AECOM

Submitted to
DTE Energy, Inc.

Submitted by
AECOM
1300 East 9th Street, Suite 500
Cleveland, OH 44114
August 2024
AECOM Project No. 60516675

Periodic Safety Factor Assessment

Area 15 Inactive Bottom Ash Impoundment
DTE Monroe Power Plant

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Executive Summary

This Coal Combustion Residuals (CCR) Periodic Certification Report for the Inactive Bottom Ash Impoundment (Inactive BAI) at the DTE Monroe Power Plant has been prepared in accordance with the requirements specified in the United States Environmental Protection Agency (USEPA) CCR Rule under 40 Code of Federal Regulations (CFR) §257.100 (e). The original safety factor assessment for this site was completed in March 2018 and later revised on August 30, 2019 [AECOM, 2019]. The regulations also require a periodic update to the CCR impoundment safety factor assessments to be completed periodically. The original analyses have been updated and/or expanded, to reflect conditions at the Inactive BAI as they exist at the time of this report. The following report presents this updated analysis.

Required factors of safety were analyzed in compliance with the CCR Rule. The engineering analyses determined that the Inactive BAI meets the regulatory requirements for the safety factor assessment analysis, as summarized in **Table ES-1**.

Table ES-1 – Certification Summary

Report Section	CCR Rule Reference	Requirement Summary	Requirement Met?	Comments
Safety Factor				
4.1	§257.73 (e)(1)(i) per §257.100 (e)	Maximum storage pool safety factor must be at least 1.50	Yes	Safety factors were calculated to be 1.54 and higher.
4.1	§257.73 (e)(1)(ii) per §257.100 (e)	Maximum surcharge pool safety factor must be at least 1.40	Yes	Safety factors were calculated to be 1.45 and higher.
4.2	§257.73 (e)(1)(iii) per §257.100 (e)	Seismic safety factor must be at least 1.00	Yes	Safety factors were calculated to be 1.15 and higher.
4.2	§257.73 (e)(1)(iv) per §257.100 (e)	Liquefaction safety factor must be at least 1.20	Yes	Safety factors were calculated to be 1.30 and higher.

1 Introduction

1.1 Purpose of this Report

The Area 15 Inactive Bottom Ash Impoundment (BAI) is an inactive CCR surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that an updated safety factor assessment for an inactive CCR surface impoundment be completed periodically. 40 CFR §257.100 (e) specifically states:

40 CFR §257.100(e)(3)

- *(v) No later than April 17, 2018, complete the initial hazard potential classification, structural stability, and safety factor assessments as set forth by § 257.73(a)(2), (b), (d), (e), and (f).*

40 CFR §257.73(e)

- *(1) Conduct initial and periodic safety factor assessments for each CCR unit and document whether the calculated factors of safety for each CCR unit achieve minimum safety factors specified in (e)(1)(i) through (iv) of this section for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The safety factor assessments must be supported by appropriate engineering calculations.*

The aforementioned regulatory requirements and the corresponding section of this report are summarized in **Table 1-1** below.

Table 1-1 – CCR Rule Cross Reference Table

Report Section	Title	CCR Rule Reference
4.1	Factor of Safety: Maximum Storage Pool Loading	§257.73 (e)(1)(i) per §257.100 (e)
4.1	Factor of Safety: Maximum Surcharge Pool Loading	§257.73 (e)(1)(ii) per §257.100 (e)
4.2	Factor of Safety: Seismic	§257.73 (e)(1)(iii) per §257.100 (e)
4.2	Factor of Safety: Post-Liquefaction	§257.73 (e)(1)(iv) per §257.100 (e)

The Inactive BAI consists of a bottom ash impoundment bordered by Lake Erie to the east and an existing channel to the west, which discharges cooling water from the Monroe coal power plant to the lake. The impoundment is separated from the discharge channel and Lake Erie by a perimeter dike. The southern perimeter dike of the impoundment is constructed of aggregate material and separates the impoundment from the process waste and storm water basin to the south. The dikes have been evaluated to determine whether safety factor requirements are met. The following sections summarize the evaluations performed and the results from the analyses.

Since the submittal of the original Safety Factor Assessment Report, DTE Energy has initiated a closure-by-removal of the Inactive BAI. At the time of this report, the closure-by-removal is near-completion. This work includes dredging and removal of CCR material from within the impoundment. As such, grades internal to the pond and around its perimeter at certain areas have or will be changed, relative to the conditions at the time of the original safety factor assessment.

Specifically, changes to the perimeter dike system of the BAI as part of the Closure by Removal include the following:

- The inner faces of the dike along the west perimeter were partially regraded as part of the Closure by Removal leaving the inner side slopes steeper and taller than the pre-closure condition;

- The northeast and eastern perimeter dikes were largely left in place following the Closure by Removal. A process wastewater ditch was created along the northeast and eastern dikes by construction of a second dike running parallel to and inboard (pondward) of the existing dike;

- The outer faces of the dikes that face Lake Erie and the Discharge Channel were not altered as part of the Closure by Removal;

Herein, the safety factor analysis cross sections have been updated to represent the current bathymetry within the pond and other grading adjustments that have been made. The current surface and bathymetric elevation data was mased on as-built survey data provided by DTE. This periodic assessment adds new safety factor analyses focused on the inner (eastern) slopes of the west perimeter dike, which is the only portion of the dike to have been significantly altered in the Closure by Removal. The results previously reported in the original assessment [AECOM, 2019] still pertain at other areas and slopes of the impoundment.

The ongoing closure-by-removal project may alter the slopes and grades of the southern perimeter dike, depending on the extent and depth of CCR that is removed from its vicinity. Herein, the dike has been evaluated in its current configuration as it exists at the time of this report. Its final configuration may be evaluated in future periodic assessments.

2 Summary of Investigations

A comprehensive geotechnical investigation and laboratory testing program was performed for the Inactive BAI in 2018, as part of the original safety factor assessment. Detailed discussion of the subsurface conditions is presented in the report entitled "Safety Factor Assessment Report, Inactive Bottom Ash Impoundment, DTE Monroe Power Plan," dated August 30, 2019. Subsurface data from that investigation has been utilized for this periodic assessment. No additional subsurface explorations were performed nor were necessary.

3 Safety Factor Assessment

Analyses completed for this periodic safety factor assessment of the ash impoundment are described in this section. Data from AECOM's previous 2017 subsurface exploration and laboratory testing results, design information provided by DTE, and safety factor criteria outlined in 40 CFR §257.100 (e) for inactive CCR impoundments were used to complete the safety factor assessment of the Inactive BAI located at the subject site. As part of the periodic assessment, global or general failure analyses were performed by AECOM to evaluate the potential for mass slope instabilities of the perimeter dikes. The potential for global instability is dependent on factors such as slope geometry, groundwater/phreatic surface conditions, loading conditions, and shear strength of the embankments and foundation materials. This section summarizes the methodology, loading conditions and assumptions of the analyses. Figures and computer program outputs are provided in **Appendices B and C**.

3.1 Cross-Sections Selected for Analysis

For this periodic assessment, AECOM started by reviewing each of the cross-sections analyzed in the original analysis, which included five cross-sections (A-A through E-E'): Three along the dike on the west side of the impoundment (A-A', B-B', and C-C'), one on the south side (D-D'), and one along the east side of the impoundment (E-E'). Locations of the sections are shown **on Figure 2** of **Appendix A**. Current grades and configurations at each section were compared to those present at the time of the original assessment, to identify the locations where significant changes have occurred. Based on this review, two sections, A-A and C-C, both located along the western dike of the impoundment, have undergone significant regrading and were selected for analysis as part of this periodic assessment:

- **Cross-Section A-A':** The inner (eastern) slope of this section was subject to significant excavation. As such, the failure direction analyzed for this assessment is the inward (eastward) slope movement (reversed from the outward/westward failure direction in the original assessment). The outer (western) slope facing the Discharge Channel has not been regraded and has the same configuration as in the original safety factor assessment. Since the original assessment already included analysis of the outer slope, it has not been re-analyzed herein.

  Cross-Section A-A was analyzed based on stratigraphy from Boring B-02 on the west side of the crest of the western perimeter dike and from Boring B-01 on the east side of the crest of the perimeter dike.
- **Cross-Section C-C':** Similar to Section A-A, the inner (eastern) slope at Section C-C has undergone significant excavation and regrading and this slope has been analyzed herein. The outer slope facing the Discharge Channel has not been altered and therefore was not re-analyzed.

  Section C-C was analyzed based on stratigraphy from Boring B-04 on the crest of the western perimeter dike, south of the existing overflow weir, and just north of the divider berm.

Re-analysis of the other cross-sections considered in the original safety factor analysis was determined to be unnecessary, for the following reasons:

- **Cross-Section B-B:** This section is located along the western side of the impoundment, in between A-A and C-C, but has not undergone any significant regrading.
- **Cross-Section D-D:** This section was located along the southern perimeter dike of the BAI. As discussed previously, construction of the closure-by-removal project at the BAI is ongoing. The final

condition of the divider berm will depend on the extent of CCR that is excavated along the southern portion of the impoundment and is not currently established. As such, Cross-Section D-D was analyzed based on the configuration of the southern dike as it exists at the time of this report.

- **Cross-Section E-E':** This section is representative of the eastern perimeter dike and was based on stratigraphy from Borings B-08 and B-09 drilled on the eastern perimeter dike. Since the original safety factor assessment, the eastern boundary of the pond was moved inward from the original perimeter dike by construction of a new perimeter dike. A process wastewater ditch was formed between the new perimeter dike and the old perimeter dike. The original geometry and stratigraphy of the old perimeter dike (which is still in place) has not changed from the conditions analyzed in the original assessment, and so was not re-analyzed here.

The topography for each analysis cross-section was determined based on specific ground surveys performed to support this project. Bathymetry data from plans provided by DTE are available within the impoundment and along a portion of the dredged channel abutting the western dike of the pond. This data was used to establish bathymetric grades for analysis cross-sections A-A', and C-C'. The bathymetry for the Discharge Channel and Lake Erie was not altered as part of the Closure by Removal, and the bathymetric data was carried forward from the original assessment.

3.2 Loading Conditions

Consistent with the criteria provided in the USEPA CCR Rule §257.100 (e), stability analyses for the selected cross-sections of the perimeter dikes were evaluated for four load cases:

3.2.1 Static, Steady-State, Normal Pool Condition

This case models the perimeter dike embankments under static, long-term conditions, at normal water level within the impoundment. The USEPA CCR Rule requires a maximum storage pool factor of safety greater than or equal to 1.50.

3.2.2 Static, Maximum Surcharge Pool Condition

This case models the conditions under short-term surcharge pool conditions, which herein was taken as a condition in which the water level in the ash impoundment is at El. 577, which corresponds to between 0 and 1 ft below the top of the dike at any location. This condition requires a minimum factor of safety greater than or equal to 1.40.

3.2.3 Seismic (Pseudostatic) Load Condition

These analyses incorporate a horizontal seismic coefficient, k_h, selected to be representative of expected loading during the design earthquake event (i.e., a "pseudostatic" analysis). The design earthquake event is one with a 2% probability of exceedance in 50 years (approximately 2,500 year recurrence interval), as required by the CCR Rule. The horizontal seismic coefficient was estimated to be 0.11g for the subject site as described in the original safety factor assessment. The analyses utilized peak undrained strength parameters for soils that are not considered to be rapidly draining materials (such as the soft clay and till foundation soils), and peak drained strengths for materials that are rapidly draining (the various sand strata at the site). The phreatic surface and pore water pressures corresponding to the steady-state pool from the static analyses were utilized. This loading condition requires a minimum Factor of Safety greater than or equal to 1.00.

3.2.4 Post-Liquefaction Condition

The purpose of the post-liquefaction stability analysis is to assess stability conditions immediately following the design seismic event. No horizontal seismic coefficient is included in these analyses, but selection of strength parameters for the analyses takes into account the potential for the liquefaction of the soils as a result of pore pressures generated in sand-like materials, or cyclic softening in clay-like materials due to the earthquake shaking. Liquefaction potential analysis has been previously performed as part of the original safety factor assessment and those results were carried forward for the current assessment.

3.3 Material Engineering Parameters

Stratigraphy and material parameters for this periodic assessment were the same as used previously in the original assessment, as no changes to subsurface conditions (other than those described above) are understood to have occurred. Refer to the 2019 [AECOM, 2019] report for detailed descriptions of the subsurface strata and the methodology and interpretations used to select material parameters for slope stability analyses.

Material shear strength parameters used in the slope stability analyses for each of the pertinent strata are summarized in **Tables 3-2 and 3-3** below.

Table 3-2 – Material Properties For Static Slope Stability Analyses

Material	Unit Weight (pcf)	Peak Effective (drained) Shear Strength Parameters		Peak Total (undrained) Shear Strength Parameters	
		c' (psf)	Φ' (°)	c (psf)	Φ (°)
Fill –Dike	120	0	30	0	30
Aggregate Fill – Southern Perimeter Dike	130	0	33	0	33
Soft Clay and Silt Strata	100	110	32	220	16.4
Loose Sand	120	0	28	0	28
Sand and Gravel	120	0	33	0	33
Till[1]	130	4,000	0	4,000	0
Bedrock	Assumed to be impenetrable in the slope stability models				

Table 3-3 – Material Properties Considered For Seismic Slope Stability Analyses

Material	Unit Weight (pcf)	Pseudostatic Loading Condition		Post-Earthquake Loading Condition	
		c (psf)	Φ (°)	c (psf)	Φ (°)
Fill –Dike	120	0	30	0	25
Aggregate Fill – Southern Perimeter Dike	130	0	33	0	27
Soft Clay	100	220	16.4	176	13.2

Table 3-3 – Material Properties Considered For Seismic Slope Stability Analyses					
Material	Unit Weight (pcf)	Pseudostatic Loading Condition		Post-Earthquake Loading Condition	
		c (psf)	Φ (°)	c (psf)	Φ (°)
Loose Sand	120	0	28	S_r = 250 psf	
Sand and Gravel	120	0	33	0	33
Till	130	4,000	0	4,000	0
Bedrock	Assumed to be impenetrable in the slope stability models				

3.4 Methodology

Limit equilibrium stability analysis was completed using the two-dimensional Slope/W computer program by Geo-Slope International. Factors of safety were calculated using Spencer's method and using iterative analyses of both circular and block failure surfaces to determine the critical failure surface for each analysis section and load case. Shallow finite slope failure surfaces were not considered as they correspond to sloughing which can be addressed as part of regular maintenance. Critical surfaces with respect to dam safety were considered to be those which intersected the dike crest at or upstream of its centerline. Such failures are considered to have the potential to create an immediate threat to dike safety. Pore pressures were assigned as hydrostatic pressure under the phreatic surface.

A summary of the analyses is presented in the following sections. Full results of the analyses are presented in **Appendix B**.

3.4.1 Static Analysis Conditions

3.4.1.1 *Pool Elevations*

The static analysis conditions include the steady-state normal pool and maximum surcharge pool loading conditions. Static stability was evaluated for steady-state conditions using a normal pool elevation of 575 ft, and a flood pool surcharge elevation of the lower of 577 ft or the peak elevation of the dike crest at the cross section location (whichever was lower).

3.4.1.2 *Phreatic Surface*

The phreatic surface used in the steady-state normal pool condition was established using the pool elevations of the pond, the discharge channel, and Lake Erie in conjunction with the groundwater levels encountered in each boring. The water elevations were drawn into the stability models with straight line interpolation between the impoundment pool elevation, boring locations, and discharge channel or Lake Erie pool elevations. The discharge channel and Lake Erie were assumed at El. 570, which corresponds to the average low water level in Lake Erie (as defined by NOAA).

For the maximum surcharge pool condition, the pool level in the impoundment was raised to the surcharge pool elevation, but the water level in Lake Erie was kept at El. 570 ft. The straight-line interpolation described above was applied for this case as well. Therefore, the phreatic surface used for this loading condition corresponds to steady-state seepage to the raised pool level. This is a conservative representation, as the maximum storage pool water level is likely to be a short-term event and steady state seepage conditions through the dike are unlikely to develop.

3.4.1.3 *Shear Strength Parameters*

For the steady-state normal pool condition, drained (effective stress) shear strength parameters, as shown in **Table 3-2**, were used for all materials.

The change in water level from the normal pool case to the maximum surcharge pool condition is relatively small (less than 3 vertical ft). The small forcing effect created by this change is not expected to generate an undrained stress condition in the dike or its foundation. Therefore, drained (effective stress) shear strength parameters were used for all materials under the maximum surcharge pool loading condition as well.

3.4.2 Earthquake Analysis Conditions

Assumptions and seismic input parameters used in this periodic assessment were the same as for the original assessment:

- The design earthquake was an event with 2 percent probability of exceedance in 50 years (approximately 2,500-year return period).
- A horizontal seismic coefficient, k_h, of 0.10g was calculated for use in the seismic (pseudostatic) loading condition slope stability analysis.
- Peak undrained strength parameters (as summarized in **Table 3-2**) were utilized in the slope stability analyses of the seismic loading condition. As this condition incorporates a horizontal seismic coefficient, liquefied strengths are not pertinent to the analysis and were not utilized.
- The Loose Sand stratum was assumed to liquefy under the design earthquake, so liquified strengths in this layer were assumed in the post-earthquake analysis case. The embankment fill soils and the Soft Clay foundation soils were generally soft to stiff. Based on that, the peak undrained shear strength used for these soils were reduced by 20% to account for the possibility of cyclic-softening of these materials. See **Table 3-3** for strengths used in post-liquefaction load condition.
- Pool elevation in the impoundment and the phreatic surface for both the seismic and post-liquefaction loading conditions were the same as utilized in the steady-state normal pool loading condition.

4 Results of Analysis

4.1 Results of Static Stability Analyses

The results of the limit equilibrium slope stability analyses for the static load cases are summarized in **Table 4-1**. The SLOPE/W output figures showing the critical slip surfaces and details of the analyses are included in **Appendix B**.

Table 4-1 – Summary of Minimum Slope Stability Factors of Safety for Static Load Cases

Load Case	Criteria	Slip Surface Type	Cross-Section		
			A-A'	C-C'	D-D
Steady-State (Normal Pool)	FS ≥ 1.50	Circular	1.80	2.36	1.98
		Block	1.79	4.53	1.83
Maximum Surcharge Pool	FS ≥ 1.40	Circular	1.53	3.01	1.94
		Block	1.92	5.58	1.80

The calculated factors of safety at all analysis sections are greater than the minimum values required per USEPA CCR Rule §257.100 (e) and §257.73 (e).

4.2 Results of Earthquake Stability Analyses

The results of the slope stability analyses for the seismic load cases are summarized in **Table 4-2**. The SLOPE/W output figures showing the critical slip surfaces and details of the analyses are included in **Appendix B**.

Table 4-2 – Summary of Minimum Slope Stability Factors of Safety for Earthquake Load Cases

Load Case	Criteria	Slip Surface Type	Cross-Section		
			A-A'	C-C'	D-D
Seismic (Pseudostatic)	FS ≥ 1.00	Circular	1.15	2.04	2.50
		Block	1.30	1.91	2.35
Post-Liquefaction	FS ≥ 1.20	Circular	1.37	2.41	2.14
		Block	1.36	3.07	2.01

The calculated factors of safety at all analysis sections are greater than the minimum values required in USEPA CCR Rule §257.100 (e) and §257.73(e).

4.3 Pertinent Results of Original Safety Factor Assessment

As described above, the original safety factor assessment evaluated several critical cross-sections and considered stability of the outside slopes of the perimeter impoundment dikes (slopes that face Lake Erie or the Discharge Channel) – namely Sections B-B and E-E (as shown in **Figures 2-1 and 2-2**). The configuration of these slopes has not significantly changed in the interim period, so the factors of safety are estimated to be the same as previously calculated. **Tables 4-3 and 4-4** summarize those original results for these sections and slopes, and slope stability outputs are provided in **Appendix C**.

Table 4-3 – Summary of Minimum Slope Stability Factors of Safety for Static Load Cases – Outside Dike Slopes

Load Case	Criteria	Slip Surface Type	Cross-Section			
			A-A	B-B	C-C	E-E’
Steady-State (Normal Pool)	FS ≥ 1.50	Circular	2.31	1.75	1.54	2.42
		Block	2.31	2.04	1.87	2.41
Maximum Surcharge Pool	FS ≥ 1.40	Circular	2.16	1.69	1.45	2.28
		Block	2.17	1.98	1.77	2.30

Table 4-4 – Summary of Minimum Slope Stability Factors of Safety for Earthquake Load Cases

Load Case	Criteria	Slip Surface Type	Cross-Section			
			A-A	B-B	C-C	E-E’
Seismic (Pseudostatic)	FS ≥ 1.00	Circular	1.26	1.24	1.22	1.39
		Block	1.28	1.31	1.25	1.46
Post-Liquefaction	FS ≥ 1.20	Circular	1.38	1.33	1.30	1.49
		Block	1.36	1.36	1.31	1.51

The calculated factors of safety at all these analysis sections are greater than the minimum values required per USEPA CCR Rule §257.100 (e) and §257.73 (e).

5 Conclusions

7
As discussed herein, this periodic assessment has added analyses of the inside slopes of the eastern dike of the BAI at critical cross-sections A-A and C-C, where appreciable regrading has occurred. The calculated factors of safety from the this slope stability analysis satisfy the USEPA CCR Rule §257.100(e) and §257.73(e) requirements for all the load cases analyzed at these sections. The original safety factor assessment analyzed five representative cross-sections and included evaluations of the outside slopes of the impoundment dikes, which face Lake Erie or the Discharge Channel. Those slopes also had factors of safety that met the factor of safety requirements and since no changes have been made to them, they still meet the requirements at this time.

Therefore, this periodic safety factor assessment concludes that the Area 15 Inactive BAI continues to be in compliance with the requirements of USEPA CCR Rule §257.100(e) and §257.73(e).

6 Limitations

Background information, design basis, and other data have been furnished to AECOM by DTE. AECOM has used this data in preparing this report. AECOM has relied on this information as furnished, and is not responsible for the accuracy of this information.

Borings have been spaced as closely as economically feasible, but variations in soil properties between borings, that may become evident at a later date, are possible. The conclusions developed in this report are based on the assumption that the subsurface soil, rock, and groundwater conditions do not deviate appreciably from those encountered in the site-specific exploratory borings. If any variations or undesirable conditions are encountered in any future exploration, we should be notified so that additional analyses can be made, if necessary.

The conclusions presented in this report are intended only for the purpose, site location, and project indicated. The recommendations presented in this report should not be used for other projects or purposes. Conclusions or recommendations made from these data by others are their responsibility. The conclusions and recommendations are based on AECOM's understanding of current plant operations, maintenance, stormwater handling, and ash handling procedures at the station, as provided by DTE. Changes in any of these operations or procedures may invalidate the findings in this report until AECOM has had the opportunity to review the findings, and revise the report if necessary.

The conclusions presented in this report are professional opinions based on the indicated project criteria and data available at the time this report was prepared. Our services were provided in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. No other representation is intended.

7 References

AECOM. (2019). “Safety Factor Assessment Report, Inactive Bottom Ash Impoundment, DTE Monroe Power Plant – Rev. 1”. August 30, 2019.

U.S. Environmental Protection Agency [USEPA]. (2015). Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments. 40 CFR §257. Federal Register 80, Subpart D, April 17, 2015.

Idriss, I.M., and Boulanger, R. W. (2008). “SPT-Based Liquefaction Triggering Procedures”, Report No. UCD/CGM-10-02, Center for Geotechnical Modeling, Department of Civil and Environmental Engineering, University of California, Davis, CA.

Idriss, I.M. and Boulanger, R.W. (2014). “CPT and SPT Based Liquefaction Triggering Procedures”, Center of Geotechnical Modeling, Department of Civil and Environmental Engineering, University of California, Davis, California.

8 Certification

This Certification Statement documents that the Inactive BAI at the DTE Monroe Power Plant meets the requirements specified in 40 CFR §257.100 (e) and §257.73(e).

CCR Unit: DTE Monroe Power Plant Inactive BAI

I, Vikram Gautam, being a Registered Professional Engineer in good standing in the State of Michigan, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above referenced CCR Unit, that the safety factor assessment meets the requirements of 40 §257.100 (e) and §257.73(e).

Vikram K. Gautam
Printed Name

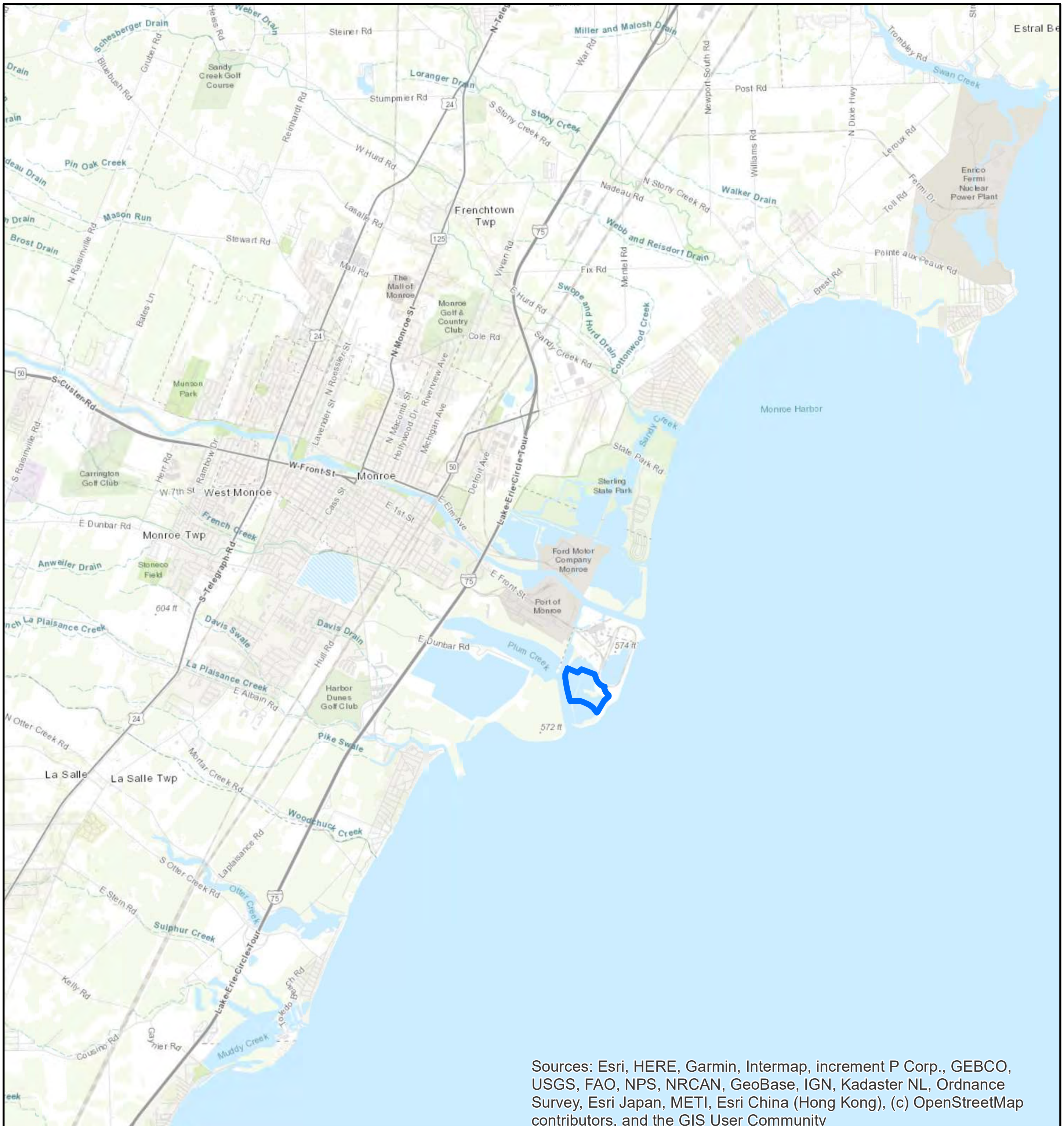
8/30/2024
Date

Revision Log

The table below provides a description of revisions to the Safety Factor Assessment Report.

REVISION #	REVISION DATE	DESCRIPTION OF REVISION
0	March 2018	Original Safety Factor Assessment
1	August 30, 2019	Updated Original Safety Factor Assessment
2	August 30, 2024	1st Periodic Safety Factor Assessment

Appendix A
Figures



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Legend

Ash Impoundment Boundary

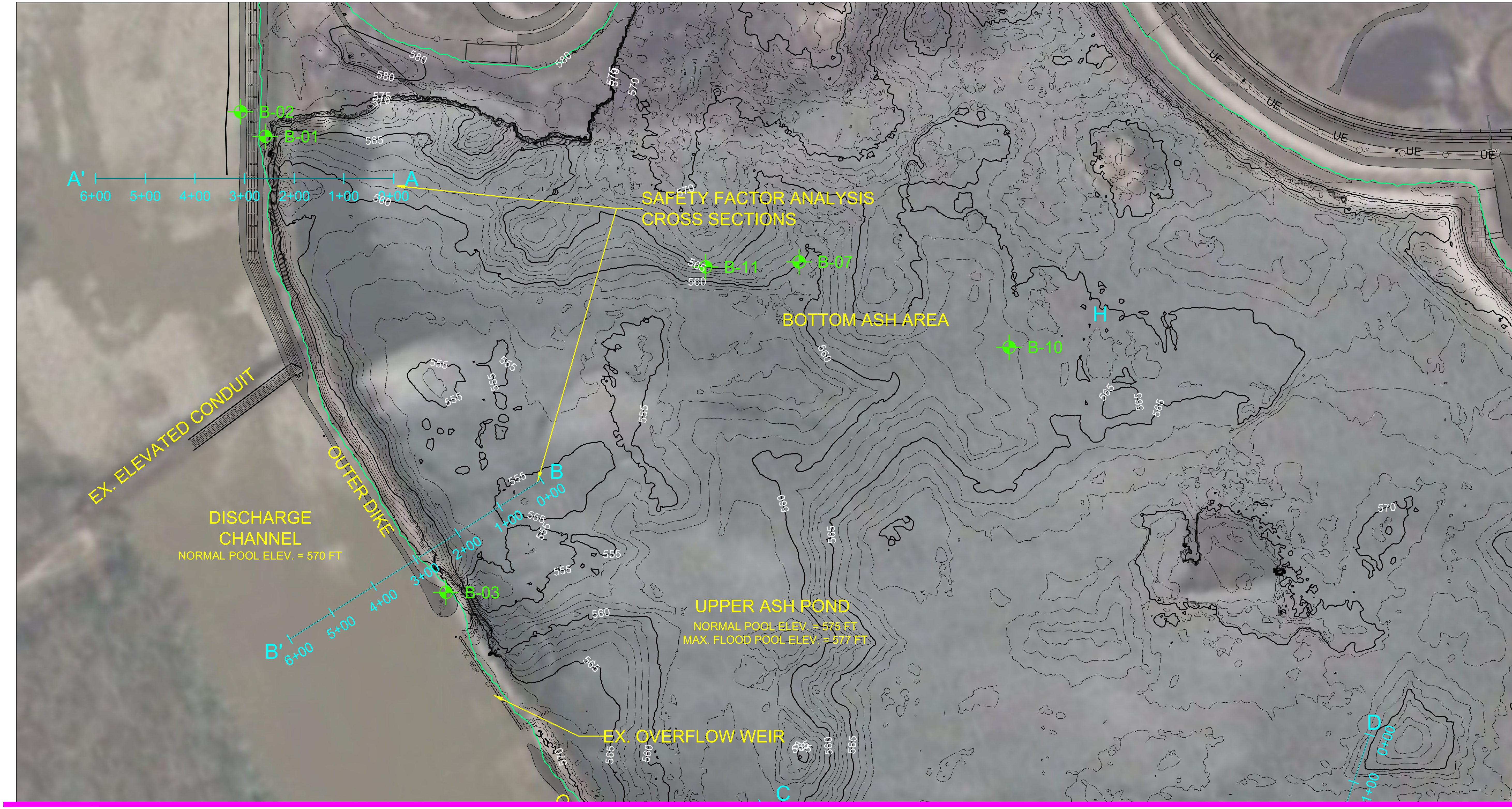
N

0 1 2 Miles

DTE Monroe Power Plant

FIGURE 1
SITE LOCATION MAP

DATE: 08/30/2024
PROJECT NO.: 60733958



MATCH LINE (FIGURE 2-2)

SOIL BORING LOCATION

0 100 200

SCALE: 1"=200'

AECOM

DTE MONROE POWER PLANT AREA 15

MONROE, MICHIGAN

GEOTECHNICAL SITE PLAN
SHEET 1 of 2

DRAWN BY:	CHECKED BY:	PROJECT No:	DATE:	FIGURE No:
EJB	VKG	60516675	8/30/2024	2-1

0 100 200

SCALE: 1"=200'

SOIL BORING LOCATION

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DTE MONROE POWER PLANT AREA 15

MONROE, MICHIGAN

GEOTECHNICAL SITE PLAN

SHEET 2 of 2

DRAWN BY:	CHECKED BY:	PROJECT No:	DATE:	FIGURE No:
EJB	VKG	60516675	8/30/2024	2-2

Appendix B
Results of New (2024) Slope Stability Analyses

DTE Monroe - Area 15 Safety Factor Analysis

Cross Section A-A'

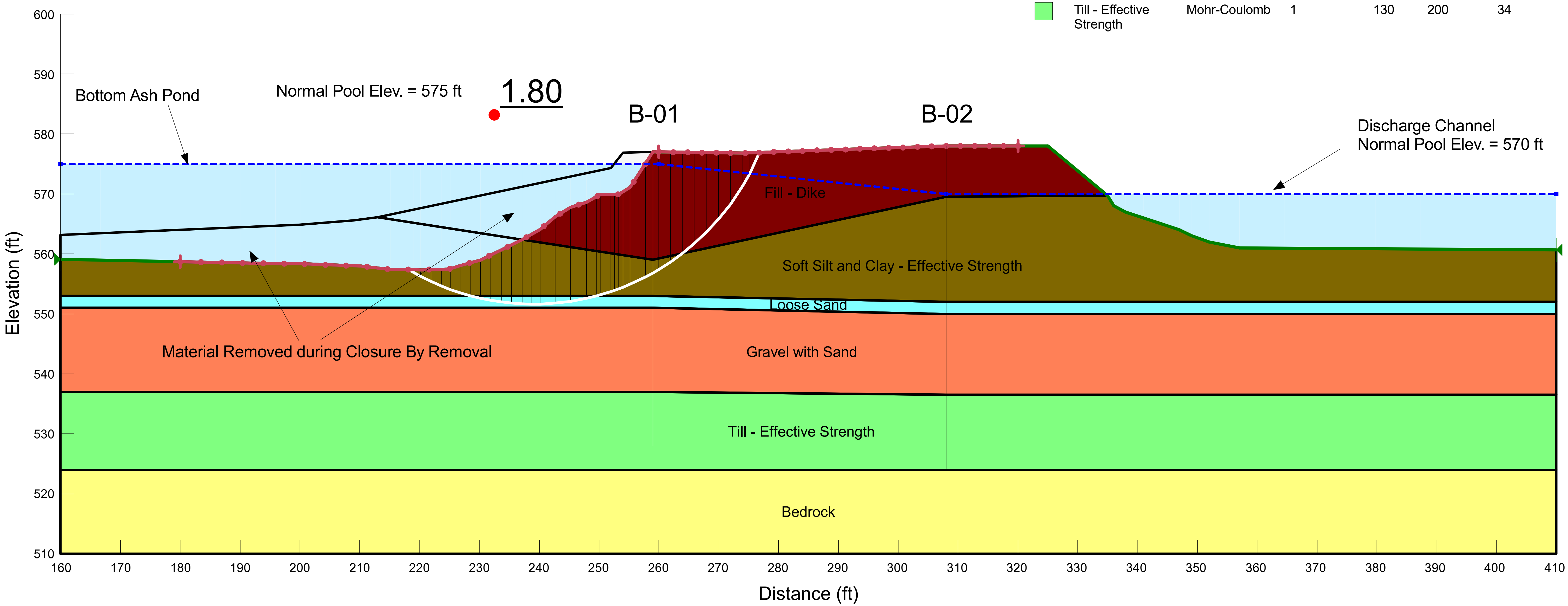
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Static Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Gravel with Sand	Mohr-Coulomb	1	125	0	33
	Loose Sand	Mohr-Coulomb	1	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
	Till - Effective Strength	Mohr-Coulomb	1	130	200	34



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section A-A'

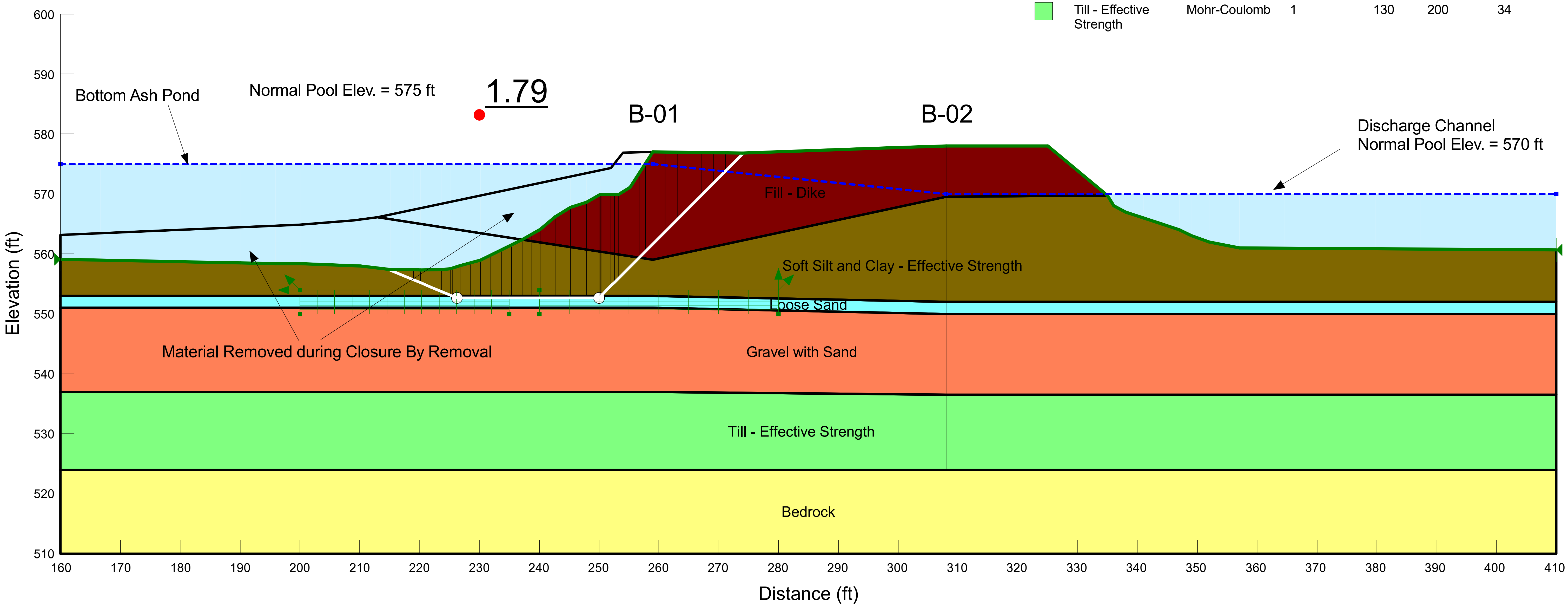
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Static Analysis
Block Failure

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Gravel with Sand	Mohr-Coulomb	1	125	0	33
	Loose Sand	Mohr-Coulomb	1	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
	Till - Effective Strength	Mohr-Coulomb	1	130	200	34



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section A-A'

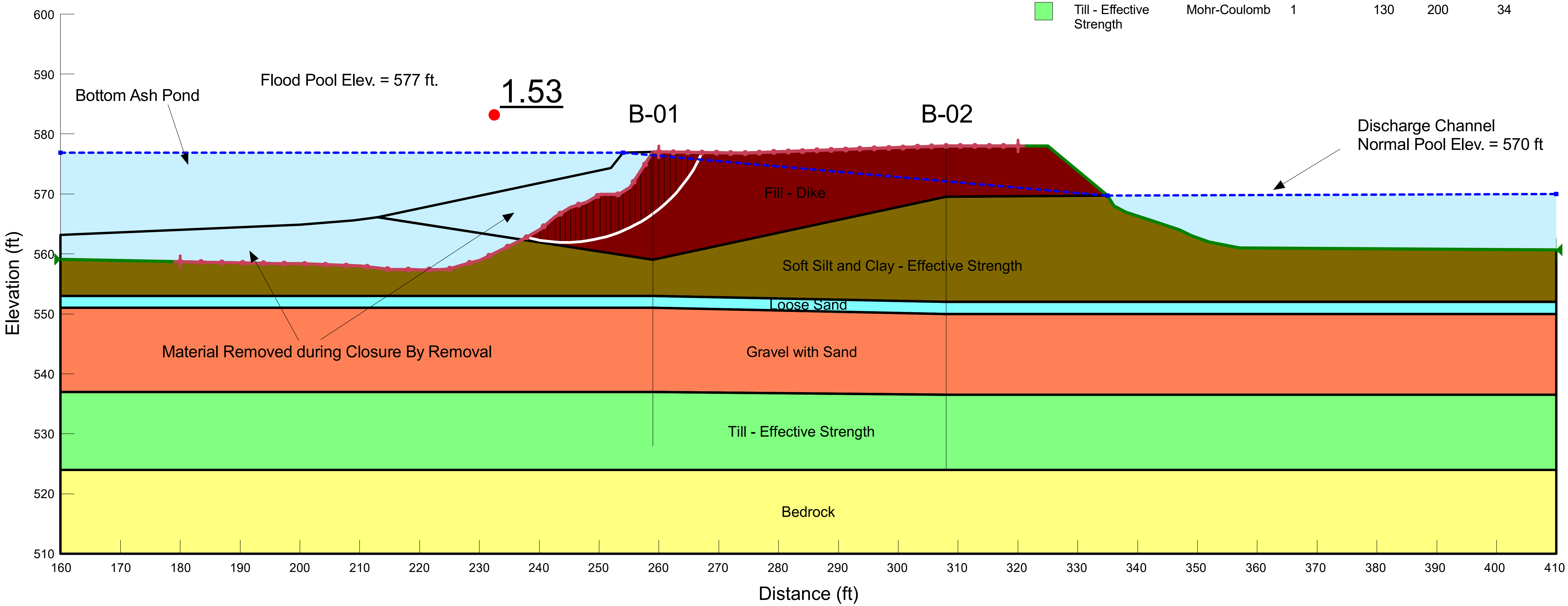
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Static Analysis with Flood Pool Surcharge
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
Yellow	Bedrock	Bedrock (Impenetrable)	1			
Dark red	Fill - Dike	Mohr-Coulomb	1	120	0	30
Orange	Gravel with Sand	Mohr-Coulomb	1	125	0	33
Cyan	Loose Sand	Mohr-Coulomb	1	120	0	28
Brown	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
Green	Till - Effective Strength	Mohr-Coulomb	1	130	200	34



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section A-A'

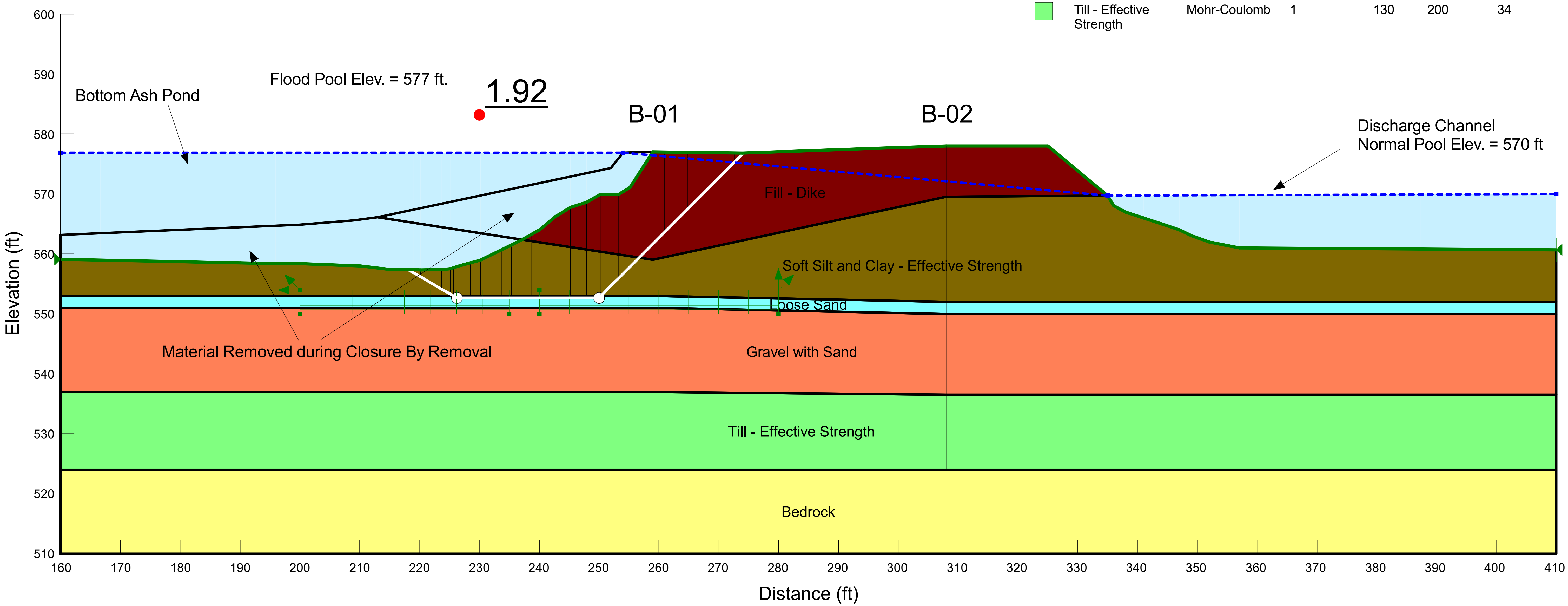
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Static Analysis with Flood Pool Surcharge
Block Failure

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Gravel with Sand	Mohr-Coulomb	1	125	0	33
	Loose Sand	Mohr-Coulomb	1	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
	Till - Effective Strength	Mohr-Coulomb	1	130	200	34



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section A-A'

Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

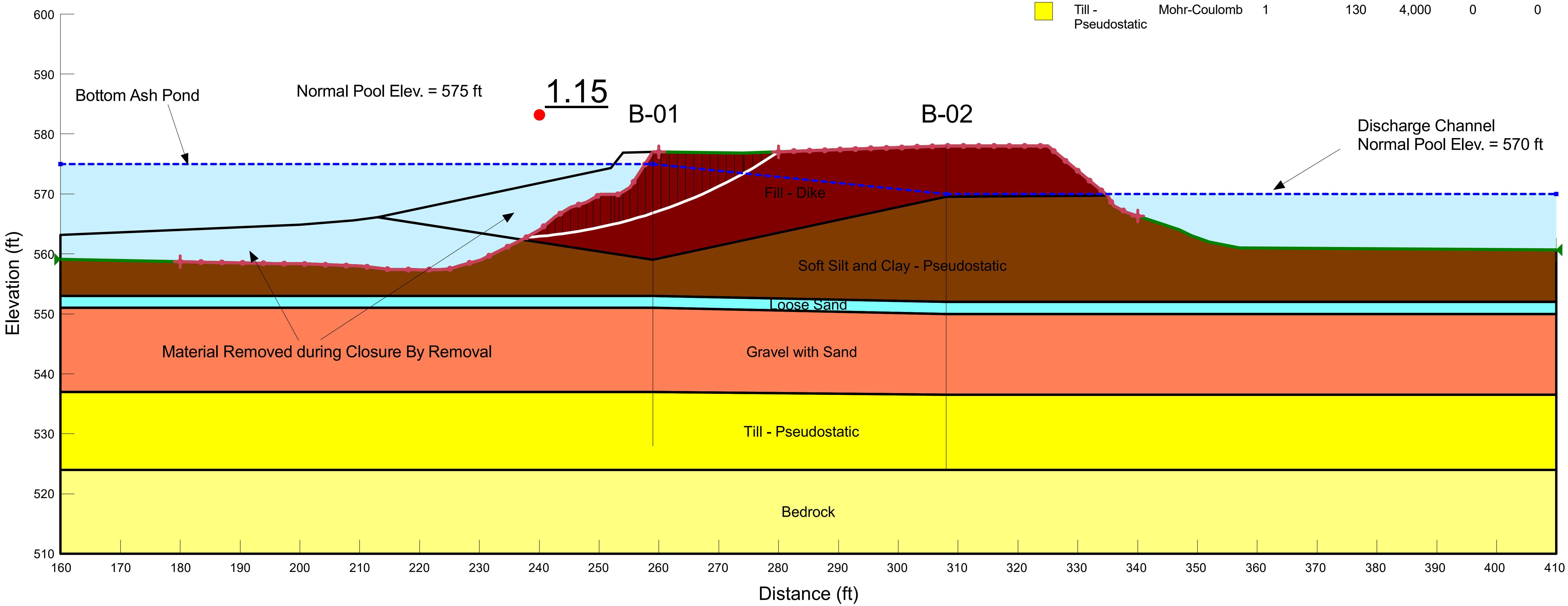
Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Pseudostatic (Seismic) Analysis
Circular Slip Surfaces

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Cohesion R (psf)	Phi R (°)
	Bedrock	Bedrock (Impenetrable)	1					
	Fill - Dike	Mohr-Coulomb	1	120	0	30	0	0
	Gravel with Sand	Mohr-Coulomb	1	125	0	33	0	0
	Loose Sand	Mohr-Coulomb	1	120	0	28	0	0
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	1	100	220	16	0	0
	Till - Pseudostatic	Mohr-Coulomb	1	130	4,000	0	0	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section A-A'

Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

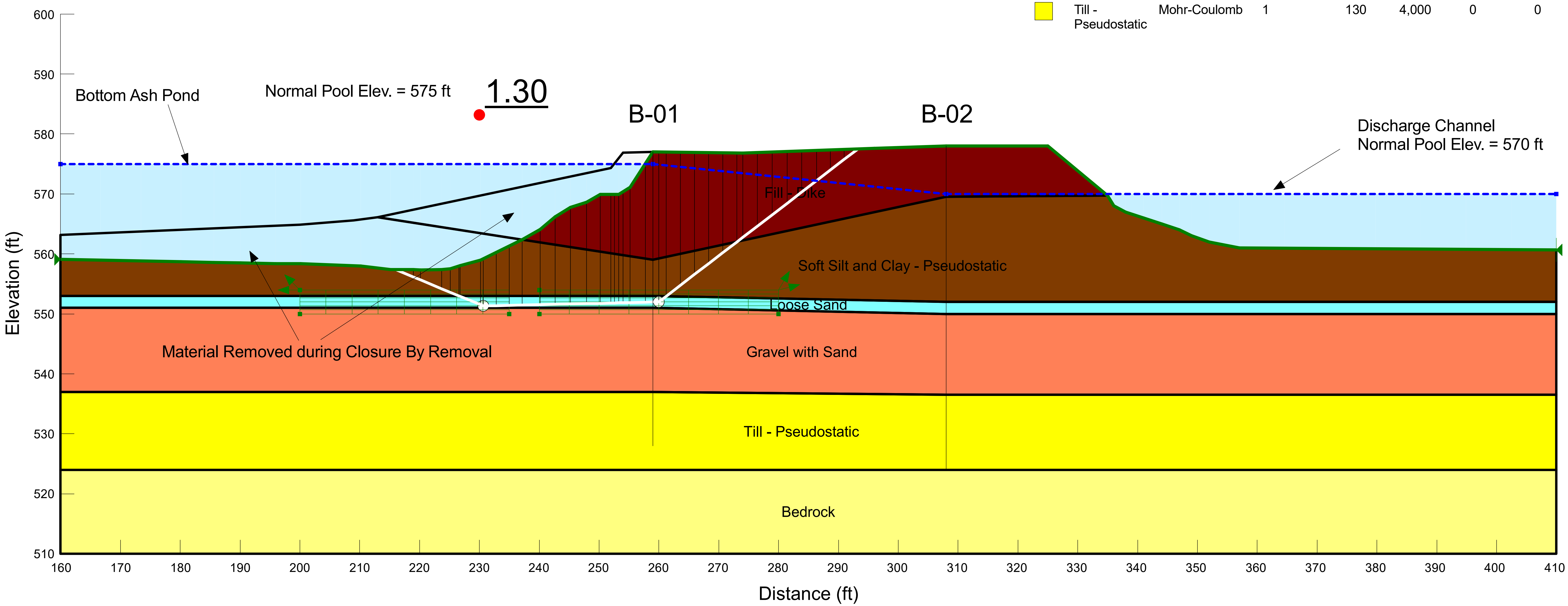
Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Pseudostatic (Seismic) Analysis
Block Failure

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Cohesion R (psf)	Phi R (°)
	Bedrock	Bedrock (Impenetrable)	1					
	Fill - Dike	Mohr-Coulomb	1	120	0	30	0	0
	Gravel with Sand	Mohr-Coulomb	1	125	0	33	0	0
	Loose Sand	Mohr-Coulomb	1	120	0	28	0	0
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	1	100	220	16	0	0
	Till - Pseudostatic	Mohr-Coulomb	1	130	4,000	0	0	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section A-A'

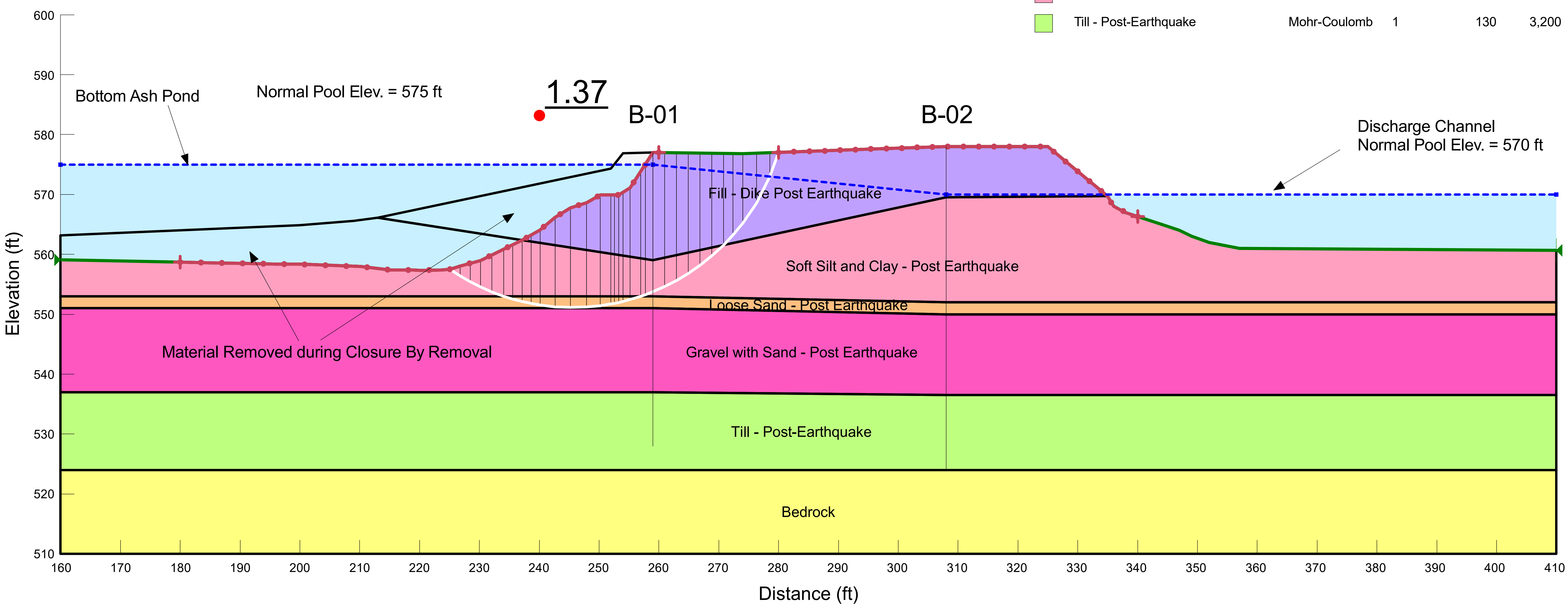
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike Post Earthquake	Mohr-Coulomb	1	120	0	25
	Gravel with Sand - Post Earthquake	Mohr-Coulomb	1	125	0	28
	Loose Sand - Post Earthquake	Mohr-Coulomb	1	120	250	0
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	1	100	176	13.2
	Till - Post-Earthquake	Mohr-Coulomb	1	130	3,200	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section A-A'

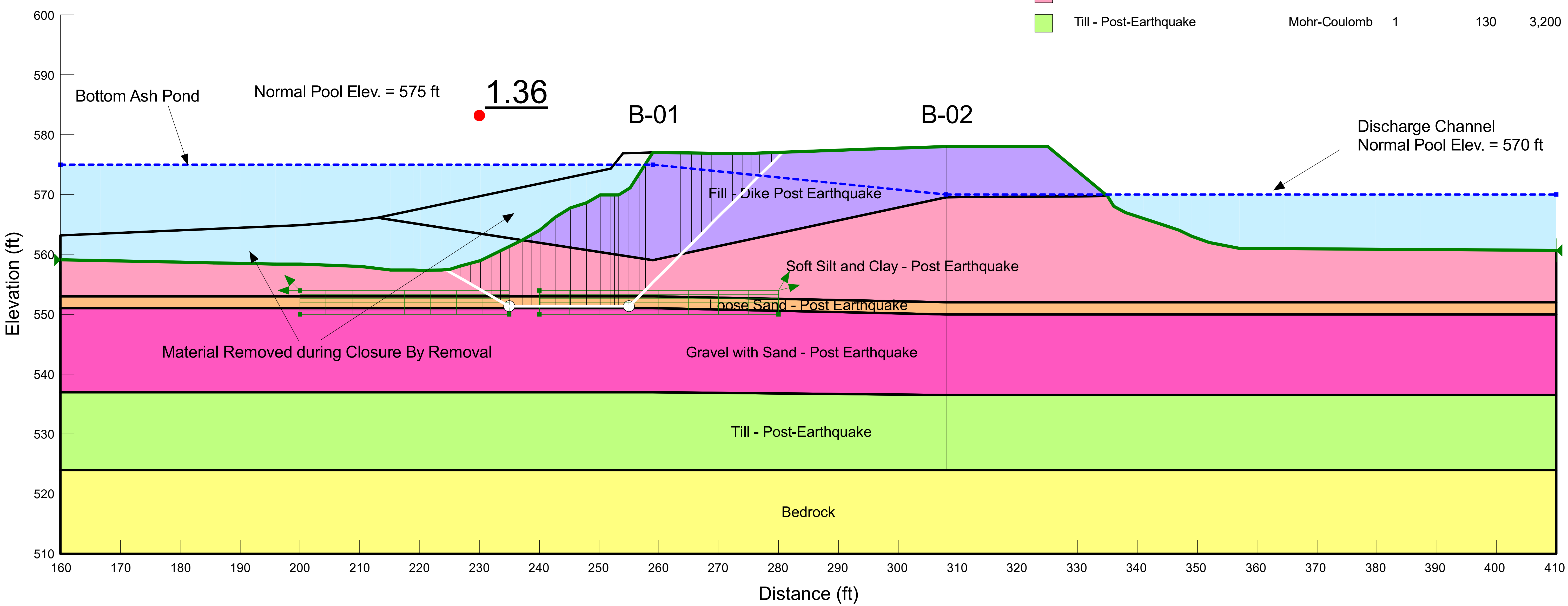
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Block Failure

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike Post Earthquake	Mohr-Coulomb	1	120	0	25
	Gravel with Sand - Post Earthquake	Mohr-Coulomb	1	125	0	28
	Loose Sand - Post Earthquake	Mohr-Coulomb	1	120	250	0
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	1	100	176	13.2
	Till - Post-Earthquake	Mohr-Coulomb	1	130	3,200	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section C-C'

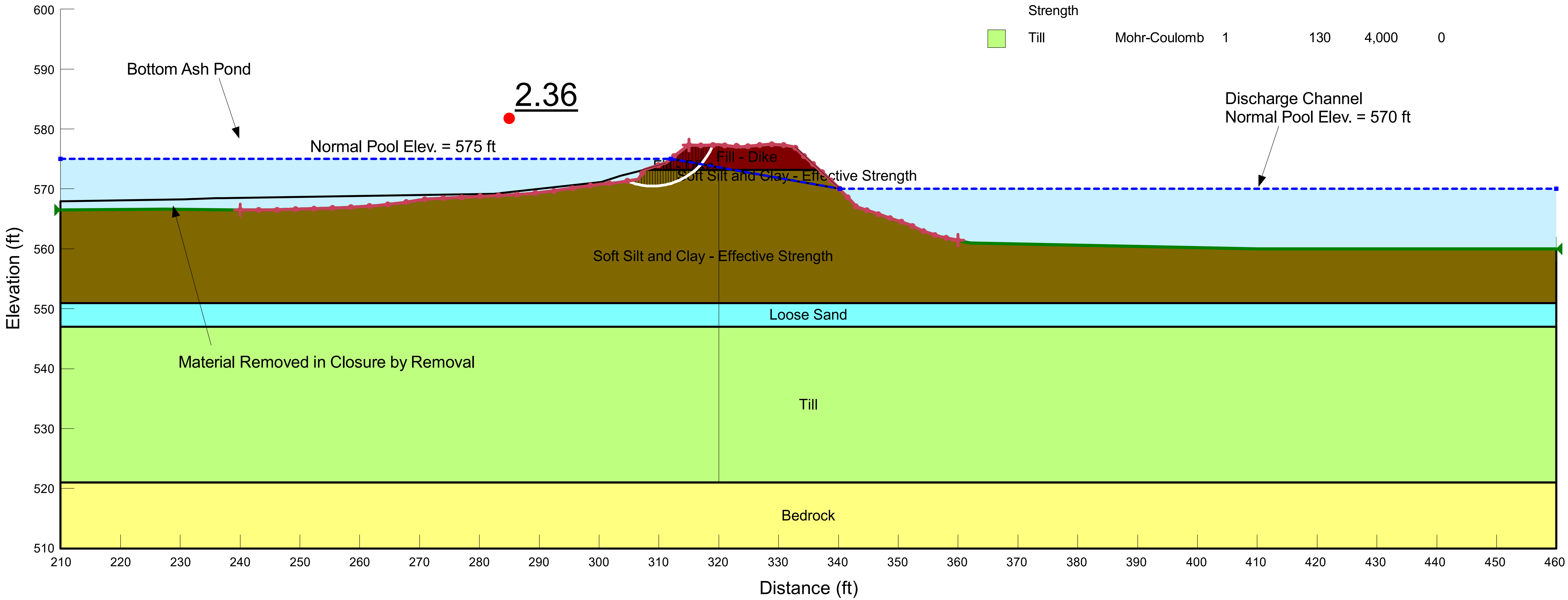
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Static Analysis
Block Failure

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Loose Sand	Mohr-Coulomb	1	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
	Till	Mohr-Coulomb	1	130	4,000	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section C-C'

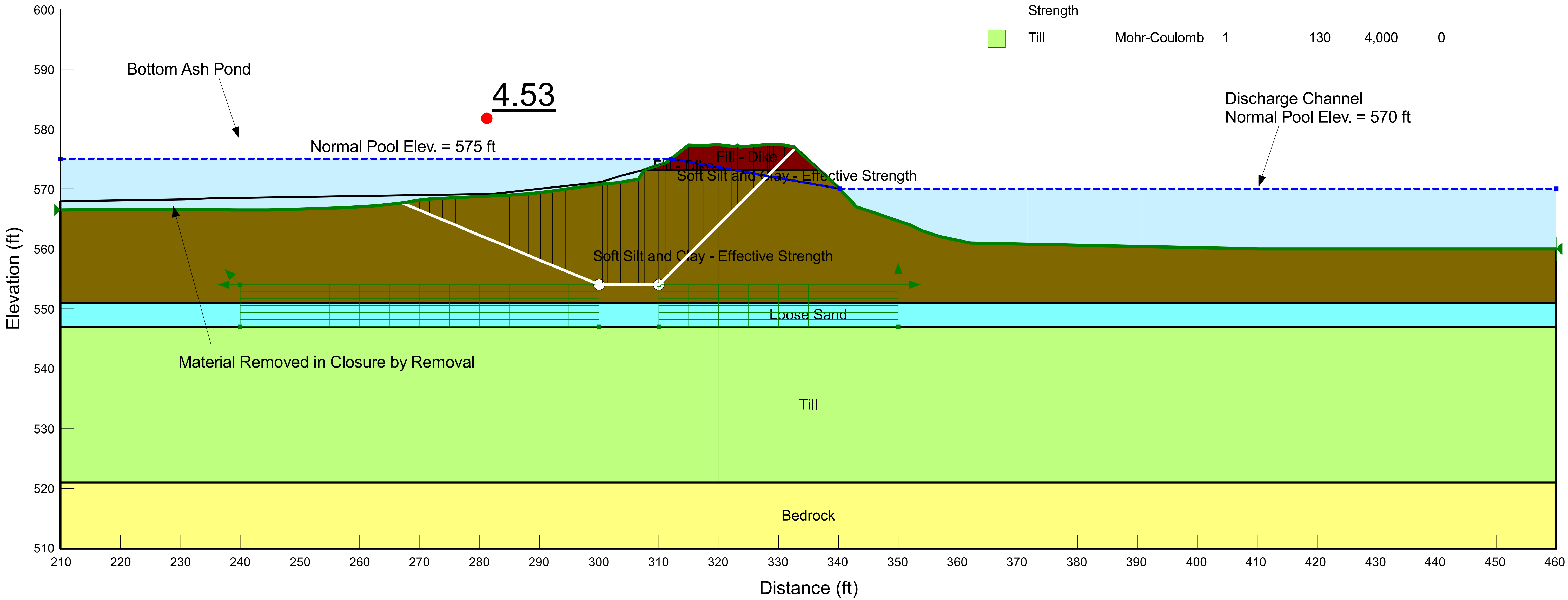
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Static Analysis
Block Failure

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
(yellow)	Bedrock	Bedrock (Impenetrable)	1			
(dark red)	Fill - Dike	Mohr-Coulomb	1	120	0	30
(cyan)	Loose Sand	Mohr-Coulomb	1	120	0	28
(brown)	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
(light green)	Till	Mohr-Coulomb	1	130	4,000	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section C-C'

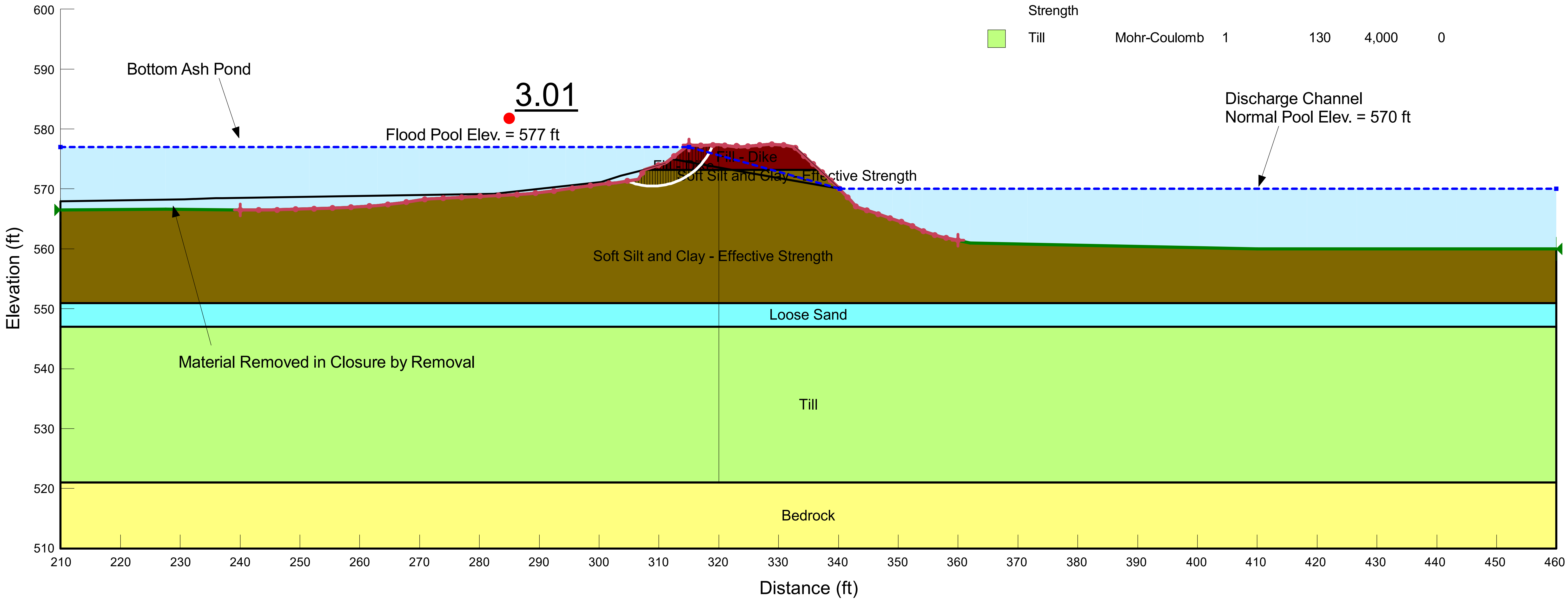
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Static Analysis with Flood Pool Surcharge
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Loose Sand	Mohr-Coulomb	1	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
	Till	Mohr-Coulomb	1	130	4,000	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section C-C'

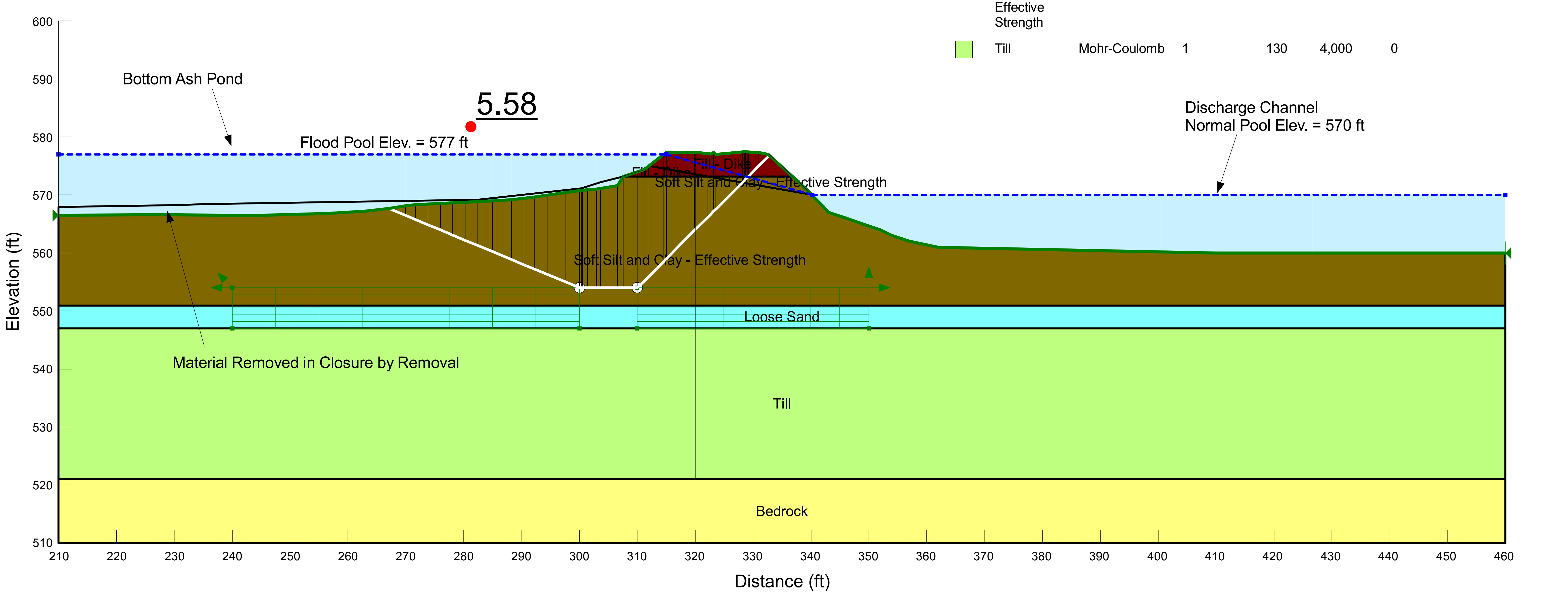
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Static Analysis with Flood Pool Surcharge
Block Failure

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Loose Sand	Mohr-Coulomb	1	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
	Till	Mohr-Coulomb	1	130	4,000	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section C-C'

Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

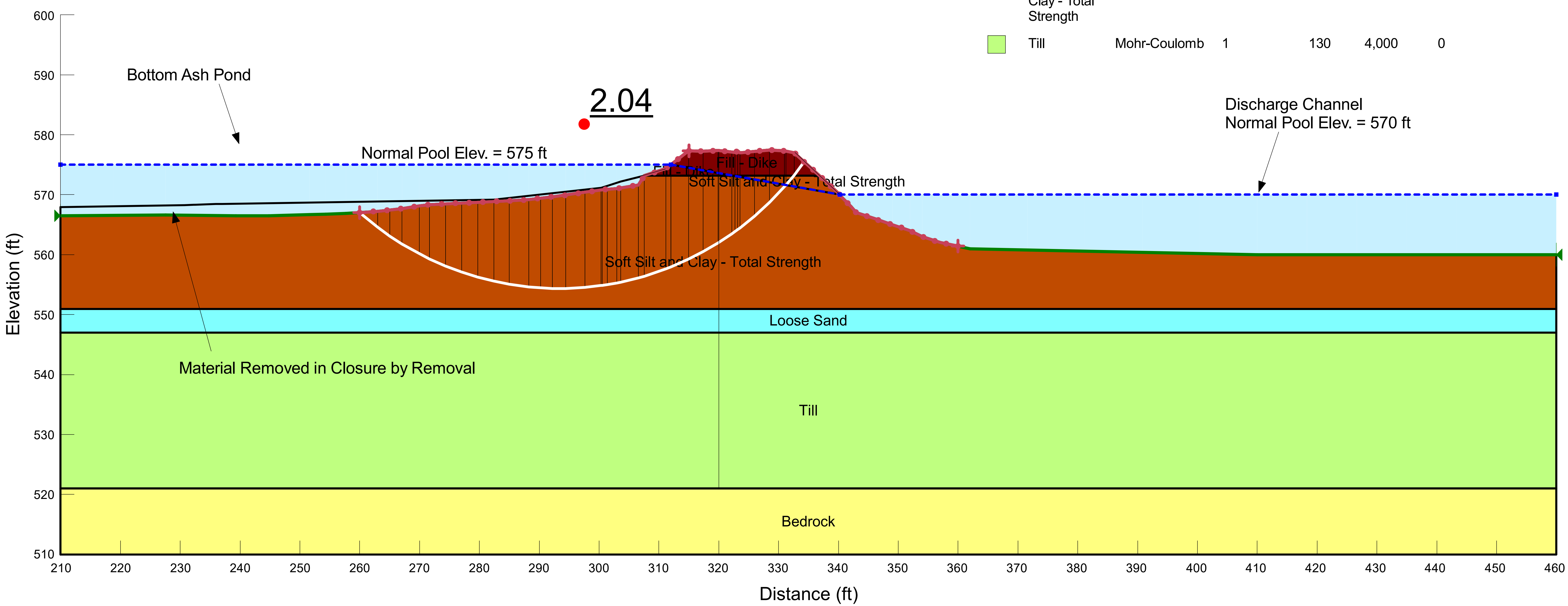
Alignment Azimuth Angle
237.7 degrees

Pseudostatic (Seismic) Analysis
Circular Slip Surfaces

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Loose Sand	Mohr-Coulomb	1	120	0	28
	Soft Silt and Clay - Total Strength	Mohr-Coulomb	1	100	220	16
	Till	Mohr-Coulomb	1	130	4,000	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section C-C'

Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

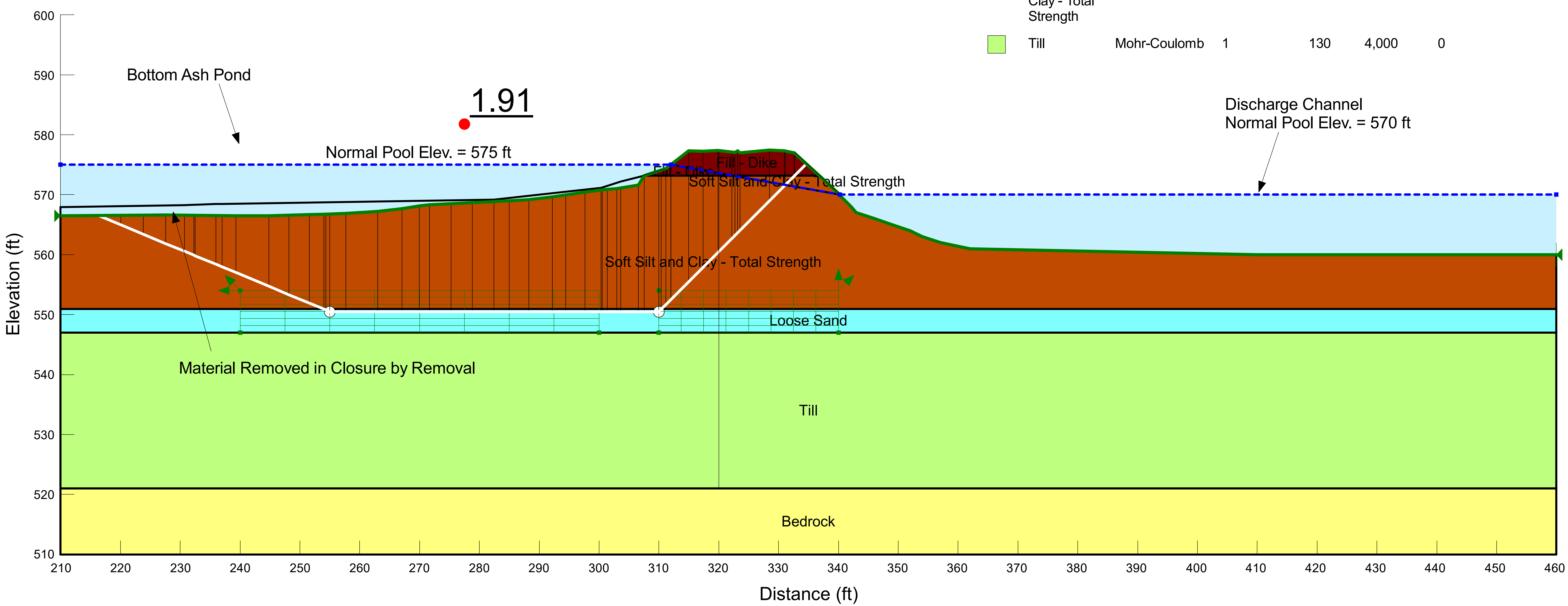
Alignment Azimuth Angle
237.7 degrees

Pseudostatic (Seismic) Analysis
Block Failure

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
Yellow	Bedrock	Bedrock (Impenetrable)	1			
Dark red	Fill - Dike	Mohr-Coulomb	1	120	0	30
Cyan	Loose Sand	Mohr-Coulomb	1	120	0	28
Orange-brown	Soft Silt and Clay - Total Strength	Mohr-Coulomb	1	100	220	16
Light green	Till	Mohr-Coulomb	1	130	4,000	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section C-C'

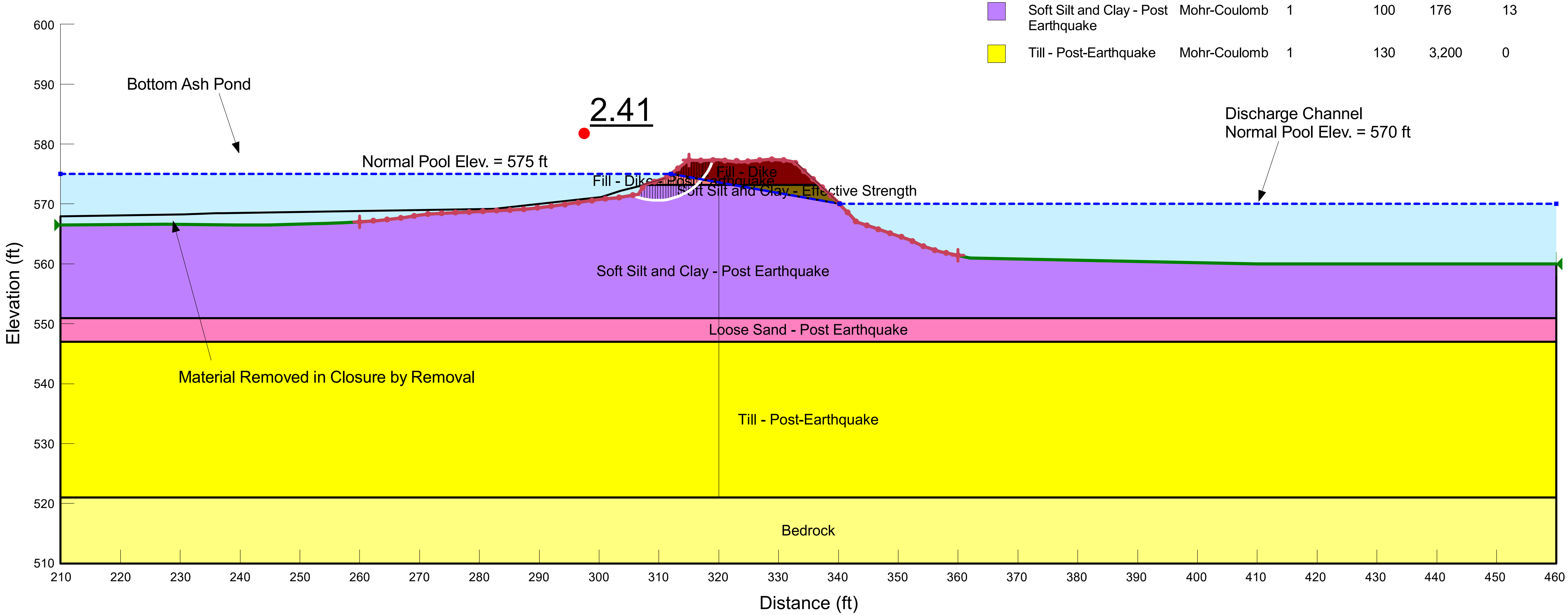
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Fill - Dike - Post Earthquake	Mohr-Coulomb	1	120	0	25
	Loose Sand - Post Earthquake	Mohr-Coulomb	1	120	250	0
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	1	100	176	13
	Till - Post-Earthquake	Mohr-Coulomb	1	130	3,200	0



DTE Monroe - Area 15 Safety Factor Analysis

Cross Section C-C'

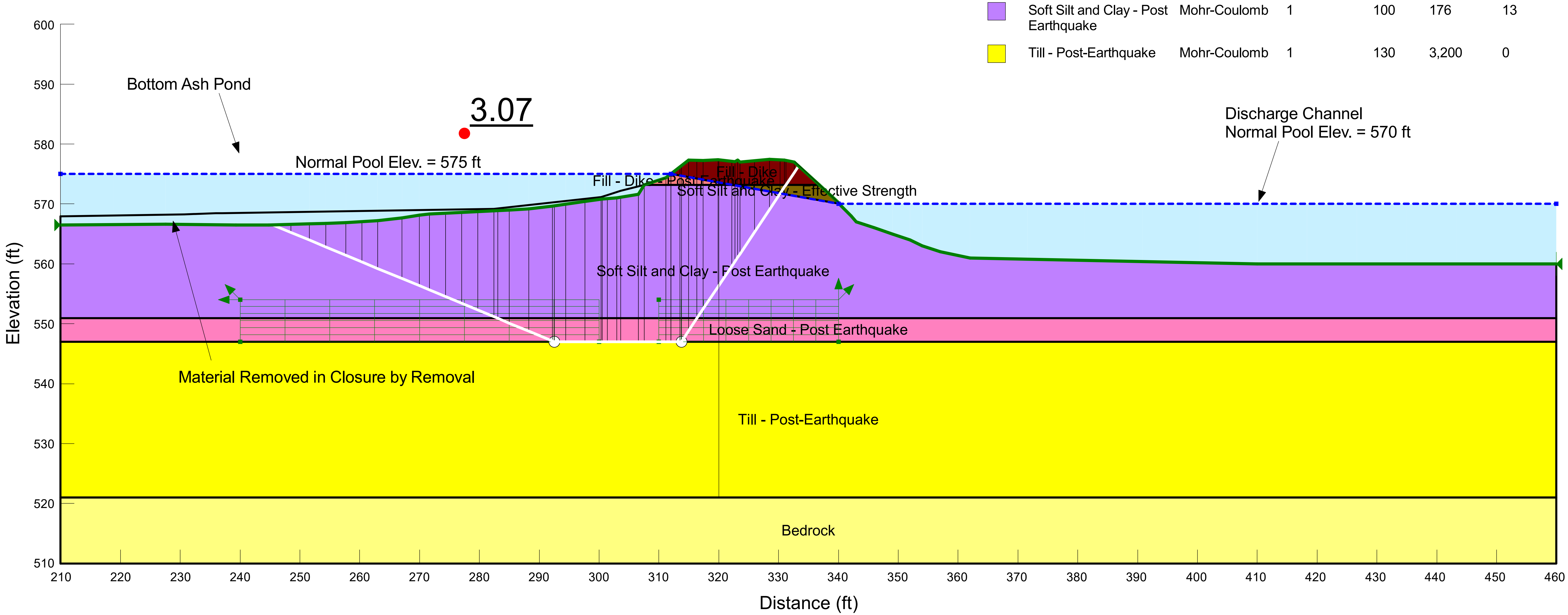
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Block Failure

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Dike	Mohr-Coulomb	1	120	0	30
	Fill - Dike - Post Earthquake	Mohr-Coulomb	1	120	0	25
	Loose Sand - Post Earthquake	Mohr-Coulomb	1	120	250	0
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	1	100	100	30
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	1	100	176	13
	Till - Post-Earthquake	Mohr-Coulomb	1	130	3,200	0



DTE Monroe - Area 15 Safety Factor Analysis

Slope Stability Analysis - Section D-D'

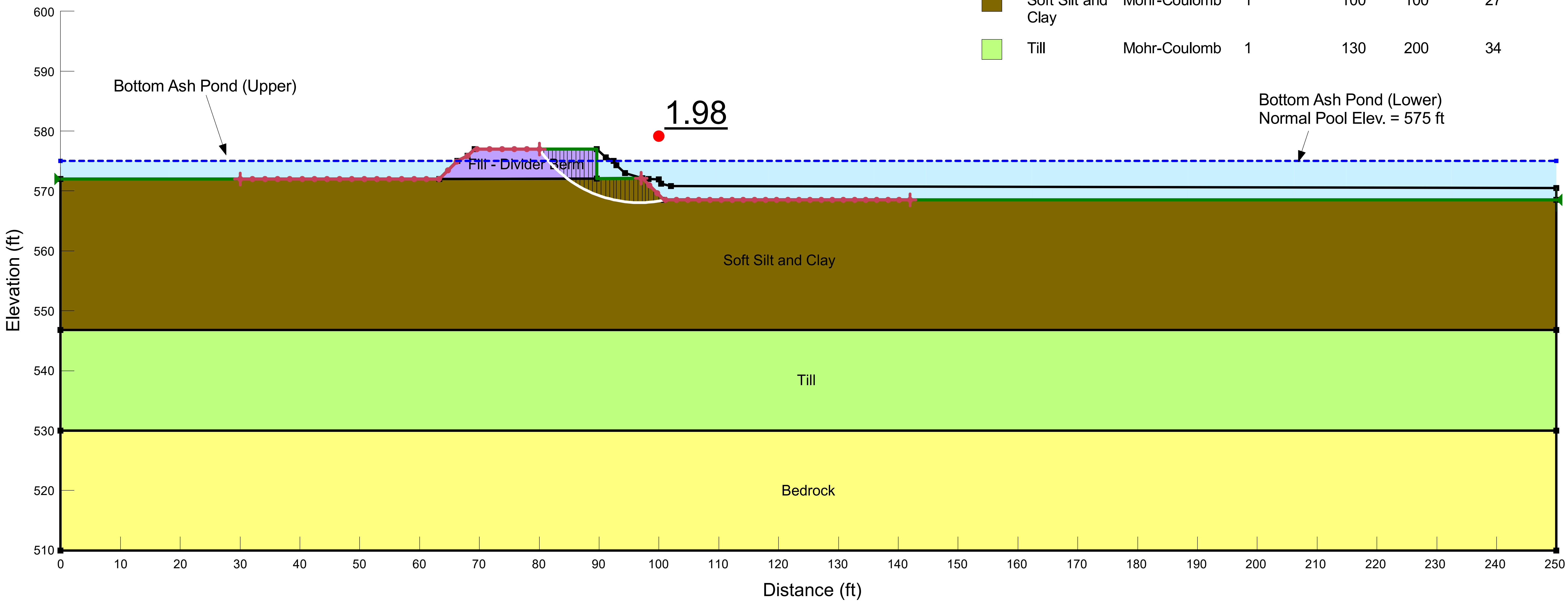
Alignment Reference Point:
N 4443.45 ft
E 8631.45 ft

Alignment Azimuth Angle
0.0 degrees

Static Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Divider Berm	Mohr-Coulomb	1	130	0	33
	Soft Silt and Clay	Mohr-Coulomb	1	100	100	27
	Till	Mohr-Coulomb	1	130	200	34



DTE Monroe - Area 15 Safety Factor Analysis

Slope Stability Analysis - Section D-D'

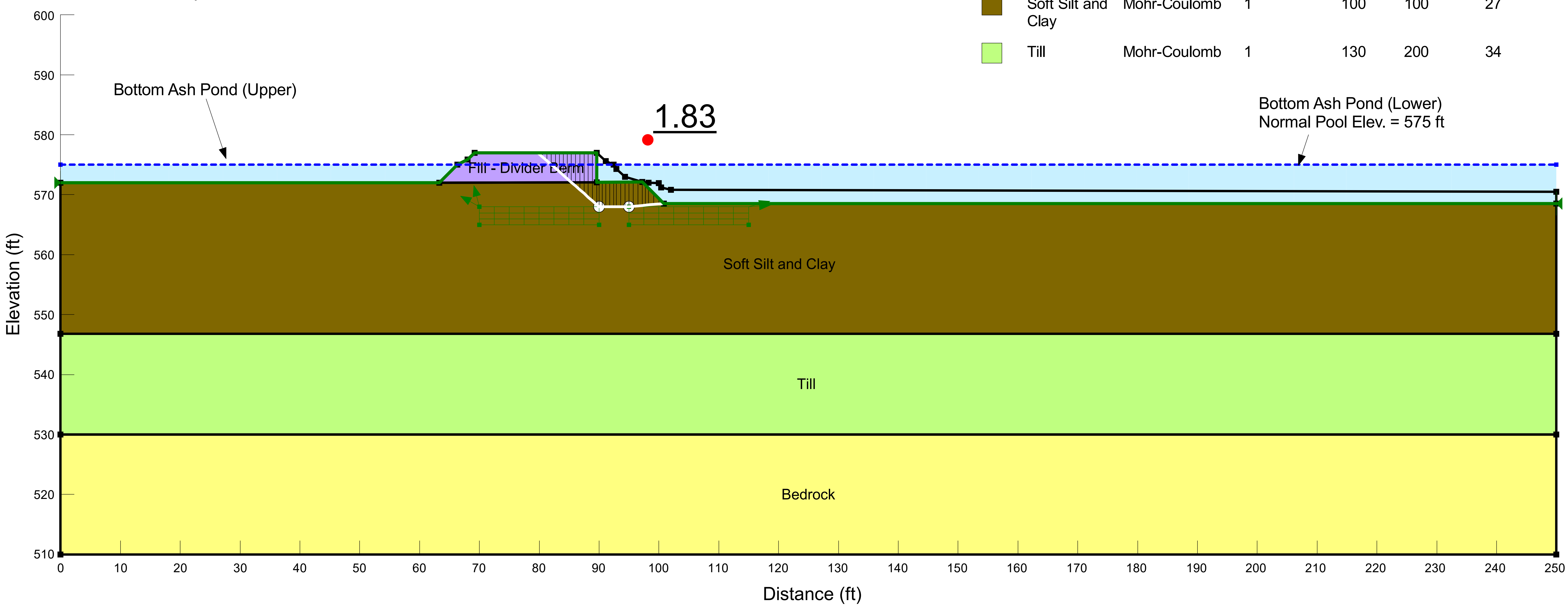
Alignment Reference Point:
N 4443.45 ft
E 8631.45 ft

Alignment Azimuth Angle
0.0 degrees

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
Yellow	Bedrock	Bedrock (Impenetrable)	1			
Purple	Fill - Divider Berm	Mohr-Coulomb	1	130	0	33
Brown	Soft Silt and Clay	Mohr-Coulomb	1	100	100	27
Light green	Till	Mohr-Coulomb	1	130	200	34

Static Analysis
Block-Defined Slip Surfaces



DTE Monroe - Area 15 Safety Factor Analysis

Slope Stability Analysis - Section D-D'

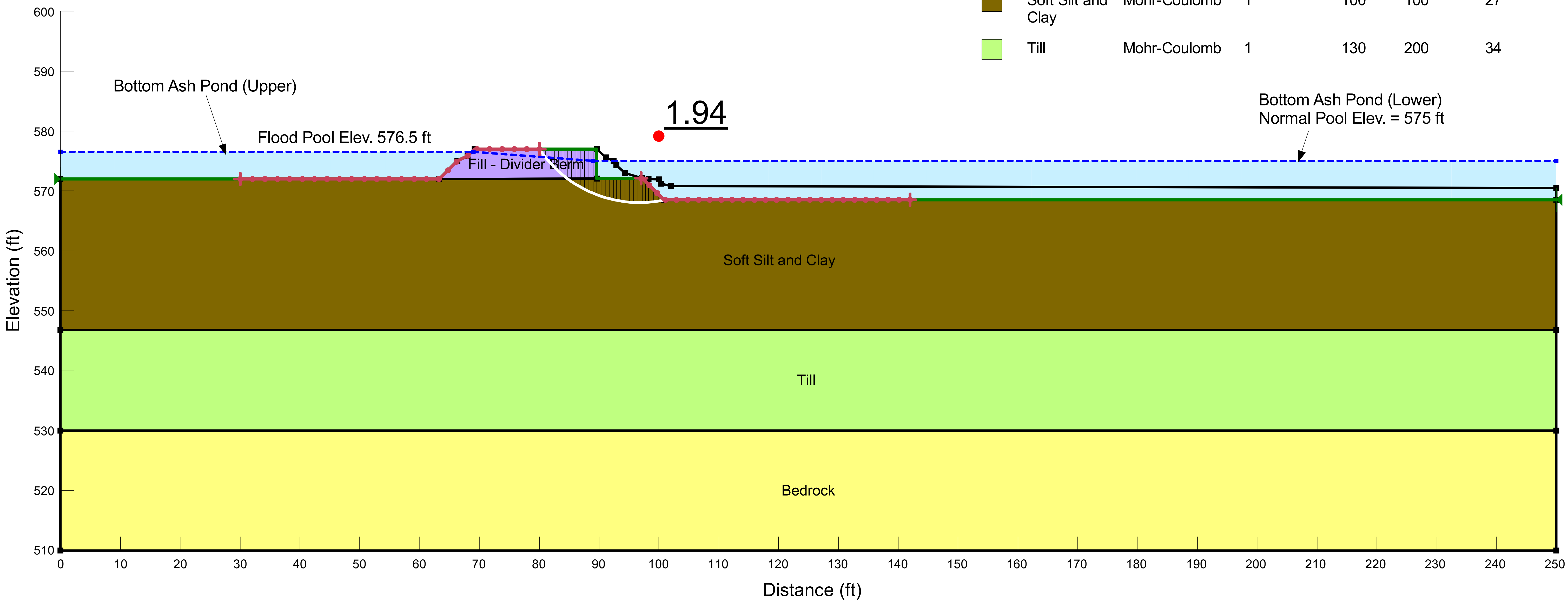
Alignment Reference Point:
N 4443.45 ft
E 8631.45 ft

Alignment Azimuth Angle
0.0 degrees

Static Analysis with Flood Pool Surcharge
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Divider Berm	Mohr-Coulomb	1	130	0	33
	Soft Silt and Clay	Mohr-Coulomb	1	100	100	27
	Till	Mohr-Coulomb	1	130	200	34



DTE Monroe - Area 15 Safety Factor Analysis

Slope Stability Analysis - Section D-D'

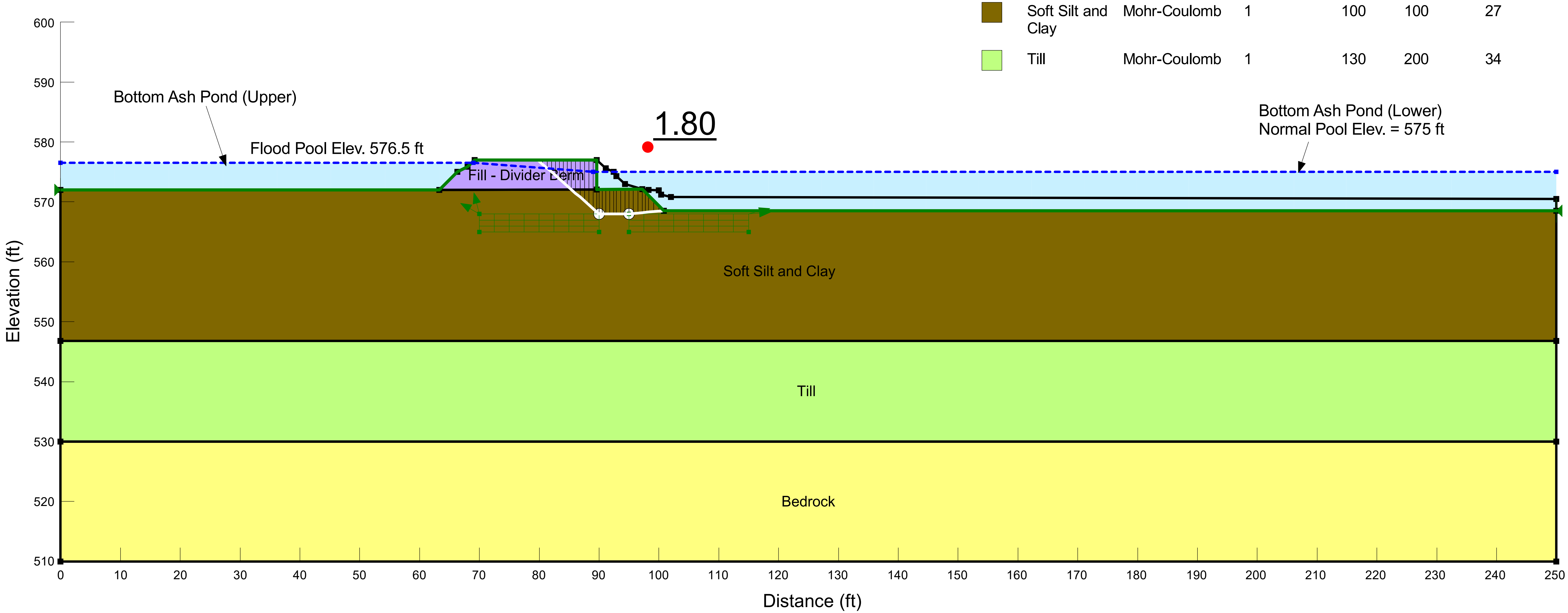
Alignment Reference Point:
N 4443.45 ft
E 8631.45 ft

Alignment Azimuth Angle
0.0 degrees

Static Analysis with Flood Pool Surcharge
Block-Defined Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Divider Berm	Mohr-Coulomb	1	130	0	33
	Soft Silt and Clay	Mohr-Coulomb	1	100	100	27
	Till	Mohr-Coulomb	1	130	200	34



DTE Monroe - Area 15 Safety Factor Analysis

Slope Stability Analysis - Section D-D'

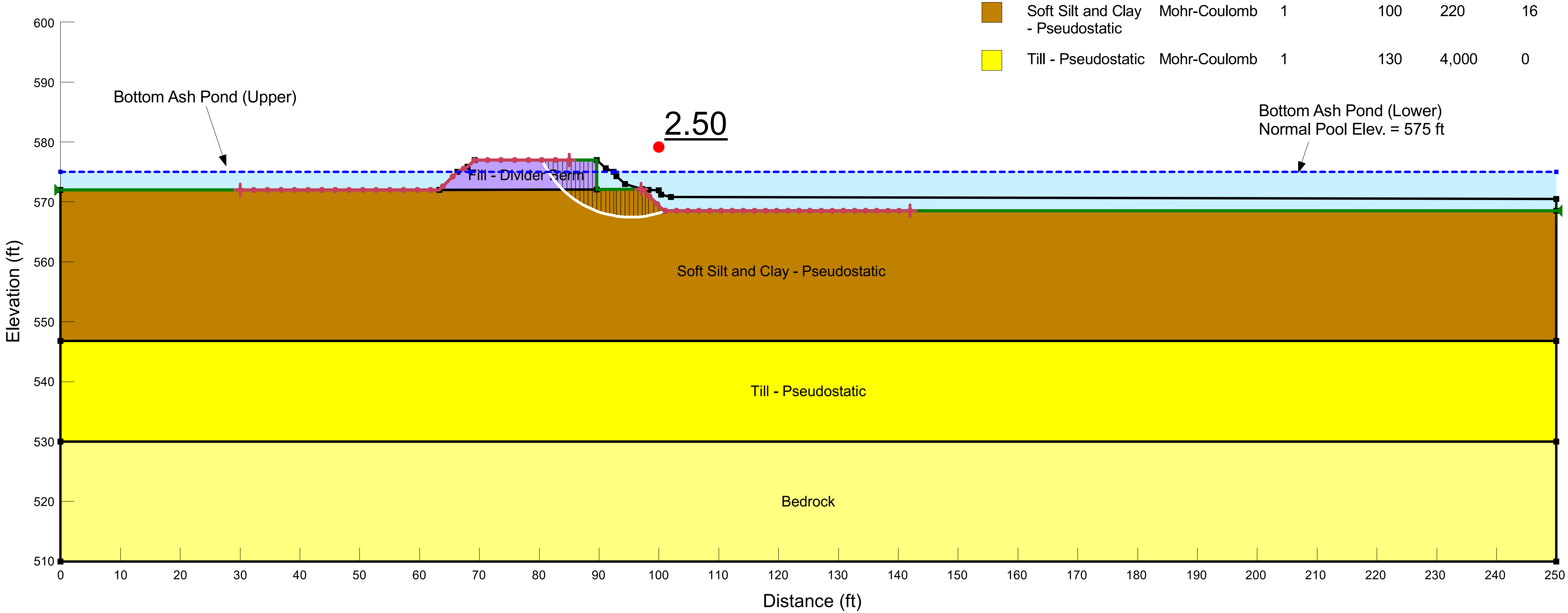
Alignment Reference Point:
N 4443.45 ft
E 8631.45 ft

Alignment Azimuth Angle
0.0 degrees

Pseudostatic Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Divider Berm	Mohr-Coulomb	1	130	0	33
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	1	100	220	16
	Till - Pseudostatic	Mohr-Coulomb	1	130	4,000	0



DTE Monroe - Area 15 Safety Factor Analysis

Slope Stability Analysis - Section D-D'

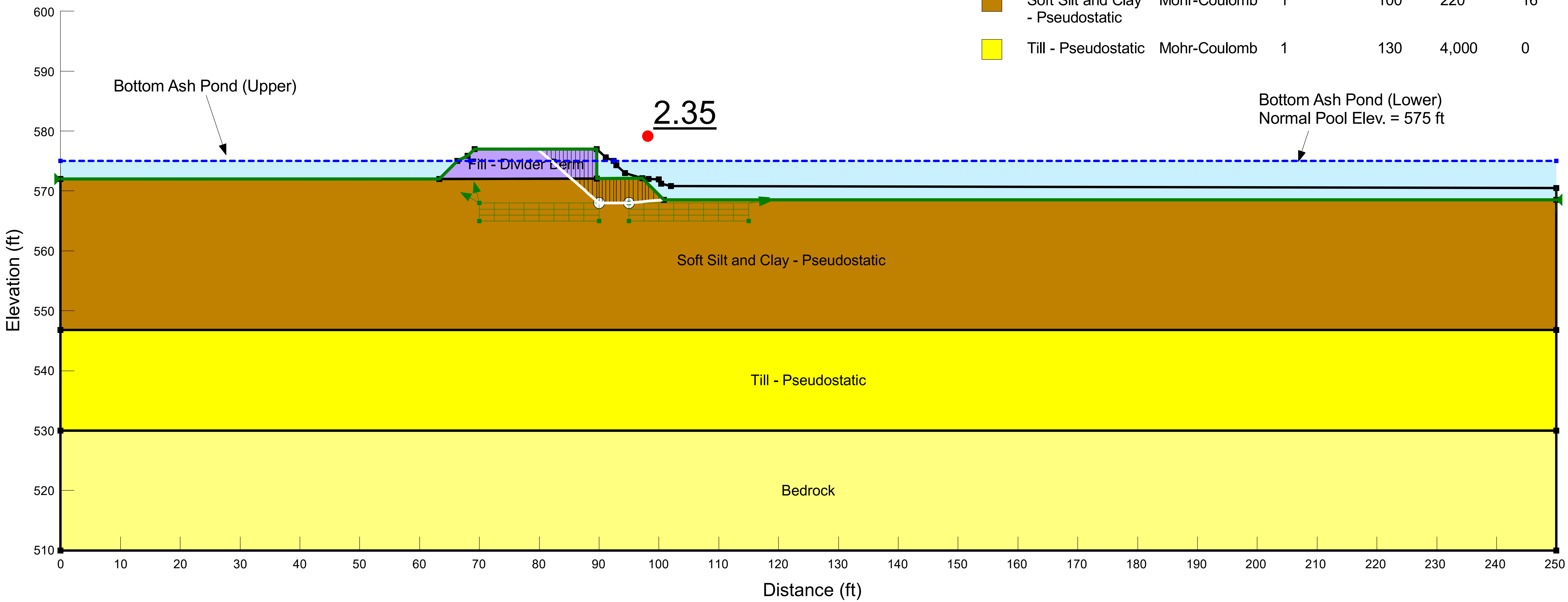
Alignment Reference Point:
N 4443.45 ft
E 8631.45 ft

Alignment Azimuth Angle
0.0 degrees

Pseudostatic Analysis
Block-Definied Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Divider Berm	Mohr-Coulomb	1	130	0	33
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	1	100	220	16
	Till - Pseudostatic	Mohr-Coulomb	1	130	4,000	0



DTE Monroe - Area 15 Safety Factor Analysis

Slope Stability Analysis - Section D-D'

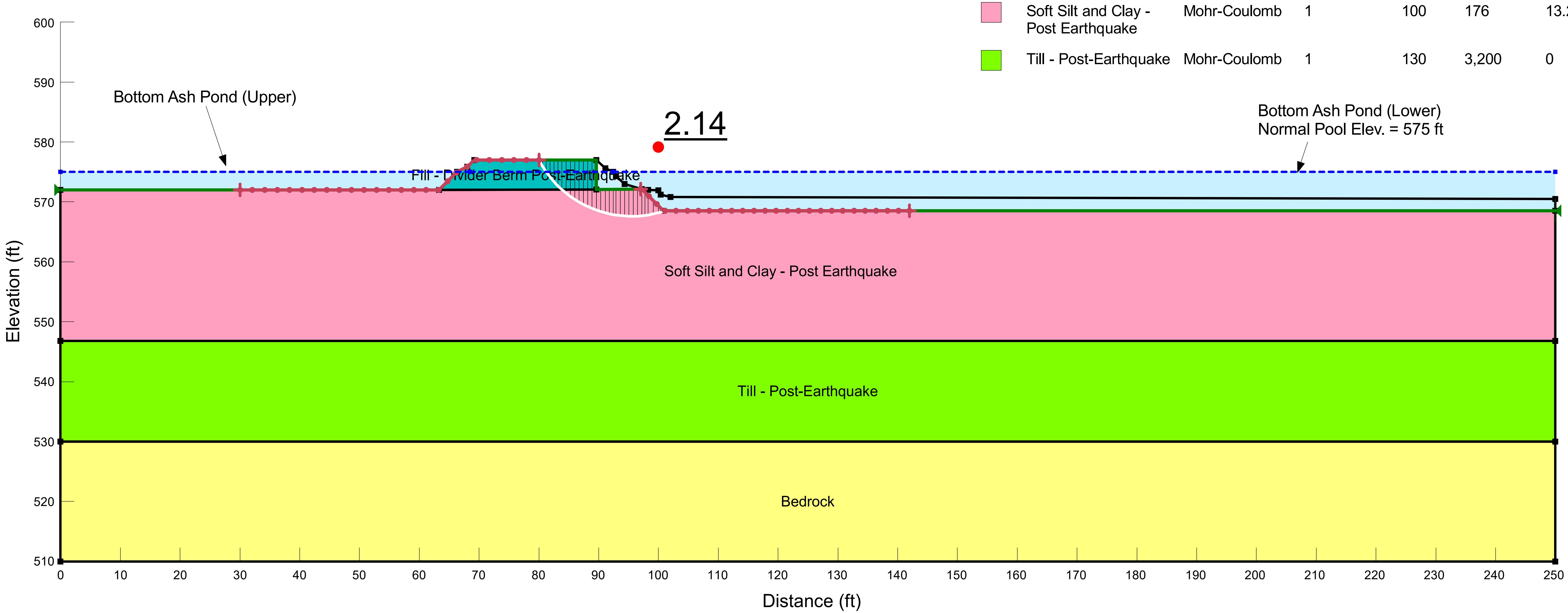
Alignment Reference Point:
N 4443.45 ft
E 8631.45 ft

Alignment Azimuth Angle
0.0 degrees

Post-Earthquake Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Divider Berm Post-Earthquake	Mohr-Coulomb	1	120	0	25
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	1	100	176	13.2
	Till - Post-Earthquake	Mohr-Coulomb	1	130	3,200	0



DTE Monroe - Area 15 Safety Factor Analysis

Slope Stability Analysis - Section D-D'

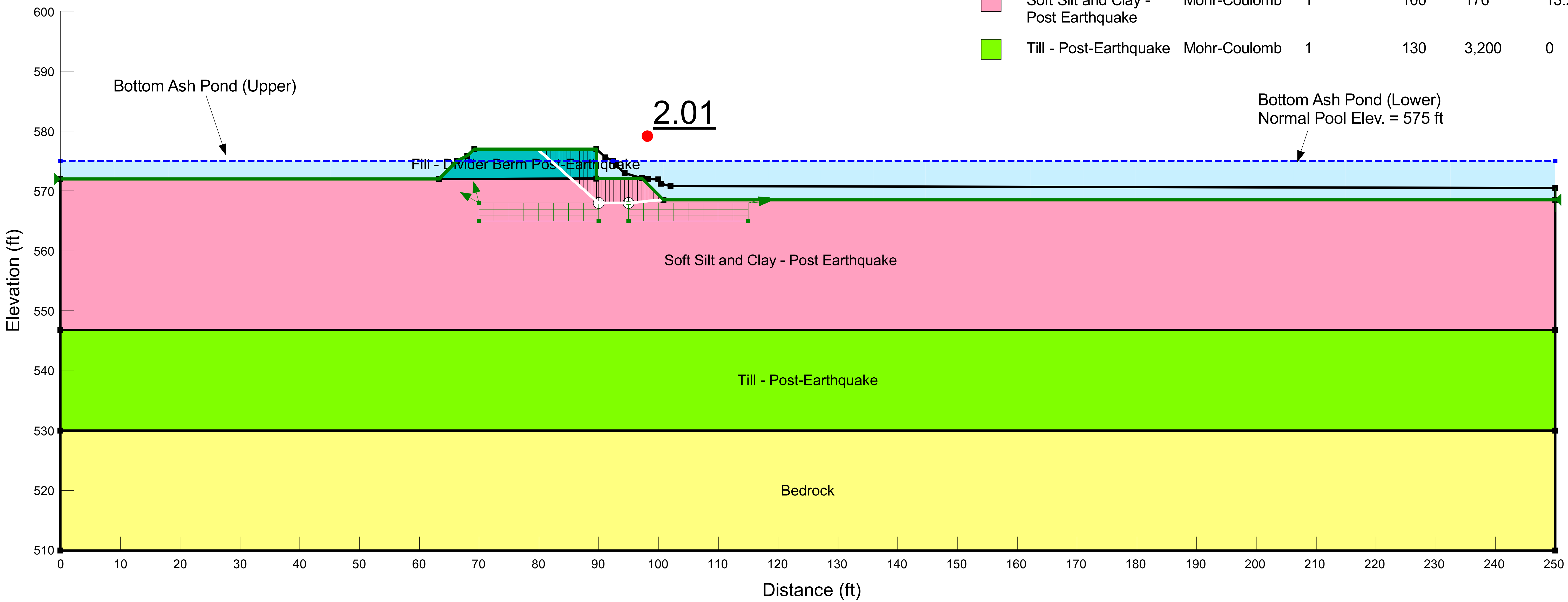
Alignment Reference Point:
N 4443.45 ft
E 8631.45 ft

Alignment Azimuth Angle
0.0 degrees

Post-Earthquake Analysis
Block-Defined Slip Surfaces

Material Properties

Color	Name	Slope Stability Material Model	Piezometric Surface	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)	1			
	Fill - Divider Berm Post-Earthquake	Mohr-Coulomb	1	120	0	25
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	1	100	176	13.2
	Till - Post-Earthquake	Mohr-Coulomb	1	130	3,200	0



Appendix C
Pertinent Results of Original Safety Factor Assessment

DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section A-A'

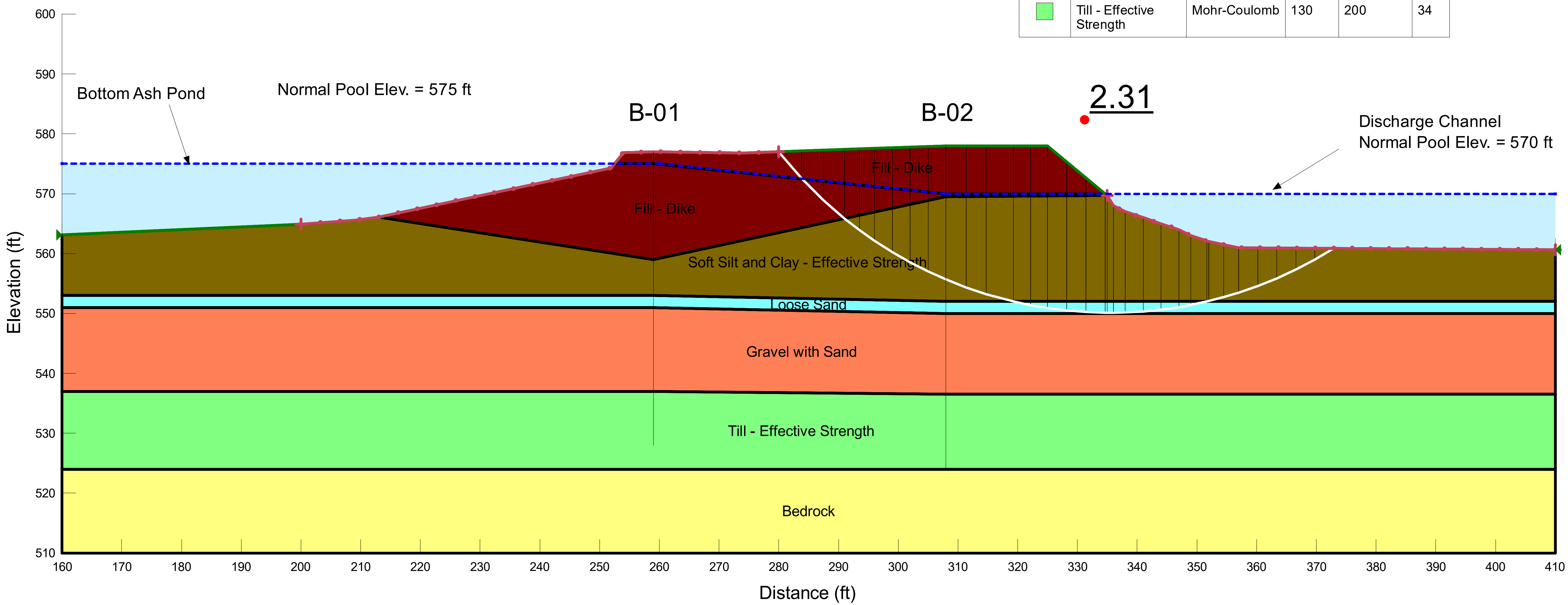
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Static Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	34



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section A-A'

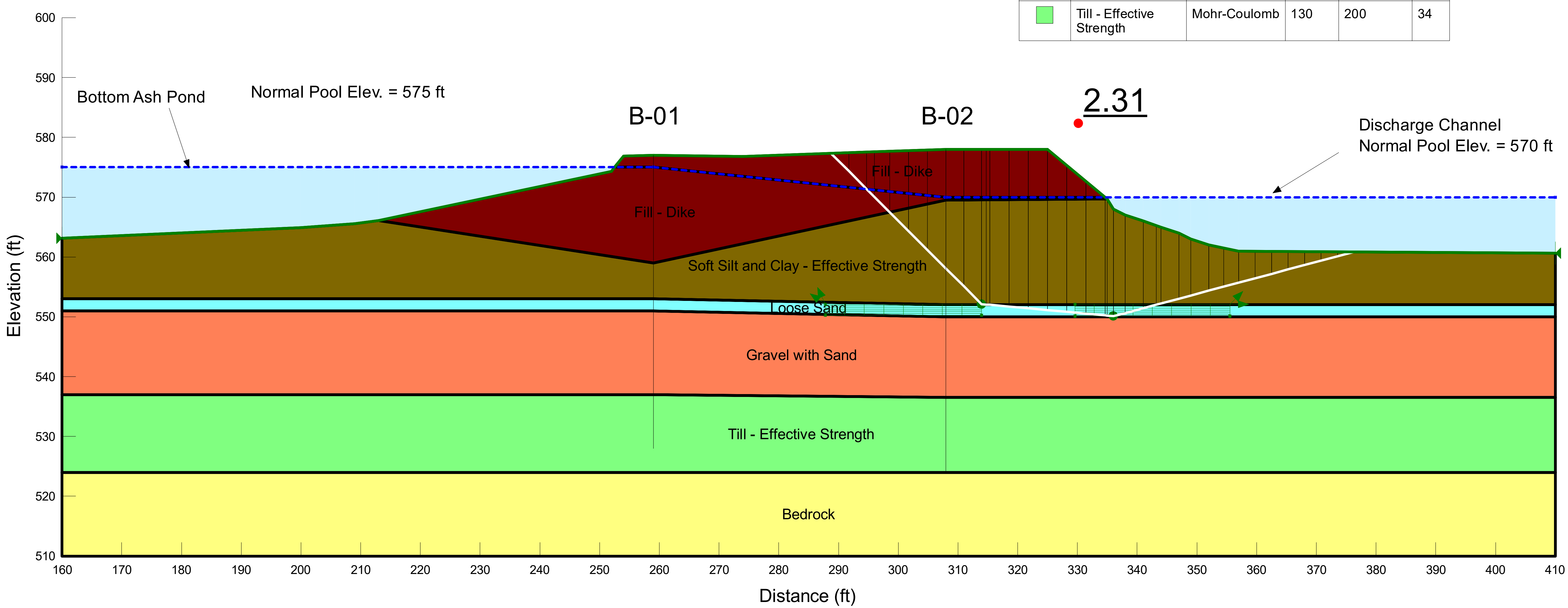
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Static Analysis
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	34



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section A-A'

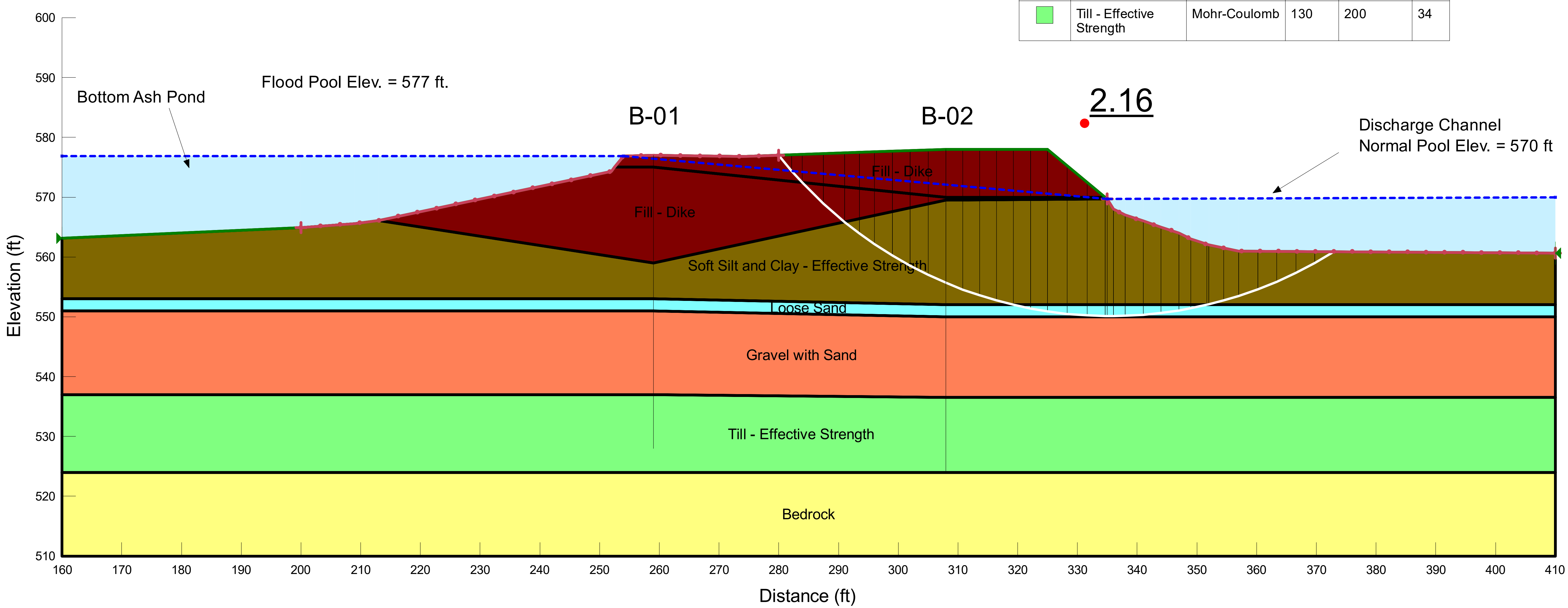
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Static Analysis with Flood Pool Surcharge
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	34



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section A-A'

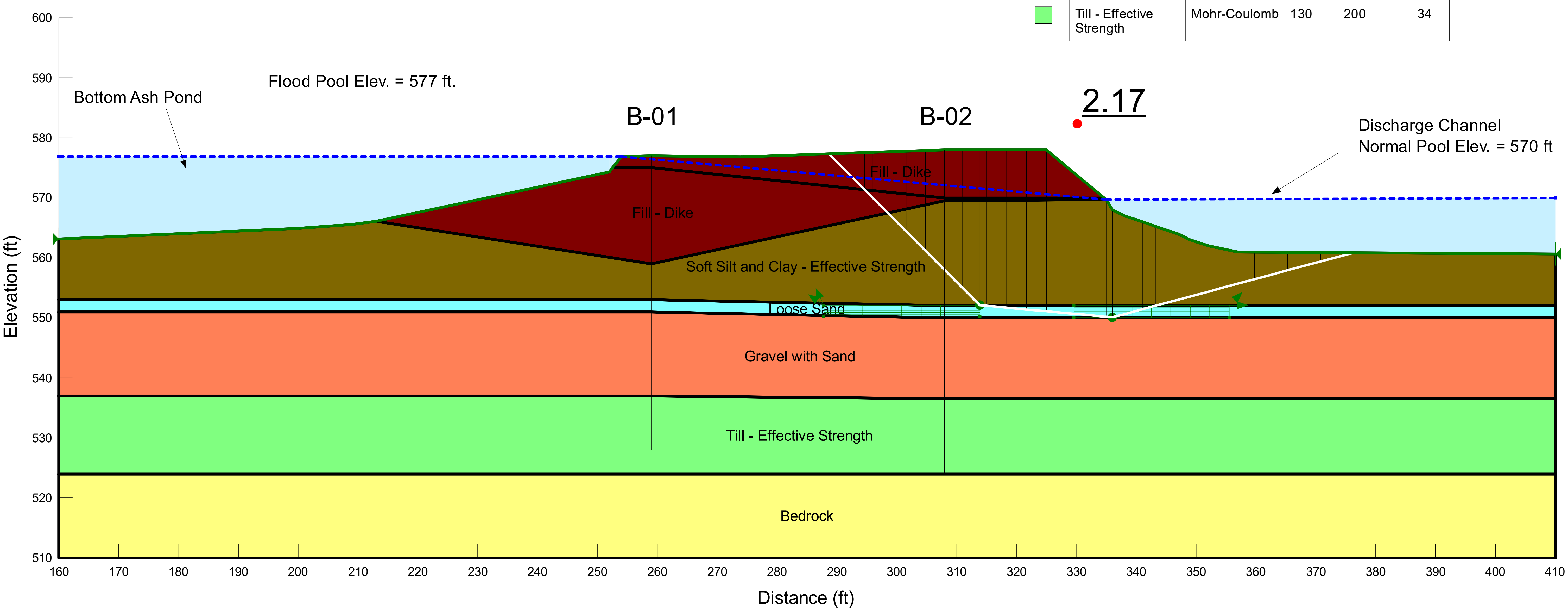
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Static Analysis with Flood Pool Surcharge
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	34



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section A-A'

Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

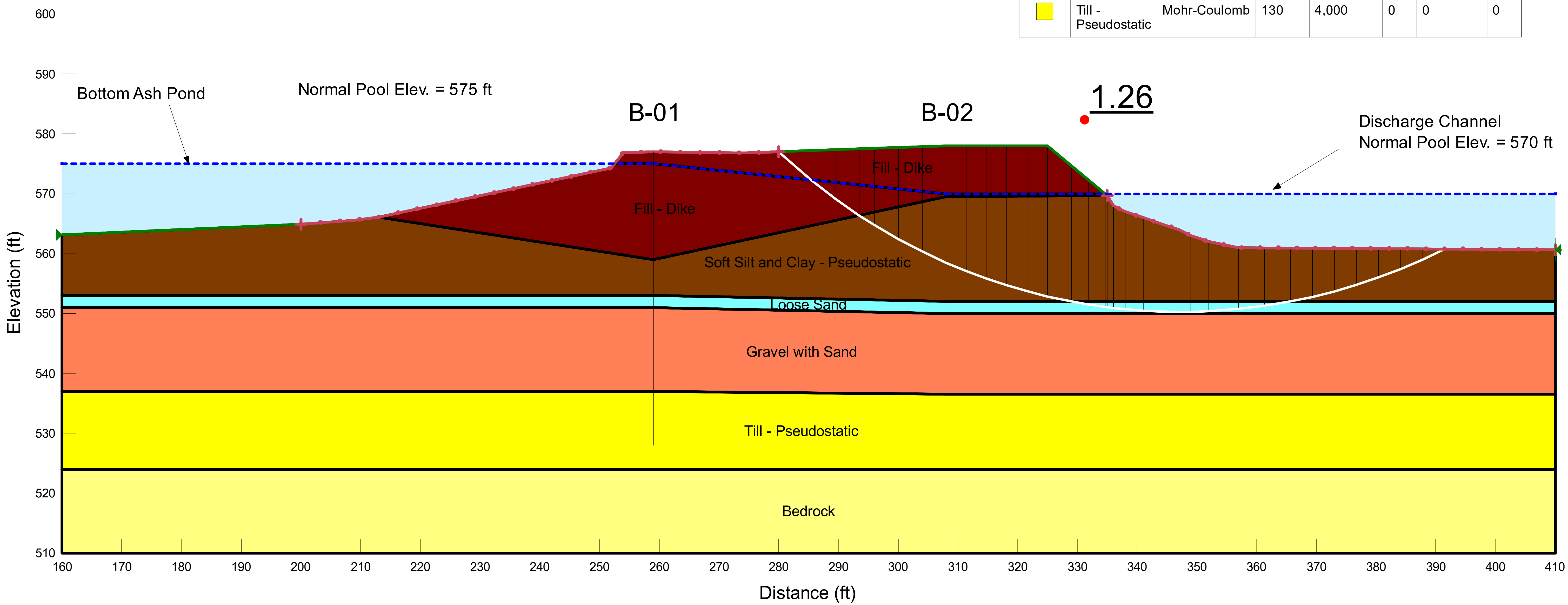
Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Pseudostatic (Seismic) Analysis
Circular Slip Surfaces

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Cohesion R (psf)	Phi R (°)
	Bedrock	Bedrock (Impenetrable)					
	Fill - Dike	Mohr-Coulomb	120	0	30	0	0
	Gravel with Sand	Mohr-Coulomb	125	0	33	0	0
	Loose Sand	Mohr-Coulomb	120	0	28	0	0
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	100	220	16	0	0
	Till - Pseudostatic	Mohr-Coulomb	130	4,000	0	0	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section A-A'

Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

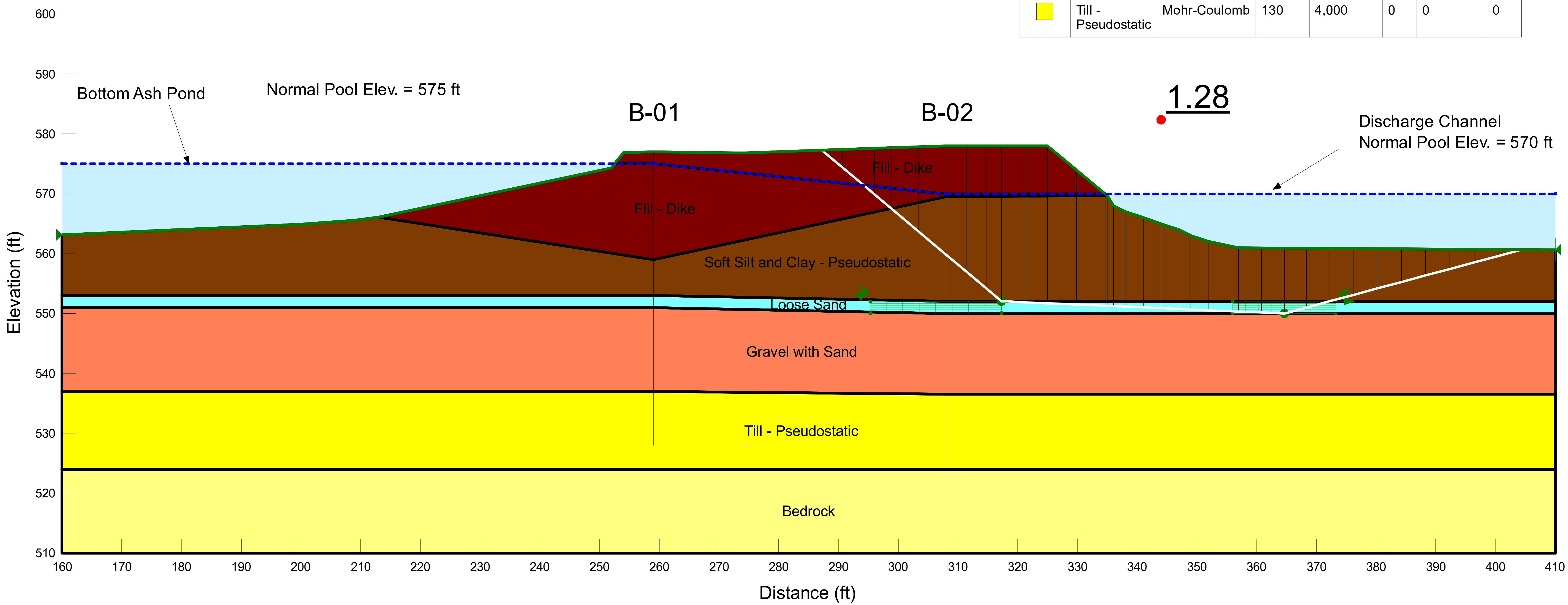
Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Pseudostatic (Seismic) Analysis
Block Failure

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Cohesion R (psf)	Phi R (°)
	Bedrock	Bedrock (Impenetrable)					
	Fill - Dike	Mohr-Coulomb	120	0	30	0	0
	Gravel with Sand	Mohr-Coulomb	125	0	33	0	0
	Loose Sand	Mohr-Coulomb	120	0	28	0	0
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	100	220	16	0	0
	Till - Pseudostatic	Mohr-Coulomb	130	4,000	0	0	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section A-A'

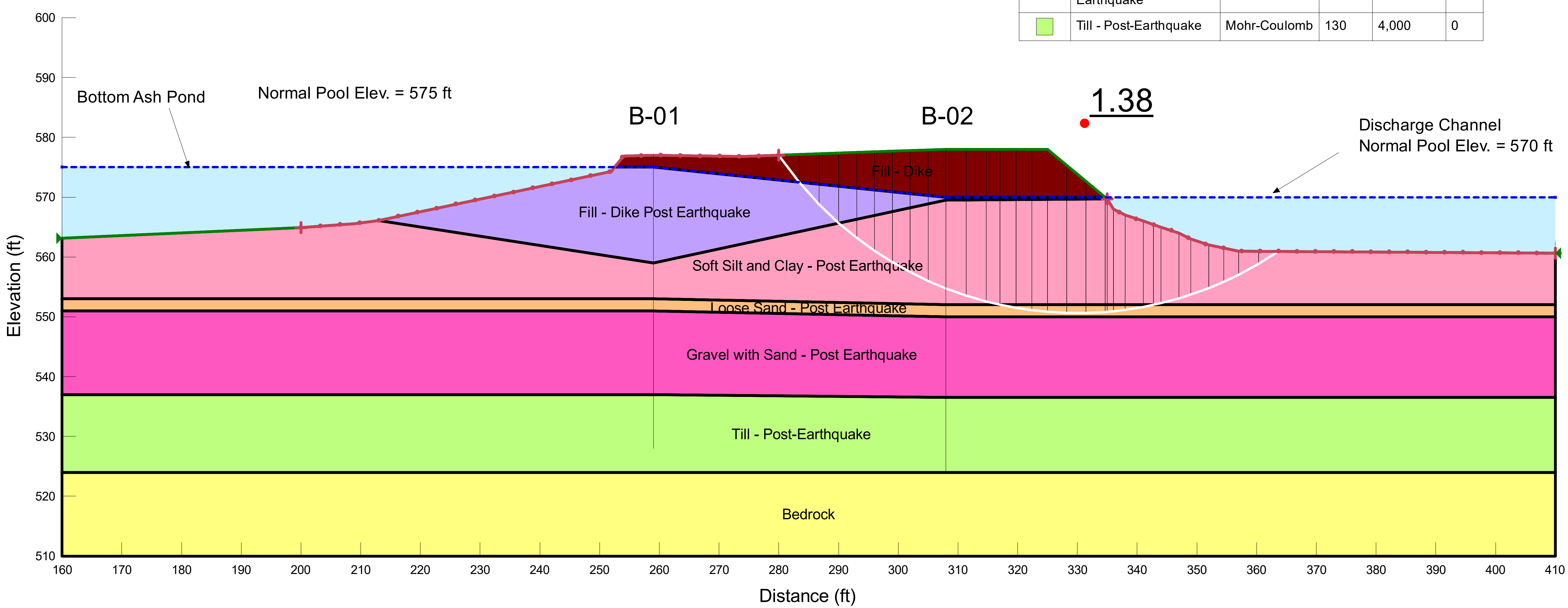
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Fill - Dike Post Earthquake	Mohr-Coulomb	120	0	25
	Gravel with Sand - Post Earthquake	Mohr-Coulomb	125	0	33
	Loose Sand - Post Earthquake	Mohr-Coulomb	120	250	0
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	100	176	13.2
	Till - Post-Earthquake	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section A-A'

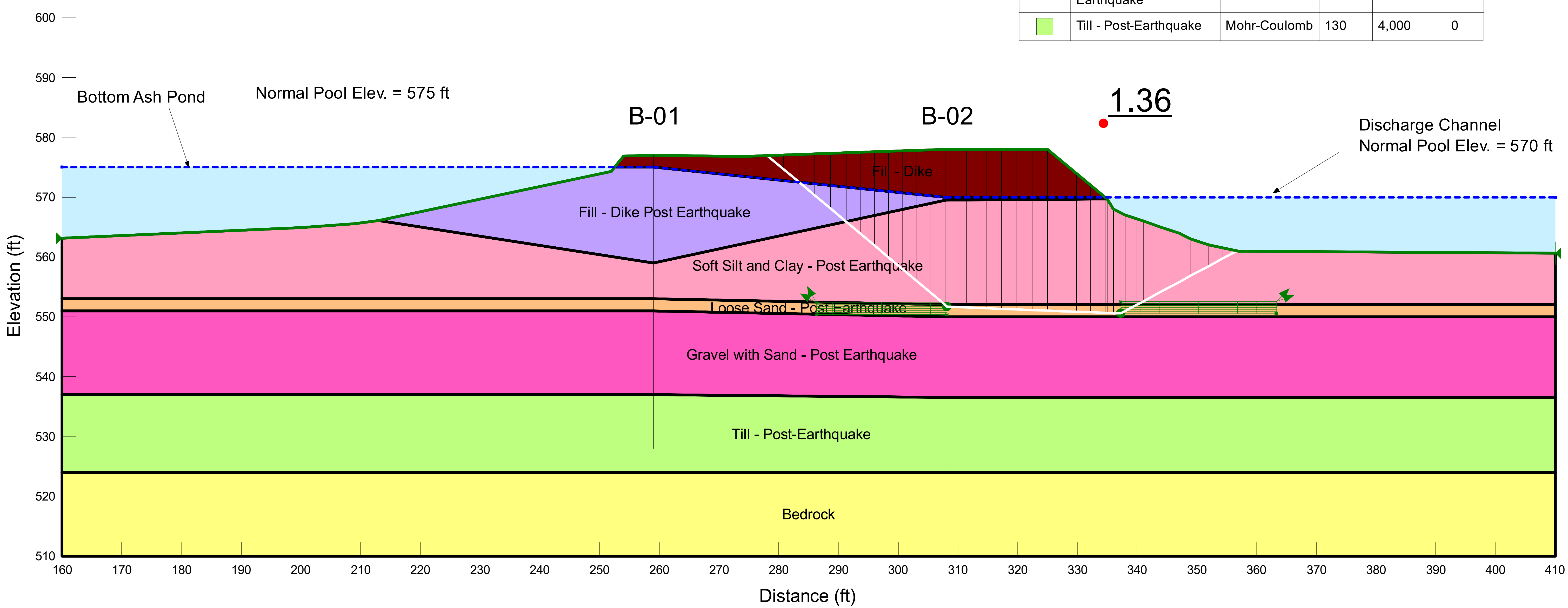
Alignment Reference Point (Local Plant Datum):
N 5861.23 ft
E 7227.31 ft

Alignment Azimuth Angle (Local Plant Datum):
270.0 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Fill - Dike Post Earthquake	Mohr-Coulomb	120	0	25
	Gravel with Sand - Post Earthquake	Mohr-Coulomb	125	0	33
	Loose Sand - Post Earthquake	Mohr-Coulomb	120	250	0
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	100	176	13.2
	Till - Post-Earthquake	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section B-B'

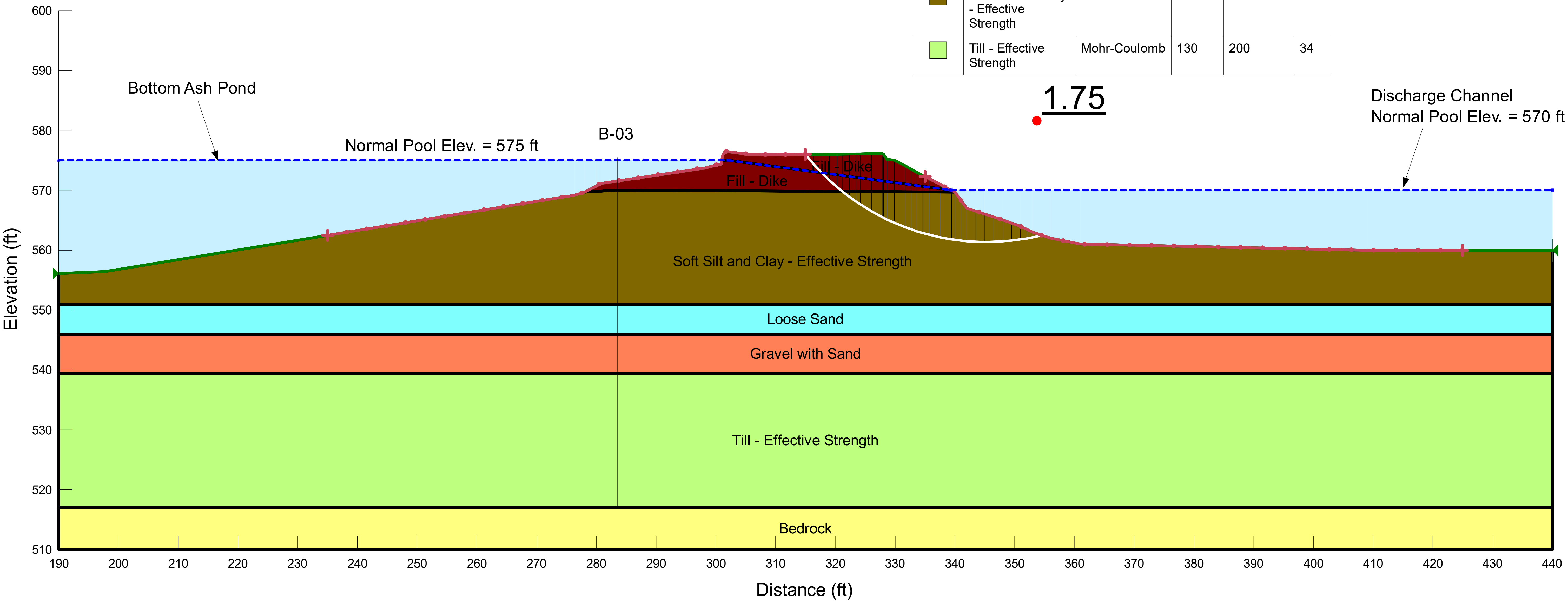
Alignment Reference Point (Local Plant Datum):
N 5254.53 ft
E 7525.40 ft

Azimuth Angle (Local Plant Datum):
237.7 degrees

Static Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	34



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section B-B'

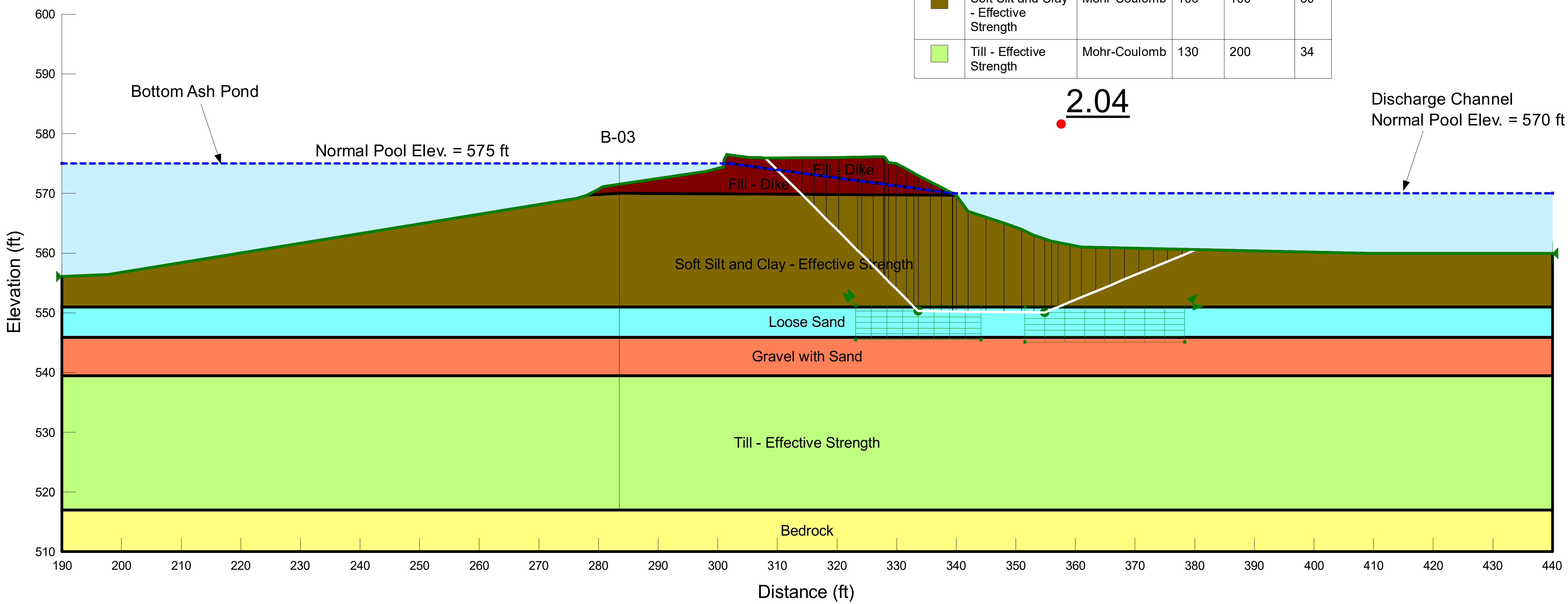
Alignment Reference Point (Local Plant Datum):
N 5254.53 ft
E 7525.40 ft

Azimuth Angle (Local Plant Datum):
237.7 degrees

Static Analysis
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	34



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section B-B'

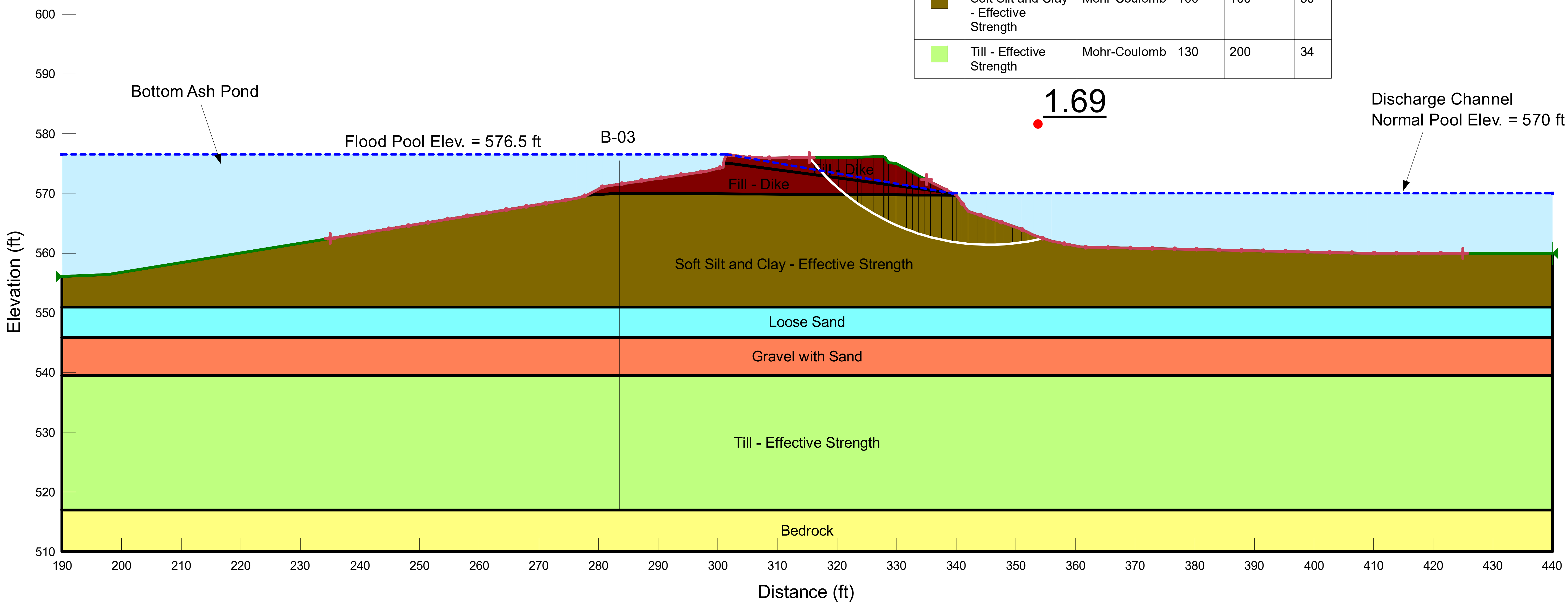
Alignment Reference Point (Local Plant Datum):
N 5254.53 ft
E 7525.40 ft

Azimuth Angle (Local Plant Datum):
237.7 degrees

Static Analysis with Flood Pool Surcharge
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	34



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section B-B'

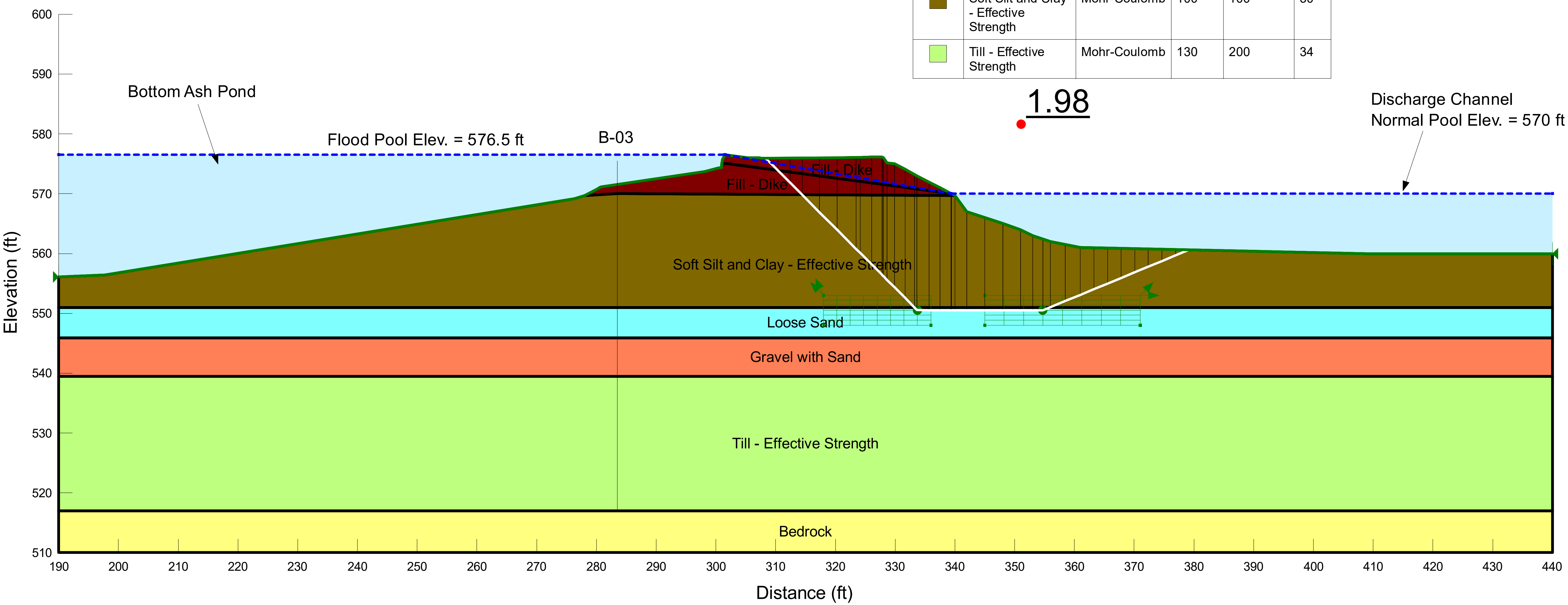
Alignment Reference Point (Local Plant Datum):
N 5254.53 ft
E 7525.40 ft

Azimuth Angle (Local Plant Datum):
237.7 degrees

Static Analysis with Flood Pool Surcharge
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	34



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section B-B'

Alignment Reference Point (Local Plant Datum):
N 5254.53 ft
E 7525.40 ft

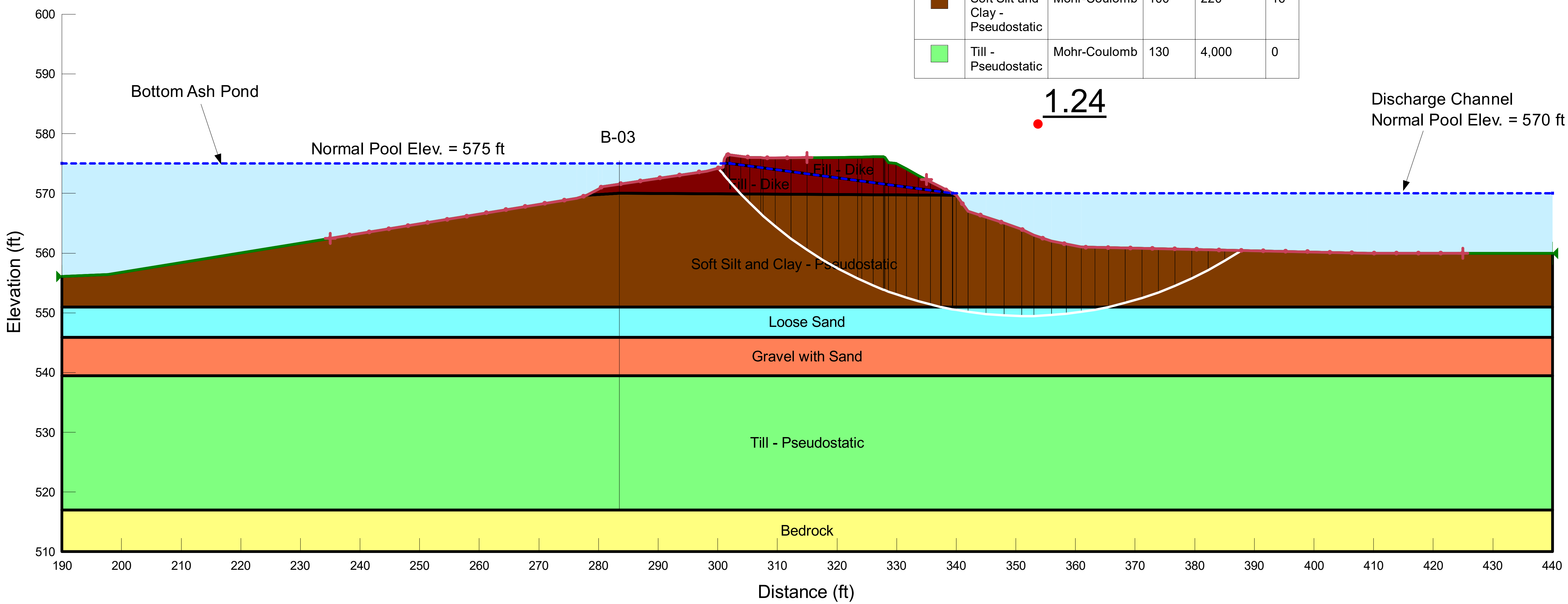
Azimuth Angle (Local Plant Datum):
237.7 degrees

Pseudostatic (Seismic) Analysis
Circular Slip Surfaces

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	100	220	16
	Till - Pseudostatic	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section B-B'

Alignment Reference Point (Local Plant Datum):
N 5254.53 ft
E 7525.40 ft

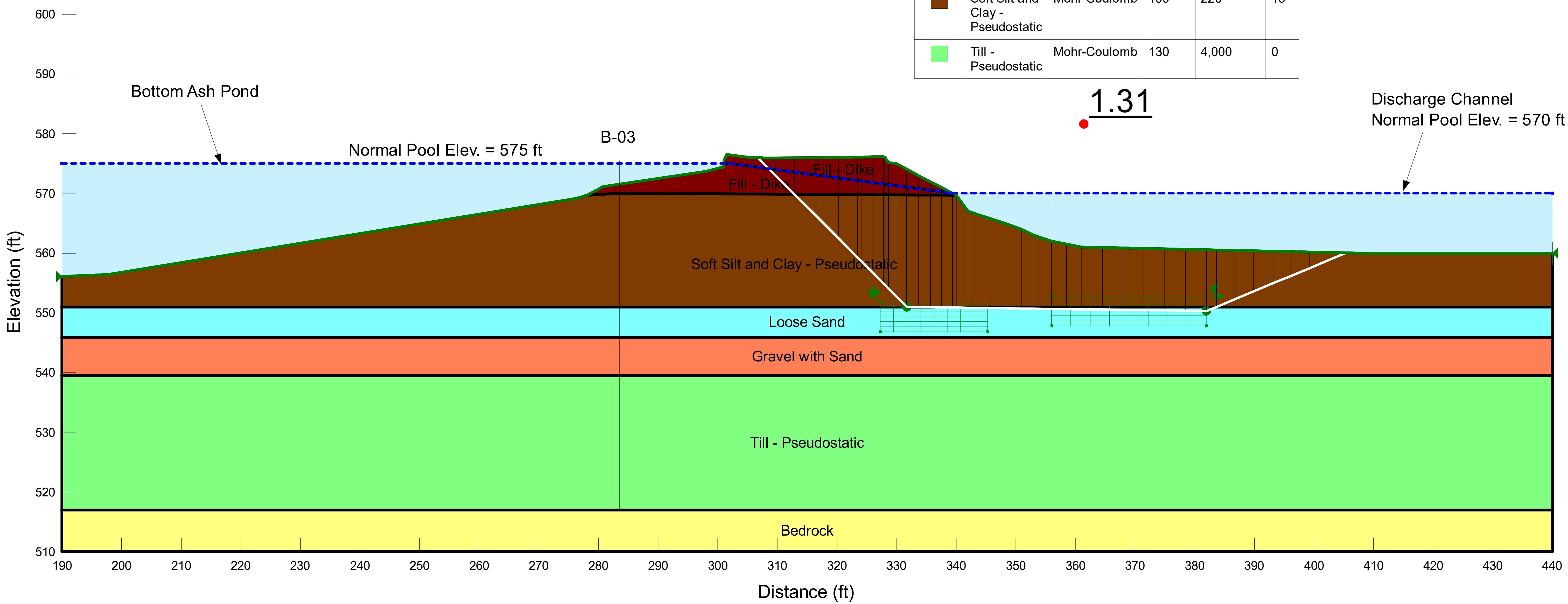
Azimuth Angle (Local Plant Datum):
237.7 degrees

Pseudostatic (Seismic) Analysis
Block Failure

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Gravel with Sand	Mohr-Coulomb	125	0	33
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	100	220	16
	Till - Pseudostatic	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section B-B'

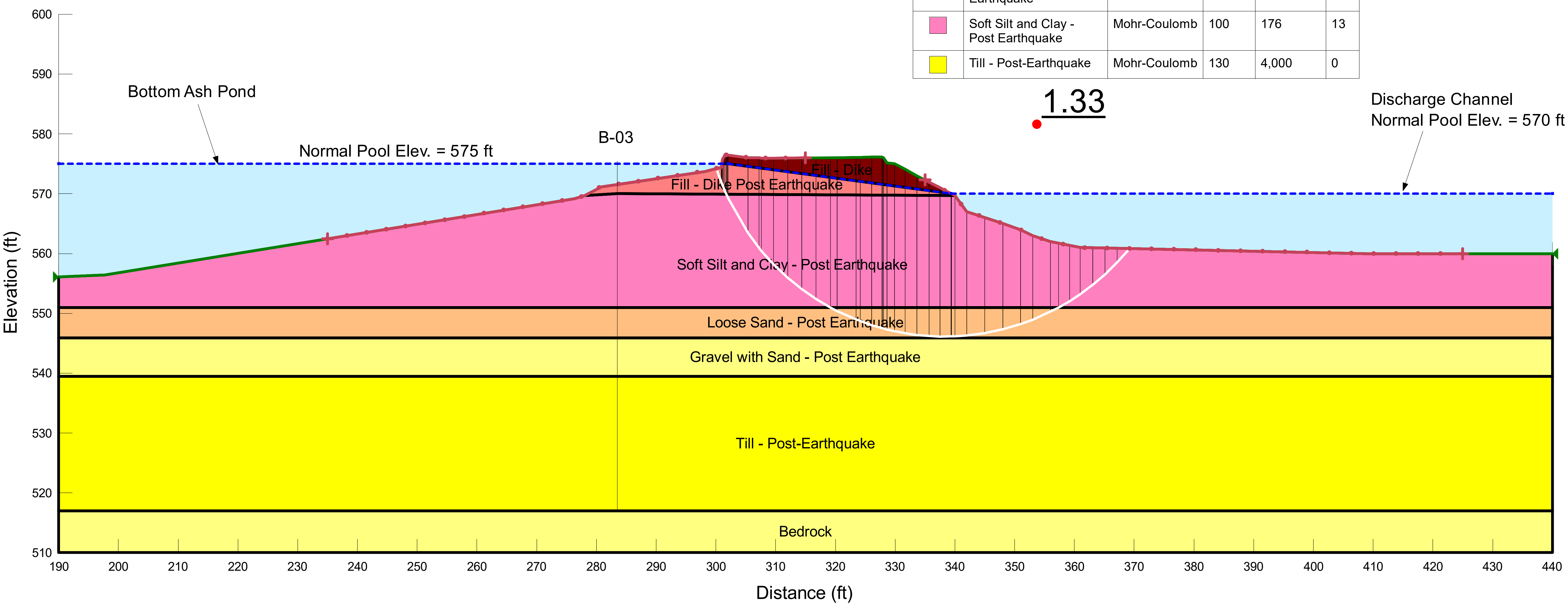
Alignment Reference Point (Local Plant Datum):
N 5254.53 ft
E 7525.40 ft

Azimuth Angle (Local Plant Datum):
237.7 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Fill - Dike Post Earthquake	Mohr-Coulomb	120	0	25
	Gravel with Sand - Post Earthquake	Mohr-Coulomb	125	0	33
	Loose Sand - Post Earthquake	Mohr-Coulomb	120	250	0
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	100	176	13
	Till - Post-Earthquake	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section B-B'

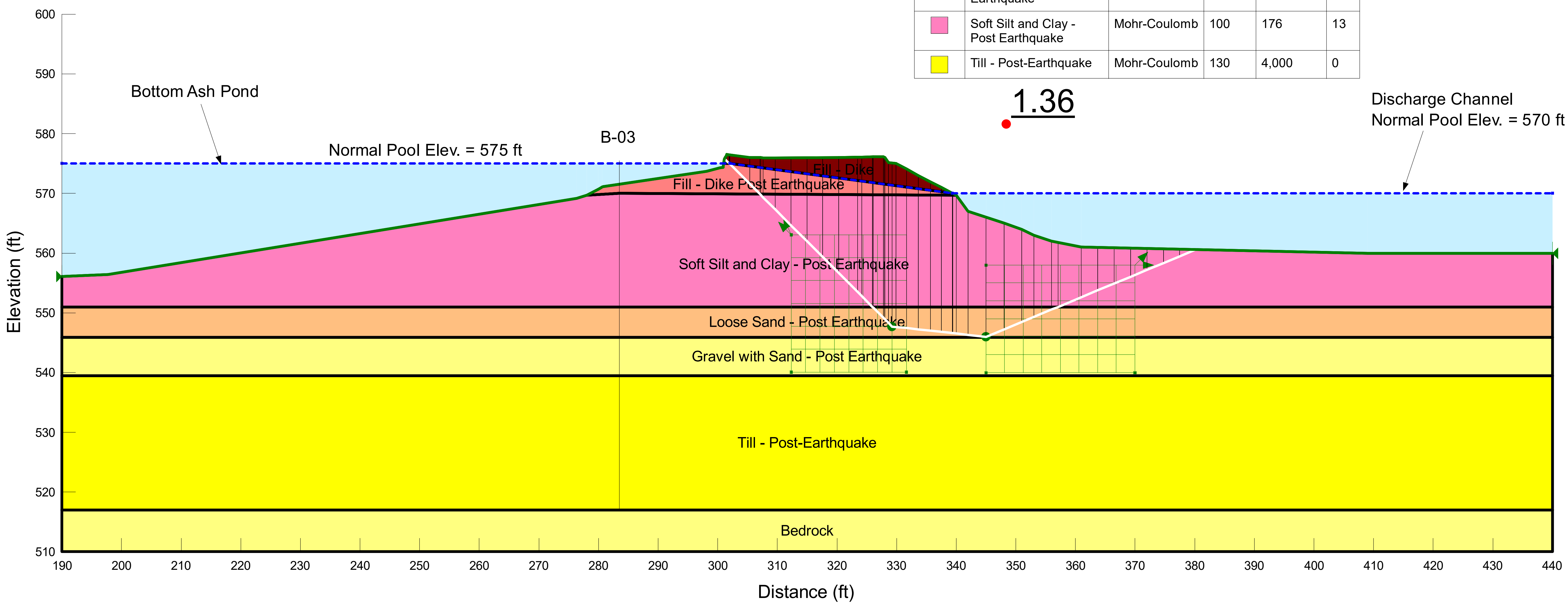
Alignment Reference Point (Local Plant Datum):
N 5254.53 ft
E 7525.40 ft

Azimuth Angle (Local Plant Datum):
237.7 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Fill - Dike Post Earthquake	Mohr-Coulomb	120	0	25
	Gravel with Sand - Post Earthquake	Mohr-Coulomb	125	0	33
	Loose Sand - Post Earthquake	Mohr-Coulomb	120	250	0
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	100	176	13
	Till - Post-Earthquake	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section C-C'

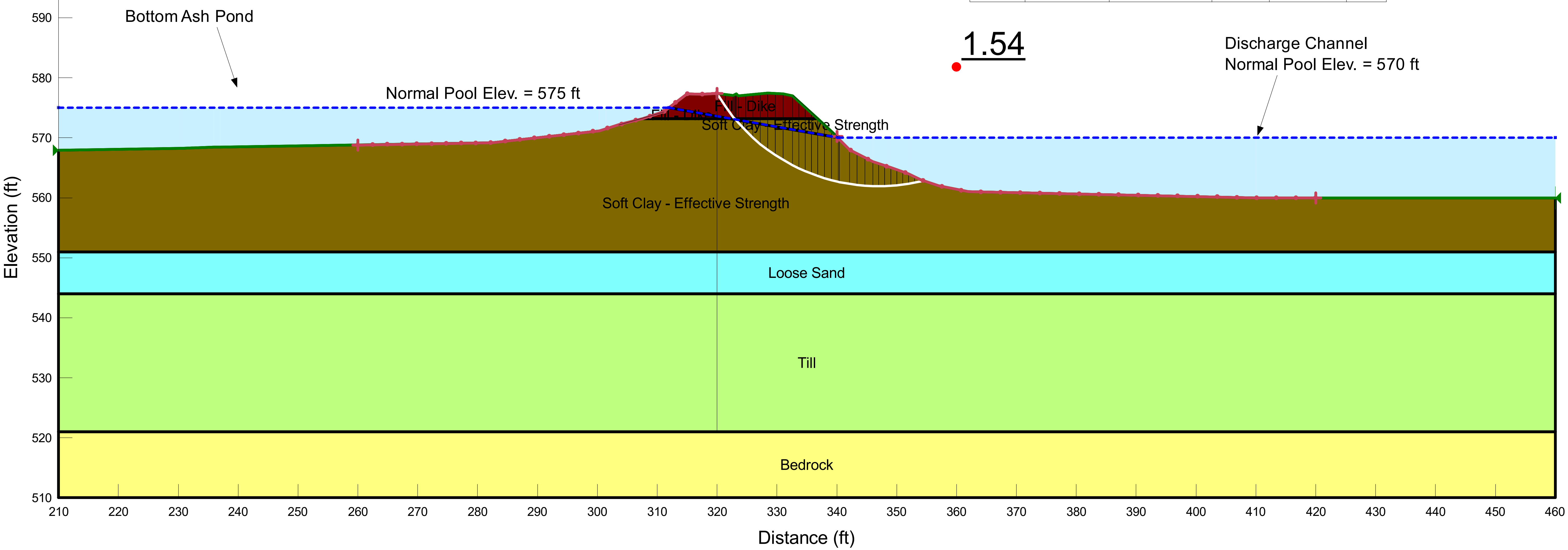
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Static Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section C-C'

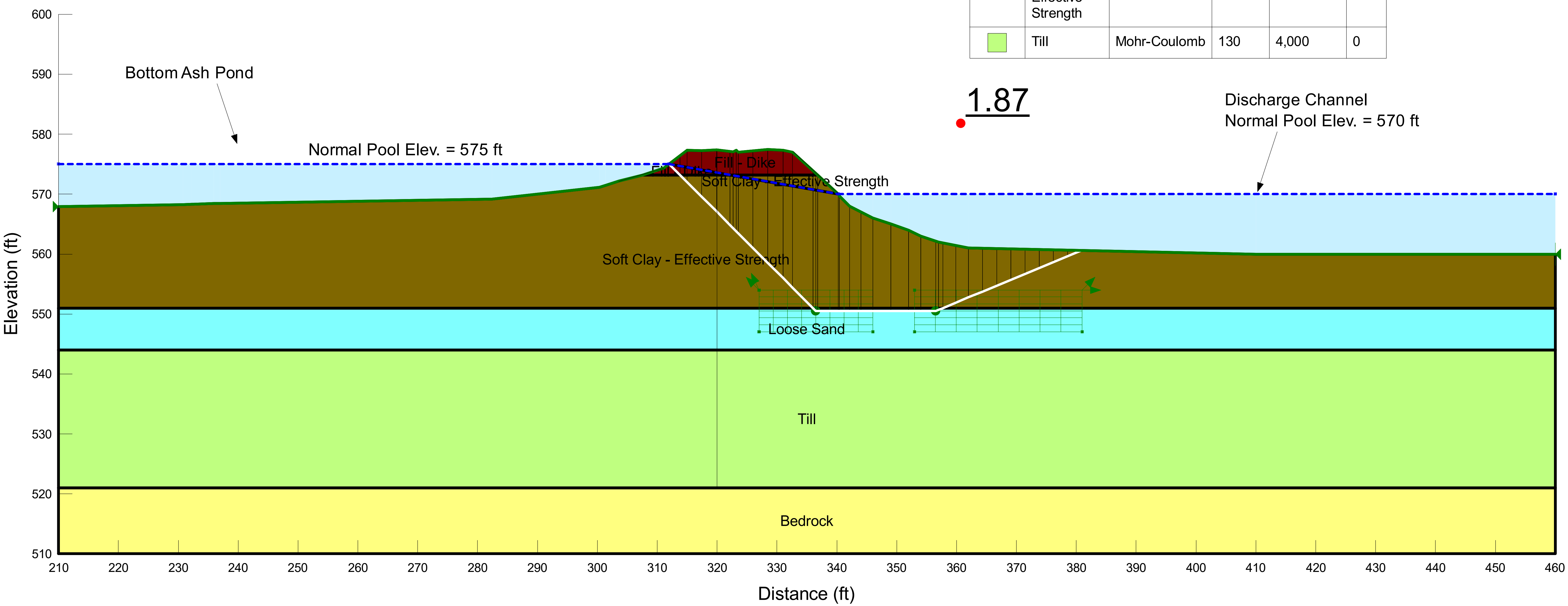
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Static Analysis
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
Yellow	Bedrock	Bedrock (Impenetrable)			
Dark red	Fill - Dike	Mohr-Coulomb	120	0	30
Cyan	Loose Sand	Mohr-Coulomb	120	0	28
Brown	Soft Clay - Effective Strength	Mohr-Coulomb	100	100	30
Light green	Till	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section C-C'

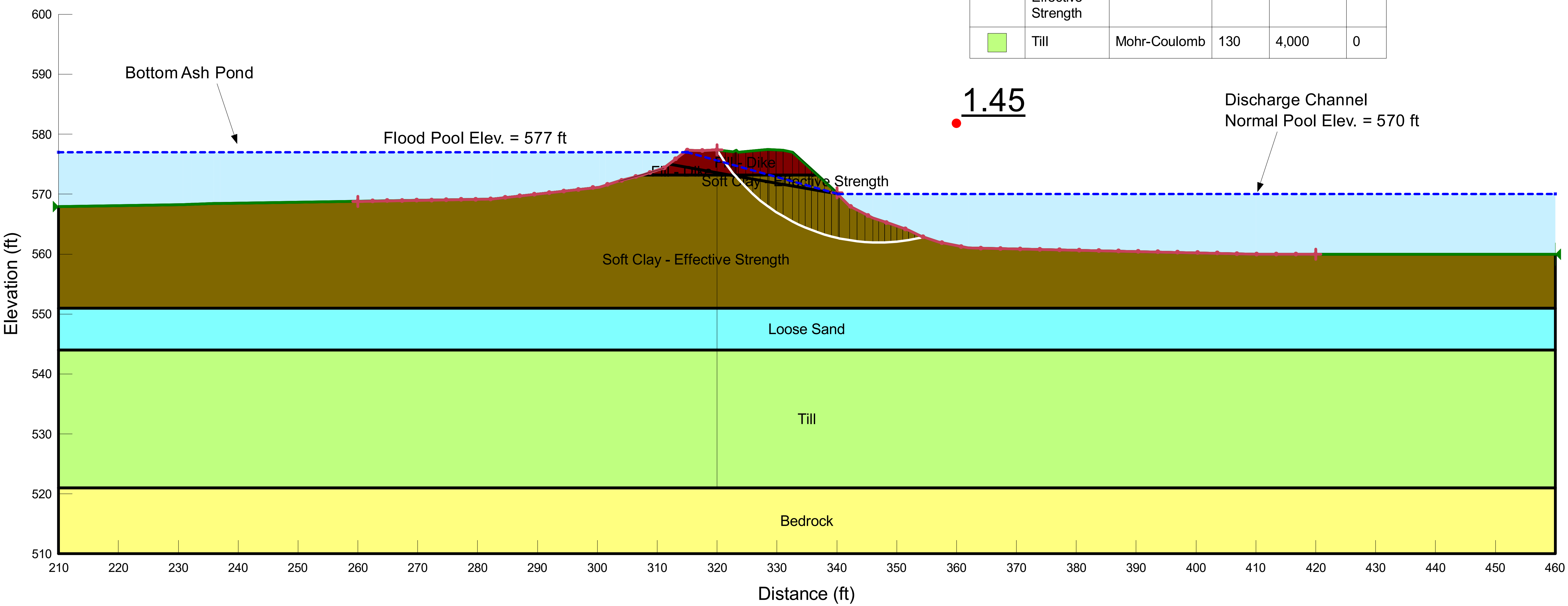
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Static Analysis with Flood Pool Surcharge
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section C-C'

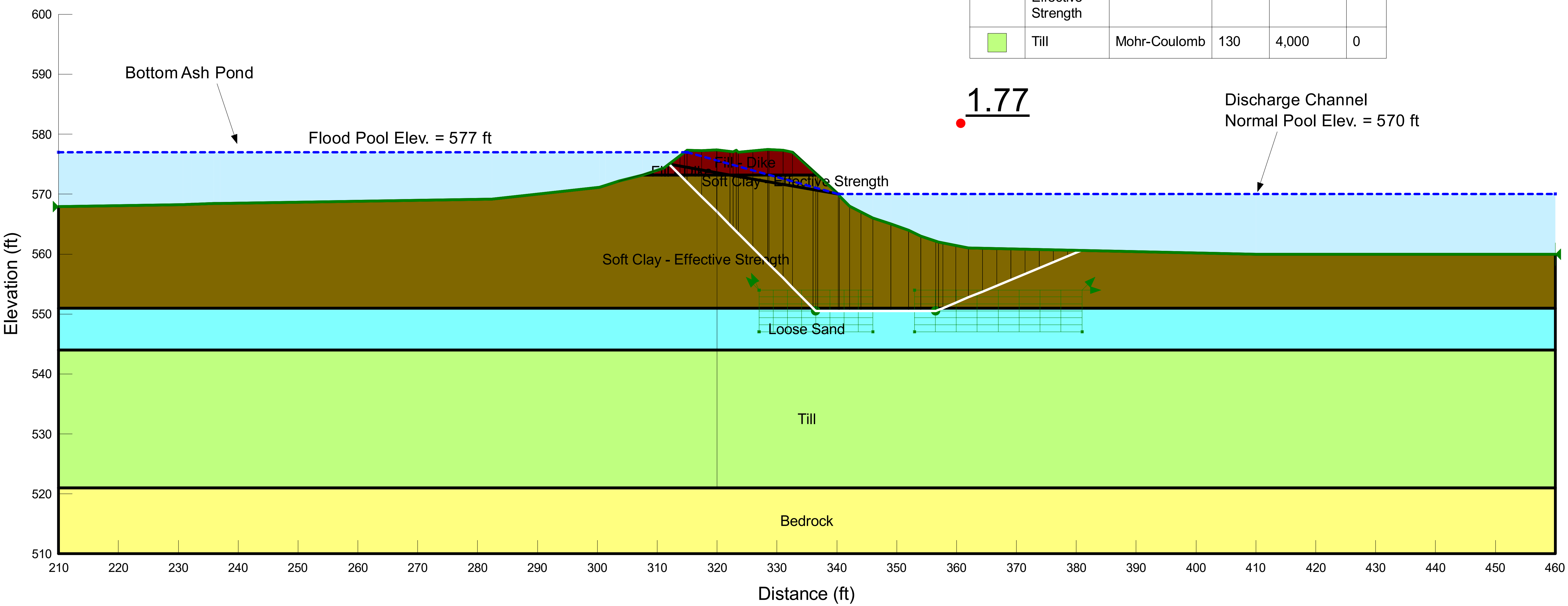
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Static Analysis with Flood Pool Surcharge
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section C-C'

Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

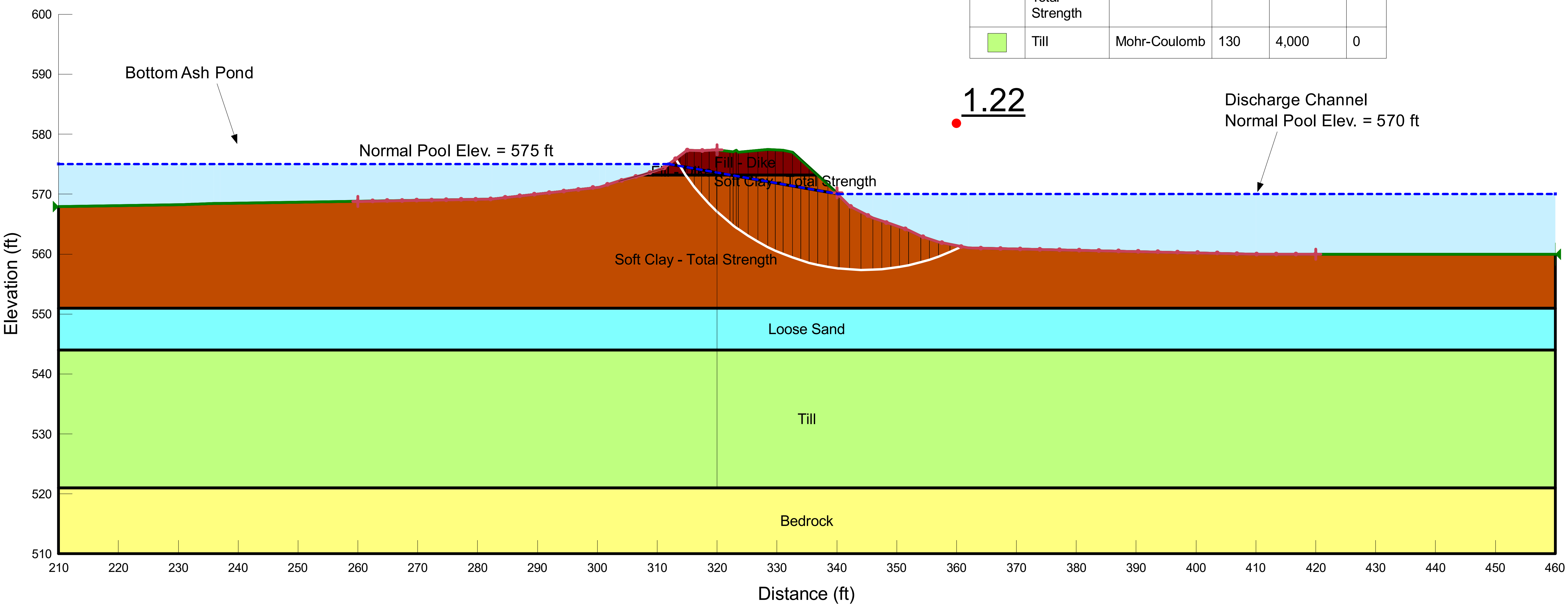
Alignment Azimuth Angle
237.7 degrees

Pseudostatic (Seismic) Analysis
Circular Slip Surfaces

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Clay - Total Strength	Mohr-Coulomb	100	220	16
	Till	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section C-C'

Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

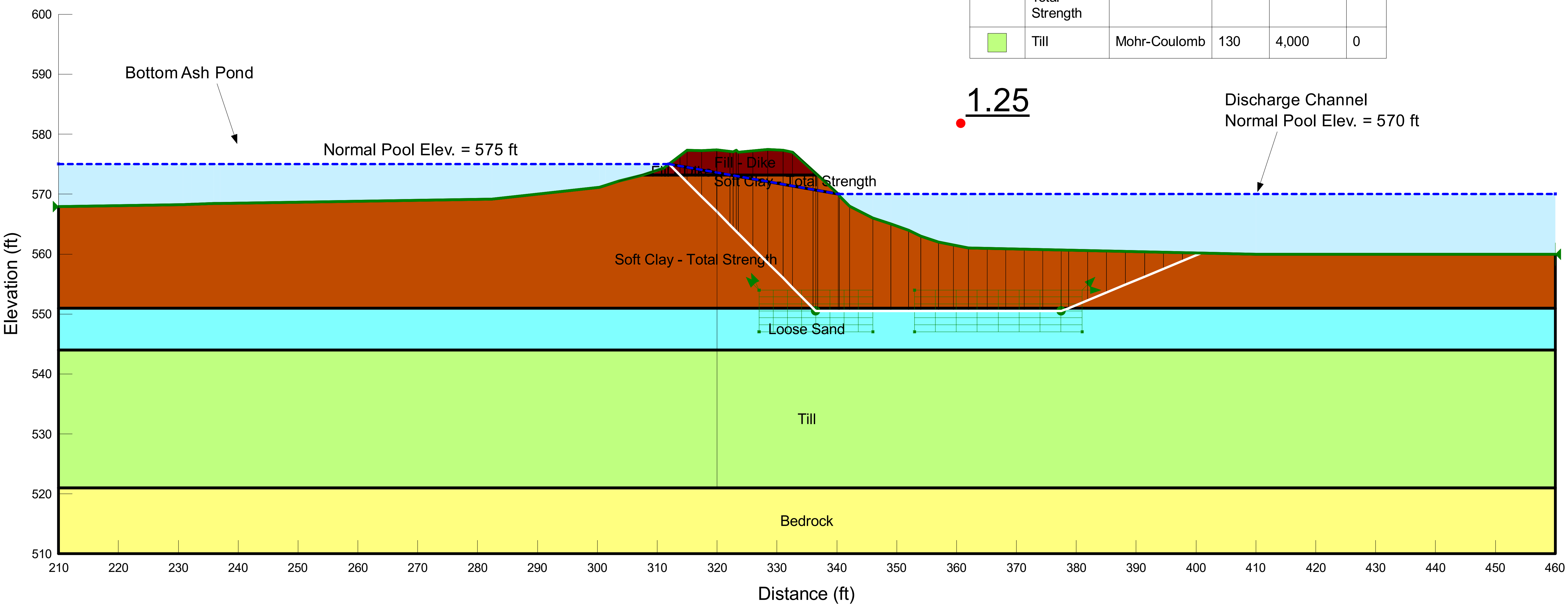
Alignment Azimuth Angle
237.7 degrees

Pseudostatic (Seismic) Analysis
Block Failure

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Clay - Total Strength	Mohr-Coulomb	100	220	16
	Till	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section C-C'

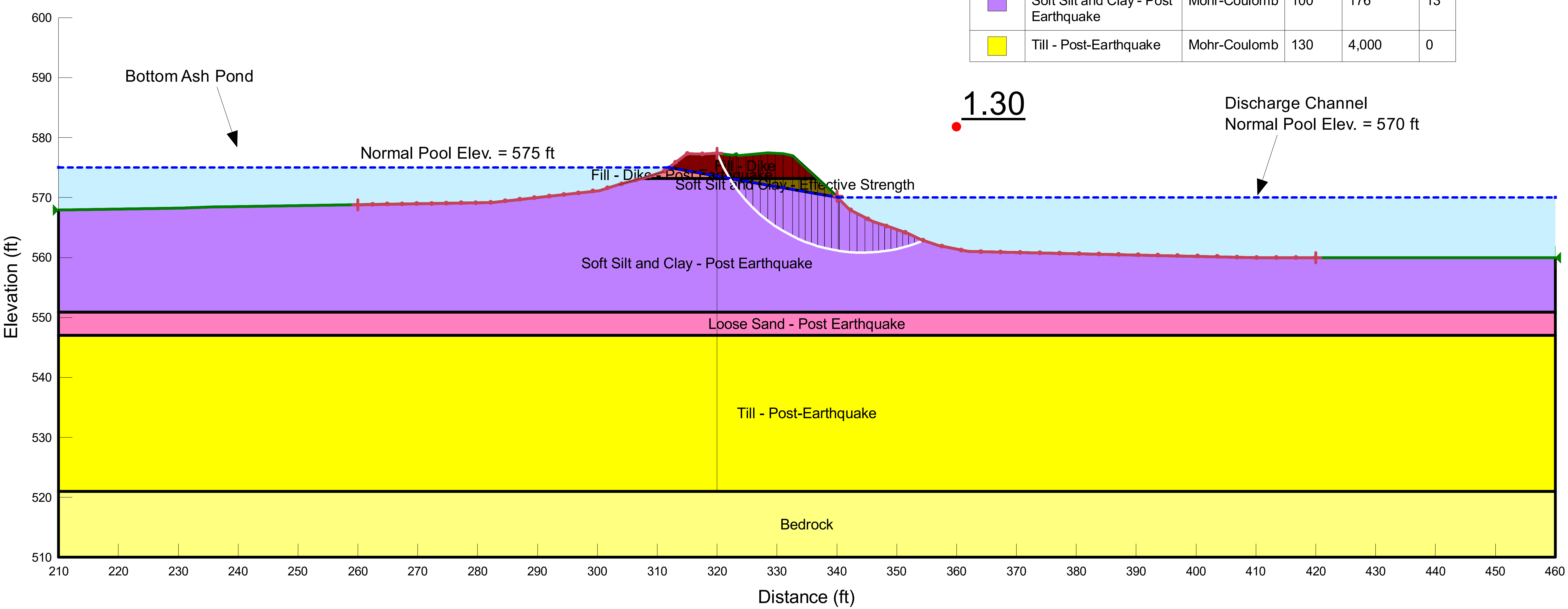
Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Fill - Dike - Post Earthquake	Mohr-Coulomb	120	0	25
	Loose Sand - Post Earthquake	Mohr-Coulomb	120	250	0
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	100	176	13
	Till - Post-Earthquake	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

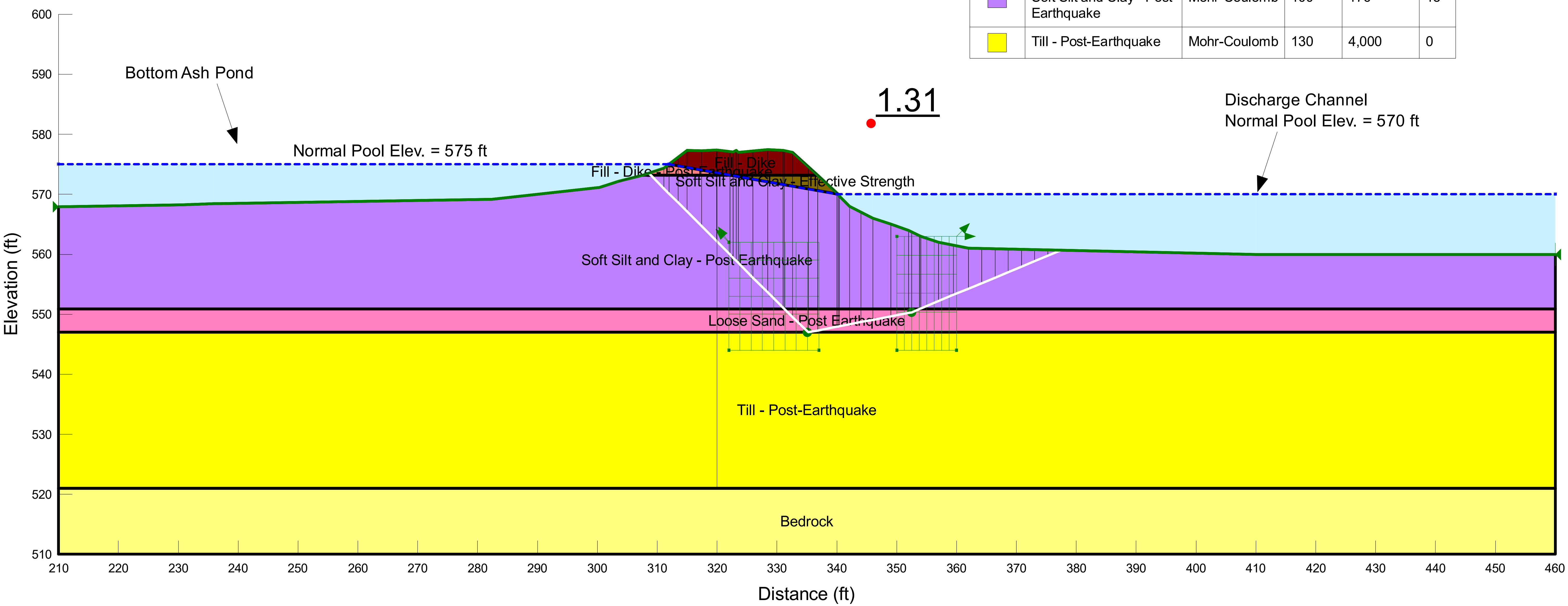
Cross Section C-C'

Alignment Reference Point:
N 4602.51 ft
E 7968.22 ft

Alignment Azimuth Angle
237.7 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Block Failure

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
Material Properties					
	Bedrock	Bedrock (Impenetrable)			
	Fill - Dike	Mohr-Coulomb	120	0	30
	Fill - Dike - Post Earthquake	Mohr-Coulomb	120	0	25
	Loose Sand - Post Earthquake	Mohr-Coulomb	120	250	0
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Soft Silt and Clay - Post Earthquake	Mohr-Coulomb	100	176	13
	Till - Post-Earthquake	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section E-E'

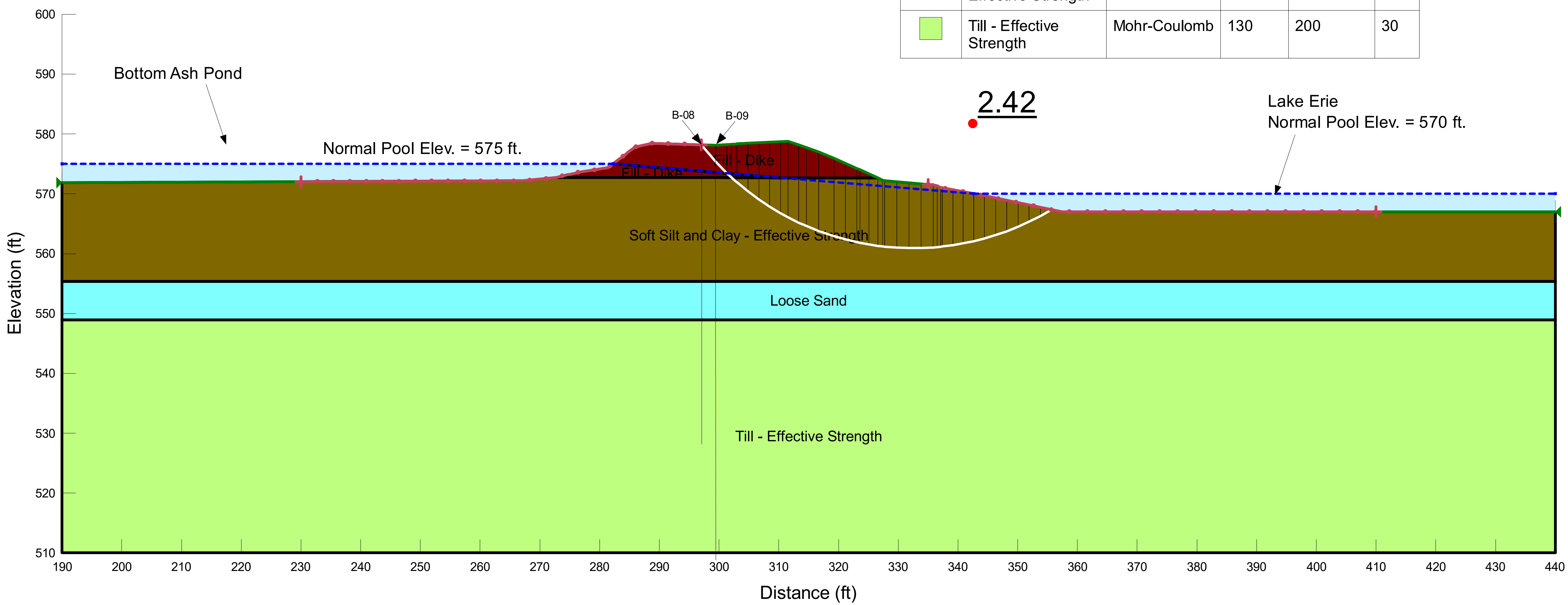
Alignment Reference Point:
N 4409.03 ft
E 9343.45 ft

Alignment Azimuth Angle
100.4 degrees

Static Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	30



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section E-E'

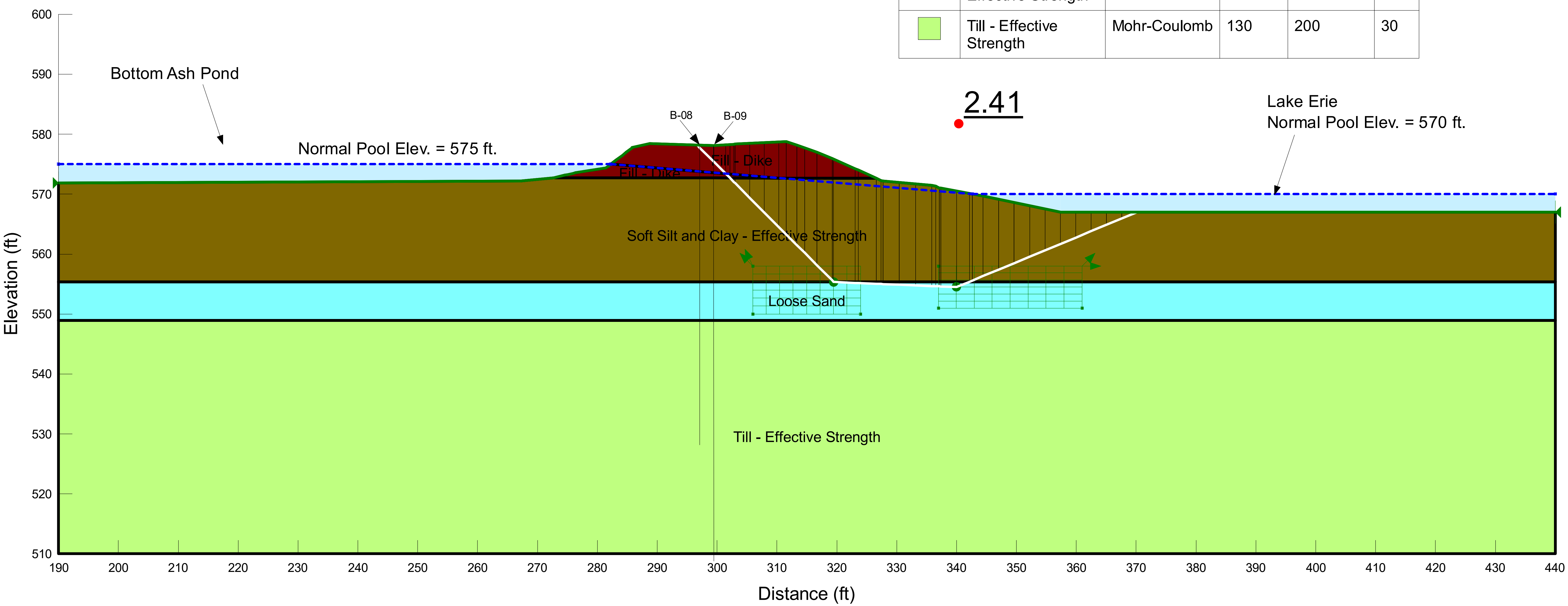
Alignment Reference Point:
N 4409.03 ft
E 9343.45 ft

Alignment Azimuth Angle
100.4 degrees

Static Analysis
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	30



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section E-E'

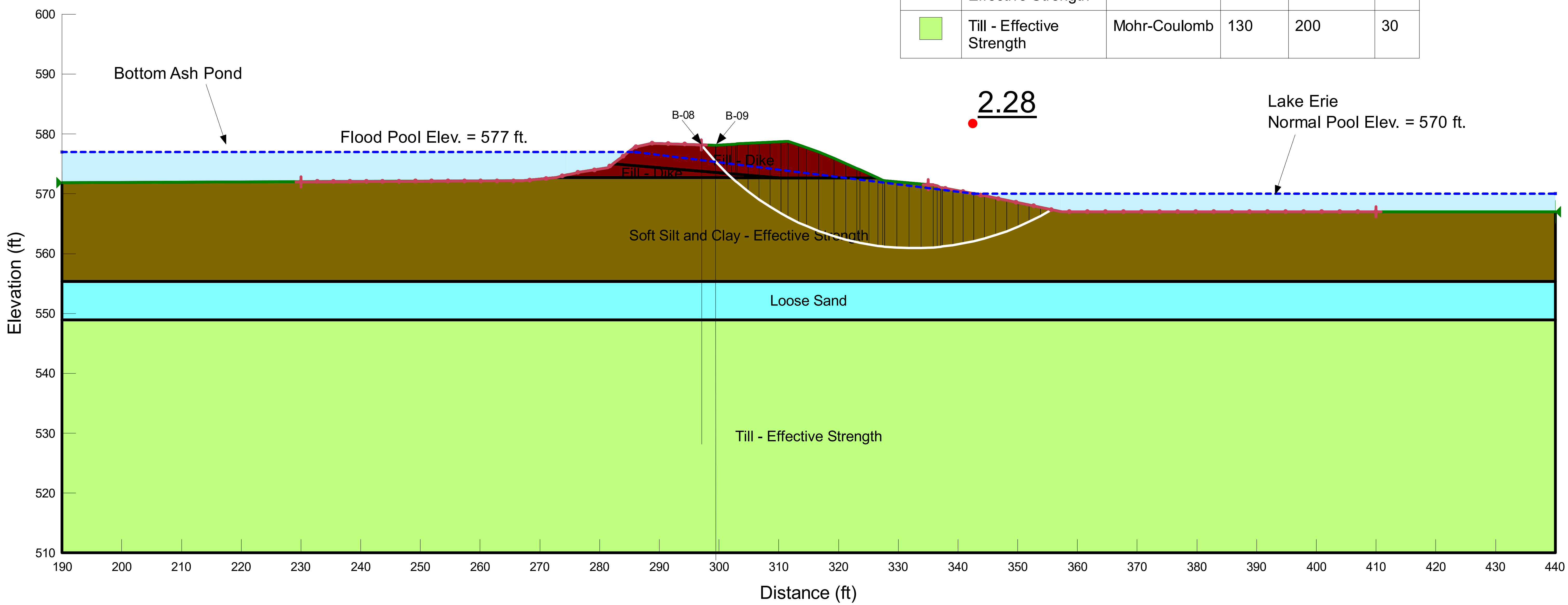
Alignment Reference Point:
N 4409.03 ft
E 9343.45 ft

Alignment Azimuth Angle
100.4 degrees

Static Analysis with Flood Pool Surcharge
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	30



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section E-E'

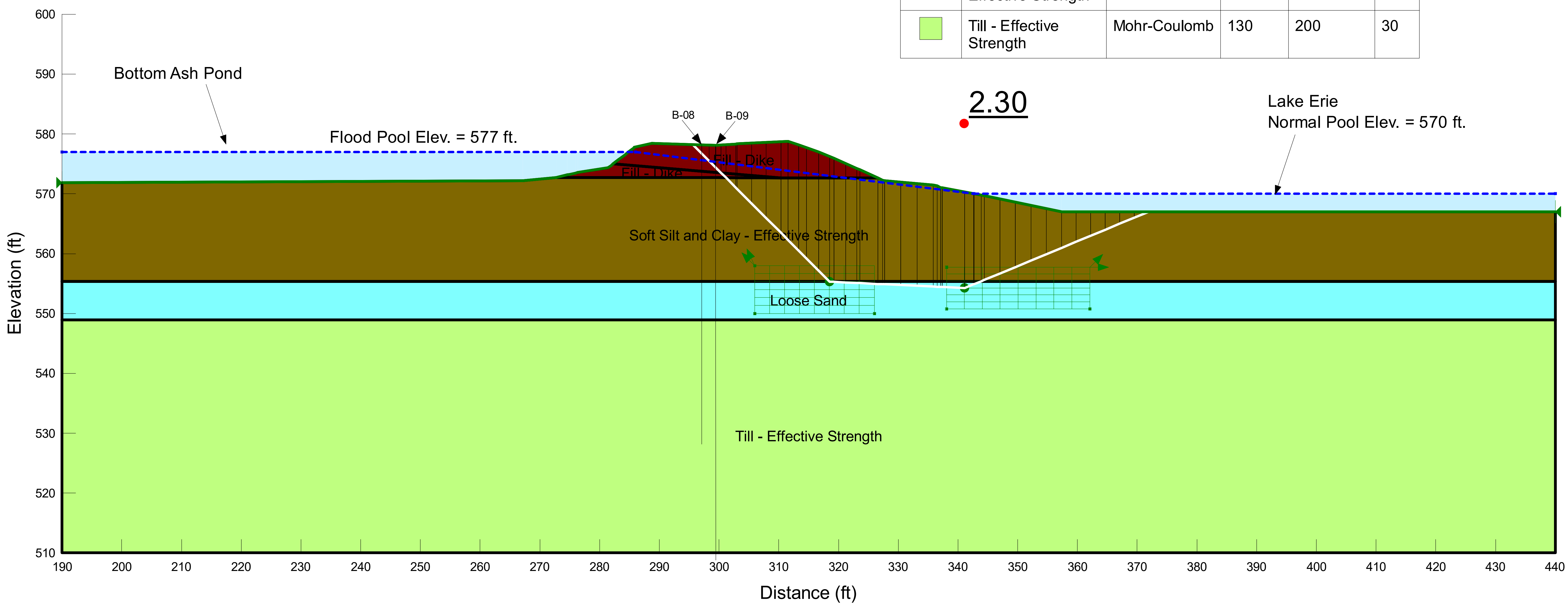
Alignment Reference Point:
N 4409.03 ft
E 9343.45 ft

Alignment Azimuth Angle
100.4 degrees

Static Analysis with Flood Pool Surcharge
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Effective Strength	Mohr-Coulomb	100	100	30
	Till - Effective Strength	Mohr-Coulomb	130	200	30



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section E-E'

Alignment Reference Point:
N 4409.03 ft
E 9343.45 ft

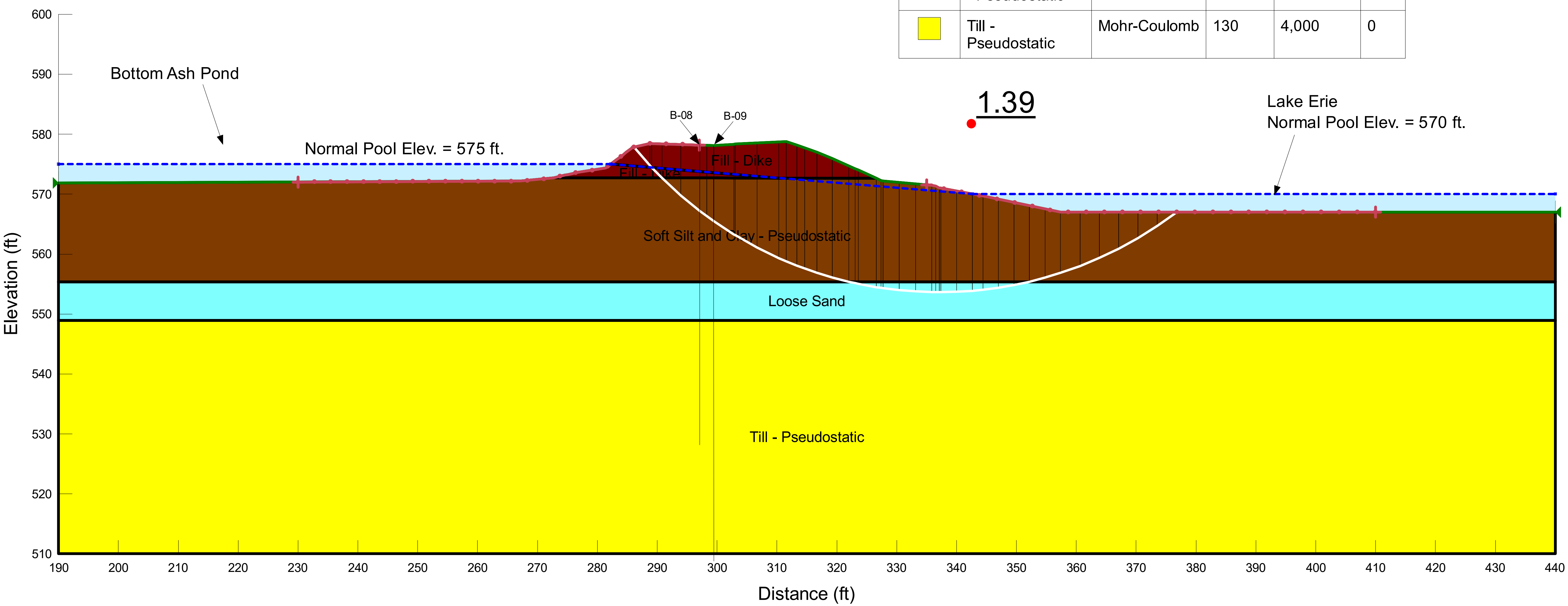
Alignment Azimuth Angle
100.4 degrees

Pseudostatic (Seismic) Analysis
Circular Slip Surfaces

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill - Dike	Mohr-Coulomb	120	0	30
	Loose Sand	Mohr-Coulomb	120	0	28
	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	100	220	16
	Till - Pseudostatic	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section E-E'

Alignment Reference Point:
N 4409.03 ft
E 9343.45 ft

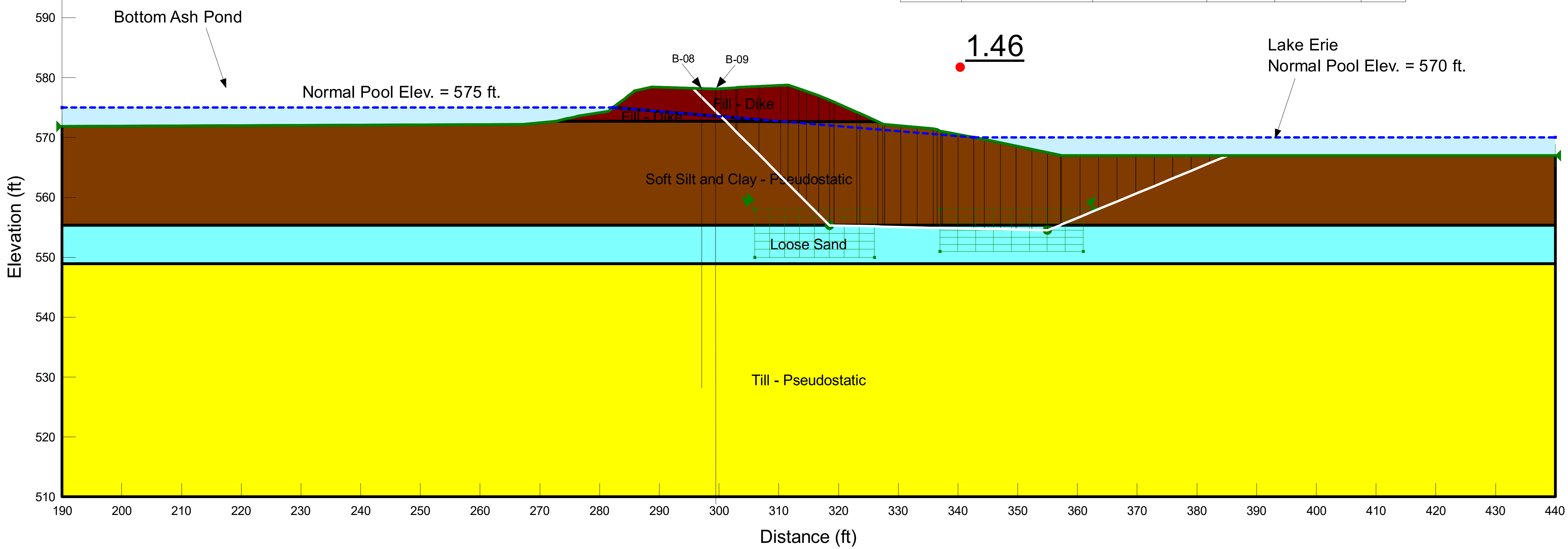
Alignment Azimuth Angle
100.4 degrees

Pseudostatic (Seismic) Analysis
Block Failure

Pseudostatic Analysis
Seismic Coefficient = 0.11g

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
(dark red)	Fill - Dike	Mohr-Coulomb	120	0	30
(cyan)	Loose Sand	Mohr-Coulomb	120	0	28
(brown)	Soft Silt and Clay - Pseudostatic	Mohr-Coulomb	100	220	16
(yellow)	Till - Pseudostatic	Mohr-Coulomb	130	4,000	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section E-E'

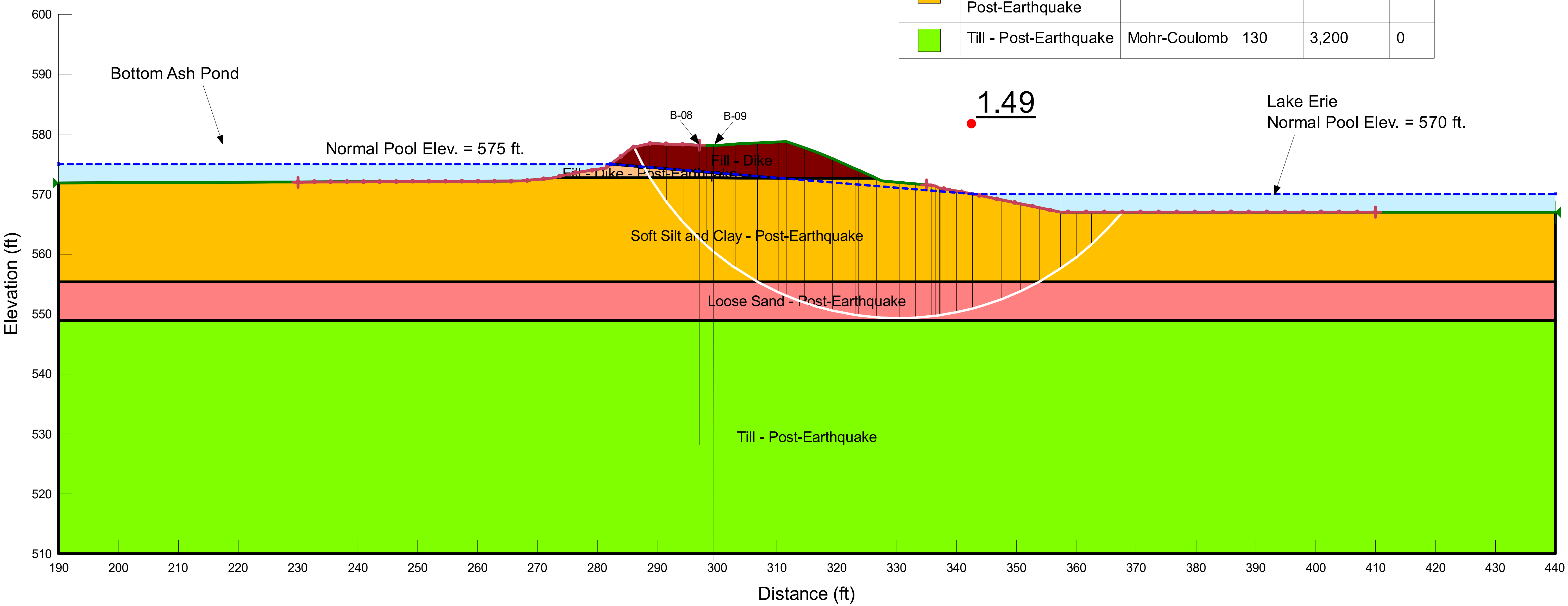
Alignment Reference Point:
N 4409.03 ft
E 9343.45 ft

Alignment Azimuth Angle
100.4 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Circular Slip Surfaces

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill - Dike	Mohr-Coulomb	120	0	30
	Fill - Dike - Post-Earthqake	Mohr-Coulomb	120	0	25
	Loose Sand - Post-Earthquake	Mohr-Coulomb	120	250	0
	Soft Silt and Clay - Post-Earthquake	Mohr-Coulomb	100	176	13
	Till - Post-Earthquake	Mohr-Coulomb	130	3,200	0



DTE Monroe - Inactive BAI Safety Factor Analysis

Cross Section E-E'

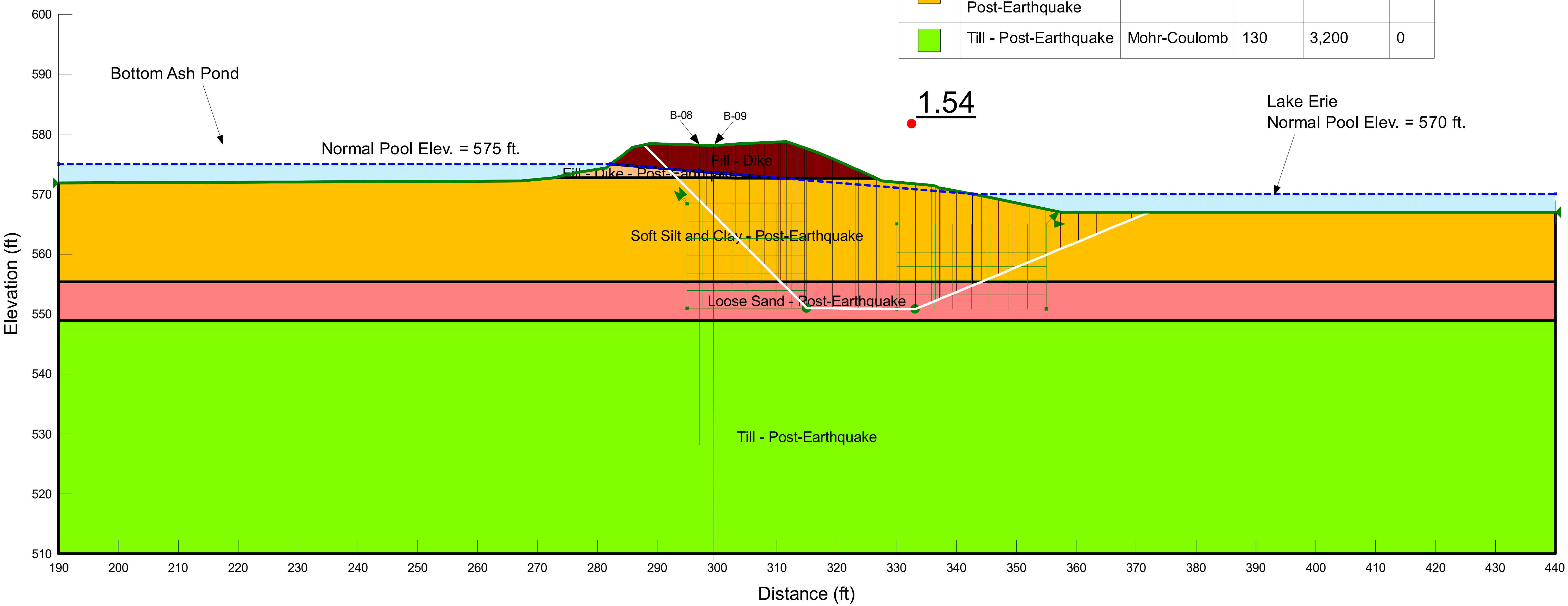
Alignment Reference Point:
N 4409.03 ft
E 9343.45 ft

Alignment Azimuth Angle
100.4 degrees

Post-Earthquake (Post-Liquefaction) Analysis
Block Failure

Material Properties

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill - Dike	Mohr-Coulomb	120	0	30
	Fill - Dike - Post-Earthqake	Mohr-Coulomb	120	0	25
	Loose Sand - Post-Earthquake	Mohr-Coulomb	120	250	0
	Soft Silt and Clay - Post-Earthquake	Mohr-Coulomb	100	176	13
	Till - Post-Earthquake	Mohr-Coulomb	130	3,200	0



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