



**SAFETY FACTOR ASSESSMENT  
40 C.F.R. SECTION 257.73(e)  
PLANT SCHOLZ CLOSED ASH POND  
FLORIDA POWER & LIGHT COMPANY**

The United States Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments" Final Rule (40 Code of Federal Regulations (C.F.R.) Part 257, Subpart D), requires the owner or operator of an existing CCR surface impoundment to conduct initial and periodic safety factor assessments in accordance with 40 C.F.R. §257.73(e). The owner or operator of the coal combustion residual (CCR) unit must conduct an assessment and document that the minimum safety factors outlined in 40 C.F.R. §257.73(e)(1)(i) through (iv) for the critical cross section of the embankment are achieved.

The CCR in the Plant Scholz Closed Ash Pond has been excavated, dewatered, consolidated, capped, and closed in place in accordance with 40 C.F.R. §257.102(d). The Closed Ash Pond no longer receives CCR, or non-CCR wastewater, while stormwater is routed over the capped closure area to an outlet structure located at the southeast area of the CCR unit.

The four loading conditions required for assessment per 40 C.F.R. §257.73(e) are:

- Storage Pool (40 C.F.R. § 257.73(e)(i))
- Surcharge Pool (40 C.F.R. § 257.73(e)(ii))
- Seismic Loading Conditions (40 C.F.R. § 257.73(e)(iii))
- Post-Seismic Liquefaction Conditions (when liquefaction susceptible materials are present; 40 C.F.R. § 257.73(e)(iv)).

Engineering analyses of the Closed Ash Pond in its current condition were evaluated for each loading condition. Stability safety factors were evaluated for each of the loading scenarios using the computer program SLIDE (2018). As required by the EPA rule, a general limit equilibrium (GLE) method (Morgenstern and Price) was used to calculate factors of safety, and the factors of safety were calculated by dividing the resisting forces by the driving forces along the calculated critical slip surface of a given slope.

Stability was evaluated along the two most critical cross-sections of the Closed Ash Pond (namely section A-A' of the Eastern Berm of the pond and section B-B' of the Southern Berm of the pond). The subsurface stratigraphy of these critical cross sections was developed based on a combination of historical site data, subsequent subsurface investigations by WSP completed between 2017 and 2020 and observations during Ash Pond closure construction activities. These two cross sections are shown in Figure 1 below.

For the surcharge pool scenario, WSP considered the effects of the 100-year 24-hour rain event. However, since the closure of the Ash Pond is designed to prevent rainwater from infiltrating into the CCR by the ClosureTurf™ system, a single modelled water level in the Closed Ash Pond is representative for both the Storage Pool and Surcharge Pool conditions from a slope stability standpoint – labelled "Long-Term Scenario" in the attached calculations.



**Figure 1 - Aerial Plan View**

The factors of safety for stability under seismic conditions were calculated based on the earthquake hazard corresponding to a probability of exceedance of 2% in 50 years (2475-year return period). WSP used the Bray and Travasarou displacement-based seismic slope stability screening method (Bray and Travasarou 2009) to evaluate the seismic stability. WSP utilized National Center for Earthquake Engineering (NCEER) methods to evaluate liquefaction susceptibility of soils underlying the embankment of the critical cross section.

Given the low seismicity of the site, the NCEER screening method yielded results indicating that seismically induced liquefaction will not occur. Based on these results, WSP did not perform stability calculations using seismically induced post-liquefied strengths for the materials on site.

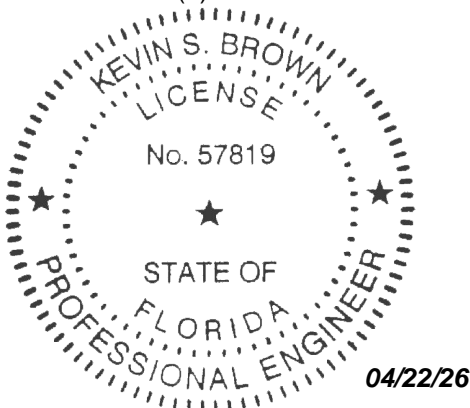
The table below summarizes the results of the slope stability analyses for the current conditions at Plant Scholz, with figures displaying the stability analysis results attached to this demonstration (Attachment 1 – Slope Stability Analysis Results).

<b>Current Conditions Stability Analysis Results</b>			
<b>Analysis Case</b>	Storage Pool	Surcharge Pool	Seismic
<b>Rule Section</b>	§ 257.73(e)(i)	§ 257.73(e)(ii)	§ 257.73(e)(iii)
<b>Target Factor of Safety</b>	1.5	1.4	1.0
<b>Cross-Section</b>	<b>Calculated Factor of Safety</b>		
Section A-A'	1.6		1.5
Section B-B'	1.5		1.3

The Closed Ash Pond has completed closure in accordance with the requirements of 40 C.F.R. § 257.102(d). The factors of safety presented in the table above are consistent with best engineering practices and the Closed Ash Pond’s constructed closure design meets the factor of safety requirements.

### **CERTIFICATION**

I certify that the safety factor assessment for the Plant Scholz Closed Ash Pond was conducted in accordance with 40 C.F.R. 257.73(e).

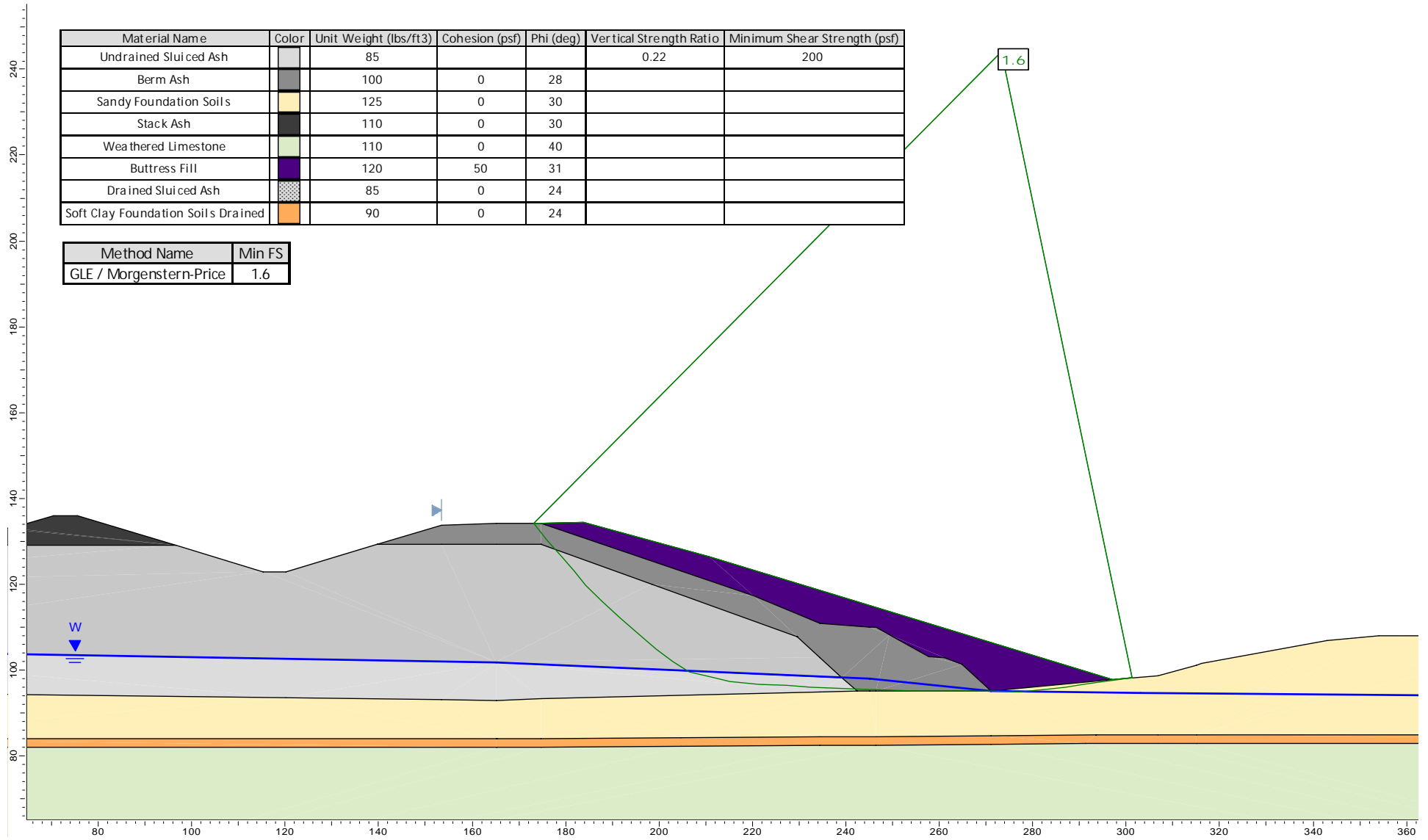


*This item has been digitally signed and sealed by Kevin Brown on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies*

Kevin S. Brown, P.E.  
 Florida Licensed Professional Engineer No. 57819  
 WSP USA, Inc.

**ATTACHMENT 1**

**Slope Stability Analysis Results**



Material Name	Color	Unit Weight (lbs/ft <sup>3</sup> )	Cohesion (psf)	Phi (deg)	Vertical Strength Ratio	Minimum Shear Strength (psf)
Undrained Sluiced Ash		85			0.22	200
Berm Ash		100	0	28		
Sandy Foundation Soils		125	0	30		
Stack Ash		110	0	30		
Weathered Limestone		110	0	40		
Buttress Fill		120	50	31		
Drained Sluiced Ash		85	0	24		
Soft Clay Foundation Soils Drained		90	0	24		

Method Name	Min FS
GLE / Morgenstern-Price	1.6



SCALE	AS SHOWN
DATE	Nov 2024
MADE BY	SSS
CAD	-

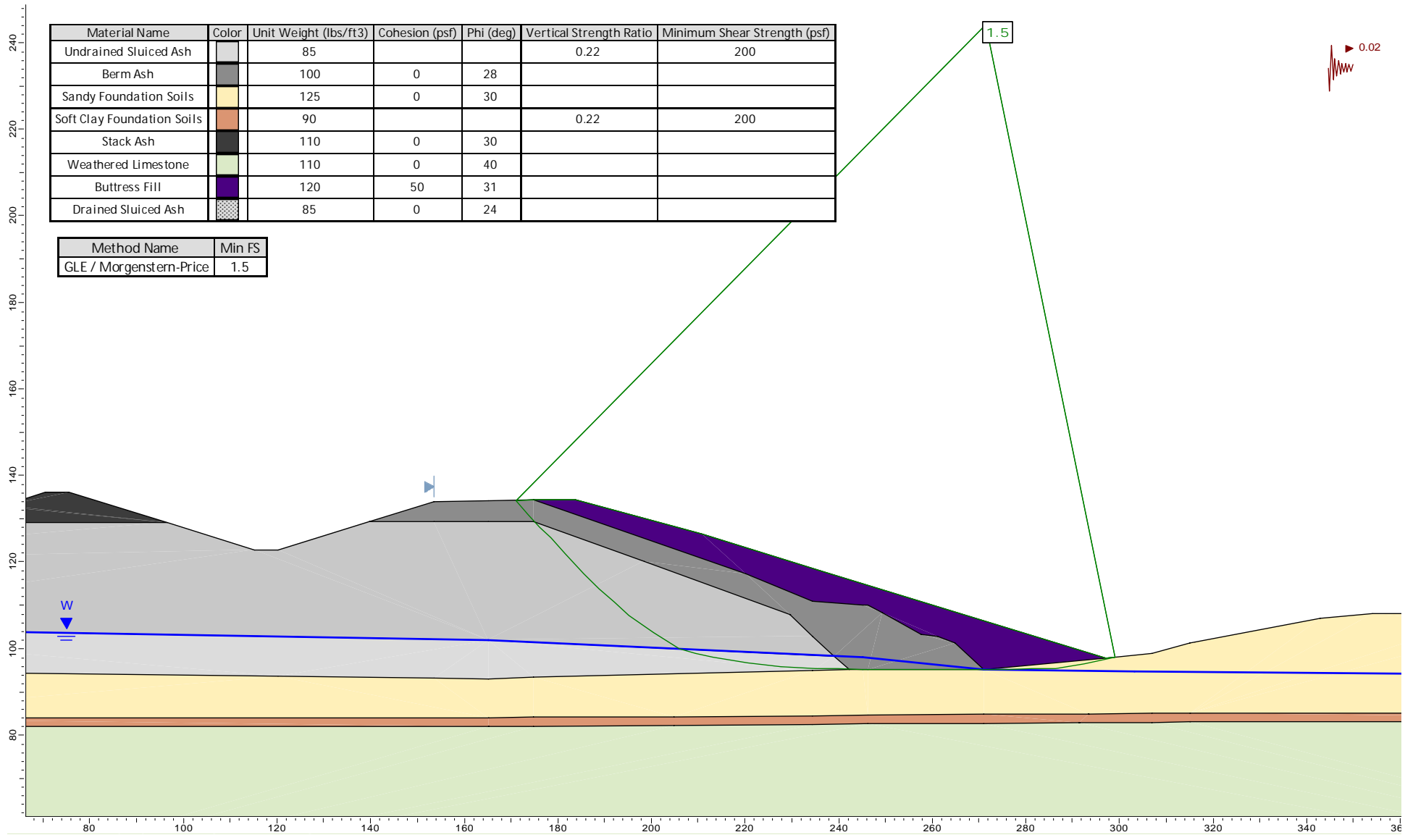
PROJECT	<b>PLANT SCHOLZ SAFETY FACTOR ASSESSMENT</b>
TITLE	<b>Section A-A' Pond Eastern Berm Long-Term Scenario</b>

CHECK	LJ
REVIEW	KSB

CLIENT	<b>FLORIDA POWER AND LIGHT</b>
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FILE	STABILITY
PROJECT No.	1663473
REV.	

FIGURE	<b>1</b>
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Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)	Vertical Strength Ratio	Minimum Shear Strength (psf)
Undrained Sluiced Ash		85			0.22	200
Berm Ash		100	0	28		
Sandy Foundation Soils		125	0	30		
Soft Clay Foundation Soils		90			0.22	200
Stack Ash		110	0	30		
Weathered Limestone		110	0	40		
Buttress Fill		120	50	31		
Drained Sluiced Ash		85	0	24		

Method Name	Min FS
GLE / Morgenstern-Price	1.5



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PROJECT	PLANT SCHOLZ SAFETY FACTOR ASSESSMENT
TITLE	Section A-A' Pond Eastern Berm Seismic Scenario








FILE	STABILITY
PROJECT No.	1663473
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REVIEW	KSB

CLIENT	FLORIDA POWER AND LIGHT
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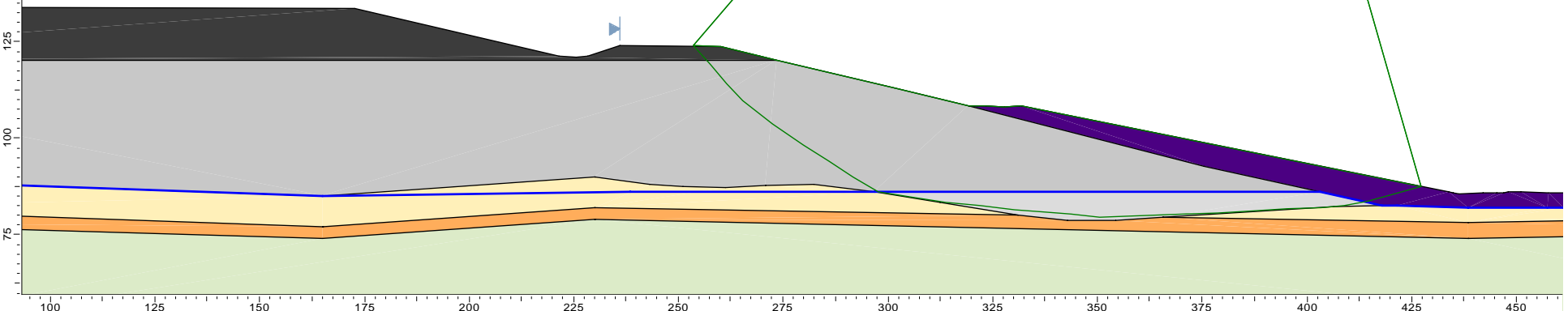
FIGURE	2
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300  
275  
250  
225  
200  
175  
150  
125  
100  
75

Material Name	Color	Unit Weight (lbs/ft <sup>3</sup> )	Strength Type	Cohesion (psf)	Phi (deg)	Vertical Strength Ratio	Minimum Shear Strength (psf)
Undrained Sluiced Ash		85	Vertical Stress Ratio			0.22	200
Sandy Foundation Soils		125	Mohr-Coulomb	0	30		
Stack Ash		110	Mohr-Coulomb	0	30		
Weathered Limestone		110	Mohr-Coulomb	0	40		
Buttress Fill		120	Mohr-Coulomb	50	31		
Drained Sluiced Ash		85	Mohr-Coulomb	0	24		
Soft Clay Foundation Soils Drained		90	Mohr-Coulomb	0	24		

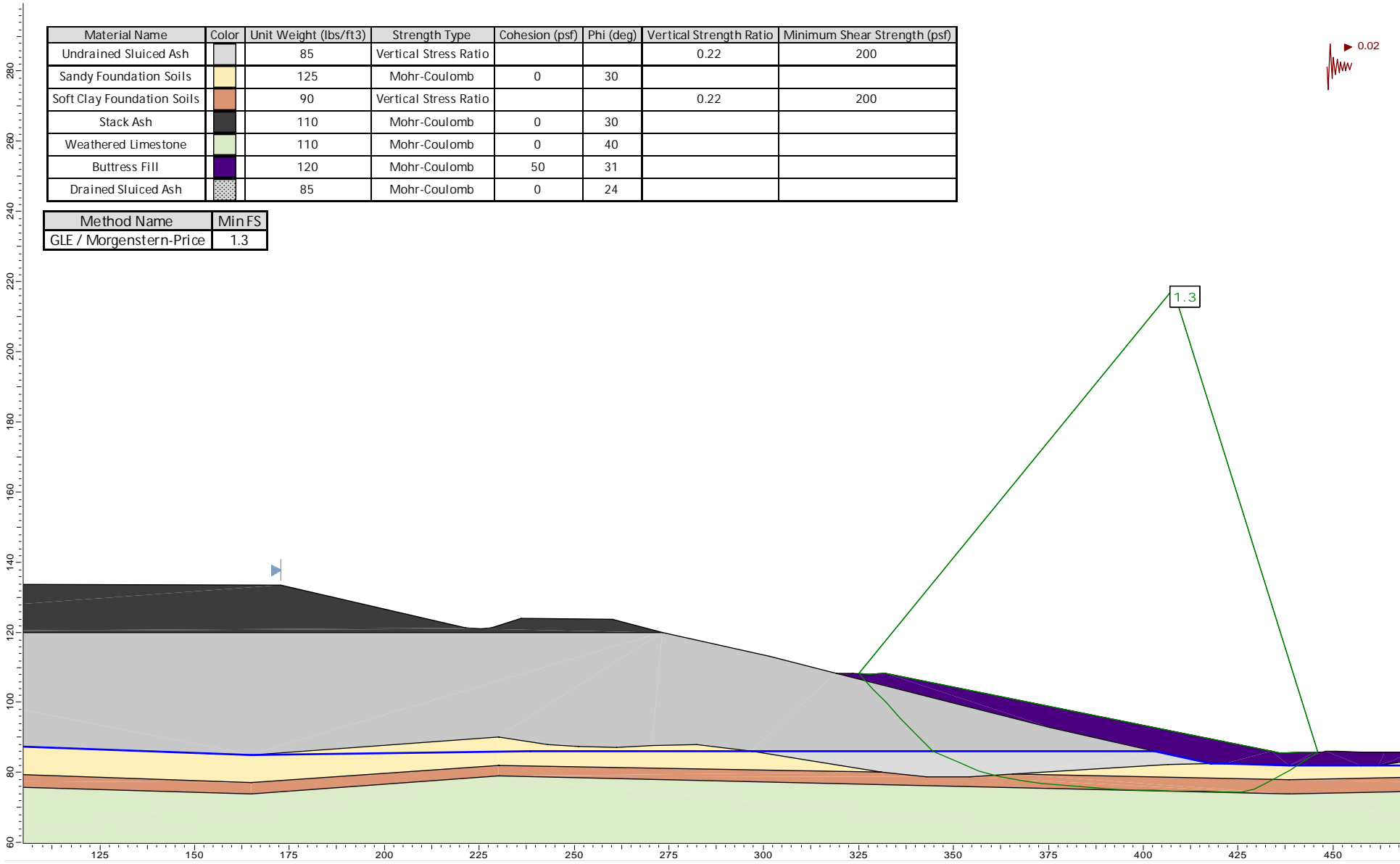
Method Name	Min FS
GLE / Morgenstern-Price	1.5

1.5



SCALE	AS SHOWN
DATE	Nov 2024
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PROJECT	<b>PLANT SCHOLZ SAFETY FACTOR ASSESSMENT</b>	
TITLE	<b>Section B-B' Pond Southern Berm Long-Term Scenario</b>	
CLIENT	<b>FLORIDA POWER AND LIGHT</b>	
FILE	STABILITY	FIGURE
PROJECT No.	1663473	<b>3</b>



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Vertical Strength Ratio	Minimum Shear Strength (psf)
Undrained Sluiced Ash	Grey	85	Vertical Stress Ratio			0.22	200
Sandy Foundation Soils	Yellow	125	Mohr-Coulomb	0	30		
Soft Clay Foundation Soils	Brown	90	Vertical Stress Ratio			0.22	200
Stack Ash	Black	110	Mohr-Coulomb	0	30		
Weathered Limestone	Light Green	110	Mohr-Coulomb	0	40		
Buttress Fill	Purple	120	Mohr-Coulomb	50	31		
Drained Sluiced Ash	White with dots	85	Mohr-Coulomb	0	24		

Method Name	Min FS
GLE / Morgenstern-Price	1.3



FILE STABILITY  
PROJECT No. 1663473

SCALE	AS SHOWN
DATE	Nov 2024
MADE BY	SSS
CAD	-
CHECK	LJ
REVIEW	KSB

PROJECT **PLANT SCHOLZ SAFETY FACTOR ASSESSMENT**

TITLE **Section B-B'  
Pond Southern Berm  
Seismic Scenario**

CLIENT **FLORIDA POWER AND LIGHT**

FIGURE **4**