TOWN OF DENTON
4 N. 2nd STREET, DENTON, MD 21629

CROUSE PARK BULKHEAD RENOVATION

ADDENDUM 01

January 28, 2026

PURPOSE

Please be advised that the Town of Denton has issued an addendum for the Crouse Park Bulkhead Renovation project.

The bid due date remains Friday, February 13th, 2026, at 2:00pm.

The attention of prospective bidders is directed to the following revisions, additions, and/or deletions to the Bid Documents. The bidder is responsible for notifying their Subcontractors regarding items covered by all Addenda.

REVISIONS

1. None.

ATTACHMENTS

The following documents are included as attachments to this addendum.

1. Pre-bid presentation slides, sign-in sheet, and meeting minutes, and associated attachments to the minutes.
2. Geotechnical Evaluation completed by Stable Ground In-Situ (SGI) dated February 9, 2025.

*** END OF ADDENDUM NO. 1 ***

Crouse Park Bulkhead Renovation

Pre-Bid Meeting: January 21, 2026

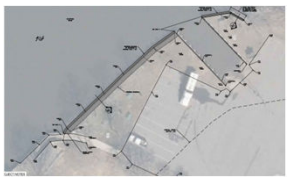
1

Project Description

Original bulkhead at Crouse Park was constructed in the 1960s and has been repaired multiple times.

Replacing approximately 240 feet of the existing bulkhead located at the boat ramp.

Project also includes constructing a landside timber boardwalk.



2

Project Team

- **Town of Denton: Katie Northam, LEEP AP BD+C**

4 N 2nd Street, Denton, MD 21619

Phone: (410) 479 – 3625

Email: knortham@dentonmaryland.com

- **George, Miles, & Buhr LLC: Reggie Mariner, PE**

206 West Main Street, Salisbury, MD 21801

Phone: (410) 742 – 3115

3

Bid Documents

- Specifications

Division 00 – Procurement and Contracting Requirements

- 00010 Advertisement for Bids
- 00015 Bid Schedule
- 00100 Instructions to Bidders
- 00200 Bid Form
- 00500 Agreement
- 00600 Performance Bond
- 00650 Payment Bond
- 00720 General Conditions
- 00730 Supplemental General Conditions
- 00740 Special Provisions

Division 02 – Existing Conditions

- 02100 Subsurface Exploration

- Drawings
  - Sheet S1.1 Existing Site Plan
  - Sheet S1.2 Proposed Site Plan
  - Sheet S2.1 Sections and Details

4

Project Schedule

Tentative Date for Award by Town Council: March 5, 2026

Successful bidder must fully complete the project within 365 days of written Notice to Proceed.

5

Funding

Maryland Department of Natural Resources

Waterway Improvement Funds (WIF)

6

Eligibility Requirements

- Contractor shall have a minimum (3) years of experience performing construction work of a similar nature.
- Bidders shall visit the site before submitting a bid for this work.
- No bidder may withdraw their bid within sixty (60) days after the actual date of opening.
- Each bid must be accompanied by a Bid Bond payable to the Owner for five (5) percent of the total amount of the bid.

7

Bid Submission

BIDS DUE: Friday, February 13th, 2026, at 2:00pm

- Bid opening will be **public.**

Bids can be mailed, shipped, or delivered to:

Town of Denton
Attn: Katie Northam
4 N Second Street
Denton, MD 21629

Reference Specifications for directions on how to label sealed envelope.

8

Index of Bid Forms – Spec 00200

- Standard Sealed Bid Form
- Bid Schedule
- Listing of Subcontractors
- Bid Bond
- Affidavit of Qualification to Bid
- Non-Collusion Certificate

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

SECTION 00200

BID FORM

BULKHEAD RENOVATION
CROUSE PARK
DENTON, MARYLAND

DATE: _____

TO: TOWN OF DENTON
_____
_____

Gentlemen:

Proposal of _____, hereinafter called "BIDDER", organized and existing under the laws of the State of _____ doing business as "a corporation", "a partnership" or "an individual" or applicable) To the Honorable

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the BULKHEAD RENOVATION, CROUSE PARK, DENTON, MARYLAND in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated in the BID SCHEDULE.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that this BID has been arrived at by the BIDDER independently and has been submitted without collusion with and without agreement to, or any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT within 365 days. The schedule for the WORK will be predicted upon a speed. BIDDER further agrees to pay liquidated damages, the sum of $500.00 for each consecutive calendar day thereafter as specified in the Agreement.

BIDDER acknowledges receipt of the following ADDENDA:

_____ _____
_____ _____
_____ _____

_____

240200 00200 - 1

9

Bid Form – Pricing Information

BID SCHEDULE

BASE BID: BULKHEAD RENOVATION COMBINED LUMP SUM BID

Furnishing all materials, labor and equipment to complete the project BULKHEAD RENOVATION, CROUSE PARK, DENTON, MARYLAND as described in the Contract Documents and other appurtenant items as required by the Contract Documents, for the lump sum amount of

BASE BID:_____ Dollars ($_____).

10

Basis of Award

- Contract shall be awarded to the lowest **responsible** and **responsive** BIDDER complying with the provisions of the BID documents
- Review Specification Section 00100 Instructions to Bidders for more detailed information regarding the Owner's consideration of the BIDDER's responsibility and responsiveness.

11

Insurance & Bonding Requirements

- Insurance requirements are included in the General Conditions of the Specifications.
- The awarded contractor will be required to provide payment and performance bonds.

12

Bid Questions

All questions should be forwarded to Katie Northam by email at knortham@dentonmaryland.com.

Deadline for Questions: Wednesday, February 4th at 4:00pm.

Final Addendum: Friday, February 6th.

13

QUESTIONS

14

Crouse Park Bulkhead Renovation

Pre-Bid Meeting: January 21, 2026 at 10:00am

Sign-In Sheet

Name	Company	Email	Phone Number
Scott Getchell	Town of Denton	sgetchell@dentonmaryland.com	410-479-2050
Katie Northam	Town of Denton	knortham@dentonmaryland.com	410-479-3625
Jack Clemmer	Dissen-Juhn	Jclemmer@dissen-Juhn.com	410-739-8156
Tim Goertemiller	Living Ecosystems	livingecosystems@gmail.com	410-310-1842

PLANNING AND CODES
TOWN OF DENTON

RE: Crouse Park Bulkhead Renovation
Pre-Bid Meeting Minutes

Date: Wednesday, January 21, 2026
Time: 10:00 am – 10:30 am
Location: Town Office, 4 N. Second Street, Denton, MD 21629

Attendees: Reference attached sign-in sheet.

Discussion Topics: Reference attached slides included in the presentation.

Question & Answer:

1. **Question:** Is there a preferred timeline within the 365 day schedule for construction?
   Response: The Town would prefer that construction either begin immediately after award, or the contractor wait until next fall to begin. The Town does not want construction to occur during summer as the boat ramp is heavily used by the public.

2. **Question:** Does proof of a site visit need to be provided?
   Response: No, a site visit is highly recommended but not required.

3. **Question:** Is there any geotechnical information available for the project?
   Response: Please see attached Geotechnical Evaluation completed by Stable Ground In-Situ (SGI) dated February 9, 2025.

4. **Question:** For future questions, should drawing references be included?
   Response: Yes, if a question is specific to information included on a drawing, please include reference to the specific drawing associated with the question.

5. **Question:** Where will bids be opened?
   Response: Bids will be opened at the Town Office, in the same location as the pre-bid meeting (second floor training room).

6. **Question:** Should bids be brought to the bid opening? Or delivered prior to?
   Response: Bids should be delivered prior to the actual bid opening, to allow for time of receipt stamp.

7. **Question:** There are notes on the drawings that reference coordination with the engineer. Please clarify who this coordination should be with.
   Response: The engineer of record for the project is Reggie Mariner, PE with GMB.

8. **Question:** How many contractors have been solicited?
   Response: The Town reached out to known local contractors. The bid documents are publicly available on the Town's website.

9. **Question:** Is there a depth restriction for access to the site?
   Response: Please reference the specifications for the MDE and Army Corp permits for the project and any associated restrictions.

10. **Question:** Who should submittals be sent to once the project is awarded?
    Response: Submittals and any other project documentation should be sent to Katie Northam with the Town of Denton.

11. **Question:** Is there a designated laydown area?
    Response: No, a designated laydown area is not shown on the plans. There is space available for a laydown area at Crouse Park; the Town will coordinate the location with the awarded contractor.

12. **Question:** Are there any power lines in the vicinity of the project?
    Response: No, there are not any power lines in the immediate vicinity of the project. The only anticipated potential obstructions are existing trees.

13. **Question:** If existing trees need to be removed, who is responsible for replacement?
    Response: The awarded contractor will be responsible for replacement of existing trees (if any) that need to be removed.

If anyone takes exception to these minutes, please contact our department within **ten (10) days** from the recent of this document.

Respectfully submitted,

Katie Northam, LEED AP BD+C
Project Manager
Department of Planning & Codes

KN/swg

cc: All Attendees

February 9, 2025

Mr. Reggie Mariner
George, Miles & Buhr
206 West Main Street
Salisbury, MD 21801

Reference: Daniel Crouse Memorial Park Bulkhead
Geotechnical Evaluation
Denton, Maryland
SGI Project Number: 25003

Dear Mr. Mariner:

Stable Ground In-Situ, LLC (SGI) is pleased to submit this report concerning the soil exploration and geotechnical evaluation conducted for the Daniel Crouse Memorial Park bulkhead in Denton, Maryland; as shown on the CPT Logs in the attachments. The data reported herein outlines the subgrade soil parameters found at the project site as it pertains to future construction.

To gain information as to the properties of the existing native soils, one (1) Cone Penetration Test (CPT) soundings was performed within the influence area of the proposed constructions. The sounding was named *Crouse Memorial Park CPT-1*. The sounding was performed to approximately 50 feet below existing grades. The sounding location was selected GMB and advanced at the vicinity of the proposed structures by SGI. The approximate sounding location and estimated elevation is shown on the attached CPT Logs.

The Cone Penetration Test (CPT) is an in-situ testing method used to determine the geotechnical engineering properties of soils and delineating soil stratigraphy. It was initially developed in the 1950s at the Laboratory for Soil Mechanics in Denmark in order to investigate soft soils. Based on this history it has also been called the "Dutch cone test". Today, the CPT is one of the most used and accepted in-situ test methods for soil investigation worldwide.

The CPT test method consists of pushing an instrumented cone tip first into the ground at a controlled rate (usually 2 centimeters/second). The resolution of the CPT in delineating stratigraphic layers is related to the size of the cone tip, with typical cone tips having a cross-sectional area of either 10 or 15 cm², corresponding to diameters of 3.6 and 4.4 cm. SGI uses a 10 cm² cross-sectional area cone.

The early applications of CPT mainly determined the soil geotechnical property of bearing capacity. The original cone penetrometers involved simple mechanical measurements of the total penetration resistance to pushing a tool with a conical tip into the soil. Different methods were employed to separate the total measured resistance into components generated by the conical tip (the "tip friction") and friction generated by the rod string. A friction sleeve was added to quantify this component of the friction and aid in determining soil cohesive strength in the 1960s

(Begemann, 1965). Electronic measurements began in 1948 and improved further in the early 1970s (de Reister, 1971).

Most modern electronic CPT cones now also employ a pressure transducer with a filter to gather pore water pressure data. The filter is usually located on the cone tip (the so-called U1 position), immediately behind the cone tip (the most common U2 position – SGI cone) or behind the friction sleeve (U3 position). Pore water pressure data aids determining stratigraphy and is primarily used to correct tip friction values for those effects. CPT testing which also gathers this 10 cm², piezometer data is called CPTU testing. CPT and CPTU testing equipment generally advance the cone using hydraulic rams mounted on either a heavily ballasted vehicle or using screwed-in anchors as a counter-force.

CPT for geotechnical applications was standardized in 1986 by ASTM and is now covered by Standard D 3441 (ASTM, 2004). Later ASTM Standards have addressed the use of CPT for various environmental site characterization and groundwater monitoring activities. Particularly for geotechnical soil investigations, CPT is gaining popularity compared to standard penetration testing as a method of geotechnical soil investigation by its increased accuracy, speed of deployment and reduced cost over other soil testing methods.

Soil Properties

Soil properties have been provided in the form of a CPT log and generalized geotechnical Section. The CPT logs include more detailed soil characteristics at a smaller interval. The CPT Sections have been simplified into broader strata to aid in the boat ramp design. The CPT Sections are inherently less representative of the overall native soils but generally provide an acceptable estimation for use in design.

All professional services were performed in accordance with generally accepted engineering practice. Should there be any questions or additional information required, please contact SGI at 410-422-4674 or 267-896-5380.

Best Regards,

Ryan C. Ward, P.E.
Principal
rward@sgi-insitu.com

Fernando Garcia, P.E., D. GE.
Principal
fgarcia@sgi-insitu.com

CPT Logs and Interpretations

Stable Ground In-Situ, LLC
ENGINEERING INVESTIGATIONS AND CONSULTING
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www.sgi-insitu.com

Project: **Daniel Crouse Memorial Park Boat Ramp**
Location: **Denton, MD**

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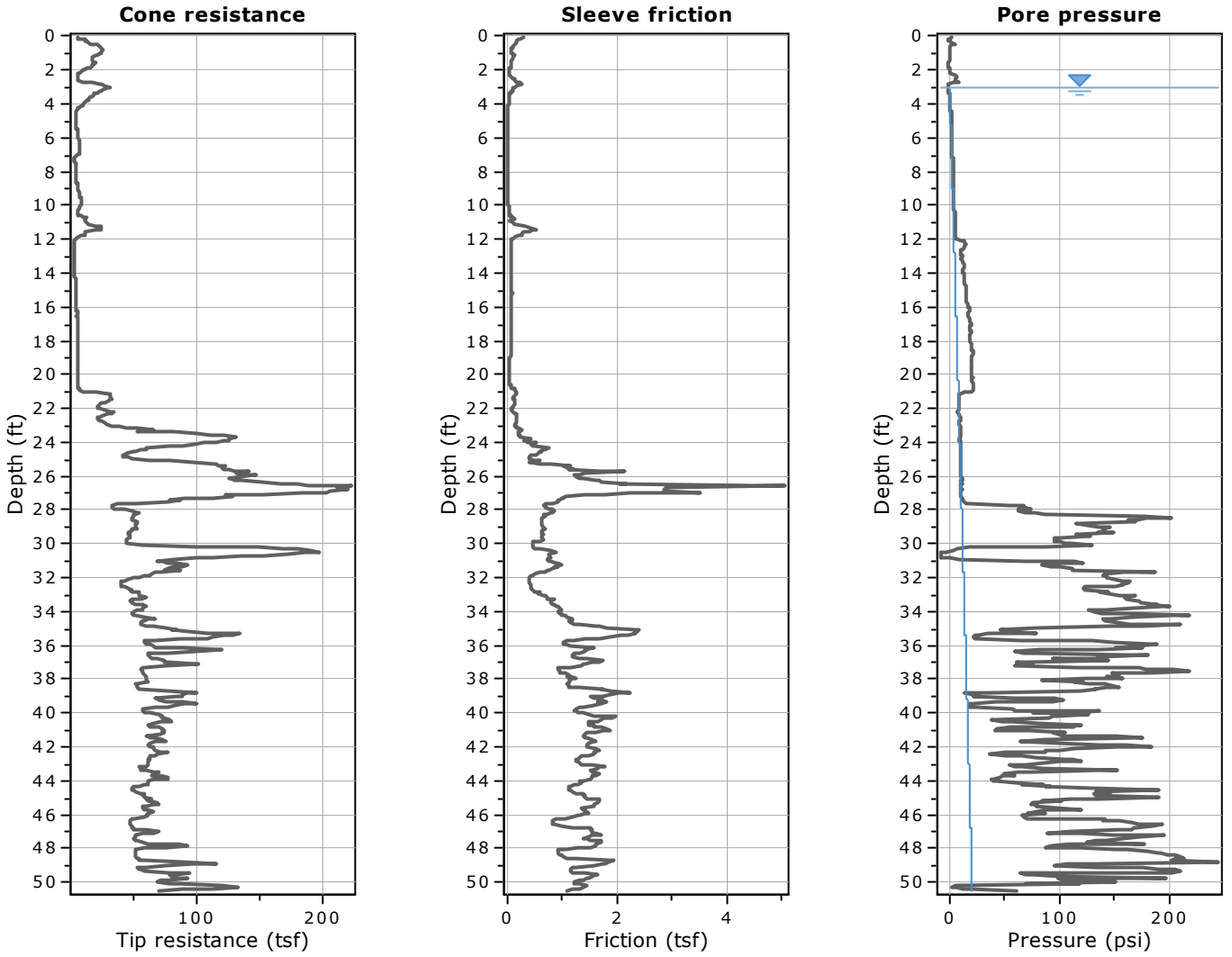
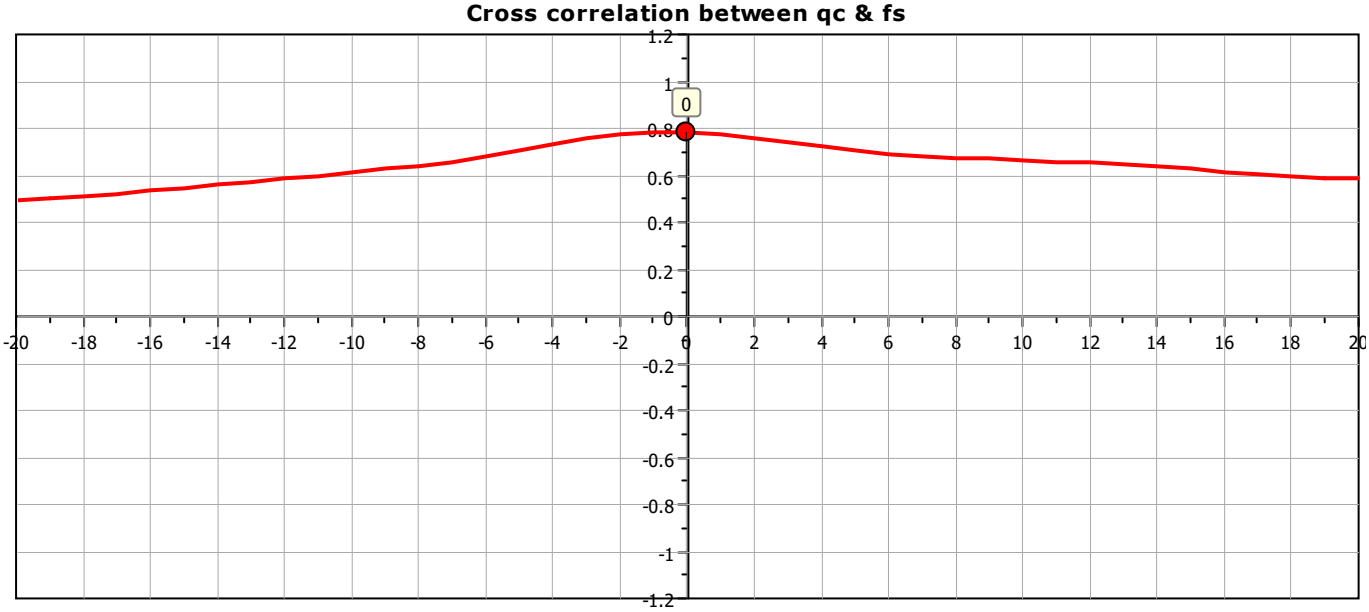
Crouse Memorial Park CPT-1
Total depth: 50.51 ft, Date: 2/5/2025
Surface Elevation: 4.00 ft, Est. GWL: 3.00 ft
Coords: lat 38.8886087252804° lon -75.8378930724394°
Cone Type: Geoprobe u2
Cone Operator: R. Ward, PE, F. Garcia, PE, D.GE

Project: **Daniel Crouse Memorial Park Boat Ramp**
Location: **Denton, MD**



The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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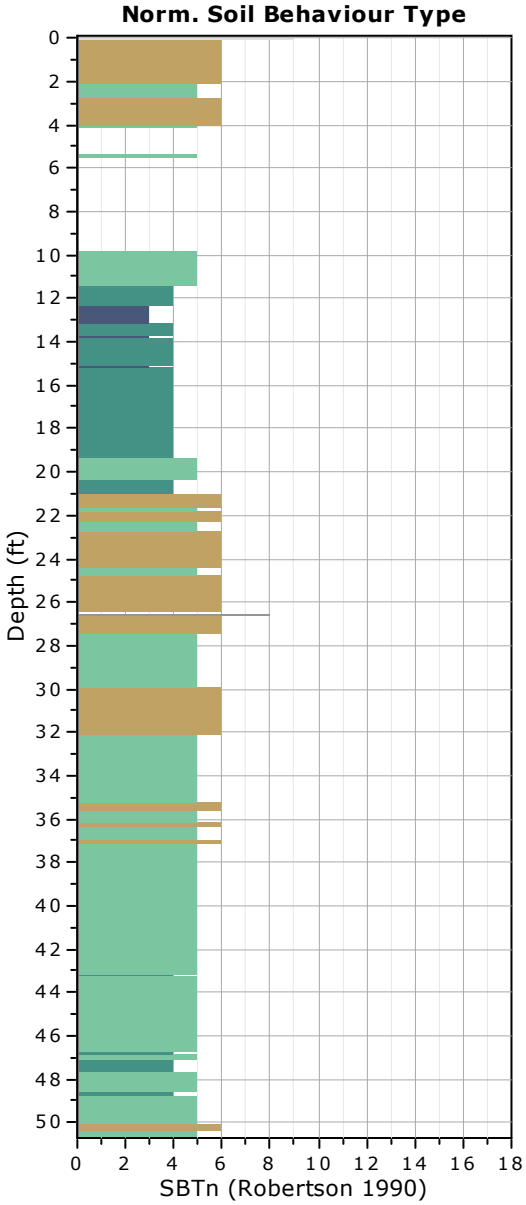

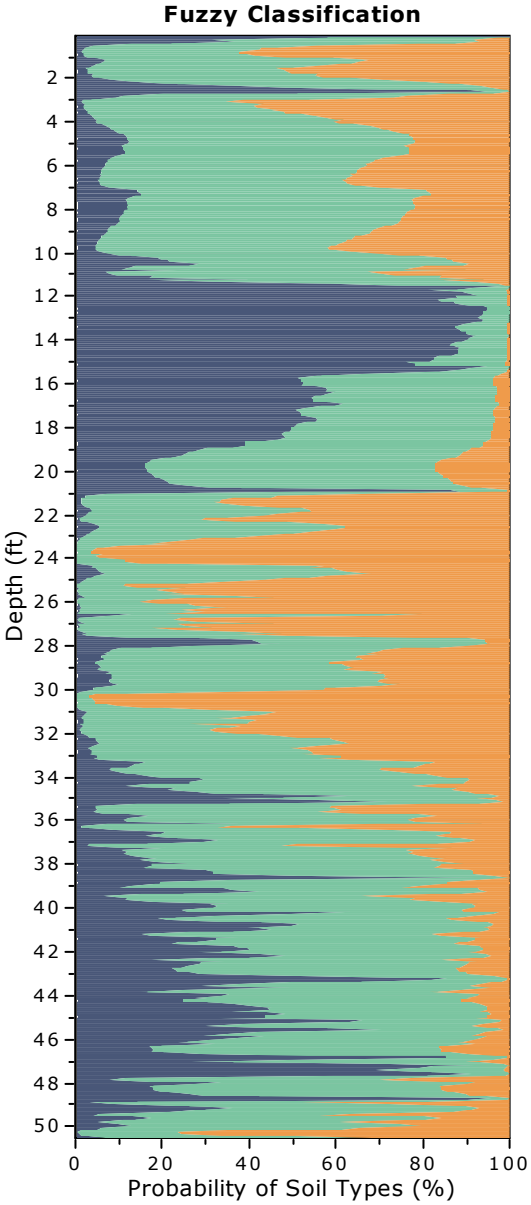

Fuzzy classifiaction legend
- Highly probable clayey soil
- Highly probable mixture soil
- Highly probable sandy soil

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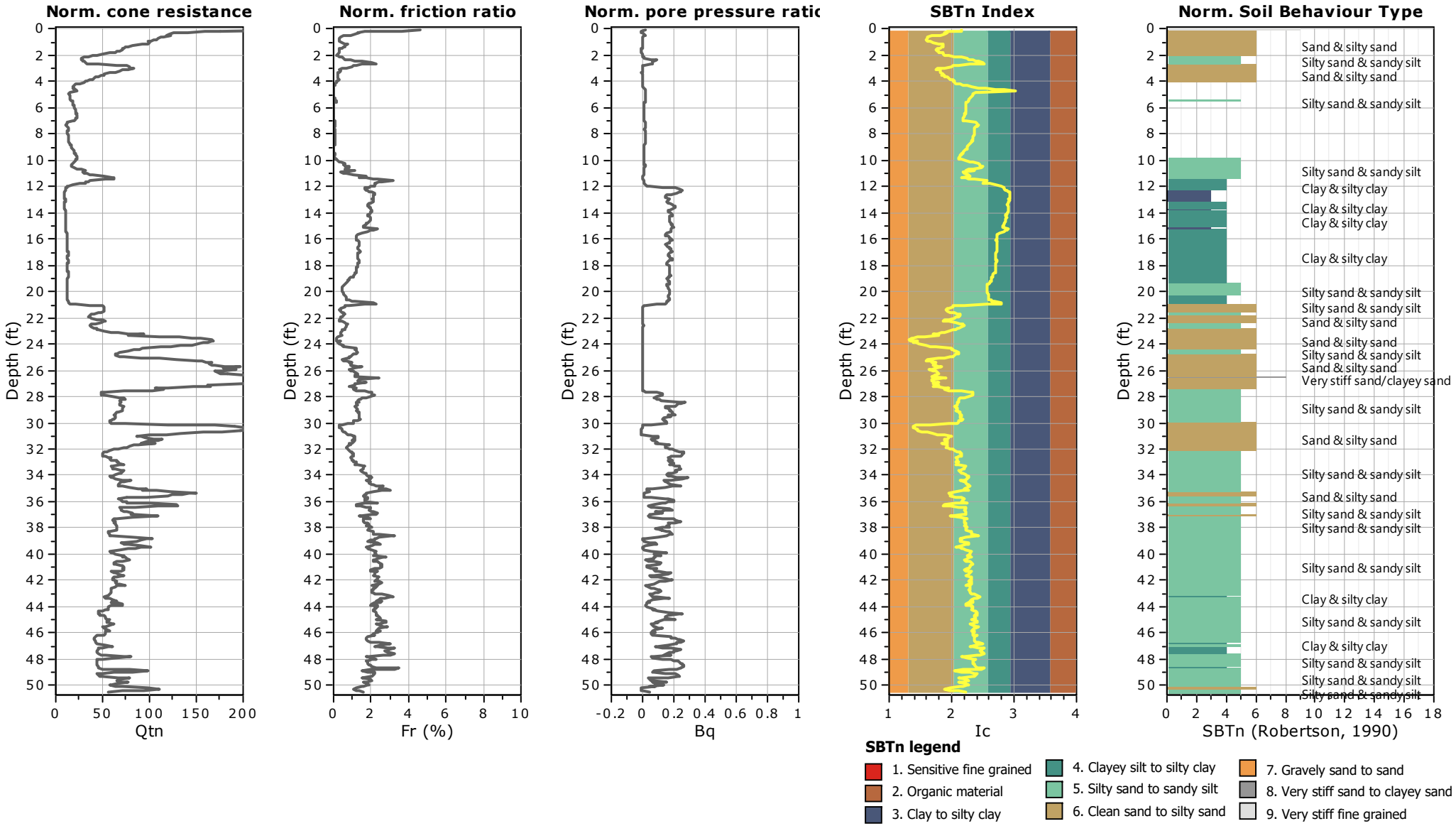

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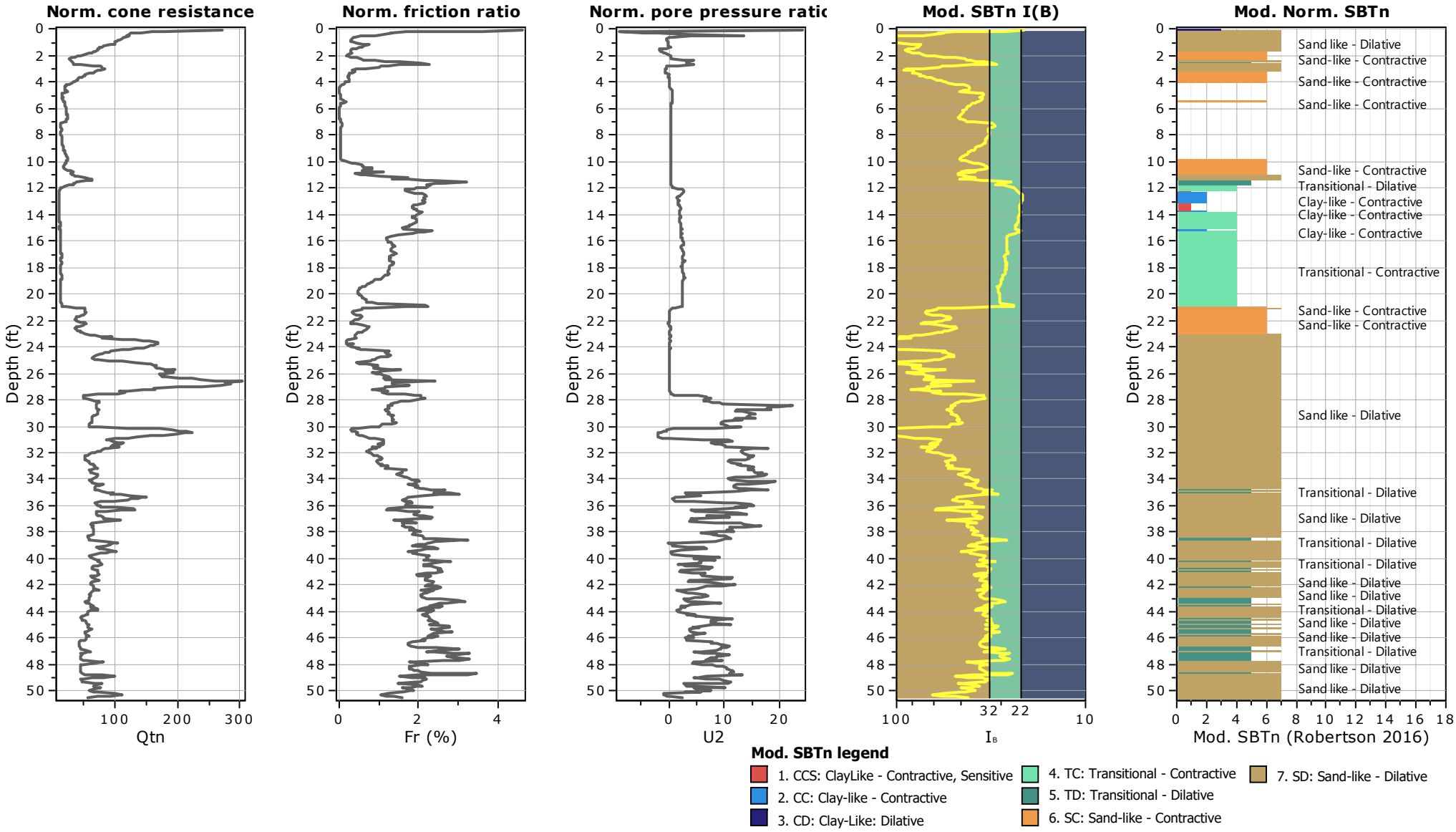

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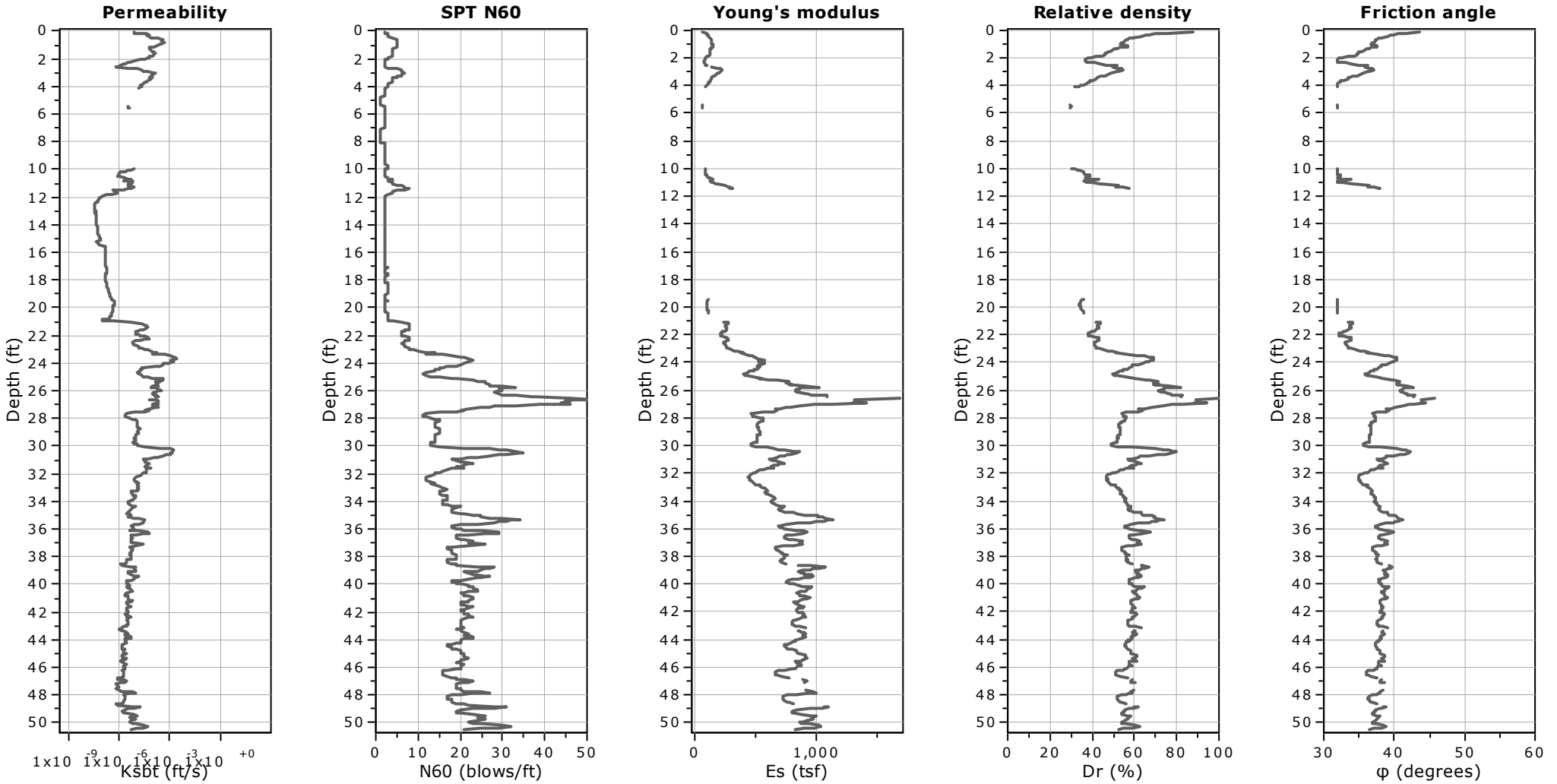

Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
Phi: Based on Kulhawy & Mayne (1990)

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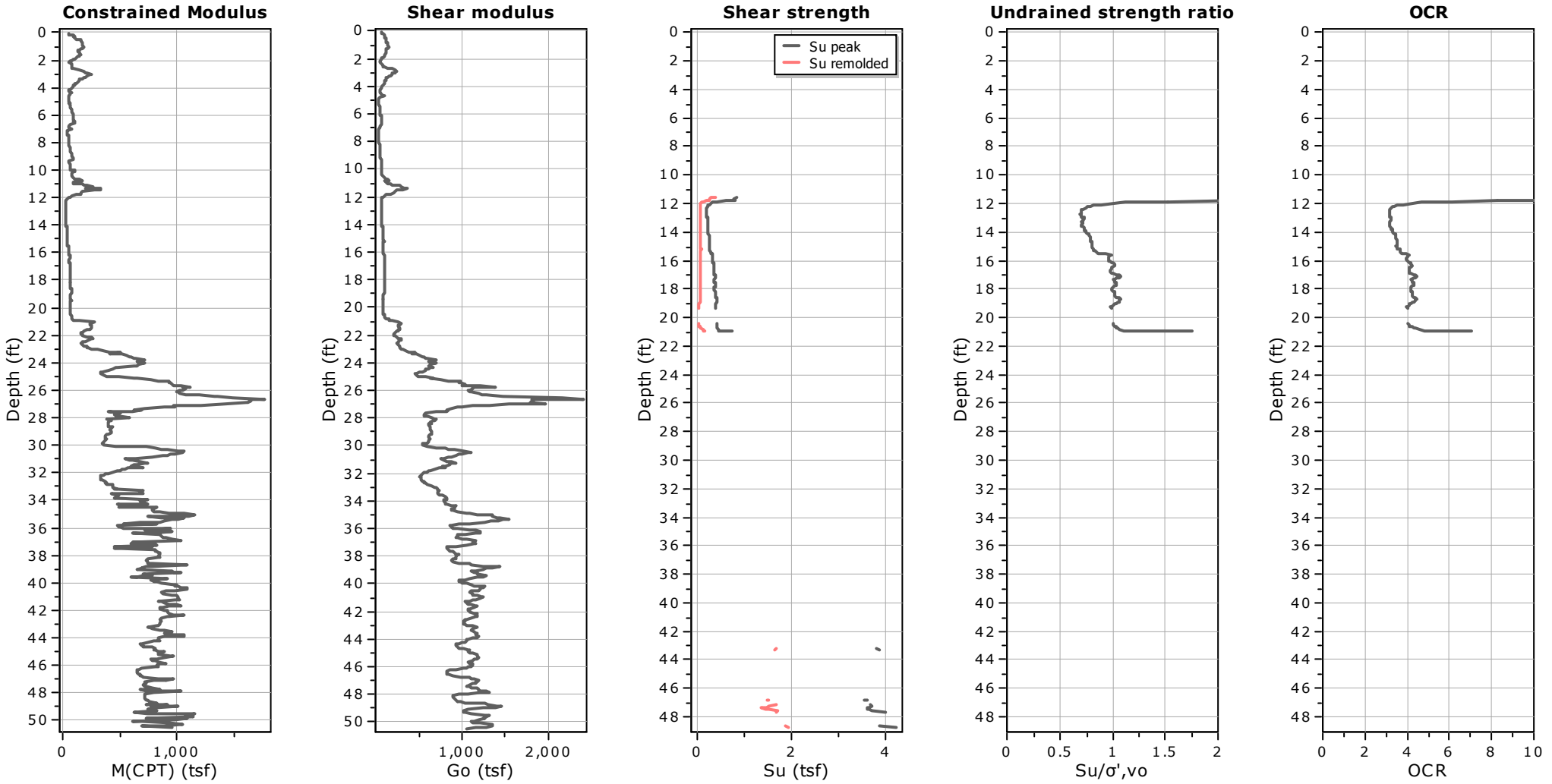

Calculation parameters
Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
Go: Based on variable *alpha* using I_c (Robertson, 2009)
Undrained shear strength cone factor for clays, N_{kt}: 14
OCR factor for clays, N_{kt}: 0.33
Flat Dilatometer Test data

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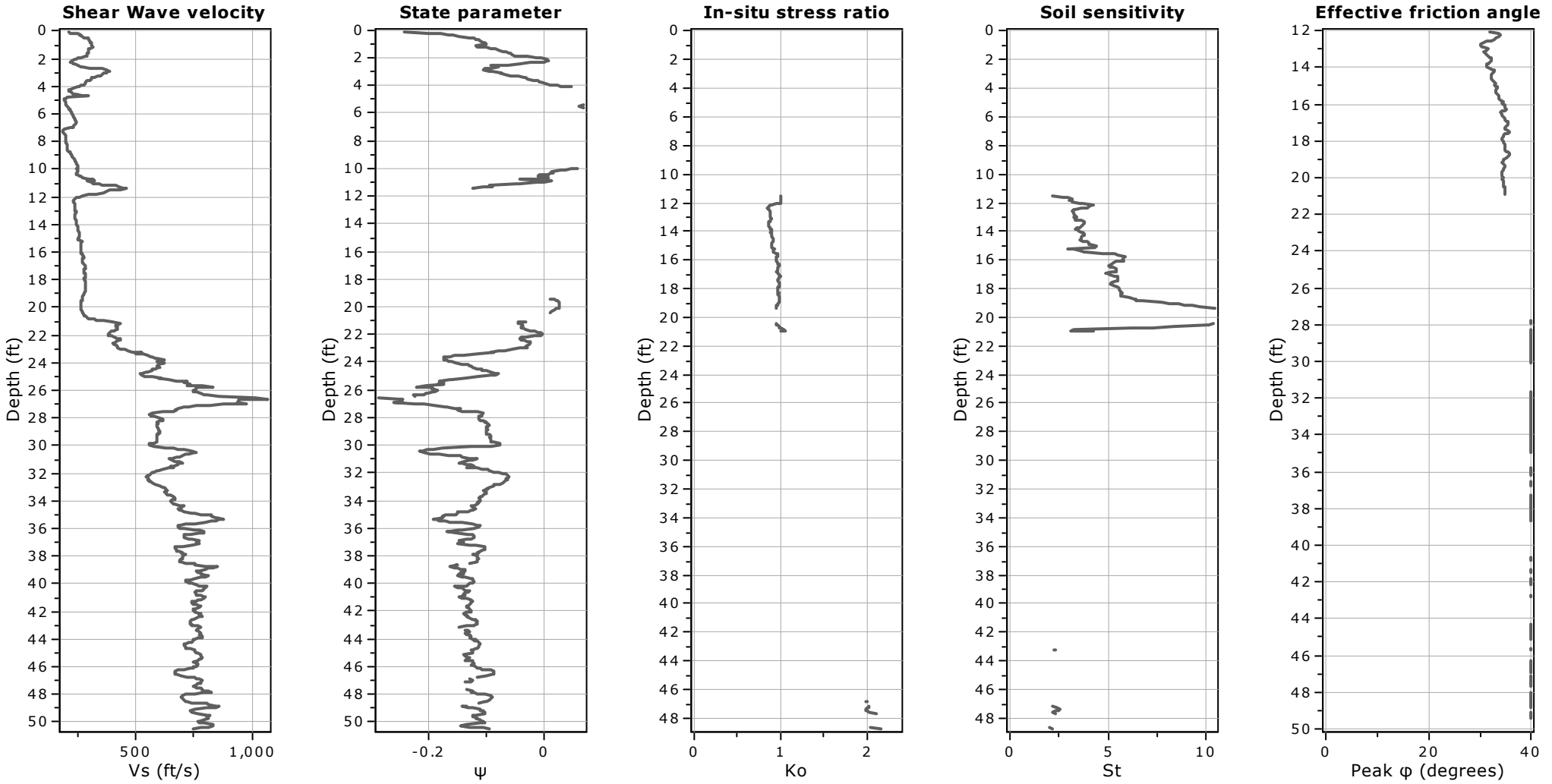

Calculation parameters

Soil Sensitivity factor, N_S: 7.00

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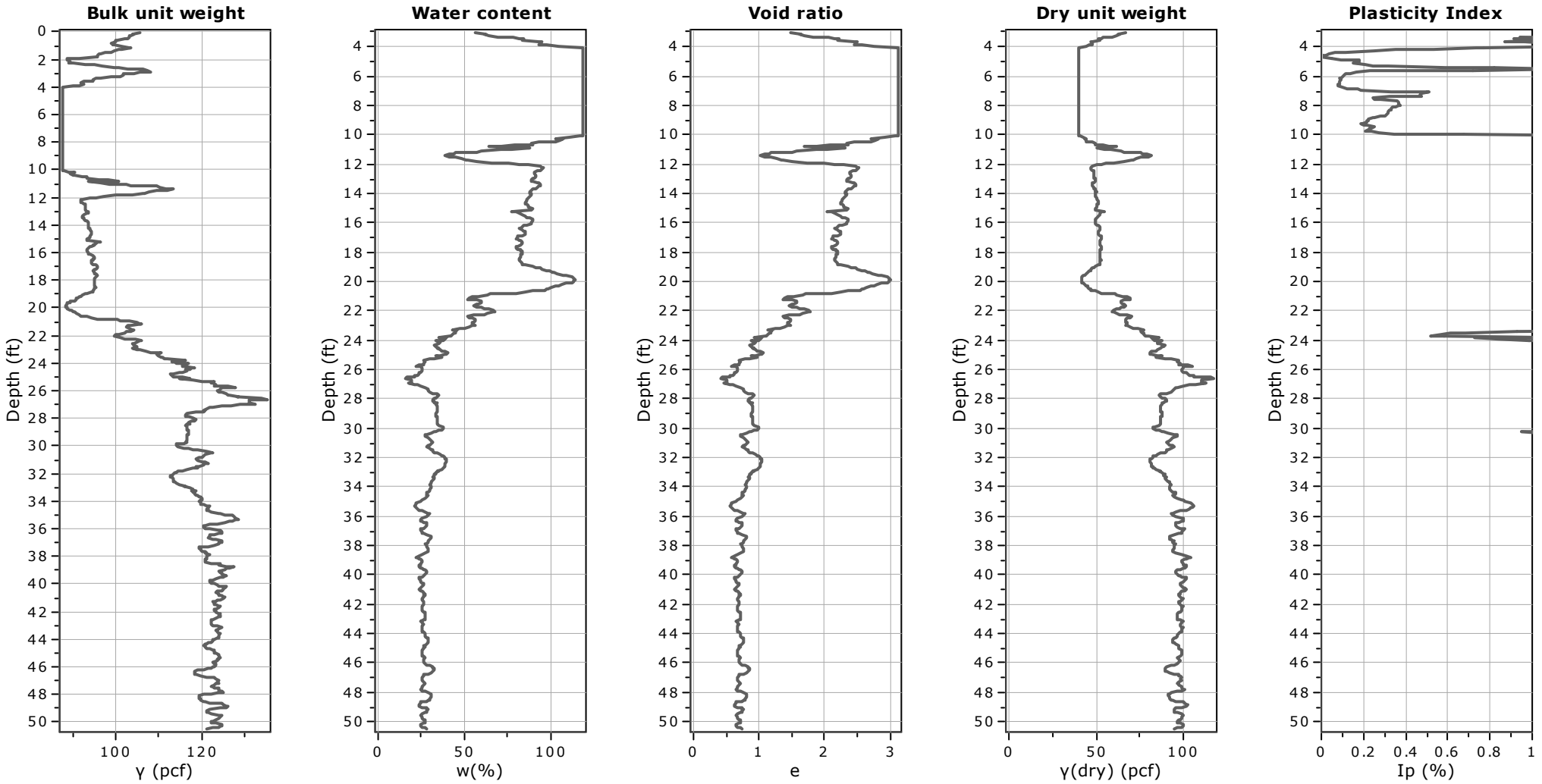

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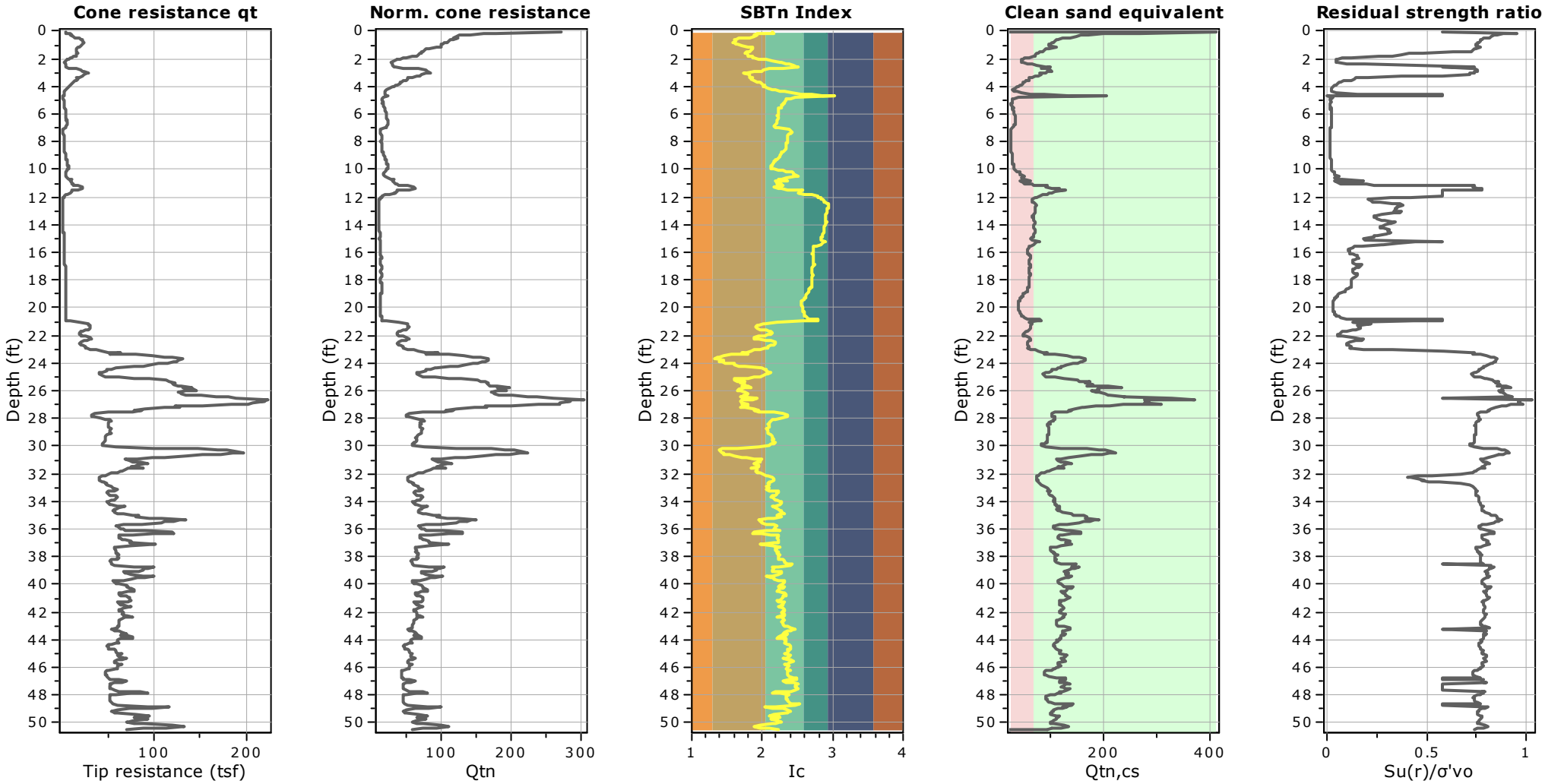

Presented below is a list of formulas used for the estimation of various soil properties. The formulas are presented in SI unit system and assume that all components are expressed in the same units.

:: Unit Weight, g (kN/m³) ::

$$g = g_w \cdot \left(0.27 \cdot \log(R_f) + 0.36 \cdot \log(\frac{q_t}{p_a}) + 1.236 \right)$$

where g_w = water unit weight

:: Permeability, k (m/s) ::

$I_c < 3.27$ and $I_c > 1.00$ then $k = 10^{0.952-3.04 \cdot I_c}$

$I_c \leq 4.00$ and $I_c > 3.27$ then $k = 10^{-4.52-1.37 \cdot I_c}$

:: N_{SPT} (blows per 30 cm) ::

$$N_{60} = \left(\frac{q_c}{P_a} \right) \cdot \frac{1}{10^{1.1268-0.2817 \cdot I_c}}$$

$$N_{1(60)} = Q_{tn} \cdot \frac{1}{10^{1.1268-0.2817 \cdot I_c}}$$

:: Young's Modulus, Es (MPa) ::

$$(q_t - \sigma_v) \cdot 0.015 \cdot 10^{0.55 \cdot I_c + 1.68}$$

(applicable only to $I_c < I_{c\_cutoff}$)

:: Relative Density, Dr (%) ::

$$100 \cdot \sqrt{\frac{Q_{tn}}{k_{DR}}}$$ (applicable only to SBT_n: 5, 6, 7 and 8 or $I_c < I_{c\_cutoff}$)

:: State Parameter, ψ ::

$$\psi = 0.56 - 0.33 \cdot \log(Q_{tn,cs})$$

:: Drained Friction Angle, φ (°) ::

$$\varphi = \varphi'_{cv} + 15.94 \cdot \log(Q_{tn,cs}) - 26.88$$

(applicable only to SBT_n: 5, 6, 7 and 8 or $I_c < I_{c\_cutoff}$)

:: 1-D constrained modulus, M (MPa) ::

If $I_c > 2.20$
$\alpha = 14$ for $Q_{tn} > 14$
$\alpha = Q_{tn}$ for $Q_{tn} \leq 14$
$M_{CPT} = \alpha \cdot (q_t - \sigma_v)$

If $I_c \geq 2.20$

$$M_{CPT} = 0.03 \cdot (q_t - \sigma_v) \cdot 10^{0.55 \cdot I_c + 1.68}$$

:: Small strain shear Modulus, Go (MPa) ::

$$G_0 = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 \cdot I_c + 1.68}$$

:: Shear Wave Velocity, Vs (m/s) ::

$$V_s = \left(\frac{G_0}{\rho} \right)^{0.50}$$

:: Undrained peak shear strength, Su (kPa) ::

$N_{kt} = 10.50 + 7 \cdot \log(F_r)$ or user defined

$$S_u = \frac{(q_t - \sigma_v)}{N_{kt}}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: Remolded undrained shear strength, Su(rem) (kPa) ::

$S_{u(rem)} = f_s$ (applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: Overconsolidation Ratio, OCR ::

$$k_{OCR} = \left[\frac{Q_{tn}^{0.20}}{0.25 \cdot (10.50 \cdot + 7 \cdot \log(F_r))} \right]^{1.25}$$ or user defined

$OCR = k_{OCR} \cdot Q_{tn}$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: In situ Stress Ratio, Ko ::

$$K_O = (1 - \sin\varphi') \cdot OCR^{\sin\varphi'}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: Soil Sensitivity, S_t ::

$$S_t = \frac{N_S}{F_r}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c\_cutoff}$)

:: Peak Friction Angle, φ' (°) ::

$$\varphi' = 29.5° \cdot B_q^{0.121} \cdot (0.256 + 0.336 \cdot B_q + \log Q_t)$$

(applicable for $0.10 < B_q < 1.00$)

References

• Robertson, P.K., Cabal K.L., Guide to Cone Penetration Testing for Geotechnical Engineering, Gregg Drilling & Testing, Inc., 5th Edition, November 2012

• Robertson, P.K., Interpretation of Cone Penetration Tests - a unified approach., Can. Geotech. J. 46(11): 1337–1355 (2009)

• N Barounis, J Philpot, Estimation of in-situ water content, void ratio, dry unit weight and porosity using CPT for saturated sands, Proc. 20th NZGS Geotechnical Symposium

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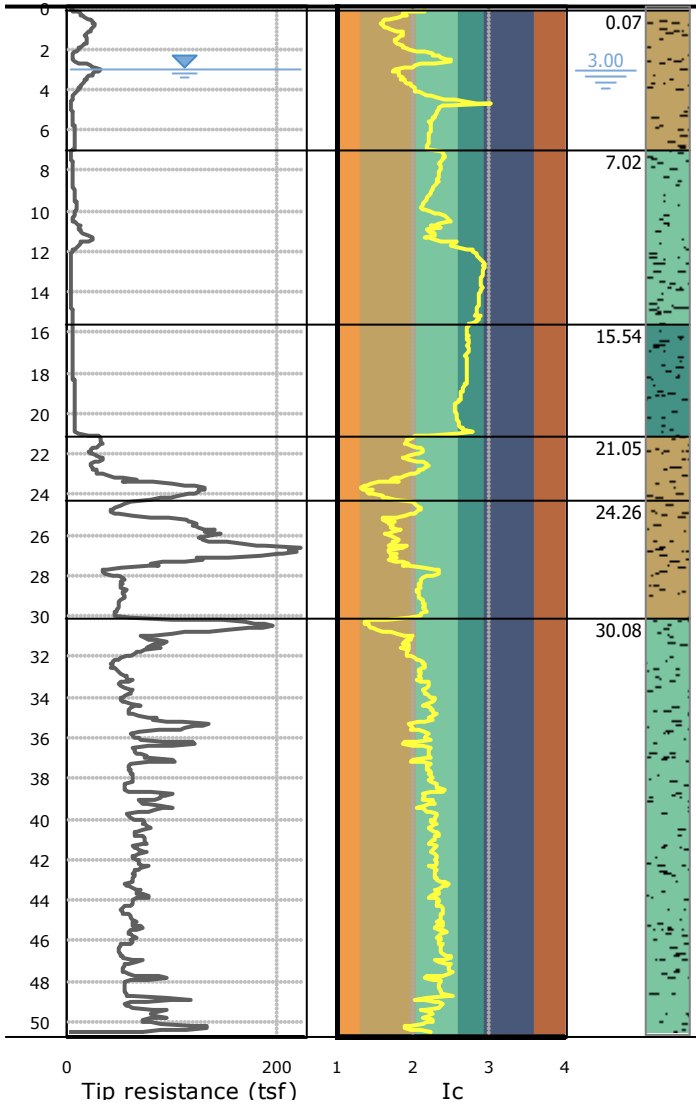
Generalized Geotechnical Section

Stable Ground In-Situ, LLC
ENGINEERING INVESTIGATIONS AND CONSULTING
BUILD CONFIDENTLY
www.sgi-insitu.com

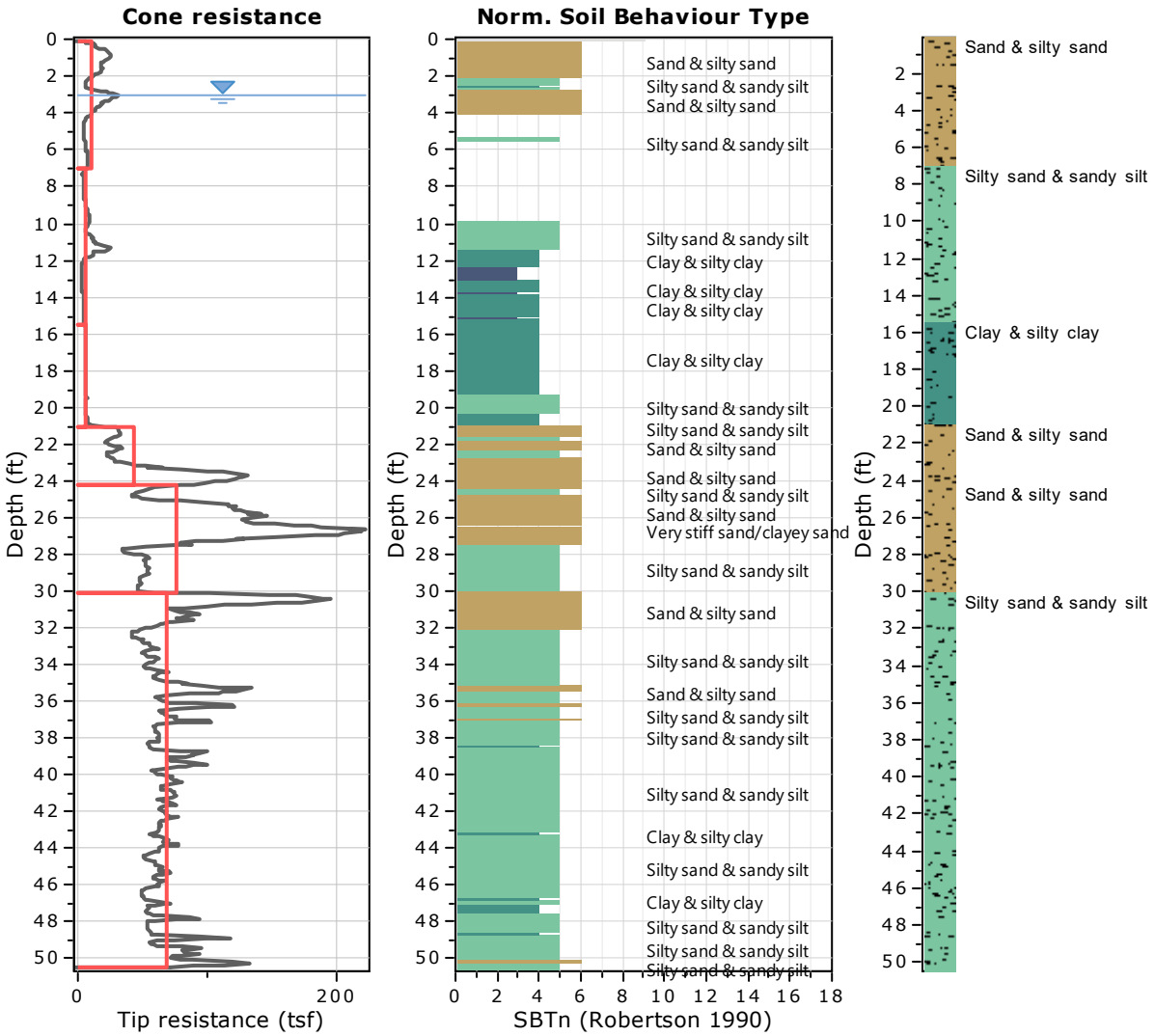
Project: **Daniel Crouse Memorial Park Boat Ramp**
Location: **Denton, MD**

Crouse Memorial Park CPT-1

Total depth: 50.51 ft, Date: 2/5/2025
Surface Elevation: 4.00 ft, Est. GWL: 3.00 ft
Coords: lat 38.8886087252804° lon -75.8378930724394°
Cone Type: Geoprobe u2
Cone Operator: R. Ward, PE, F. Garcia, PE, D.GE



Depth (ft)	Description	qt (tsf)	Ksbt (ft/s)	N60	Es (tsf)	Dr	Phi (°)	M (tsf)	Go (tsf)	Su (tsf)	Su ratio	OCR	Gamma (pcf)
0.07	Sand & silty sand	10.0	3.64E-5	2.7	118.3	46.8	35.1	97.8	96.1	-	-	-	93.4
7.02	Silty sand & sandy silt	5.5	1.82E-7	2.1	137.4	40.2	33.3	56.3	88.3	-	-	-	92.6
15.54	Clay & silty clay	6.3	2.30E-7	2.3	-	-	-	68.1	111.9	0.4	0.9	4.2	93.6
21.05	Sand & silty sand	42.6	6.35E-5	10.0	314.5	47.8	35.1	307.0	352.8	-	-	-	106.6
24.26	Sand & silty sand	75.6	3.20E-5	19.1	631.2	61.4	38.6	609.0	805.4	-	-	-	120.0
30.08	Silty sand & sandy silt	68.2	5.65E-6	20.2	773.1	58.0	37.9	753.4	998.4	-	-	-	121.9



Tabular results

.:: Layer No: 1 ::.

Code: Layer_1 **Start depth:** 0.07 (ft), **End depth:** 7.02 (ft)

Description: Sand & silty sand

Basic results

Total cone resistance: 10.00 ±7.72 tsf
Sleeve friction: 0.01 ±0.08 tsf
Ic: 2.06 ±0.28
σ_v': 0.11 ±0.06 tsf
SBT_n: 6
SBTn description: Sand & silty sand
Schneider zone: N/A
Schneider desc.: N/A

Estimation results

Permeability: 3.64E-05 ±1.20E-04 ft/s
N_{60}: 2.67 ±1.52 blows
Es: 118.30 ±38.17 tsf
Dr (%): 46.77 ±11.15
φ (degrees): 35.12 ±2.70 °
Unit weight: 93.39 ±6.62 pcf
Constrained Mod.: 97.84 ±48.48 tsf
Go: 96.07 ±46.72 tsf
Su: 0.00 ±0.00 tsf
Su ratio: 0.00 ±0.00
O.C.R.: 0.00 ±0.00

.:: Layer No: 2 ::.

Code: Layer_2 **Start depth:** 7.02 (ft), **End depth:** 15.54 (ft)

Description: Silty sand & sandy silt

Basic results	Estimation results	
Total cone resistance: 5.54 ±4.34 tsf	Permeability: 1.82E-07 ±2.12E-06 ft/s	Constrained Mod.: 56.32 ±59.35 tsf
Sleeve friction: 0.02 ±0.10 tsf	N_{60}: 2.10 ±1.23 blows	Go: 88.32 ±60.24 tsf
Ic: 2.54 ±0.29	Es: 137.42 ±75.08 tsf	Su: 0.00 ±0.00 tsf
σ_v': 0.26 ±0.04 tsf	Dr (%): 40.24 ±8.11	Su ratio: 0.00 ±0.00
SBT_n: 5	φ (degrees): 33.35 ±2.08 °	O.C.R.: 0.00 ±0.00
SBTn description: Silty sand & sandy silt	Unit weight: 92.62 ±5.97 pcf	
Schneider zone: Zone 3		
Schneider desc.: Transitional soils		

.:: Layer No: 3 ::.

Code: Layer_3 **Start depth:** 15.54 (ft), **End depth:** 21.05 (ft)

Description: Clay & silty clay

Basic results	Estimation results	
Total cone resistance: 6.26 ±1.78 tsf	Permeability: 2.30E-07 ±5.77E-07 ft/s	Constrained Mod.: 68.12 ±25.71 tsf
Sleeve friction: 0.05 ±0.03 tsf	N_{60}: 2.32 ±0.64 blows	Go: 111.90 ±23.00 tsf
Ic: 2.67 ±0.08	Es: 0.00 ±0.00 tsf	Su: 0.38 ±0.05 tsf
σ_v': 0.37 ±0.03 tsf	Dr (%): 0.00 ±0.00	Su ratio: 0.92 ±0.08
SBT_n: 4	φ (degrees): 0.00 ±0.00 °	O.C.R.: 4.23 ±0.38
SBTn description: Clay & silty clay	Unit weight: 93.58 ±3.01 pcf	
Schneider zone: Zone 1a		
Schneider desc.: Silts and low Ir clays		

.:: Layer No: 4 ::.

Code: Layer_4 **Start depth:** 21.05 (ft), **End depth:** 24.26 (ft)

Description: Sand & silty sand

Basic results	Estimation results	
Total cone resistance: 42.60 ±39.31 tsf	Permeability: 6.35E-05 ±7.57E-04 ft/s	Constrained Mod.: 307.04 ±196.53 tsf
Sleeve friction: 0.17 ±0.11 tsf	N_{60}: 10.03 ±6.09 blows	Go: 352.81 ±155.13 tsf
Ic: 1.84 ±0.27	Es: 314.54 ±118.74 tsf	Su: 0.00 ±0.00 tsf
σ_v': 0.45 ±0.02 tsf	Dr (%): 47.76 ±10.49	Su ratio: 0.00 ±0.00
SBT_n: 6	φ (degrees): 35.15 ±2.75 °	O.C.R.: 0.00 ±0.00
SBTn description: Sand & silty sand	Unit weight: 106.57 ±4.83 pcf	
Schneider zone: Zone 2		
Schneider desc.: Essentially drained sands		

.:: Layer No: 5 ::.

Code: Layer_5 **Start depth:** 24.26 (ft), **End depth:** 30.08 (ft)

Description: Sand & silty sand

Basic results	Estimation results	
Total cone resistance: 75.62 ±54.50 tsf	Permeability: 3.20E-05 ±1.04E-04 ft/s	Constrained Mod.: 608.98 ±411.08 tsf
Sleeve friction: 0.89 ±0.88 tsf	N_{60}: 19.08 ±10.58 blows	Go: 805.39 ±416.77 tsf
Ic: 1.95 ±0.21	Es: 631.15 ±266.99 tsf	Su: 0.00 ±0.00 tsf
σ_v': 0.57 ±0.05 tsf	Dr (%): 61.35 ±12.60	Su ratio: 0.00 ±0.00
SBT_n: 6	φ (degrees): 38.62 ±2.59 °	O.C.R.: 0.00 ±0.00
SBTn description: Sand & silty sand	Unit weight: 120.05 ±5.43 pcf	
Schneider zone: N/A		
Schneider desc.: N/A		

.:: Layer No: 6 ::.

Code: Layer_6 **Start depth:** 30.08 (ft), **End depth:** 50.51 (ft)

Description: Silty sand & sandy silt

Basic results

Total cone resistance: 68.21 ±24.24 tsf
Sleeve friction: 1.19 ±0.42 tsf
Ic: 2.20 ±0.20
σ_v': 0.94 ±0.18 tsf
SBT_n: 5
SBTn description: Silty sand & sandy silt
Schneider zone: Zone 1a
Schneider desc.: Silts and low Ir clays

Estimation results

Permeability: 5.65E-06 ±2.23E-04 ft/s
N_{60}: 20.20 ±4.18 blows
Es: 773.11 ±142.58 tsf
Dr (%): 58.01 ±5.30
φ (degrees): 37.91 ±1.22 °
Unit weight: 121.91 ±3.07 pcf
Constrained Mod.: 753.35 ±183.63 tsf
Go: 998.45 ±202.90 tsf
Su: 0.00 ±0.00 tsf
Su ratio: 0.00 ±0.00
O.C.R.: 0.00 ±0.00

Summary table of mean values

From depth To depth (ft)	Thickness (ft)	Permeability (ft/s)	SPT_{N60} (blows/ft)	E_s (tsf)	D_r (%)	Friction angle	Constrained modulus, M (tsf)	Shear modulus, G_O (tsf)	Undrained strength, S_U (tsf)	Undrained strength ratio	OCR	Unit weight (pcf)
0.07	6.95	3.64E-05	2.7	118.3	46.8	35.1	97.8	96.1	0.0	0.0	0.0	93.4
7.02		(±1.20E-04)	(±1.5)	(±38.2)	(±11.1)	(±2.7)	(±48.5)	(±46.7)	(±0.0)	(±0.0)	(±0.0)	(±6.6)
7.02	8.52	1.82E-07	2.1	137.4	40.2	33.3	56.3	88.3	0.0	0.0	0.0	92.6
15.54		(±2.12E-06)	(±1.2)	(±75.1)	(±8.1)	(±2.1)	(±59.3)	(±60.2)	(±0.0)	(±0.0)	(±0.0)	(±6.0)
15.54	5.51	2.30E-07	2.3	0.0	0.0	0.0	68.1	111.9	0.4	0.9	4.2	93.6
21.05		(±5.77E-07)	(±0.6)	(±0.0)	(±0.0)	(±0.0)	(±25.7)	(±23.0)	(±0.1)	(±0.1)	(±0.4)	(±3.0)
21.05	3.21	6.35E-05	10.0	314.5	47.8	35.1	307.0	352.8	0.0	0.0	0.0	106.6
24.26		(±7.57E-04)	(±6.1)	(±118.7)	(±10.5)	(±2.7)	(±196.5)	(±155.1)	(±0.0)	(±0.0)	(±0.0)	(±4.8)
24.26	5.82	3.20E-05	19.1	631.2	61.4	38.6	609.0	805.4	0.0	0.0	0.0	120.0
30.08		(±1.04E-04)	(±10.6)	(±267.0)	(±12.6)	(±2.6)	(±411.1)	(±416.8)	(±0.0)	(±0.0)	(±0.0)	(±5.4)
30.08	20.43	5.65E-06	20.2	773.1	58.0	37.9	753.4	998.4	0.0	0.0	0.0	121.9
50.51		(±2.23E-04)	(±4.2)	(±142.6)	(±5.3)	(±1.2)	(±183.6)	(±202.9)	(±0.0)	(±0.0)	(±0.0)	(±3.1)

Depth values presented in this table are measured from free ground surface

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