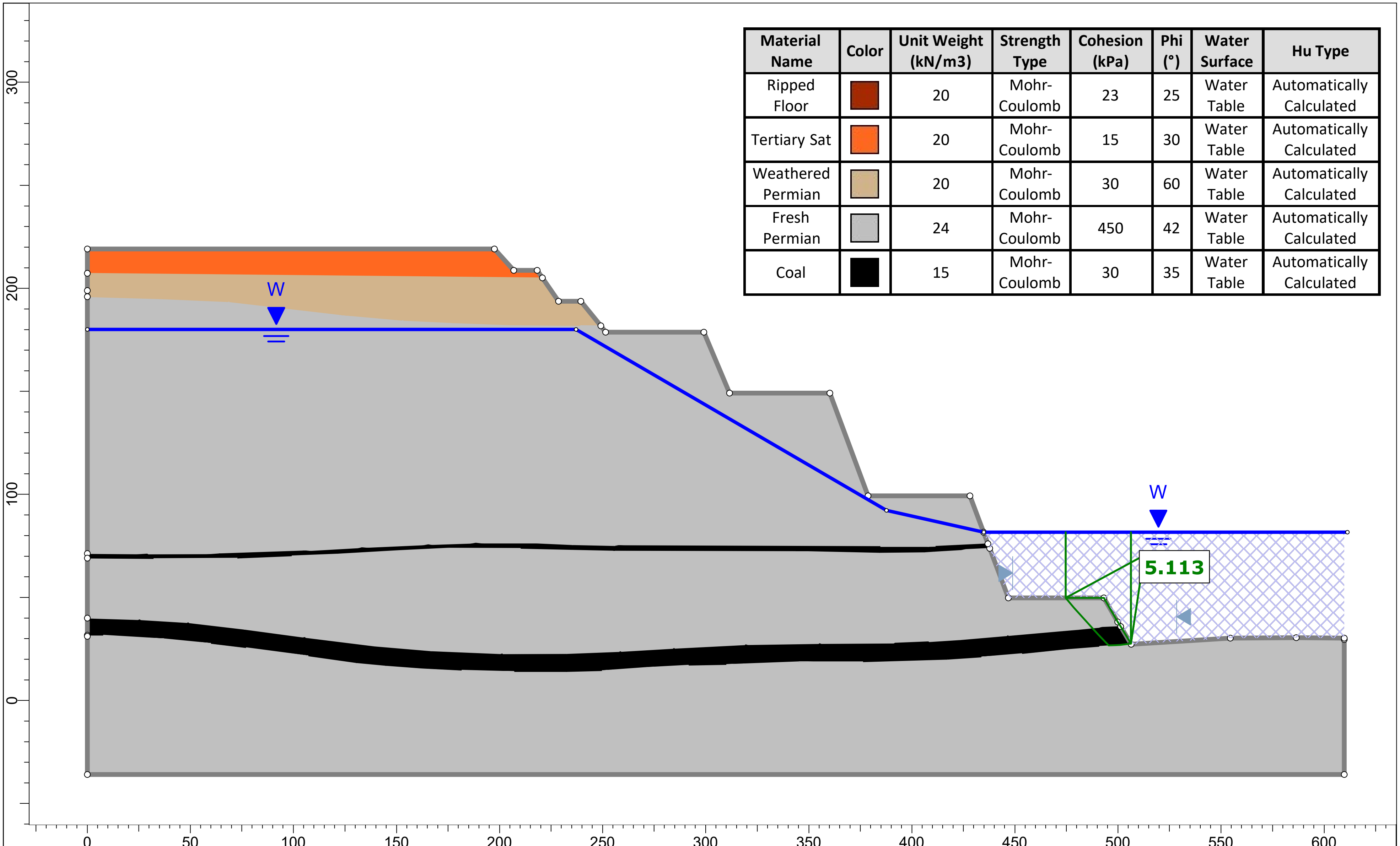
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 3 Cuckoo Search	*Scenario*	B-B' - Water 1/3rd Height of Highwall
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

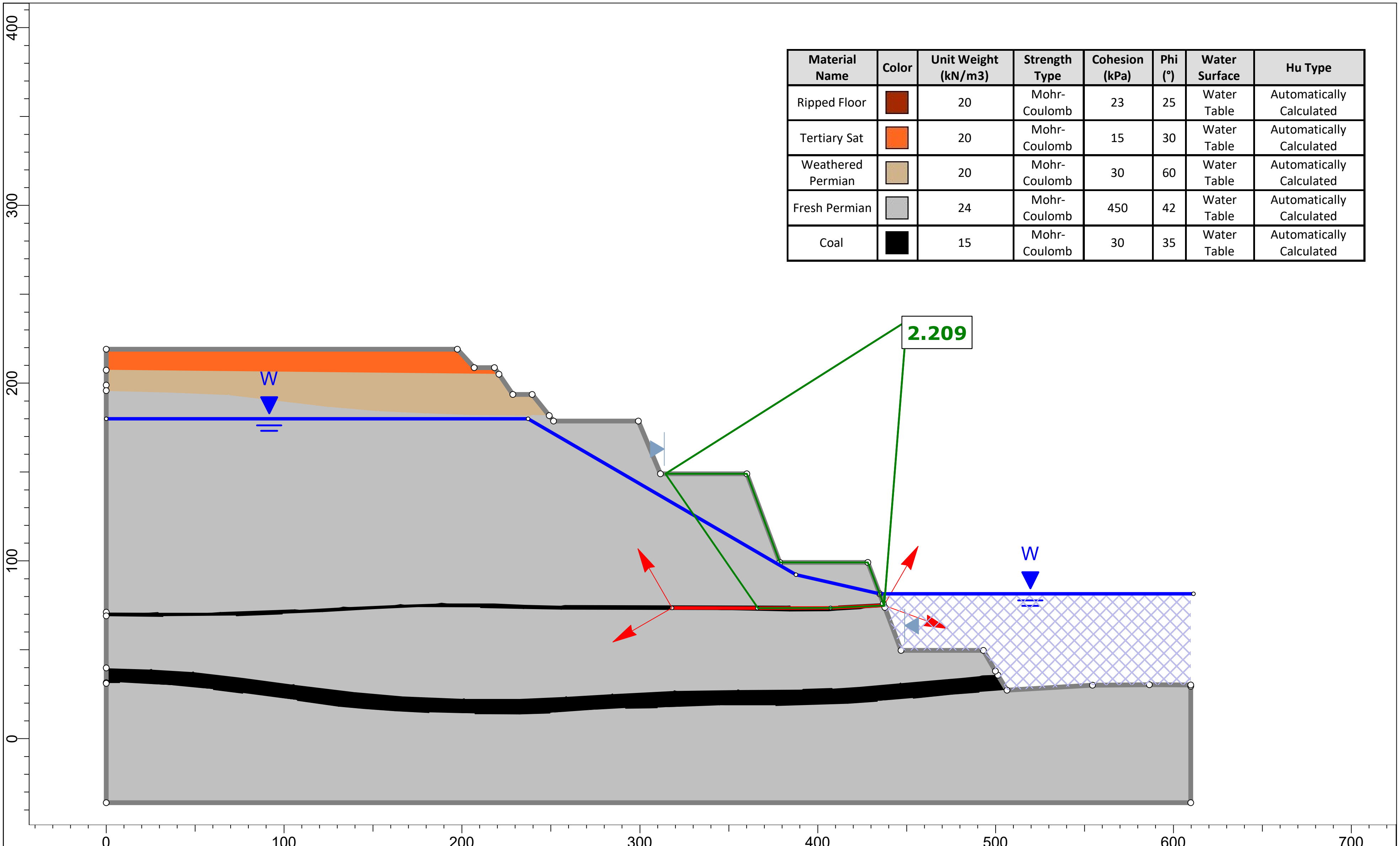
CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

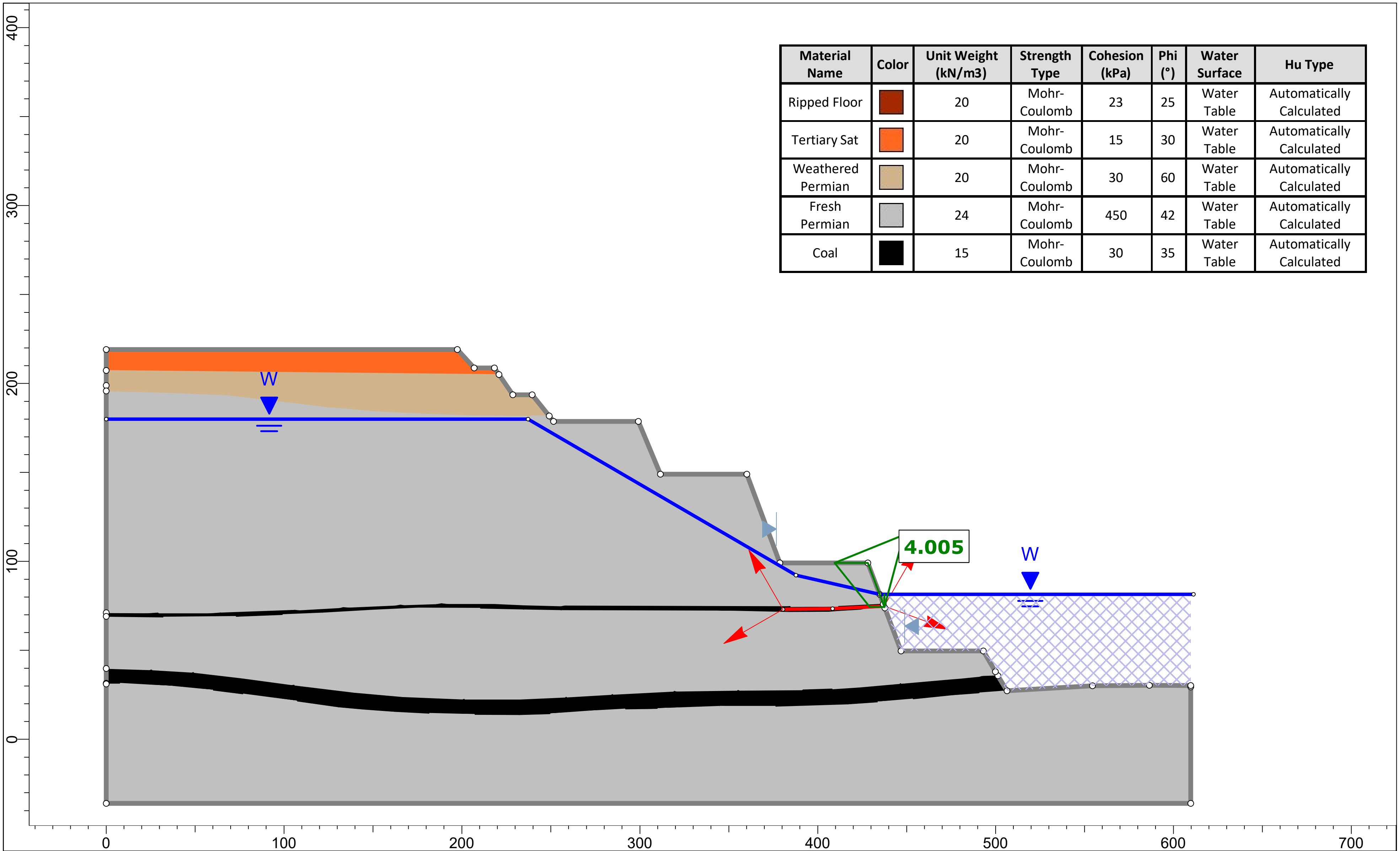
Search Method	Janbu - Bench 4 Cuckoo Search	*Scenario*	B-B' - Water 1/3rd Height of Highwall
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Janbu - Benches 2-3 Block Search	*Scenario* B-B' - Water 1/3rd Height of Highwall	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	



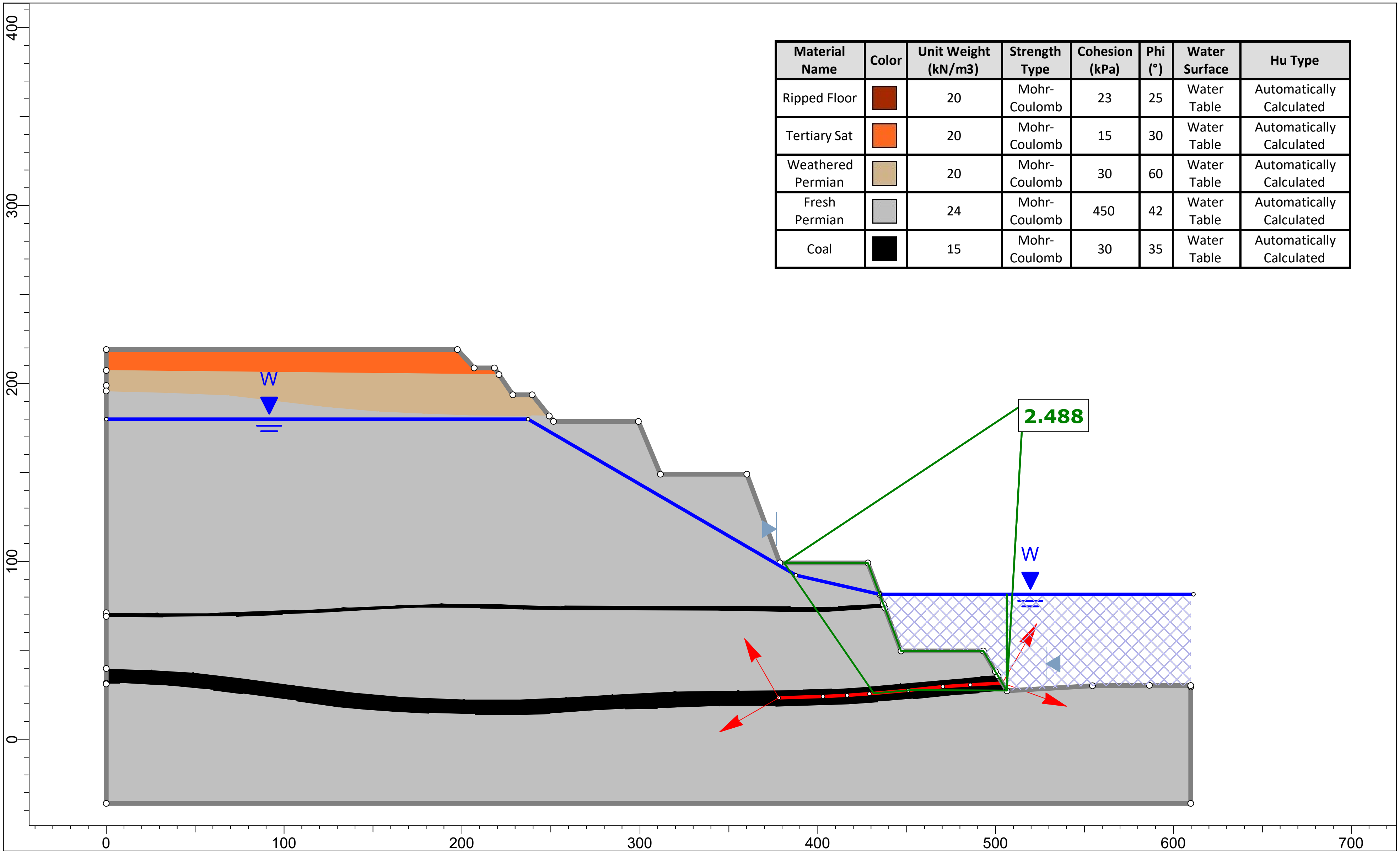
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 3 Block Search	*Scenario*	B-B' - Water 1/3rd Height of Highwall
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031



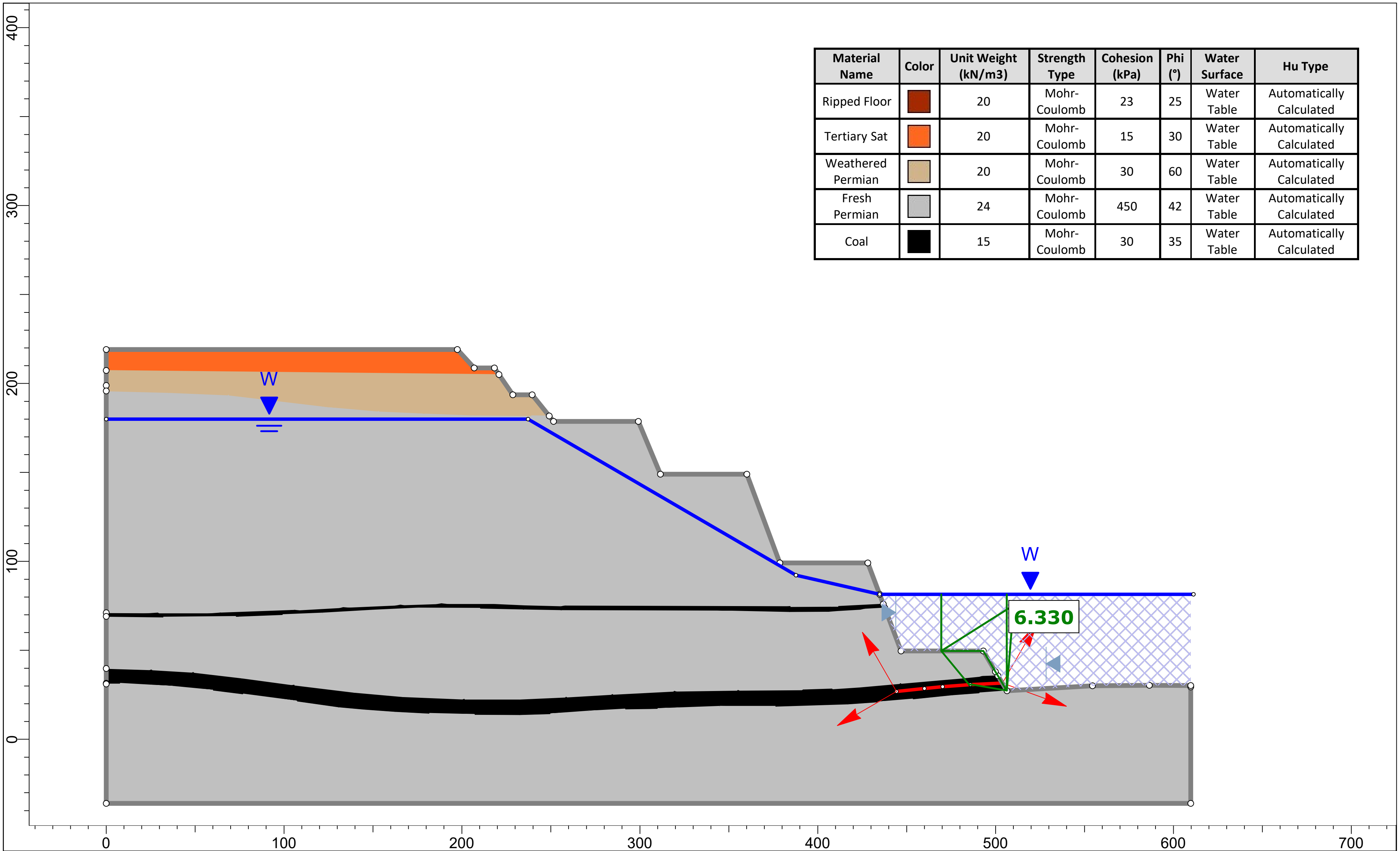
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Benches 3-4 Block Search	*Scenario*	B-B' - Water 1/3rd Height of Highwall
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

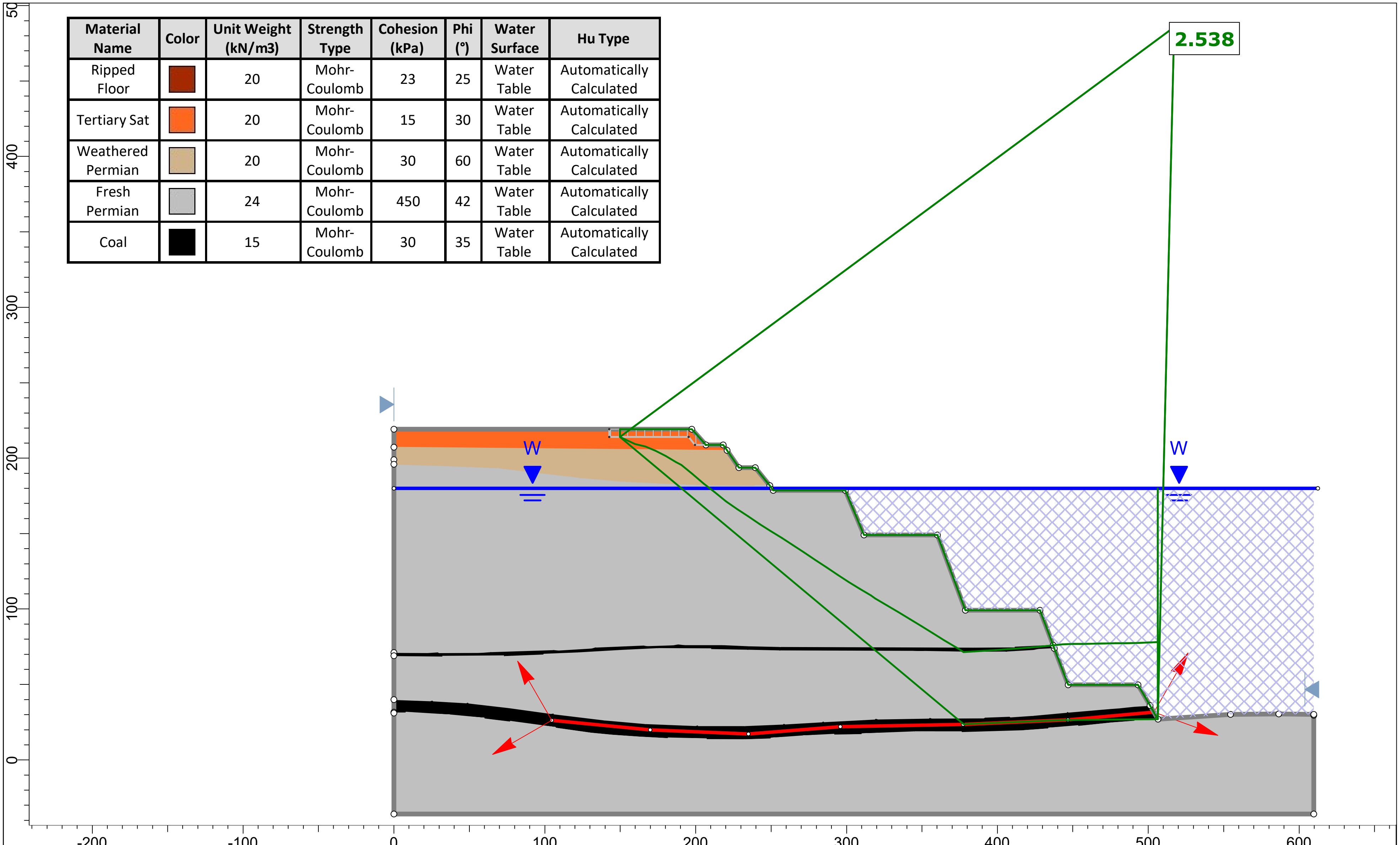
CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 4 Block Search	*Scenario*	B-B' - Water 1/3rd Height of Highwall
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

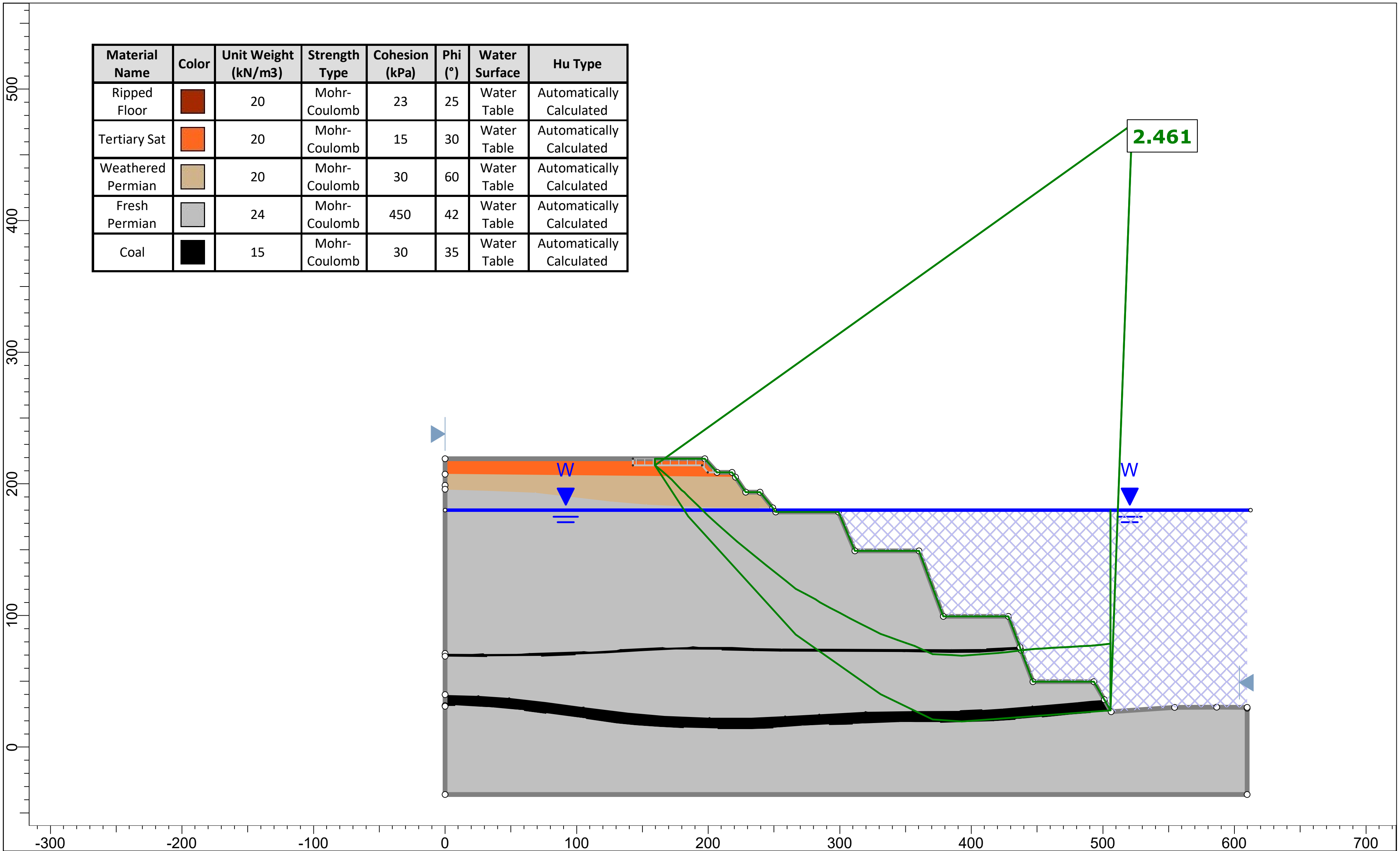


CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Search Method	Janbu - Global Block Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



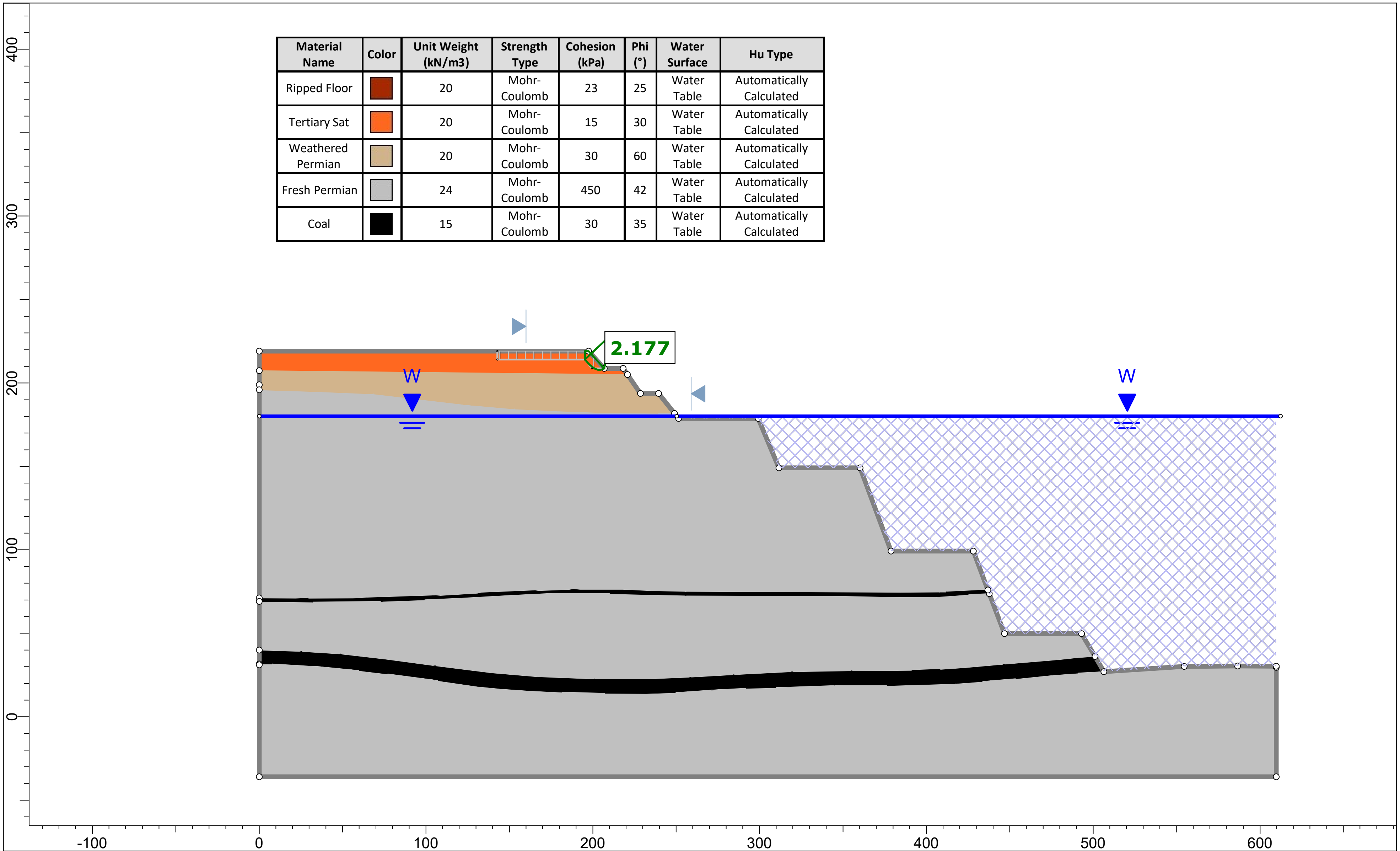
	Coppabella PRCP Final Void Assessment

CARTLEDGE MINING AND GEOTECHNICS

Search Method	Spencer - Global Cuckoo Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

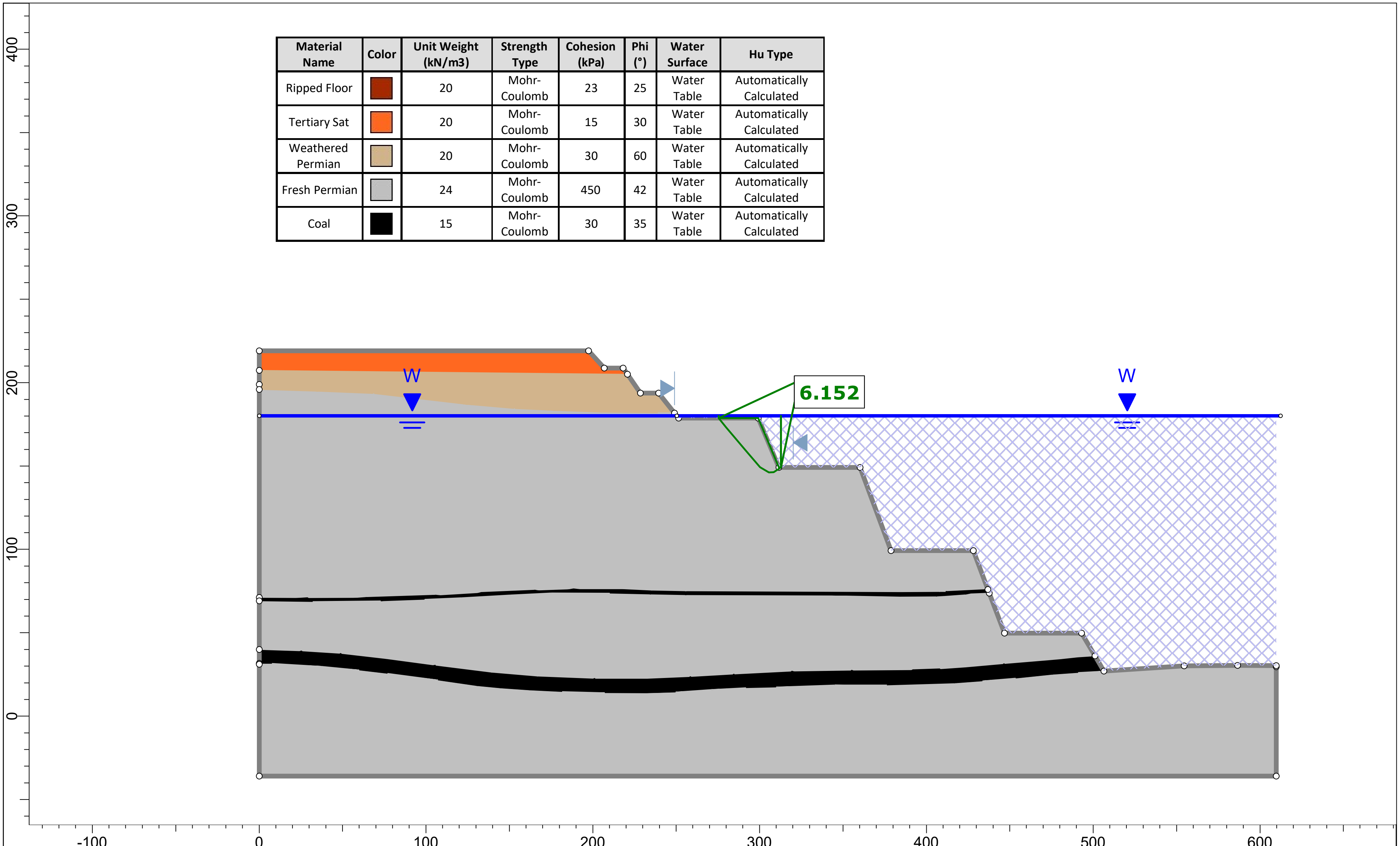


CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment

Search Method	Spencer - Overburden Cuckoo Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



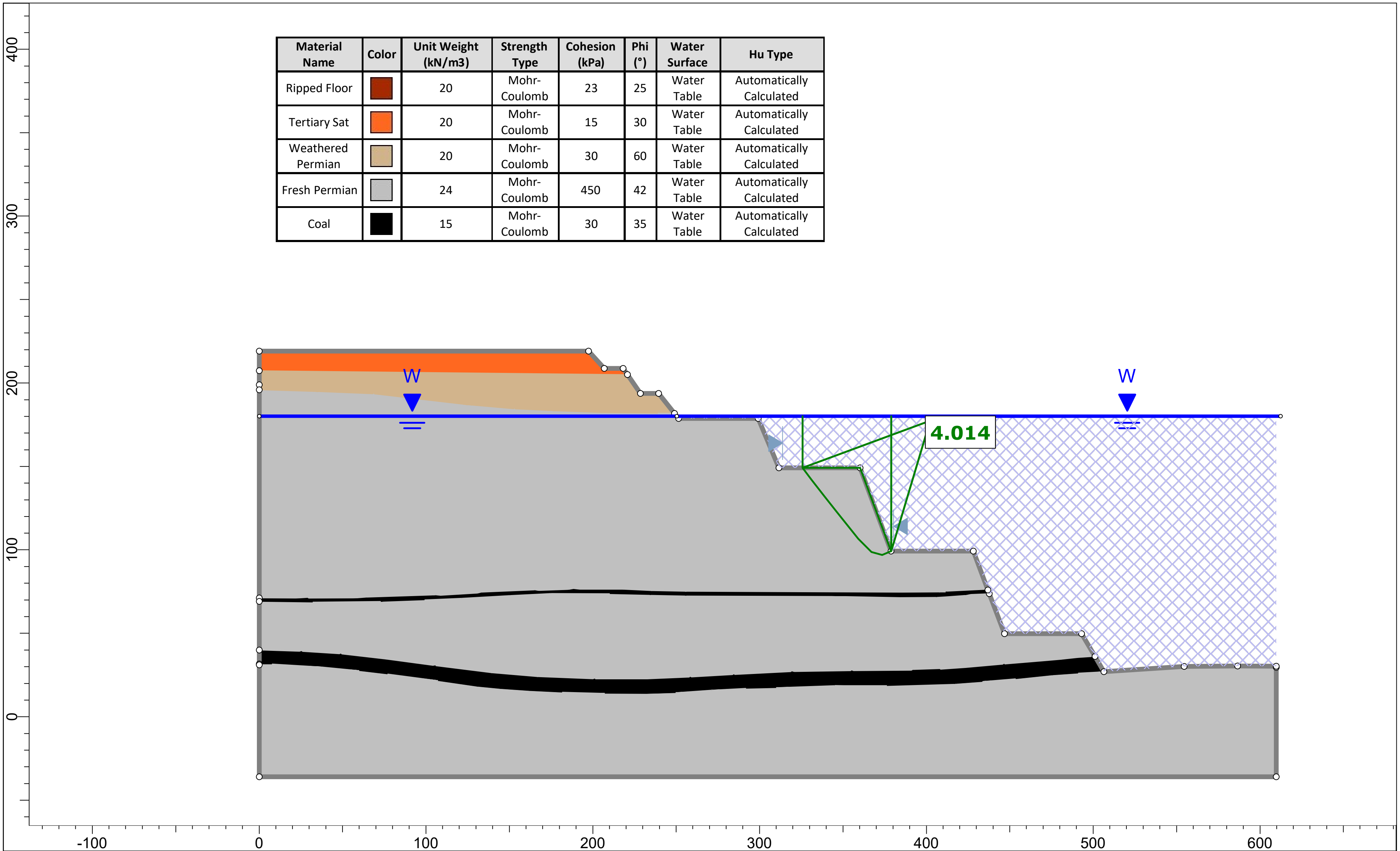
Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 1 Cuckoo Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

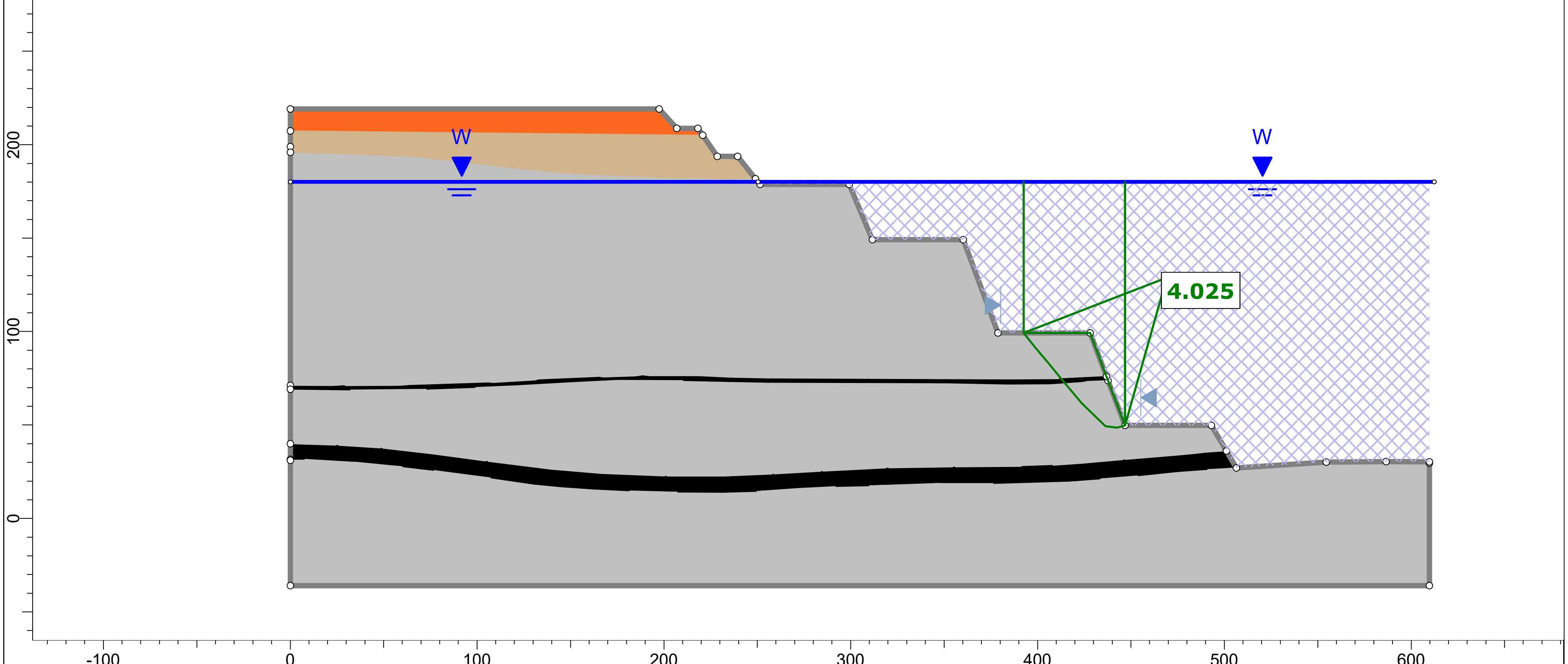


CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Search Method	Janbu - Bench 2 Cuckoo Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

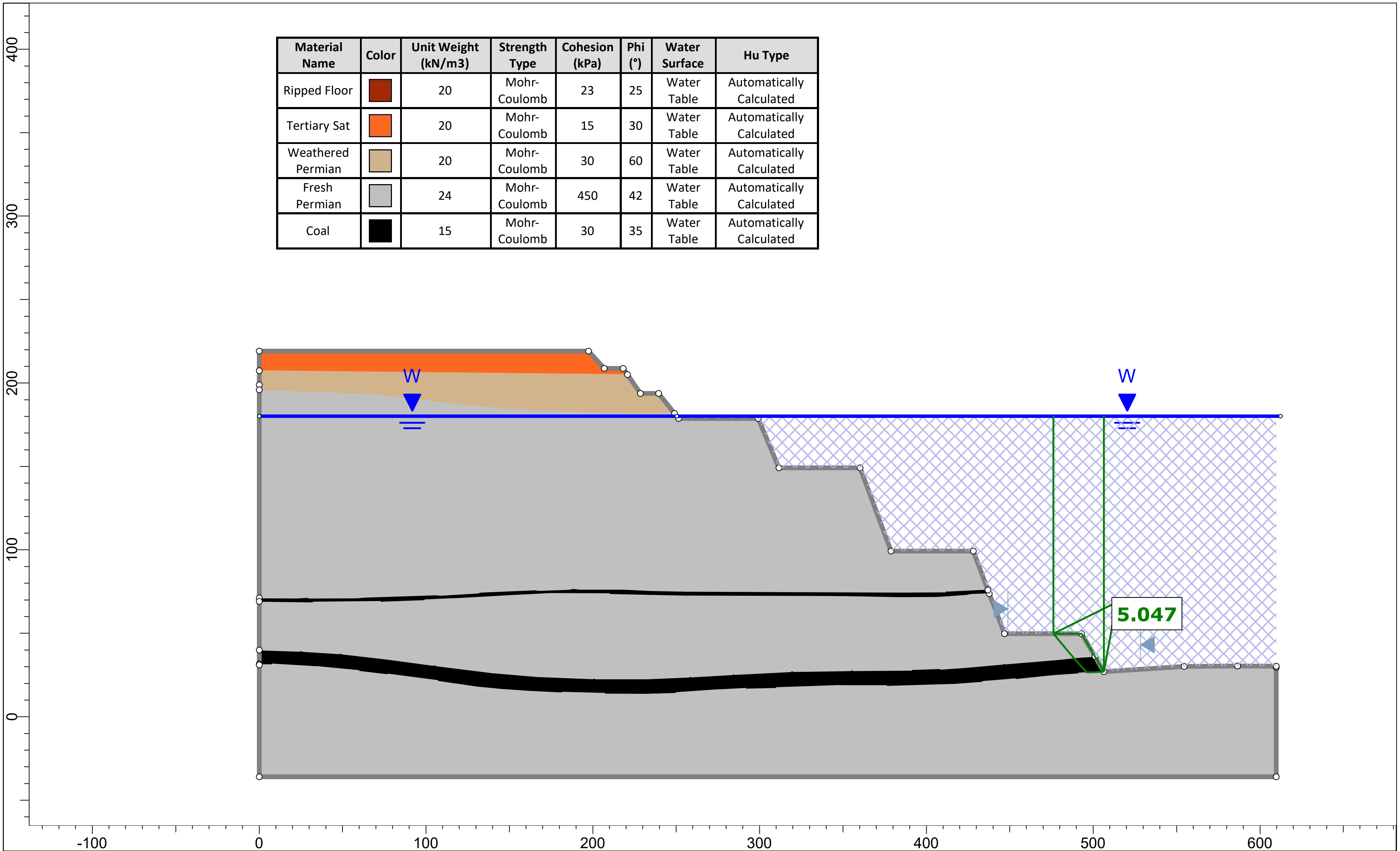


CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 3 Cuckoo Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031

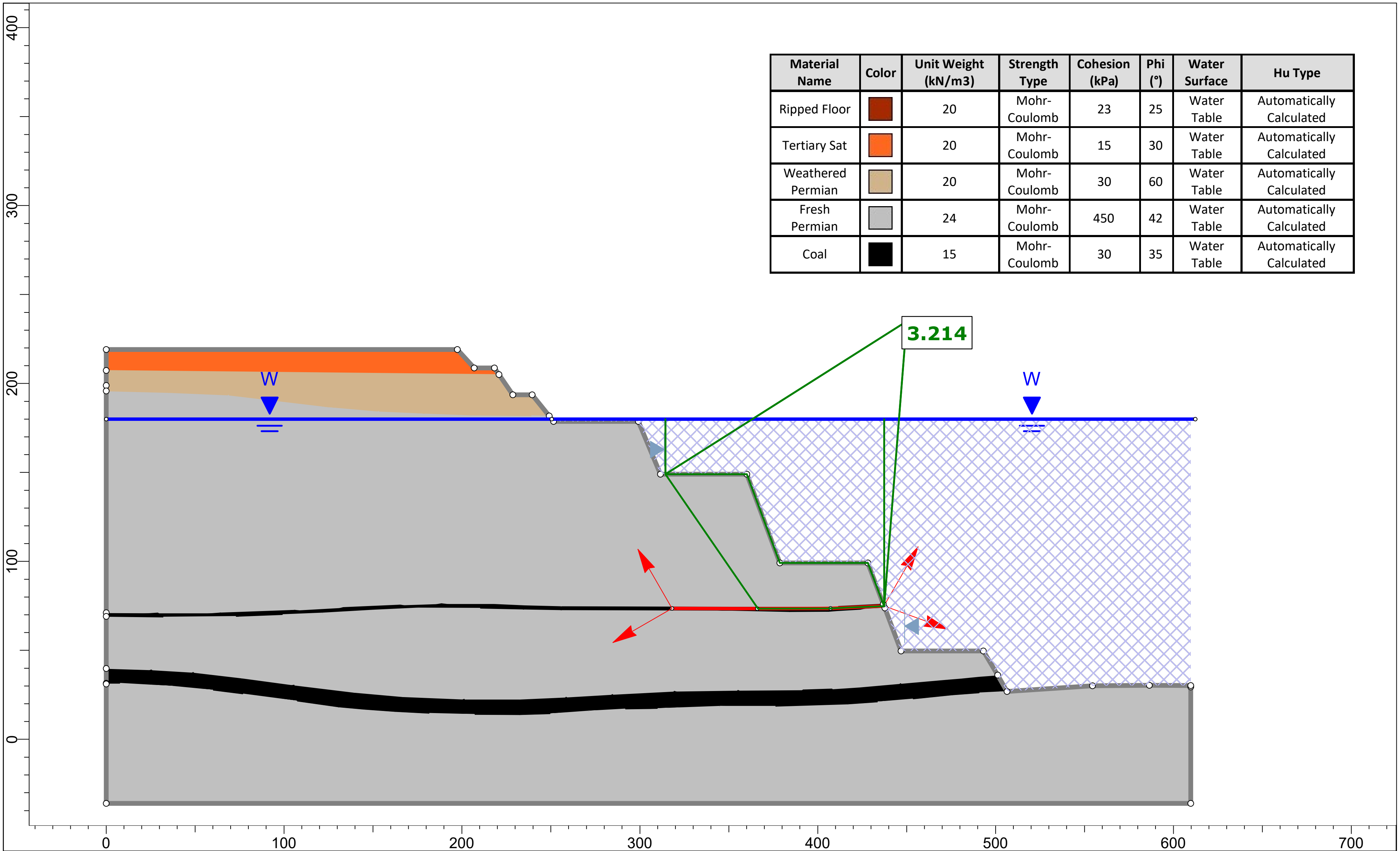
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Search Method	Janbu - Bench 4 Cuckoo Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

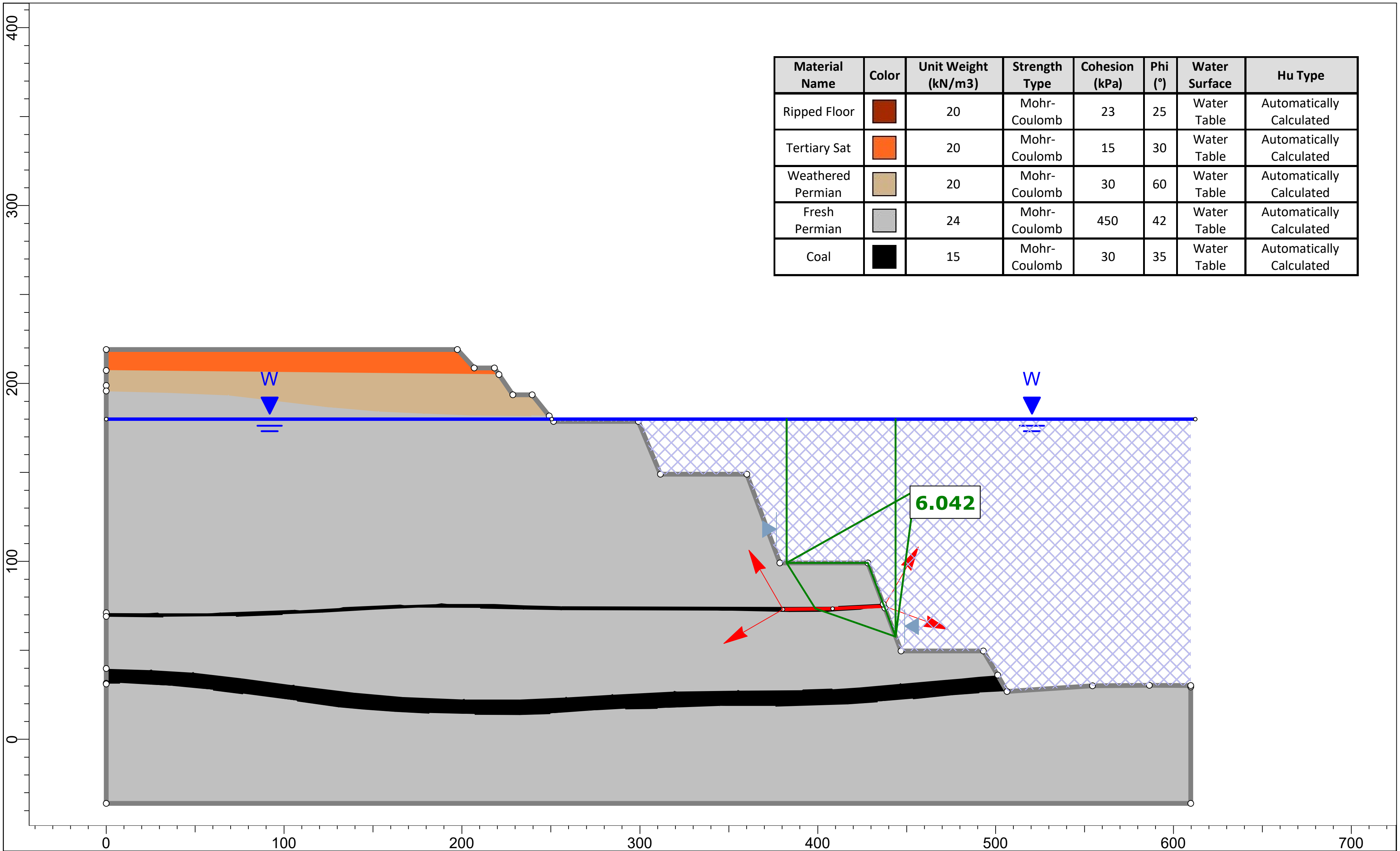
CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

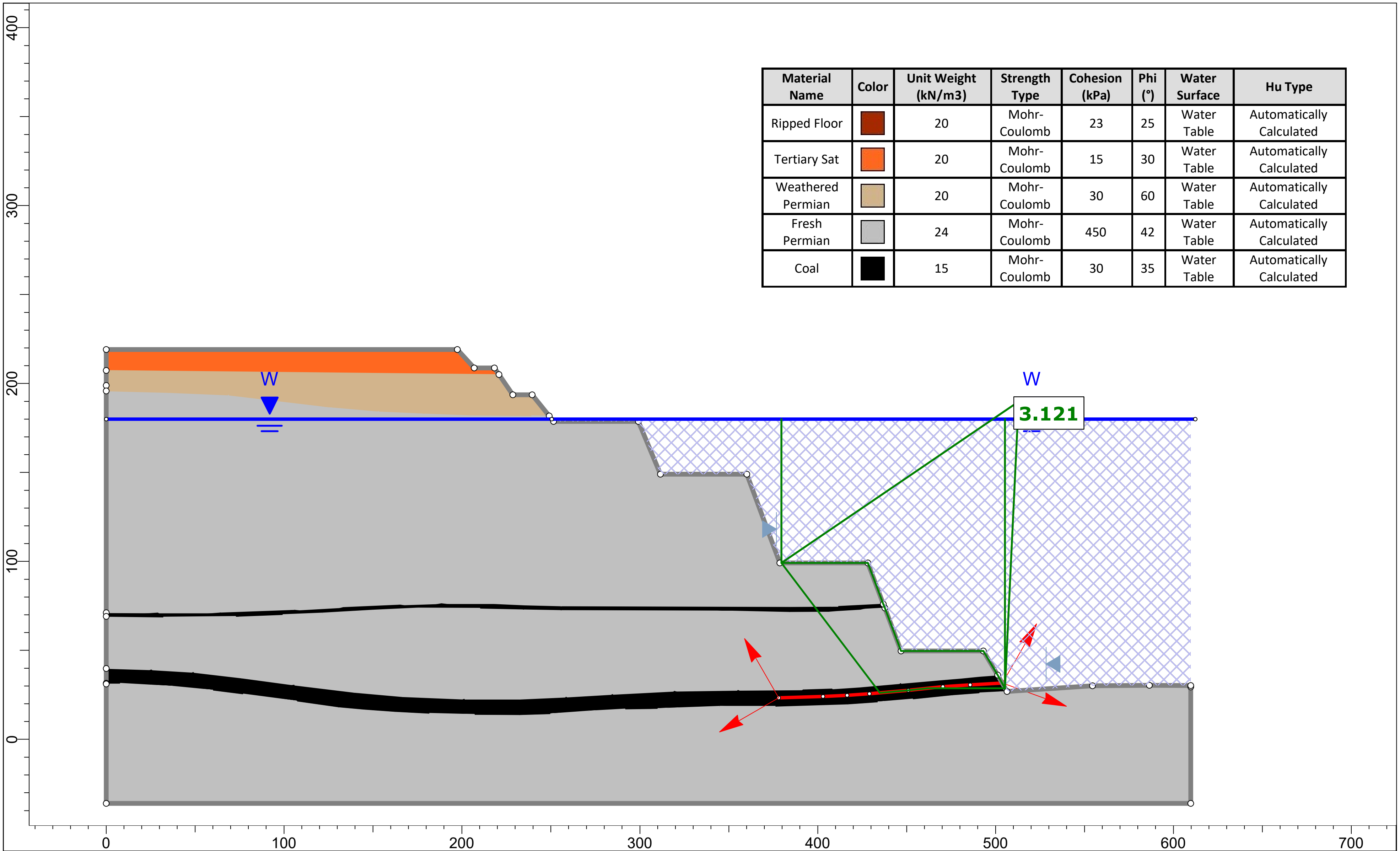
Coppabella PRCP Final Void Assessment

Search Method	Janbu - Benches 2-3 Block Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated



CARTLEDGE MINING AND GEOTECHNICS	Coppabella PRCP Final Void Assessment		
	Search Method Janbu - Bench 3 Block Search	*Scenario* B-B' - Water at RL180m	
	Drawn By B.Ryan	*Company* CMJV - Peabody Energy	
SLIDEINTERPRET 9.031	*Date* 24/01/2024	*File Name* PEA040013_COP_PRCP.slmd	



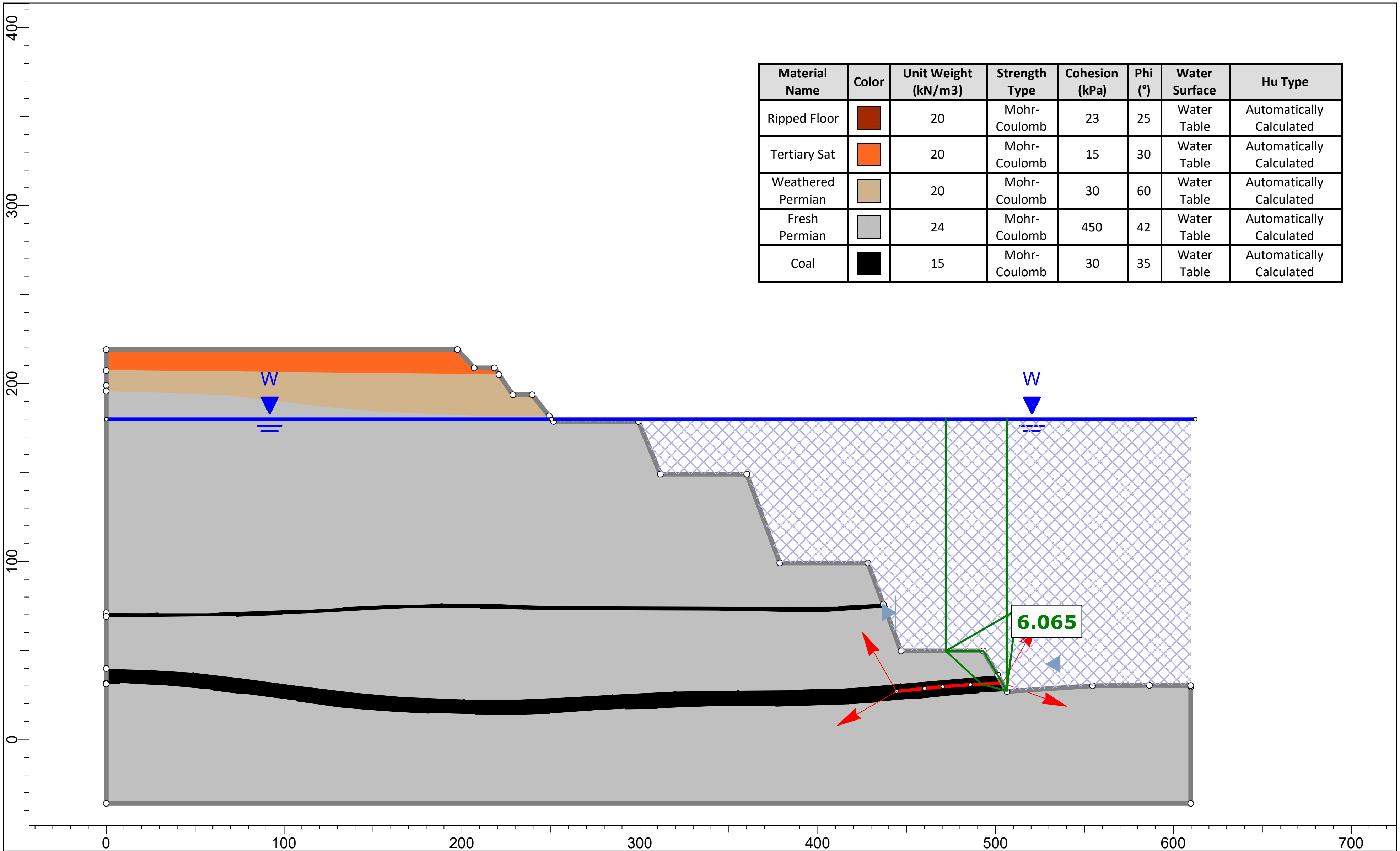
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Benches 3-4 Block Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031



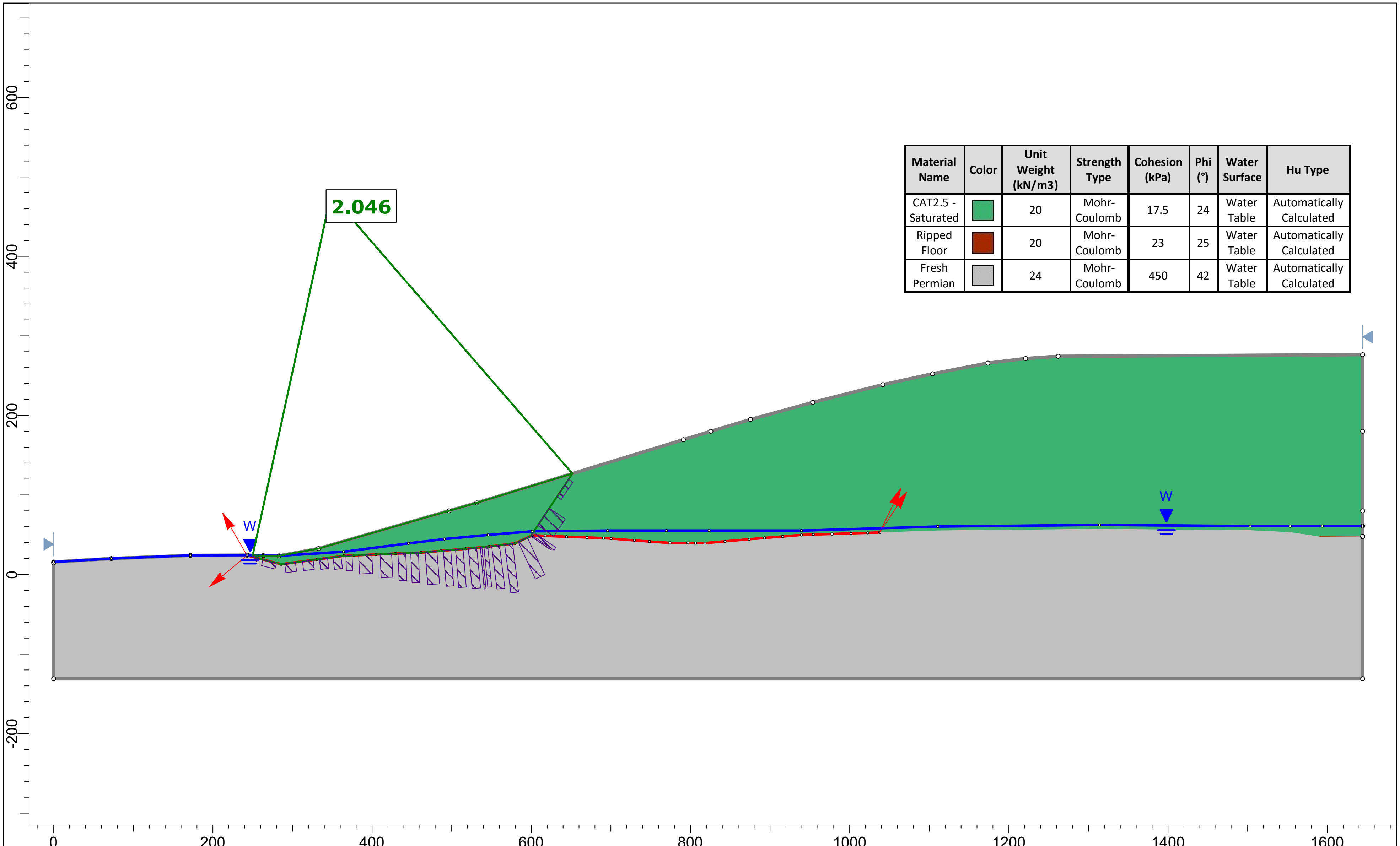
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Tertiary Sat		20	Mohr-Coulomb	15	30	Water Table	Automatically Calculated
Weathered Permian		20	Mohr-Coulomb	30	60	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated
Coal		15	Mohr-Coulomb	30	35	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Search Method	Janbu - Bench 4 Block Search	*Scenario*	B-B' - Water at RL180m
Drawn By	B.Ryan	*Company*	CMJV - Peabody Energy
Date	24/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

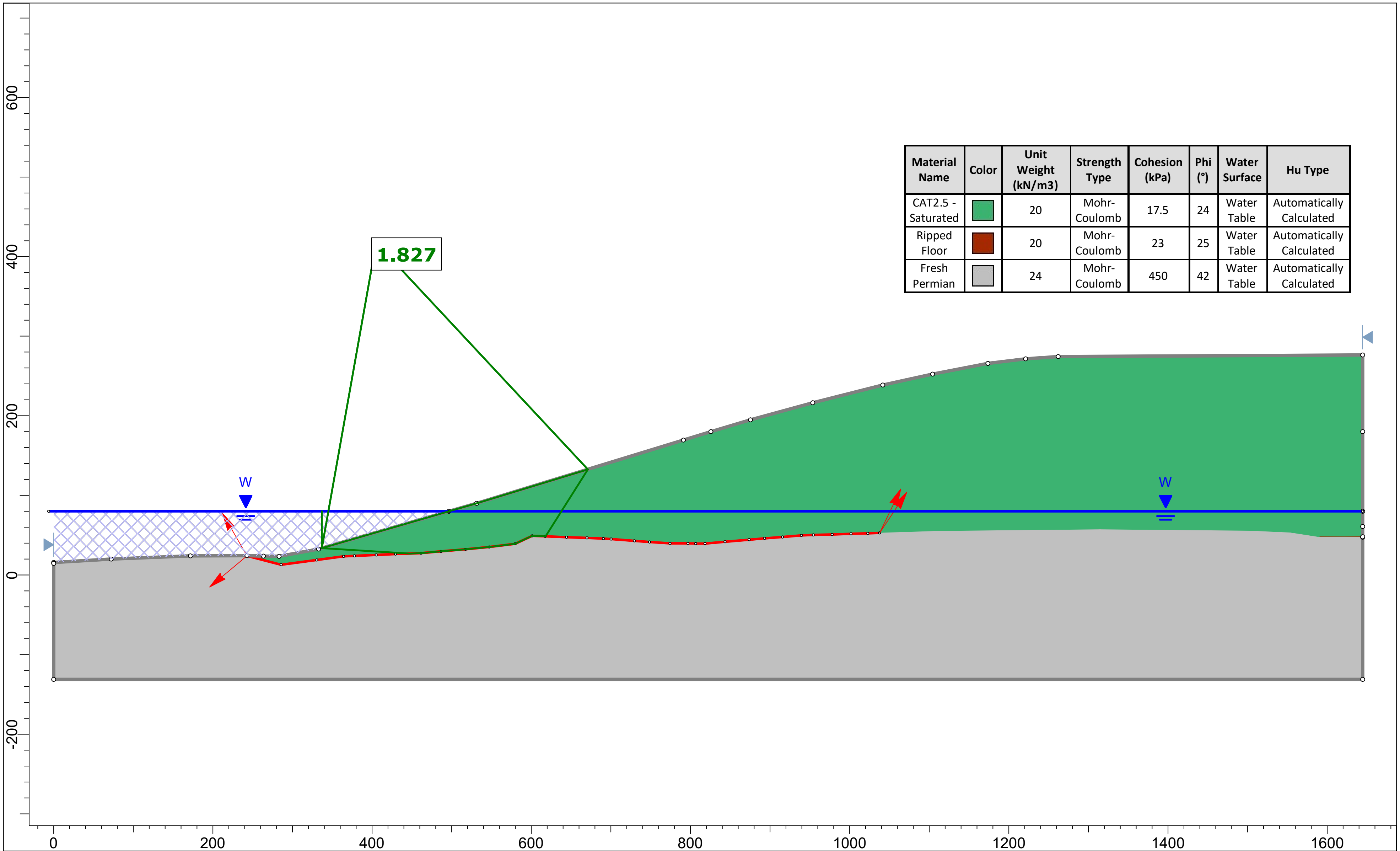


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment			
Group	Coppabella Moorvale Joint Venture (CMJV)	*Scenario*	C-C' - Global Sarma Block Search - No Water in Pit
Drawn By	B.Ryan	*Company*	Peabody Energy
Date	18/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



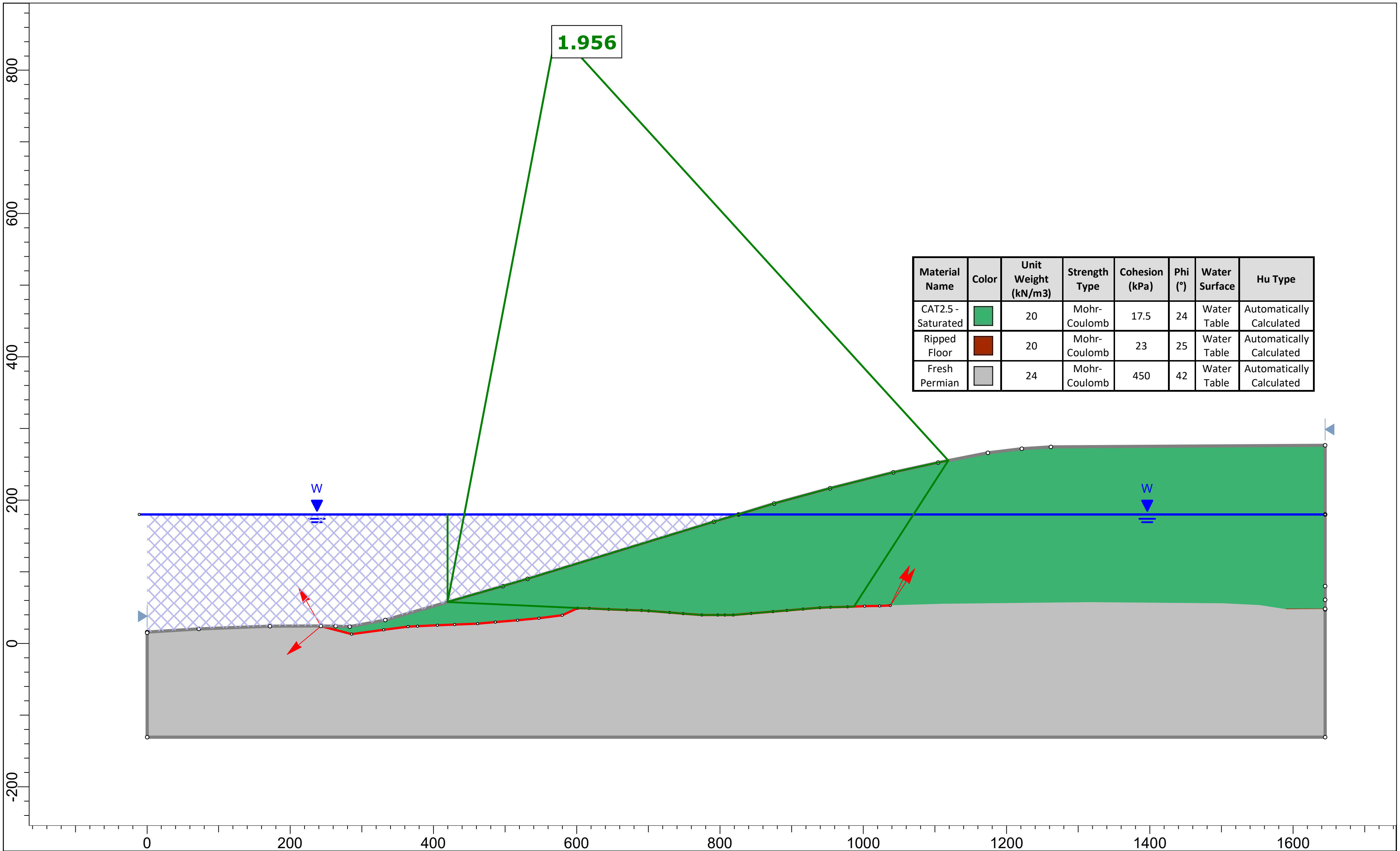
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Group	Coppabella Moorvale Joint Venture (CMJV)	*Scenario*	C-C' - Global Sarma Block Search - RL80m Water in Pit
Drawn By	B.Ryan	*Company*	Peabody Energy
Date	18/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



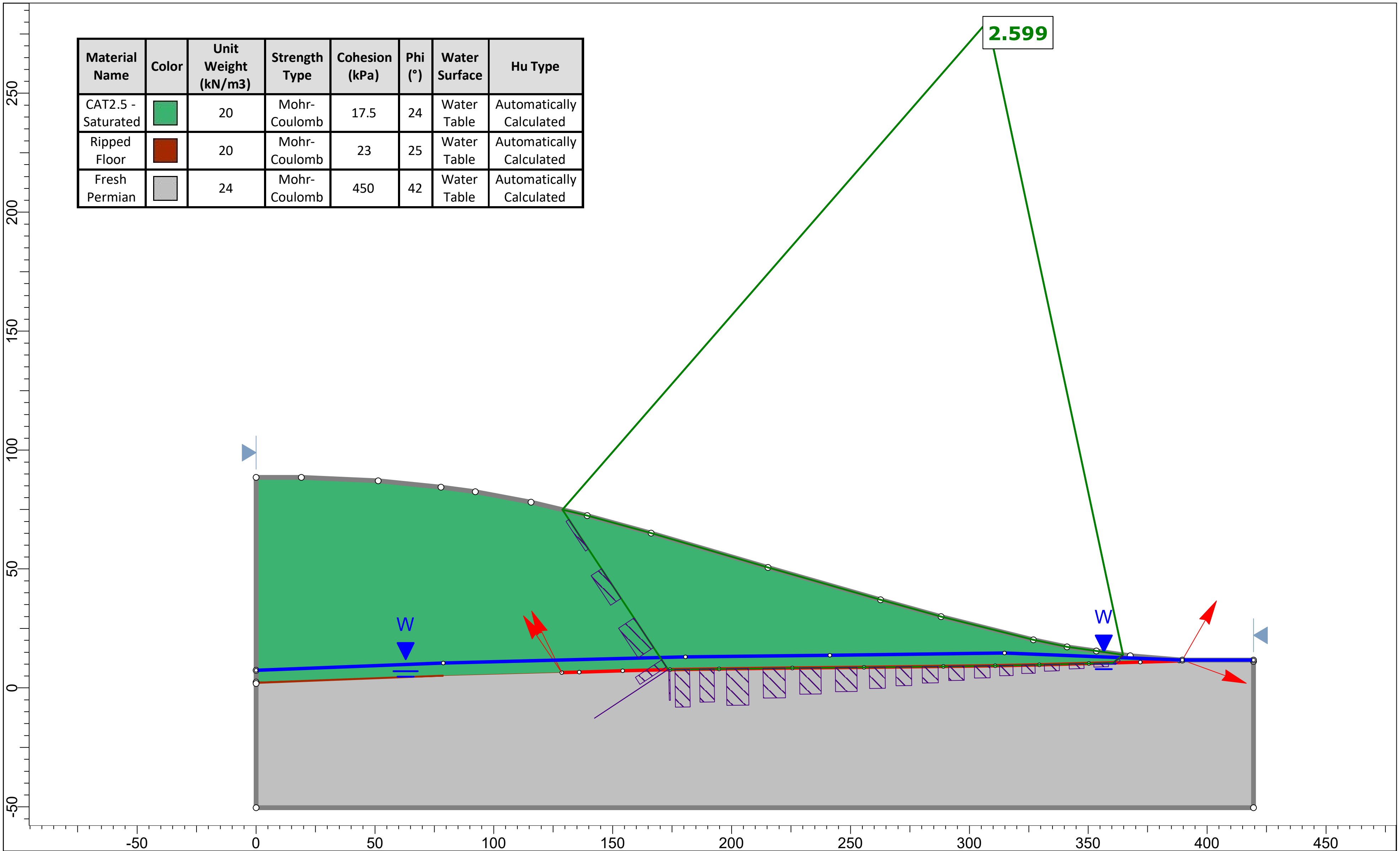
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

Coppabella PRCP Final Void Assessment

Group	Coppabella Moorvale Joint Venture (CMJV)	*Scenario*	C-C' - Global Sarma Block Search - RL180m Water in Pit
Drawn By	B.Ryan	*Company*	Peabody Energy
Date	18/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

SLIDEINTERPRET 9.031



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated

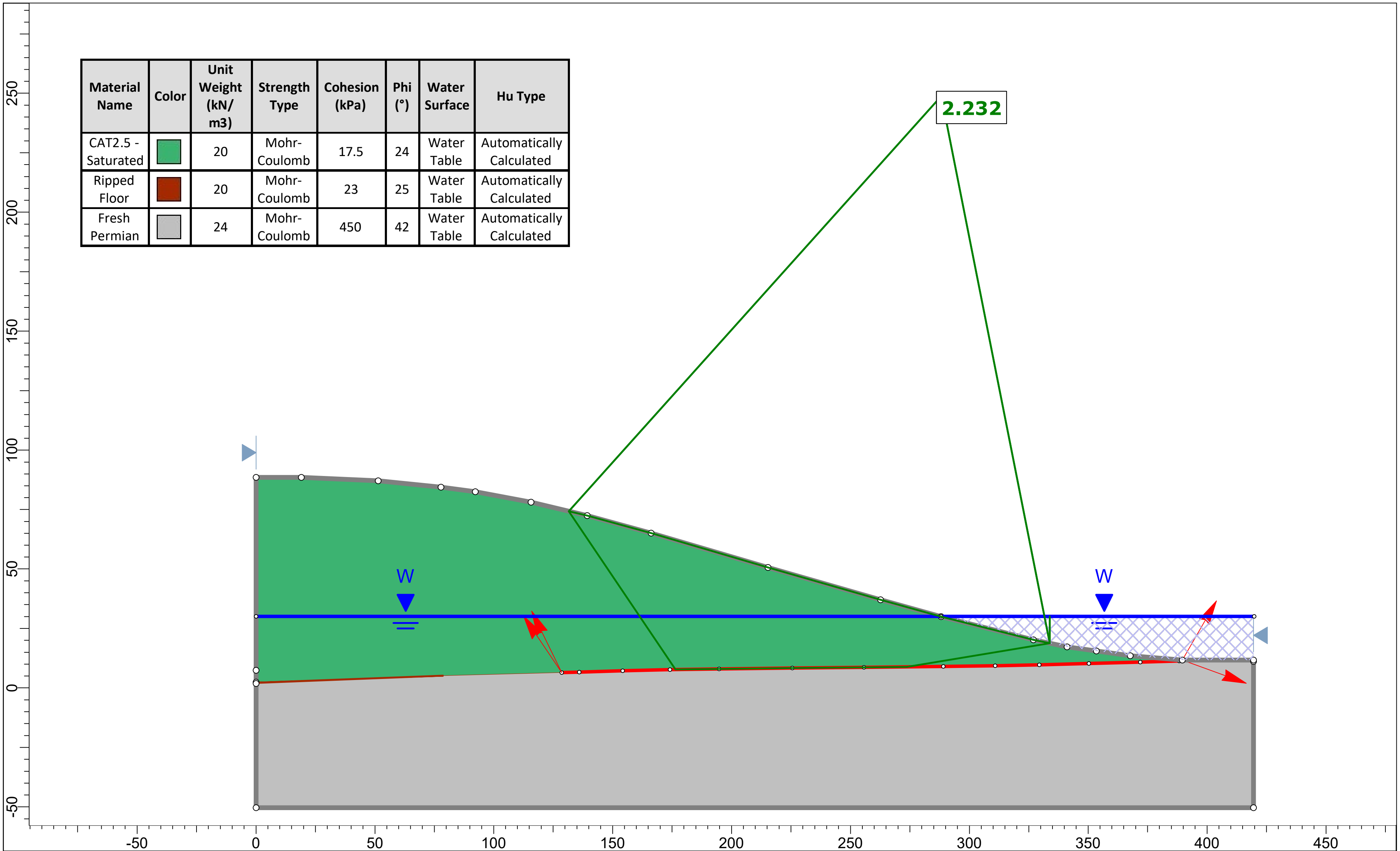
CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Group	Coppabella Moorvale Joint Venture (CMJV)	*Scenario*	D-D' - Global Sarma Block Search - No Water in Pit
Drawn By	B.Ryan	*Company*	Peabody Energy
Date	18/01/2024	*File Name*	PEA040013_COP_PRCP.slmd

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated

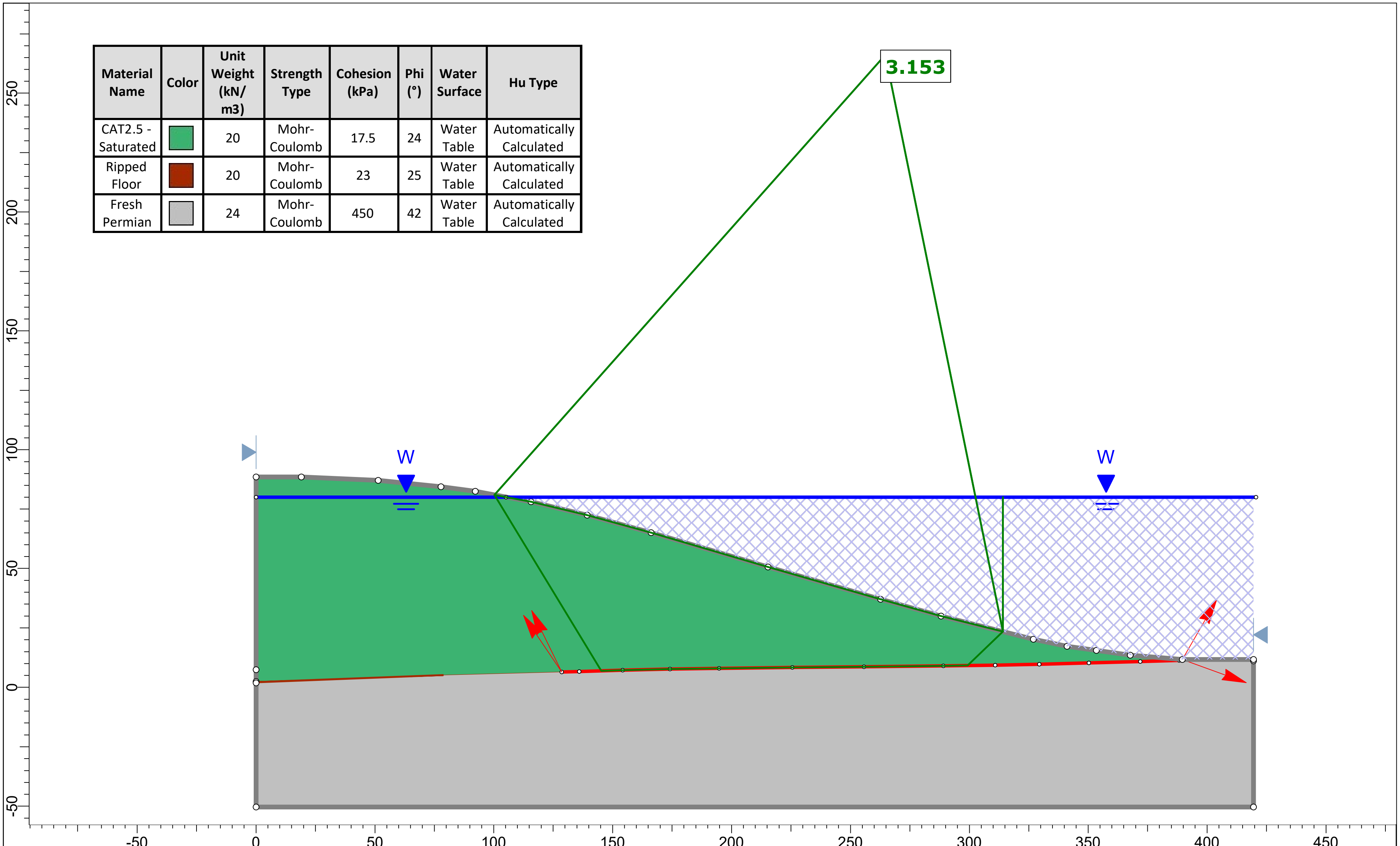


CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Group	Coppabella Moorvale Joint Venture (CMJV)	*Scenario*	D-D' - Global Sarma Block Search - RL30m Water in Pit
Drawn By	B.Ryan	*Company*	Peabody Energy
Date	18/01/2024	*File Name*	PEA040013_COP_PRCP.slmd



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
CAT2.5 - Saturated		20	Mohr-Coulomb	17.5	24	Water Table	Automatically Calculated
Ripped Floor		20	Mohr-Coulomb	23	25	Water Table	Automatically Calculated
Fresh Permian		24	Mohr-Coulomb	450	42	Water Table	Automatically Calculated

CARTLEDGE MINING AND GEOTECHNICS

SLIDEINTERPRET 9.031

Coppabella PRCP Final Void Assessment

Group	Coppabella Moorvale Joint Venture (CMJV)	*Scenario*	D-D' - Global Sarma Block Search - RL80m Water in Pit
Drawn By	B.Ryan	*Company*	Peabody Energy
Date	18/01/2024	*File Name*	PEA040013_COP_PRCP.slmd