NEW CASTLE COUNTY
VO-TECH SCHOOL DISTRICT

PAUL M. HODGSON
VOCATIONAL TECHNICAL HIGH SCHOOL

State of Delaware DBE Pilot Project

2575 Glasgow Avenue, Newark, DE 19702

PROJECT MANUAL

BSA+A PROJECT #22.011

Contract No. [TBD]

Bid Package C – Foundations and Structure

GSS My Marketplace

September 05, 2023

ABHA | BSA+A

PROJECT MANUAL

NEW CASTLE COUNTY VO-TECH SCHOOL DISTRICT

PAUL M. HODGSON VOCATIONAL-TECHNICAL HIGH SCHOOL

Contract No. [TBD]

ARCHITECT
BSA+A, Inc.
954 Justison St.
Wilmington, DE 19801
(302) 658.9300
fax (302) 658.1125

ARCHITECT
ABHA, Inc.
1621 North Lincoln St.
Wilmington, DE 19801
(302) 658.6426
Fax (302) 658.8431

CONSTRUCTION MANAGER
EDiS Company
110 South Poplar St., Suite 400
Wilmington, DE 19801
(302) 421.2973

CIVIL ENGINEER
Landmark Science & Engineering
200 Continental Dr., Suite 400
Newark, DE 19713
(302) 323.9377

STRUCTURAL ENGINEER
DCI-Macintosh Engineers, Inc.
2 Mill Road, Suite 100
Wilmington, DE 19806
(302) 252.9200
Fax (302) 252.9201

MECHANICAL/ELECTRICAL/ PLUMBING ENGINEER
Gipe Associates, Inc.
8719 Brooks Drive
Easton, MD 21601
(410) 822.8688

FOOD SERVICE CONSULTANT
Corsi Associates, LLC
300 Smith St.
Farmingdale, NY 11735
(610) 888.1955

THEATER CONSULTANT
Stages Consultants, LLC
300 Raritan Ave 2nd Floor
Highland Park, NJ 08904
(732) 333.8003

ACOUSTICAL CONSULTANT
Acentech
620 W. Germantown Pike, Suite 210
Plymouth Meeting, PA 19462
(215) 245.8244

SECURITY/TECHNOLOGY CONSULTANT
Educational Systems Planning
2448 Holly Avenue, Suite 302
Annapolis, MD 21401
(410) 573.9148

GSS My Marketplace
September 05, 2023

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BPA Turf Field Drawings dated February 16, 2023
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BPA Addendum #2 dated April 3, 2023
BPB Sitework and Utilities dated 25 May 23
BPB Addendum #1 dated 1 Aug 23
BPB Addendum #2 dated 7 Aug 23
BPB Addendum #3 dated 10 Aug 23

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SECTION 000115 - LIST OF DRAWINGS

The following previously issued Bid Package documentation is included by reference:
BPA Turf Field dated 20 Feb 23
BPA Addendum #1 dated 30 March 23
BPA Addendum #2 dated 3 April 23
BPB Sitework and Utilities dated 25 May 23
BPB Addendum #1 dated 1 Aug 23
BPB Addendum #2 dated 7 Aug 23
BPB Addendum #3 dated 10 Aug 23

DRWG NO.	DRAWING NAME	BID PACKS	ISSUE DATE	LATEST REV. DATE
G001	Cover Sheet	C	9/5/23	
G002	Drawing List	C	9/5/23	
G003	Code Review	C	9/5/23	
G004	Code Review Plan First Floor	C	9/5/23	
G005	Code Review Plan Second Floor	C	9/5/23	
G007	School Safety Review – Overall Plans	C	9/5/23	
G008	Dema – Main Office Security Plan, Elevations, and Details	C	9/5/23	
G009	Keyplans	C	9/5/23	
S001	Cover Sheet	C	9/5/23	
S002	General Notes	C	9/5/23	
S003	General Notes	C	9/5/23	
S004	Project Schedules	C	9/5/23	
S101	Overall Foundation Plan	C	9/5/23	
S102	Overall Second Floor Framing Plan	C	9/5/23	
S103	Overall Roof Framing Plan	C	9/5/23	
S111	Keyplan 1 - Foundation Plan	C	9/5/23	
S112	Keyplan 2 - Foundation Plan	C	9/5/23	
S113	Keyplan 3 - Foundation Plan	C	9/5/23	
S114	Keyplan 4 - Foundation Plan	C	9/5/23	
S115	Keyplan 5 - Foundation Plan	C	9/5/23	
S116	Keyplan 6 - Foundation Plan	C	9/5/23	
S116A	Keyplan 6 - Alternate Foundation Plan	C	9/5/23	
S117	Keyplan 7 - Foundation Plan	C	9/5/23	
S118	Keyplan 8 - Foundation Plan	C	9/5/23	
S119	Keyplan 9 - Foundation Plan	C	9/5/23	
S120	Keyplan 10 - Foundation Plan	C	9/5/23	
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S131	Keyplan 1 - Second Floor Framing Plan	C	9/5/23	
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DRWG NO.	DRAWING NAME	BID PACKS	ISSUE DATE	LATEST REV. DATE
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S135	Keyplan 5 - Second Floor Framing Plan	C	9/5/23	
S136	Keyplan 6 - Second Floor Framing Plan	C	9/5/23	
S136A	Keyplan 6 - Alternate Second Floor Framing Plan	C	9/5/23	
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S139	Keyplan 9 - Second Floor Framing Plan	C	9/5/23	
S140	Keyplan 10 - Second Floor Framing Plan	C	9/5/23	
S141	Keyplan 11 - Second Floor Framing Plan	C	9/5/23	
S151	Keyplan 1 - Roof Framing Plan	C	9/5/23	
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S154	Keyplan 4 - Roof Framing Plan	C	9/5/23	
S155	Keyplan 5 - Roof Framing Plan	C	9/5/23	
S156	Keyplan 6 - Roof Framing Plan	C	9/5/23	
S156A	Keyplan 6 - Alternate Roof Framing Plan	C	9/5/23	
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S158	Keyplan 8 - Roof Framing Plan	C	9/5/23	
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S161	Keyplan 11 - Roof Framing Plan	C	9/5/23	
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S401	Enlarged Plans	C	9/5/23	
S501	Typical Foundation Details	C	9/5/23	
S502	Typical Foundation Details	C	9/5/23	
S503	Typical Foundation Details	C	9/5/23	
S504	Foundation Sections and Details	C	9/5/23	
S505	Foundation Sections and Details	C	9/5/23	
S511	Typical Framing Details	C	9/5/23	
S512	Typical Framing Details	C	9/5/23	
S513	Typical Framing Details	C	9/5/23	
S514	Framing Sections and Details	C	9/5/23	
S515	Framing Sections and Details	C	9/5/23	
S516	Framing Sections and Details	C	9/5/23	
S517	Framing Sections and Details	C	9/5/23	
S518	Framing Sections and Details	C	9/5/23	
S519	Framing Sections and Details	C	9/5/23	
S520	Framing Sections and Details	C	9/5/23	
S521	Framing Sections and Details	C	9/5/23	
S522	Framing Sections and Details	C	9/5/23	
S720	CFMF Details	C	9/5/23	

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A001	General Notes, Symbols and Abbreviations	C	9/5/23	
A002	Accessible Restroom Details	C	9/5/23	
A003	Exterior Wall Assemblies	C	9/5/23	
A004	Partition Types	C	9/5/23	
A100	Architectural Site Plan	C	9/5/23	
A101	Overall First Floor Plan - Base Bid	C	9/5/23	
A102	Overall Second Floor Plan - Base Bid	C	9/5/23	
A103	Floor Plan Shops - Mezzanine Level	C	9/5/23	
A104	Overall First Floor Plan - Add Alternate #2	C	9/5/23	
A105	Overall Second Floor Plan - Add Alternate #2	C	9/5/23	
A106	Courtyard Plans	C	9/5/23	
A111	First Floor Plan - Keyplan 1	C	9/5/23	
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A114	First Floor Plan - Keyplan 4	C	9/5/23	
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A116	First Floor Plan - Keyplan 6	C	9/5/23	
A116A	First Floor Plan - Keyplan 6 - Alternate	C	9/5/23	
A117	First Floor Plan - Keyplan 7	C	9/5/23	
A118	First Floor Plan- Keyplan 8	C	9/5/23	
A119	First Floor Plan - Keyplan 9	C	9/5/23	
A120	First Floor Plan - Keyplan 10	C	9/5/23	
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A132	Second Floor Plan- Keyplan 5	C	9/5/23	
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A135	Second Floor Plan - Keyplan 9	C	9/5/23	
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A192	Roof Plan - Areas 1 & 2	C	9/5/23	
A193	Roof Plan - Areas 3 & 6	C	9/5/23	
A194	Roof Plan - Areas 6, 8, & 11	C	9/5/23	
A195	Roof Plan - Areas 4, 5, 7, 8, 9, 10	C	9/5/23	
A201	Exterior Building Elevations	C	9/5/23	
A202	Exterior Building Elevations	C	9/5/23	
A203	Exterior Building Elevations	C	9/5/23	
A204	Exterior Building Elevations	C	9/5/23	
A205	Exterior Building Elevations	C	9/5/23	
A206	Exterior Building Elevations	C	9/5/23	
A207	Exterior Building Elevations	C	9/5/23	

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A208	Building Elevations - Alternate #2	C	9/5/23	
A301	Building Sections	C	9/5/23	
A302	Building Sections	C	9/5/23	
A303	Building Sections	C	9/5/23	
A304	Building Sections	C	9/5/23	
A305	Building Sections	C	9/5/23	
A311	Wall Sections	C	9/5/23	
A312	Wall Sections	C	9/5/23	
A312	Wall Sections	C	9/5/23	
A313	Wall Sections	C	9/5/23	
A314	Wall Sections	C	9/5/23	
A315	Wall Sections	C	9/5/23	
A316	Wall Sections	C	9/5/23	
A317	Wall Sections	C	9/5/23	
A318	Wall Sections	C	9/5/23	
A319	Wall Sections	C	9/5/23	
A320	Wall Sections	C	9/5/23	
A321	Wall Sections	C	9/5/23	
A322	Wall Sections	C	9/5/23	
A323	Wall Sections	C	9/5/23	
A324	Wall Sections	C	9/5/23	
A325	Wall Sections	C	9/5/23	
A326	Fire Wall Sections	C	9/5/23	
A327	Fire Wall Sections	C	9/5/23	
A401	Enlarged Plans -Toilet Rooms	C	9/5/23	
A402	Enlarged Plans - Toilet Rooms	C	9/5/23	
A403	Enlarged Plan – Auditorium	C	9/5/23	
A404	Gymnasium Detailed Plans	C	9/5/23	
A420	Enlarged Plan - PTMA	C	9/5/23	
A421	Enlarged Plan - Nurse Tech	C	9/5/23	
A422	Enlarged Plan - Technical Drafting	C	9/5/23	
A423	Enlarged Plan - CNAP & Manuf & Engineering	C	9/5/23	
A424	Enlarged Plan - Electrical Shop	C	9/5/23	
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A426	Enlarged Plan - Plumbing Shop	C	9/5/23	
A427	Enlarged Plan - Carpentry Shop	C	9/5/23	
A428	Enlarged Plan - Cosmetology	C	9/5/23	
A429	Enlarged Plan - Dental Assisting	C	9/5/23	
A430	Enlarged Plan - Industrial Millwright	C	9/5/23	
A431	Enlarged Plan - Auto Body	C	9/5/23	
A432	Enlarged Plan - Auto Tech	C	9/5/23	

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A434	Enlarged Plans - Science Classrooms	C	9/5/23	
A435	Enlarged Plans - Administration & Guidance Suites	C	9/5/23	
A436	Enlarged Plans - Nurse & Special Education Suites	C	9/5/23	
A437	Enlarged Plans - Media Center	C	9/5/23	
A438	Enlarged Plans - Teaching Academy	C	9/5/23	
A501A	Exterior Plan Details – First Floor	C	9/5/23	
A501B	Exterior Plan Details – Second Floor	C	9/5/23	
A701	Stair #1 & 8 - Plans and Sections	C	9/5/23	
A702	Stair #2 & 3 & 6 - Plans and Sections	C	9/5/23	
A703	Stair #4 & 7 - Plans and Sections	C	9/5/23	
A704	Decorative Stairs - Plans and Sections	C	9/5/23	
A705	Elevator #1 - Plan and Sections	C	9/5/23	
A706	Misc. Stairs, Ramps, And Details	C	9/5/23	
M001	Legend And Abbreviations - HVAC	C	9/5/23	
M111	First Floor – Keyplan 1 – HVAC	C	9/5/23	
M112	First Floor – Keyplan 2 – HVAC	C	9/5/23	
M113	First Floor – Keyplan 3 – HVAC	C	9/5/23	
M114	First Floor – Keyplan 4 – HVAC	C	9/5/23	
M115	First Floor – Keyplan 5 – HVAC	C	9/5/23	
M116	First Floor – Keyplan 6 – HVAC	C	9/5/23	
M117	First Floor – Keyplan 7 – HVAC	C	9/5/23	
M118	First Floor – Keyplan 8 – HVAC	C	9/5/23	
M119	First Floor – Keyplan 9 – HVAC	C	9/5/23	
M120	First Floor – Keyplan 10 – HVAC	C	9/5/23	
M121	First Floor – Keyplan 11 – HVAC	C	9/5/23	
M122	First Floor – Fieldhouse – HVAC	C	9/5/23	
M131	Second Floor – Keyplan 1 – HVAC	C	9/5/23	
M132	Second Floor – Keyplan 2 – HVAC	C	9/5/23	
M133	Second Floor – Keyplan 3 – HVAC	C	9/5/23	
M134	Second Floor – Keyplan 4 – HVAC	C	9/5/23	
M135	Second Floor – Keyplan 5 – HVAC	C	9/5/23	
M136	Second Floor – Keyplan 6 – HVAC	C	9/5/23	
M137	Second Floor – Keyplan 7 – HVAC	C	9/5/23	
M138	Second Floor – Keyplan 8 – HVAC	C	9/5/23	
M139	Second Floor – Keyplan 9 – HVAC	C	9/5/23	
M140	Second Floor – Keyplan 10 – HVAC	C	9/5/23	
M141	Second Floor – Keyplan 11 – HVAC	C	9/5/23	
MP111	First Floor – Keyplan 1 – Mechanical Piping	C	9/5/23	
MP112	First Floor – Keyplan 2 – Mechanical Piping	C	9/5/23	
MP113	First Floor – Keyplan 3 – Mechanical Piping	C	9/5/23	

DRWG NO.	DRAWING NAME	C	9/5/23	LATEST REV. DATE
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MP115	First Floor – Keyplan 5 – Mechanical Piping	C	9/5/23	
MP116	First Floor – Keyplan 6 – Mechanical Piping	C	9/5/23	
MP117	First Floor – Keyplan 7 – Mechanical Piping	C	9/5/23	
MP118	First Floor – Keyplan 8 – Mechanical Piping	C	9/5/23	
MP119	First Floor – Keyplan 9 – Mechanical Piping	C	9/5/23	
MP120	First Floor – Keyplan 10 – Mechanical Piping	C	9/5/23	
MP121	First Floor – Keyplan 11 – Mechanical Piping	C	9/5/23	
MP122	First Floor – Fieldhouse – Mechanical Piping	C	9/5/23	
MP131	Second Floor – Keyplan 1 – Mechanical Piping	C	9/5/23	
MP132	Second Floor – Keyplan 2 – Mechanical Piping	C	9/5/23	
MP133	Second Floor – Keyplan 3 – Mechanical Piping	C	9/5/23	
MP134	Second Floor – Keyplan 4 – Mechanical Piping	C	9/5/23	
MP135	Second Floor – Keyplan 5 – Mechanical Piping	C	9/5/23	
MP136	Second Floor – Keyplan 6 – Mechanical Piping	C	9/5/23	
MP137	Second Floor – Keyplan 7 – Mechanical Piping	C	9/5/23	
MP138	Second Floor – Keyplan 8 – Mechanical Piping	C	9/5/23	
MP139	Second Floor – Keyplan 9 – Mechanical Piping	C	9/5/23	
MP140	Second Floor – Keyplan 10 – Mechanical Piping	C	9/5/23	
MP141	Second Floor – Keyplan 11 – Mechanical Piping	C	9/5/23	
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M152	Roof – Area 2 – HVAC	C	9/5/23	
M153	Roof – Area 3 – HVAC	C	9/5/23	
M154	Roof – Area 4 – HVAC	C	9/5/23	
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M202	Part Plans – HVAC	C	9/5/23	
M203	Part Plans – HVAC	C	9/5/23	
M204	Part Plans – HVAC	C	9/5/23	
M205	Part Plans – HVAC	C	9/5/23	
M301	Details - HVAC	C	9/5/23	
M302	Details - HVAC	C	9/5/23	
M303	Details - HVAC	C	9/5/23	
M304	Details - HVAC	C	9/5/23	
M305	Details - HVAC	C	9/5/23	
M306	Details - HVAC	C	9/5/23	
M307	Details - HVAC	C	9/5/23	
M308	Details - HVAC	C	9/5/23	
M309	Details - HVAC	C	9/5/23	
M310	Details - HVAC	C	9/5/23	
M311	Details - HVAC	C	9/5/23	

DRWG NO.	DRAWING NAME	C	9/5/23	LATEST REV. DATE
M312	Details - HVAC	C	9/5/23	
M313	Details - HVAC	C	9/5/23	
M314	Details - HVAC	C	9/5/23	
M315	Details - HVAC	C	9/5/23	
M316	Details - HVAC	C	9/5/23	
M317	Details - HVAC	C	9/5/23	
M318	Details - HVAC	C	9/5/23	
M319	Details - HVAC	C	9/5/23	
M401	Automatic Temperature Controls	C	9/5/23	
M402	Automatic Temperature Controls	C	9/5/23	
M403	Automatic Temperature Controls	C	9/5/23	
M404	Automatic Temperature Controls	C	9/5/23	
M405	Automatic Temperature Controls	C	9/5/23	
M406	Automatic Temperature Controls	C	9/5/23	
M407	Automatic Temperature Controls	C	9/5/23	
M408	Automatic Temperature Controls	C	9/5/23	
M409	Automatic Temperature Controls	C	9/5/23	
M410	Automatic Temperature Controls	C	9/5/23	
M411	Automatic Temperature Controls	C	9/5/23	
M412	Automatic Temperature Controls	C	9/5/23	
M413	Automatic Temperature Controls	C	9/5/23	
M414	Automatic Temperature Controls	C	9/5/23	
M415	Automatic Temperature Controls	C	9/5/23	
M416	Automatic Temperature Controls	C	9/5/23	
M417	Automatic Temperature Controls	C	9/5/23	
M418	Automatic Temperature Controls	C	9/5/23	
M419	Automatic Temperature Controls	C	9/5/23	
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M502	Schedules - HVAC	C	9/5/23	
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M504	Schedules - HVAC	C	9/5/23	
M505	Schedules - HVAC	C	9/5/23	
M506	Schedules - HVAC	C	9/5/23	
M507	Schedules - HVAC	C	9/5/23	
M508	Schedules - HVAC	C	9/5/23	
M509	Schedules - HVAC	C	9/5/23	
M601	Site Plan – HVAC	C	9/5/23	
E004	Site Plan	C	9/5/23	
E401	Part Plan – Main Electrical – Mechanical Room	C	9/5/23	

DRWG NO.	DRAWING NAME	C	9/5/23	LATEST REV. DATE
E501	Power Riser	C	9/5/23	
E502	Power Riser	C	9/5/23	
E503	Power Riser	C	9/5/23	
E504	Power Riser	C	9/5/23	
E601	Panel Sched	C	9/5/23	
E603	Panel Sched	C	9/5/23	
E607	Panel Sched	C	9/5/23	
E609	Panel Sched	C	9/5/23	
E613	Panel Sched	C	9/5/23	
E615	Panel Sched	C	9/5/23	
E616	Panel Sched	C	9/5/23	
E701	Details	C	9/5/23	
E709	Details	C	9/5/23	
EF001	First Floor – Keyplan 1 – Electrical Foundation	C	9/5/23	
EF002	First Floor – Keyplan 2 – Electrical Foundation	C	9/5/23	
EF003	First Floor – Keyplan 3 – Electrical Foundation	C	9/5/23	
EF004	First Floor – Keyplan 4 – Electrical Foundation	C	9/5/23	
EF005	First Floor – Keyplan 5 – Electrical Foundation	C	9/5/23	
EF006	First Floor – Keyplan 6 – Electrical Foundation	C	9/5/23	
EF007	First Floor – Keyplan 7 – Electrical Foundation	C	9/5/23	
EF008	First Floor – Keyplan 8 – Electrical Foundation	C	9/5/23	
EF009	First Floor – Keyplan 9 – Electrical Foundation	C	9/5/23	
EF010	First Floor – Keyplan 10 – Electrical Foundation	C	9/5/23	
EF011	First Floor – Keyplan 11 – Electrical Foundation	C	9/5/23	

END OF SECTION

SECTION 001116 - INVITATION TO BID

Receipt of Bids

Public notice is hereby given that sealed bids for the following prime contracts will be received for the construction of New Castle County Vocational Technical School District Hodgson Vo-Tech High School Sitework and Utilities located in Wilmington, Delaware. **Bids will be received at the office of New Castle County Vo-Tech School District, 1417 Newport Road, Wilmington, DE 19804 until 3:00 local time on Tuesday, October 17, 2023**, at which time they will be publicly opened and read aloud. The outer envelope should clearly indicate: "NEW CASTLE COUNTY VOCATIONAL TECHNICAL SCHOOL DISTRICT - HODGSON VO-TECH HIGH SCHOOL-Foundations and Structure BP-C____ SEALED BID-DO NOT OPEN." ***Bidder bears the risk of late delivery. Any bids received after the stated time will be returned unopened.***

Contract C-01: Concrete and Reinforcing
Contract C-02: Foundation Masonry
Contract C-03: Structural Steel, Joists and Deck

This project is a pilot project authorized by SB 160, Section 34, in which seven percent (7%) of the contractors for the project are DBEs. Non-DBE contractors may achieve the seven percent (7%) by hiring DBE firms as subcontractors or having their subcontractors hire DBE firms. All DBE firms must be registered with either the Delaware Department of Transportation or the Delaware Office of Supplier Diversity. The percentage requirement and the registration requirements will remain in place for the length of the project.

The selected project, New Castle County Vocational Technical School District's Hodgson Vo-Tech, includes a cooperative program in which students from Vocational Technical schools will work on the project in compliance with 19 Del. C. ch. 5.

Bids will be evaluated based on a best value process that is described in the Instruction to Bidders.

Bidding Documents

1. It is the responsibility of each bidder to review and coordinate all Project Documents. This includes plans, specifications, and addendums.
2. Documents, for review only, may be examined on or after **Monday, September 25, 2023** on the State of Delaware Online Bid Solicitation Directory, http://bids.delaware.gov, or at the office of the Construction Manager, EDIS Company, 110 S. Poplar Street, Suite 400, Wilmington, Delaware 19801;.
3. Bid documents will be available on the EDiS FTP site. In order to obtain access to biddable documents on the EDiS FTP site, bidders must download and complete the Plans Request form from http://bids.delaware.gov, and submit to: planrequests@delaware.gov for approval. Once the plans request is approved and you want to receive the biddable plans submit your request for access to the FTP site via email to Jackie McKee at jmckee@ediscompany.com. Your request should include the following information: your company name, contact name, email address, phone number, fax number, and postal mailing address.

Bid Security

A bid security in the amount of ten percent (10%) of the bid, plus a consent of surety must accompany each bid. Bid Security shall specify the Owner as the obligee. Owner: New Castle County Vo-Tech School District, 1417 Newport Road, Wilmington, DE 19804.

Pre-Bid Meeting

A **NON-mandatory** pre-bid meeting will be held at the **New Castle County Vocational Technical School District Hodgson Vo-Tech, 2575 Glasgow Ave, Newark, DE 19702 on Thursday, September 28, 2023 at 3:30 PM local time.** A site visit will be conducted immediately following the pre-bid meeting. This site visit will be the only opportunity for the bidders to visit the existing building and review existing conditions affecting the work. Attendance is highly suggested but not mandatory.

Questions

Please contact EDiS Company, Kevin Lucas at klucas@ediscompany.com, (302) 420-3083 with questions. All bid questions must be submitted electronically. All bid questions must be submitted by **Tuesday, October 10, 2023.**

Conformance to the Delaware Architectural Accessibility Act and the standards of the Architectural Accessibility Board is required on the Project.

Prevailing Wage Rates

Prevailing Wage Rates, as directed by Delaware Law, must be adhered to where applicable. Davis-Bacon Act wages, in accordance with Subchapter IV of Chapter 31 of Title 40USC, must be adhered to. Contractors must pay the higher of the two rates.

Drug Testing Requirements

Pursuant to the Office of Management and Budget (OMB) "4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects" required that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds implement a Mandatory Drug Testing Program. The latest regulation can be downloaded from the following website: http://regulations.delaware.gov/AdminCode/title19/4000/4100/4104.pdf

Craft Training for Public Works Procurement

In accordance with Delaware Code, Title 29, Chapter 69, Section 6962, requires: A public works contract must include a requirement that the contractor provide craft training for journeyman and apprentice levels if all of the following apply:

A. The project requires prevailing wages and,
B. The contractor or subcontractor employs 10 or more people and,
C. It is not a federal highway project.

The craft training may be provided by any of the following:

A. The contractor, or
B. The subcontractor, or
C. A program registered pursuant under Section 1101-4.0 of Title 19 of the Delaware Administrative Code.

Subsection 6902 defines "Craft Training" as "an apprenticeship program approved by and registered with any state apprenticeship agency or the United States Department of Labor. The Secretary of the Department of Labor shall maintain a list of crafts for which there are approved and registered training programs."

Delaware's Contractor Registration Act Is Effective July 1, 2021

https://labor.delaware.gov/divisions/industrial-affairs/labor-law/contractor-registration-act/

Bidders will not be subject to discrimination on the basis of race, creed, color, sex, sexual orientation, gender identity or national origin in consideration of this award, and Minority Business Enterprises, Disadvantaged Business Enterprises, Women-Owned Business Enterprises and Veteran-Owned Business Enterprises will be afforded full opportunity to submit bids on this contract. Each bid must be accompanied by a bid security equivalent to ten percent of the bid amount and all additive alternates. The successful bidder must post a performance bond and payment bond in a sum equal to 100 percent of the contract price upon execution of the contract. The Owner reserves the right to reject any or all bids and to waive any informalities therein. The Owner may extend the time and place for the opening of the bids from that described in the advertisement, with not less than two calendar days' notice by certified delivery, facsimile machine, or other electronic means to those bidders receiving plans.

END OF SECTION

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

1. GENERAL

2. BIDDER'S REPRESENTATION

3. BIDDING DOCUMENTS

4. BIDDING PROCEDURES

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7. PERFORMANCE BOND AND PAYMENT BOND

8. FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

ARTICLE 1: GENERAL

1.0 This project is a pilot project authorized by SB 160, Section 34, in which seven (7) percent of the contractors for the project are DBEs. Non-DBE contractors may achieve the 7% by hiring DBE firms as subcontractors or having their subcontractors hire DBE firms. All DBE firms must be registered with either the Delaware Department of Transportation or the Delaware Office of Supplier Diversity. The percentage requirement and the registration requirements will remain in place for the length of the project.

The selected project, New Castle County Vocational Technical School District's Hodgson Vo-Tech, includes a cooperative program in which students from Vocational Technical schools will work on the project in compliance with Title 19, Chapter 5 of the Delaware Code. The wage rate has been established by the Office of Management and Budget (OMB) and the New Castle County Vocational Technical School District and shall appear in the project specifications. So that you are aware, this wage rate shall be recognized by the Delaware Department of Labor as "OMB Pilot Program Coop Student Rate" in lieu of a Prevailing Wage rate on the pilot project. This Student Rate is applicable to this pilot project only.

Bids will be evaluated based on a best value process that is described in Article 5 of these Instructions to Bidders.

Bidders should be aware that OMB is required to provide annual reports by January 1 to the Joint Committee on Capital Improvement that includes OMB's assessment of the pilot, including, but not limited to, employee hiring statistics, cost savings, project quality, worker safety, and the effectiveness of contracting disadvantaged businesses, including but not limited to, subcontractors. To that end, awarded contractors shall be required to provide reports to the Construction Managers for this project. The awarded contractors will be provided a report form to be completed quarterly over of the life of the project that includes: (i) number of DBEs; (ii) total amount paid to each DBE as of the date of reporting; (iii) confirmation that the DBE listed is still registered; and (iv) whether the DBE's work is completed or still in progress at the time of reporting.

1.1 DEFINITIONS

1.1.1 Whenever the following terms are used, their intent and meaning shall be interpreted as follows:

1.2 STATE: The State of Delaware.

1.3 AGENCY: Contracting State Agency as noted on cover sheet.

1.4 DESIGNATED OFFICIAL: The agent authorized to act for the Agency.

1.5 BIDDING DOCUMENTS: Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement for Bid, Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the Bid Form (including the Non-collusion Statement), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, as well as the Drawings, Specifications (Project Manual) and all Addenda issued prior to execution of the Contract.

1.6 CONTRACT DOCUMENTS: The Contract Documents consist of the Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the form of agreement between the Owner and the Contractor, Drawings (if any), Specifications (Project Manual), and all addenda.

1.7 AGREEMENT: The form of the Agreement shall be AIA Document A132, Standard Form of Agreement Between Owner and Contractor, *Construction Manager as Adviser Edition* where the basis of payment is a STIPULATED SUM. In the case of conflict between the instructions contained therein and the General Requirements herein, the General Requirements shall prevail.

1.8 GENERAL REQUIREMENTS (or CONDITIONS): General Requirements (or conditions) are instructions pertaining to the Bidding Documents and to contracts in general. They contain, in summary, requirements of laws of the State, policies of the Agency and instructions to bidders.

1.9 SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the bidding documents and to the contract under consideration and are supplemental to the General Requirements. Should the Special Provisions conflict with the General Requirements, the Special Provisions shall prevail.

1.10 ADDENDA: Written or graphic instruments issued by the Owner/Architect prior to the execution of the contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

1.11 BIDDER OR VENDOR: A person or entity who formally submits a Bid for the material or Work contemplated, acting directly or through a duly authorized representative who meets the requirements set forth in the Bidding Documents.

1.12 SUB-BIDDER: A person or entity who submits a Bid to a Bidder for materials or labor, or both for a portion of the Work.

1.13 BID: A complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

1.14 BASE BID: The sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids (if any are required to be stated in the bid).

1.15 ALTERNATE BID (or ALTERNATE): An amount stated in the Bid, where applicable, to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents is accepted.

1.16 UNIT PRICE: An amount stated in the Bid, where applicable, as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

1.17 SURETY: The corporate body which is bound with and for the Contract, or which is liable, and which engages to be responsible for the Contractor's payments of all debts pertaining to and for his acceptable performance of the Work for which he has contracted.

1.18 BIDDER'S DEPOSIT: The security designated in the Bid to be furnished by the Bidder as a guaranty of good faith to enter into a contract with the Agency if the Work to be performed or the material or equipment to be furnished is awarded to him.

1.19 CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.

1.20 CONTRACTOR: Any individual, firm or corporation with whom a contract is made by the Agency.

1.21 SUBCONTRACTOR: An individual, partnership or corporation which has a direct contract with a contractor to furnish labor and materials at the job site, or to perform construction labor and furnish material in connection with such labor at the job site.

1.22 CONTRACT BOND: The approved form of security furnished by the contractor and his surety as a guaranty of good faith on the part of the contractor to execute the work in accordance with the terms of the contract.

1.23 DISADVANTAGED BUSINESS ENTERPRISE (DBE): A for-profit businesses in which at least 51 percent of the business is owned by one or more individuals who are both socially and economically disadvantaged; and whose daily operations are managed by one or more individuals who are both socially and economically disadvantaged.

1.24 BEST VALUE PROCESS: The bid evaluation process for this project, which will include the price and the percentage of DBEs identified in the bid. In addition, all bids are subject to an evaluation for responsiveness and responsibility.

1.25 CONSTRUCTION MANAGER: EDiS Company, who was hired by the New Castle County Vocational Technical School District for this project.

ARTICLE 2: BIDDER'S REPRESENTATION

2.1 PRE-BID MEETING

2.1.1 A pre-bid meeting for this project will be held at the time and place designated. Attendance at this meeting is a pre-requisite for submitting a Bid, unless this requirement is specifically waived elsewhere in the Bid Documents.

2.2 By submitting a Bid, the Bidder represents that:

2.2.1 The Bidder has read and understands the Bidding Documents and that the Bid is made in accordance therewith.

2.2.2 The Bidder has visited the site, become familiar with existing conditions under which the Work is to be performed, and has correlated the Bidder’s personal observations with the requirements of the proposed Contract Documents.

2.2.3 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

2.3 JOINT VENTURE REQUIREMENTS

2.3.1 For Public Works Contracts, each Joint Venturer shall be qualified and capable to complete the Work with their own forces.

2.3.2 Included with the Bid submission, and as a requirement to bid, a copy of the executed Joint Venture Agreement shall be submitted and signed by all Joint Venturers involved.

2.3.3 All required Bid Bonds, Performance Bonds, Material and Labor Payment Bonds must be executed by both Joint Venturers and be placed in both of their names.

2.3.4 All required insurance certificates shall name both Joint Venturers.

2.3.5 Both Joint Venturers shall sign the Bid Form.

2.3.6 Both Joint Venturers shall include their Federal E.I. Number with the Bid.

2.3.7 In the event of a mandatory Pre-bid Meeting, each Joint Venturer shall have a representative in attendance.

2.3.8 Due to exceptional circumstances and for good cause shown, one or more of these provisions may be waived at the discretion of the State.

2.4 ASSIGNMENT OF ANTITRUST CLAIMS

2.4.1 As consideration for the award and execution by the Owner of this contract, the Contractor hereby grants, conveys, sells, assigns and transfers to the State of Delaware all of its right, title and interests in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the Owner pursuant to this contract.

ARTICLE 3: BIDDING DOCUMENTS

3.1 COPIES OF BID DOCUMENTS

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the Architectural/Engineering firm designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein.

3.1.2 Bidders shall use complete sets of Bidding Documents for preparation of Bids. The issuing Agency nor the Architect assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.3 Any errors, inconsistencies or omissions discovered shall be reported to the Architect immediately.

3.1.4 The Agency and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall report any errors, inconsistencies, or ambiguities discovered to the Architect.

3.2.2 Bidders or Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Architect at least seven days prior to the date for receipt of Bids. Interpretations, corrections, and changes to the Bidding Documents will be made by written Addendum. Interpretations, corrections, or changes to the Bidding Documents made in any other manner shall not be binding.

3.2.3 The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specification compliance will be the responsibility of the Bidder.

3.2.4 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all permits, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

3.2.5 The Owner will bear the costs for all impact and user fees associated with the project.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of quality, required function, dimension, and appearance to be met by any proposed substitution. The specification of a particular manufacturer or model number is not intended to be proprietary in any way. Substitutions of products for those named will be considered, providing that the Vendor certifies that the function, quality, and performance characteristics of the material offered is equal or superior to that specified. It shall be the Bidder's responsibility to assure that the proposed substitution will not affect the intent of the design, and to make any installation modifications required to accommodate the substitution.

3.3.2 Requests for substitutions shall be made in writing to the Architect at least ten days prior to the date of the Bid Opening. Such requests shall include a complete description of the proposed substitution, drawings, performance and test data, explanation of required installation modifications due the substitution, and any other information necessary for an evaluation. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s decision of approval or disapproval shall be final. The Architect is to notify Owner prior to any approvals.

3.3.3 If the Architect approves a substitution prior to the receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding.

3.3.4 The Architect shall have no obligation to consider any substitutions after the Contract award.

3.4 ADDENDA

3.4.1 Addenda will be mailed or delivered to all who are known by the Architect to have received a complete set of the Bidding Documents.

3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

3.4.3 No Addenda will be issued later than 2 calendar days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which extends the time or changes the location for the opening of bids.

3.4.4 Each bidder shall ascertain prior to submitting his Bid that they have received all Addenda issued and shall acknowledge their receipt in their Bid in the appropriate space. Not acknowledging an issued Addenda could be grounds for determining a bid to be non-responsive.

ARTICLE 4: BIDDING PROCEDURES

4.1 PREPARATION OF BIDS

4.1.1 Submit the bids on the Bid Forms included with the Bidding Documents.

4.1.2 Submit the original Bid Form for each bid. Bid Forms may be removed from the project manual for this purpose.

4.1.3 Execute all blanks on the Bid Form in a non-erasable medium (typewriter or manually in ink).

4.1.4 Where so indicated by the makeup on the Bid Form, express sums in both words and figures, in case of discrepancy between the two, the written amount shall govern.

4.1.5 Interlineations, alterations or erasures must be initialed by the signer of the Bid.

4.1.6 BID ALL REQUESTED ALTERNATES AND UNIT PRICES, IF ANY. If there is no change in the Base Bid for an Alternate, enter “No Change”. The Contractor is responsible for verifying that they have received all addenda issued during the bidding period. Work required by Addenda shall automatically become part of the Contract.

4.1.7 Make no additional stipulations on the Bid Form and do not qualify the Bid in any other manner.

4.1.8 Each copy of the Bid shall include the legal name of the Bidder and a statement whether the Bidder is a sole proprietor, a partnership, a corporation, or any legal entity, and each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current Power of Attorney attached, certifying agent's authority to bind the Bidder.

4.1.9 Bidder shall complete the Non-Collusion Statement form included with the Bid Forms and include it with their Bid.

4.1.10 In the construction of all Public Works projects for the State of Delaware or any agency thereof, preference in employment of laborers, workers or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State.

4.1.11 Each bidder shall include a signed Affidavit for the Bidder certifying compliance with OMB Regulation 4104 - “Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on “Large Public Works Projects.” “Large Public Works” is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

4.2 BID SECURITY

4.2.1 All bids shall be accompanied by a deposit of either a good and sufficient bond to the agency for the benefit of the agency, with corporate surety authorized to do business in this State, the form of the bond and the surety to be approved by the agency, or a security of the

bidder assigned to the agency, for a sum equal to at least 10% of the bid plus all add Alternates, or in lieu of the bid bond a security deposit in the form of a certified check, bank treasurer's check, cashier's check, money order, or other prior approved secured deposit assigned to the State. The bid bond need not be for a specific sum but may be stated to be for a sum equal to 10% of the bid plus all add Alternates to which it relates and not to exceed a certain stated sum, if said sum is equal to at least 10% of the bid. The Bid Bond form used shall be the standard OMB form (attached).

4.2.2 The Agency has the right to retain the bid security of Bidders to whom an award is being considered until either a formal contract has been executed and bonds have been furnished or the specified time has elapsed so the Bids may be withdrawn, or all Bids have been rejected.

4.2.3 In the event of any successful Bidder refusing or neglecting to execute a formal contract and bond within 20 days of the awarding of the contract, the bid bond or security deposited by the successful bidder shall be forfeited.

4.3 SUBCONTRACTOR LIST

4.3.1 In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, each Bidder shall submit with their Bid a completed List of Sub-Contractors included with the Bid Form. NAME ONLY ONE SUBCONTRACTOR FOR EACH TRADE. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the Bidder will be using to perform the work and provide material for that subcontractor category. Should the Bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the Bidder shall list that third-tier contractor's full name and address (City & State). **If the Bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the Bidder intends to perform the work themselves, the Bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

4.3.1.1 For the purposes of this project, the Bidder shall also identify, on a separate form, those subcontractor, third-tier, or providers of material on the bidder's Subcontractor List, which, if any, are DBEs. To be able to calculate the percentage of DBE representation, the Bidder must identify all subcontractors, third-tier contractors or providers of material that will be hired for this project.

4.3.2 It is the responsibility of the Contractor to ensure that their Subcontractors are in compliance with the provisions of this law. Also, if a Contractor elects to list themselves as a Subcontractor for any category, they must specifically name themselves on the Bid Form and be able to document their capability to act as Subcontractor in that category in accordance with this law.

4.4 AFFIDAVIT OF CONTRACTOR QUALIFICATIONS

4.4.1 In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, each Bidder shall submit with their Bid the Affidavit of Contractor Qualifications certifying that the Bidder will abide by the contractor's qualifications outlined in the construction bid

specifications for the duration of the contract term. After a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

4.5 AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

4.5.1 In accordance with Title 29, Chapter 69, Section 6962(c)(13) of the Delaware Code, contractors and subcontractors must provide craft training for journeyman and apprentice levels if **all** of the following apply:

A. A project meets the prevailing wage requirement under Title 29, Chapter 69, Section 6960 of the Delaware Code.
B. The contractor employs 10 or more total employees.
C. The project is not a federal highway project

Failure to provide required craft training on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6962(c)(13) of the Delaware Code.

Bidders shall submit the Affidavit of Craft Training Compliance prior to contract execution.

4.6 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

4.6.1 During the performance of this contract, the contractor agrees as follows:

A. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

B. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

4.7 PREVAILING WAGE REQUIREMENT

4.7.1 Wage Provisions: For renovation and new construction projects whose costs exceed the thresholds contained in Delaware Code, Title 29, Section 6960, the minimum wage rates for various classes of laborers and mechanics shall be as determined by the Department of Labor, Division of Industrial Affairs of the State of Delaware.

4.7.2 The employer shall pay all mechanics and labors employed directly upon the site of work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage

rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics.

4.7.3 The scale of the wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work.

4.7.4 Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.

4.8 SUBMISSION OF BIDS

4.8.1 Enclose the Bid, the Bid Security, and any other documents required to be submitted with the Bid in a sealed opaque envelope. Address the envelope to the party receiving the Bids. Identify with the project name, project number, and the Bidder's name and address. If the Bid is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof. The State is not responsible for the opening of bids prior to bid opening date and time that are not properly marked.

4.8.2 Deposit Bids at the designated location prior to the time and date for receipt of bids indicated in the Advertisement for Bids. Bids received after the time and date for receipt of bids will be marked “LATE BID” and returned.

4.8.3 Bidder assumes full responsibility for timely delivery at location designated for receipt of bids.

4.8.4 Oral, telephonic or telegraphic bids are invalid and will not receive consideration.

4.8.5 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids, provided that they are then fully in compliance with these Instructions to Bidders.

4.9 MODIFICATION OR WITHDRAW OF BIDS

4.9.1 Prior to the closing date for receipt of Bids, a Bidder may withdraw a Bid by personal request and by showing proper identification to the Architect. A request for withdraw by letter or fax, if the Architect is notified in writing prior to receipt of fax, is acceptable. A fax directing a modification in the bid price will render the Bid informal, causing it to be ineligible for consideration of award. Telephone directives for modification of the bid price shall not be permitted and will have no bearing on the submitted proposal in any manner.

4.9.2 Bidders submitting Bids that are late shall be notified as soon as practicable and the bid shall be returned.

4.9.3 A Bid may not be modified, withdrawn or canceled by the Bidder during a thirty (30) day period following the time and date designated for the receipt and opening of Bids, and Bidder so agrees in submitting their Bid. Bids shall be binding for 30 days after the date of the Bid opening.

ARTICLE 5: CONSIDERATION OF BIDS

5.0 BEST VALUE PROCESS

Bidders shall provide their bids on the forms provided and shall indicate the percent of DBEs that the Bidder will be utilizing to complete the scope of work for the Prime Contract for

which it is bidding. The DBE may be a subcontractor, a third-tier contractor, or a provider of material. The Winning Bidder may be expected to include students from the New Castle County Vocational Training School District as identified in the individual contract Scopes of Work.

The Best Value Process will evaluate the bids as a weighted average in the following manner:
1. The Bid Amount, including any Alternates that are expected to be awarded.
2. A discount on the Bidder's Bid Amount assigned based on the chart below based on the percentage of DBE firms being hired by Bidder.

Once calculated, the Lowest Adjusted Bid will be awarded to the Bidder that is also found to be responsive and responsible. For clarification, the discount will be used for evaluation purposes only. The contract award will be based on the amount the Bidder provided in its bidding package.

DISCOUNT FOR DBE% PARTICIPATION
0% = -2% discount
1% to 2% = -1.5% discount
>2% to 3% = -1% discount
>3% to 4% = 0% discount
>4% to 5% = 1% discount
>5% to 6% = 2% discount
>6% to <7% = 3% discount
7% = 4% discount
>7% to 20% = 5% discount on bid price
>20% to 30% = 6% discount on bid price
>30% to 40% = 7% discount on bid price
>40% to 50% = 8% discount on bid price
> 50% = 10% discount on bid price

5.1 OPENING/REJECTION OF BIDS

5.1.1 Unless otherwise stated, Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids will be made available to Bidders.

5.1.2 The Agency shall have the right to reject any and all Bids. A Bid not accompanied by a required Bid Security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete, or irregular is subject to rejection.

5.1.3 If the Bids are rejected, it will be done within thirty (30) calendar day of the Bid opening.

5.2 COMPARISON OF BIDS

5.2.1 After the Bids have been opened and read, the bids will be evaluated using the Best Value Process in Article 5.0. the result of such evaluations will be made available to the public. The evaluation of the Bids will be based on the Base Bid plus desired Alternates. The Agency shall have the right to accept Alternates in any order or combination.

5.2.2 The Agency reserves the right to waive technicalities, to reject any or all Bids, or any portion thereof, to advertise for new Bids, to proceed to do the Work otherwise, or to abandon the Work, if in the judgment of the Agency or its agent(s), it is in the best interest of the State.

5.2.3 An increase or decrease in the quantity for any item is not sufficient grounds for an increase or decrease in the Unit Price.

5.2.4 The prices quoted are to be those for which the material will be furnished F.O.B. Job Site and include all charges that may be imposed during the period of the Contract.

5.2.5 No qualifying letter or statements in or attached to the Bid, or separate discounts will be considered in determining the low Bid except as may be otherwise herein noted. Cash or separate discounts should be computed and incorporated into Unit Bid Price(s).

5.3 DISQUALIFICATION OF BIDDERS

5.3.1 An agency shall determine that each Bidder on any Public Works Contract is responsible before awarding the Contract. Factors to be considered in determining the responsibility of a Bidder include:

A. The Bidder's financial, physical, personnel or other resources including Subcontracts;

B. The Bidder's record of performance on past public or private construction projects, including, but not limited to, defaults and/or final adjudication or admission of violations of the Prevailing Wage Laws in Delaware or any other state;

C. The Bidder's written safety plan;

D. Whether the Bidder is qualified legally to contract with the State;

E. Whether the Bidder supplied all necessary information concerning its responsibility; and,

F. Any other specific criteria for a particular procurement, which an agency may establish; provided however, that, the criteria be set forth in the Invitation to Bid and is otherwise in conformity with State and/or Federal law.

5.3.2 If an agency determines that a Bidder is nonresponsive and/or nonresponsible, the determination shall be in writing and set forth the basis for the determination. A copy of the determination shall be sent to the affected Bidder within five (5) working days of said determination.

5.3.3 In addition, any one or more of the following causes may be considered as sufficient for the disqualification of a Bidder and the rejection of their Bid or Bids.

5.3.3.1 More than one Bid for the same Contract from an individual, firm or corporation under the same or different names.

5.3.3.2 Evidence of collusion among Bidders.

5.3.3.3 Unsatisfactory performance record as evidenced by past experience.

5.3.3.4 If the Unit Prices are obviously unbalanced either in excess or below reasonable cost analysis values.

5.3.3.5 If there are any unauthorized additions, interlineation, conditional or alternate bids or irregularities of any kind which may tend to make the Bid incomplete, indefinite or ambiguous as to its meaning.

5.3.3.6 If the Bid is not accompanied by the required Bid Security and other data required by the Bidding Documents.

5.3.3.7 If any exceptions or qualifications of the Bid are noted on the Bid Form.

5.4 ACCEPTANCE OF BID AND AWARD OF CONTRACT

5.4.1 A formal Contract shall be executed with the successful Bidder within twenty (20) calendar days after the award of the Contract.

5.4.2 Per Section 6962(d)(13)a., Title 29, Delaware Code, "The contracting agency shall award any public works contract within thirty (30) days of the bid opening to the lowest responsive and responsible Bidder, unless the Agency elects to award on the basis of best value, in which case the election to award on the basis of best value shall be stated in the Invitation To Bid. Any public school district and its board shall award public works contracts in accordance with this section's requirements except it shall award the contract within 60 days of the bid opening."

5.4.3 Each Bid on any Public Works Contract must be deemed responsive by the Agency to be considered for award. A responsive Bid shall conform in all material respects to the requirements and criteria set forth in the Contract Documents and specifications.

5.4.4 The Agency shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid, plus accepted Alternates

5.4.5 The successful Bidder shall execute a formal contract, submit the required Insurance Certificate, and furnish good and sufficient bonds, unless specifically waived in the General Requirements, in accordance with the General Requirement, within twenty (20) days of official notice of contract award. The successful Bidder shall provide, at least two business days prior to contract execution, copies of the Employee Drug Testing Program for the Bidder and all listed Subcontractors. Bonds shall be for the benefit of the Agency with surety in the amount of 100% of the total contract award. Said Bonds shall be conditioned upon the faithful performance of the contract. Bonds shall remain in affect for period of two (2) years after the date of the Certificate of Final Payment.

5.4.6 If the successful Bidder fails to execute the required Contract, Bond and all required information, as aforesaid, within twenty (20) calendar days after the date of official Notice of the Award of the Contract, their Bid guaranty shall immediately be taken and become the property of the State for the benefit of the Agency as liquidated damages, and not as a forfeiture or as a penalty. Award will then be made to the next lowest qualified Bidder of the Work or readvertised, as the Agency may decide.

5.4.7 Each bidder shall supply with its bid its taxpayer identification number (i.e., federal employer identification number or social security number) and should the vendor be awarded a contract, such vendor shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.4.8 The Bid Security shall be returned to the successful Bidder upon the execution of the formal contract. The Bid Securities of unsuccessful bidders shall be returned within thirty (30) calendar days after the opening of the Bids.

ARTICLE 6: POST-BID INFORMATION

6.1 CONTRACTOR'S QUALIFICATION STATEMENT

6.1.1 Bidders to whom an award of a Contract is under consideration shall, if requested by the Agency, submit a properly executed AIA Document A305-2020, Contractor's Qualification Statement, unless such a statement has been previously required and submitted.

6.2 Bidders to whom an award of a Contract has been made must produce their Delaware Business License before the Contract can be executed.

ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND

7.1 BOND REQUIREMENTS

7.1.1 The cost of furnishing the required Bonds, that are stipulated in the Bidding Documents, shall be included in the Bid.

7.1.2 If the Bidder is required by the Agency to secure a bond from other than the Bidder's usual sources, changes in cost will be adjusted as provide in the Contract Documents.

7.1.3 The Performance and Payment Bond forms used shall be the standard OMB forms (attached).

7.2 TIME OF DELIVERY AND FORM OF BONDS

7.2.1 The bonds shall be dated on or after the date of the Contract.

7.2.2 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix a certified and current copy of the power of attorney.

ARTICLE 8: FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

8.1 Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A132, Standard Form of Agreement Between Owner and Contractor, *Construction Manager as Adviser Edition*.

END OF SECTION

SECTION 003132 – GEOTECHNICAL DATA

1. GENERAL

A. Owner's Disclaimer

1. Site Information: Data on subsurface conditions are made available in the Bidding Documents as a convenience to Bidders and the Contractor. They are not intended as representations or warrants of continuity of such conditions between soil borings. It shall be expressly understood that the Owner will not be responsible for interpretations or conclusions drawn there from by the Contractor. Additional test borings and other exploratory operations may be made by the Contractor at no additional cost to the Owner, provided such operations are acceptable to the Architect and Construction Manager.

B. SOIL BORING DATA

1. Boring logs and location plans are available for review at Construction Manager's office. All Contractors are strongly urged to review this information. The following Geotechnical Reports are attached following this page:

- February 9, 2023 GTA Report of Final Geotechnical Exploration
- January 10, 2023 GTA Report of Geotechnical Exploration
- June 17, 2022 GTA Report of Geotechnical Exploration

END OF SECTION

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm

February 9, 2023

New Castle County Vo-Tech School District
1703 School Lane
Wilmington, Delaware 19808

Attn: Mr. Al Schrum; Supervisor of Facilities and Special Projects

Re: Report of Final Geotechnical Exploration
NCCVT New Hodgson Vo-tech High School
New Castle County, Delaware

Dear Mr. Schrum:

In accordance with our agreements dated April 5, 2022, Geo-Technology Associates, Inc. (GTA) has performed a geotechnical exploration for the new NCCVT New Hodgson Vo-tech High School located in New Castle County, Delaware. The exploration consisted of performing Standard Penetration Test borings and Cone Penetration Test soundings across the site to evaluate the encountered materials for engineering properties. Final geotechnical recommendations regarding design and construction of the proposed buildings and pavements are included in this report. Recommendations related to the proposed stormwater management facilities will be provided under separate cover. GTA appreciates the opportunity to have been of assistance to you on this project. Should you have questions or require additional information, please contact our office at (302) 326-2100.

Sincerely,
GEO-TECHNOLOGY ASSOCIATES, INC.

Alison R. Schoch, P.E.
Senior Geotechnical Engineer

Meghan McDonough, P.E.
Principal

AJC/MM/mt
220791
Attachments

REPORT OF FINAL GEOTECHNICAL EXPLORATION

NCCVT NEW HODGSON VO-TECH HIGH SCHOOL

New Castle County, Delaware

FEBRUARY 2023

Prepared For:

NEW CASTLE COUNTY VO-TECH SCHOOL DISTRICT
1703 School Lane
Wilmington, Delaware 19808

Attn: Mr. Al Schrum

Prepared By:

GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
18 Boulden Circle, Suite 36
New Castle, Delaware 19720
(302) 326-2100

GTA Job No: 220791

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  - Exploration Logs (B-1 to B-16; CPT-1 to CPT-19)
- Appendix C – Soil Laboratory Test Data
  - Figure Nos. 3 to 5 – Particle Size Distribution Reports (3 Sheets)
  - Figure No. 6 – Standard Proctor Moisture-Density Relationship (1 Sheet)

REPORT OF FINAL GEOTECHNICAL EXPLORATION

NCCVT NEW HODGSON VO-TECH HIGH SCHOOL
NEW CASTLE COUNTY, DELAWARE
FEBRUARY 2023

INTRODUCTION

This report presents the results of the geotechnical exploration performed for the New Hodgson Vo-tech High School, located in New Castle County, Delaware. GTA was provided with an untitled plan indicating the locations of existing and proposed site features, as well as existing grading, prepared by Landmark Science and Engineering.

In April 2022, Geo-Technology Associates, Inc. (GTA) was retained to perform a preliminary geotechnical exploration at the site. This exploration included 4 Standard Penetration Test (SPT) borings and 9 Cone Penetration Test (CPT) soundings across the site. The results of the preliminary exploration were summarized in our report dated June 2022. Following further site concept development, GTA was retained to perform additional SPT borings and CPT soundings in the vicinity of the proposed buildings as well as pavement cores near the existing entrance roadway to the school. Conclusions and recommendations regarding design and construction of the proposed buildings and infrastructure were derived from engineering analysis of fieldwork.

SITE CONDITIONS

The approximate 65.0± acre site is located at 2575 Glasgow Avenue in New Castle County, Delaware as shown on the *Site Location Map, Figure 1*, included in Appendix A. The site is located within the NCCVT New Hodgson Vo-tech High School and consists of a one-story building, athletic fields, open grass areas, parking lots, and drive aisles. The exploration areas were located within the existing athletic fields, open grass areas, and the east parking lot. The site is bound by Glasgow Avenue to the west, Summit Bridge Trail and an undeveloped wooded area to the north, Summit Bridge Road to the east and south.

The north half of the site is relatively flat, with existing grades ranging between approximate elevation (EL) 83 to EL 80, with isolated mounded areas within landscaped areas which grade as high as EL 86. Along the east side of the site, east of parking lot areas, the site grades range between

EL 74 to EL 73. In the south half of the site, existing grades in this area range between EL 84 to EL 73.

PROPOSED CONSTRUCTION

Proposed construction will consist of redeveloping the existing high school campus to include a new 2-story high school building as well as proposed parking lots and access drives, a field house building, athletic fields, and associated SWM facilities. The proposed building is to be located within an area of the site currently occupied by athletic fields and the proposed athletic facilities are located within an area of the existing building. At this time, there are five locations where SWM facilities are proposed throughout the campus. The results of infiltration testing have been provided under separate cover.

The 2-story high school will consist of masonry and steel-framing and will be constructed at-grade (i.e., no basement level is proposed). The finished floor elevation for the building is anticipated to be EL 84.0. Existing grades in the proposed building area range from EL 79 to EL 83, which will require fills of up to approximately 5 feet to achieve the proposed building pad subgrade elevation. For our analysis, we have assumed structural loads on the order of 3 to 5 kips per linear foot for walls and 100 to 150 kips for columns.

The athletic facilities will include an 11,000 square-foot field house and football stadium located north of the proposed school building. We have assumed structural loads for the field house will be on the order of 2 kips per linear foot for walls and 75 kips for columns and a finished floor elevation within 2 to 3 feet of current grades in this area. The proposed pavements will include access drives throughout the site to parking lots surrounding the school and nearby the athletic fields and football stadium. A loading area was noted near the northeast corner of the school.

SITE GEOLOGY

According to the *Geologic Map of New Castle County Delaware* (GM13, 2005), published by the Delaware Geological Survey, the site vicinity is situated in the Coastal Plain. Physiographic Province. The Coastal Plain is characterized by undifferentiated and interlayered sedimentary deposits derived from eroded rock formations to the north and west. Specifically, the site is mapped

as underlain by a 30-to-50-foot thickness of the Pleistocene Age Columbia Formation. The Pleistocene deposits generally consist of quartz sand and gravel, with lenses of silt and clay. Beneath the surficial sediments of the Columbia Formation, the geologic map indicates the soils of the Potomac Formation are present.

Groundwater mapping provided by the Delaware Geologic Information Resource (DGIR) indicate that groundwater levels at the site during wet seasonal conditions will be 9 to 16 feet below grade throughout the north and west most area of the site, with an area along the south half of the site with groundwater levels of 6 to 9 feet. During normal and dry seasonal conditions groundwater levels will be 9 to 16 feet throughout the majority of the site, with areas within the north side of the site with water levels between 16 and 20 feet deep.

SUBSURFACE EXPLORATION

The field exploration consisted of drilling Standard Penetration Test (SPT) borings and Cone Penetration Test (CPT) soundings throughout the site. Between December 19 and 21, 2022, GTA performed 12 SPT borings and 10 CPT soundings in the area of the proposed school. The SPT borings were performed to depths of 20 to 25 feet below grade. The CPT soundings were performed to depths ranging between approximately 12 to 36 feet below grade. In addition, 4 pavement cores were performed through the pavement section within the entrance area driveway to the existing school. The explorations were field located by GTA via hand-held GPS and measuring from existing site features, with the approximate locations indicated on *Figure 2: Exploration Location Plan*, included in Appendix B.

Standard Penetration Testing was performed in the boreholes, with nearly continuous sampling performed in the upper 10 feet of drilling and at 5-foot intervals thereafter. Standard Penetration Testing involves driving a 2-inch outside diameter (O.D.), 1⅜-inch inside diameter (I.D.) split-spoon sampler with a 140-pound hammer free-falling 30 inches. The number of blows required to drive the sampler was recorded in intervals of 6 inches. The total number of hammer blows required to drive the sampler from the 6- to 18-inch interval is the SPT N-value. Split spoon samples retrieved from the test borings were returned to GTA's laboratory for limited testing.

The CPT soundings were performed using a 20-ton, 15 cm² single-element cone capable of measuring pore pressures at the u_2 position. The soundings were performed by pushing an electronically instrumented cone shaped probe into the soil with the hydraulic system of a track-mounted reaction device. The cone is equipped with an instrumented tip and friction sleeve that measures tip resistance and soil-to-steel friction, respectively, as the cone is being pushed. In addition, the pore water pressure response to cone penetration is measured. Measurements of tip resistance, sleeve friction, and pore pressure were taken at approximately 1-inch depth intervals. This data was transmitted to recording devices at the ground surface. Graphical cone sounding logs were constructed to show the variations of tip resistance, local friction, friction ratio, and pore pressure with depth. These values can be correlated to soil strength, compressibility, and classification. The tip resistance profile graphically presents the relative strength of the soil strata. The friction ratio, the numerical ratio of the local friction to the tip resistance, was computed for each depth interval. This ratio is an indicator of the material type, i.e. sand, silt, or clay. The friction, friction ratio, and pore pressure profiles are used primarily to interpret soil type. Refer to the attached CPT sounding logs for detailed graphical interpretation of the subsurface conditions.

GTA performed 4 pavement cores within the driveway area near the entrance to the school to evaluate the pavement section. The following table indicates the pavement section thicknesses.

PAVEMENT CORE SECTION THICKNESSES

LOCATION	ASPHALT SURFACE COURSE	ASPHALT BASE COURSE	GRADED AGGREGATE
P-1	2 inches	4 ½ inches	1 inch
P-2	1 ½ inches	3 inches	2 inches
P-3	2 inches	3 inches	2 ¼ inches
P-4	1 ½ inches	3 inches	2 inches

It should be noted that an instrument survey for elevation or location was not performed and the elevations indicated on the logs were interpolated from the site topography indicated on the referenced plan. Therefore, it should be understood that all elevations, as well as transitions in soil strata indicated on the logs are approximate.

SUBSURFACE CONDITIONS

Beneath a layer of topsoil, the subsurface conditions at the site can generally be described as a layer of fill underlain by natural soils consistent with the Columbia Formation descriptions to the completion depths of the explorations. Topsoil measured 3 to 12 inches at the ground surface. Fill material was observed in Borings B-5, B-7, B-8, B-10, B-13, B-14, and B-15 to depths of 2 to 4 feet and was likely placed during previous site development. The fill material consisted of sandy silt material with varying amounts of gravel. Beneath the fill, the natural soils generally consisted of fine-grained soils underlain by granular soils to the extent of the explorations. The fine-grained soils consisted of lean clay and silt with varying amounts of sand and gravel. The granular soils consisted of silty sand, clayey sand, and poorly-graded sand with silt. In locations B-5, B-7, and B-14, a layer of fine-grained soils was interlayered within the sand stratum.

Uncorrected SPT N-values for the encountered fine-grained soils ranged from 3 to 16 blows per foot (bpf), averaging 7 bpf, indicating these soils range from soft to stiff, and are generally medium stiff. Uncorrected SPT N-values for the coarse-grained soils ranged from 3 to 19 bpf, averaging 9 bpf, indicating these soils range from very loose to medium dense, and are generally loose to medium dense.

Cone tip resistances in the CPT logs were variable across the site. The surface fine-grained materials generally had cone tip resistances if up to approximately 50 tons per square foot (tsf) indicating soft to medium stiff materials to depths ranging between 2 to 12 feet below grade. The granular soils in the upper approximately 30 feet of generally ranged from 50 to 100 tsf, indicating medium dense or denser soils. Isolated areas throughout the sand stratum were greater than 100 tsf indicating dense soils. Based on the seismic CPT data and the site geologic profile, average shear wave velocities of more than 400 feet per second and less than 1,200 feet per second are estimated for the upper 100 feet of materials at the site. Accordingly, the site can be assigned to Site Class D – Stiff Soil Profile.

Groundwater was observed in the borings during drilling at depths ranging between approximately 8 and 15 feet below existing grades, corresponding to approximate EL 64 to EL 73. Following completion of drilling, water levels through the augers were observed to range between

approximately 7 to 20 feet below grade, corresponding to approximate EL 61 to EL 74. The boreholes were backfilled upon completion and therefore, 24-hour water level readings were not determined. In the CPT soundings, groundwater levels were observed at depths ranging from approximately 5½ to 16½ feet below grade, corresponding to approximate EL 59 to 72. The groundwater table will fluctuate several feet due to variations in precipitation and surface runoff.

LABORATORY ANALYSES

Selected samples obtained from the borings were tested for grain size analysis, Atterberg Limits, and natural moisture contents. The testing was performed to determine the Unified Soil Classification System (USCS) designation for the soil. The USCS classifications provide information regarding soil-engineering behavior. In addition, one Standard Proctor test was done to determine the moisture-density relationship of potential structural fill material. The results of the testing are summarized in the table below and in *Appendix C*.

SUMMARY OF LABORATORY TESTING

LOCATION	DEPTH (ft)	USCS CLASSIFICATION	NMC (%)	% <200 Sieve	LL (%)	PI (%)
B-15	4.0 – 6.0	Clayey SAND (SC)	15.0	45.2	29	12
B-22	2.0 – 4.0	Clayey SAND (SC)	15.0	26.1	32	12
SWM-5	0.0 – 5.0	Lean CLAY with Sand (CL)	18.2	83.6	29	10

Note: LL=Liquid Limit; PI=Plastic Index; NMC=Natural Moisture Content

CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of this exploration, it is our opinion that the proposed construction is generally feasible, given that the geotechnical recommendations are followed, and that the standard level of care is maintained during construction. The potential geotechnical issues related to site development will be demolition of existing site features and impact on new construction, moisture sensitive fine-grained soils, existing fill and obstructions, and perched water. A discussion of these issues, as well as general foundation design parameters, are included in the following paragraphs.

Demolition and Earthwork Considerations

As previously mentioned, the location of the proposed building is currently occupied by the

football field, track, and other existing athletic facility features. The existing building and pavements are located where proposed athletic facility construction is proposed. Therefore, redevelopment will include demolition of the existing structures including the existing school building, pavement and sidewalk areas, track, several football stadium structures and bleachers, various fences throughout the site, and existing utilities.

Pavements will require removal and replacement or retrofit to accompany the new construction. Asphalt millings should be segregated from the graded-aggregate base course, and should not be used as structural fill. Graded aggregate base course (GABC) can be removed and stockpiled for future use. The GABC can remain in-place in proposed parking and drive areas. GTA recommends the complete removal of all obstructions, foundations/slabs, and retaining walls from the proposed construction area. Alternately, these elements can remain in place if they are at least 20 feet from any proposed structure and removed to a minimum depth of 2 feet below final grading, provided their location does not conflict with utility installation, foundation construction or retaining wall construction. This will need to be further evaluated as design progresses.

GTA recommends that the existing utilities be removed and/or relocated to areas outside of the planned construction zone. The base of all excavations resulting from the removal of existing features and utilities, if situated below the proposed finished floor elevation, should be evaluated by the representative of the Geotechnical Engineer of Record to confirm stabilization prior to backfilling. Following confirmation of a stable subgrade, the excavations should be backfilled as specified in the *Site Grading* section of this report.

A portable crushing plant capable of handling a variety of materials of non-uniform size or composition will be required to process the building materials for re-use as structural fill. Metal and waste materials must be detected and removed at the start of processing by manual or magnetic separation. If the concrete contains steel reinforcement it will be necessary to remove this reinforcement. All reinforcing steel should be removed from the salvaged concrete either before or during the crushing operation. Any reinforcing steel not removed previously must be separated from the recycled concrete after it is processed through the primary crusher.

The recycling of the building rubble waste consists of concrete, asphalt, wood, fixtures, rebar, metals, drywall, roofing, and other materials. Appropriately labeled cans should be provided by the demolition contractor for the various materials. The concrete, masonry, brick and rebar shall be segregated and stockpiled separately. Proper separation of unsuitable materials from the crushed aggregate feedstock is important. We recommend that the feedstock slabs be processed to slabs measuring no more than 4 feet by 4 feet.

The recycled concrete aggregate shall consist of Portland Cement Concrete or other concrete containing pozzolanic binder material from only on-site sources. The recycled concrete material shall be free of reinforcing steel, expansion material, gypsum, organic substances (wood, textile fabric, paper, joint sealants, paints, etc.), chlorides, and glass. The recycled concrete aggregate for re-use as structural fill should consist of at least 70 percent, by weight, Portland cement concrete, with the following materials making up the remaining 30 percent; wood shall be no more than 0.1 percent maximum, and brick, glass, concrete masonry units, on-site soils, or other friable materials shall be no more than 29.9 percent maximum.

The percentage of wood, brick, glass, concrete masonry units, on-site soils, and other friable materials shall be determined by weighing that material retained on the No. 4 sieve, and dividing by the total weight of recycled concrete aggregate material retained on the No. 4 sieve. Fine aggregate passing the No. 4 (4.75-mm) sieve shall consist of fines from the operation of crushing the recycled concrete aggregate. The processed materials should have a unit weight of at least 110 pounds per cubic foot.

Recycled concrete aggregate samples for preliminary testing shall be furnished by the Contractor prior to the start of backfill. Samples of recycled concrete aggregate shall be furnished by the Contractor at the start of production and at intervals during production. The sampling points and intervals will be designated by the Engineer. The samples will be the basis of approval of specific lots of recycled concrete aggregate for the quality requirements.

Additionally, if any foundations fall within a sloped excavation, the foundation bearing level be lowered below the excavation support grade or supported on compacted structural fill after

completion of the foundation walls.

Site Preparation

Concluding demolition and after removal of the bituminous concrete, site preparation should include the stripping of all vegetation and other deleterious material from within and a minimum of 10 feet beyond the proposed construction limits following demolition. Topsoil thicknesses ranged between 3 and 12 inches; however actual stripping thickness will be dependent on localized topsoil development, precipitation, soil moisture, construction traffic disturbance and contractor care. The topsoil may be stockpiled for future use in landscaped areas but would not be suitable for reuse in structural areas.

Existing fill was encountered within the upper 2 to 4 feet of the ground surface. The fill materials primarily consisted of medium stiff to very stiff fine-grained materials or loose to medium dense granular materials. Fill containing organic material may not be used in structural areas and should be removed if encountered during construction. Based on the proposed finished floor elevation of 84.0 feet, fills on the order of 1 to 5 feet will be required in the building pad area. We recommend that GTA further evaluate the fill at the time of construction to determine its suitability to remain in-place for support of proposed structures. The further evaluation should consist of at a minimum the excavation of test pits, proof-rolling with a loaded tri-axle dump truck, and/or performing in-place density testing. If unsuitable conditions are encountered, they can be undercut and replaced with structural fill in accordance with the *Site Grading* section of this report. Alternatively, under suitable weather conditions, soft/loose or unstable areas which are the result of excessive moisture can be aerated, dried in-place, and recompacted. The lateral extent, depth, and method of stabilization will be dependent on actual site conditions and should be determined at the time of construction by a representative of the Geotechnical Engineer of Record.

Site Grading

Upon satisfactory evaluation of the subgrade, structural fill should be placed in lifts and compacted in accordance with the specifications included in this report. Fill materials will typically need to be within 2 to 3 percentage points of the optimum moisture content before compactive effort is applied. Moisture conditioning of the soils should be anticipated in order to obtain the

recommended degree of compaction and to provide stable subgrades. Excavated soil materials will generally need to be within 2 to 3 percentage points of the optimum moisture content before compactive effort is applied. Moisture contents for the fine-grained soils in the upper 6 feet of the surface ranged from 13 to 20 percent moisture compared to optimum moisture contents in the 14 to 16 percent range. Moisture contents for the granular materials ranged from 6 to13 percent moisture. The contractor should be prepared to moisture condition soils by discing and aerating, or cutting and blending the on-site soils with imported cohesionless granular materials that are dry of optimum if the moisture content of the excavated soils for re-use as structural fill is above the working range of optimum for compaction.

We recommend that positive drainage be maintained across the site during construction to minimize ponding of water, since the exposed subgrades could destabilize in combination with construction traffic and precipitation. Furthermore, heavy construction traffic should generally be run on designated haul roads during periods of wet weather to reduce the potential for destabilization of more subgrade areas than necessary. If the subgrade is disturbed by construction traffic and becomes unstable, undercutting and replacement of these surficial materials will likely be required.

Based on the proposed finished floor elevation of EL 84.0 for the school building pad, it is anticipated that fills on the order of 1 to 5 feet will be required in the building area. The available "cut" material from the proposed SWM areas consisted of primarily of fine-grained soils at the surface with some granular soils at deeper depths. These materials may be suitable for re-use as structural fill if they are at a moisture content at which compaction can be achieved. It should be anticipated that moisture the moisture content of the potential fill will be wetter than the optimum and some drying may be required. Proper moisture-conditioning of these soils require time and warm, dry weather. The shallow fine-grained soils are susceptible to moisture-related compaction problems and as such are considered less desirable for reuse as controlled compacted fill compared with granular materials. It should be noted that even if the soils are successfully compacted to the required densities, they can easily become unstable from excess moisture and construction equipment traffic and subsequent over-excavation of unstable soils should be expected.

If sufficient quantities of suitable on-site soils are not available for structural fill, imported borrow consisting of predominantly granular soils conforming to the requirements of DelDOT Standard Specifications Borrow Type C (Backfill) should be utilized. Other granular sources will be considered provided they are within working range of optimum moisture content for compaction at the point of placement.

Structural fill should meet USCS designation CL, ML, SM, SC, GP-GM, GM, or GW-GM and be approved by the Geotechnical Engineer prior to use. All structural fill should be constructed in maximum 8-inch thick, loose lifts and be compacted to the following specifications:

COMPACTION SPECIFICATIONS

Structure / Fill Location	Compaction / Moisture Specification
Below foundations, floor slabs, and within wall backfill or slopes steeper than 5H:1V	95 percent of ASTM D698 Moisture: ± 3% of optimum
Top 1-foot of pavement subgrade	98 percent of ASTM D698 Moisture: ± 2% of optimum
Fills below 1-foot of pavement subgrade	95 percent of ASTM D698 Moisture: ± 3% of optimum

Backfill placed in confined areas, such as foundation and utility excavations, should be spread in thinner layers and compacted to the same degree using manually operated compaction equipment.

All compactive effort should be verified by in-place density testing by a representative of GTA. The 2018/2021 IBC requires that fill subgrades and each lift of fill be observed and tested.

Foundations

The proposed school and field house buildings may be supported on shallow spread footings designed for a maximum net allowable bearing pressure of 3,000 pounds per square foot (psf). Minimum widths for wall footings of 24 inches and column footings of 36 inches are recommended when design based on 3,000 psf results in a narrower footing. For the school building, settlement on

the order of 1-inch total and ½-inch differential can be anticipated, based on the assumed loads of 3 to 5 kips per linear foot for walls and maximum column loads of 100 to 150 kips. For the field house, settlement on the order of ¾-inch total and ½ inch differential can be anticipated, based on the assumed loads of 2 kips per linear foot for walls and 75 kips for columns. Exterior footings should be founded a minimum of 32 inches below the final exterior grades to provide protection from frost action.

Footings should be supported on new compacted structural fill or medium dense/stiff natural soils. If loose or soft natural soils or undocumented, uncontrolled fill are encountered at the footing subgrade elevation, these soils should be undercut to suitable materials. The undercut volume should be backfilled with compacted structural fill, AASHTO No. 57 aggregate, or additional concrete. The aggregate should be placed in 1- to 2-foot-thick layers and be tamped with the equipment bucket with the last lift compacted with a small walk behind vibratory roller or large vibra-plate. GTA recommends that footing excavations be filled with concrete the same day the excavations are performed to prevent destabilization and softening of the subgrade soils.

Detailed foundation excavation evaluations should be performed in each footing excavation prior to the placement of crushed stone, reinforcing steel, or concrete. These evaluations should be performed by a representative of the registered Geotechnical Engineer to confirm that the design allowable soil bearing pressure is available. The foundation bearing surface evaluations should be performed using a combination of visual observation, hand-rod probing, comparison with the borings, and Dynamic Cone Penetrometer (DCP) testing, as applicable.

Seismic Information

Based on the SPT data, and the site geologic profile, the site should be assigned to Site Class D, in accordance with *Chapter 20 of the American Society of Civil Engineers (ASCE) Standard 7-20 Minimum Design Loads for Buildings and Other Structures* and *2018/2021 International Building Code*. This categorization is based on the near surface test boring results, general geologic information for the region, and the information contained in the standard.

Floor Slabs

Where floor slab loads are 100 psf or less, the floor slab can be designed as a concrete slab

on-grade using a design modulus of subgrade reaction (k) of 175 pounds per cubic inch (pci). GTA recommends that the concrete floor slabs supported on grade be founded on a 6-inch (minimum) thickness coarse granular layer. A vapor retarder should be used in occupied spaces with moisture sensitive floor finished to interrupt the rise of capillary moisture through the slab. Crushed stone or washed gravel meeting the gradation of AASHTO Size No. 57 or dense-graded aggregate can be used for the granular layer. The slabs may bear on footing projections; however, they should be jointed so that the foundations can settle without affecting the slab.

Utility and footing backfill below floor slabs should meet the compaction requirements specified herein. Open trenches should be backfilled at the end of the day with suitable structural fill, and trenches should not remain open to the elements or instability will occur. Construction activities and exposure to weather often cause deterioration of slab subgrades. The plumbing, masonry, and foundation subcontractors should exercise care prior to floor slab preparation to limit disturbance to exposed subgrades turned over to the general contractor by the earthwork contractor. It will be each subcontractors responsible to "dress" their work area and fine-grade upon completion of each's day work. Each subcontractor will be responsible for returning the slab subgrade to the approved, stable condition it was prior to the start of their work.

We recommend that the slab subgrade soils be evaluated by a representative of the Geotechnical Engineer immediately prior to stone and concrete placement. This evaluation may include a combination of visual observations, hand-rod probing, and field density tests to verify that the subgrade soils have been prepared properly. It is unlikely that proofrolling will be possible across the majority of the pad due to plumbing stick-ups and interior bearing walls, therefore observation will be mostly visual methods. If soft or loose soils, ice, or muddy conditions are encountered, recommendations for remedial measures should be provided by the Geotechnical Engineer at the time construction is performed prior to placement of stone.

Utility and footing backfill below floor slabs should meet the compaction requirements specified herein. Depending on depth of trench and bedding and cover over pipe, light weight hand operated compaction equipment may need to be utilized. Lifts within these trenches should not exceed 6-inch loose thickness.

Subsurface Utilities

The natural soils are considered suitable for support of the subsurface utilities. However, if loose/soft soils are encountered, it may be necessary to undercut the subgrade and provide a minimum 6-inch-thick granular bedding to provide uniform support, as dictated by site conditions. Backfill for the new structures should be free of organic material, rubble, and other deleterious materials. New subsurface utilities that run parallel to foundations should be set so that they fall outside of the zone of influence of the foundations (1H:1V) and conform to the plumbing code specifications.

Water was encountered at depths ranging from approximately 8 to 17 feet below existing grades within the explorations and is not anticipated to impact construction of shallower utilities. However, seepage may impact utility construction especially during the wet season or periods of prolonged precipitation. Problems associated with seepage into the excavation include loss of stability, sidewall collapse, and sloughing of soils. These problems can be reduced through the use of dewatering techniques. Dewatering through the use of "sump and pump" techniques may be required in some areas to remove perched or trapped water seepage.

All construction excavations should be sloped and shored in accordance with OSHA excavation regulations or stricter local governing safety codes. It is our opinion that the undisturbed natural soils would generally be classified as "Type C" soils under the OSHA excavation regulations. Significantly flatter excavation side-slopes will be required where groundwater seepage occurs. Utility pipe systems below pavement and other structural areas should be backfilled using controlled fill compacted in accordance with the *Site Grading* section of this report.

Pavements

GTA recommends that the upper 12 to 18 inches of roadway subgrade be constructed with the following characteristics if possible:

PAVEMENT SUBGRADE SPECIFICATIONS

Liquid Limit	35 percent or less

Plasticity Index	15 percent or less
Maximum Dry Density	110 pcf or greater
California Bearing Ratio	5 or greater

The fine-grained surface soils and on-site material to be used for fill are relatively weak and some of the materials are not expected to be suitable as pavement subgrade. Therefore, all pavement subgrade areas should be proof-rolled and evaluated for stability and to determine if they meet the specifications above. Soils that are unstable or unsuitable, will need to be stabilized for pavement support. Soils can be selectively excavated, and the resultant excavations backfilled with controlled, compacted fill or reworked, dried, and recompacted.

Prepared subgrades soils may become disturbed and softened from excess moisture and construction equipment traffic. Contractors should anticipate that remedial work could be required to achieve a stable subgrade prior to paving, even if the subgrade soils had previously been compacted to the required densities. Prudent planning and earthwork procedures will reduce the potential necessity for remedial work.

Heavy construction traffic should not be allowed on partial pavement sections since such traffic can damage the pavement. The paving contractor should be advised that they must control construction traffic to limit disturbance of previously approved subgrade, stone base course, or completed asphalt. Some patching and repair may be necessary prior to placement of the final wearing surface layer of asphalt due to construction traffic.

Proper drainage will be an important consideration for the overall performance of the pavement. Proper grading should be provided for suitable runoff from the pavement surface and beyond the limits of the paved areas. Underdrains should be considered to extend the life of the bituminous concrete pavements.

ADDITIONAL SERVICES

We recommend that during final design and construction of the subject project, a geotechnical engineer be retained to provide services for the following items.

- Perform supplemental testing including infiltration testing to confirm with local, and state regulations.
- Review final site, structural plans, and specifications to evaluate if they conform with the intent of this report.
- Review excavated footings for compliance with the project drawings and the intent of this geotechnical report.
- Provide observation and testing services during wall construction to evaluate if the earthwork is being performed in accordance with the intent of this report and project plans and specifications.
- Provide other Special Inspections as required by the project specifications and the New Castle County Department of Land Use.

LIMITATIONS

This report, including all supporting exploration logs, field data, field notes, calculations, estimates and other documents prepared by GTA in connection with this Project have been prepared for the exclusive use of New Castle County Vo-tech School District (Client) pursuant to agreements between GTA and Client in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are incorporated herein by reference. No warranty, express or implied, is made herein. Use and reproduction of this report by any other person without the expressed written permission of GTA and Client is unauthorized and such use is at the sole risk of the user.

The analysis and recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Explorations indicate soil conditions only at specific locations and times, and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between test boring locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Geo-Technology Associates, Inc.

The scope of our services for this geotechnical exploration did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the logs regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our Client.

This report and the attached logs are instruments of service. The subject matter of this report is limited to the facts and matters stated herein. Absence of a reference to any other conditions or subject matter shall not be construed by the reader to imply approval by the writer.

220791 **GEO-TECHNOLOGY ASSOCIATES, INC.**

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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APPENDIX A



Notes:

1) Base map obtained from Google Earth Imagery, Inc. from June 24, 2022.
2) Site Location Map should be reviewed in conjunction with GTA Report NCCVT New Hodgson Vo-tech High School, Job No. 220791

N

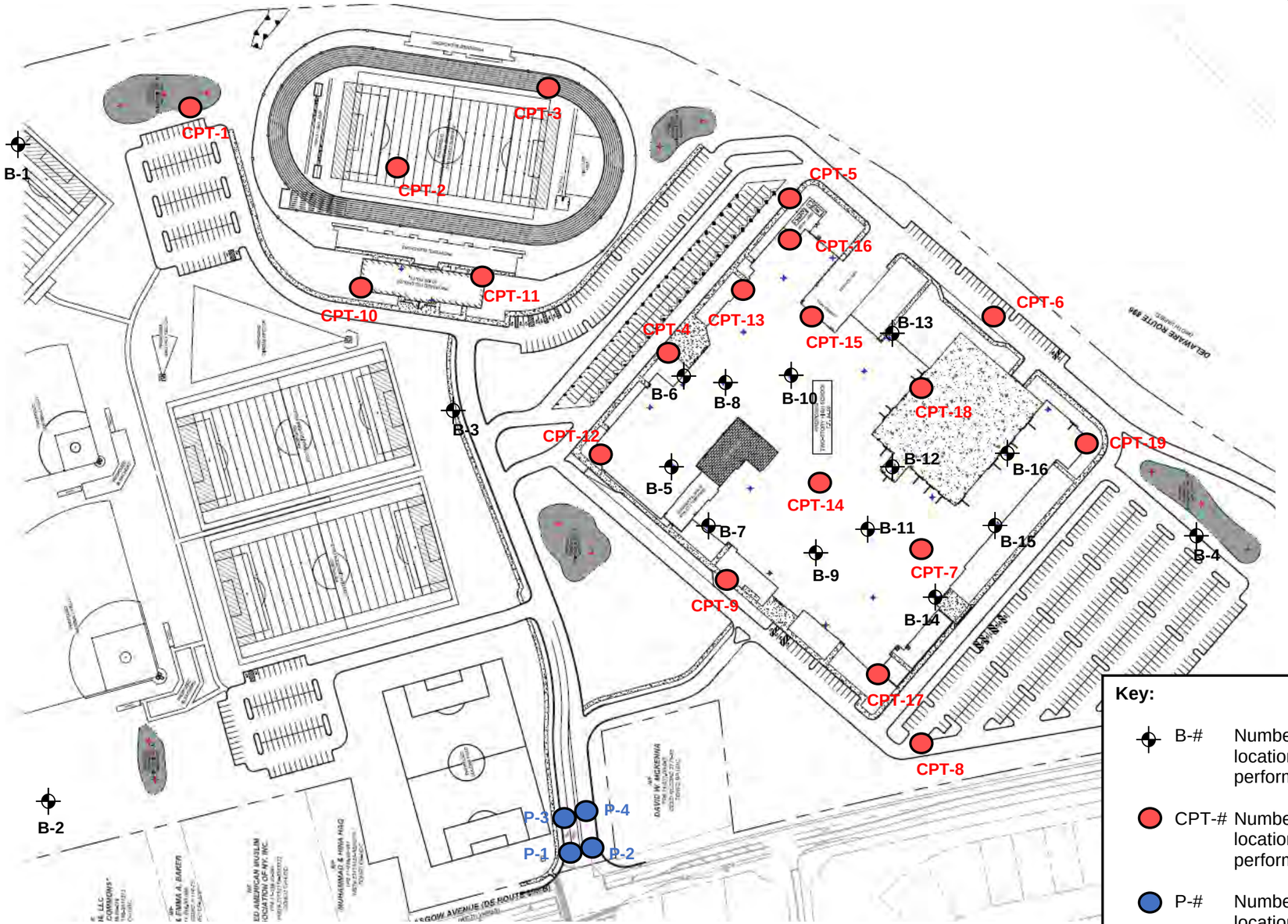
GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
18 Boulden Circle, Suite 36
New Castle, Delaware 19720
(302) 326-2100

SITE LOCATION MAP

NCCVT NEW HODGSON VO-TECH HIGH SCHOOL

NEW CASTLE COUNTY, DELAWARE

SCALE	DATE	DRAWN BY	REVIEW BY	JOB NO.	FIGURE NO.
NTS	FEB 2023	GOOGLE	MM	220791	1



Key:

B-#	Number and approximate location of Test Borings performed for this study
CPT-#	Number and approximate location of CPT Tests performed for this study
P-#	Number and approximate location of Pavement Cores performed for this study

Notes: (1) Base map prepared by Landmark Science and Engineering and use of this diagram by GTA is limited to illustration of the approximate locations of our explorations.
(2) Exploration Location Plan should be read together with GTA Report NCCVT New Hodgson Vo-tech High School, Job No. 220791 for complete evaluation. Use of the diagram is limited illustration of the approximate locations of the explorations.
(3) The approximate locations of the explorations were measured from site features and should be considered accurate to the degree implied by this method.

JOB NUMBER.:
220791

FIGURE:
2

REVIEW BY:
MM

SCALE:
NTS

DATE:
FEB 2023

EXPLORATION LOCATION PLAN
NCCVT
NEW HODGSON VO-TECH HIGH SCHOOL
NEW CASTLE COUNTY, DELAWARE

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APPENDIX B

NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)			SYMBOLS GRAPHIC	SYMBOLS LETTER
COARSE - GRAINED SOILS	GRAVEL AND GRAVELY SOILS	CLEAN GRAVELS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		GW
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE			GP
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GM
				GC
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		SW
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE			SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SM
				SC
FINE - GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		ML
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CL
		SANDY OR GRAVELY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OL
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		MH
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CH
		SANDY OR GRAVELY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OH
HIGHLY ORGANIC SOILS				PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS CONTAINING AN ESTIMATED 10% FINES BY VISUAL CLASSIFICATION OR WHEN THE SOIL HAS BETWEEN 5 AND 12 PERCENT FINES FROM LABORATORY TESTS; AND FOR FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSSHATCHED AREA. RESULTS OF LABORATORY TESTING ARE USED TO SUPPLEMENT THE CLASSIFICATION OF THE SOILS BASED ON THE VISUAL-MANUAL PROCEDURES OF ASTM D2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

	DESCRIPTION		GRAPHIC SYMBOLS
ADDITIONAL DESIGNATION	TOPSOIL		
	MAN-MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATION	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" PENETRATION, AUGER PENETRABLE	

COARSE-GRAINED SOILS
(GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D1586

FINE-GRAINED SOILS
(SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SPLIT-SPOON	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	▽
UPON COMPLETION OF DRILLING	▼
24 HOURS AFTER COMPLETION	⧩

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF BORING NO. B-1

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	12.7	Dry	BOC
DATE:	4/20/22	4/20/22	
CAVED (ft):	In Augers	9.0	

DATE STARTED: **4/20/22**
DATE COMPLETED: **4/20/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **77.0**
DATUM: **Google Earth**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					77.0	0			Topsoil +/- 6 Inches	
S-1	0.0	10	1-2-1-2	3	76.5		FILL		Dark brown, moist, soft, sandy silt FILL	
S-2	2.0	19	3-6-5-4	11	75.0		ML		Light brown, moist, stiff, Sandy SILT	
S-3	4.0	19	1-2-1-2	3	73.0	5	CL		Tan, moist, soft, Sandy Lean CLAY	
S-4	6.0	19	2-3-5-5	8	71.0		SM		Light tan, moist, loose, Silty SAND, contains gravel	
S-5	8.0	16	1-3-4-4	7					Same	
						10				
S-6	13.0	21	2-4-3-3	7					Same, wet	▽
						15				
S-7	18.0	20	2-3-5-5	8					Brown, moist, loose, Silty SAND, contains gravel	
					57.0	20			Boring terminated at 20.0 feet.	
						25				

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. B-1

LOG OF BORING NO. B-2

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	12.7	Dry	BOC
DATE:	4/20/22	4/20/22	
CAVED (ft):	In Augers	9.0	

DATE STARTED: **4/20/22**
DATE COMPLETED: **4/20/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **78.0**
DATUM: **Google Earth**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					78.0	0			Topsoil +/- 7 Inches	
S-1	0.0	18	1-2-3-5	5	77.4		FILL		Brown, moist, sandy SILT FILL	
S-2	2.0	14	4-4-3-3	7	76.0		SC		Tan, moist, loose, Clayey SAND, contains gravel	
S-3	4.0	19	3-5-5-6	10	74.0	5	SM		Tan, moist, loose, Silty SAND	
S-4	6.0	17	3-5-5-6	10					Tan, moist, loose, Silty SAND	
S-5	8.0	21	4-5-5-4	10		10			Dark orange, moist, loose, Silty SAND, contains gravel	
S-6	13.0	16	2-3-5-4	8	65.0		SP-SM		Dark orange, wet, loose, Poorly-graded SAND with SILT, contains gravel	
S-7	18.0	24	2-3-3-4	6	60.0	15	SM		Dark orange, moist, loose, Silty SAND	
					58.0	20			Boring terminated at 20.0 feet.	
						25				

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
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New Castle, DE 19720

LOG OF BORING NO. B-2

LOG OF BORING NO. B-3

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	13.0	Dry	BOC
DATE:	4/20/22	4/20/22	
CAVED (ft):	In Augers	7.9	

DATE STARTED: **4/20/22**
DATE COMPLETED: **4/20/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **78.0**
DATUM: **Google Earth**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					78.0	0			Topsoil +/- 6 Inches	
S-1	0.0	16	1-1-2-3	3	77.5		FILL		Dark brown and brown, moist, sandy SILT FILL	
S-2	2.0	22	3-6-9-11	15					Dark brown and brown, moist, stiff, sandy silt FILL, contains gravel	
S-3	4.0	19	1-5-3-4	8	74.0	5	ML		Tan, moist, medium stiff, Sandy SILT	
S-4	6.0	22	3-5-7-7	12					Same, stiff	
S-5	8.0	16	3-6-6-5	12	70.0		SM		Brown, moist, medium dense, Silty SAND, contains gravel	
						10				
S-6	13.0	18	2-3-4-4	7					Dark brown and brown, wet, loose, Silty SAND, contains gravel	▼
						15				
S-7	18.0	14	2-4-6-7	10					Brown, moist, loose, Silty SAND, contains gravel	
					58.0	20			Boring terminated at 20.0 feet.	
						25				

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
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LOG OF BORING NO. B-3

LOG OF BORING NO. B-4

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	7.2	5.7	BOC
DATE:	4/20/22	4/20/22	
CAVED (ft):	In Augers	5.9	

DATE STARTED: **4/20/22**
DATE COMPLETED: **4/20/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **8.0**
GROUND SURFACE ELEVATION: **81**
DATUM: **Google Earth**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	20	1-2-6-5	8	81.0 80.7	0	SC		Topsoil +/- 4 Inches Tan, moist, loose, Clayey SAND	
S-2	2.0	18	2-4-6-8	10					Same	
S-3	4.0	20	3-3-5-6	8		5			Same, brown	
S-4	6.0	21	5-7-6-6	13					Brown, moist, medium dense, Clayey SAND, contains gravel	
S-5	8.0	20	2-3-3-3	6	73.0		SM		Brown, wet, loose, Silty SAND, contains gravel	
						10				
S-6	13.0	24	1-4-5-5	9	68.0		SP-SM		Brown, moist, loose, Poorly-graded SAND with SILT, contains gravel	
						15				
S-7	18.0	24	2-3-3-3	6					Same	
					61.0	20			Boring terminated at 20.0 feet.	
						25				

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-4

LOG OF BORING NO. B-5

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	20.2	Dry	BOC
DATE:	12/21/22	12/21/22	
CAVED (ft):	In Augers	11.3	

DATE STARTED: **12/21/22**
DATE COMPLETED: **12/21/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **15.0**
GROUND SURFACE ELEVATION: **83.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					83.0	0			Topsoil +/- 9 Inches	
S-1	0.0	12	1-1-3-2	4	82.2		FILL		Brown, moist, soft, sandy silt FILL, contains organic material	
S-2	2.0	13	2-3-3-3	6	81.0		SC		Brown, moist, loose, Clayey SAND, contains gravel	
S-3	4.0	16	2-4-5-8	9	79.0	5	SM		Dark gray, moist, loose, Silty SAND	
S-4	6.0	15	3-6-6-7	12	77.0		SP-SM		Brown, moist, medium dense, Poorly-graded SAND with Silt, contains gravel	
S-5	8.0	19	2-3-3-6	6	75.0		CL		Gray and brown, moist, medium stiff, Lean CLAY with Sand	
						10				
S-6	13.0	21	2-2-4-5	6	70.0		SM		Orange-brown, wet, loose, Silty SAND, contains gravel	▽
						15				
S-7	18.0	15	1-2-4-6	6					Orange, moist, loose, Silty SAND, contains gravel	
						20				▼
S-8	23.0	24	5-5-5-6	10					Same	
					58.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-5

LOG OF BORING NO. B-6

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	17.7	9.5	BOC
DATE:	12/29/22	12/29/22	
CAVED (ft):	In Augers	11.5	

DATE STARTED: **12/29/22**
DATE COMPLETED: **12/29/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **82.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					82.0	0			Topsoil +/- 6 Inches	
S-1	0.0	16	2-2-2-2	4	81.5		ML		Brown, moist, soft, Sandy SILT	
S-2	2.0	15	2-2-3-2	5					Brown, moist, medium stiff, Sandy SILT, contains gravel	
S-3	4.0	15	1-1-2-5	3	78.0	5	CL		Dark brown, moist, soft, Sandy Lean CLAY, contains gravel	
S-4	6.0	20	8-5-6-6	11	76.0		ML		Gray and orange, moist, stiff, SILT with sand, contains gravel	
S-5	8.0	17	2-3-6-7	9	74.0		CL		Gray and orange, moist, stiff, Sandy Lean CLAY, contains gravel	▽
						10				
					69.0		SM		Orange, wet, very loose, Silty SAND, contains gravel	▽
S-6	13.0	16	1-2-2-2	4						
						15				
S-7	18.0	24	2-1-2-2	3					Tan, moist, very loose, Silty SAND	▽
						20				
S-8	23.0	11	2-3-6-9	9					Brown, moist, loose, Silty SAND	
					57.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-6

LOG OF BORING NO. B-7

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	16.7	Dry	BOC
DATE:	12/21/22	12/21/22	
CAVED (ft):	In Augers	9.7	

DATE STARTED: **12/21/22**
DATE COMPLETED: **12/21/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.0**
GROUND SURFACE ELEVATION: **82.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					82.0	0			Topsoil +/- 9 Inches	
S-1	0.0	18	1-2-2-4	4	81.2		FILL		Brown, moist, soft, silt with sand FILL	
					80.0		SM		Brown, moist, loose, Silty SAND	
S-2	2.0	20	2-3-4-3	7						
									Brown, moist, very loose, Silty SAND, contains gravel	
S-3	4.0	16	1-2-2-4	4		5				
									Tan, moist, medium dense, Silty SAND	
S-4	6.0	16	2-4-8-11	12						
					74.0		CL		Light brown and gray, moist, medium stiff, Lean CLAY with sand	
S-5	8.0	22	2-3-2-4	5		10				
					69.0		SM		Light brown, wet, very loose, Silty SAND	▽
S-6	13.0	14	2-1-3-3	4		15				
										▼
									Light brown, moist, loose, Silty SAND, contains gravel	
S-7	18.0	12	1-3-3-3	6		20				
					59.0		SP-SM		Orange-brown, moist, medium dense, Poorly-graded SAND with silt, contains gravel	
S-8	23.0	12	4-4-9-11	13	57.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-7

LOG OF BORING NO. B-8

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	16.5	11.0	BOC
DATE:	12/29/22	12/29/22	
CAVED (ft):	In Augers	11.5	

DATE STARTED: **12/29/22**
DATE COMPLETED: **12/29/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.0**
GROUND SURFACE ELEVATION: **82.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					82.0	0			Topsoil +/- 5 Inches	
S-1	0.0	15	1-2-2-1	4	81.6		FILL		Brown, moist, soft, sandy silt FILL, contains organic material	
					80.0					
S-2	2.0	13	2-1-2-2	3			CL		Brown, moist, soft, Sandy Lean CLAY, contains gravel	
S-3	4.0	14	1-2-2-3	4		5			Dark gray, moist, soft, Sandy Lean CLAY	
S-4	6.0	17	3-3-4-7	7					Gray and orange, medium stiff, Sandy Lean CLAY, contains gravel	
					74.0					
S-5	8.0	14	2-4-5-4	9			SM		Brown, moist, loose, Silty SAND, contains gravel	▽
						10				
S-6	13.0	18	1-1-1-2	2					Orange, moist, very loose, Silty SAND, contains gravel	▽
						15				▽
S-7	18.0	24	1-4-4-5	8					Light brown, moist, loose, Silty SAND, contains gravel	
						20				
S-8	23.0	24	3-4-6-7	10					Same, orange-brown	
					57.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
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LOG OF BORING NO. B-8

LOG OF BORING NO. B-9

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	20.0	Dry	BOC
DATE:	12/19/22	12/19/22	
CAVED (ft):	In Augers	9.8	

DATE STARTED: **12/19/22**
DATE COMPLETED: **12/19/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.0**
GROUND SURFACE ELEVATION: **81.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	19	1-3-2-3	5	81.0	0			Topsoil +/- 8 Inches	
					80.3		CL		Tan, moist, medium stiff, Lean CLAY, contains gravel and organic material	
S-2	2.0	13	2-6-7-9	13	79.0		ML		Gray and brown, moist, stiff, SILT	
S-3	4.0	24	3-6-9-9	15		5			Same, gray	
S-4	6.0	11	6-7-9-9	16					Gray, moist, very stiff, SILT, contains gravel	
S-5	8.0	21	1-1-2-3	3	73.0		SM		Tan and orange, moist, very loose, Silty SAND, contains gravel	
						10				
S-6	13.0	17	1-2-2-3	4					Light brown, wet, very loose, Silty SAND, contains gravel	▽
						15				
S-7	18.0	24	1-2-4-5	6					Brown, moist, loose, Silty SAND, contains gravel	
						20				▽
S-8	23.0	24	3-4-6-8	10					Same	
					56.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. B-9

LOG OF BORING NO. B-10

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	16.5	10.0	BOC
DATE:	12/29/22	12/29/22	
CAVED (ft):	In Augers	12.0	

DATE STARTED: **12/29/22**
DATE COMPLETED: **12/29/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **82.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					82.0	0			Topsoil +/- 5 Inches	
S-1	0.0	14	1-2-2-2	4	81.6		FILL		Brown, moist, soft, sandy silt FILL, contains organic material	
S-2	2.0	22	3-4-6-6	10	80.0		SC		Brown, moist, loose, Clayey SAND, contains gravel	
S-3	4.0	18	2-4-2-6	6		5			Brown, moist, loose, Clayey SAND	
S-4	6.0	20	6-4-4-6	8					Same	
S-5	8.0	17	2-5-6-4	11	74.0		SM		Brown, moist, medium dense, Silty SAND, contains gravel	
						10				▽
S-6	13.0	17	1-3-3-3	6					Orange, wet, loose, Silty SAND	▽
						15				▽
S-7	18.0	24	1-2-3-5	5					Yellow-brown, moist, loose, Silty SAND, contains gravel	
						20				
S-8	23.0	24	3-4-7-9	11					Orange-brown, moist, medium dense, Silty SAND, contains gravel	
					57.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-10

LOG OF BORING NO. B-11

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	16.0	Dry	BOC
DATE:	12/19/22	12/19/22	
CAVED (ft):	In Augers	9.8	

DATE STARTED: **12/19/22**
DATE COMPLETED: **12/19/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.0**
GROUND SURFACE ELEVATION: **81.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					81.0	0			Topsoil +/- 4 Inches	
S-1	0.0	21	1-3-2-3	5	80.7		CL		Brown, moist, medium stiff, Lean CLAY with sand	
					79.0					
S-2	2.0	16	1-3-6-6	9			SM		Light brown, moist, loose, Silty SAND, contains gravel and clay	
S-3	4.0	24	3-6-10-8	16		5			Brown, moist, medium dense, Silty SAND, contains gravel	
S-4	6.0	15	5-8-8-8	16					Same	
S-5	8.0	20	2-4-4-4	8					Same, loose	
						10				
S-6	13.0	18	1-3-3-3	6					Orange-brown, wet, loose, Silty SAND, contains gravel	▽
						15				▽
S-7	18.0	24	2-2-5-7	7					Light brown, moist, loose, Silty SAND	
						20				
S-8	23.0	24	6-8-11-12	19					Light brown, moist, medium dense, Silty SAND	
					56.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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18 Boulden Circle, Suite 36
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LOG OF BORING NO. B-11

LOG OF BORING NO. B-12

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	15.3	Dry	BOC
DATE:	12/21/22	12/21/22	
CAVED (ft):	In Augers	9.5	

DATE STARTED: **12/21/22**
DATE COMPLETED: **12/21/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.0**
GROUND SURFACE ELEVATION: **82.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					82.0	0			Topsoil +/- 7 Inches	
S-1	0.0	12	1-2-4-3	6	81.4		ML		Brown, moist, medium stiff, SILT	
S-2	2.0	15	2-2-3-6	5					Same, contains gravel	
					78.0	5	SM		Light brown, moist, loose, Silty SAND	
S-3	4.0	17	2-3-4-7	7						
					76.0		SP-SM		Light brown, moist, medium dense, Poorly-graded SAND with Silt, contains gravel	
S-4	6.0	19	4-9-9-9	18						
					74.0		SM		Light brown, loose, Silty SAND, contains gravel	
S-5	8.0	16	2-3-3-4	6		10				
									Orange-brown, wet, loose, Silty SAND, contains gravel	▽
S-6	13.0	15	1-2-3-3	5		15				▽
S-7	18.0	24	1-2-3-4	5					Same, moist	
						20				
S-8	23.0	24	2-2-3-5	5					Same, moist	
					57.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-12

LOG OF BORING NO. B-13

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	19.2	Dry	BOC
DATE:	12/29/22	12/29/22	
CAVED (ft):	In Augers	8.8	

DATE STARTED: **12/29/22**
DATE COMPLETED: **12/29/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.0**
GROUND SURFACE ELEVATION: **82.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					82.0	0				
S-1	0.0	13	1-2-1-1	3	81.8		FILL		Topsoil +/- 3 Inches Brown, moist, soft, sandy silt FILL, contains gravel	
S-2	2.0	22	4-4-5-5	9	80.0		SC		Brown, moist, loose, Clayey SAND, contains gravel	
S-3	4.0	13	1-1-2-2	3	78.0	5	SM		Tan, moist, very loose, Silty SAND	
S-4	6.0	19	2-4-7-7	11					Dark brown and tan, moist, medium dense, Silty SAND, contains gravel	
S-5	8.0	17	2-6-6-7	12		10			Same, orange-brown	
S-6	13.0	14	1-2-3-5	5		15			Orange, wet, loose, Silty SAND	▽
S-7	18.0	24	1-4-6-8	10		20			Orange-brown, moist, loose, Silty SAND, contains gravel	▽
S-8	23.0	24	2-3-6-7	9					Orange-brown, moist, loose, Silty SAND	
					57.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-13

LOG OF BORING NO. B-14

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	15.0	Dry	BOC
DATE:	12/19/22	12/19/22	
CAVED (ft):	In Augers	9.0	

DATE STARTED: **12/19/22**
DATE COMPLETED: **12/19/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **14.0**
GROUND SURFACE ELEVATION: **82.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					82.0	0			Topsoil +/- 5 Inches	
S-1	0.0	18	1-1-2-5	3	81.6		FILL		Light brown, moist, very loose, sandy silt FILL, contains organic material	
					80.0		SC		Orange, moist, loose, Clayey SAND	
S-2	2.0	17	3-3-6-6	9						
									Same, contains gravel	
S-3	4.0	21	3-3-4-4	7		5				
									Same	
S-4	6.0	17	2-2-3-3	5						
					74.0		ML		Light brown, moist, medium stiff, Sandy SILT	
S-5	8.0	21	2-2-3-5	5		10				
					69.0		SM		Light brown, wet, loose, Silty SAND, contains gravel	▽
S-6	13.0	18	2-3-4-4	7		15				▽
									Same	
S-7	18.0	24	1-4-4-6	8		20				
									Same, medium dense	
S-8	23.0	24	4-5-7-8	12						
					57.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-14

LOG OF BORING NO. B-15

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	14.0	Dry	BOC
DATE:	12/19/22	12/19/22	
CAVED (ft):	In Augers	10.5	

DATE STARTED: **12/19/22**
DATE COMPLETED: **12/19/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **81.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					81.0	0			Topsoil +/- 12 Inches	
S-1	0.0	22	1-2-3-3	5	80.0		FILL		Dark brown, moist, medium stiff, silt with sand FILL	
S-2	2.0	9	2-2-5-5	7	79.0		CL		Tan, moist, medium stiff, Lean CLAY with sand	
S-3	4.0	21	3-8-8-10	16	77.0	5	SM		Light brown, moist, medium dense, Silty SAND, contains gravel	
S-4	6.0	11	4-6-8-8	14					Same	
S-5	8.0	17	2-4-5-4	9					Same, loose	
						10				
S-6	13.0	18	1-2-2-3	4					Light brown, wet, very loose, Silty SAND, contains gravel	
						15				
S-7	18.0	24	2-5-5-5	10					Light brown and dark brown, moist, loose, Silty SAND, contains gravel	
						20				
S-8	23.0	24	3-5-7-8	12					Same, light brown	
					56.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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LOG OF BORING NO. B-15

LOG OF BORING NO. B-16

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	8.5	8.5	BOC
DATE:	12/19/22	12/19/22	
CAVED (ft):	In Augers	10.8	

DATE STARTED: **12/19/22**
DATE COMPLETED: **12/19/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **8.0**
GROUND SURFACE ELEVATION: **79.0**
DATUM: **Topo**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					79.0	0			Topsoil +/- 7 Inches	
S-1	0.0	21	1-2-7-9	9	78.4		SM		Orange-brown, moist, loose, Silty SAND, contains clay	
S-2	2.0	1	5-8-8-5	16					Orange-brown, moist, medium dense, Silty SAND	
S-3	4.0	15	3-6-7-5	13		5			Same, light brown	
S-4	6.0	15	4-6-7-7	13					Same, light brown	
S-5	8.0	16	2-3-5-4	8					Light brown, wet, loose, Silty SAND, contains gravel	▽
						10				
S-6	13.0	24	2-3-5-3	8					Same	
						15				
S-7	18.0	24	2-3-7-5	10					Same	
						20				
S-8	23.0	24	6-7-10-9	17					Light brown, moist, medium dense, Silty SAND, contains gravel	
					54.0	25			Boring terminated at 25.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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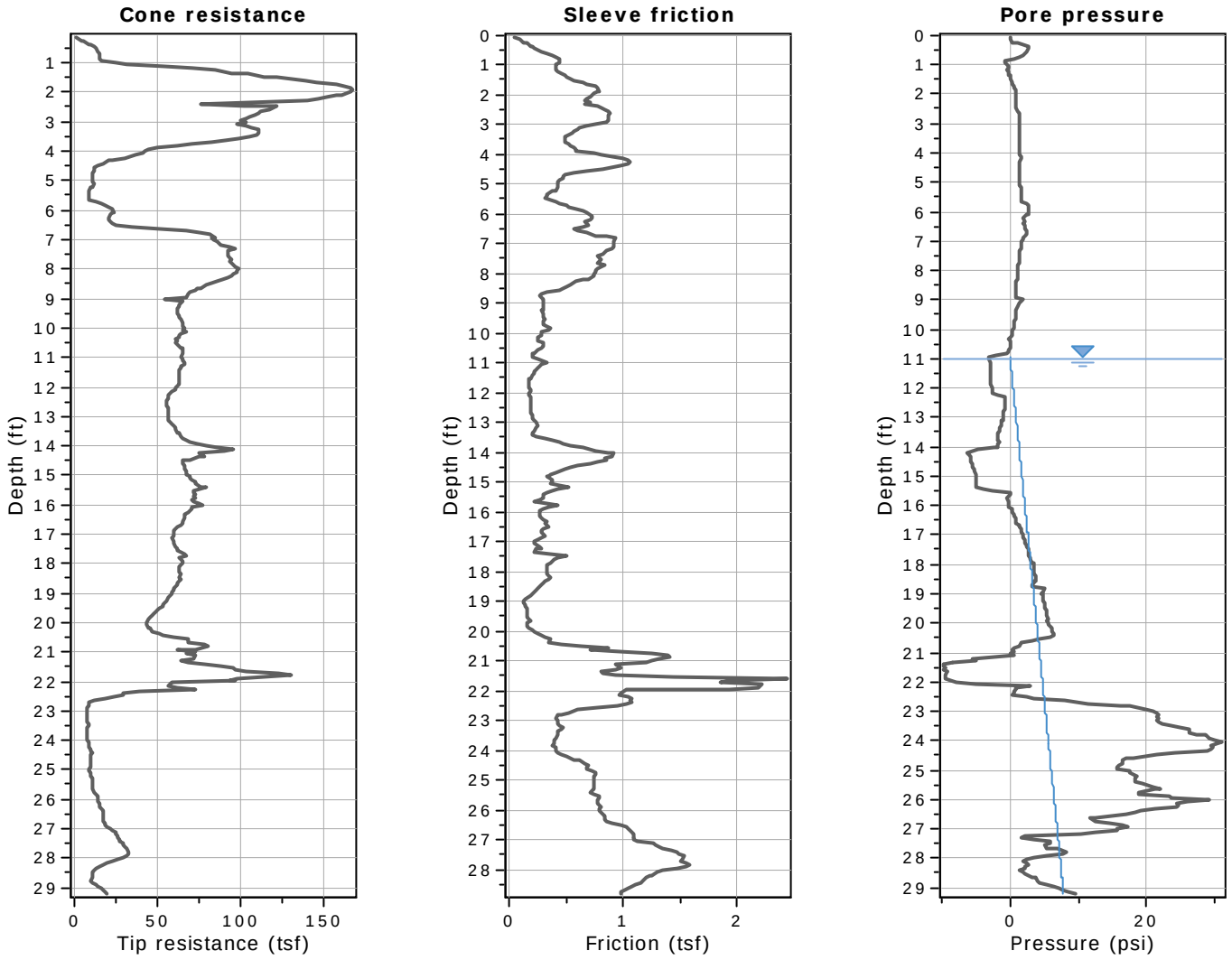
LOG OF BORING NO. B-16

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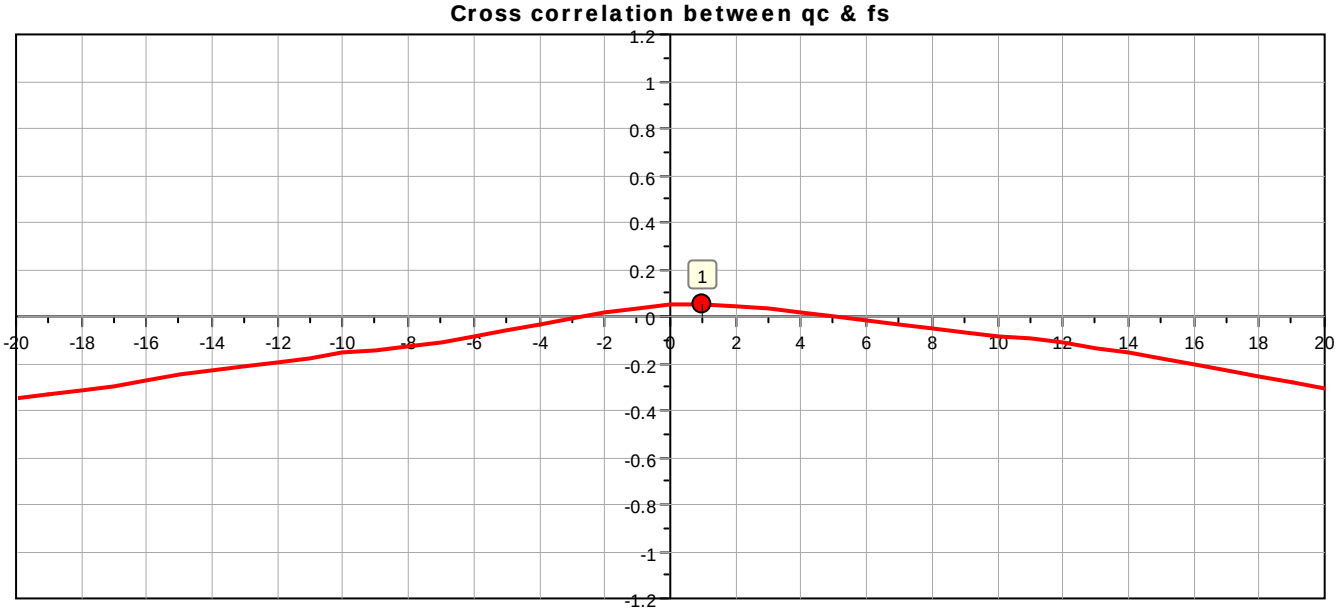
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 1
Total depth: 29.20 ft, Date: 4/20/2022
Surface Elevation: 76.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



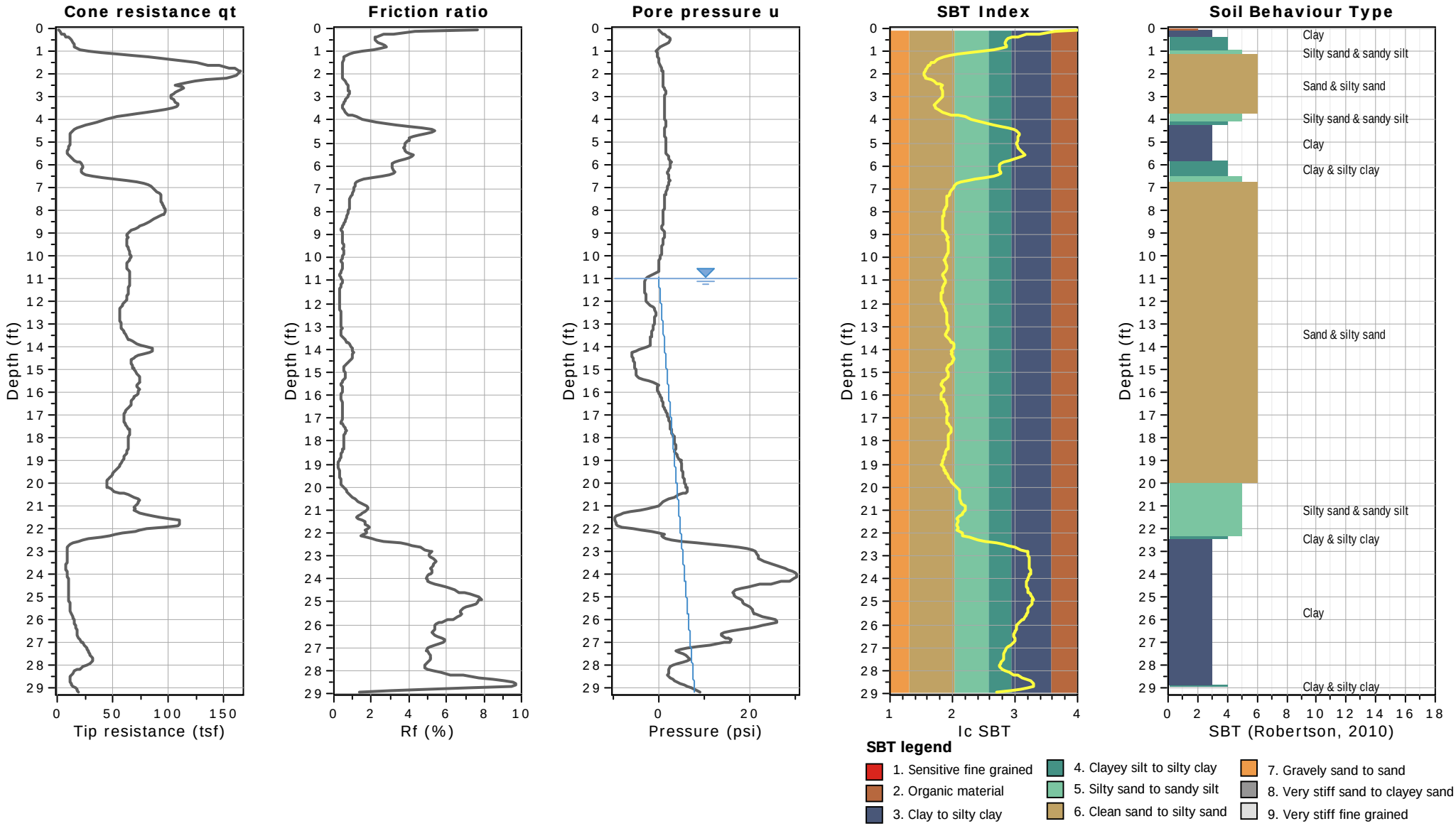
The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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CPT: 1
Total depth: 29.20 ft, Date: 4/20/2022
Surface Elevation: 76.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**

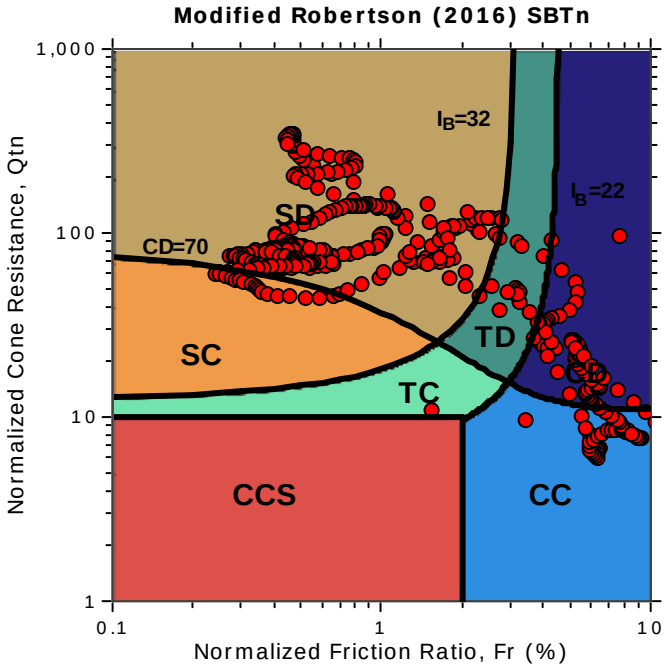


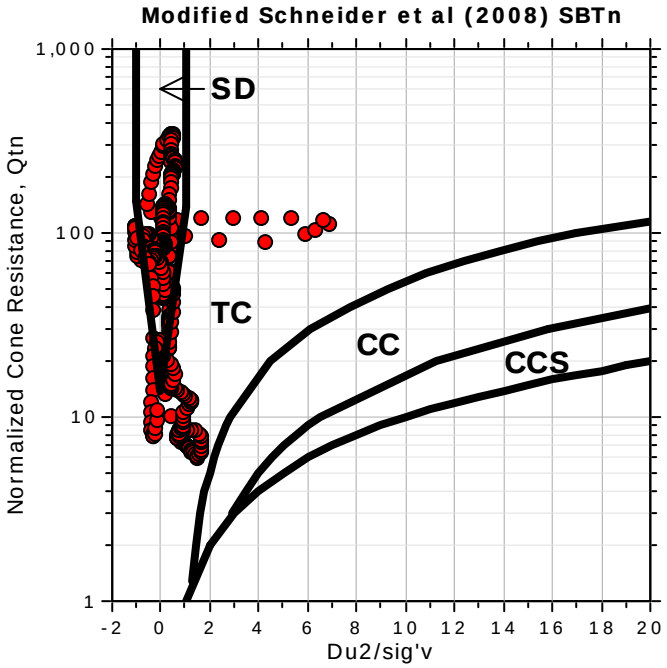
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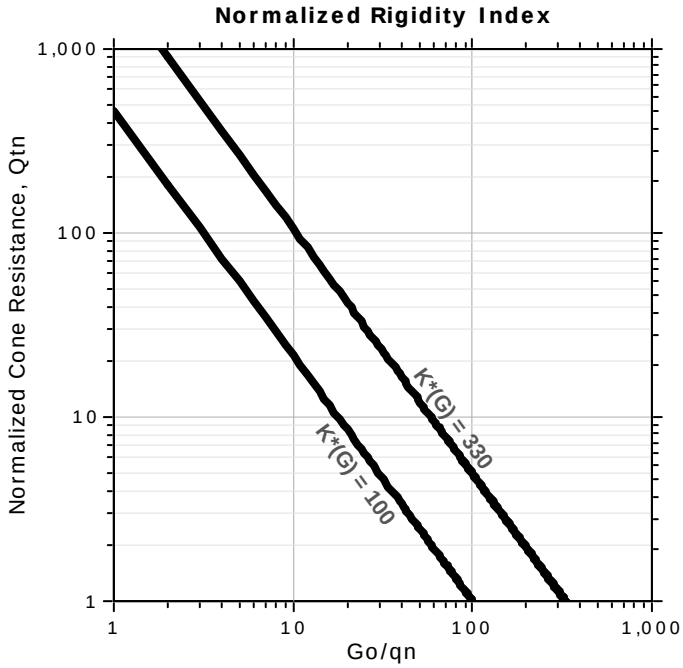
CPT: 1
Total depth: 29.20 ft, Date: 4/20/2022
Surface Elevation: 76.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: Hodgson Vo-Tech New Campus
Location: New Castle County, Delaware

Updated SBTn plots







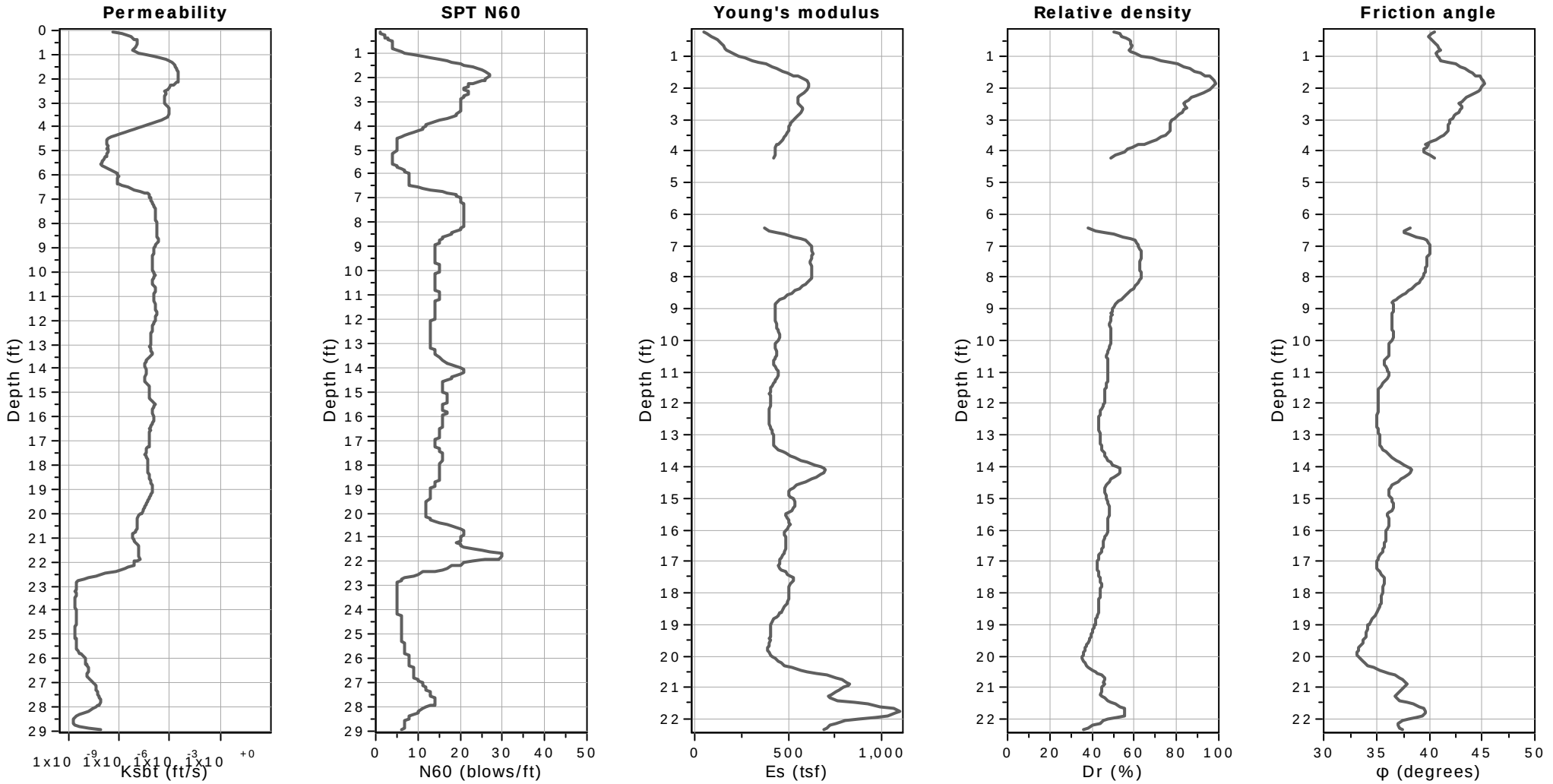
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
CD: Clay-like - Dilative
TC: Transitional - Contractive
TD: Transitional - Dilative
SC: Sand-like - Contractive
SD: Sand-like - Dilative

K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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New Castle DE 19720
302 326 2100

CPT: 1
Total depth: 29.20 ft, Date: 4/20/2022
Surface Elevation: 76.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



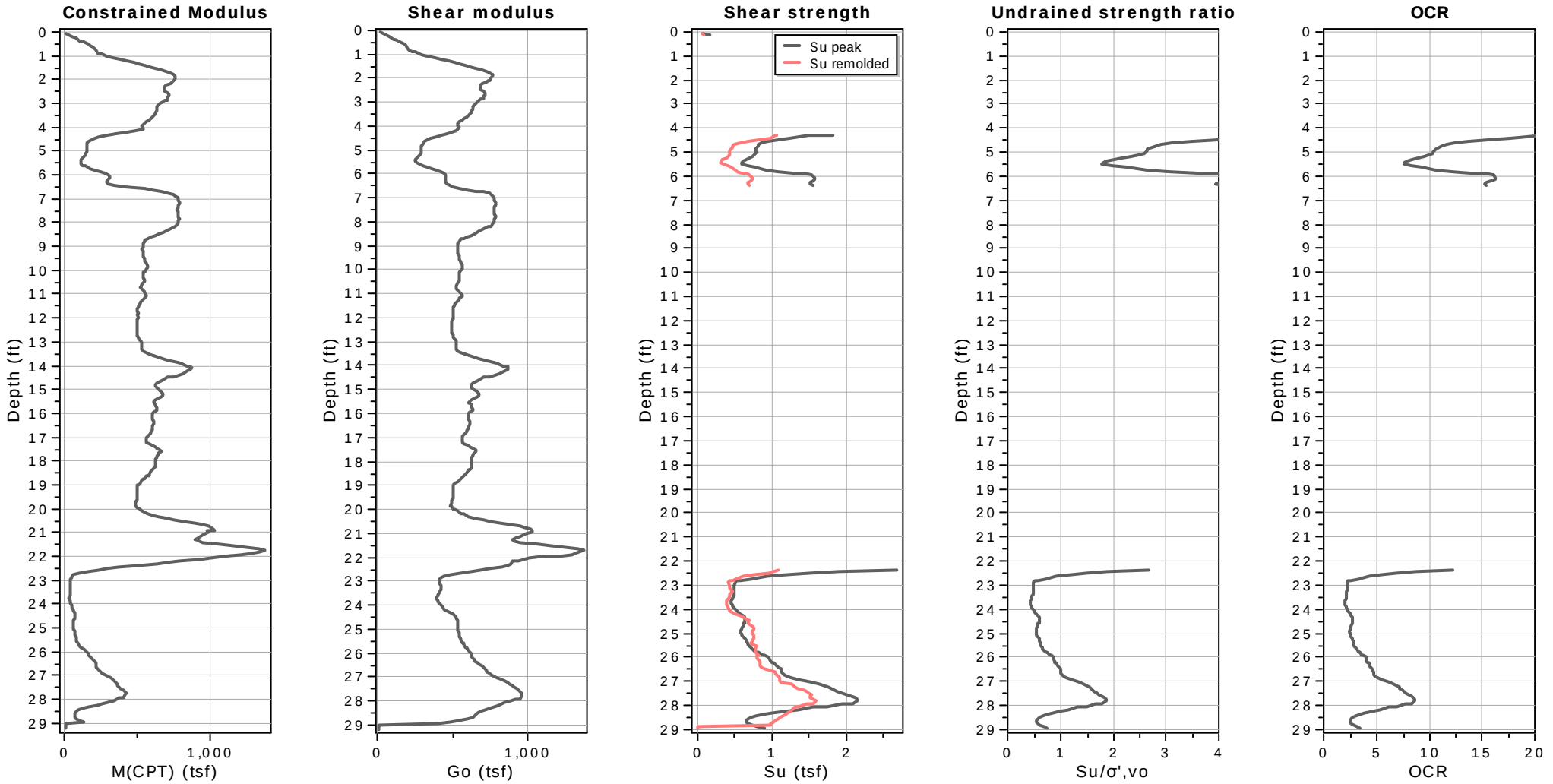
Calculation parameters

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)
User defined estimation data

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302 326 2100

CPT: 1
Total depth: 29.20 ft, Date: 4/20/2022
Surface Elevation: 76.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



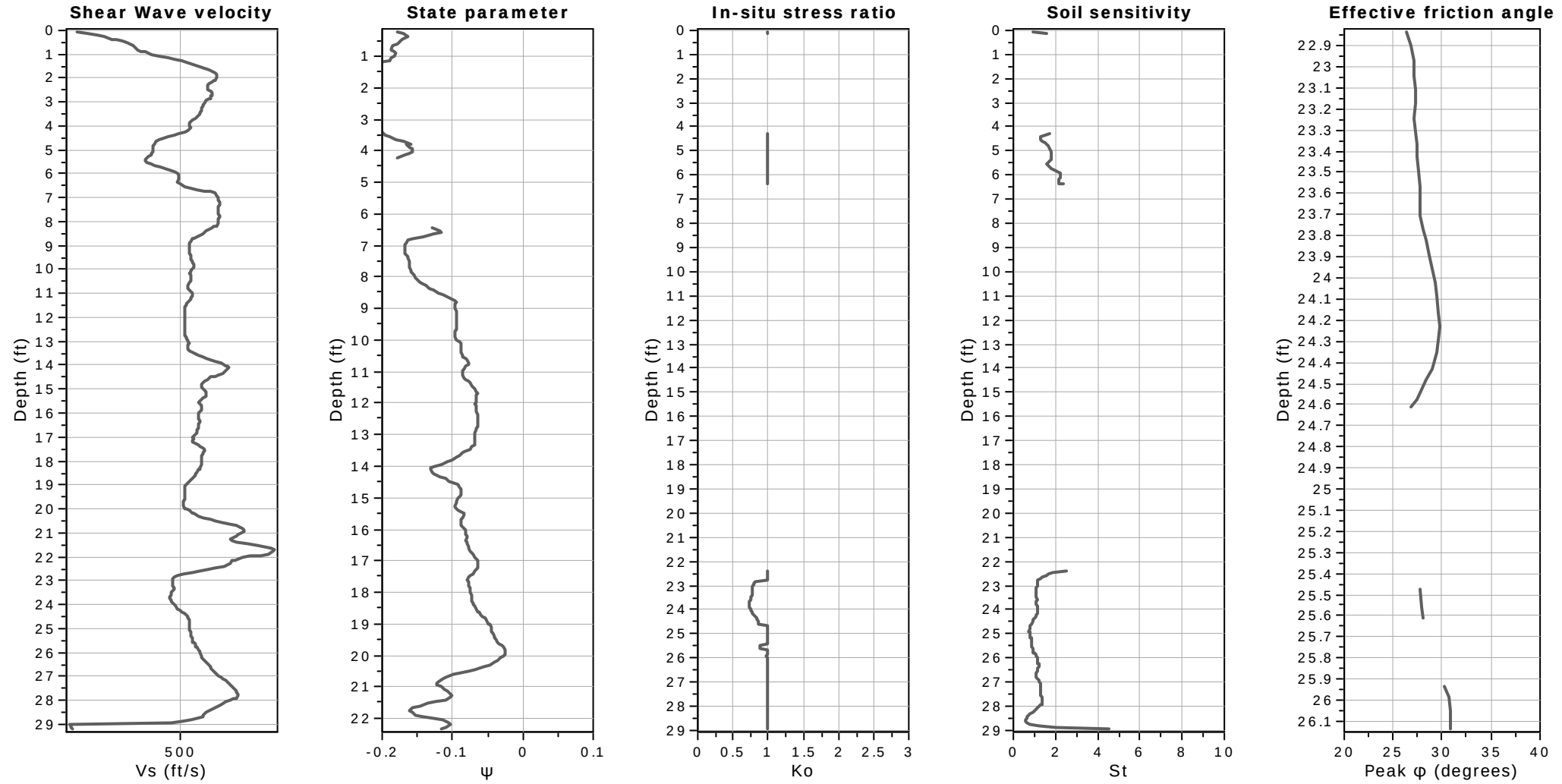
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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New Castle DE 19720
302 326 2100

CPT: 1
Total depth: 29.20 ft, Date: 4/20/2022
Surface Elevation: 76.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



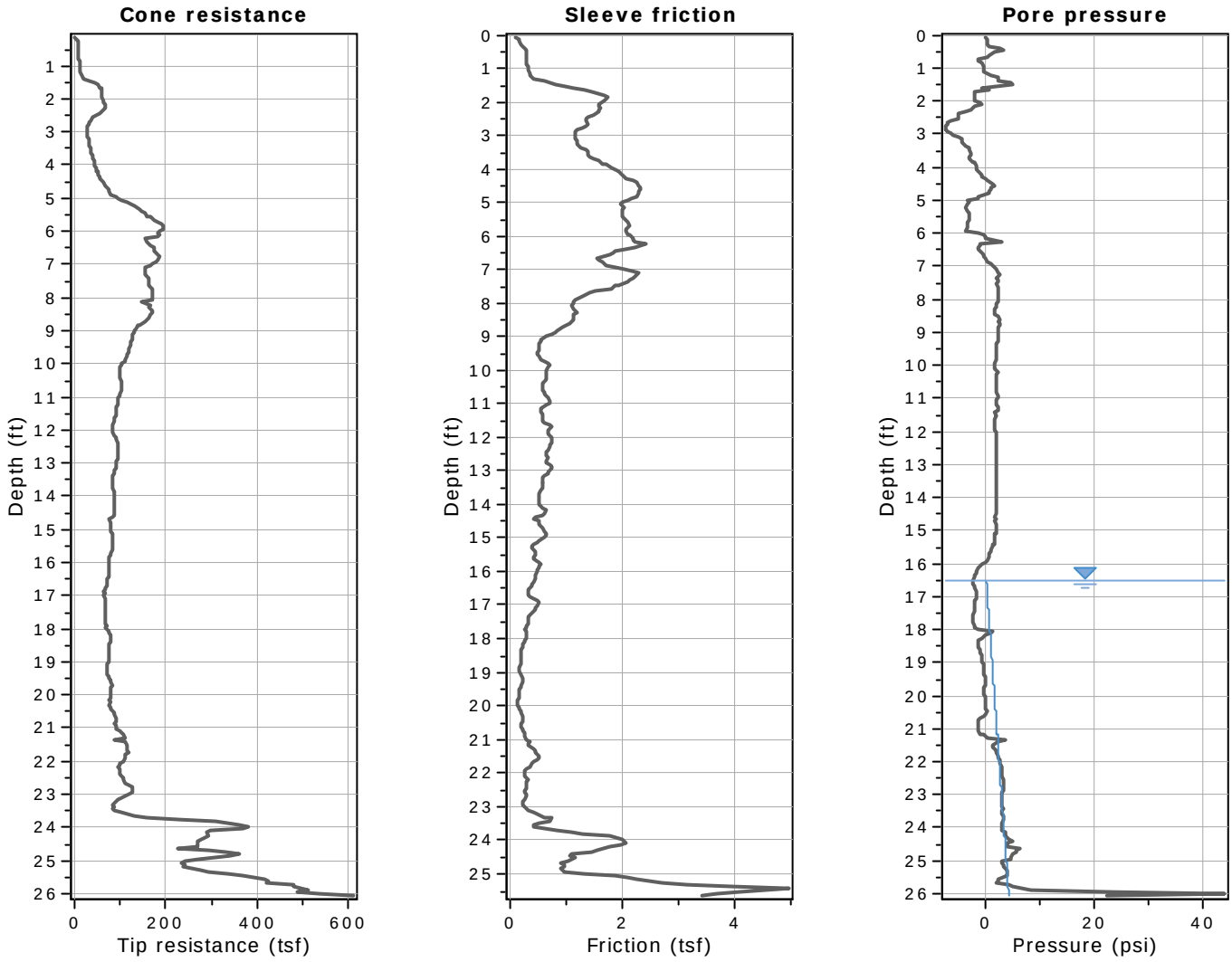
Calculation parameters

Soil Sensitivity factor, N_S: 7.00
User defined estimation data

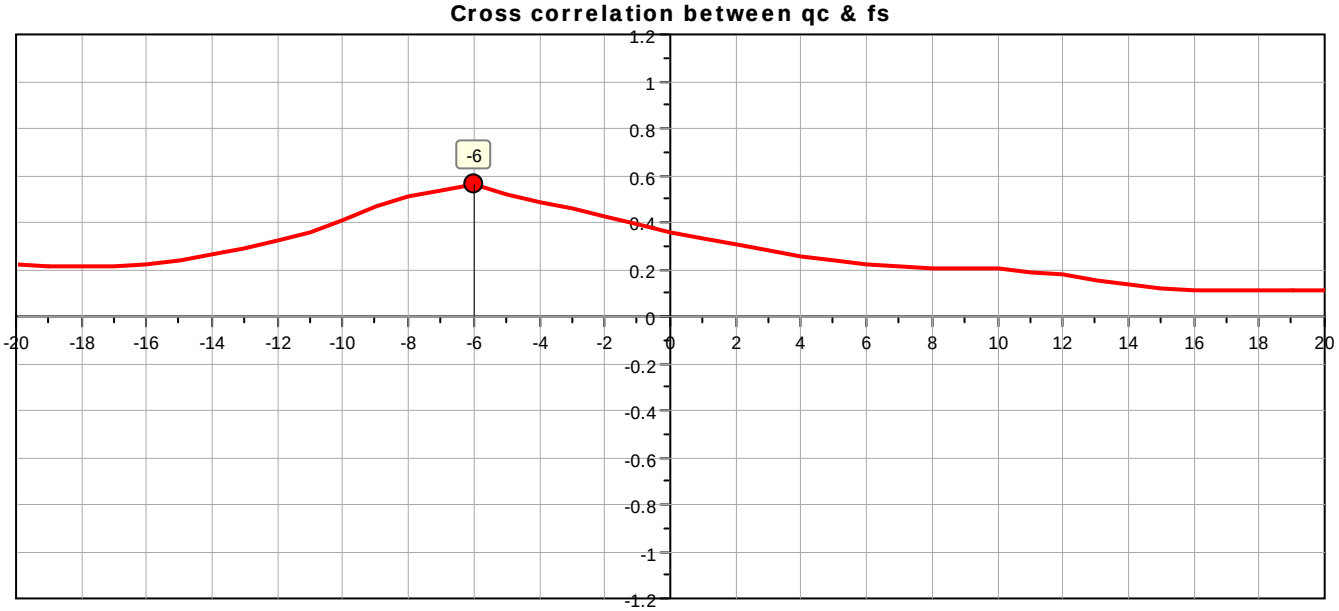
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CPT: 2
Total depth: 26.06 ft, Date: 4/20/2022
Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



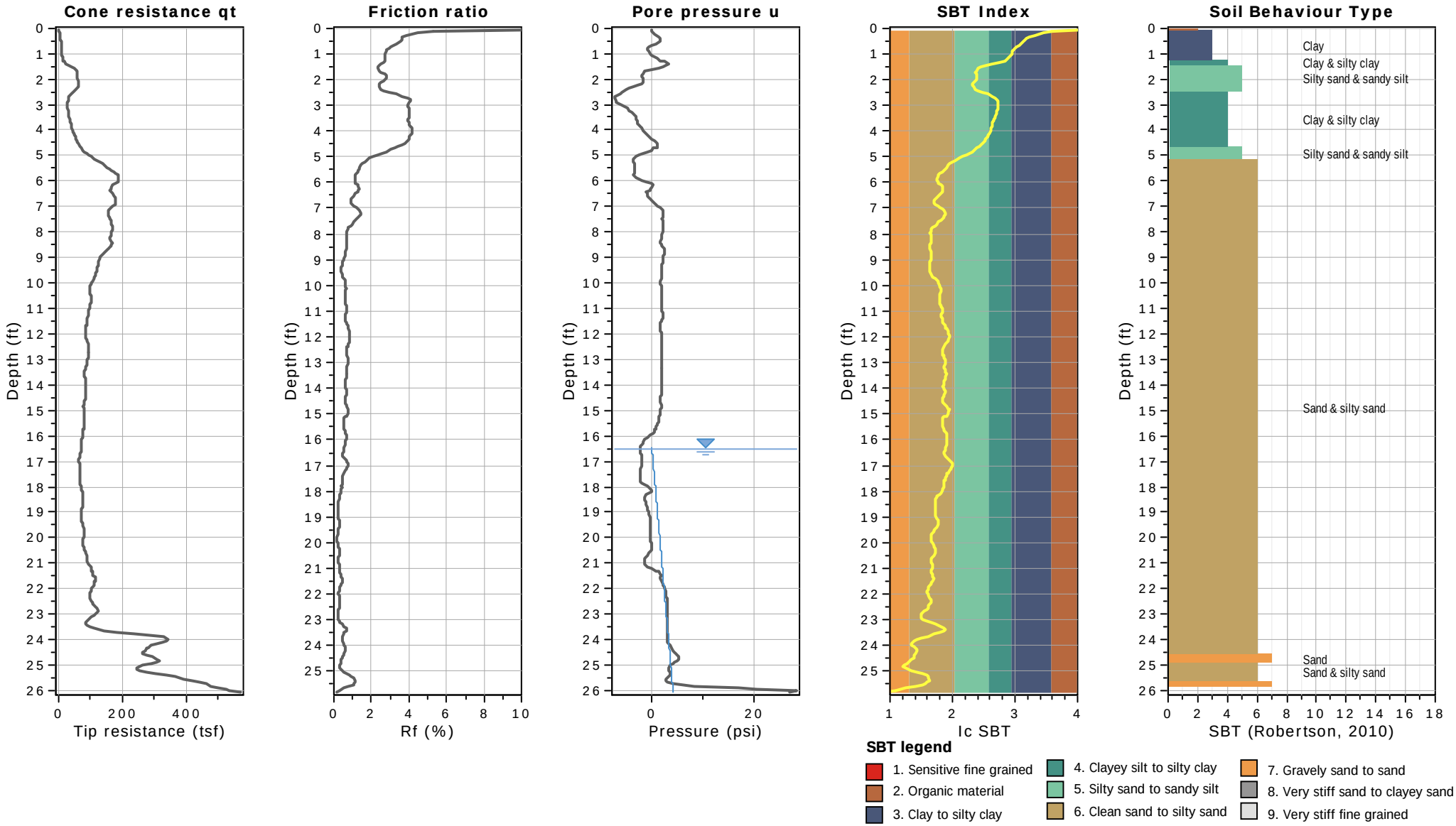
The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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New Castle DE 19720
302 326 2100

CPT: 2
Total depth: 26.06 ft, Date: 4/20/2022
Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**

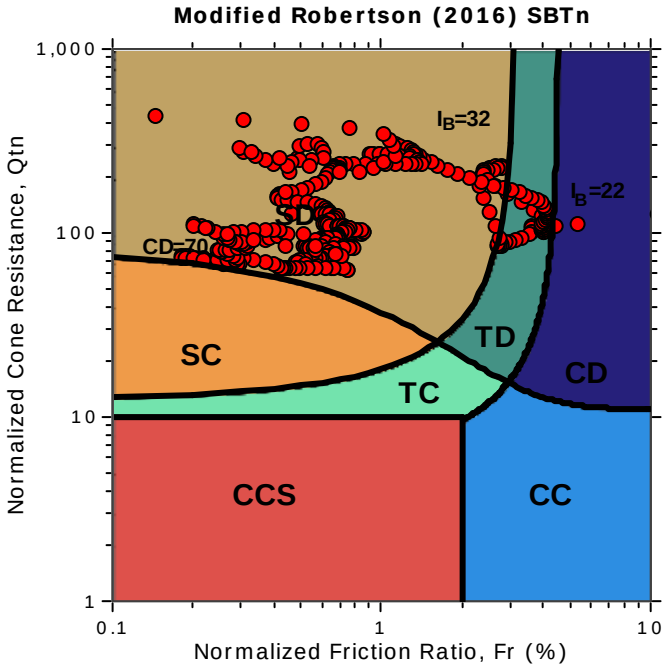


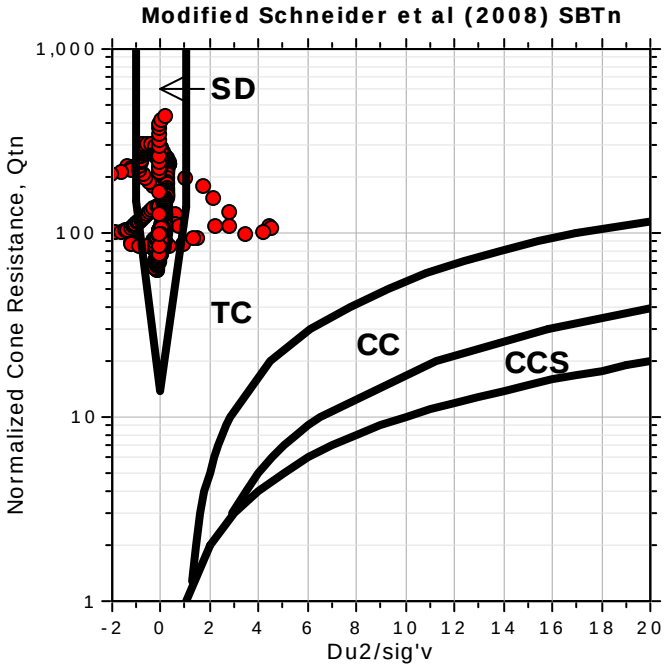
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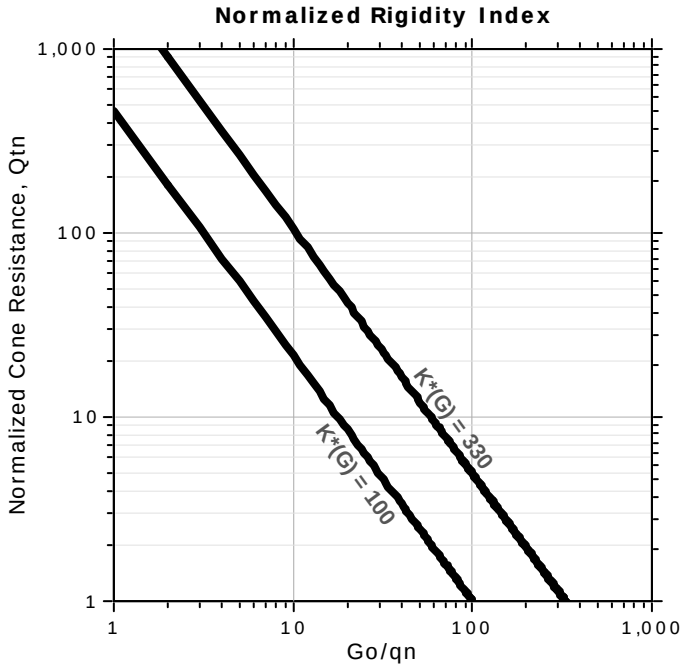
CPT: 2
Total depth: 26.06 ft, Date: 4/20/2022
Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: Hodgson Vo-Tech New Campus
Location: New Castle County, Delaware

Updated SBTn plots







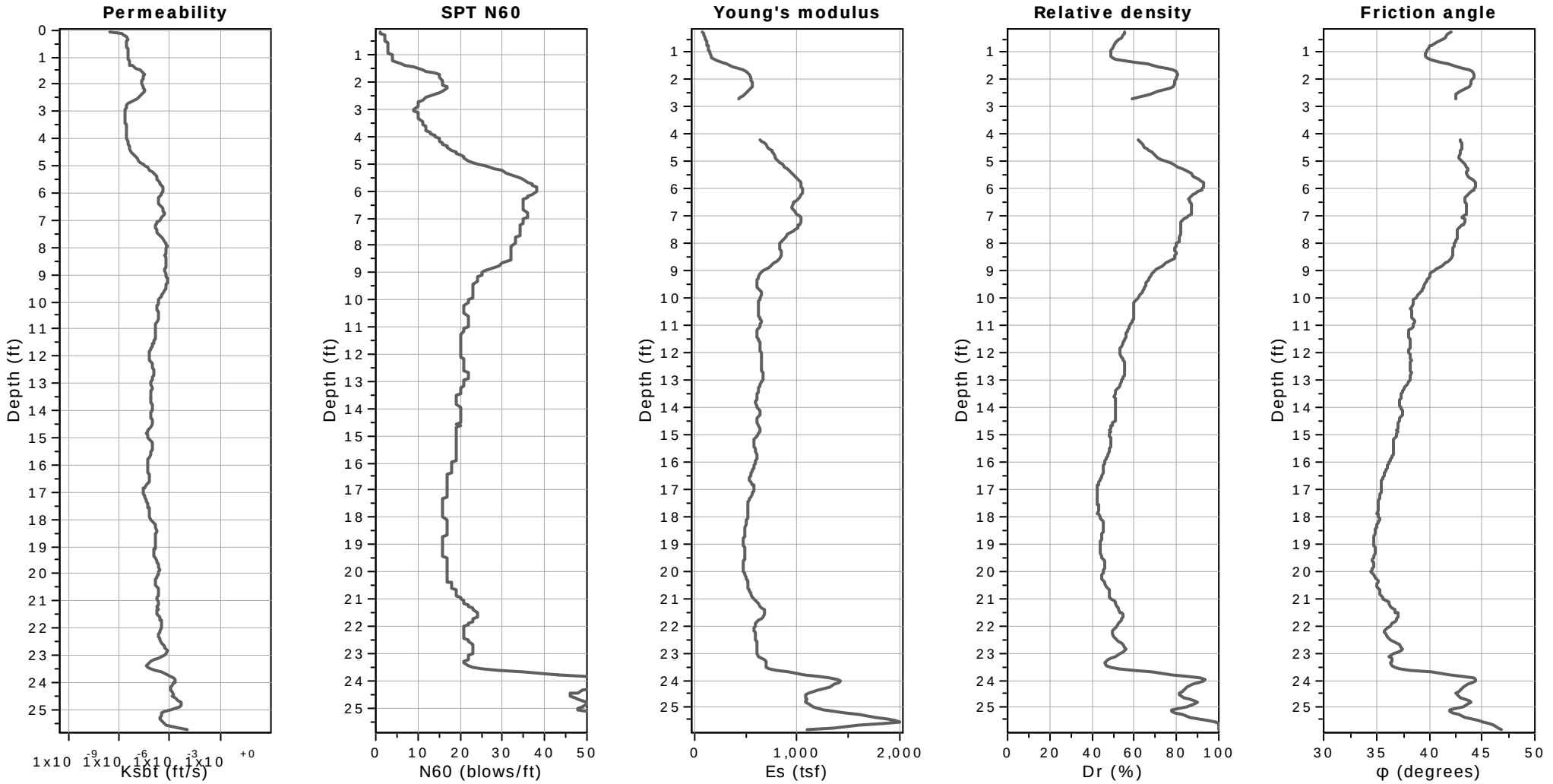
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
CD: Clay-like - Dilative
TC: Transitional - Contractive
TD: Transitional - Dilative
SC: Sand-like - Contractive
SD: Sand-like - Dilative

K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 2
Total depth: 26.06 ft, Date: 4/20/2022
Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



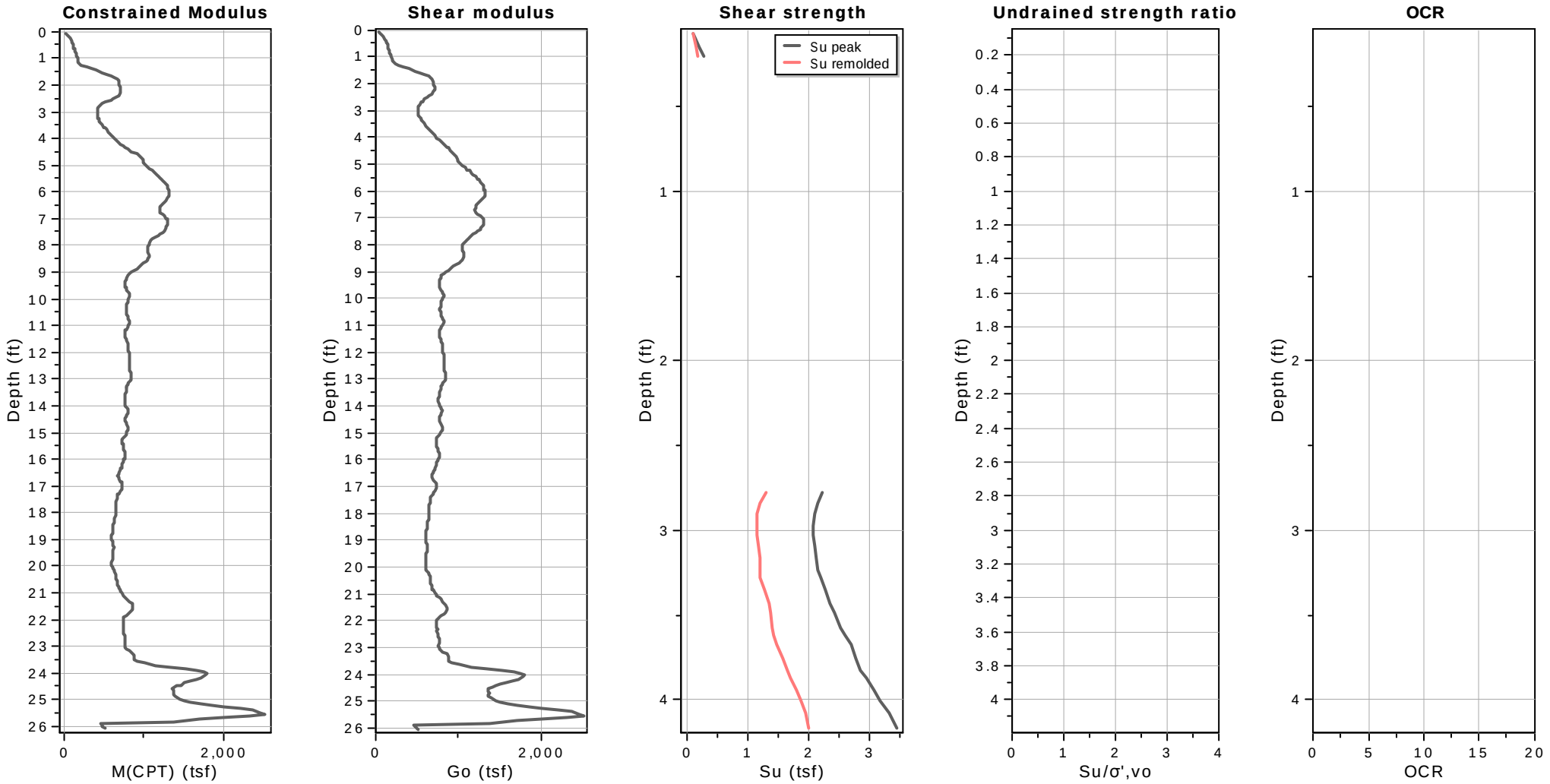
Calculation parameters

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)
User defined estimation data

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 2
Total depth: 26.06 ft, Date: 4/20/2022
Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



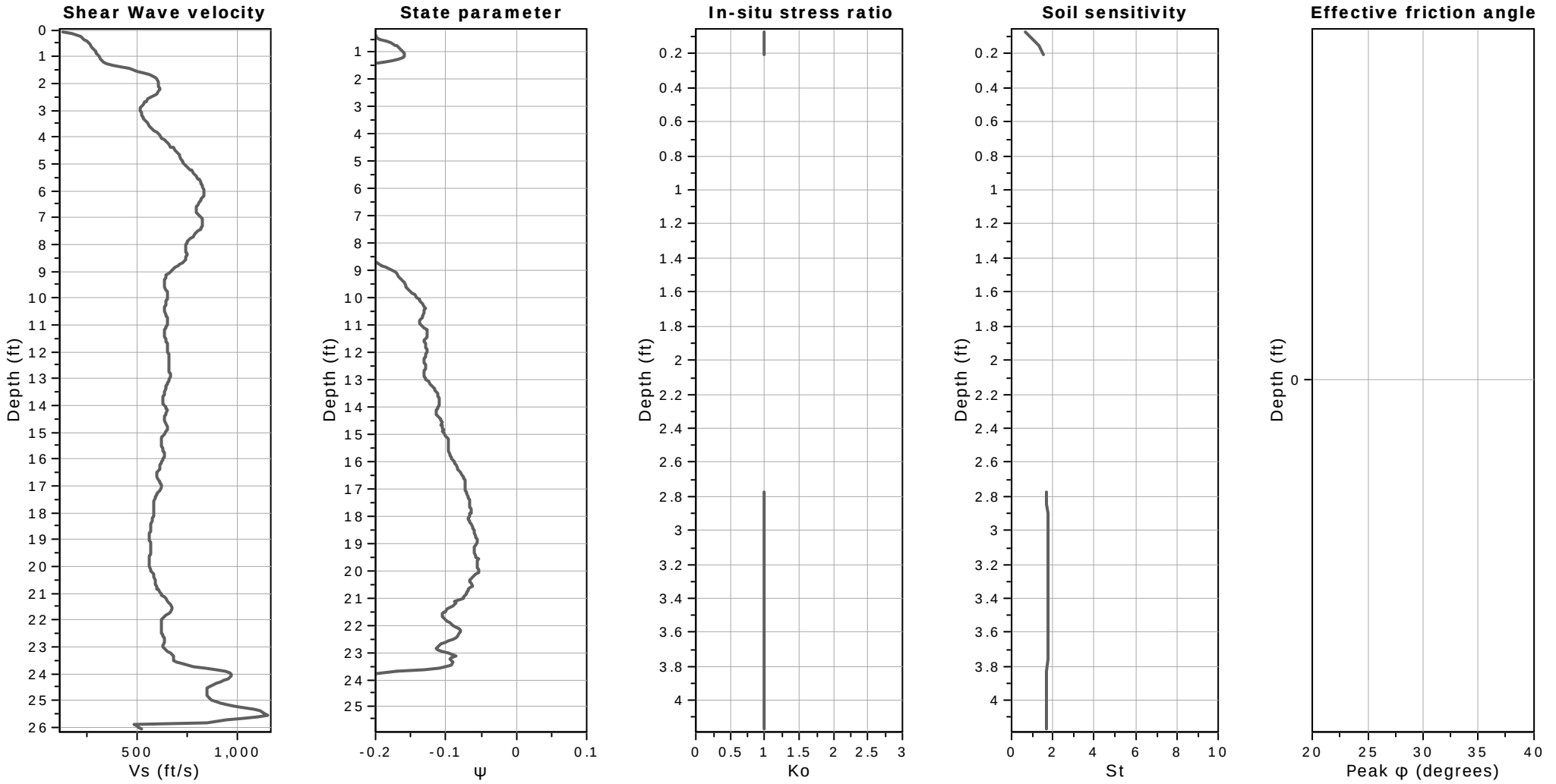
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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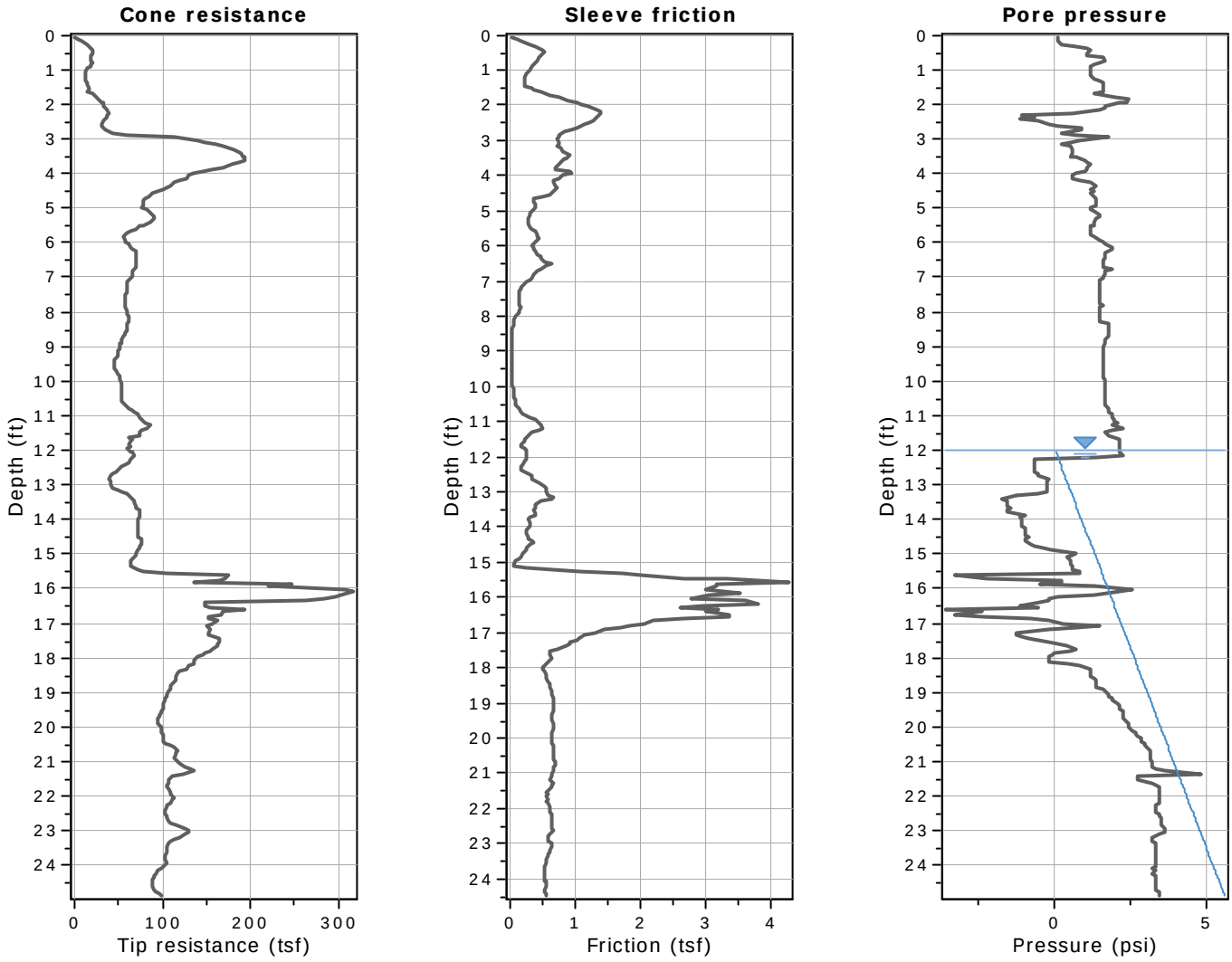
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

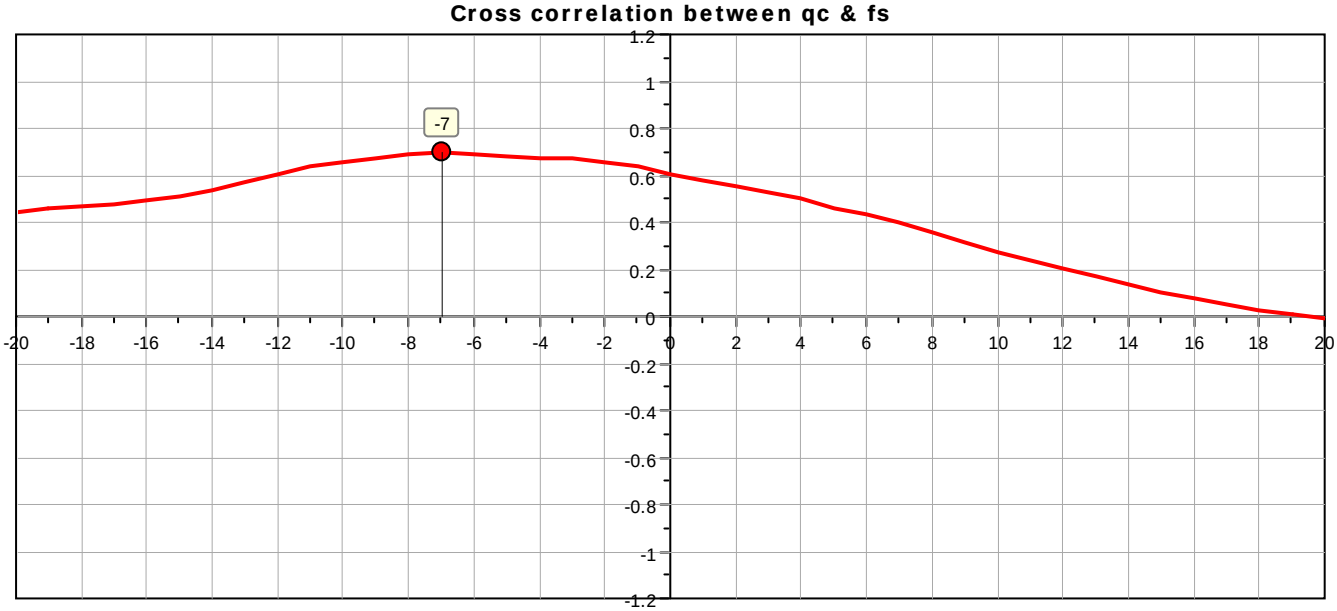
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CPT: 3
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Surface Elevation: 71.00 ft
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Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



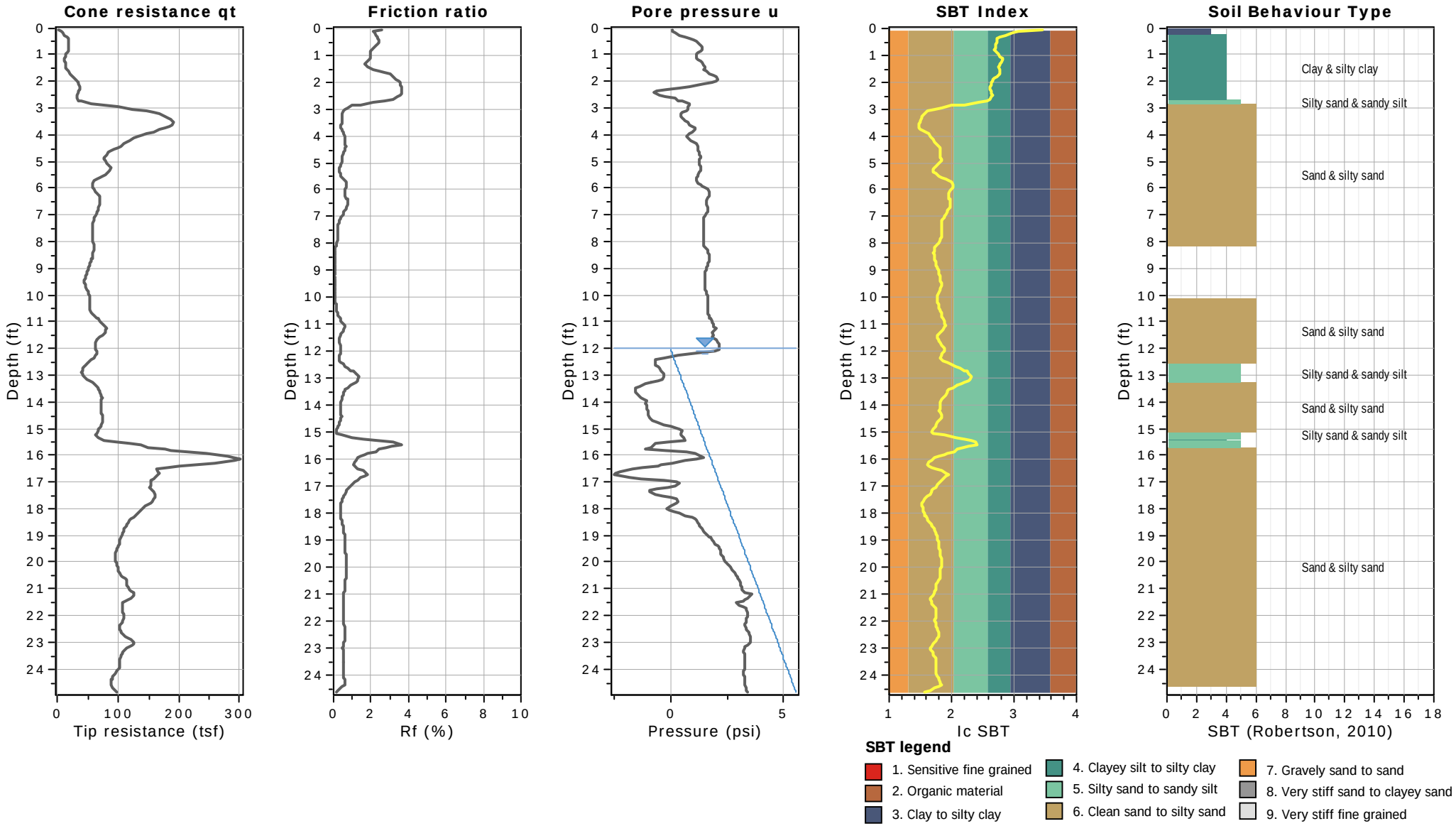
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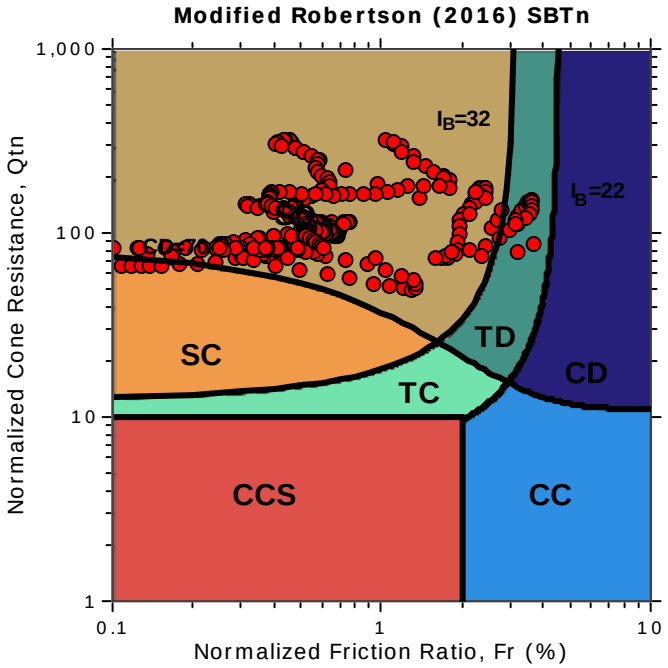


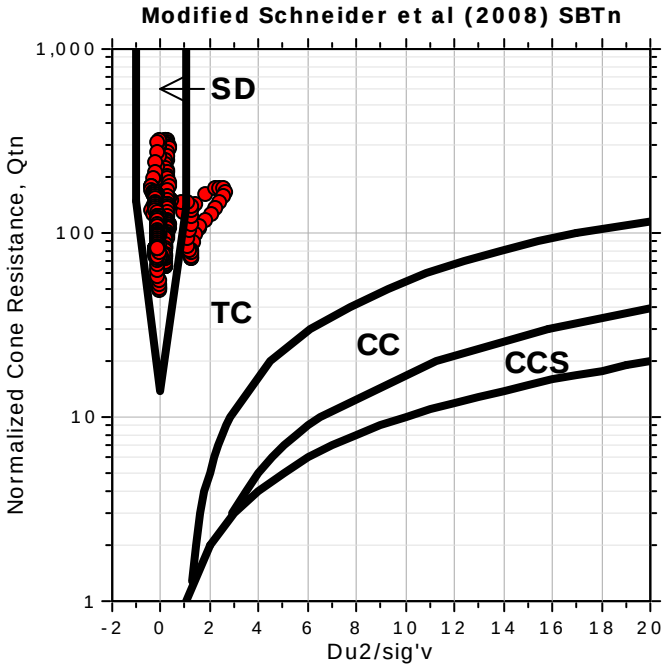
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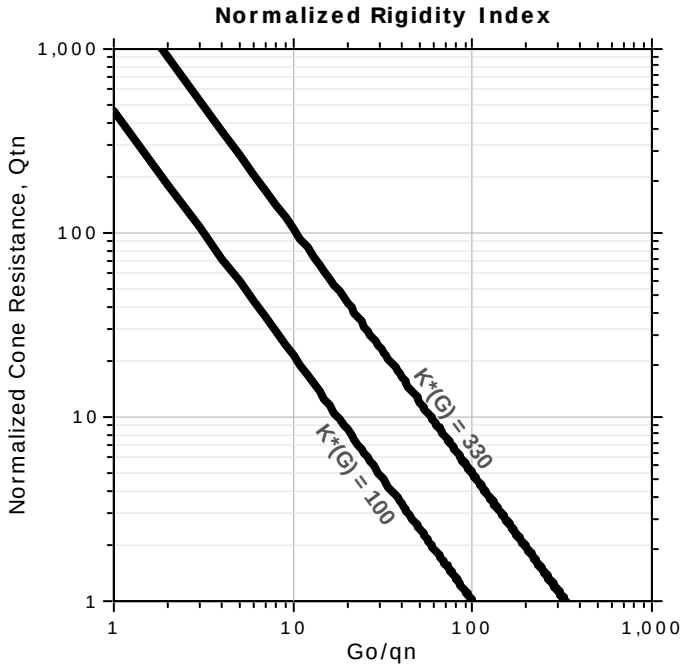
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Updated SBTn plots







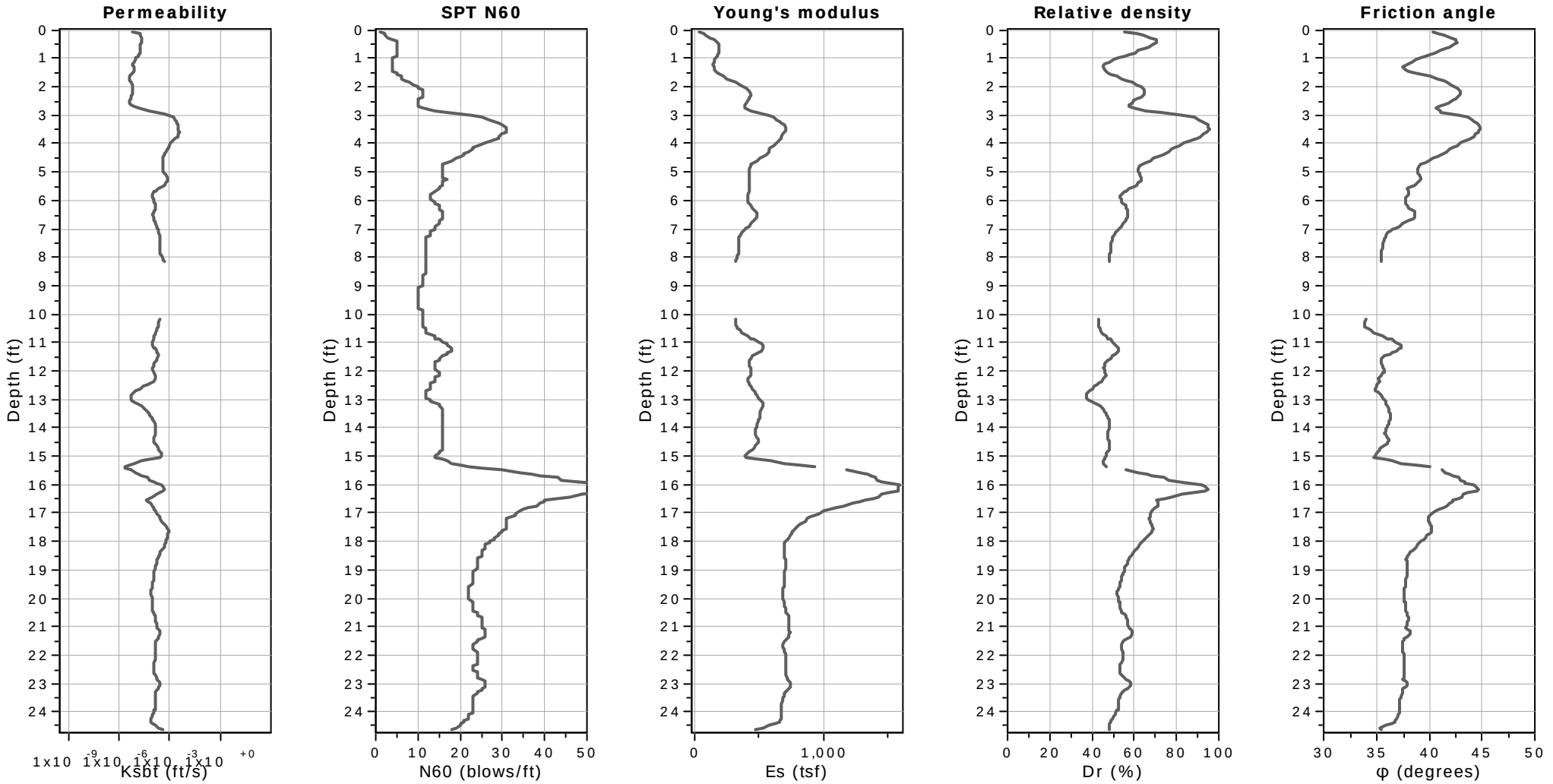
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
CD: Clay-like - Dilative
TC: Transitional - Contractive
TD: Transitional - Dilative
SC: Sand-like - Contractive
SD: Sand-like - Dilative

K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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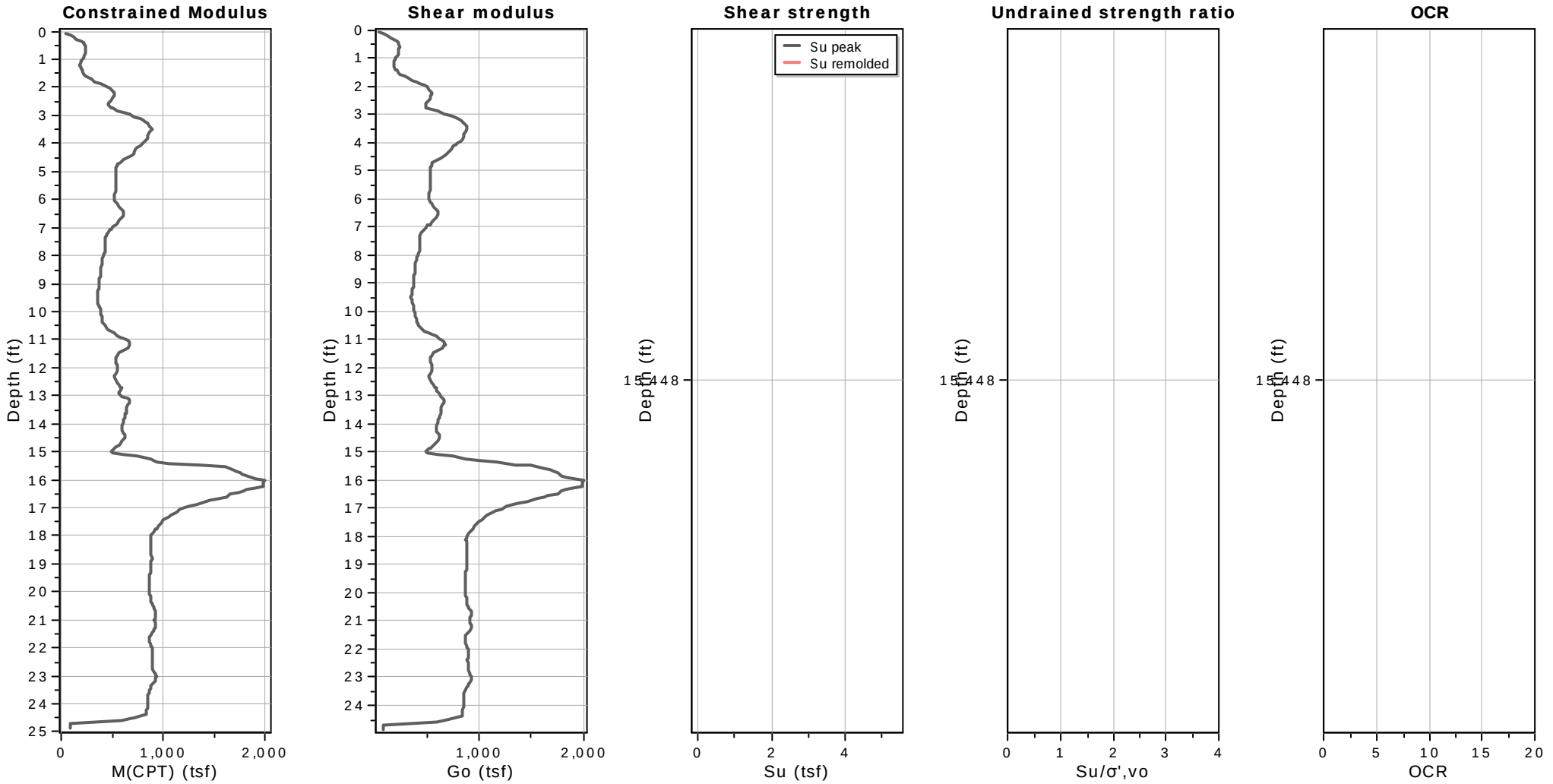
Calculation parameters

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
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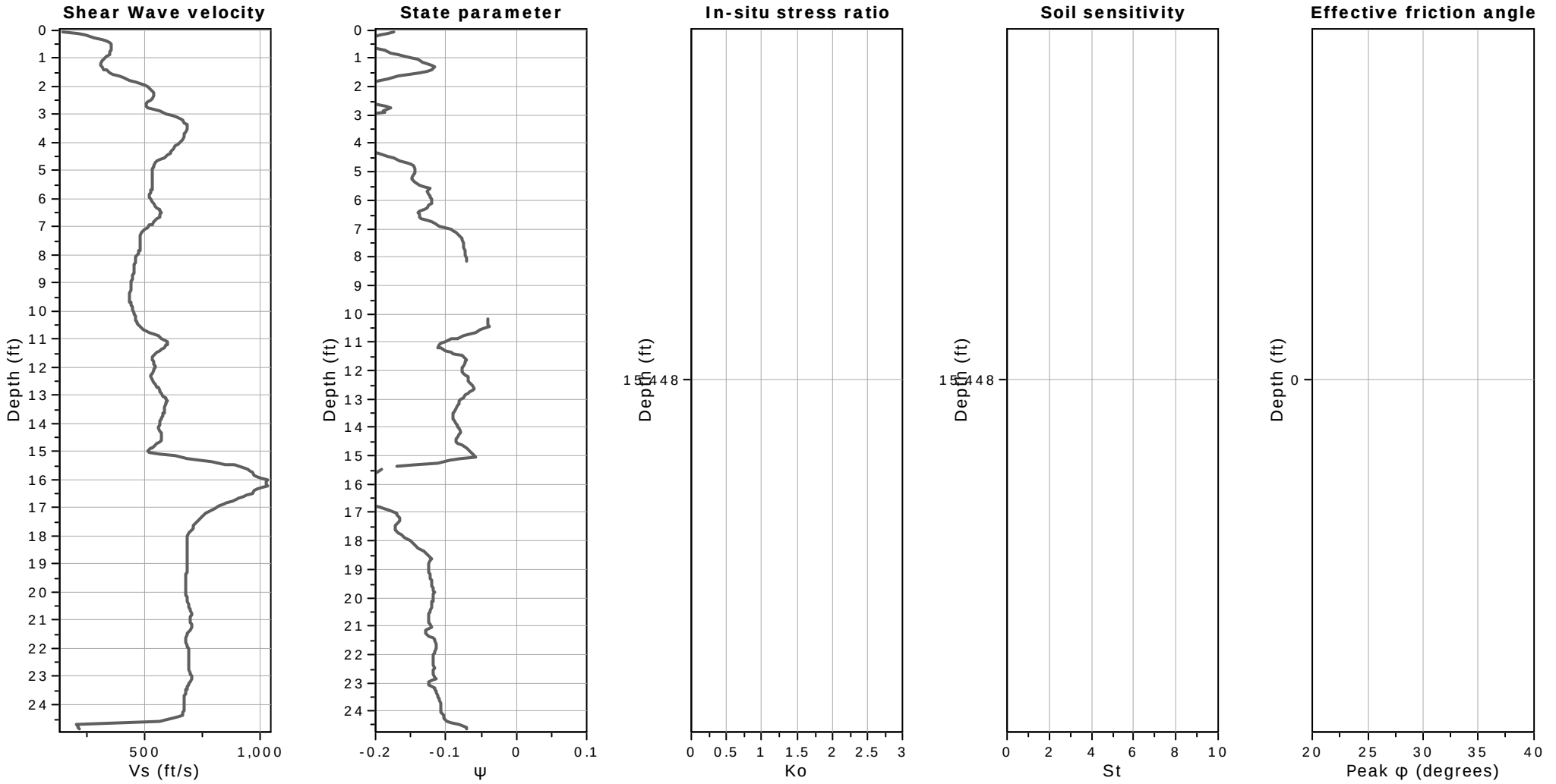
Calculation parameters

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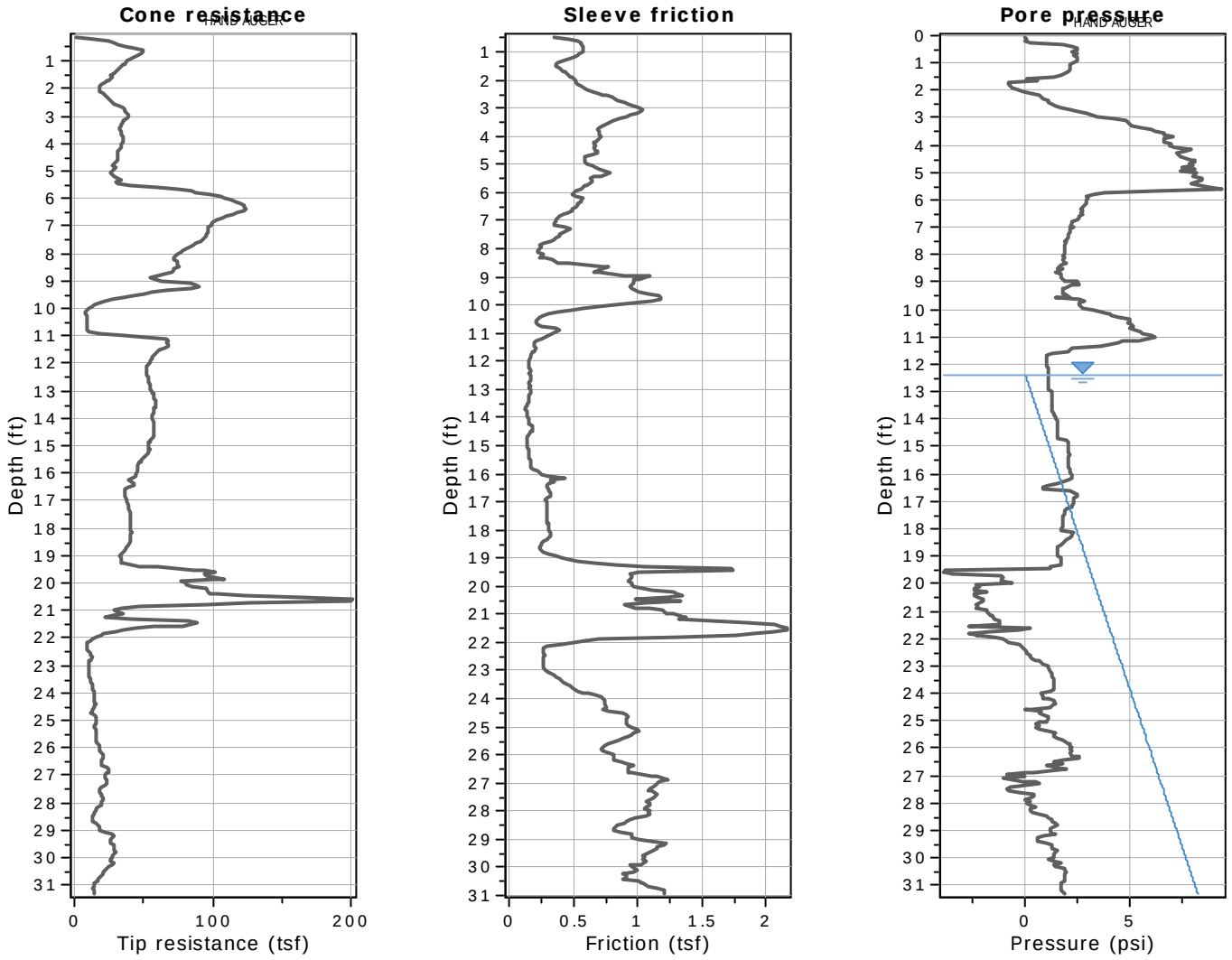
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

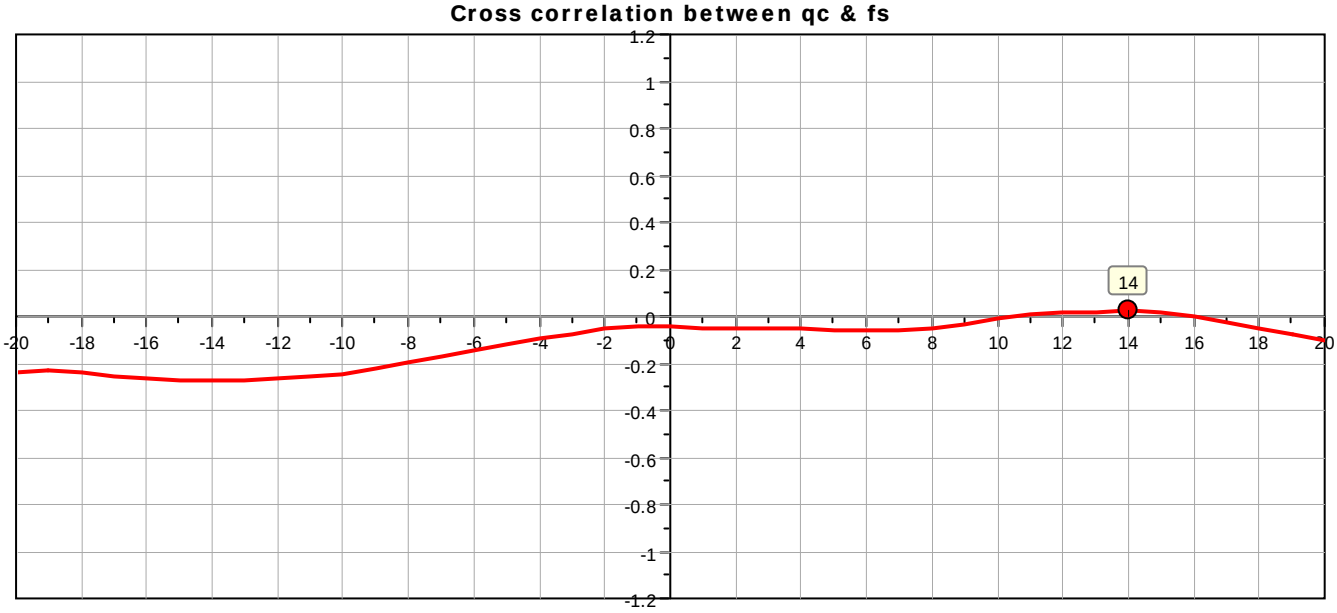
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CPT: 4
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Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



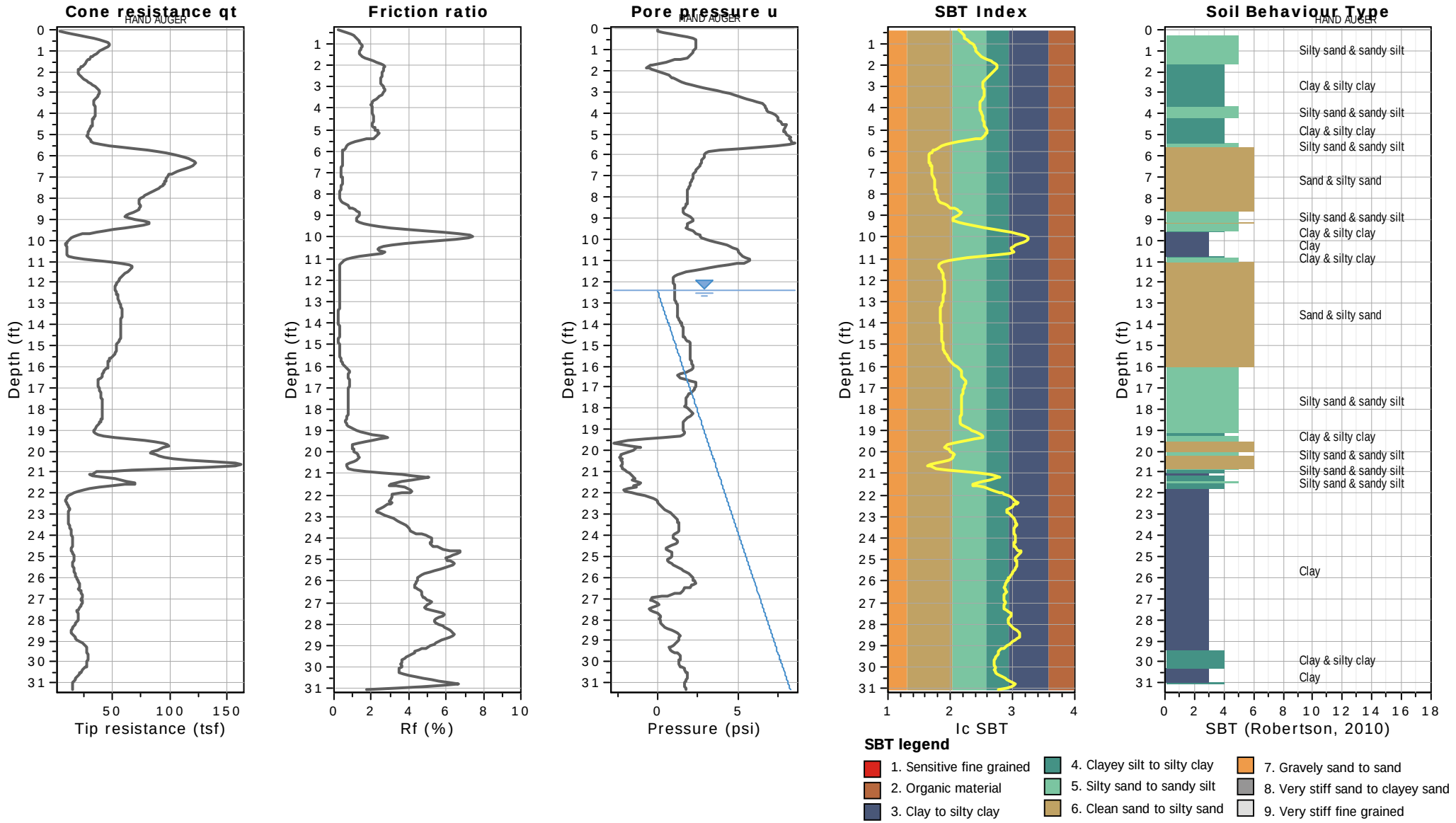
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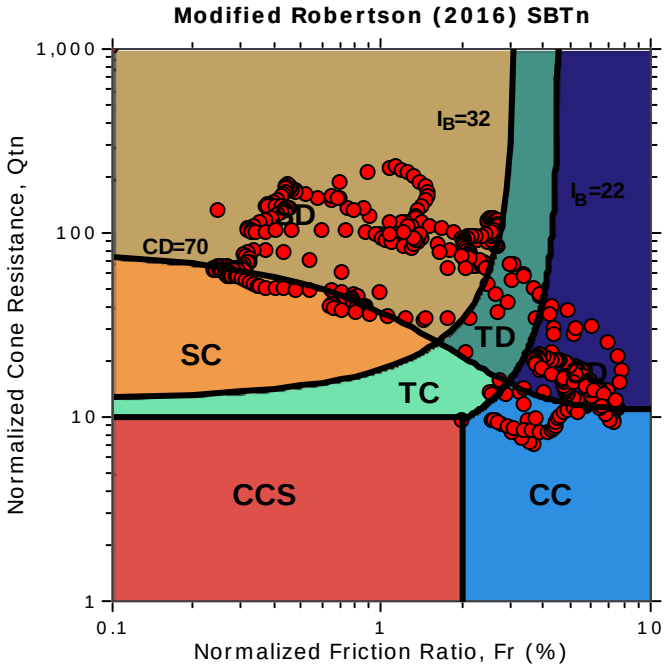


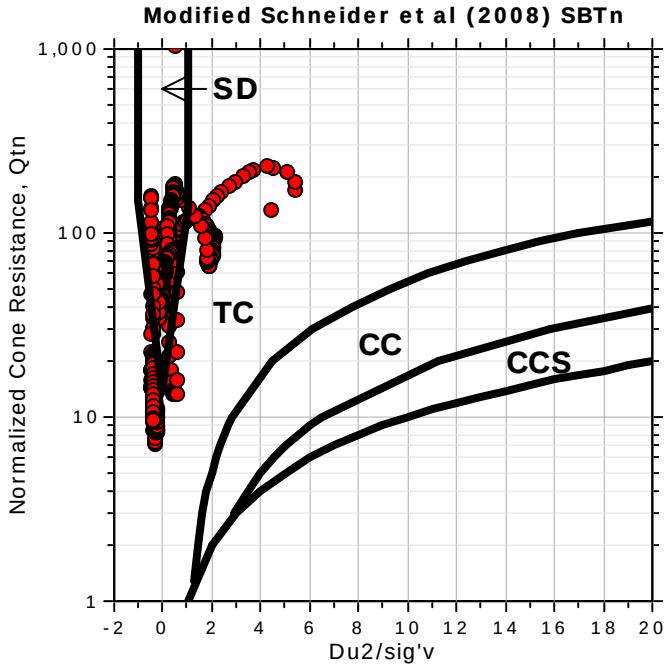
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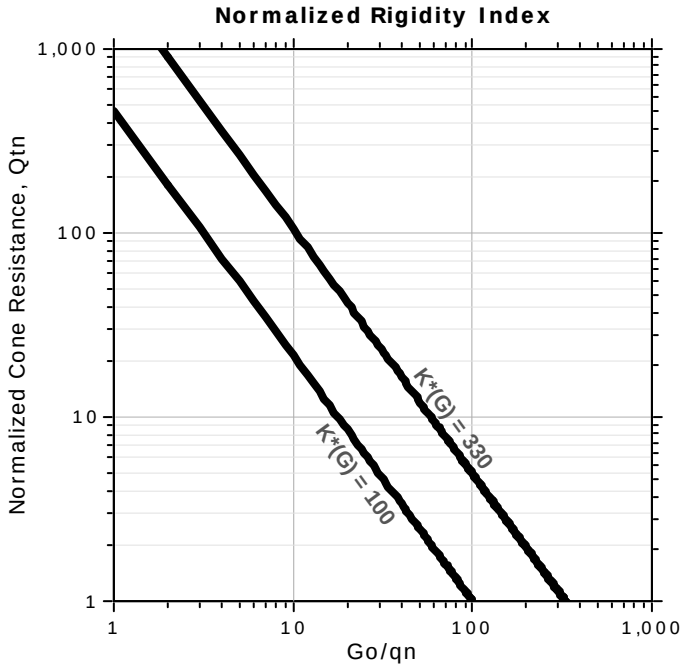
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Updated SBTn plots







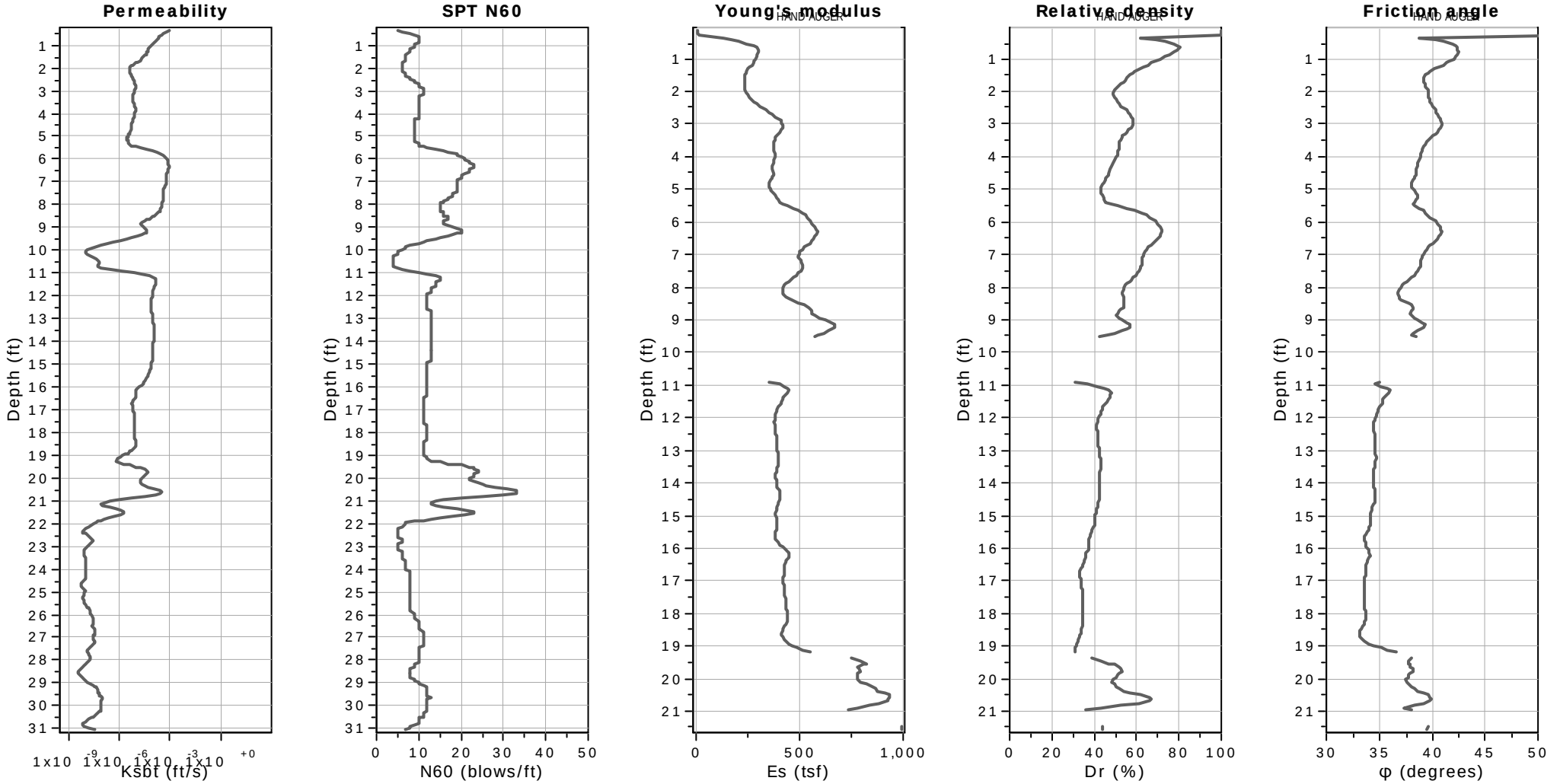
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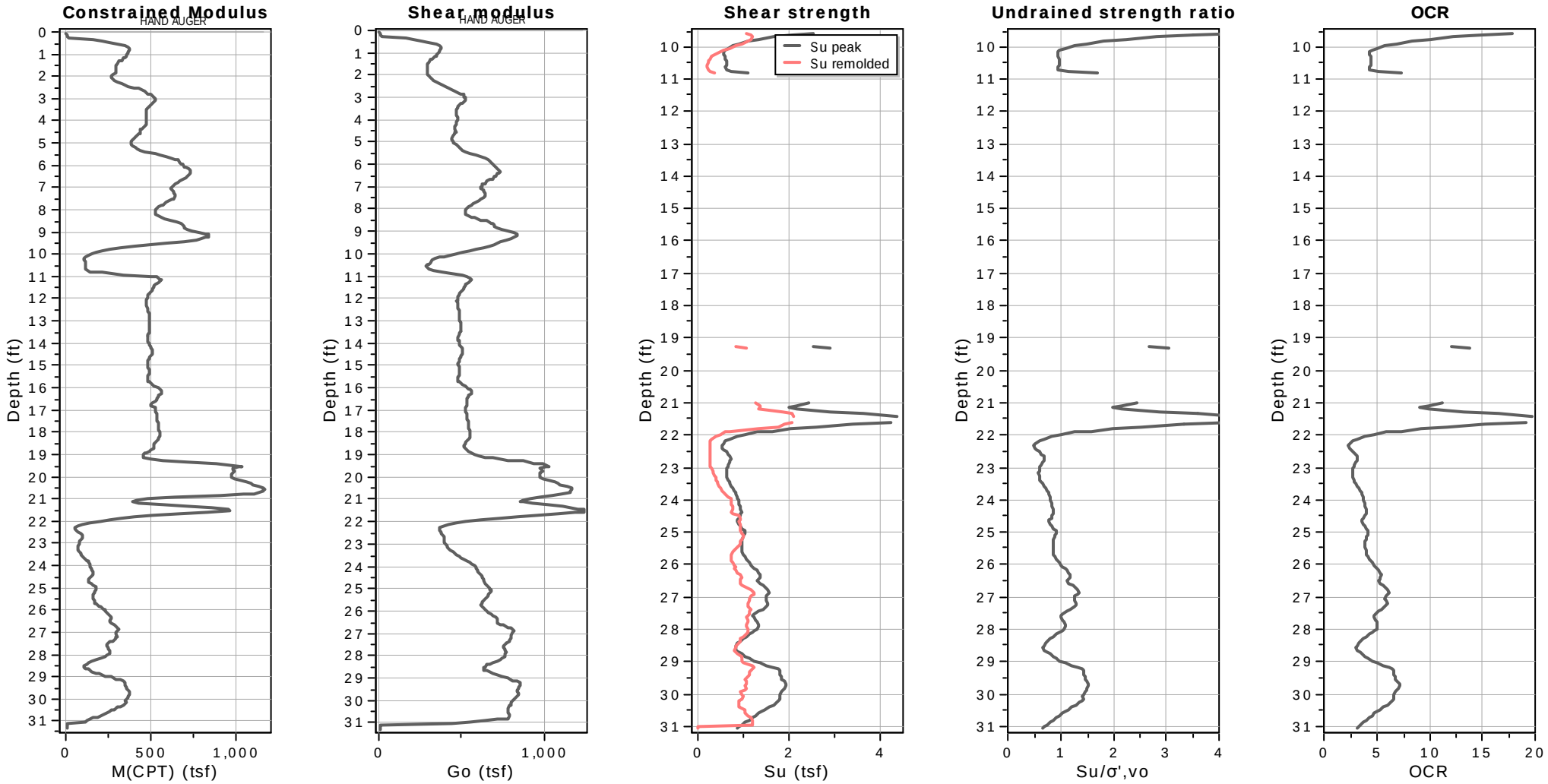
Calculation parameters

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
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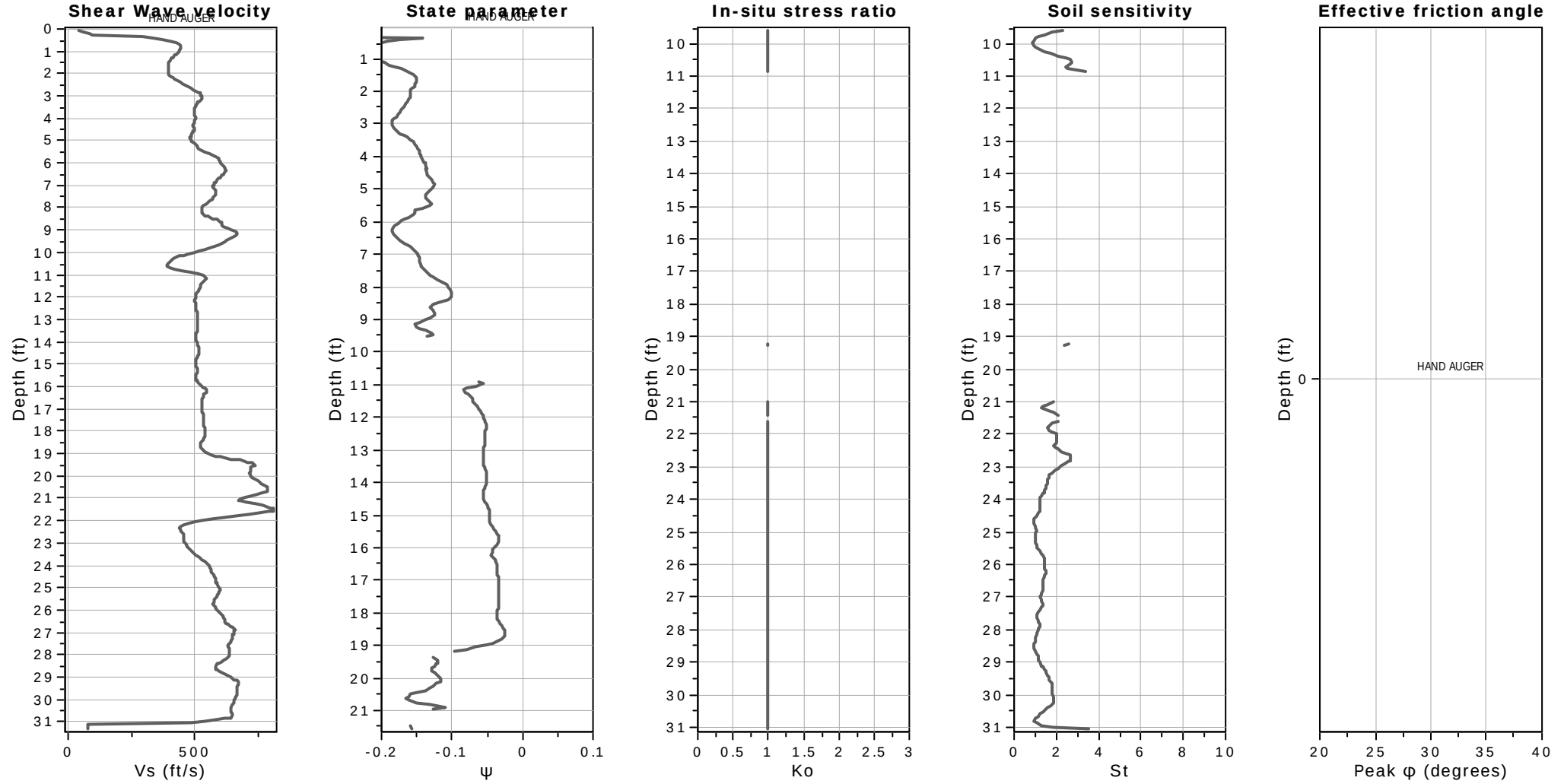
Calculation parameters

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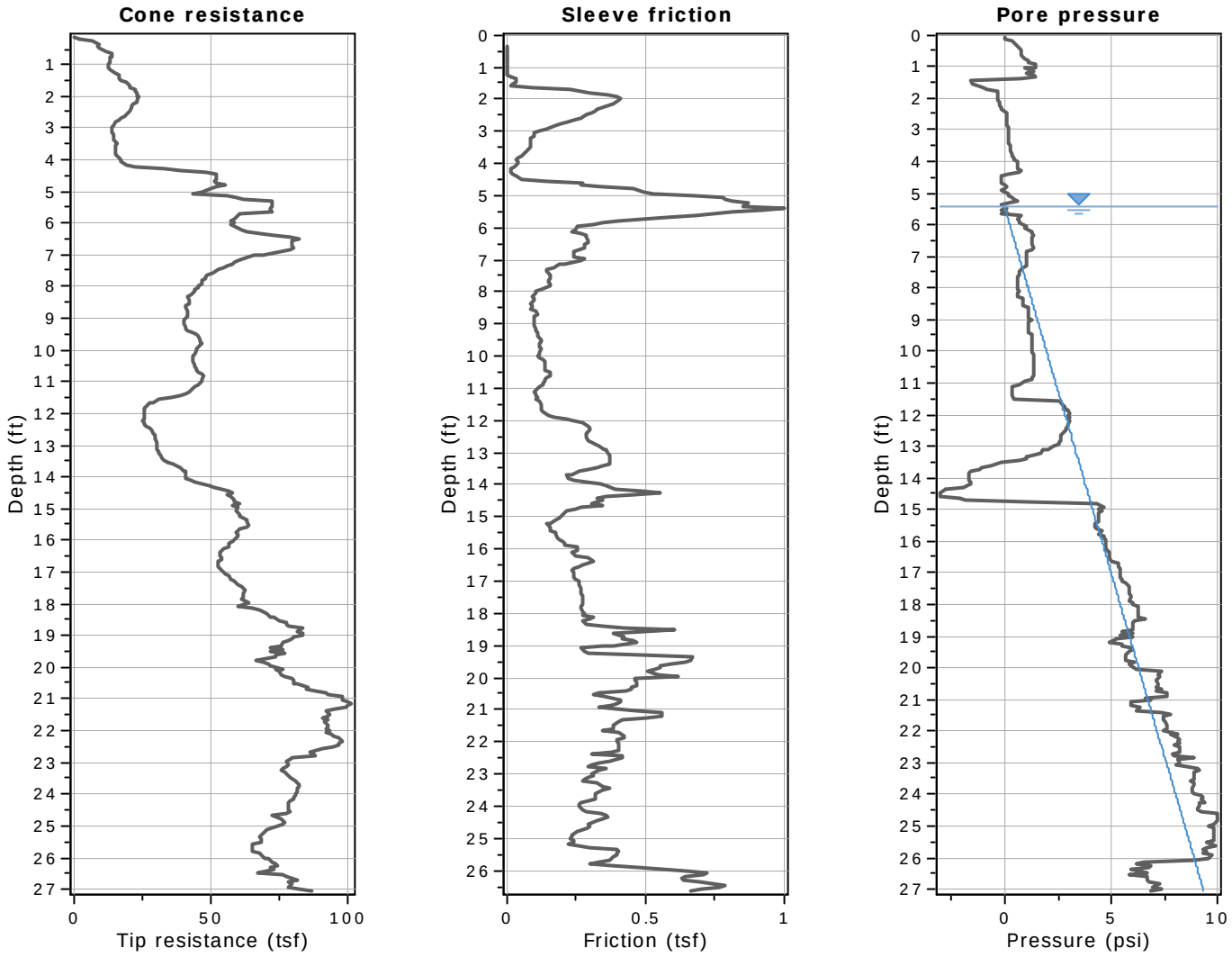
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

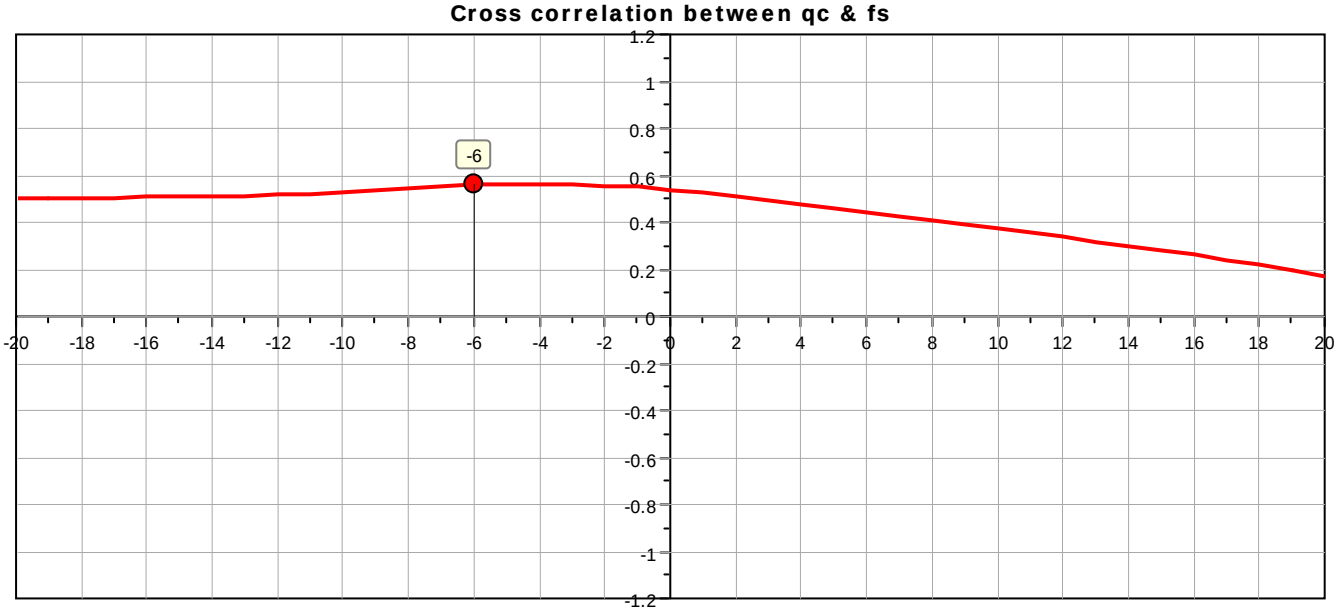
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CPT: 5
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Surface Elevation: 73.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



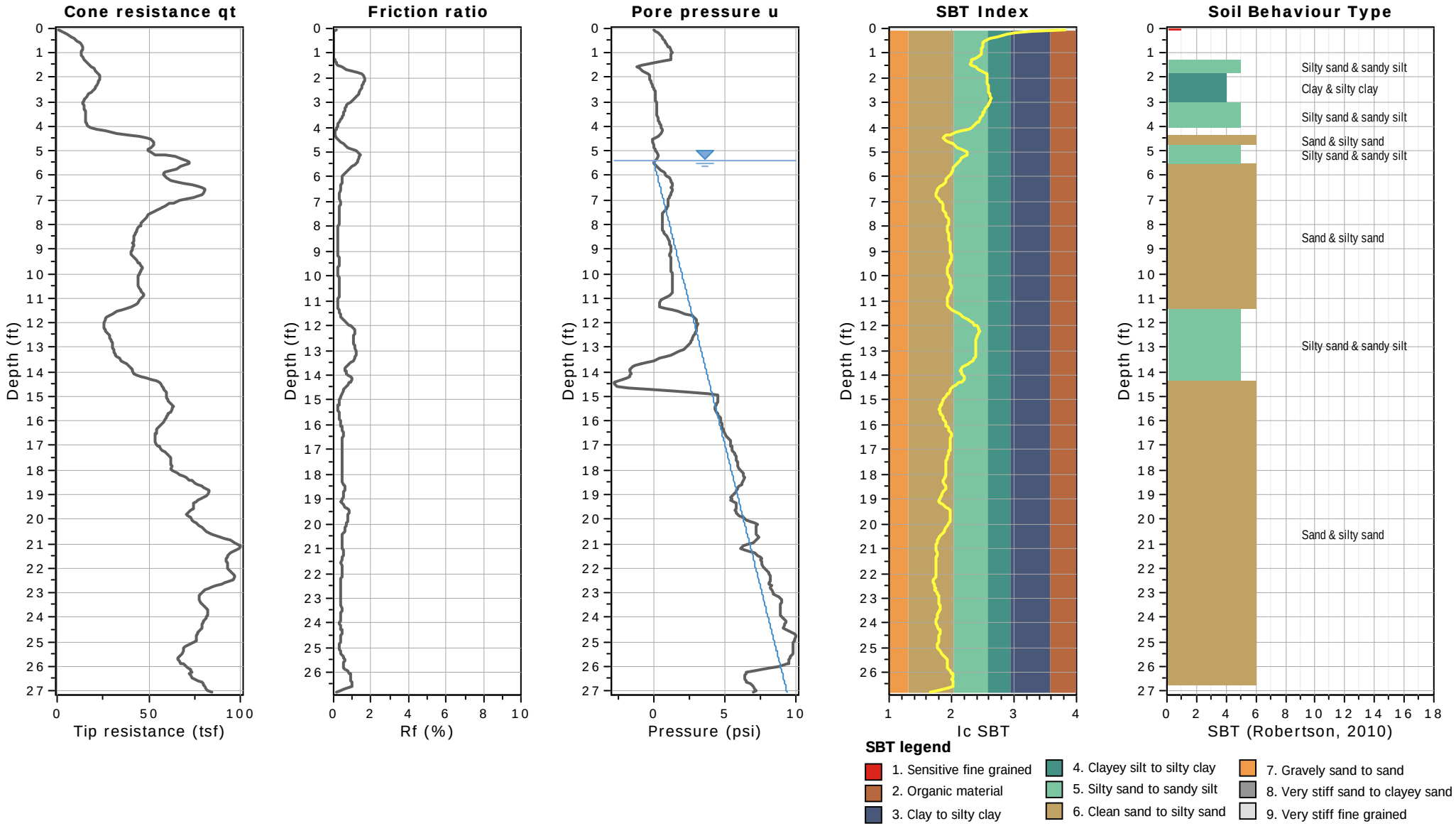
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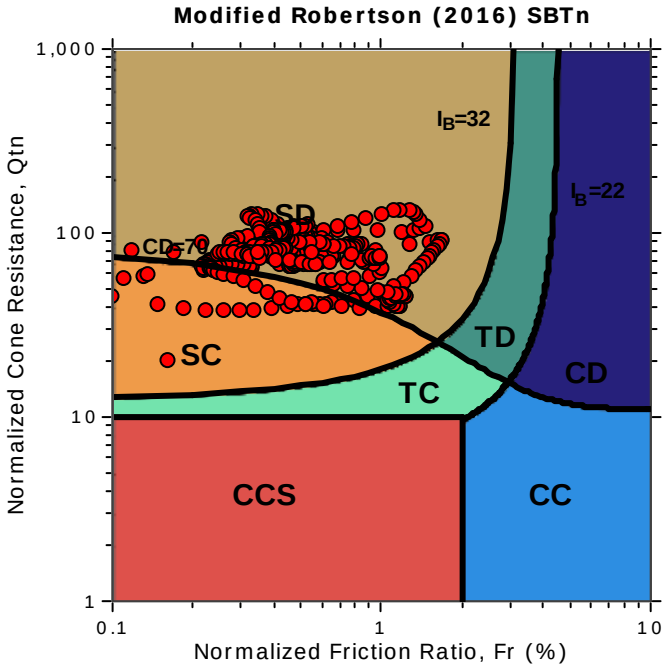


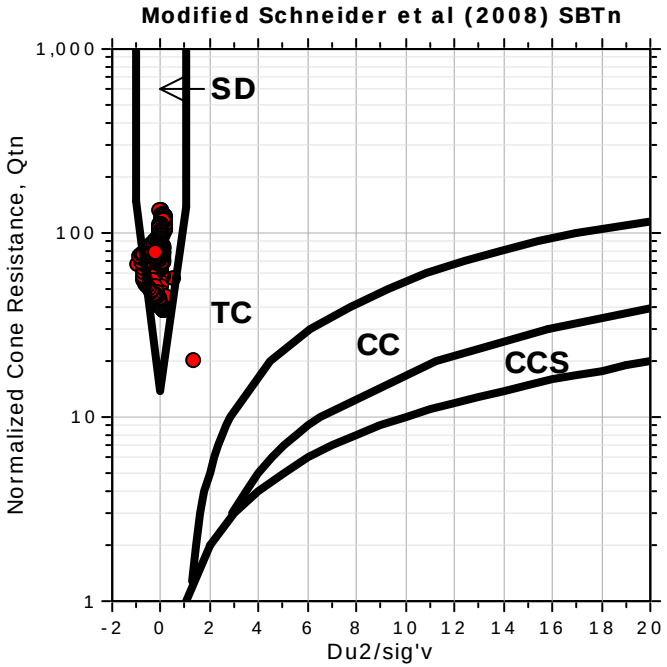
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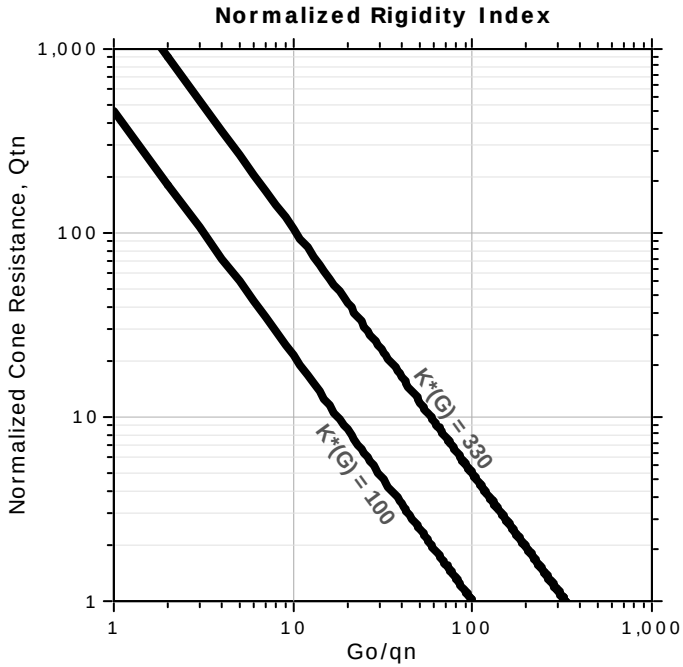
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Updated SBTn plots







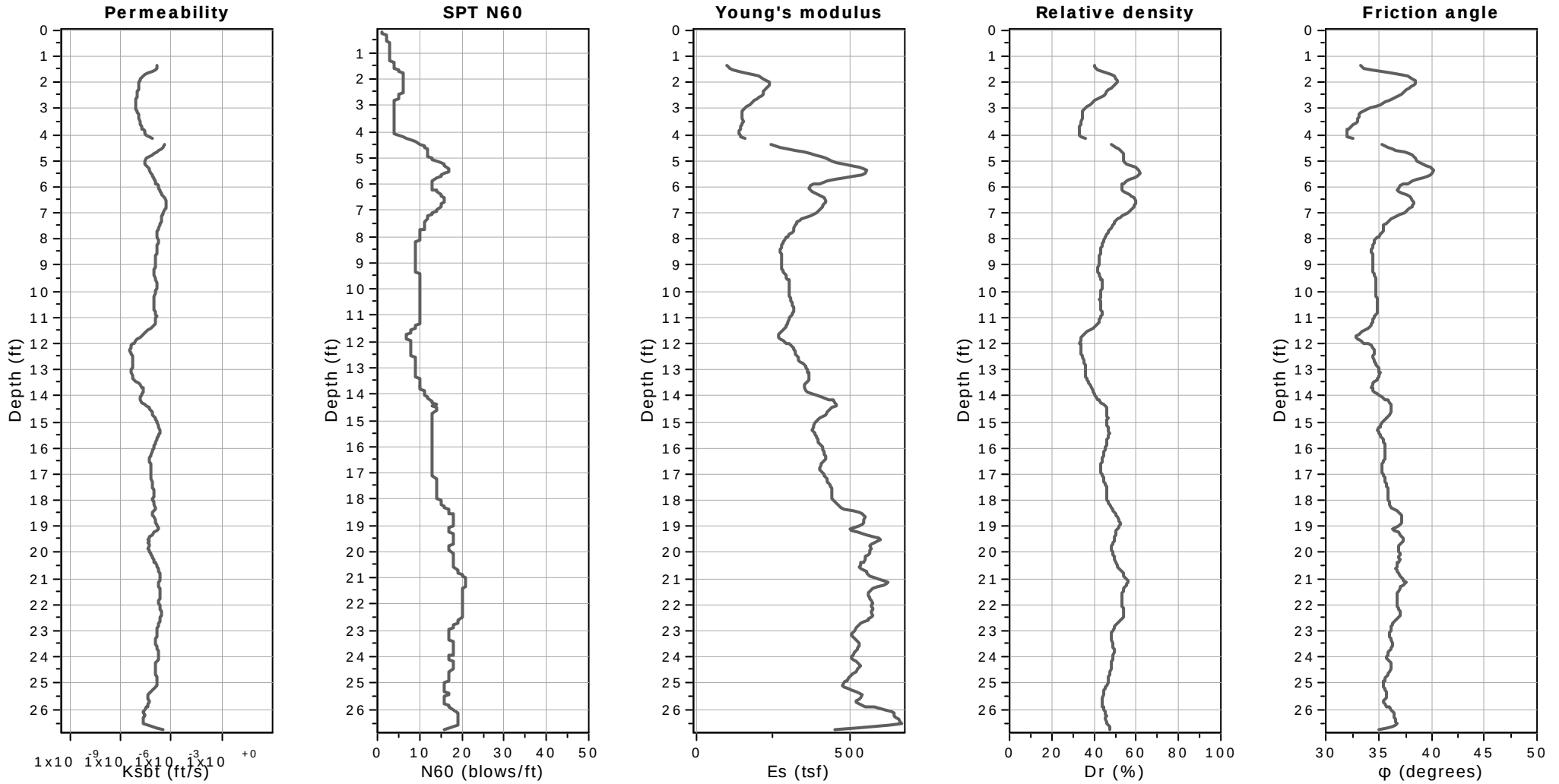
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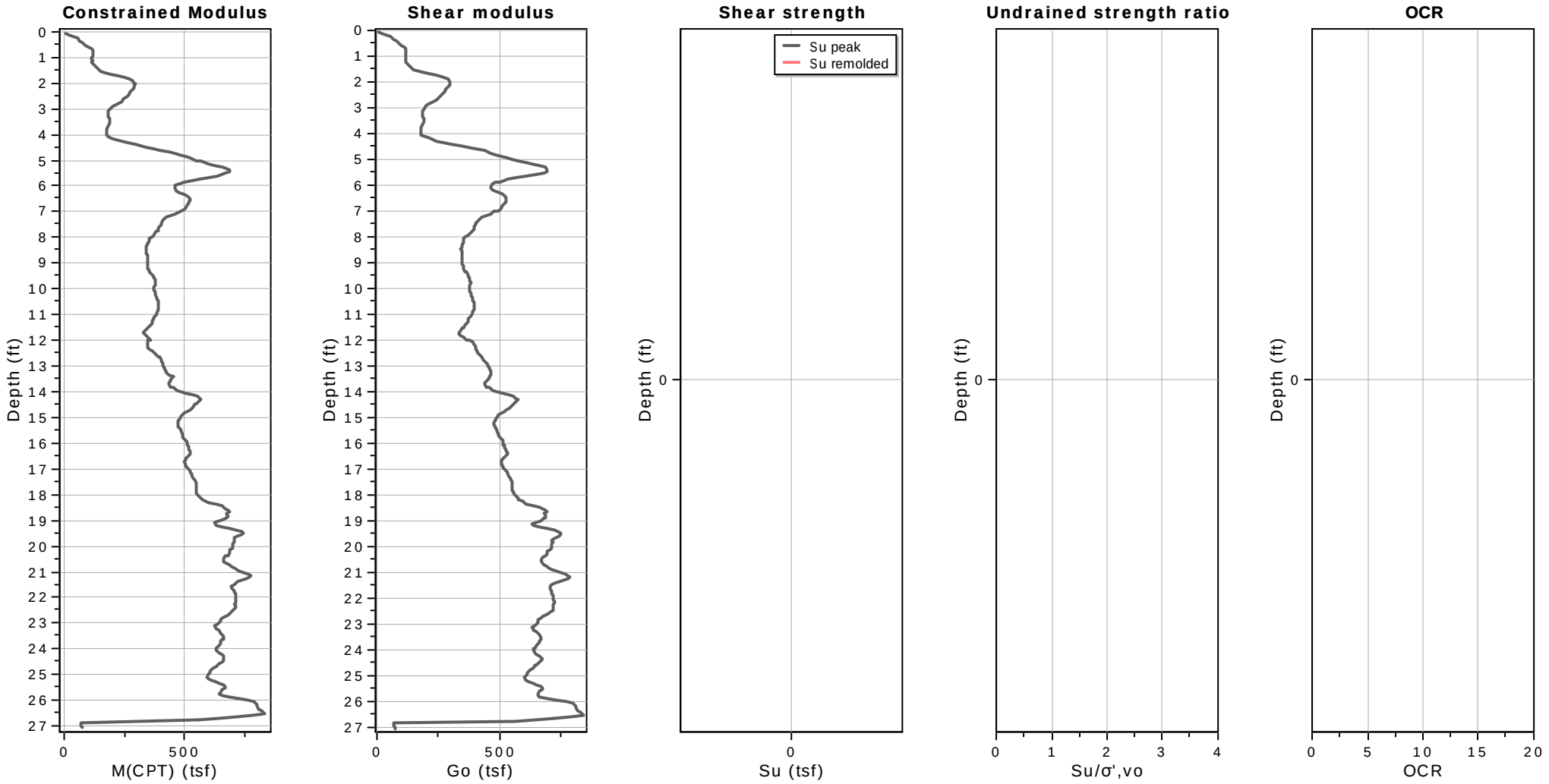
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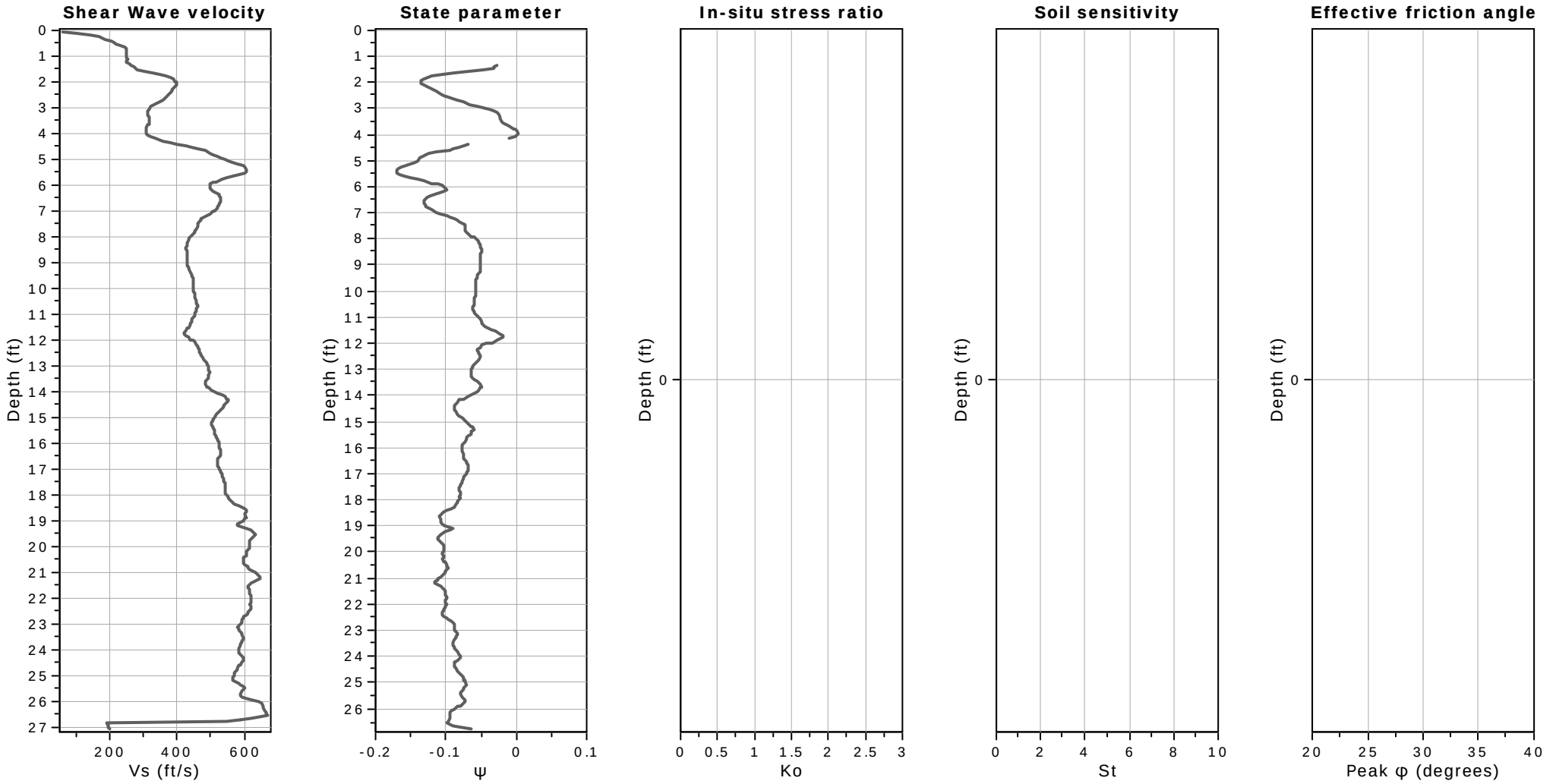
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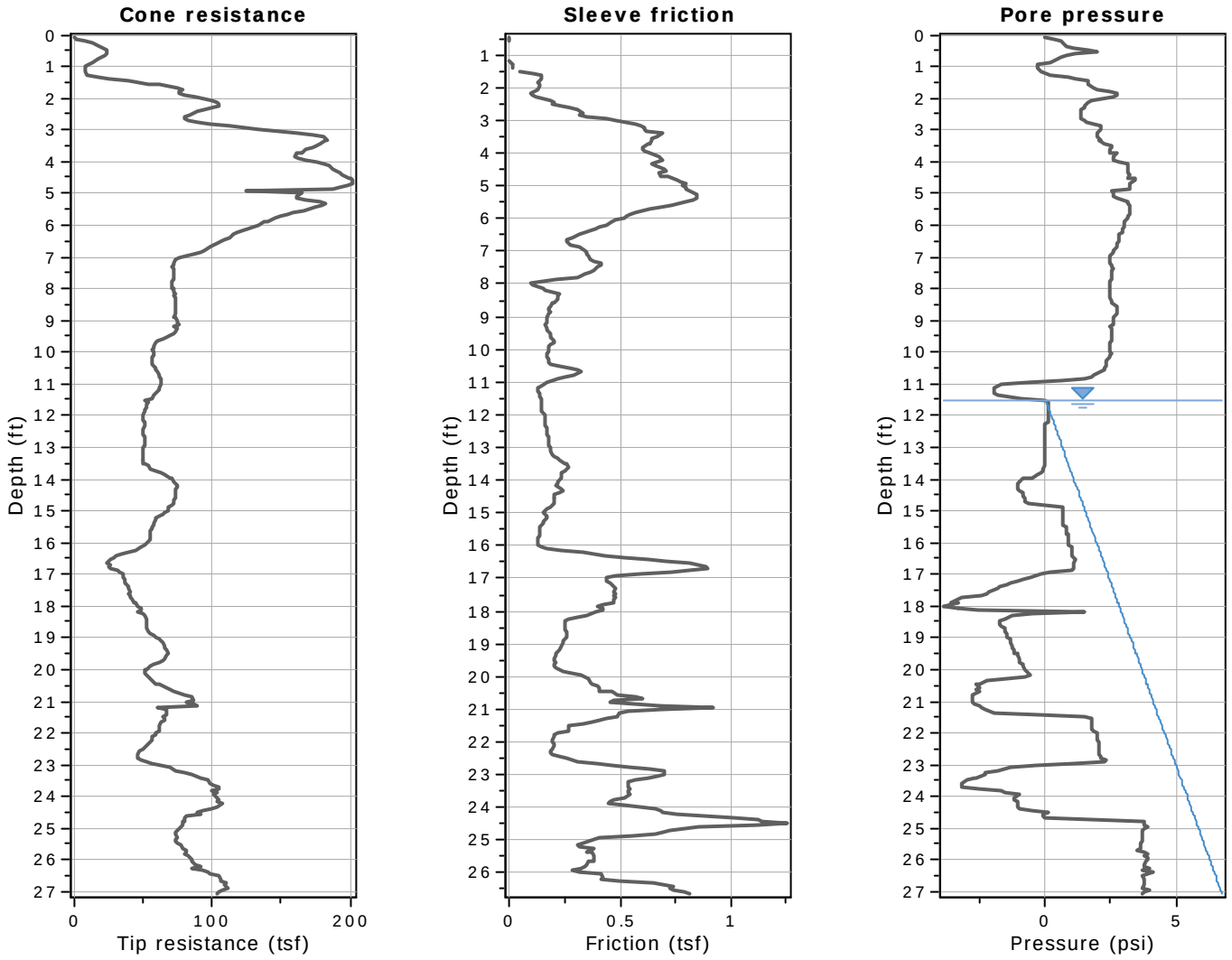
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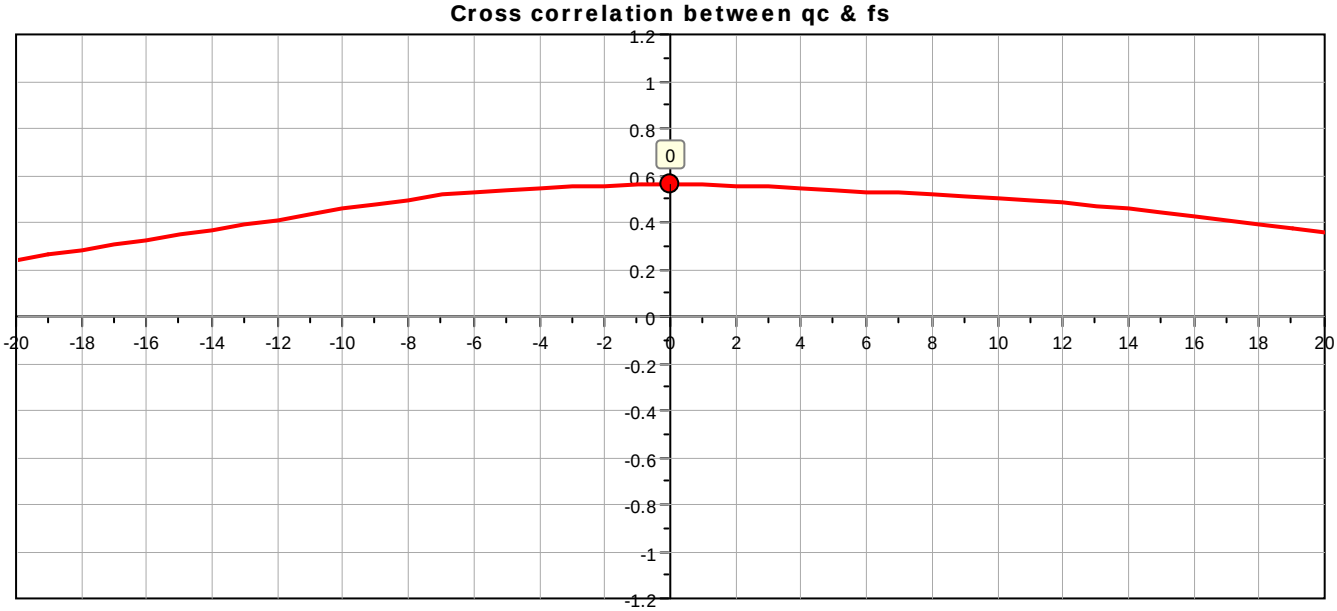
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GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 6
Total depth: 27.06 ft, Date: 4/20/2022
Surface Elevation: 78.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



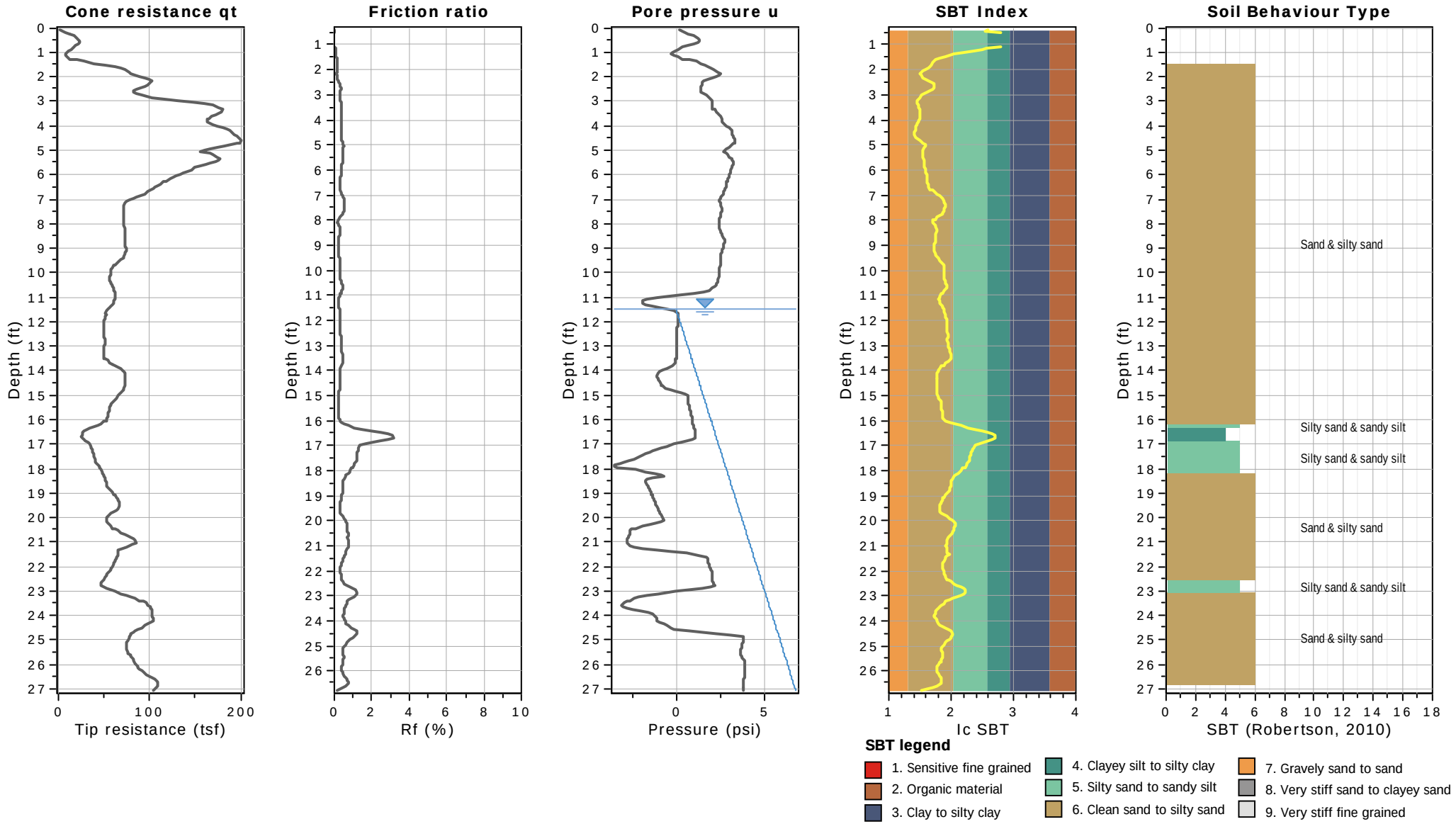
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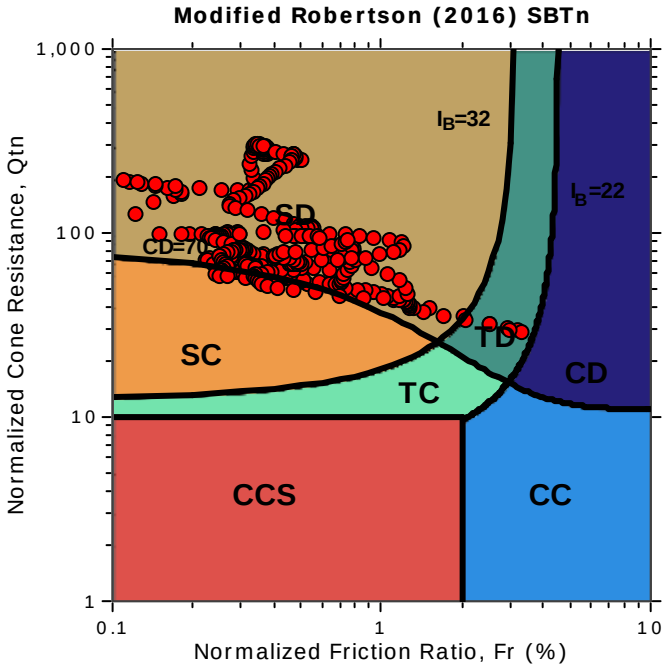


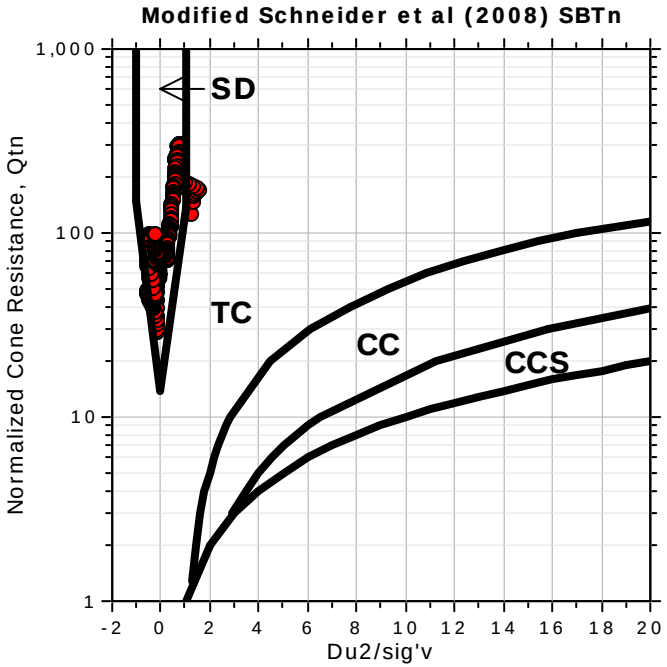
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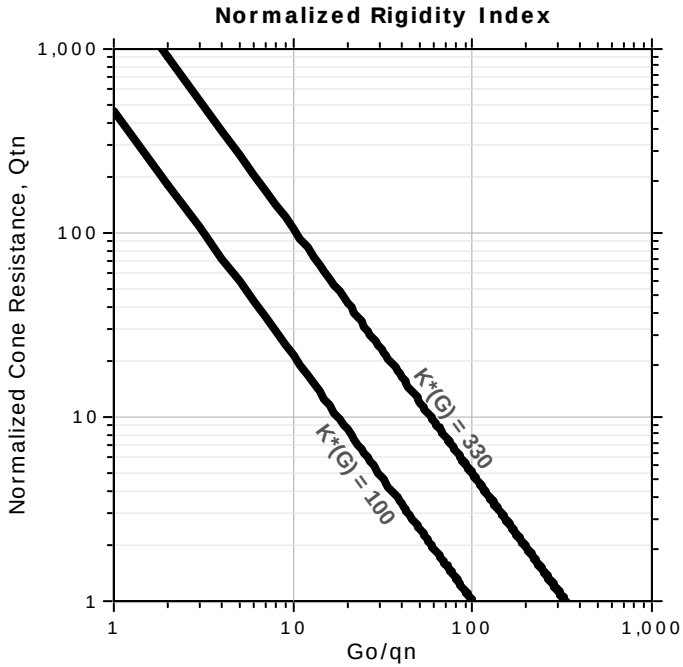
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Updated SBTn plots







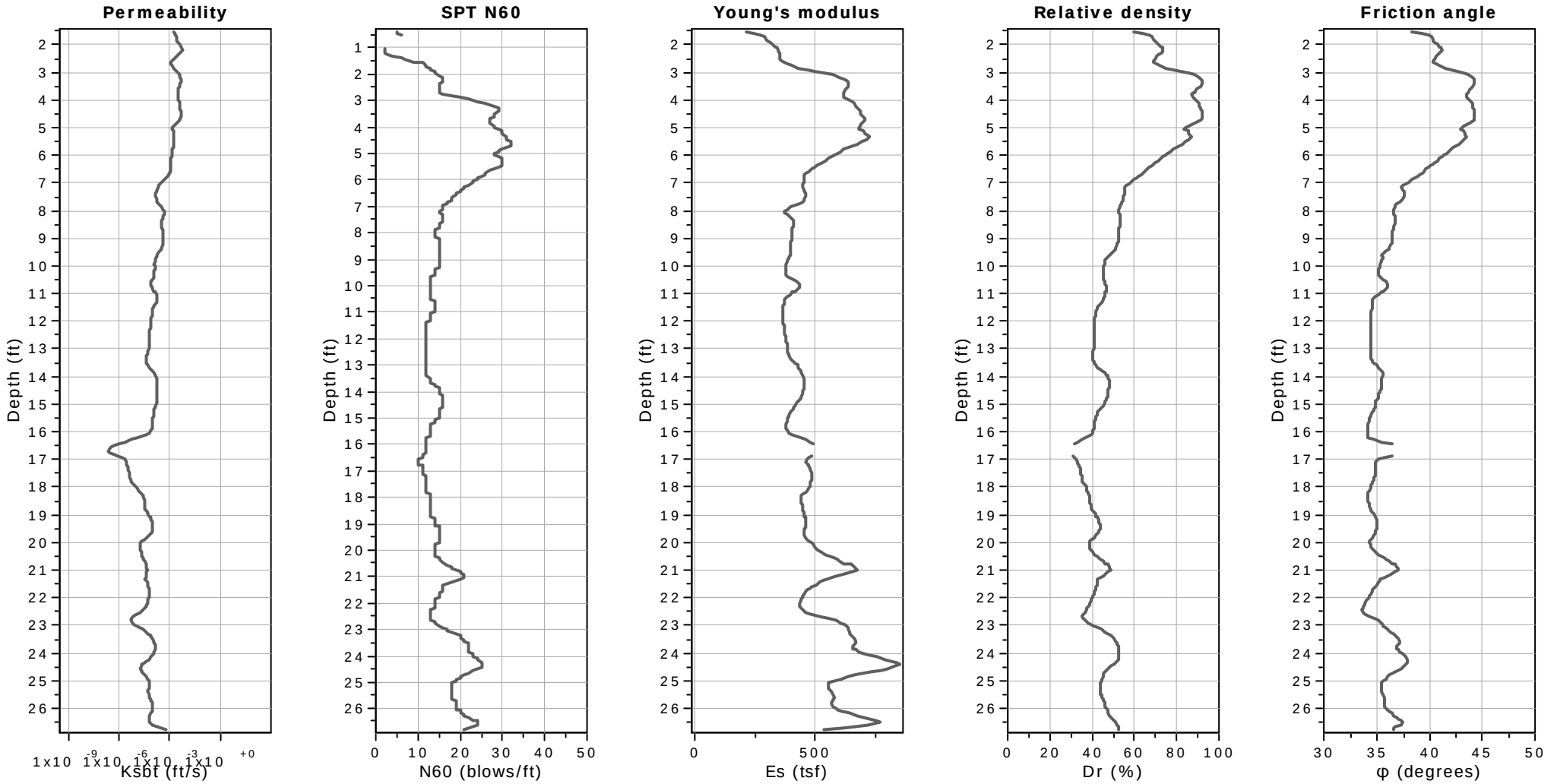
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CC: Clay-like - Contractive
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K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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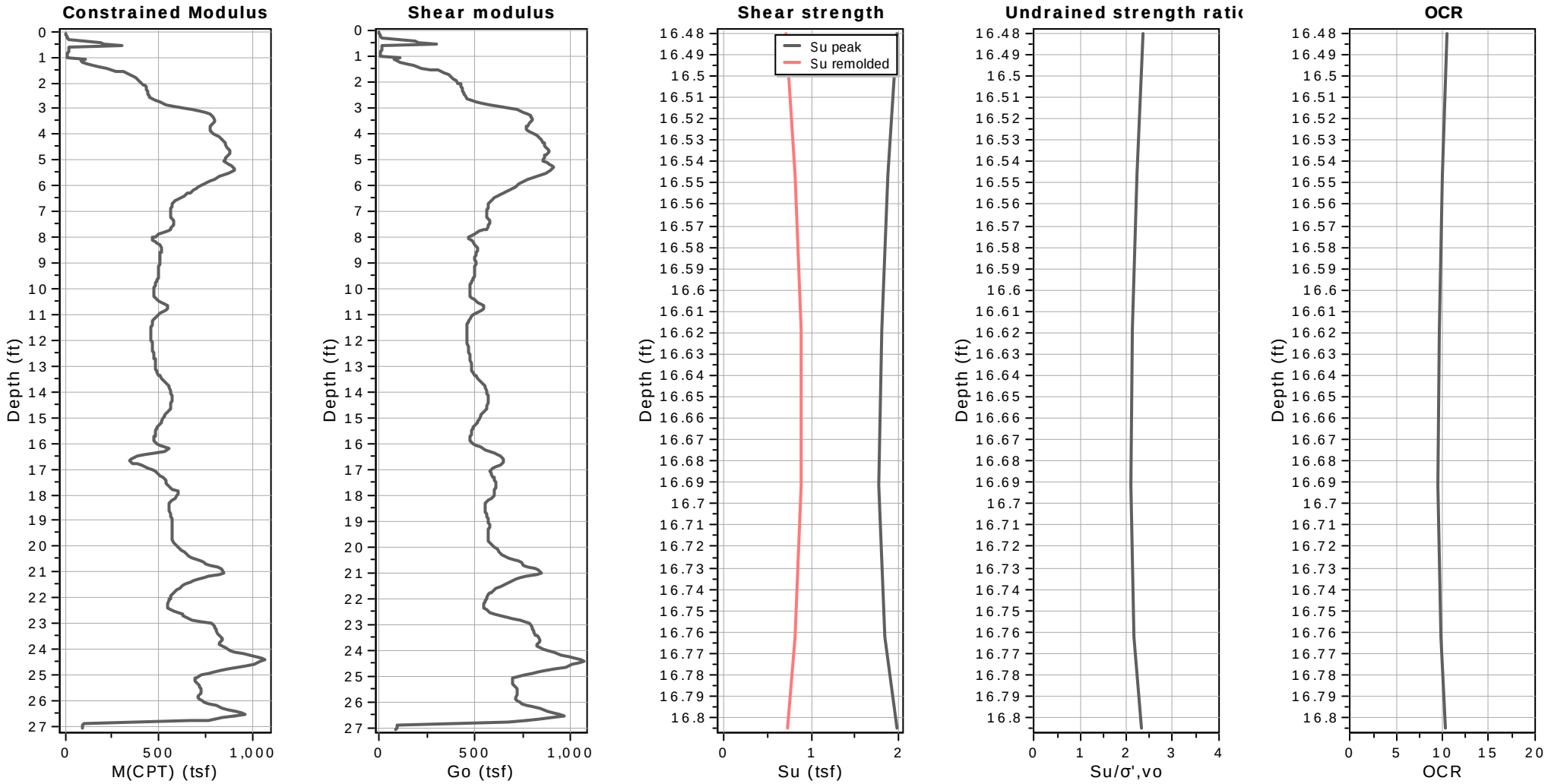
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
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Relative density constant, C_{Dr}: 350.0
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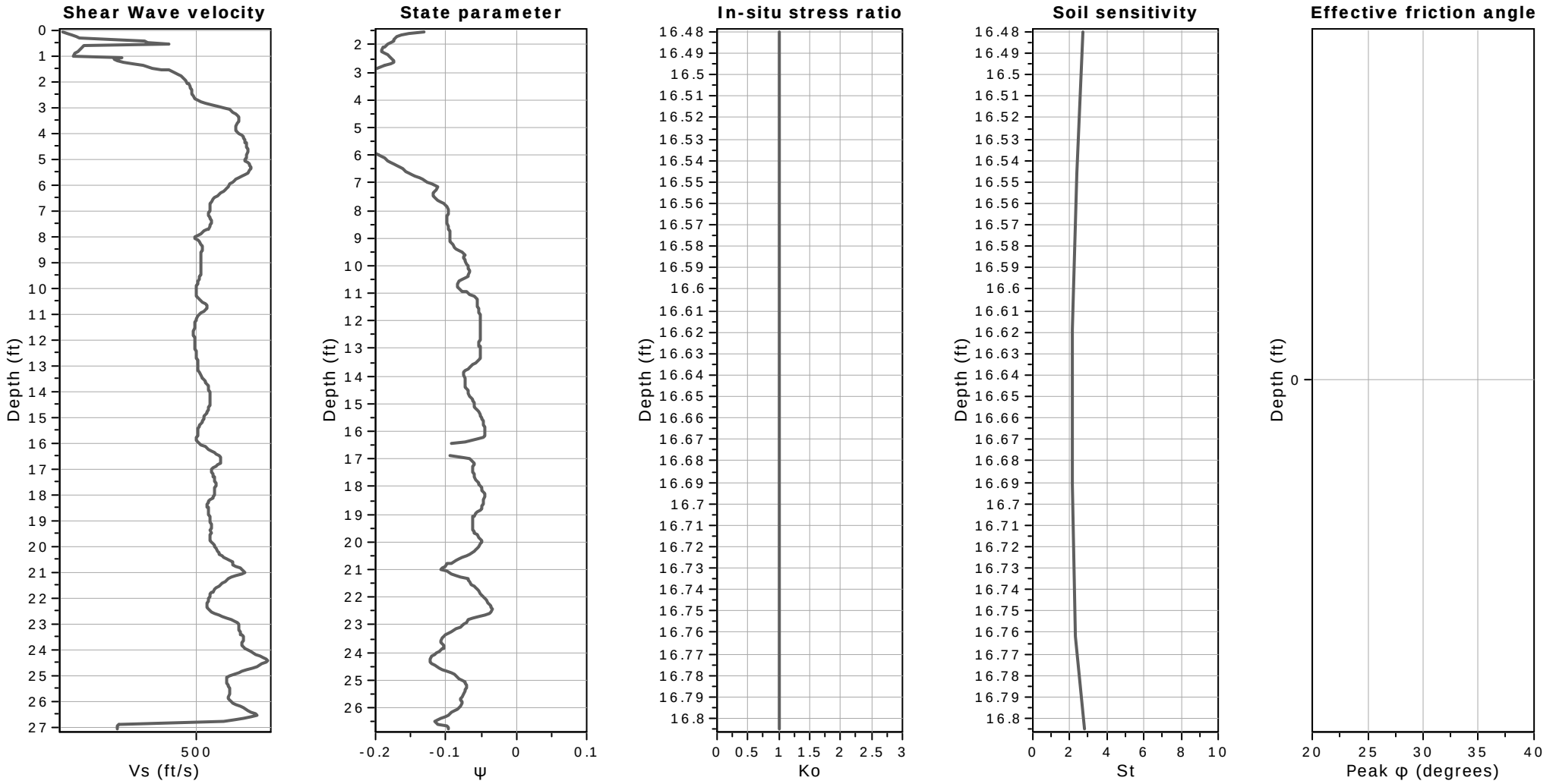
Calculation parameters

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
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User defined estimation data
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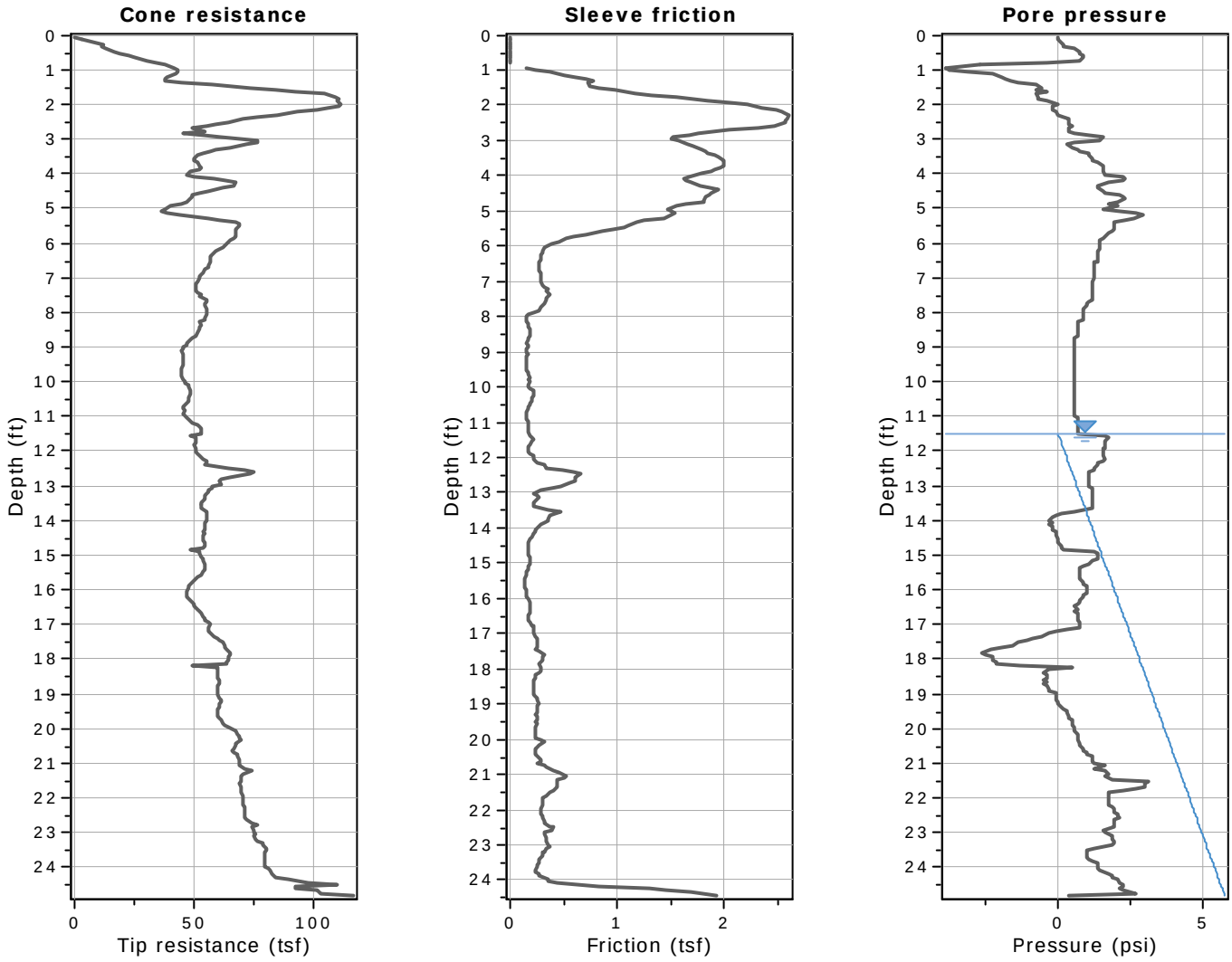
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

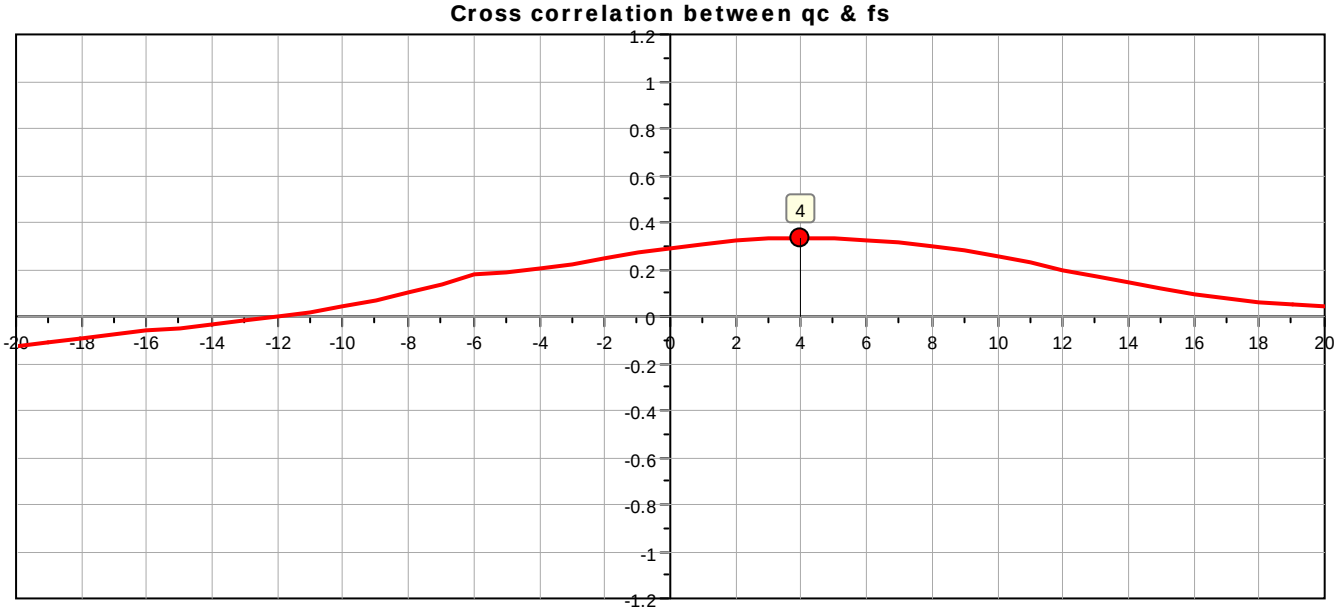
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CPT: 7
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Surface Elevation: 79.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

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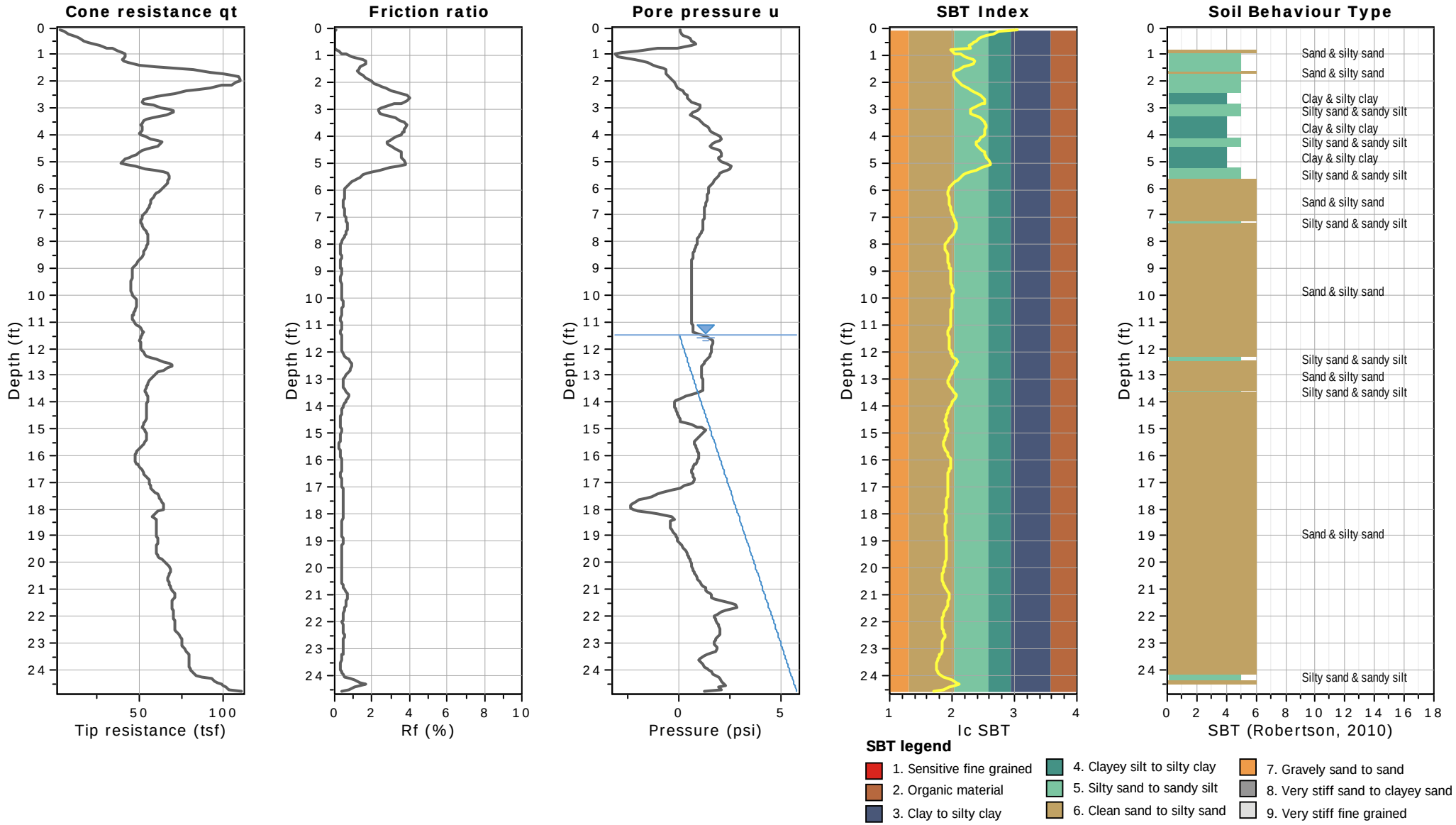
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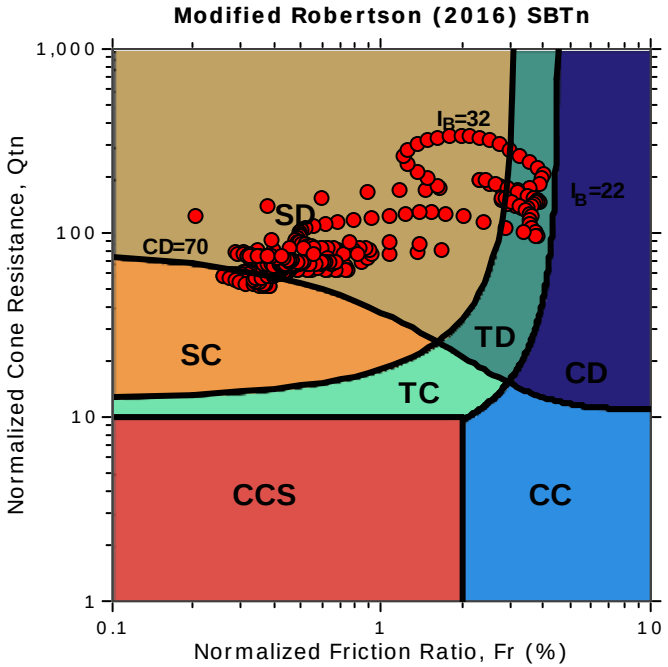


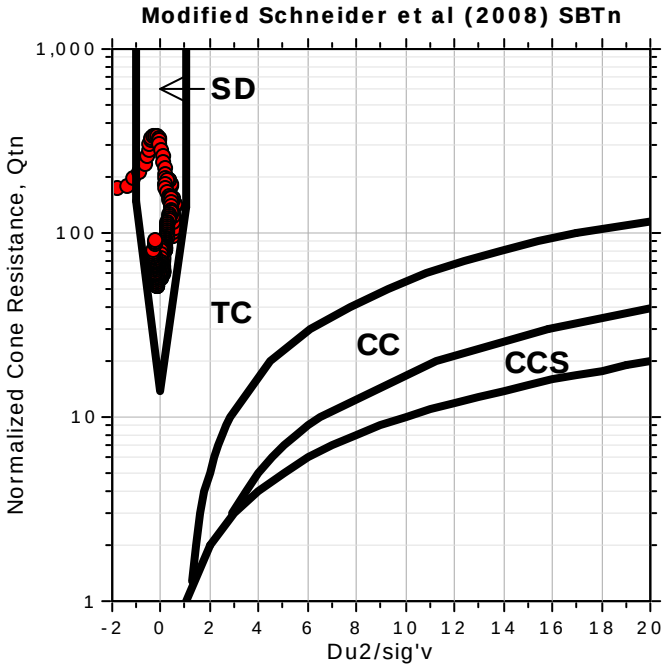
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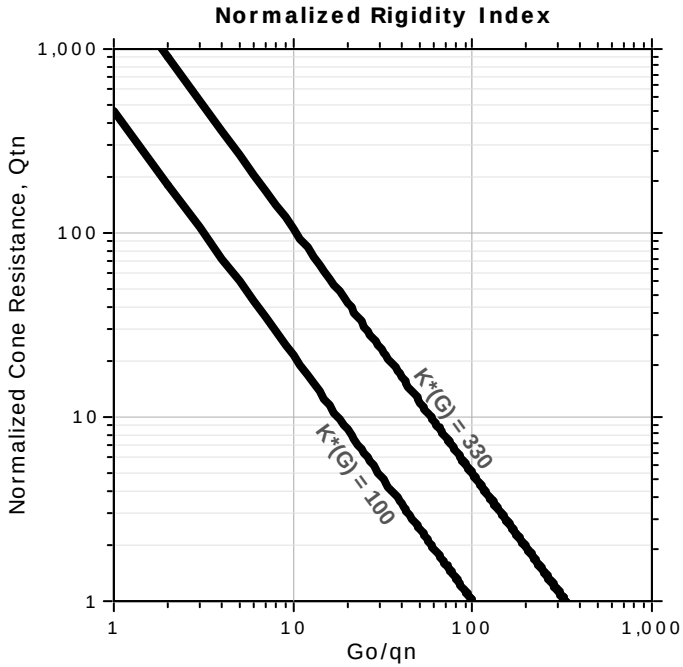
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Updated SBTn plots







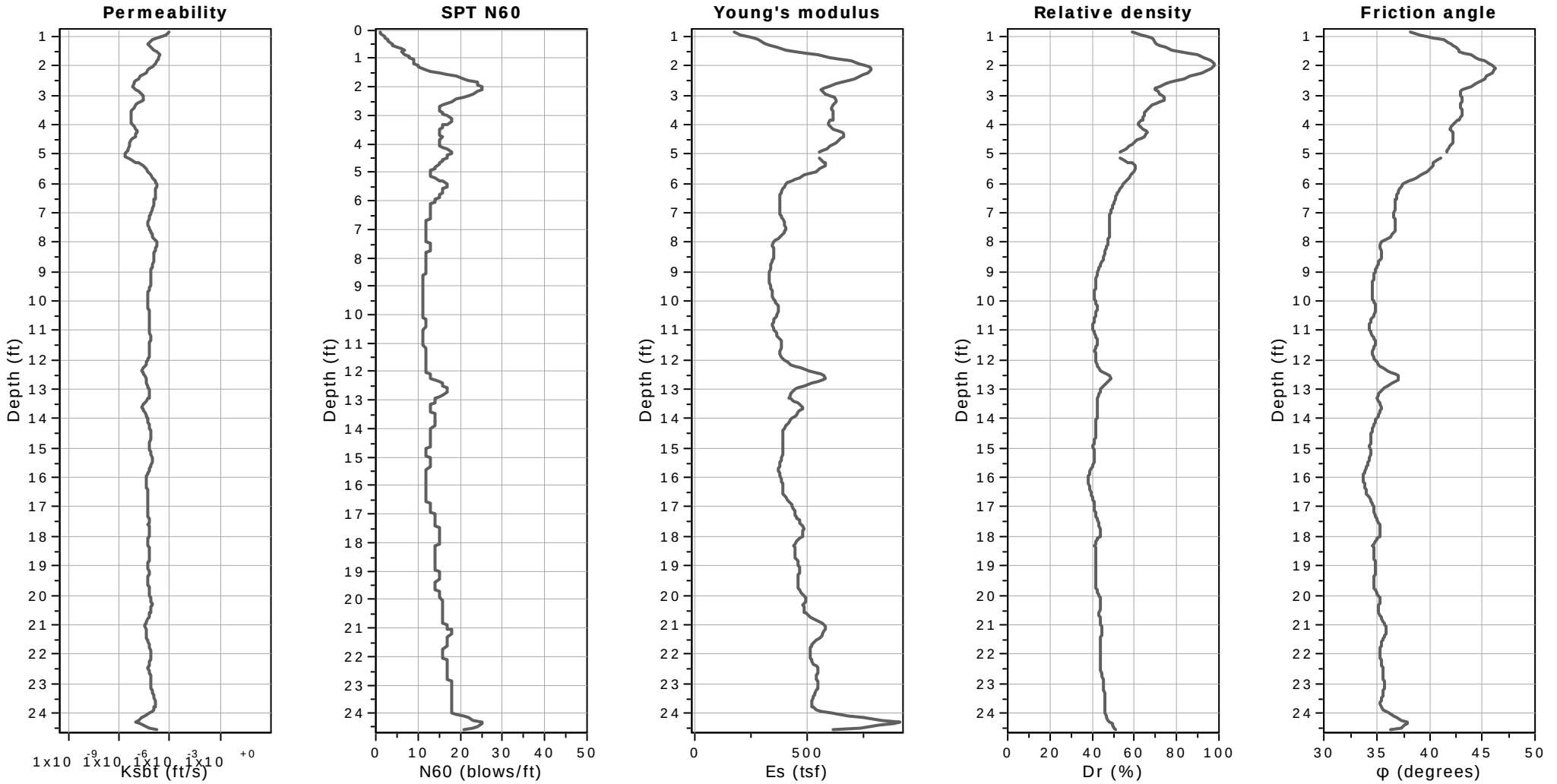
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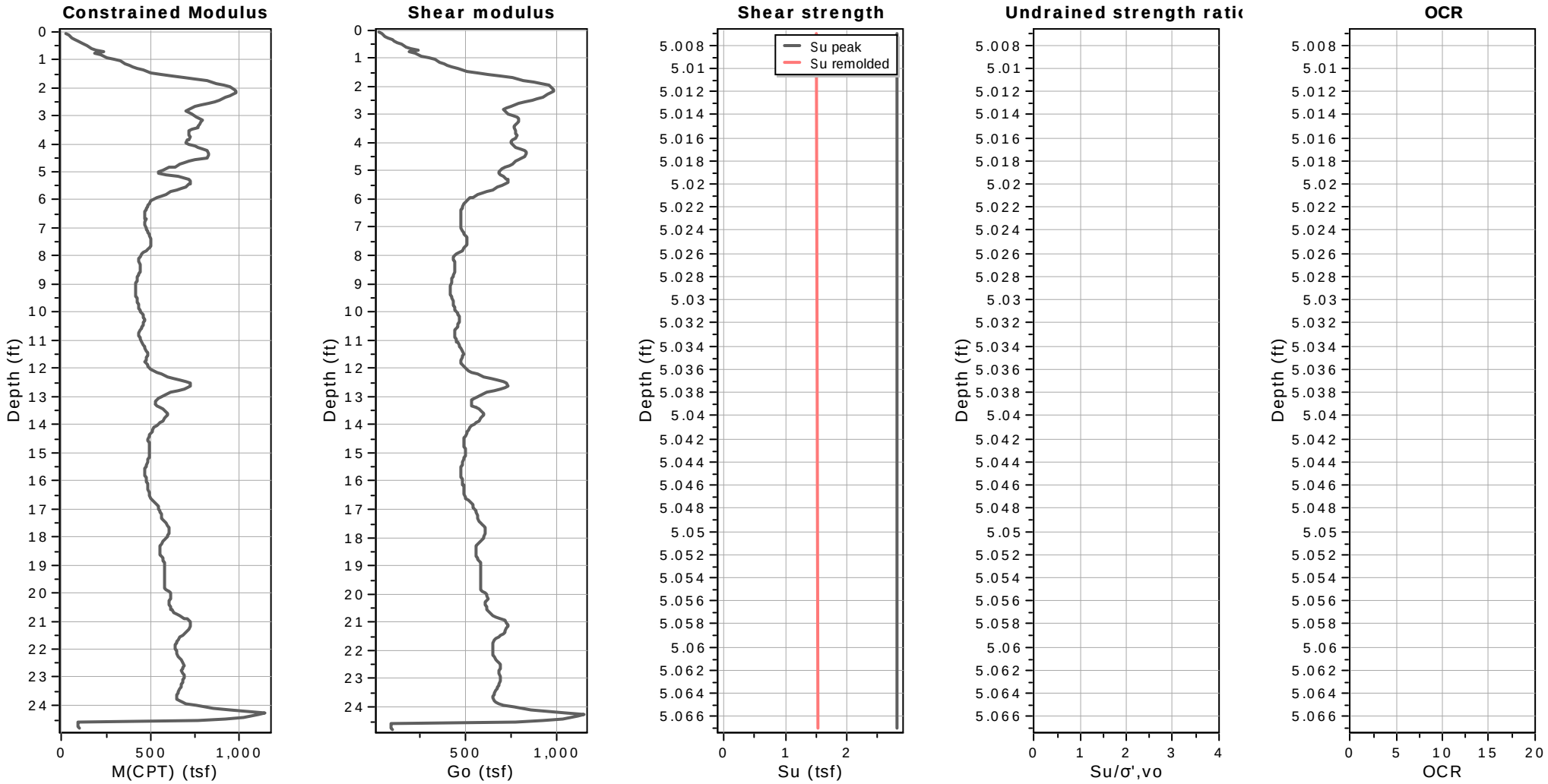
Calculation parameters

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
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User defined estimation data

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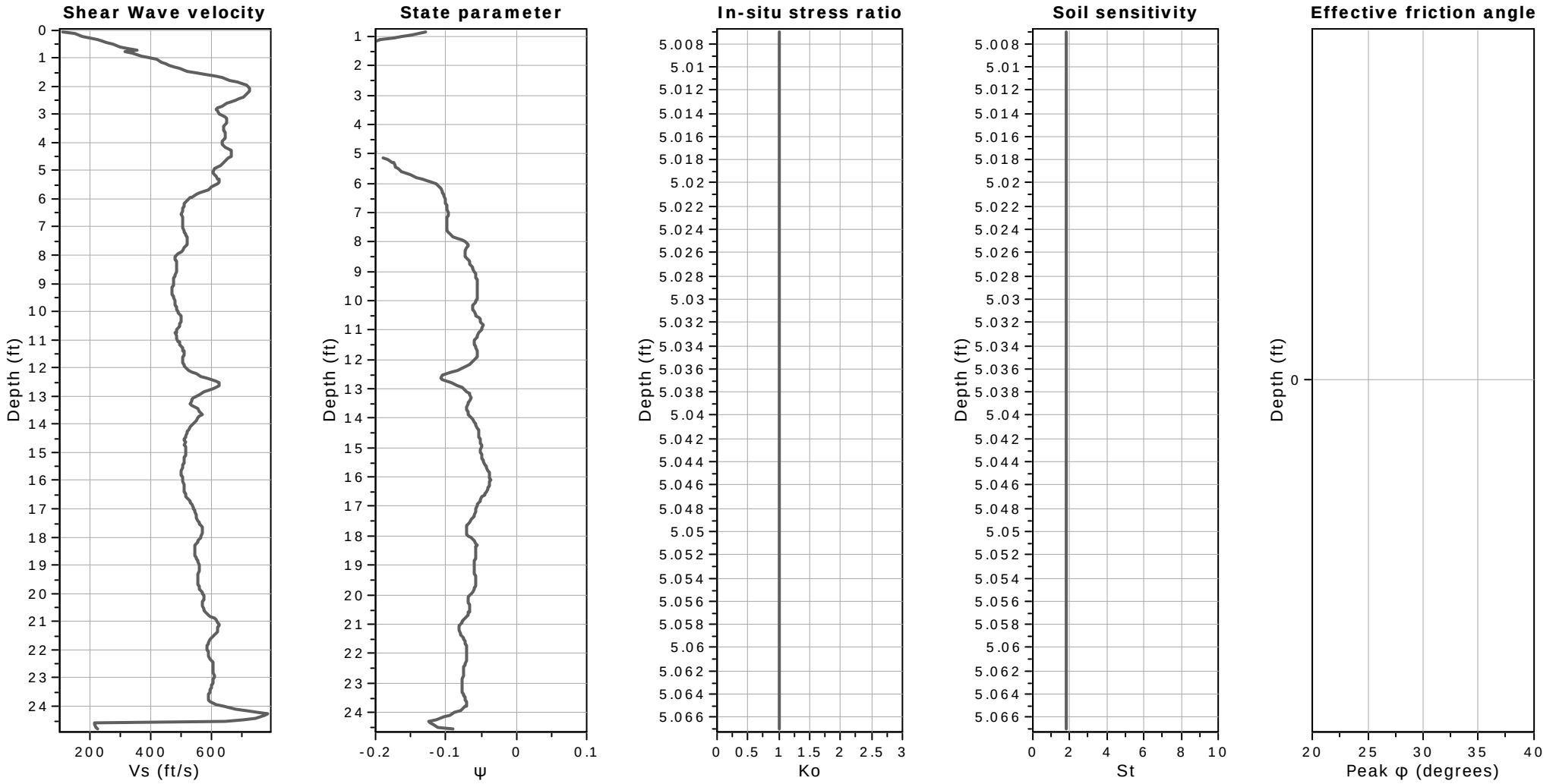
Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
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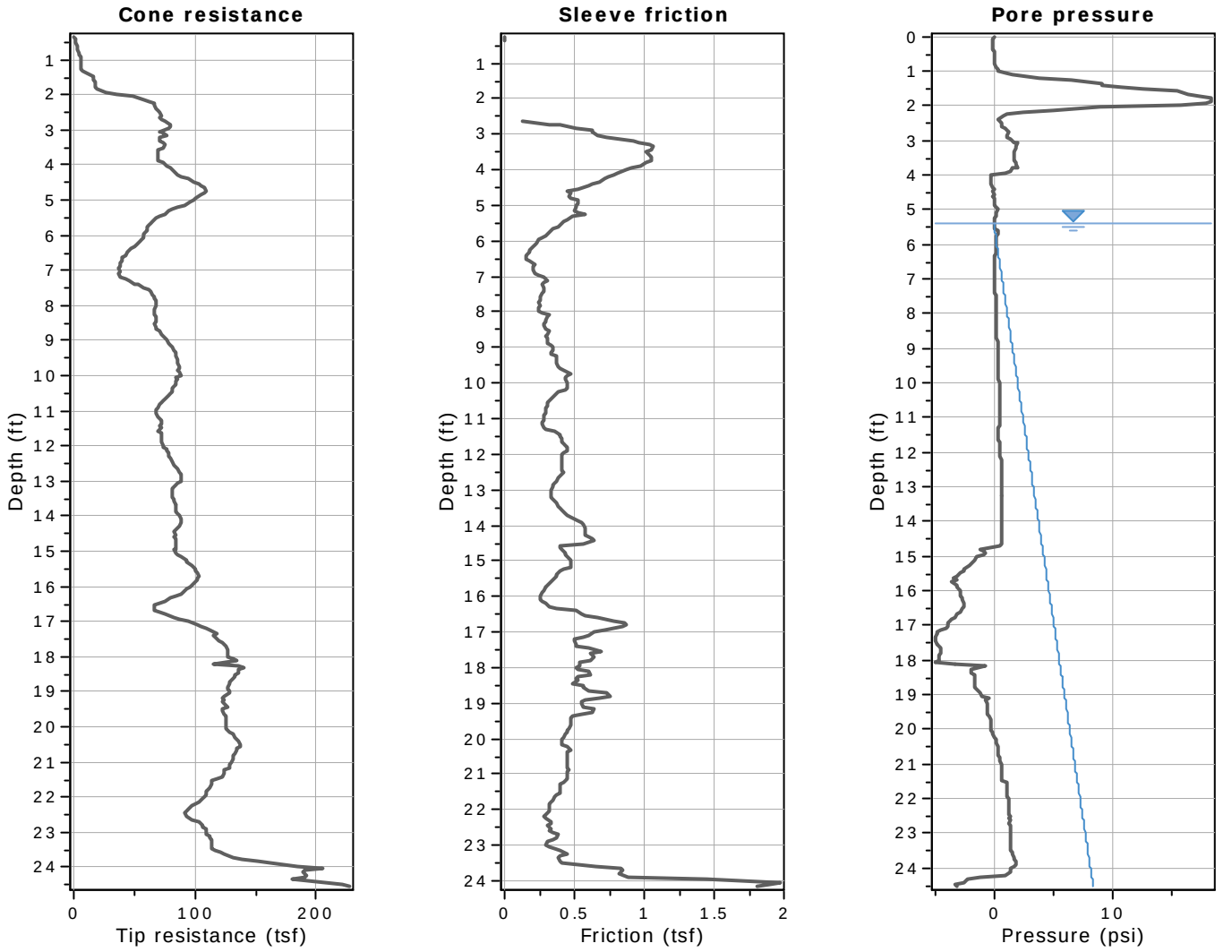
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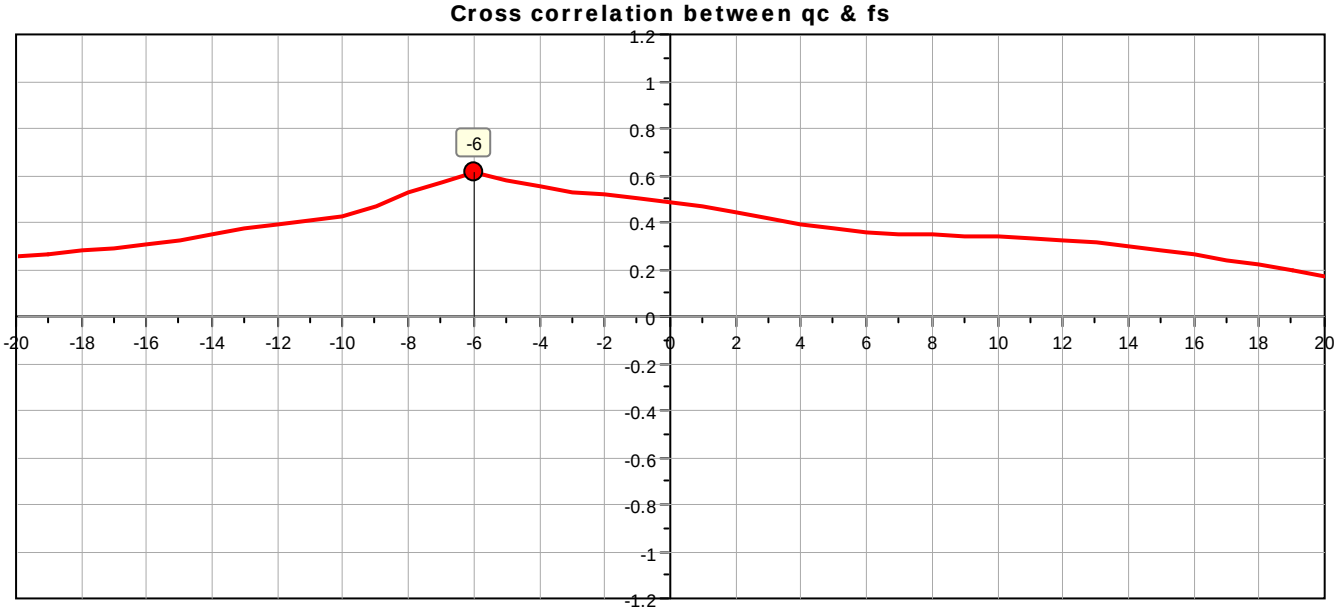
GEO-TECHNOLOGY ASSOCIATES, INC.
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18 Boulden Circle Suite 36
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CPT: 8
Total depth: 24.54 ft, Date: 4/20/2022
Surface Elevation: 84.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



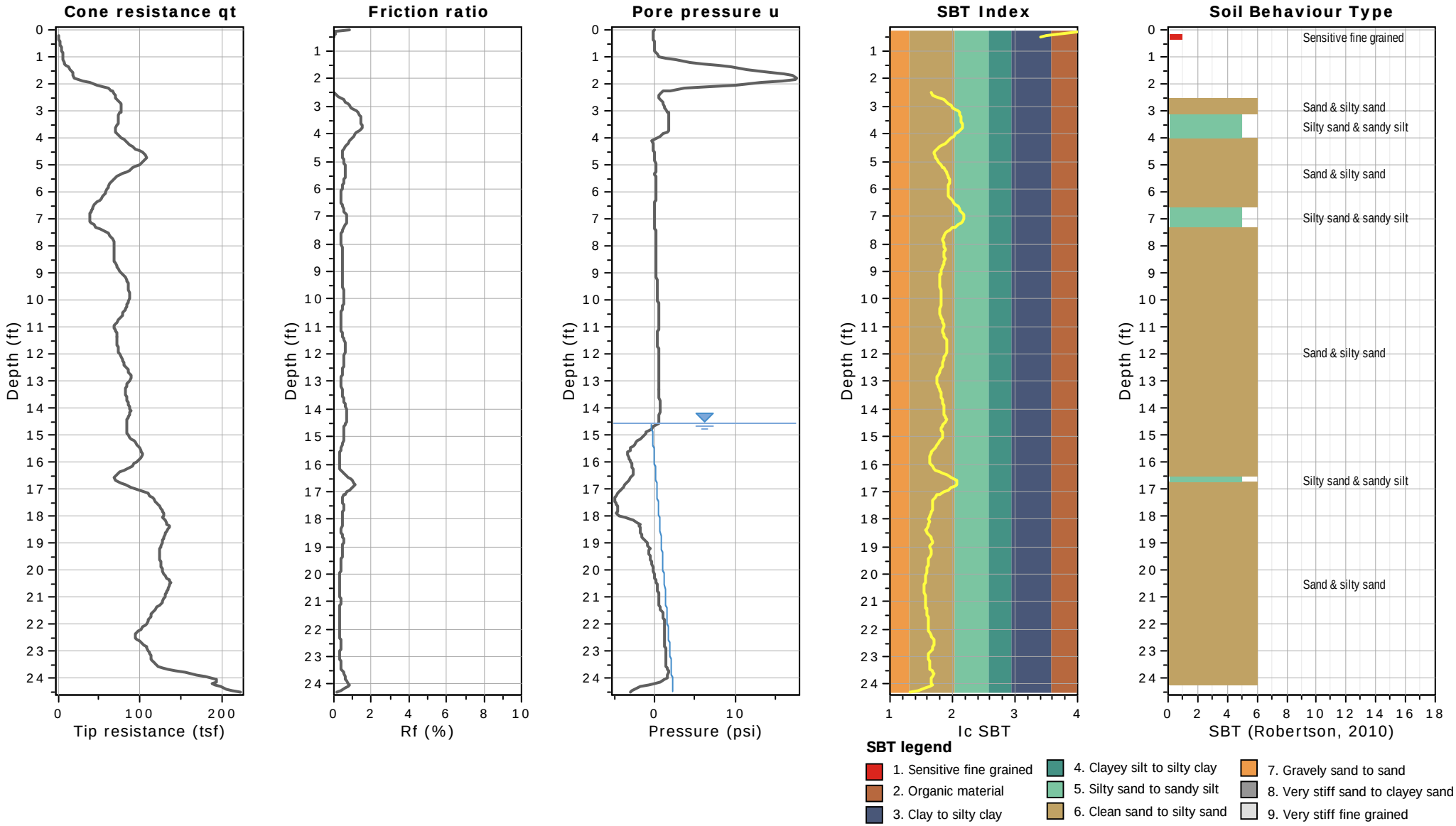
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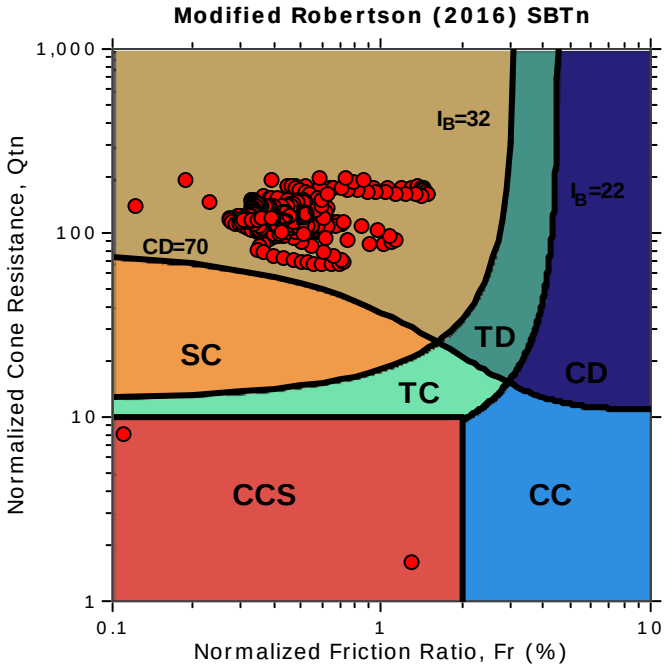


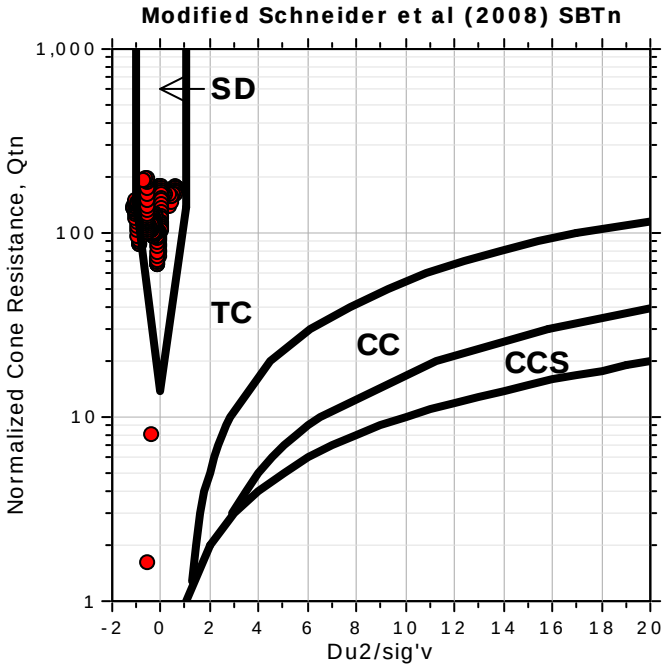
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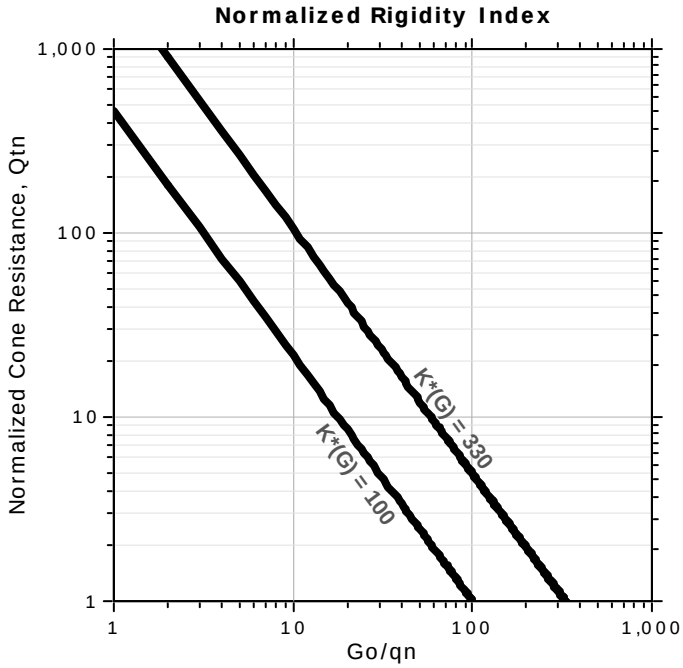
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Updated SBTn plots







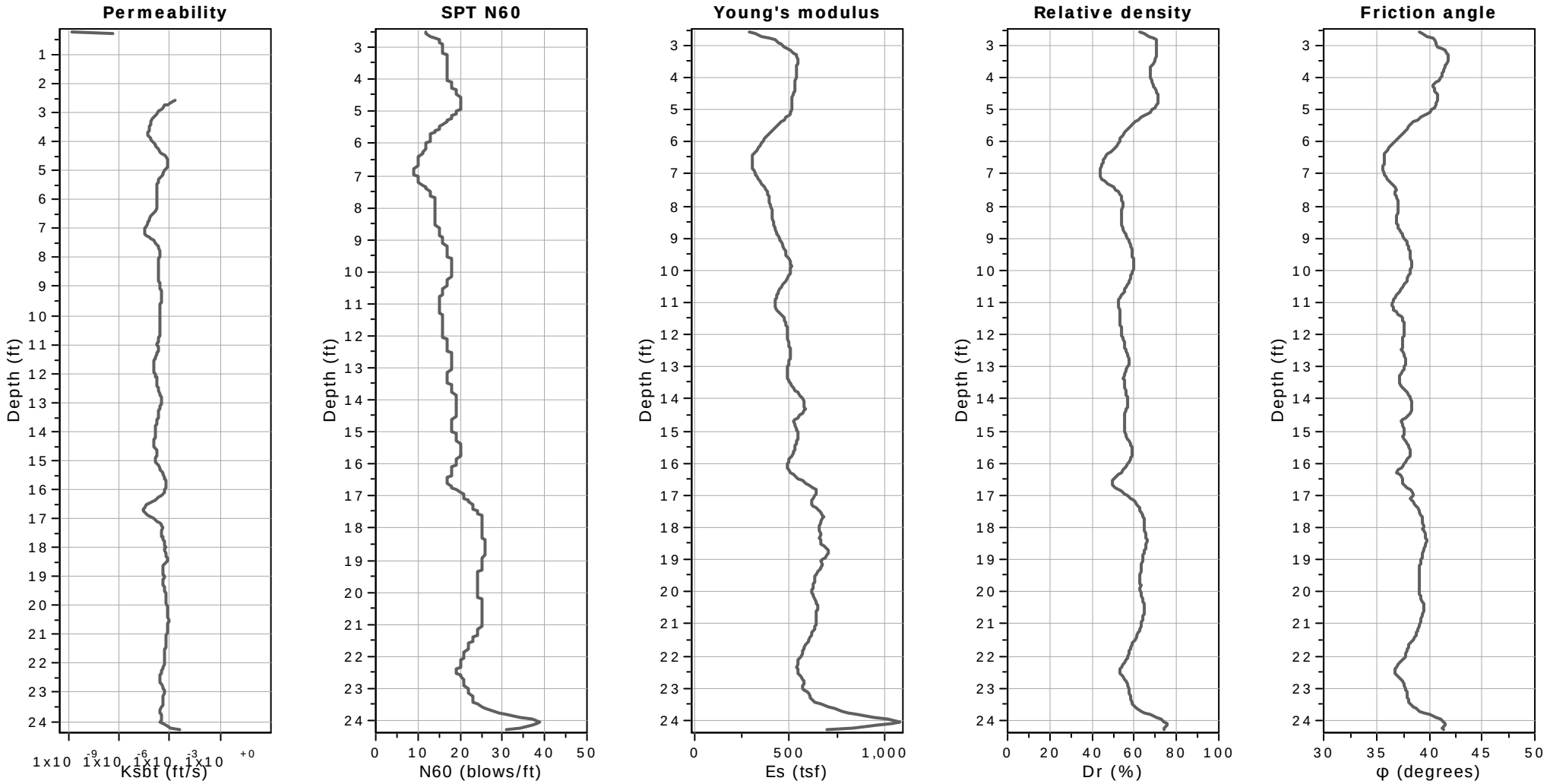
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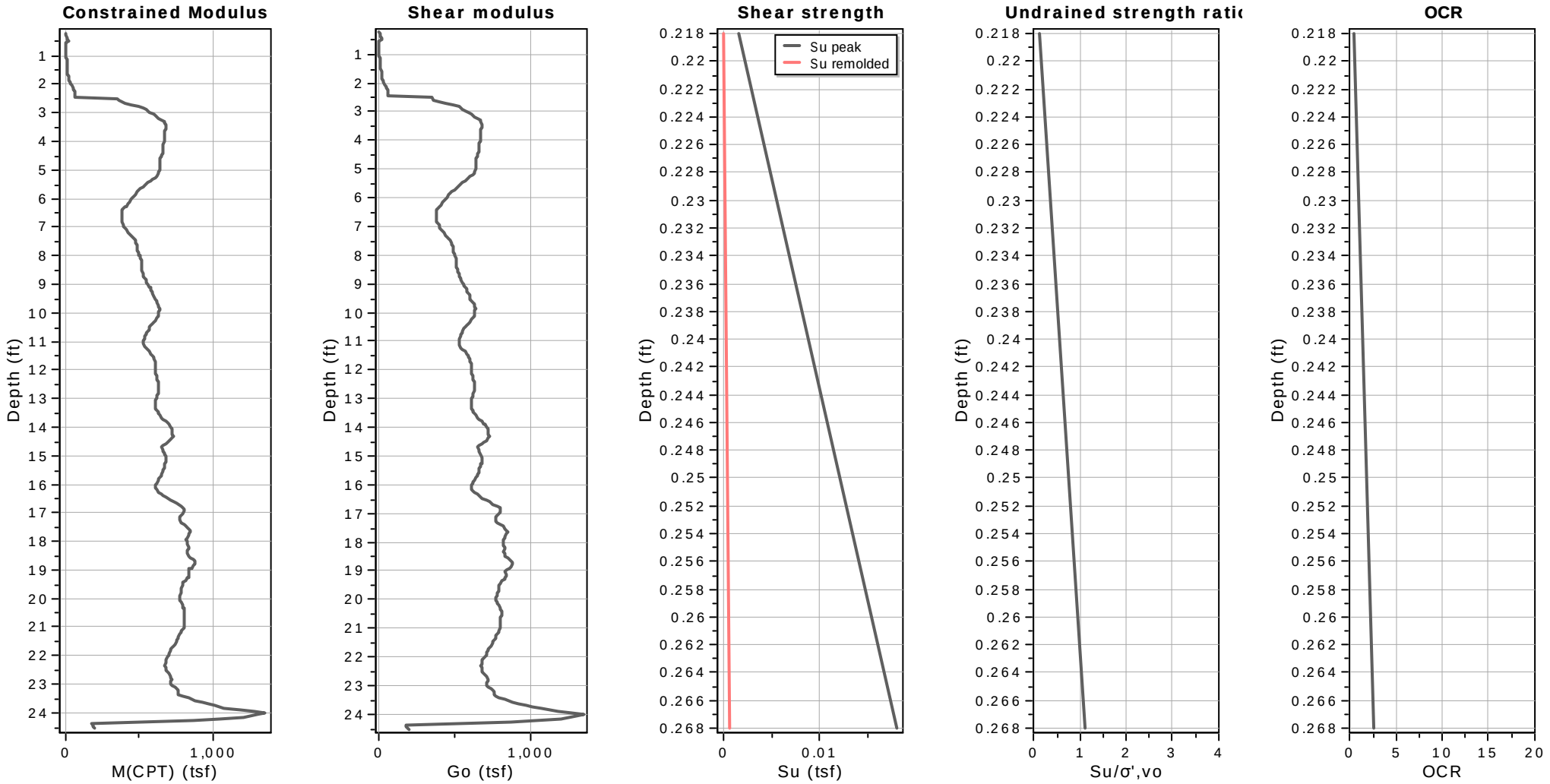
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Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
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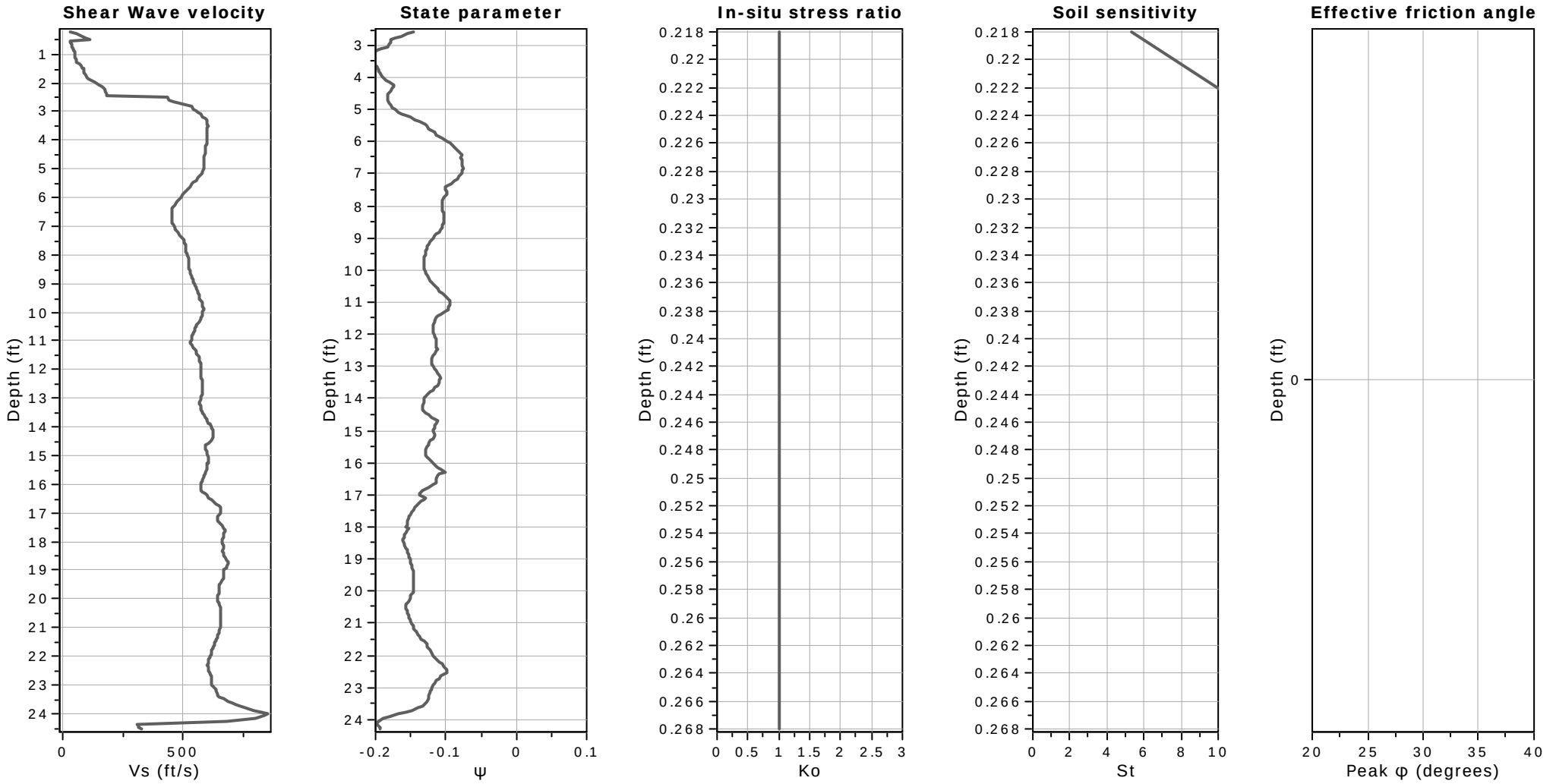
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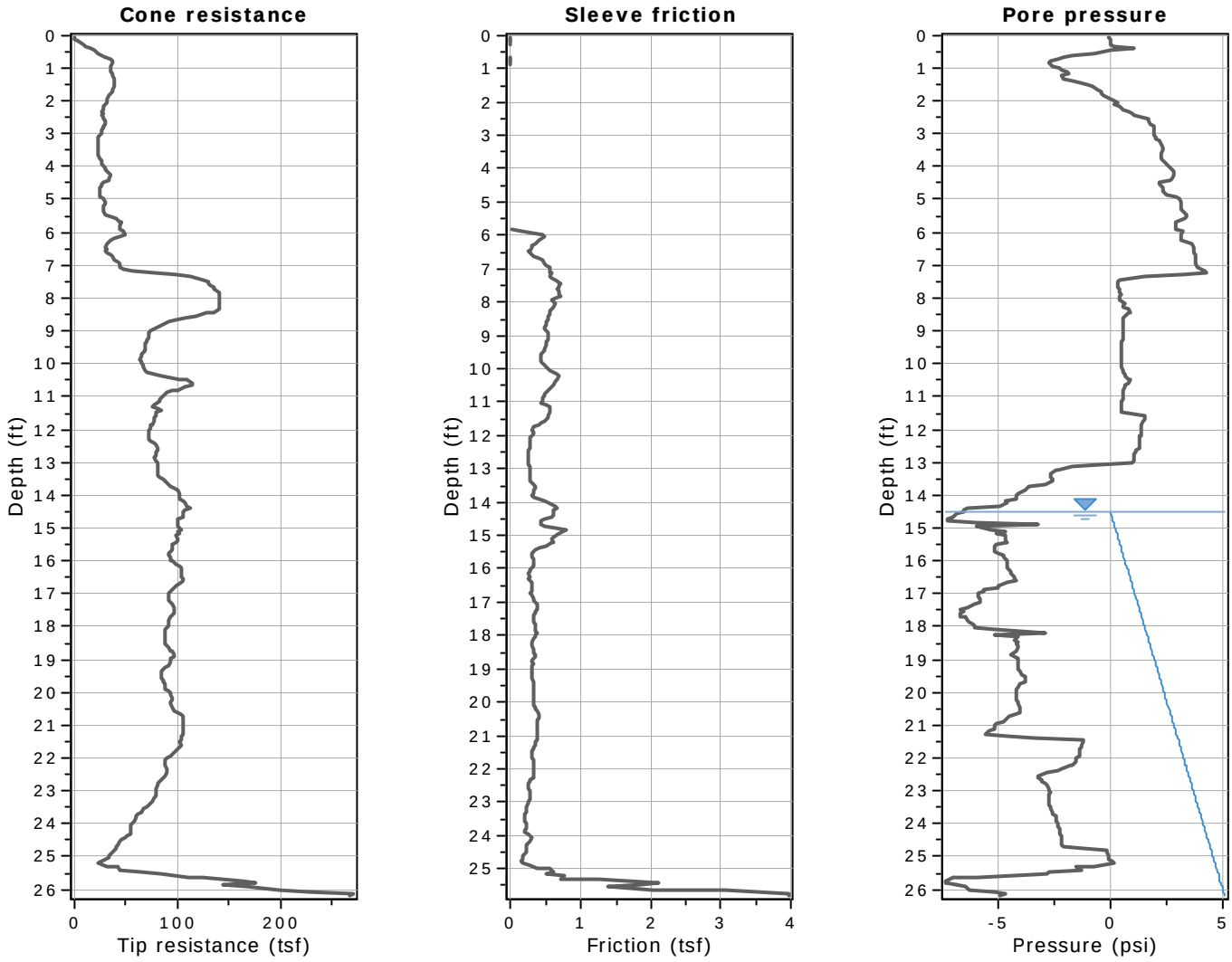
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

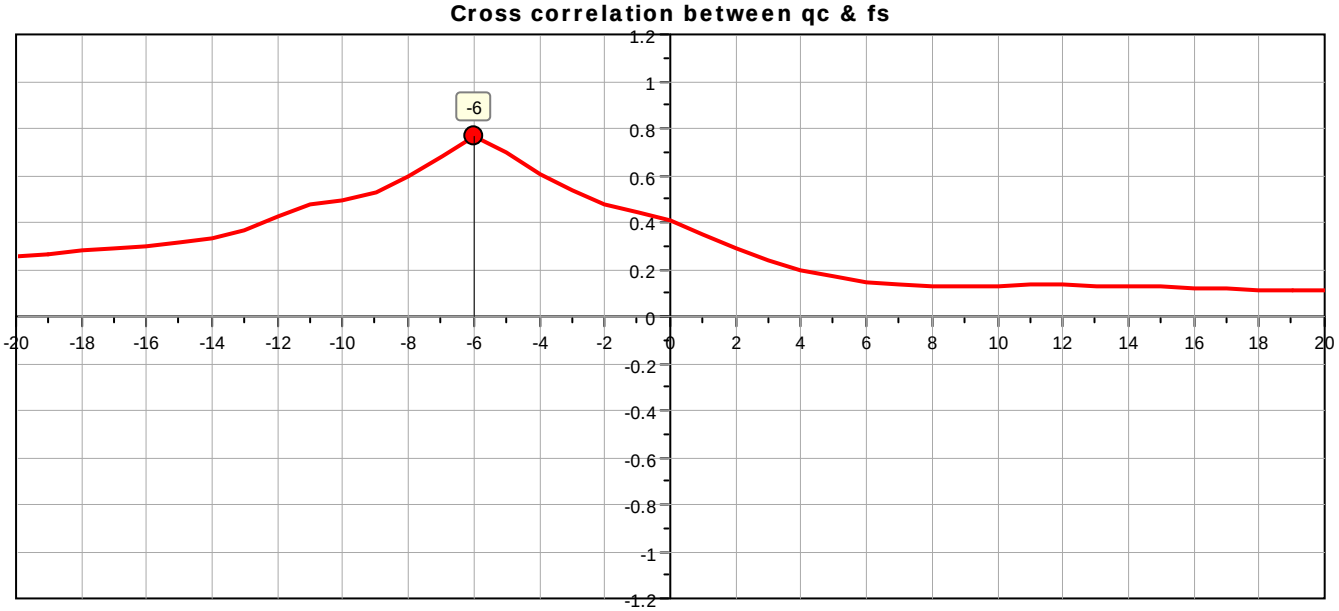
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CPT: 9
Total depth: 26.19 ft, Date: 4/20/2022
Surface Elevation: 79.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
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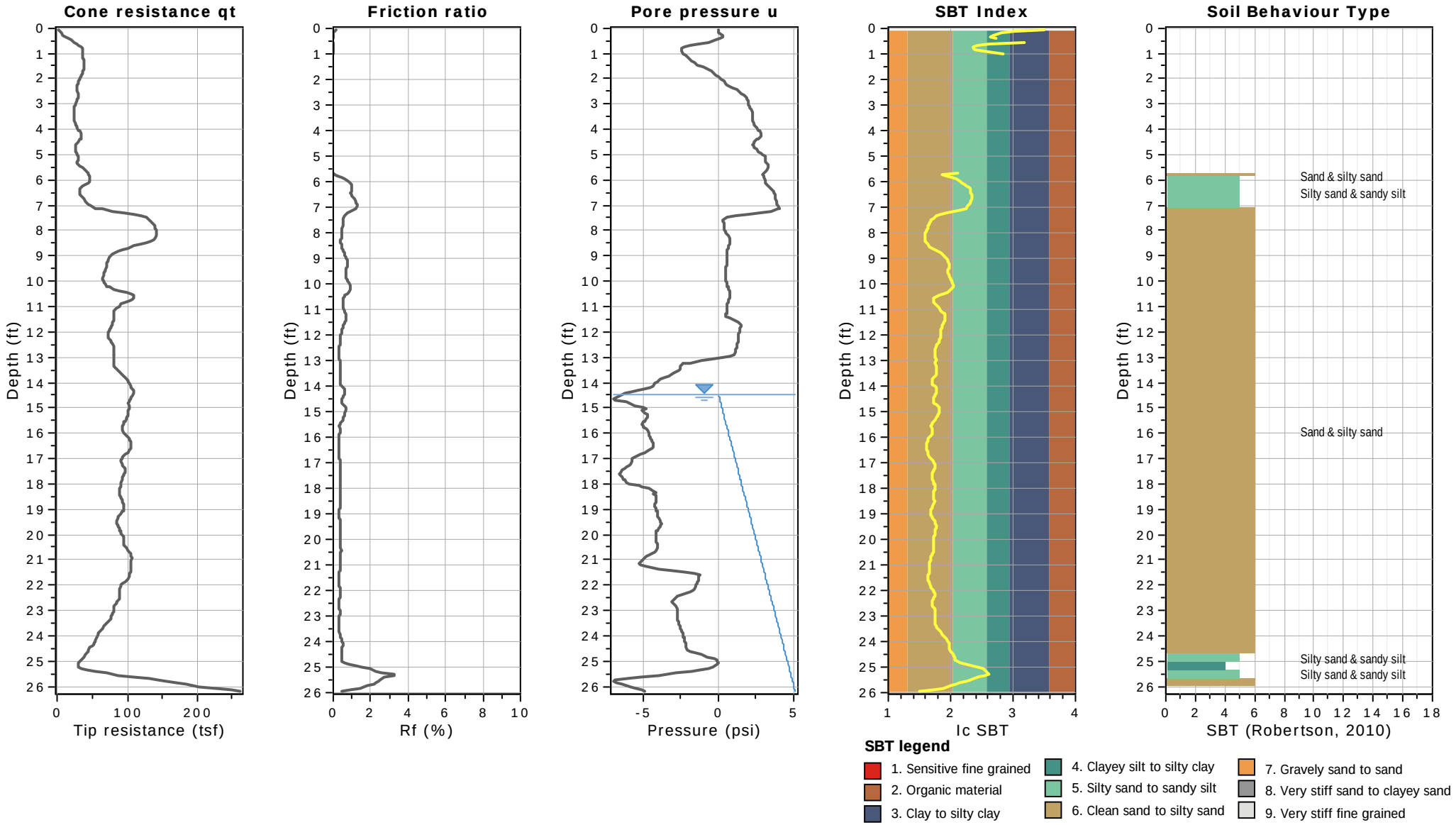
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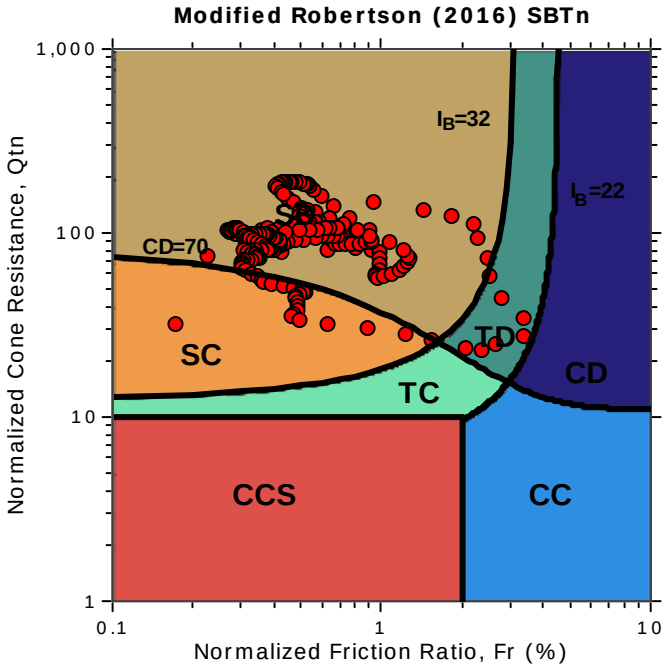


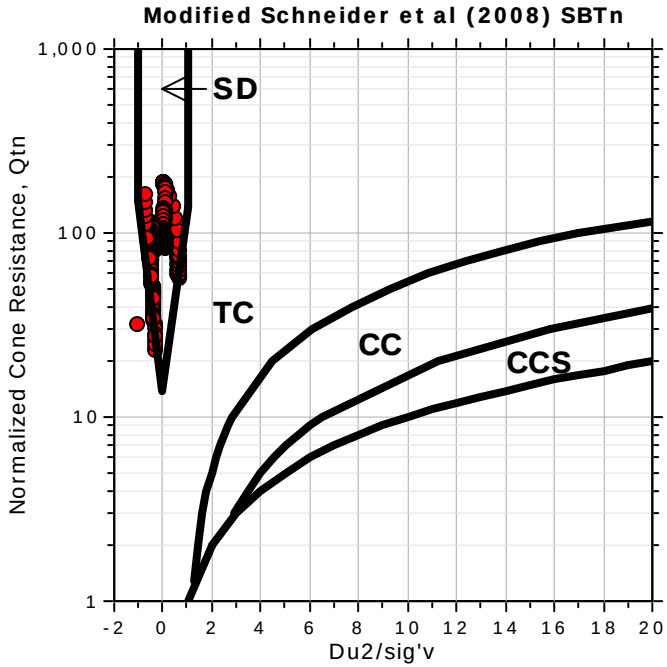
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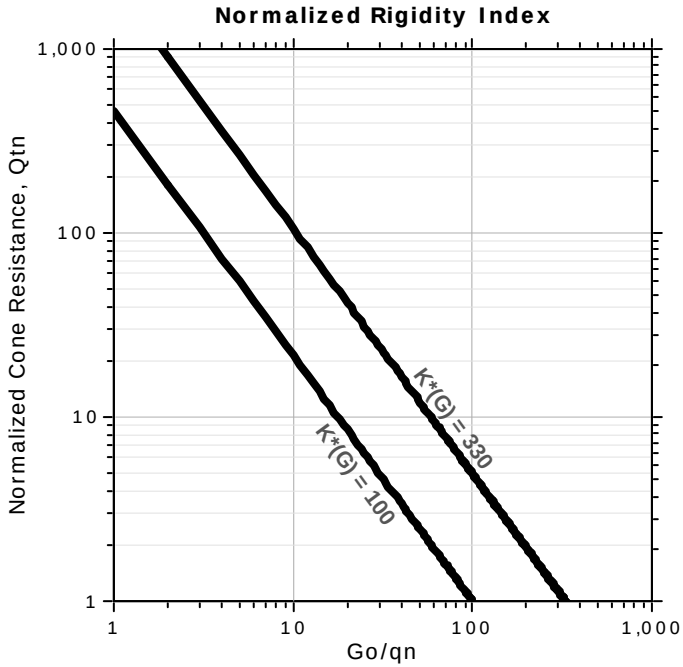
CPT: 9
Total depth: 26.19 ft, Date: 4/20/2022
Surface Elevation: 79.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: Hodgson Vo-Tech New Campus
Location: New Castle County, Delaware

Updated SBTn plots







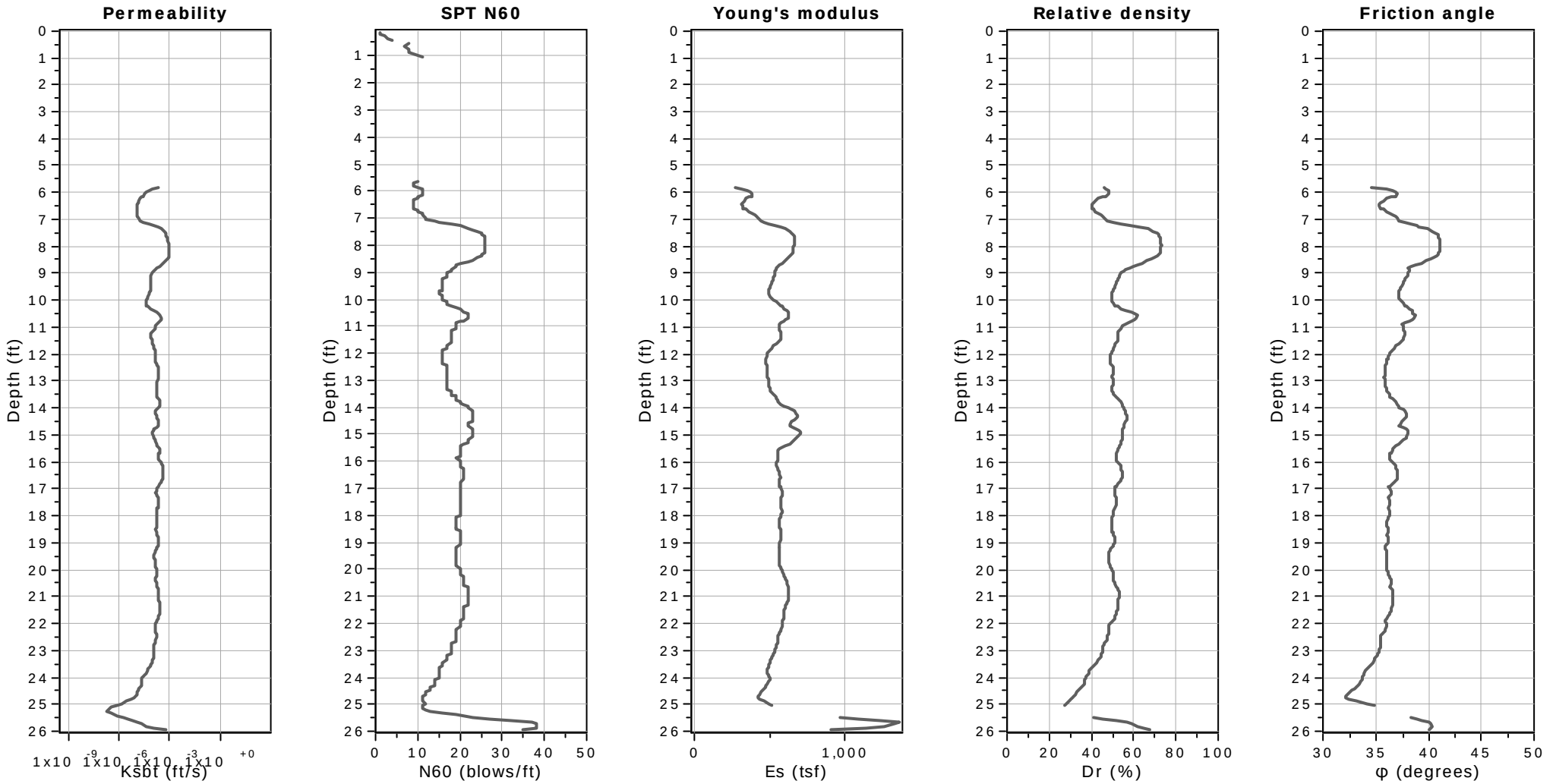
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
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SC: Sand-like - Contractive
SD: Sand-like - Dilative

K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 9
Total depth: 26.19 ft, Date: 4/20/2022
Surface Elevation: 79.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



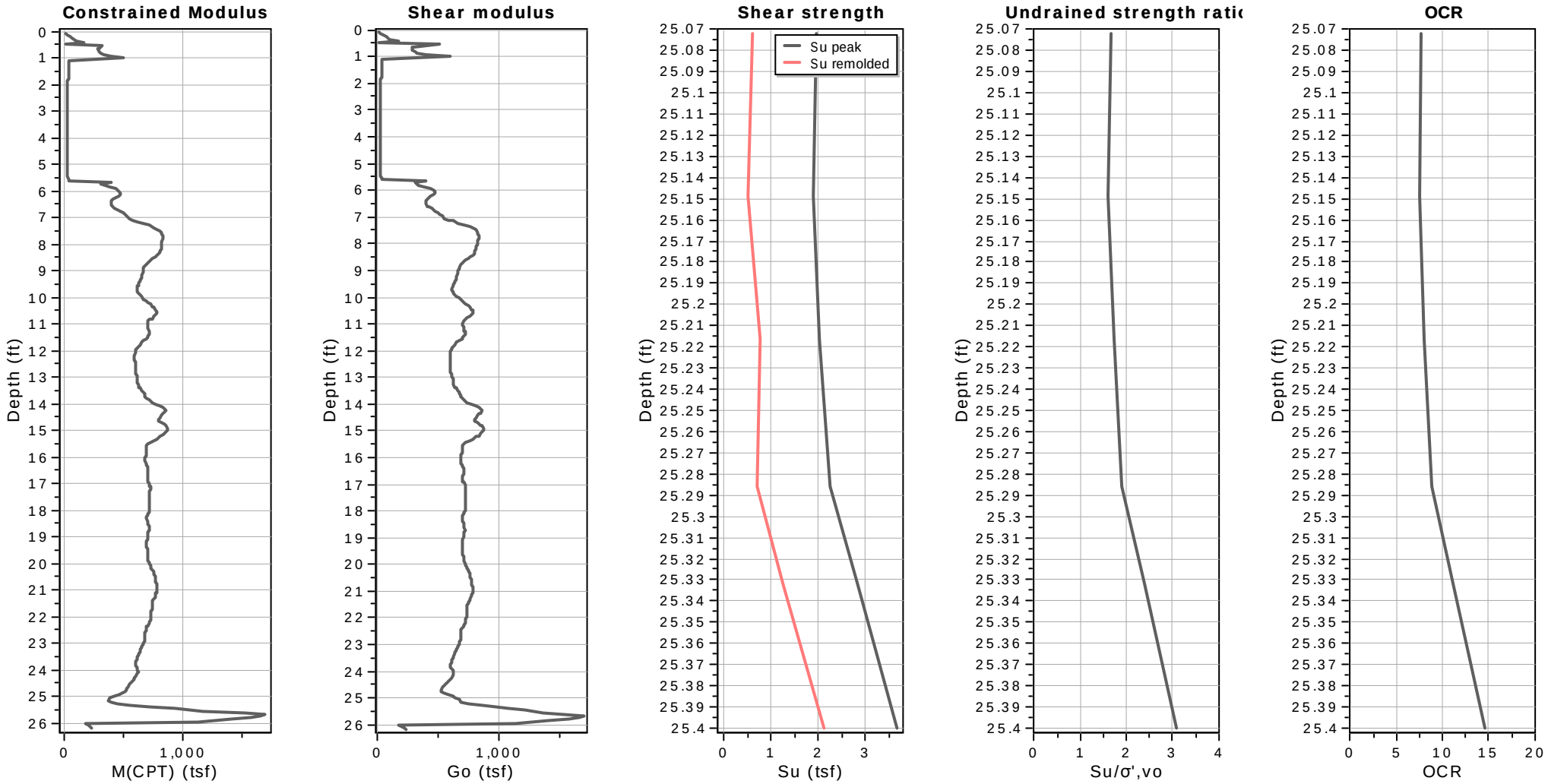
Calculation parameters

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)
User defined estimation data

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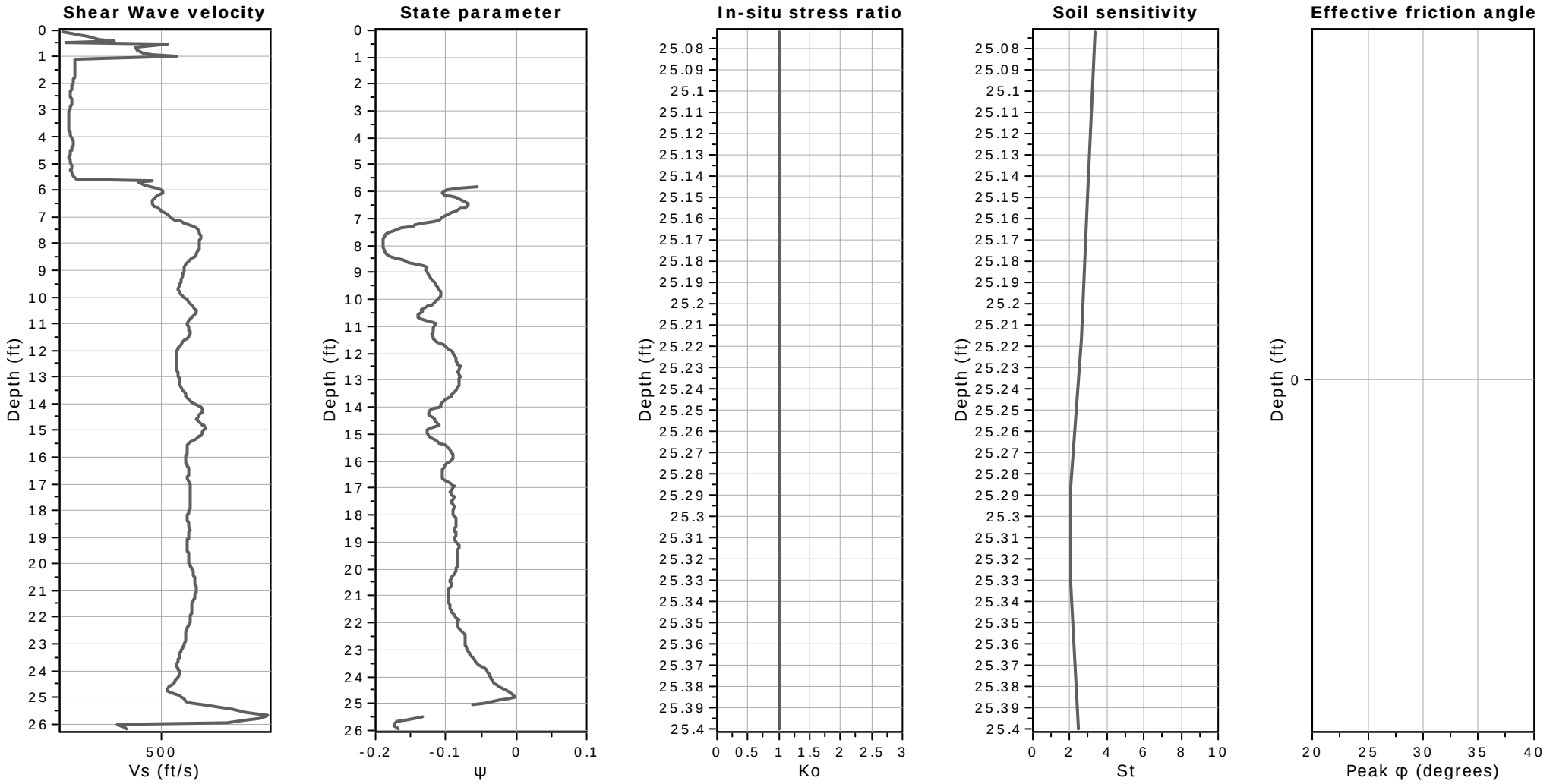
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

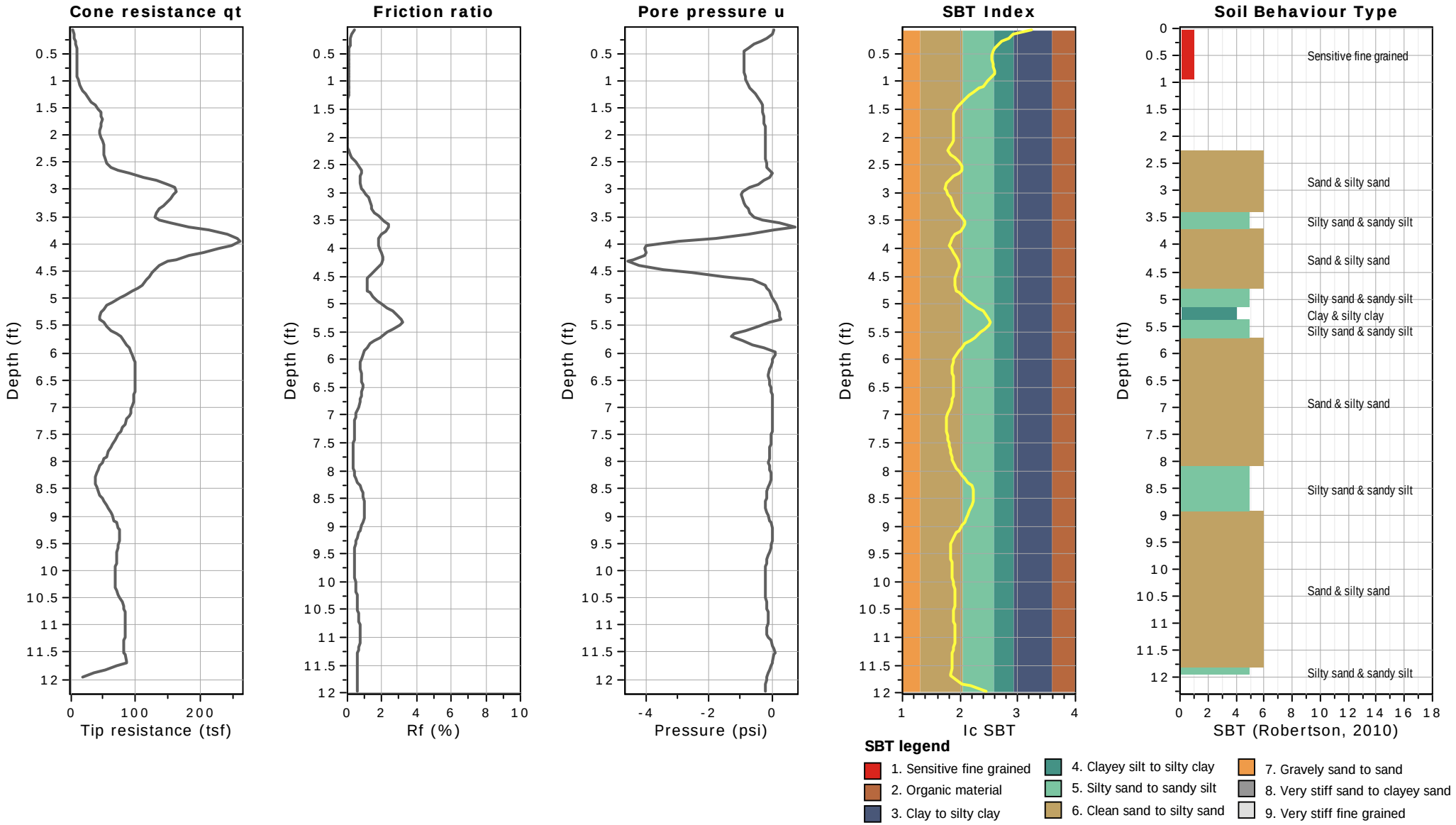
User defined estimation data

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CPT: CPT-10
Total depth: 12.22 ft, Date: 12/20/2022
Surface Elevation: 81.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

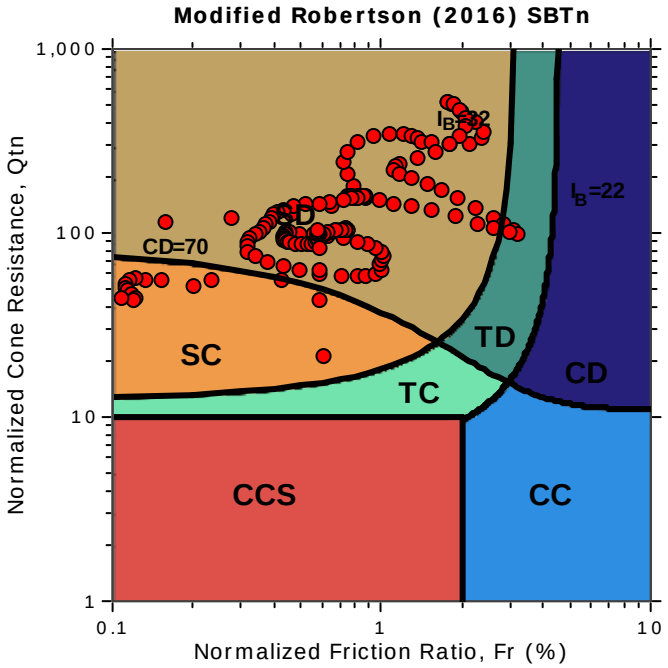


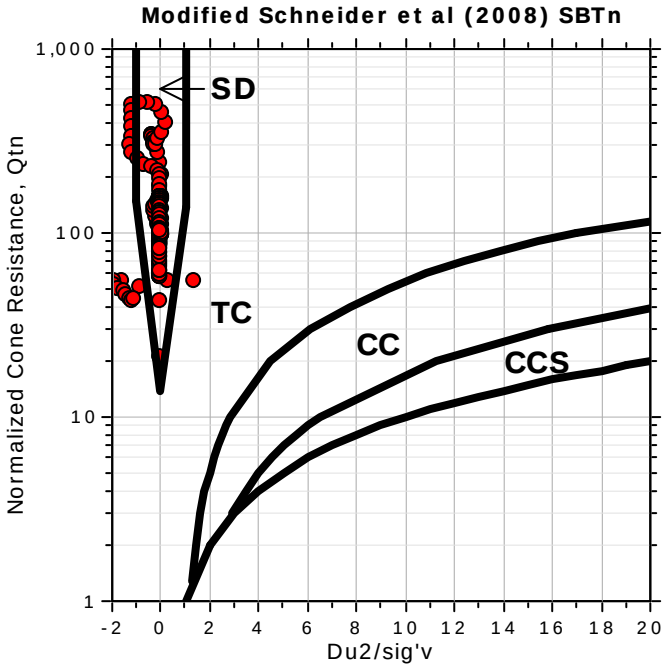
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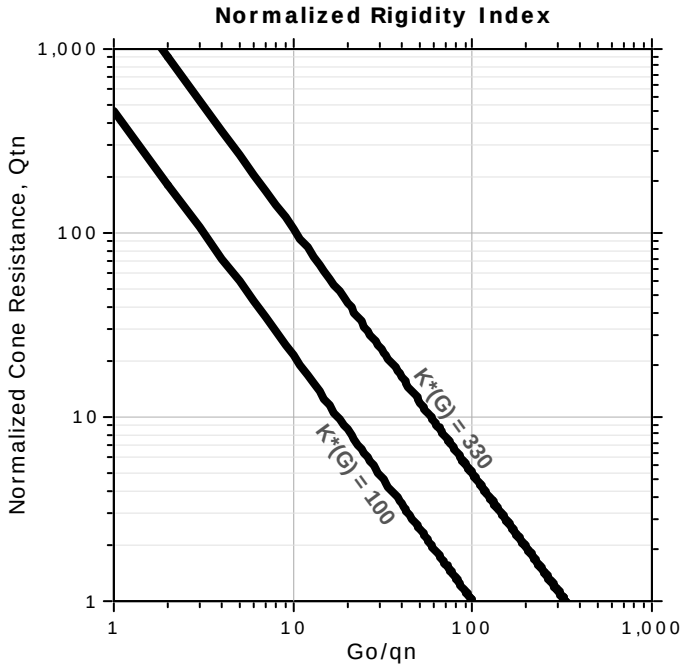
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Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

Updated SBTn plots







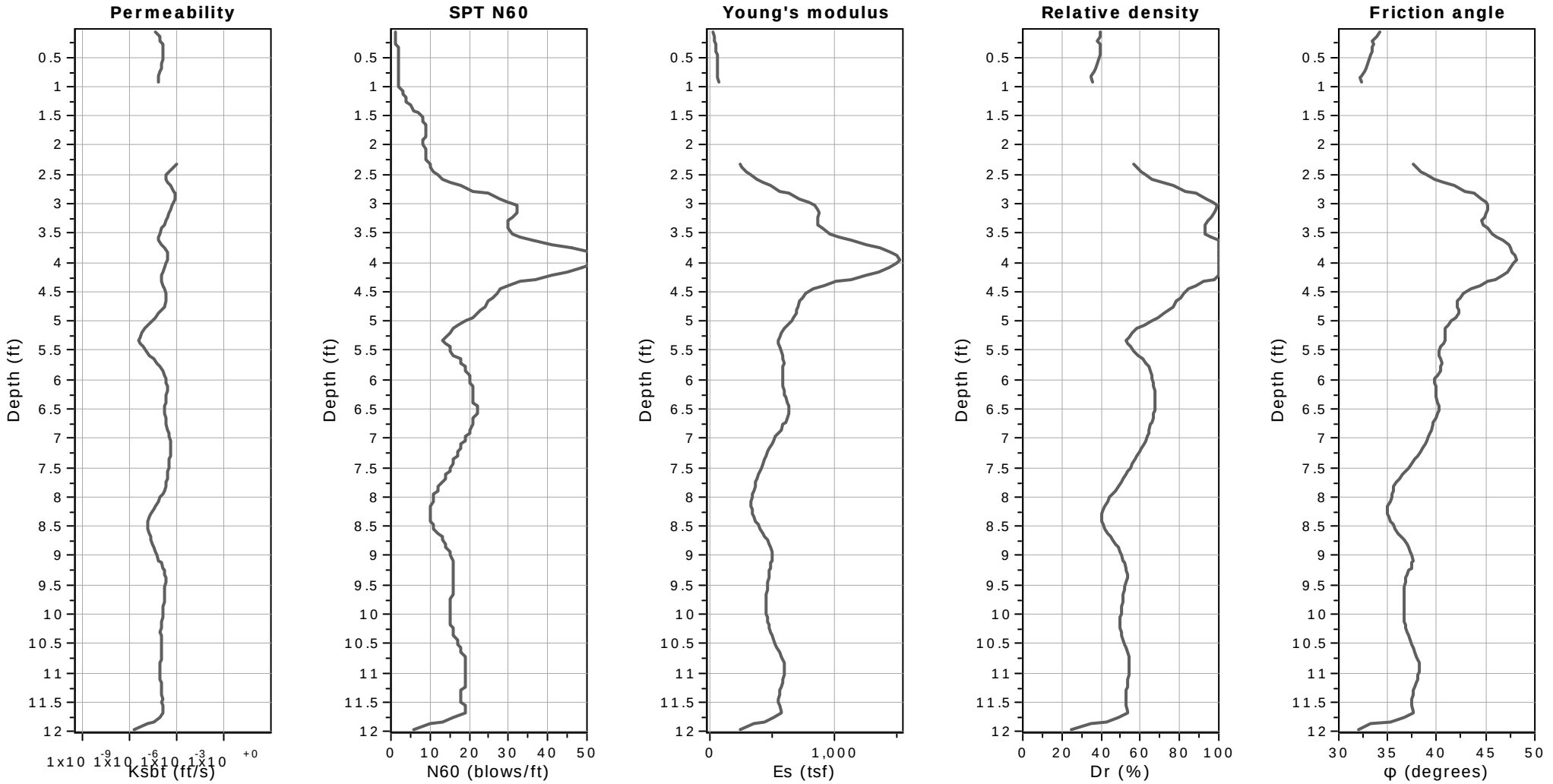
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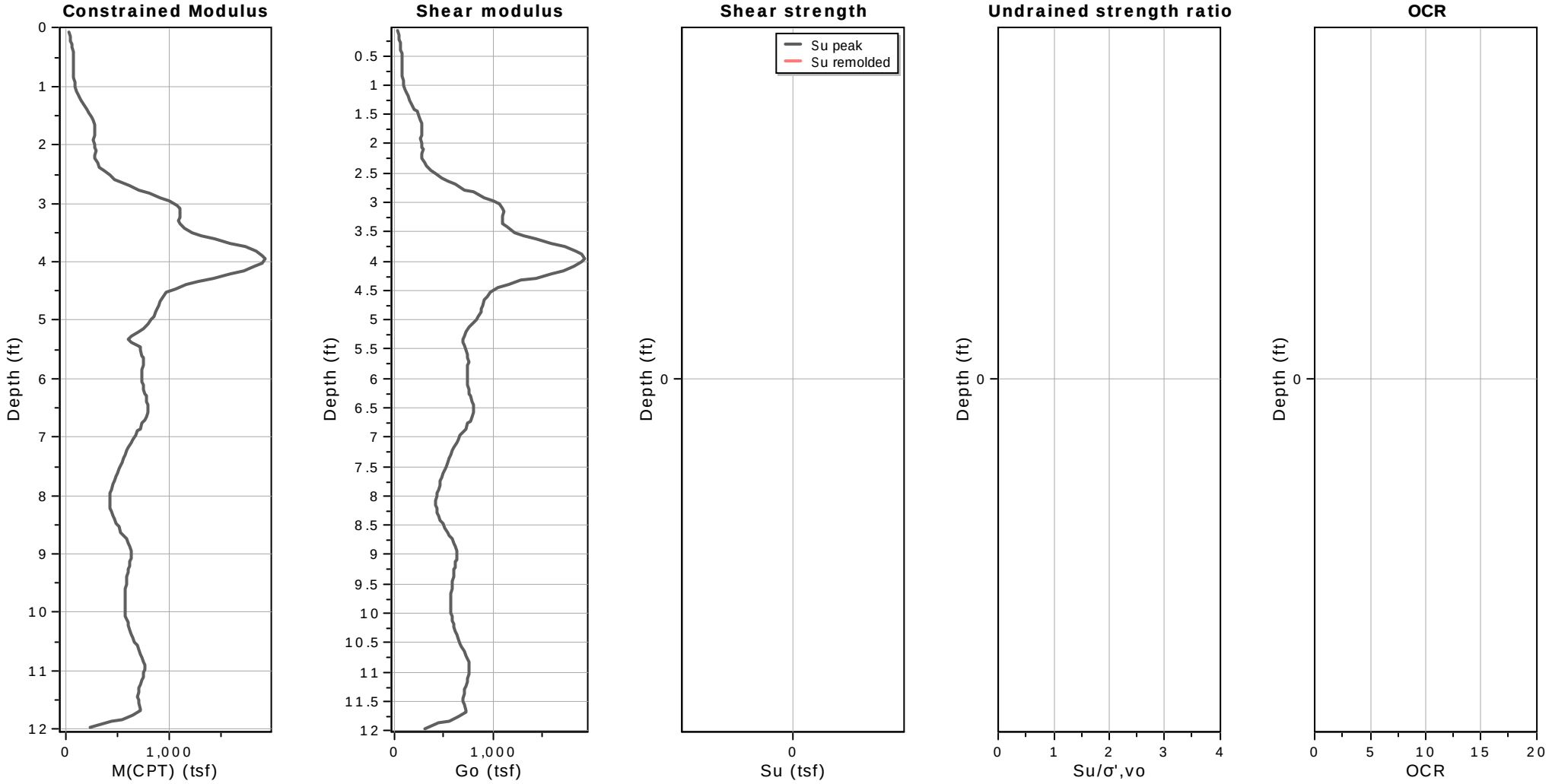
Calculation parameters

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)
User defined estimation data

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Location: **New Castle County, Delaware**



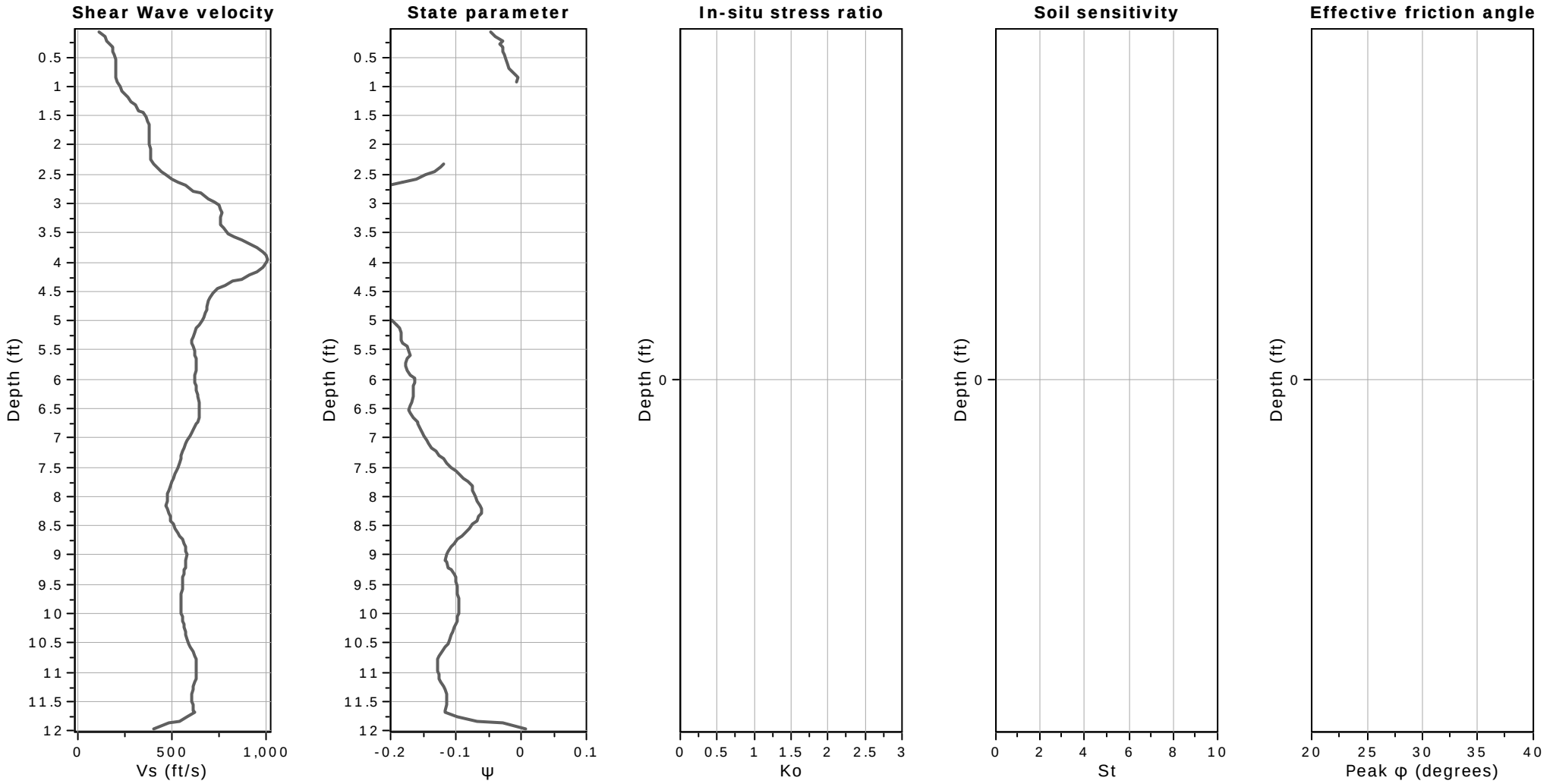
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



Calculation parameters

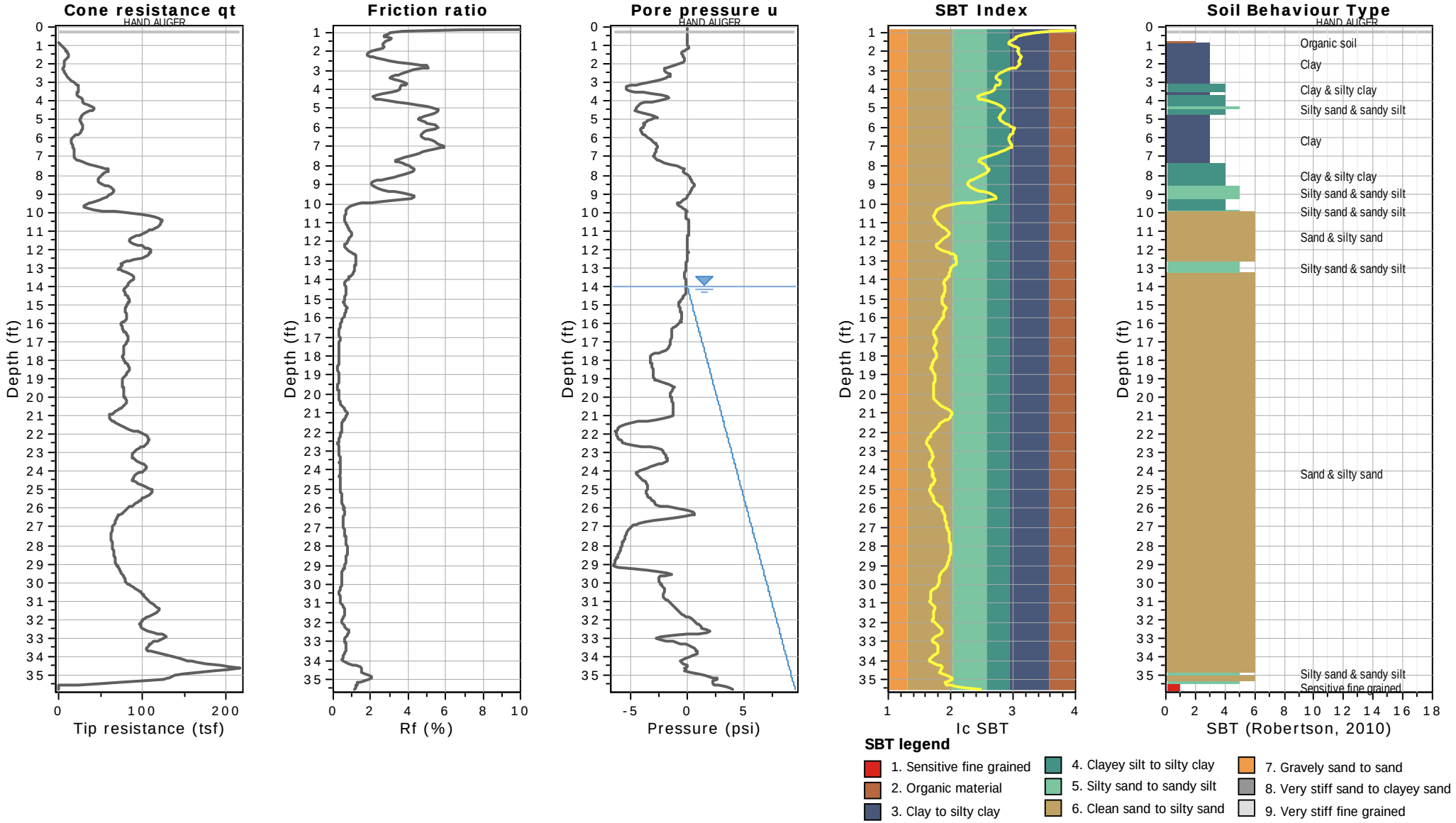
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

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CPT: CPT-11
Total depth: 35.78 ft, Date: 12/20/2022
Surface Elevation: 81.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

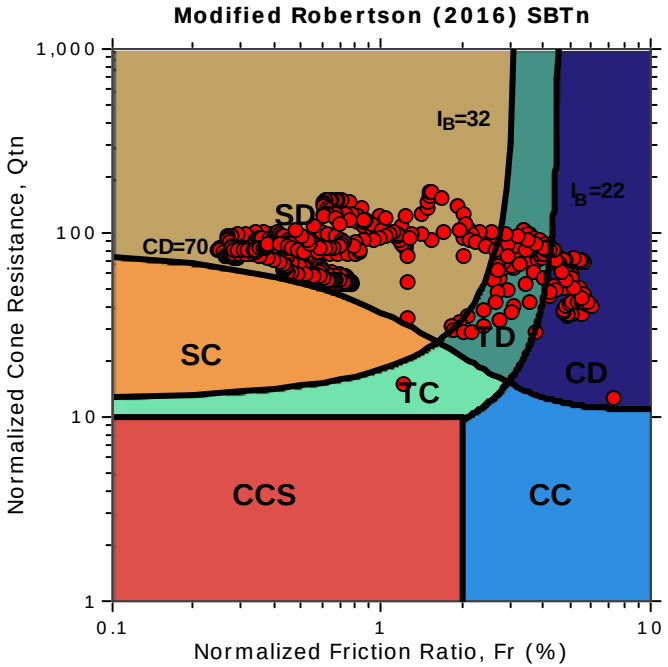


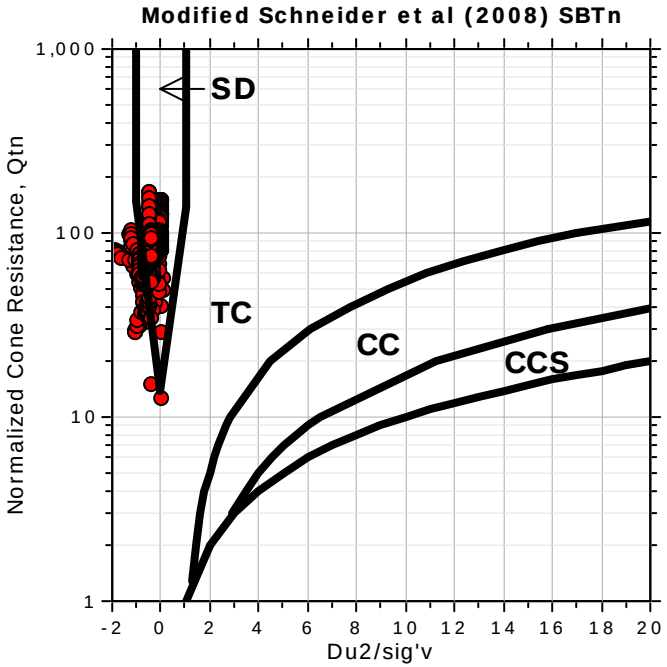
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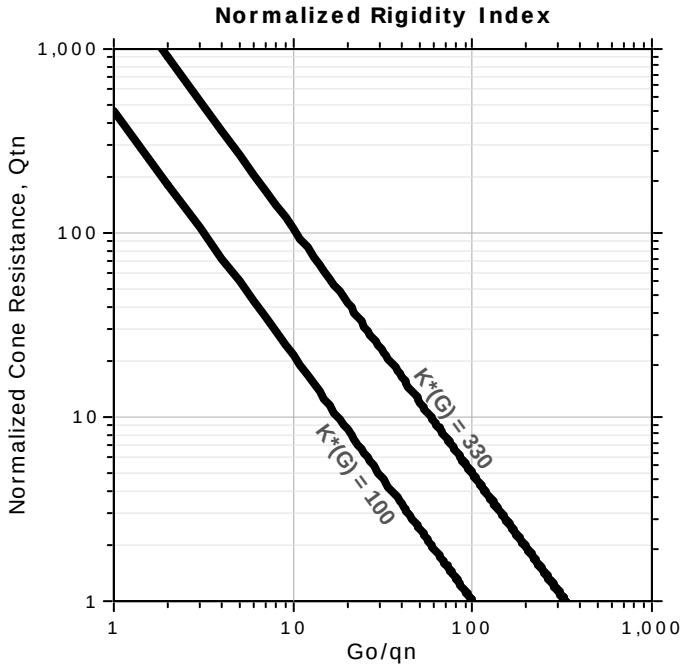
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Project: **New Hodgson Vo-Tech School**
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Updated SBTn plots







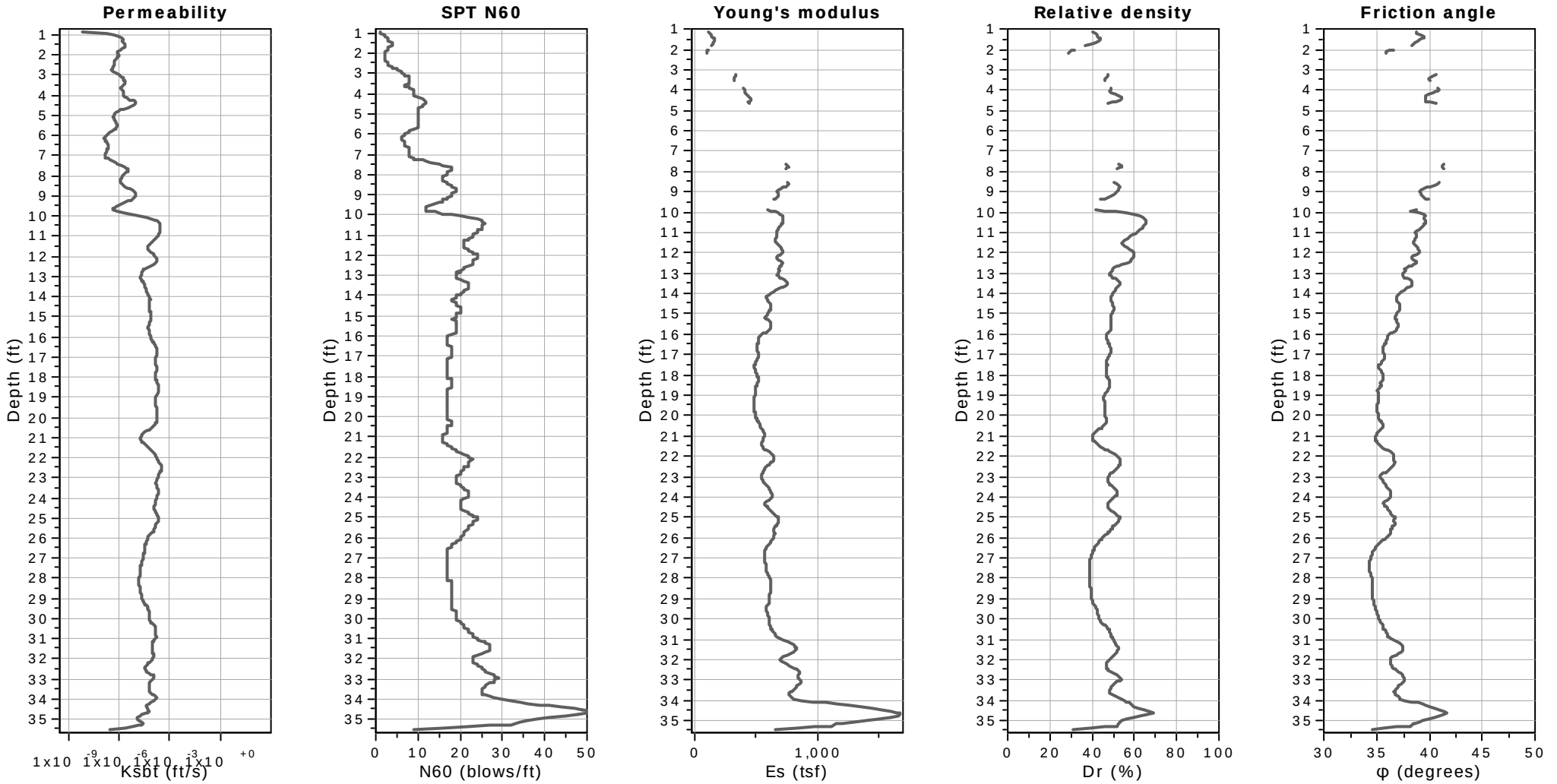
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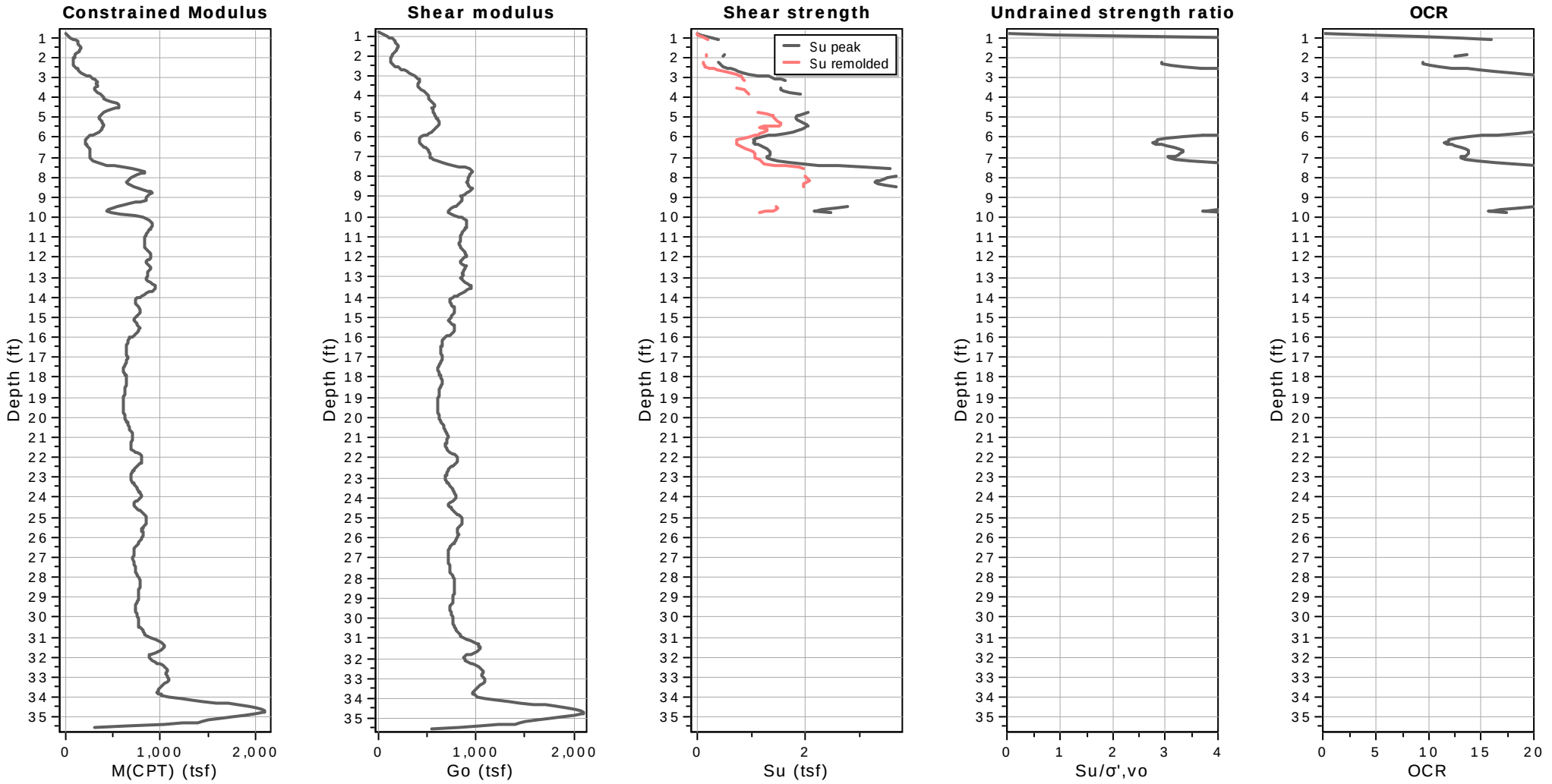
Calculation parameters

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
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User defined estimation data

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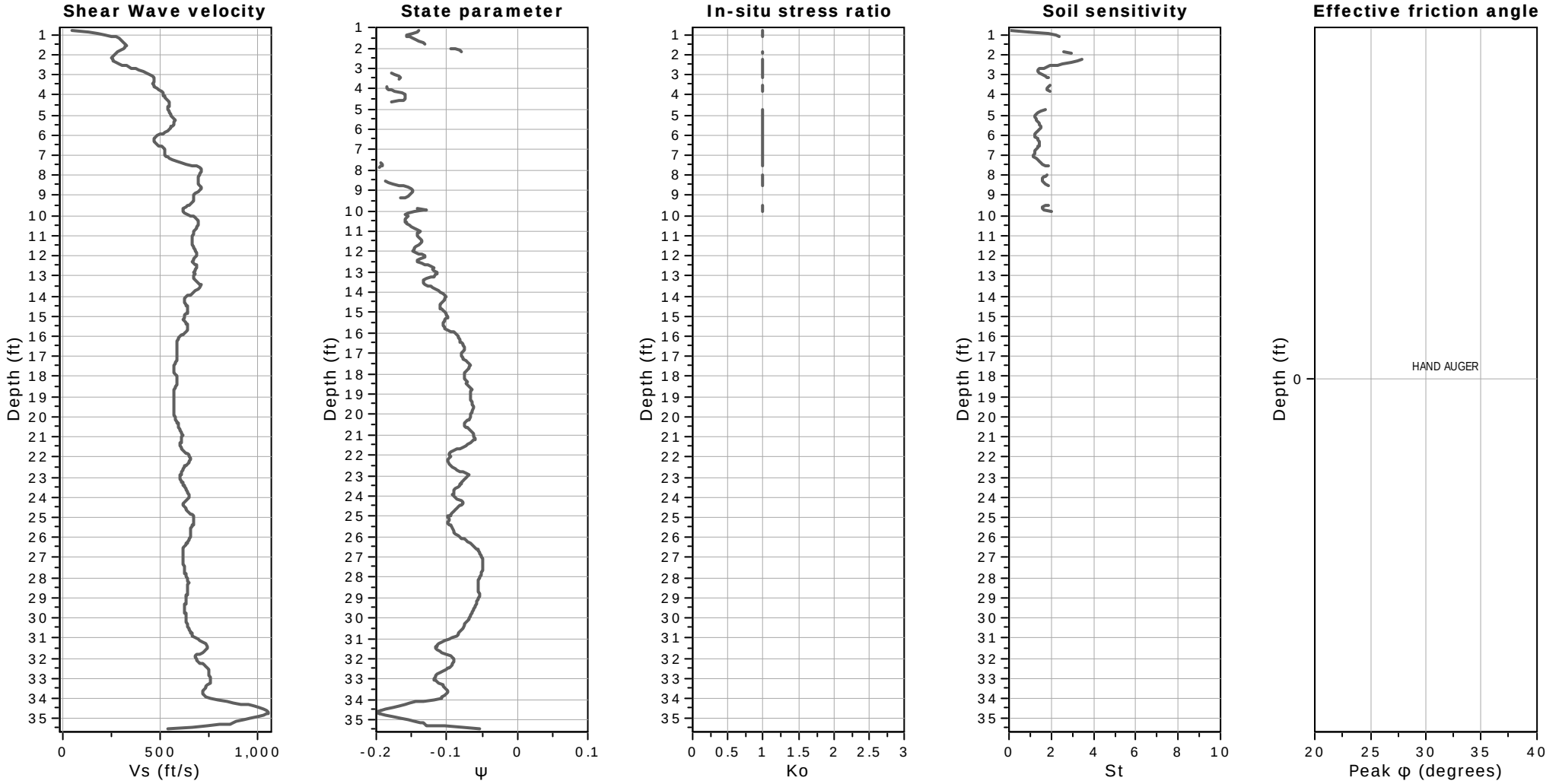
Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
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Undrained shear strength cone factor for clays, N_{kt}: 14
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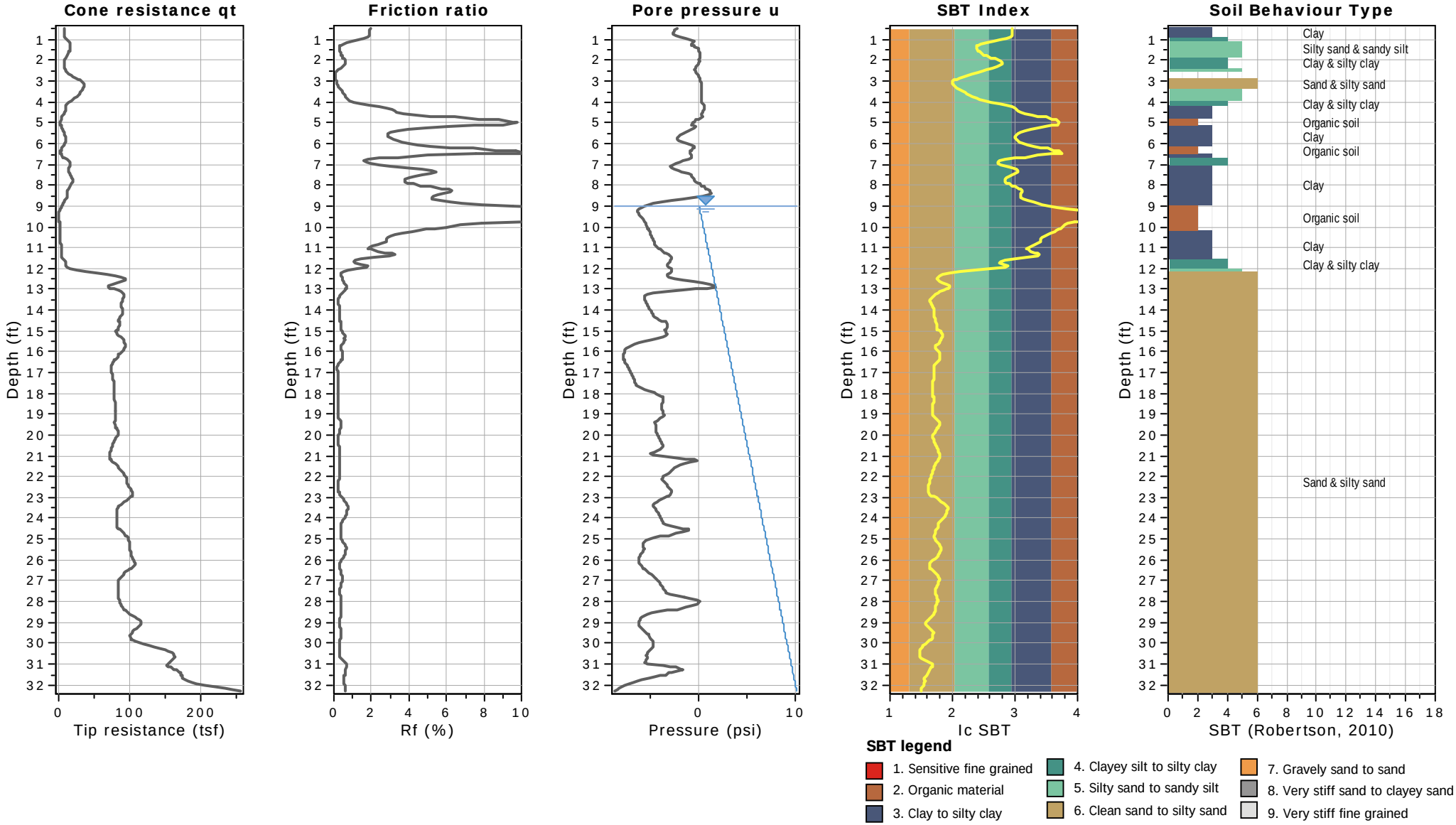
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

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18 Boulden Circle, Suite 36
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CPT: CPT-12
Total depth: 32.30 ft, Date: 12/20/2022
Surface Elevation: 81.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

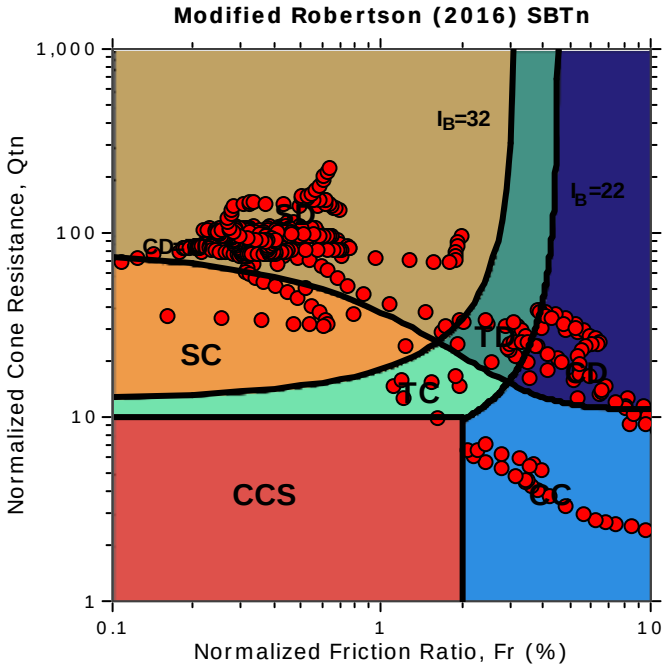


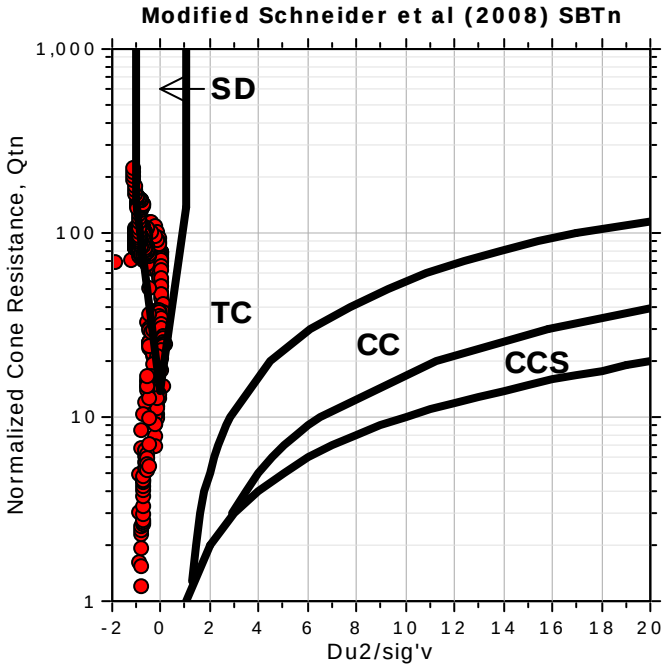
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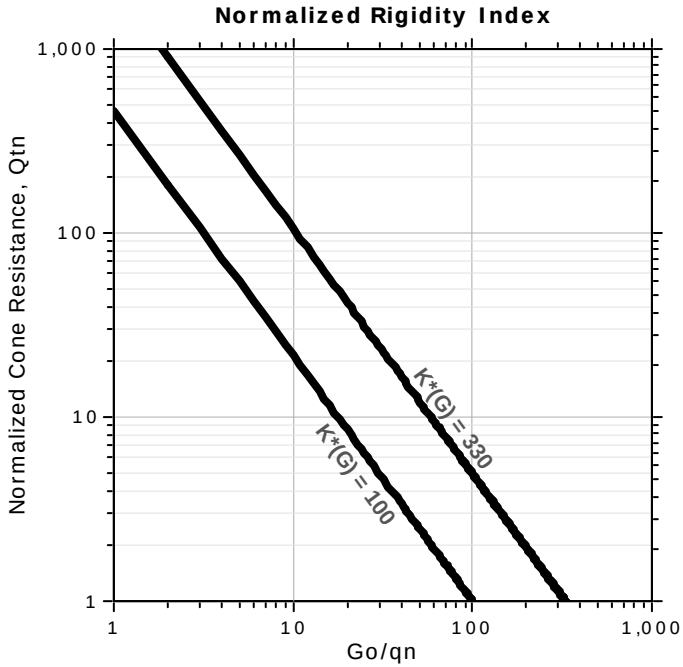
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Cone Type: Hogentogler
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Location: **New Castle County, Delaware**

Updated SBTn plots







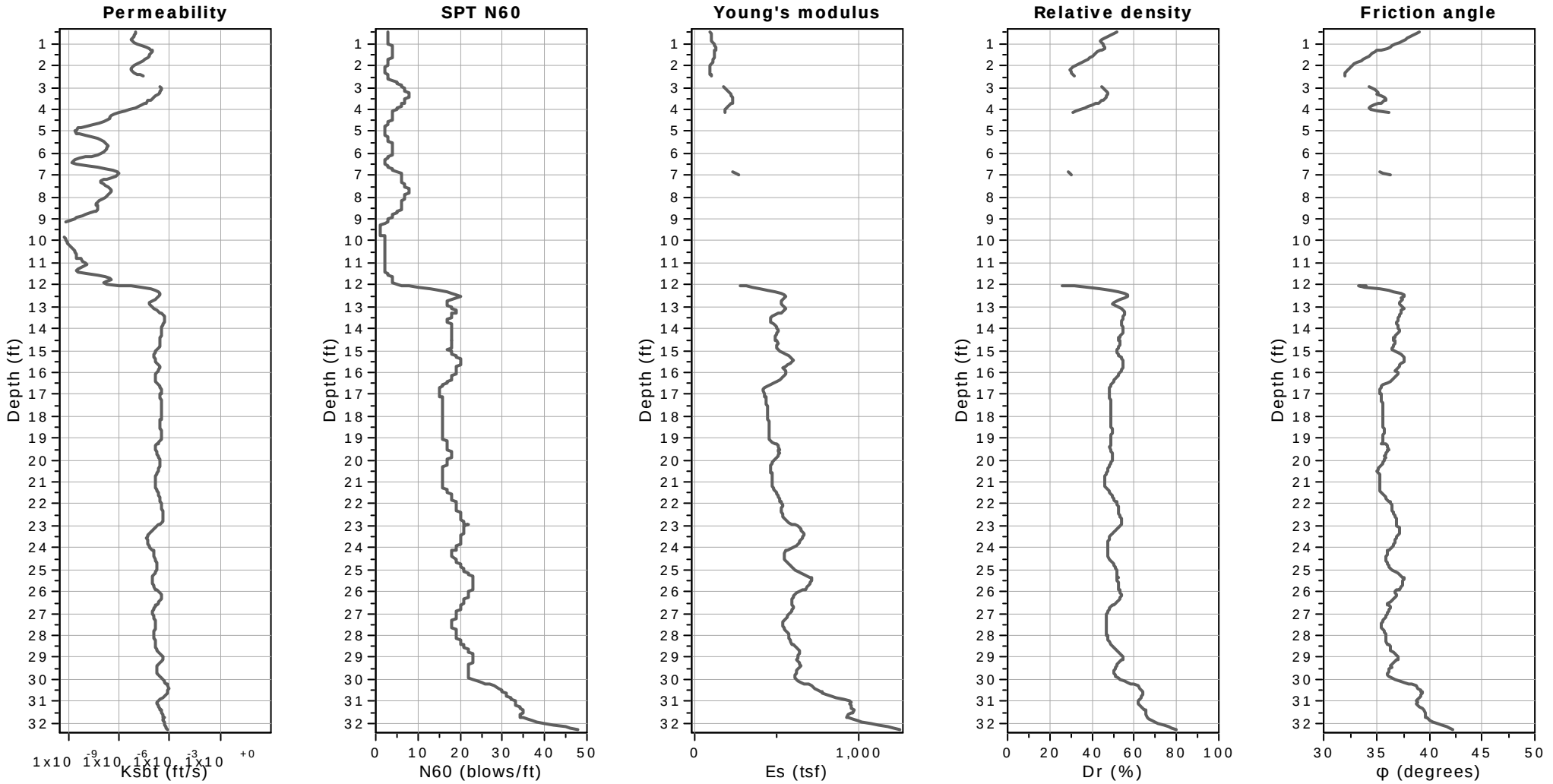
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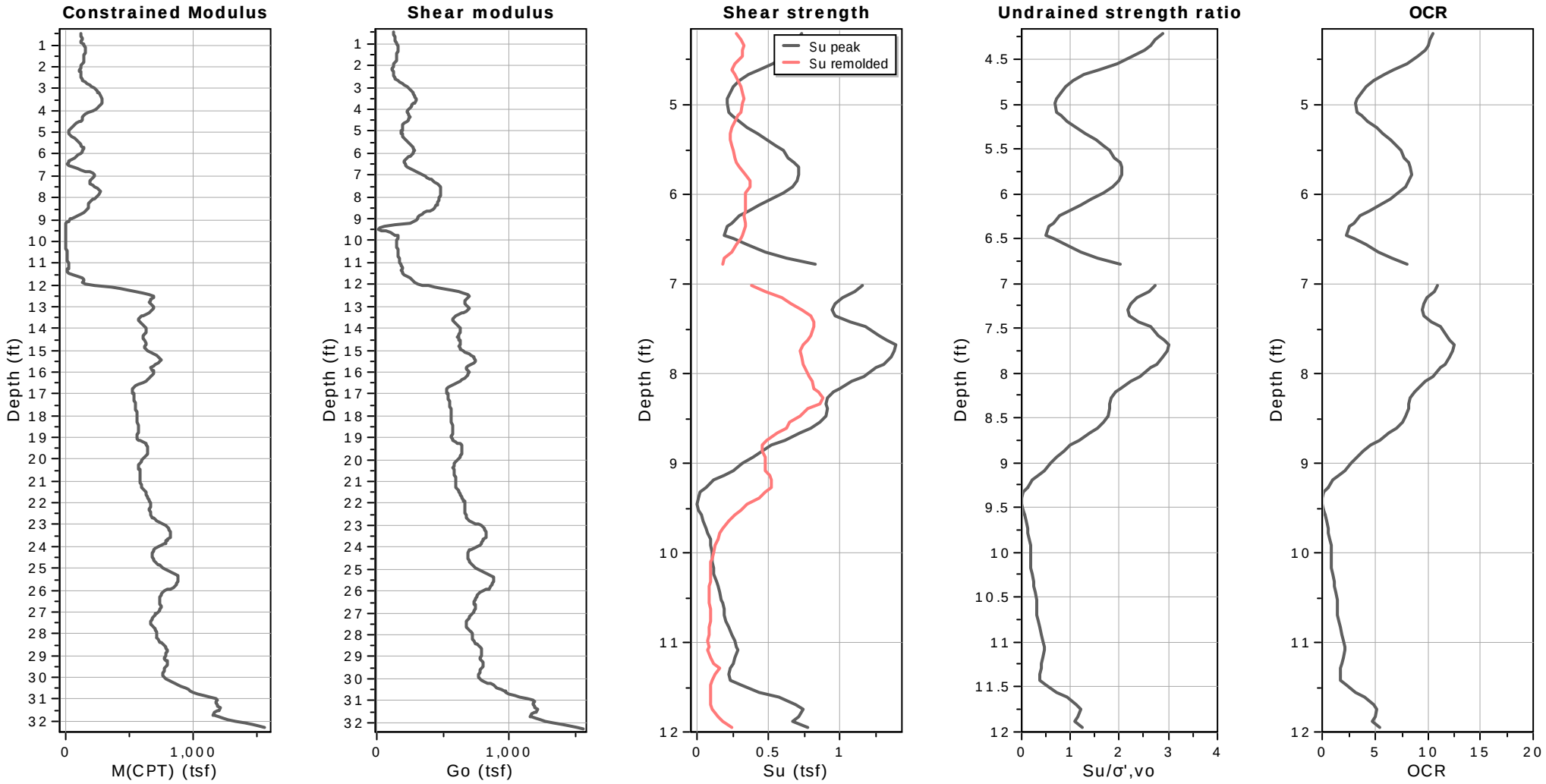
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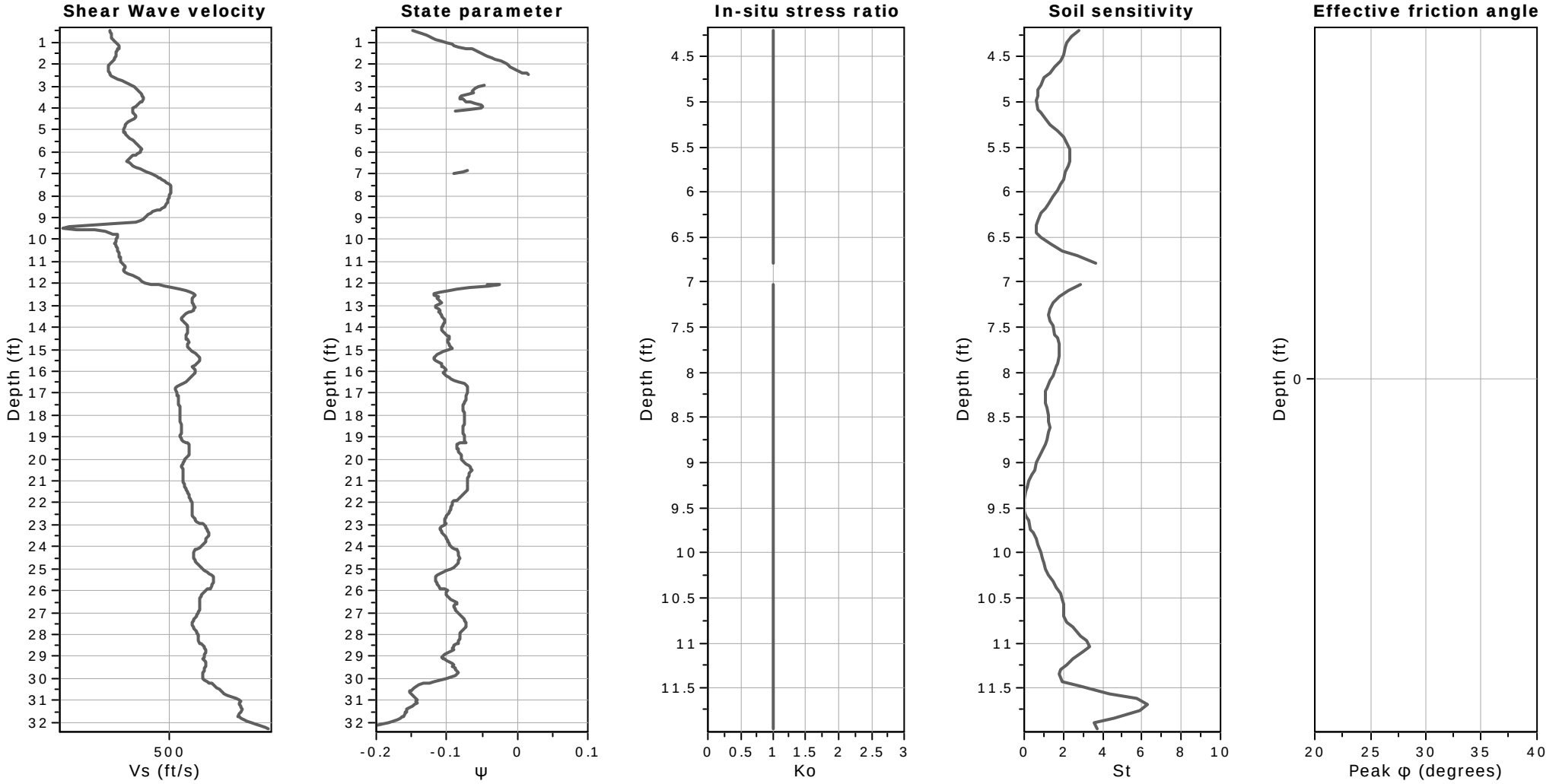
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Calculation parameters

Soil Sensitivity factor, N_S: 7.00

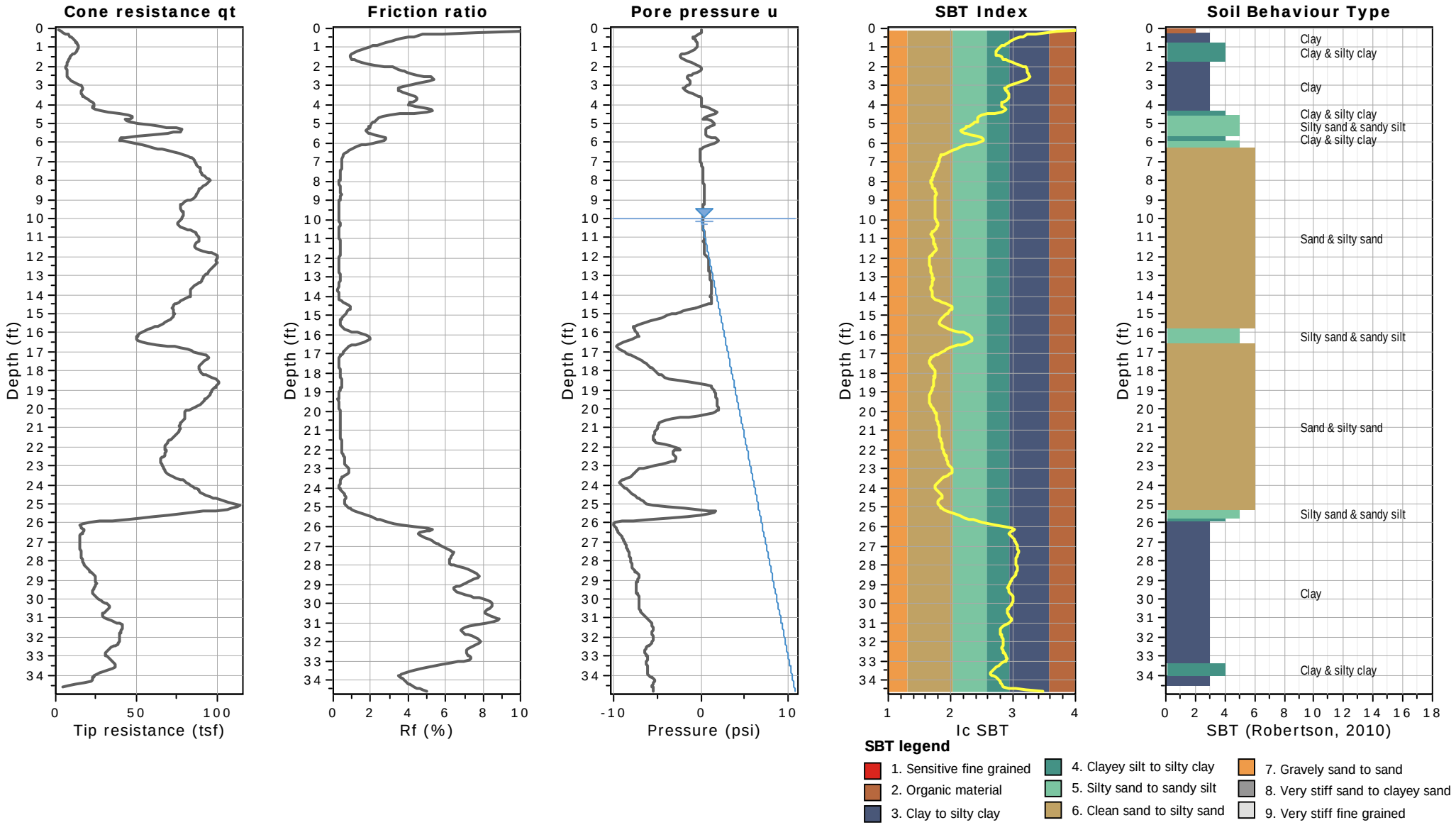
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CPT: CPT-13
Total depth: 34.85 ft, Date: 12/20/2022
Surface Elevation: 81.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

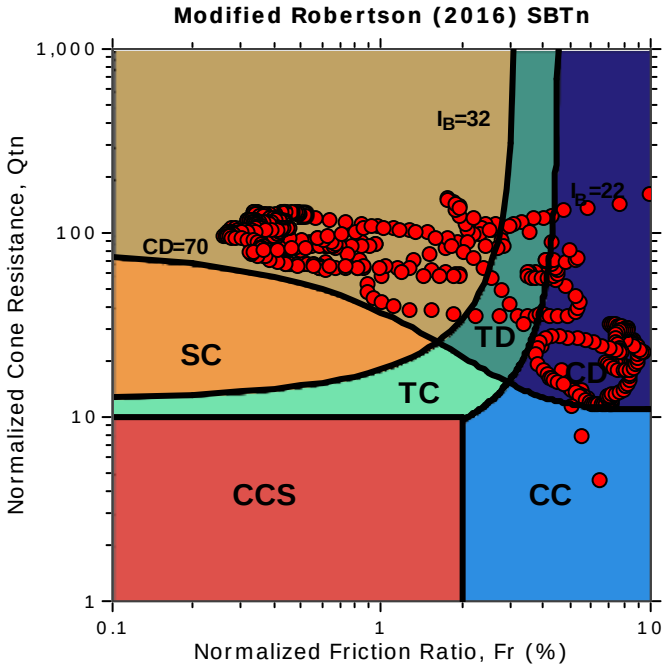


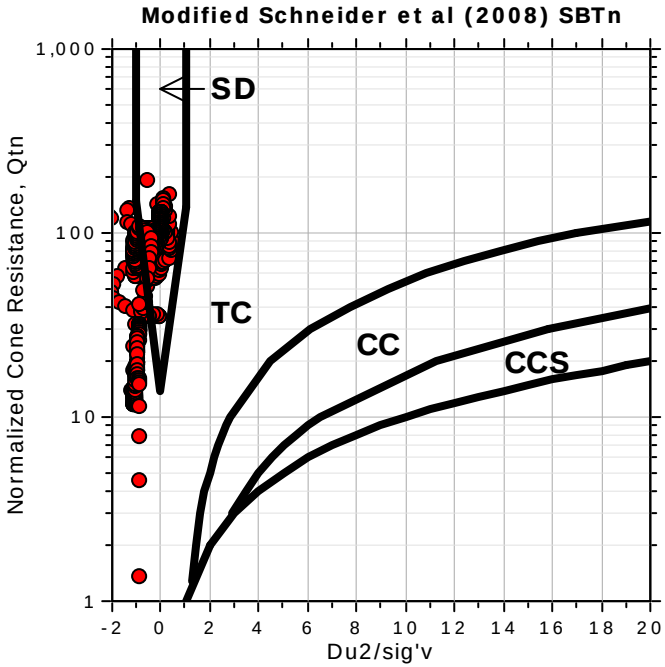
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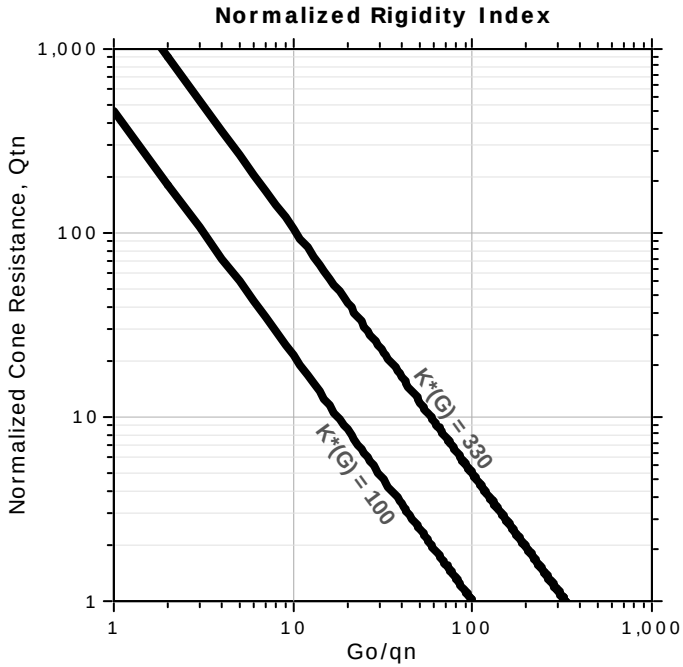
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Surface Elevation: 81.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

Updated SBTn plots







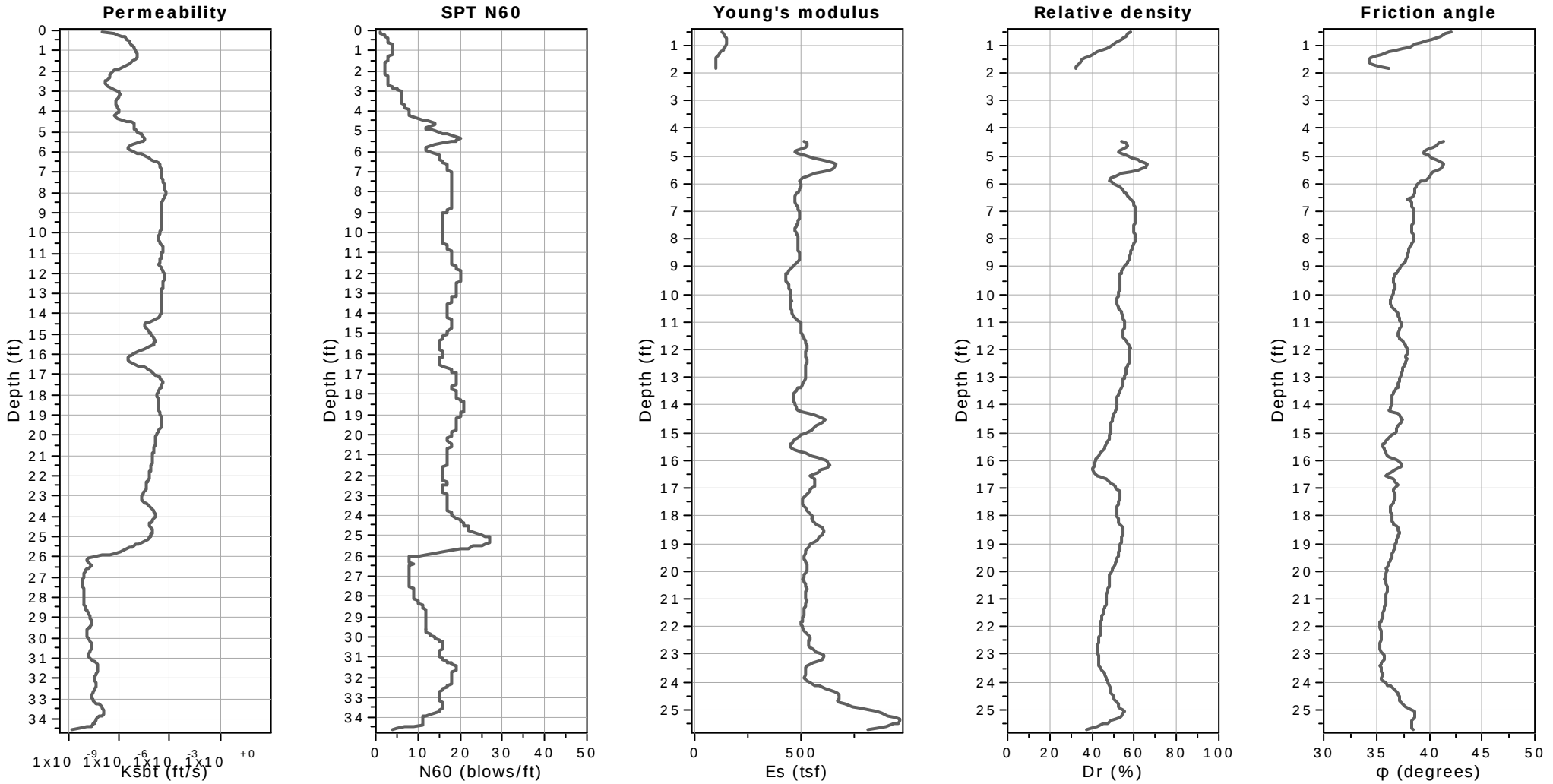
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
CD: Clay-like - Dilative
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K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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CPT: CPT-13
Total depth: 34.85 ft, Date: 12/20/2022
Surface Elevation: 81.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



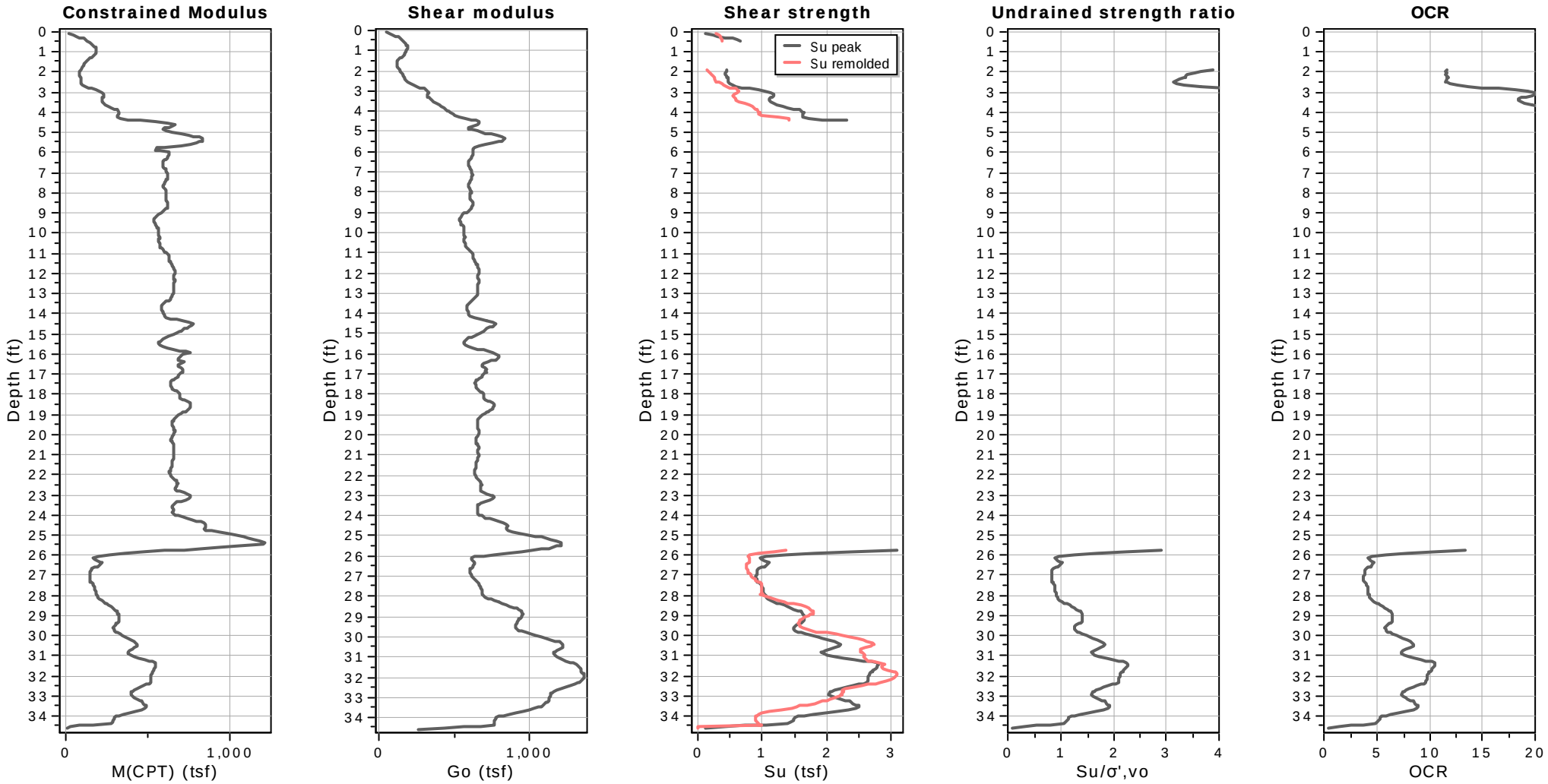
Calculation parameters

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)
User defined estimation data

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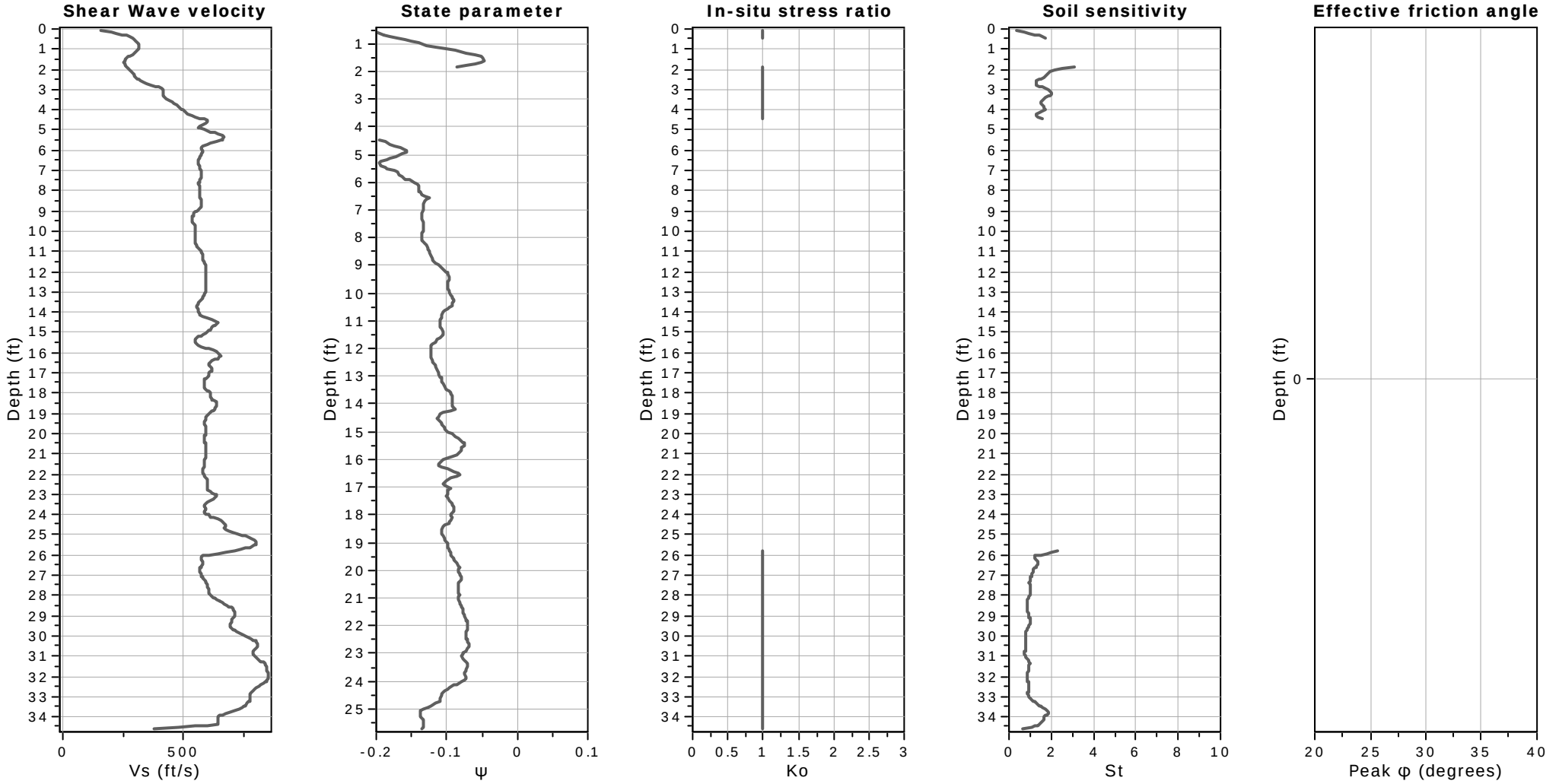
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



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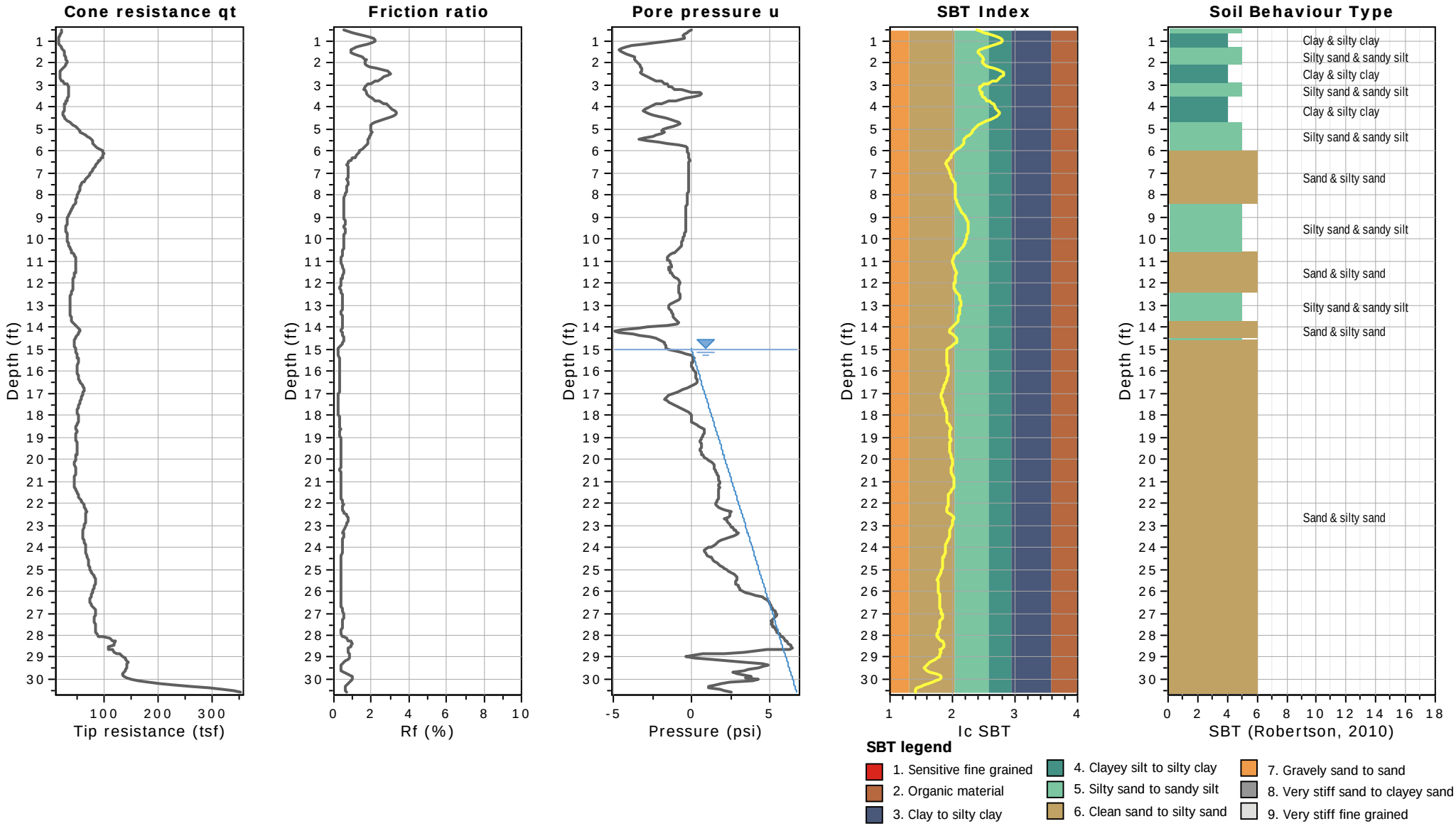
Soil Sensitivity factor, N_S: 7.00
User defined estimation data

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CPT: CPT-14
Total depth: 30.58 ft, Date: 12/21/2022
Surface Elevation: 82.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

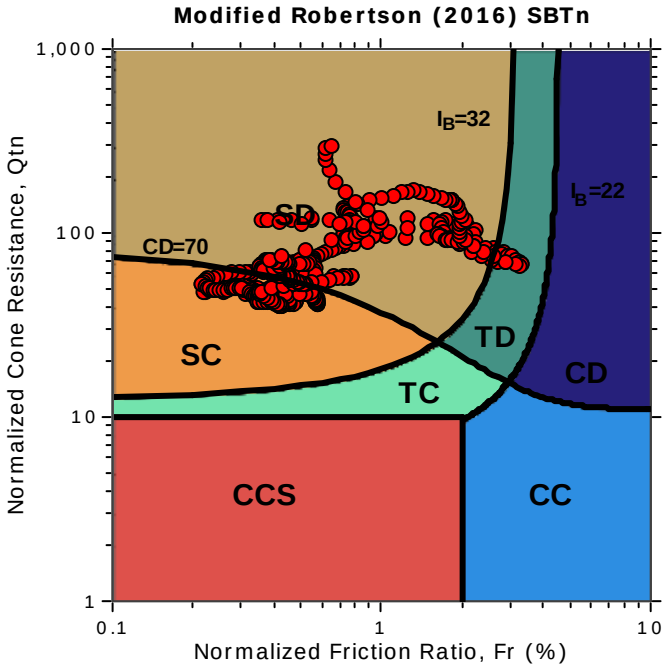


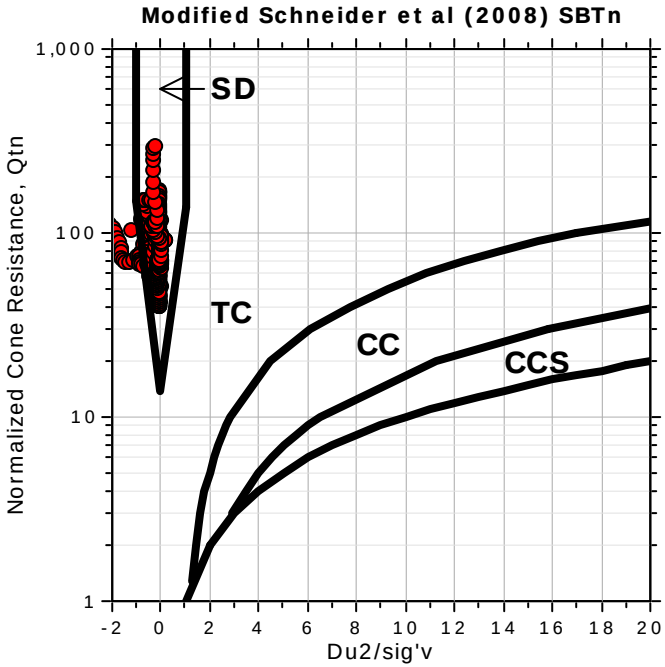
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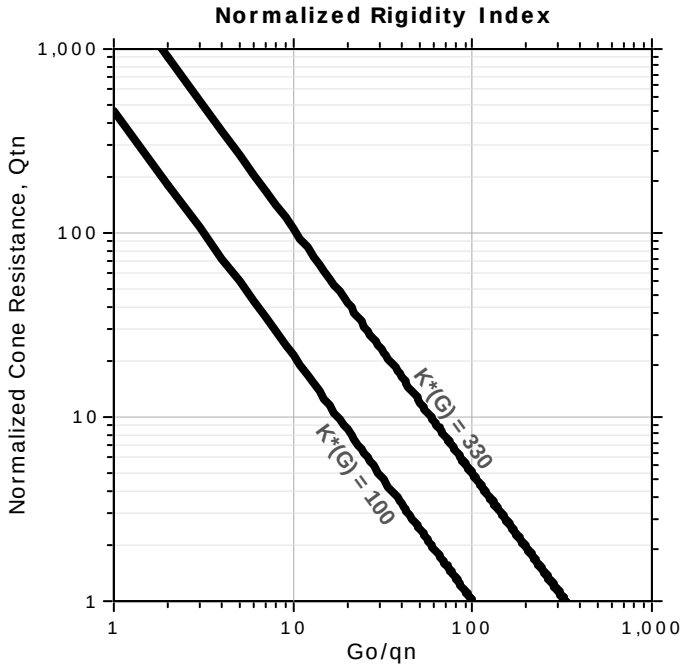
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Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

Updated SBTn plots







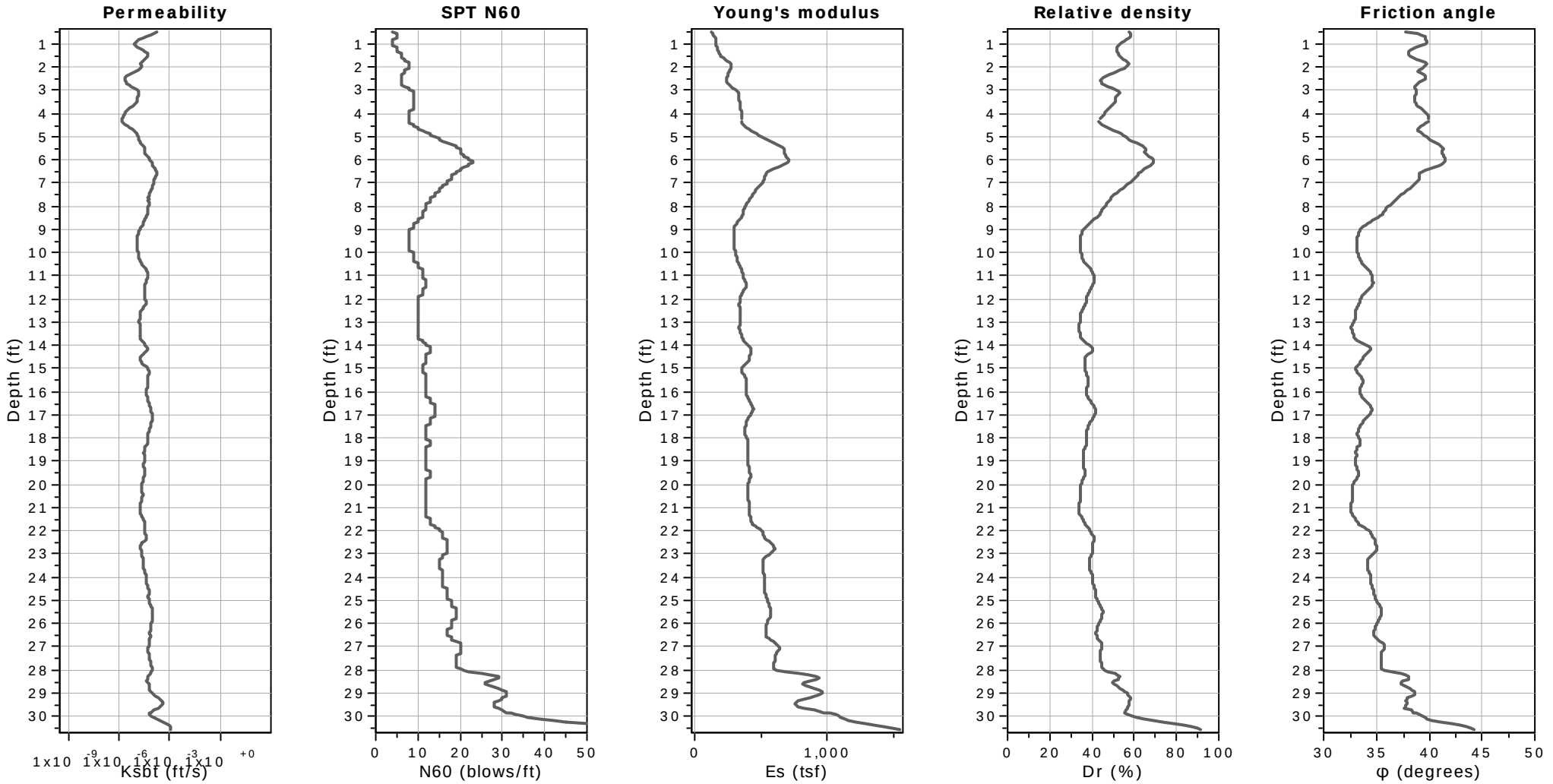
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Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



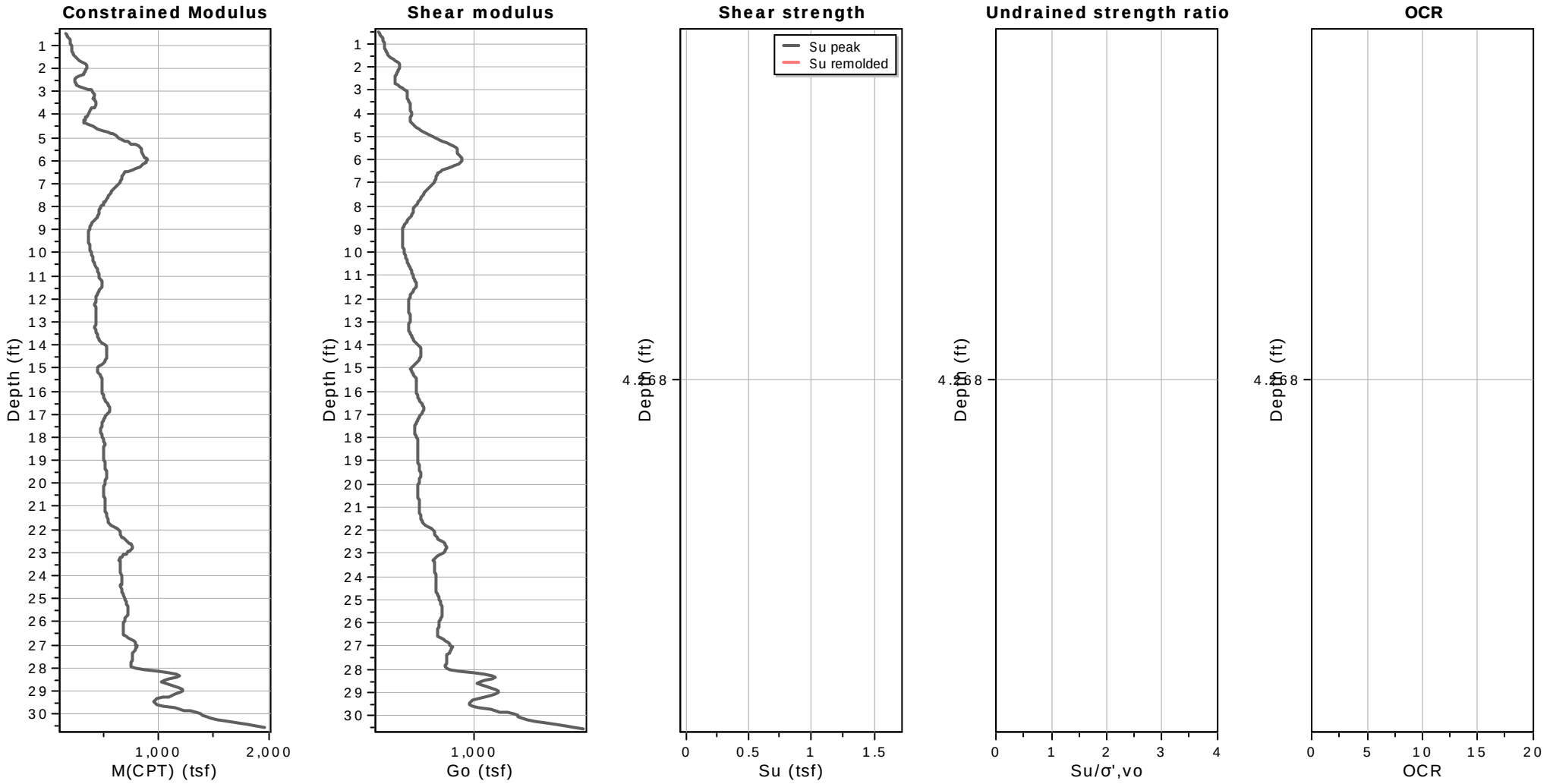
Calculation parameters

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)
User defined estimation data

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Location: **New Castle County, Delaware**



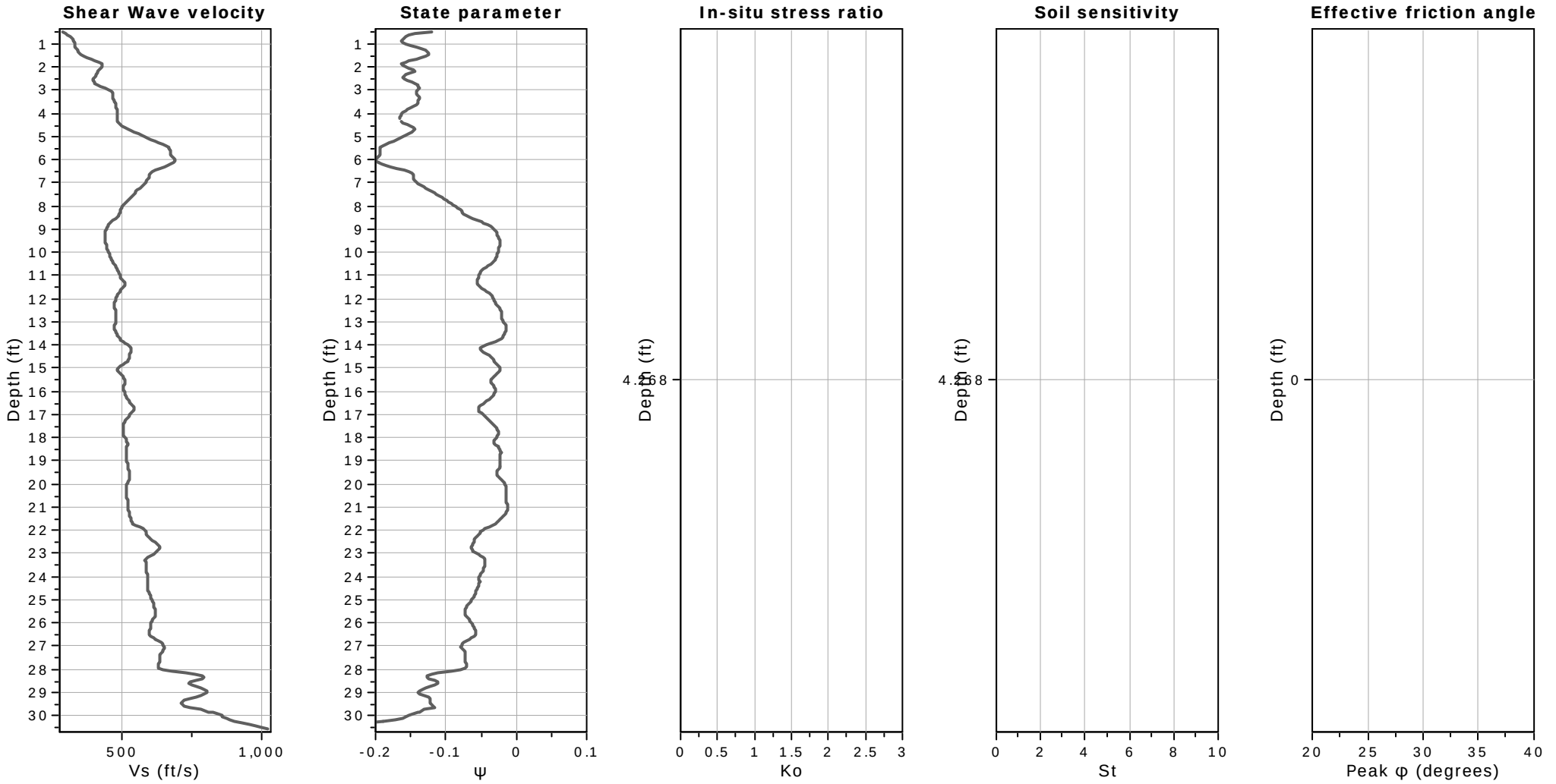
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



Calculation parameters

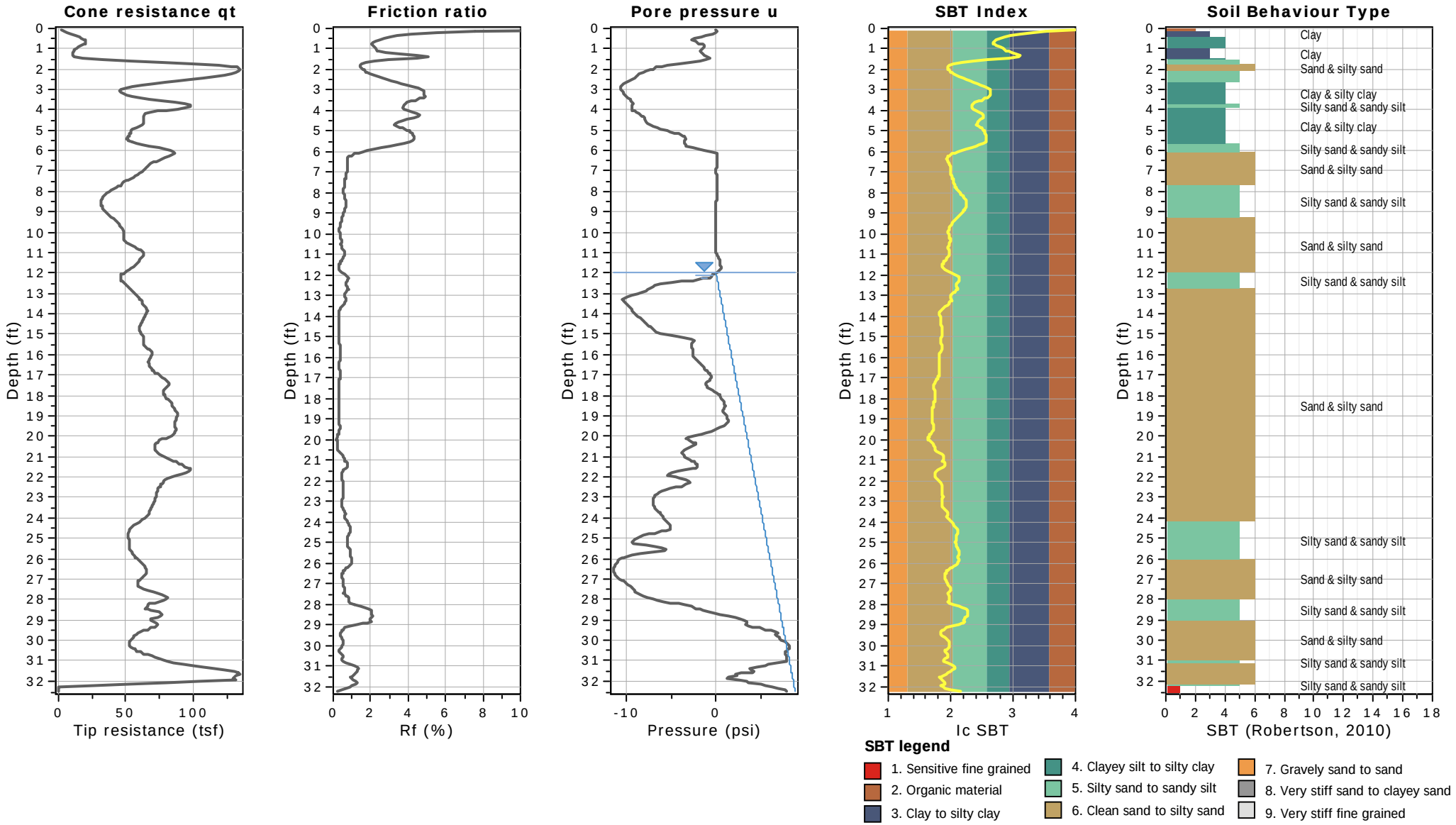
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

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CPT: CPT-15
Total depth: 32.51 ft, Date: 12/20/2022
Surface Elevation: 80.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

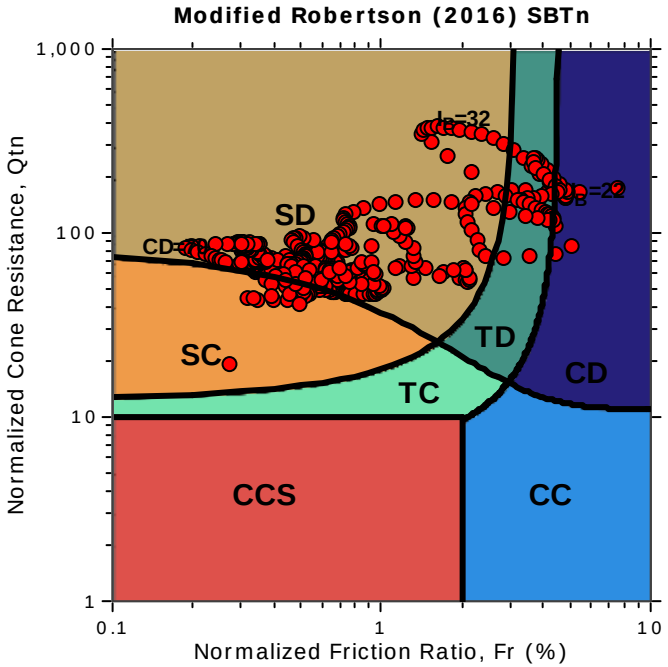


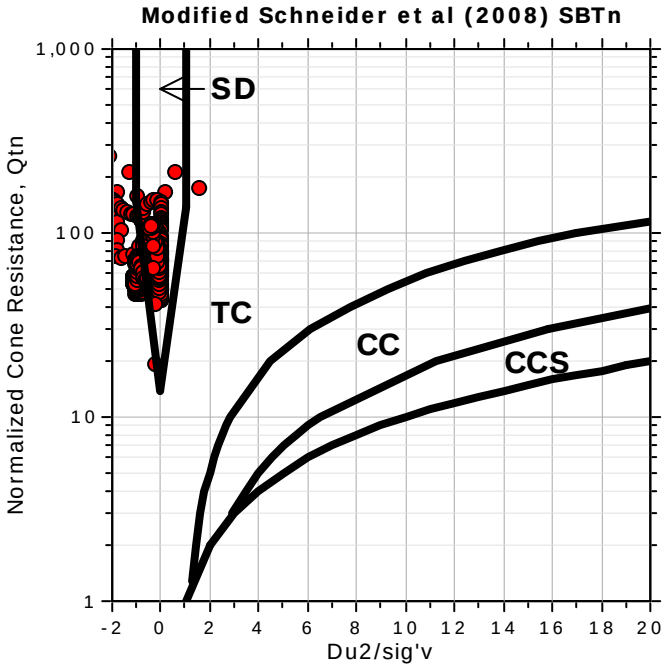
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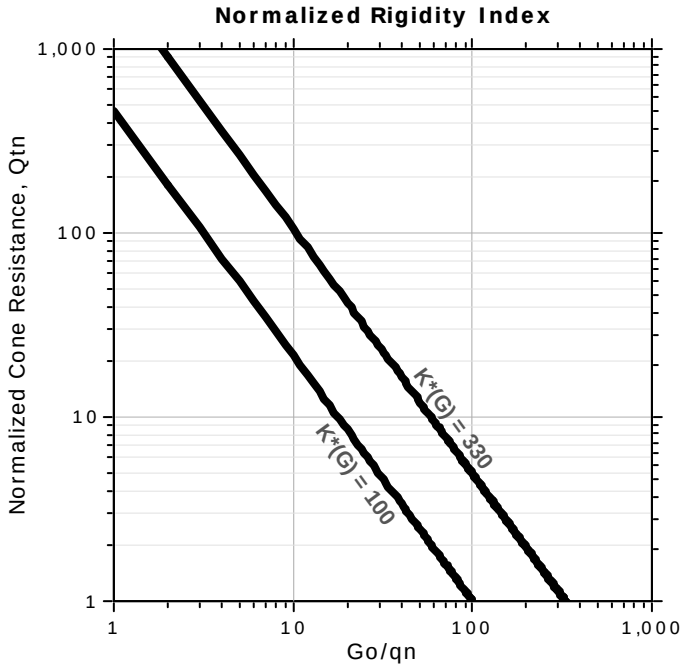
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Location: **New Castle County, Delaware**

Updated SBTn plots







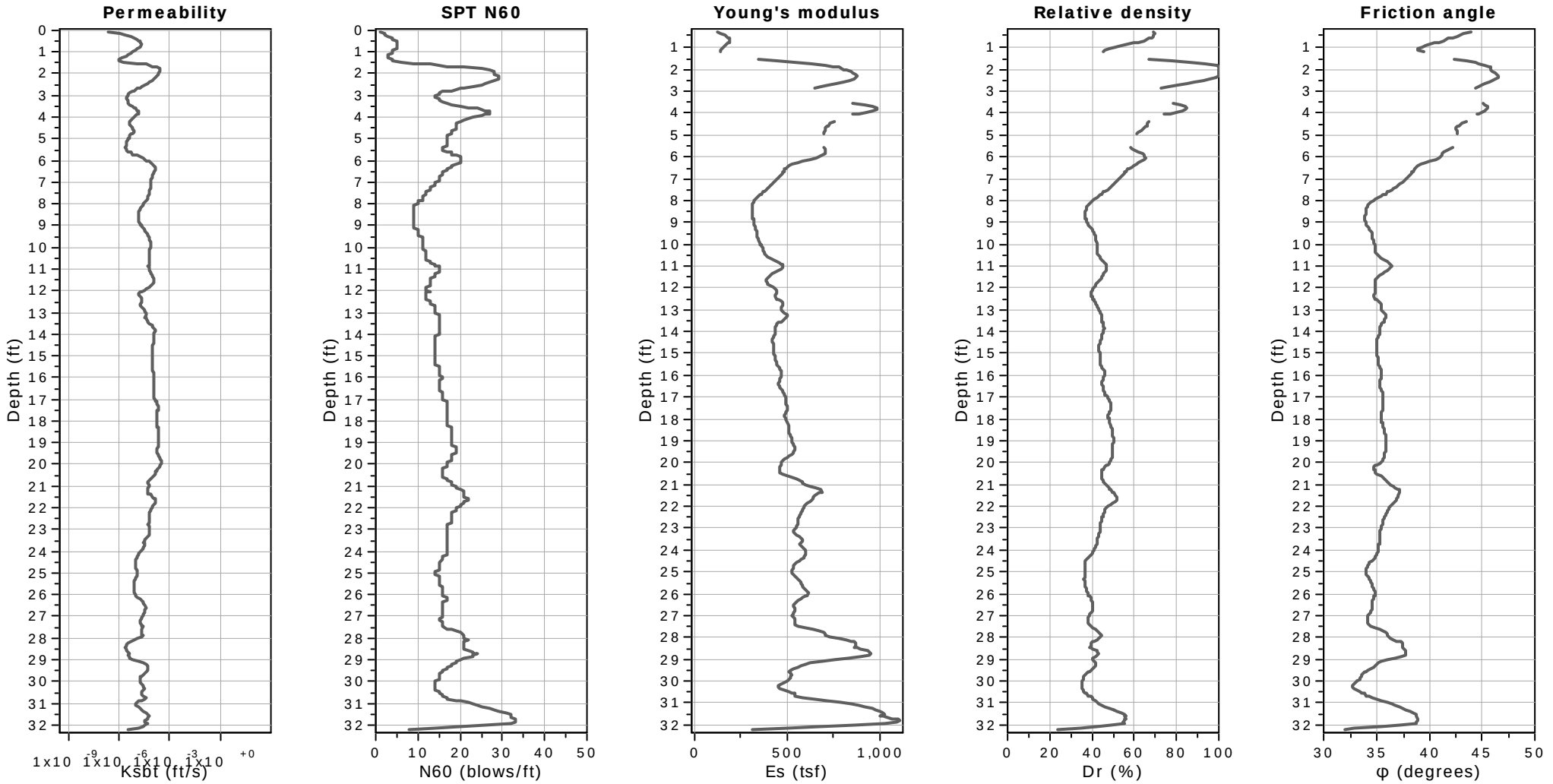
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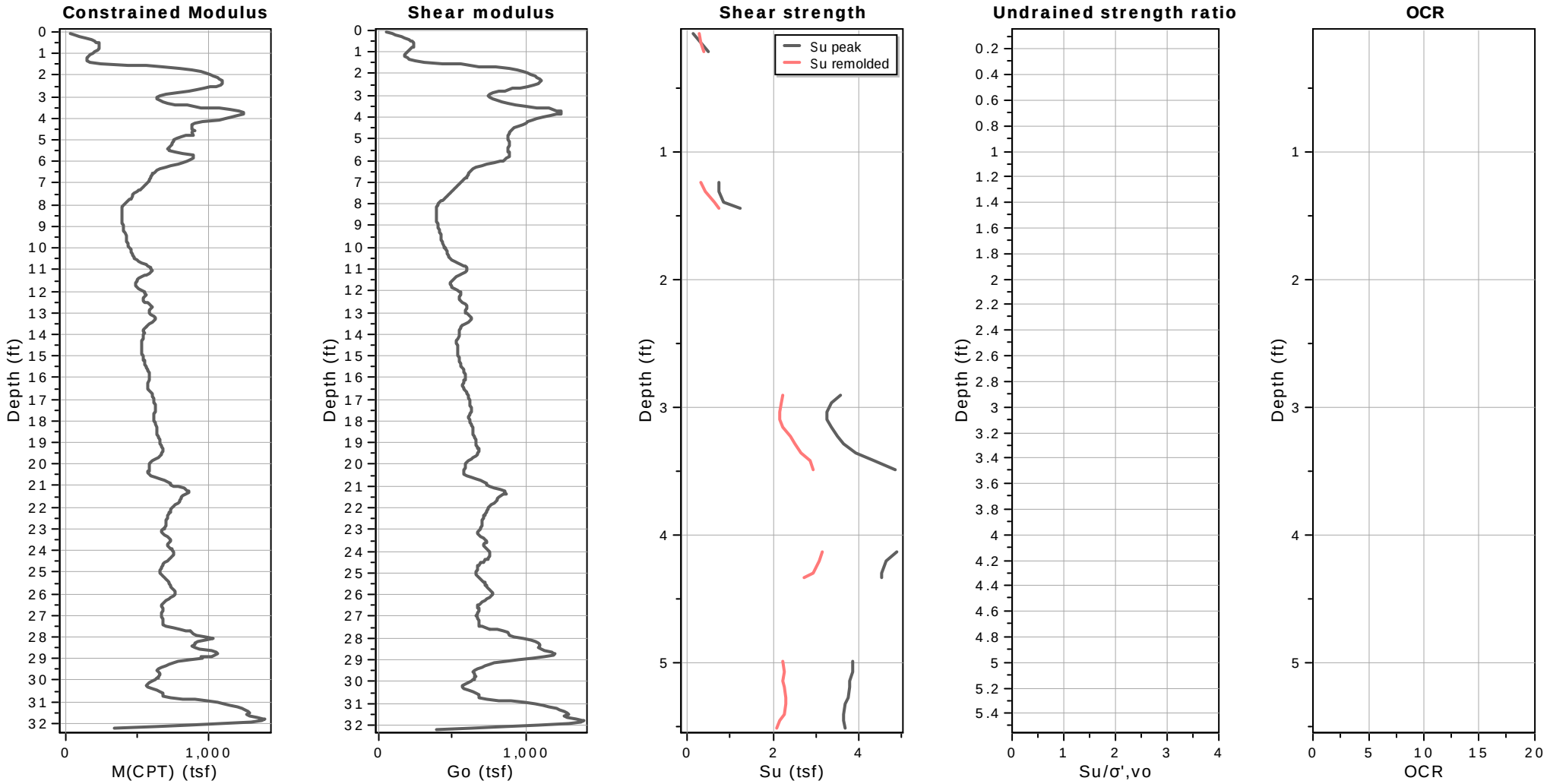
Calculation parameters

Permeability: Based on SBT_n
SPT N_{60}: Based on I_c and q_t
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Relative density constant, C_{Dr}: 350.0
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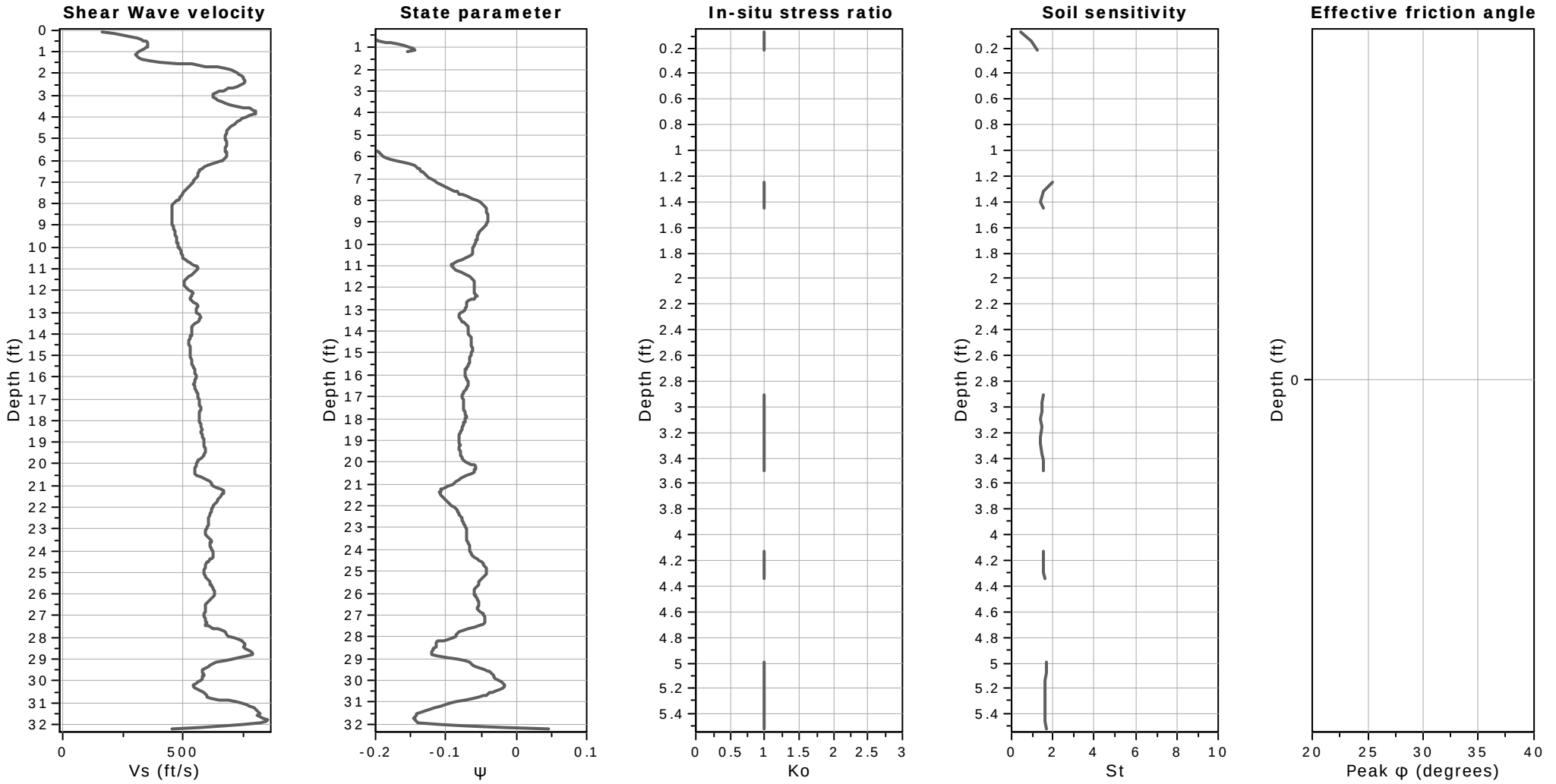
Calculation parameters

Constrained modulus: Based on variable *alpha* using I_c and Q_{tn} (Robertson, 2009)
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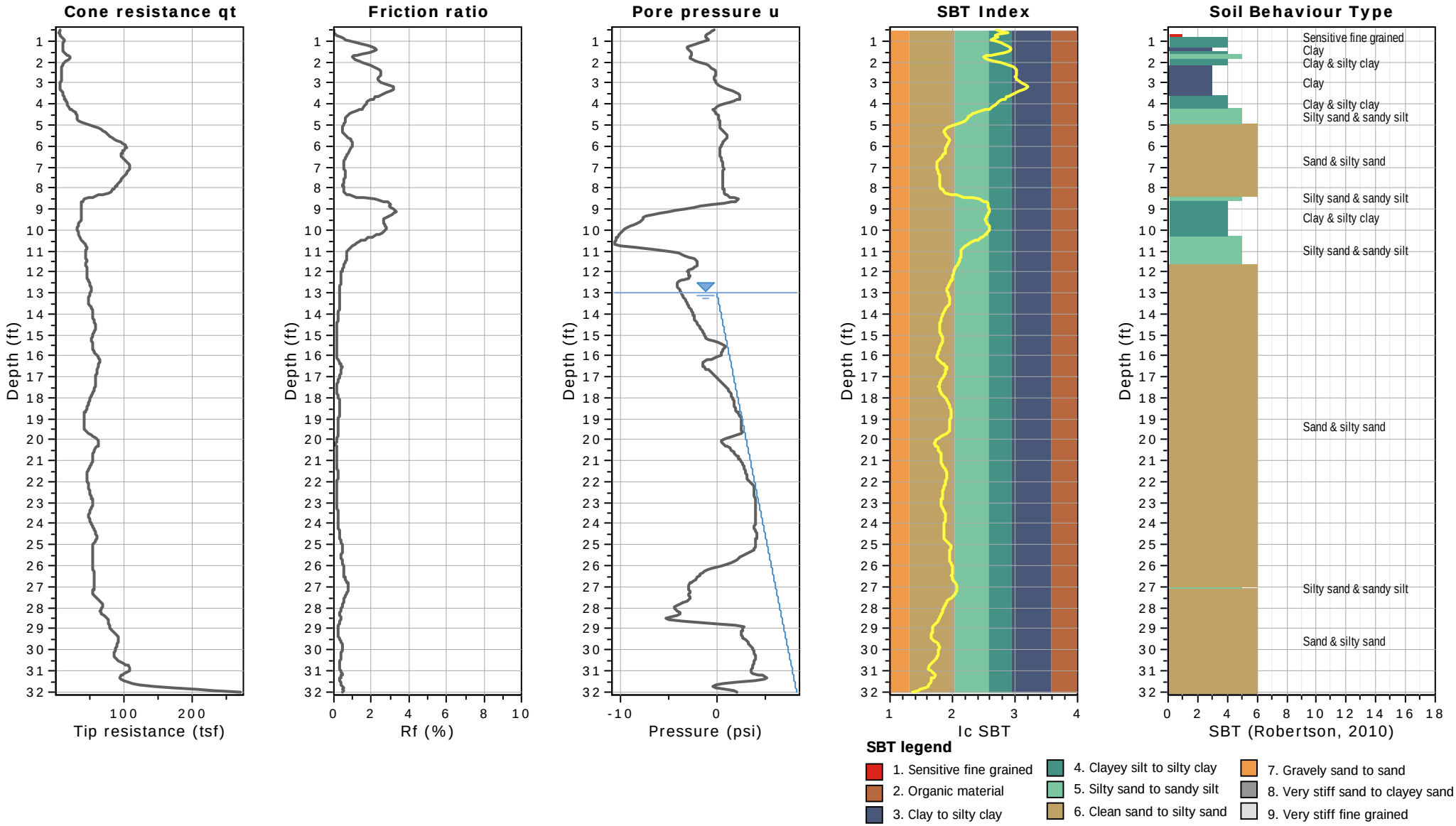
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

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CPT: CPT-16
Total depth: 32.03 ft, Date: 12/20/2022
Surface Elevation: 79.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

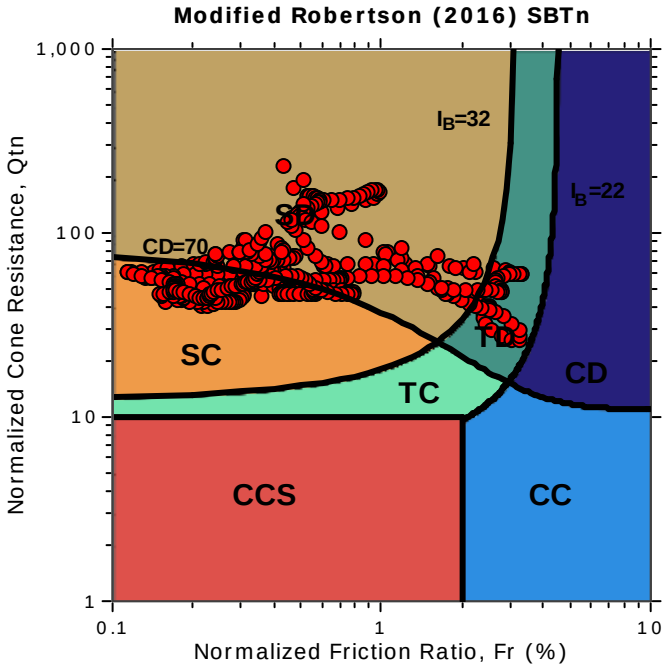


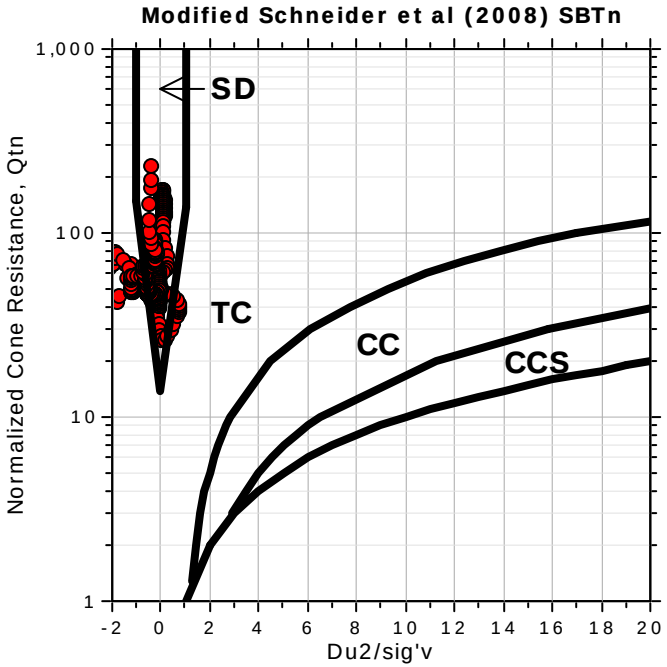
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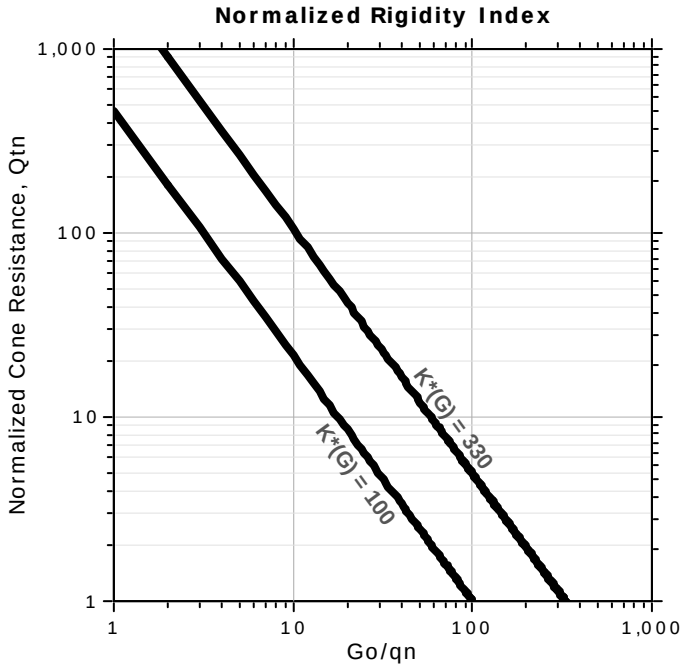
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Updated SBTn plots







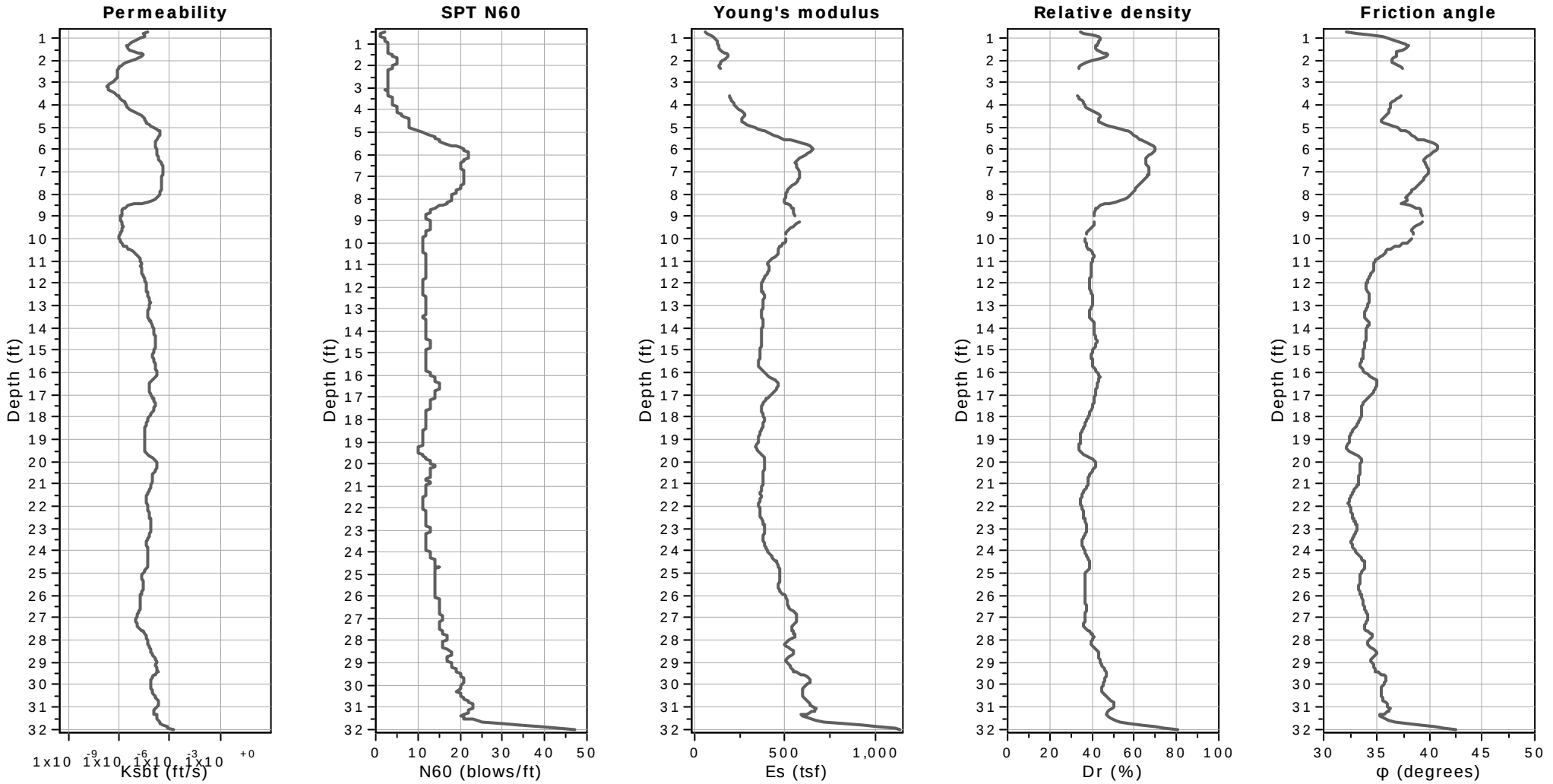
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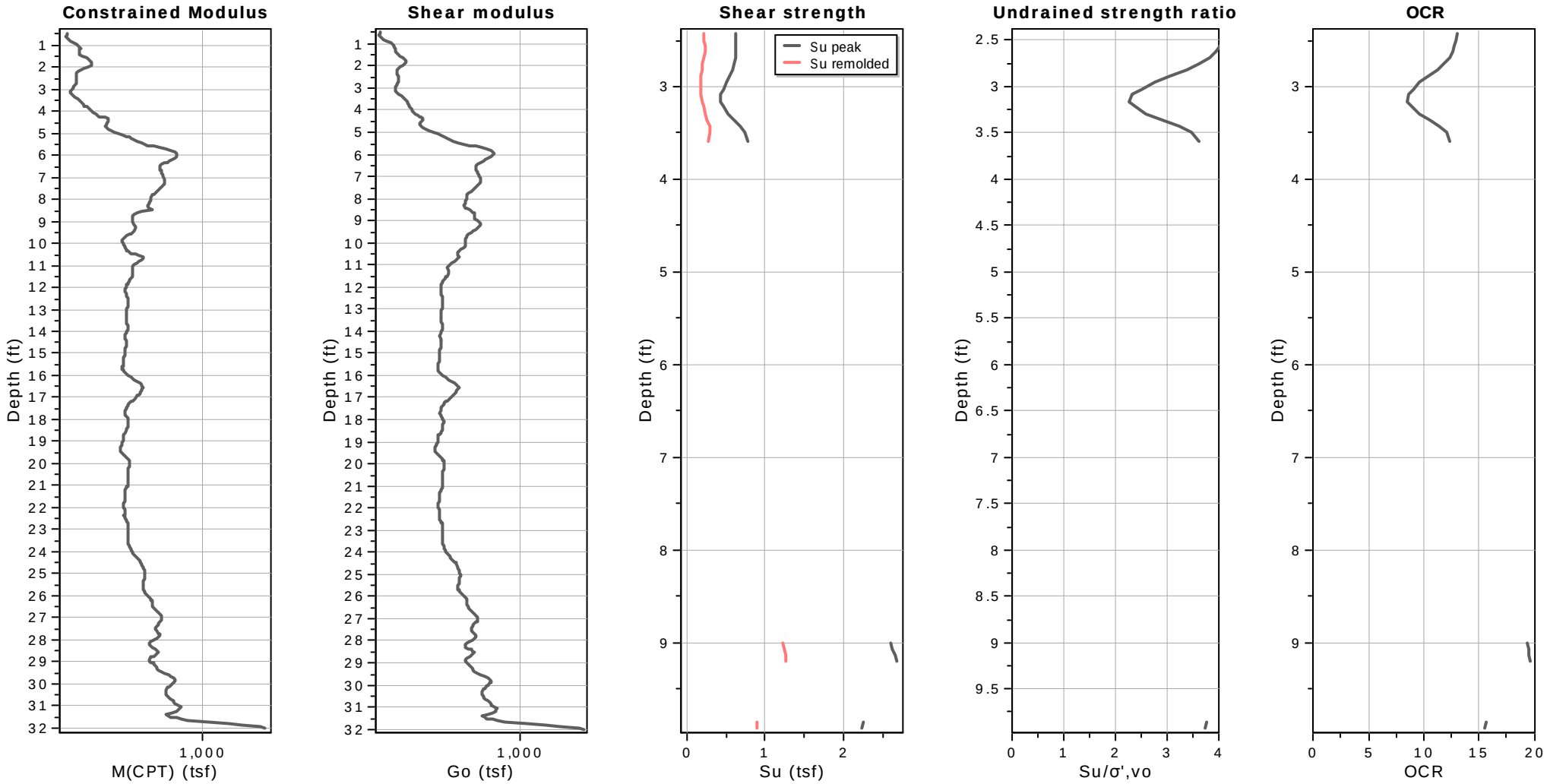
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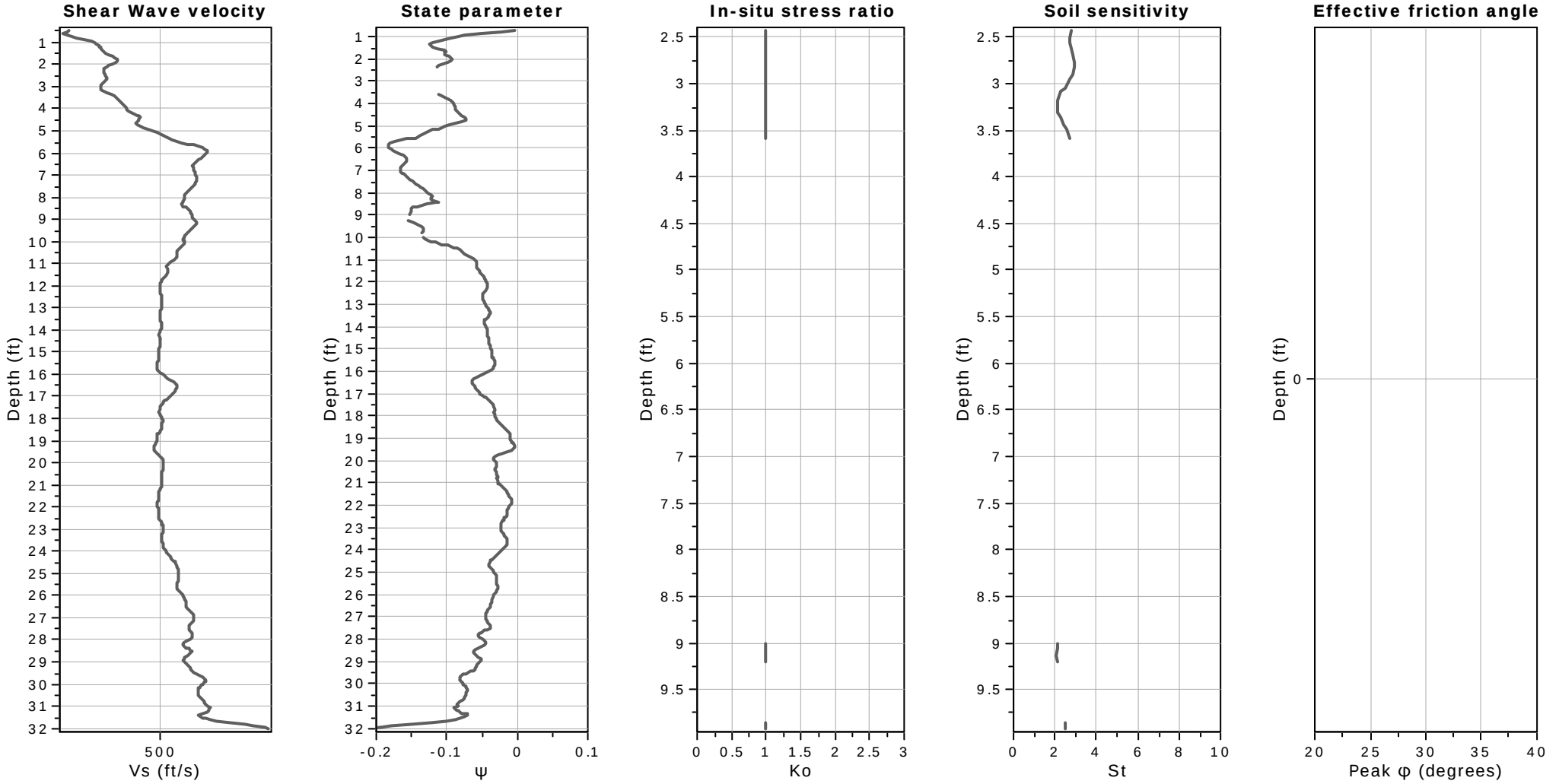
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Calculation parameters

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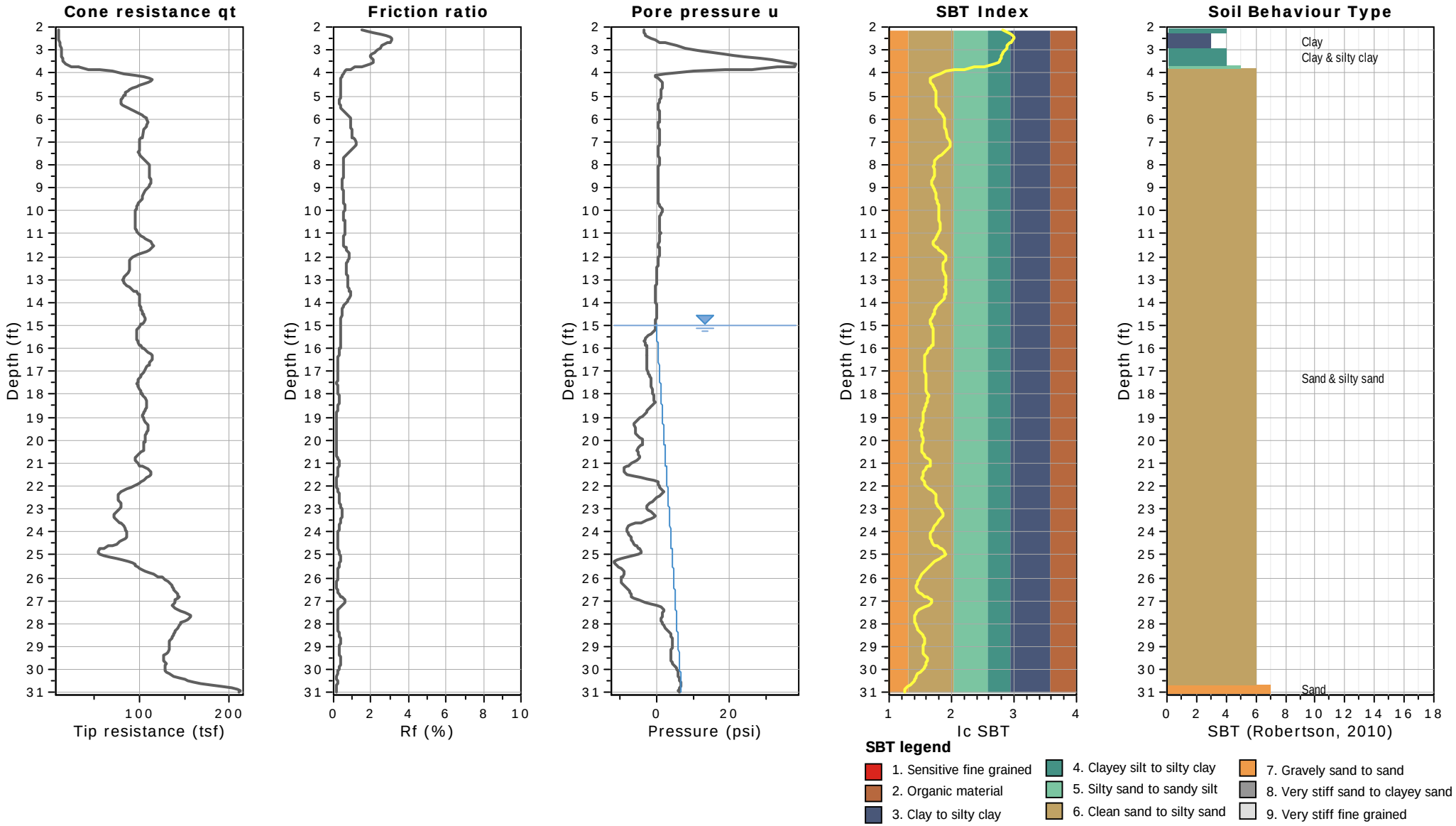
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CPT: CPT-17
Total depth: 30.98 ft, Date: 12/20/2022
Surface Elevation: 83.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

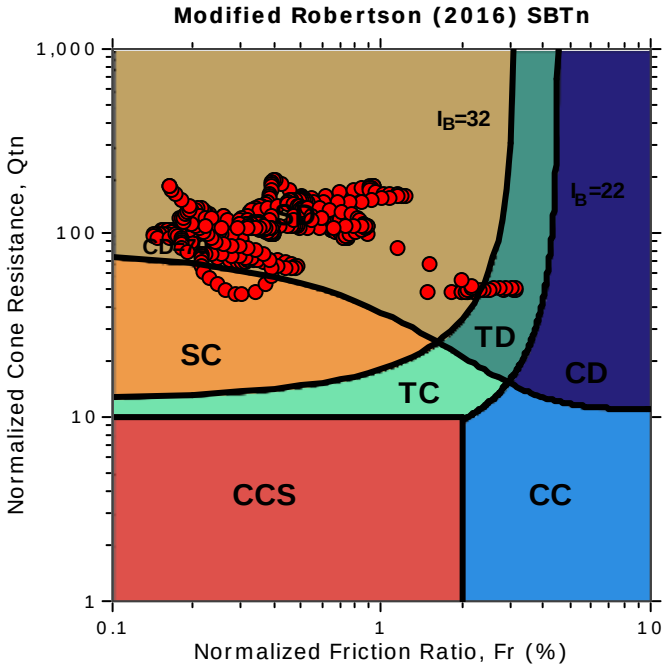


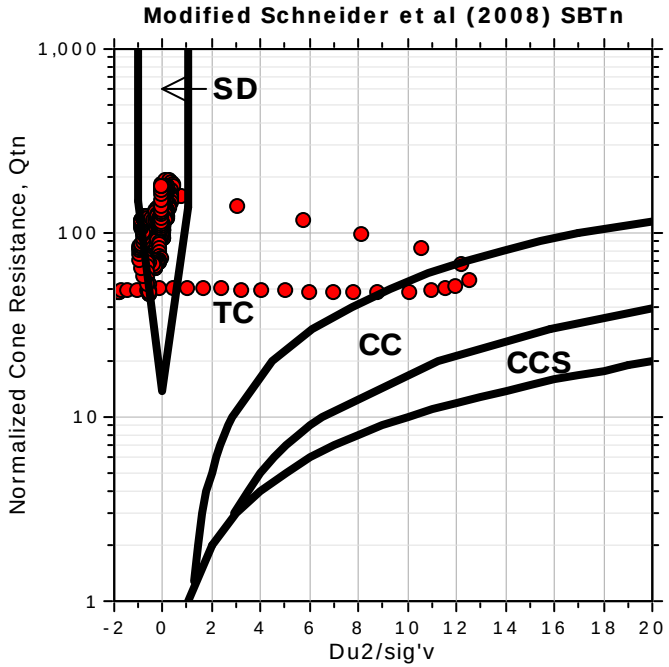
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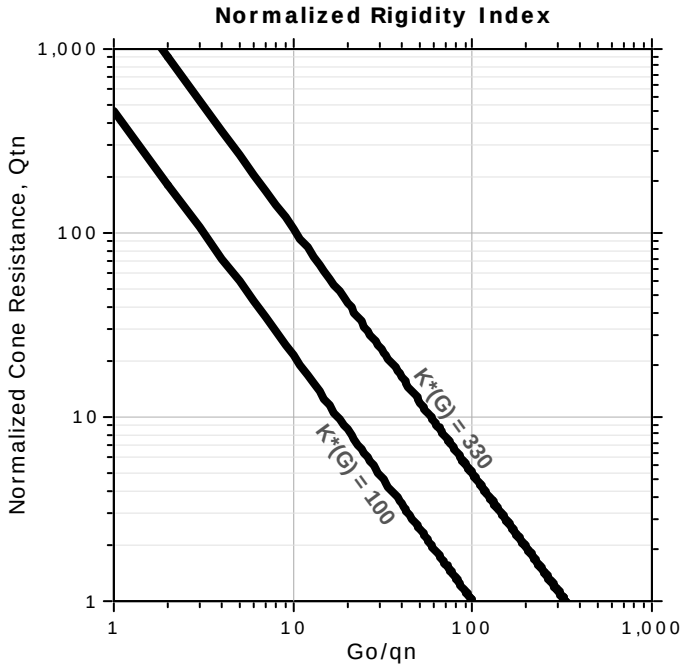
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Location: **New Castle County, Delaware**

Updated SBTn plots







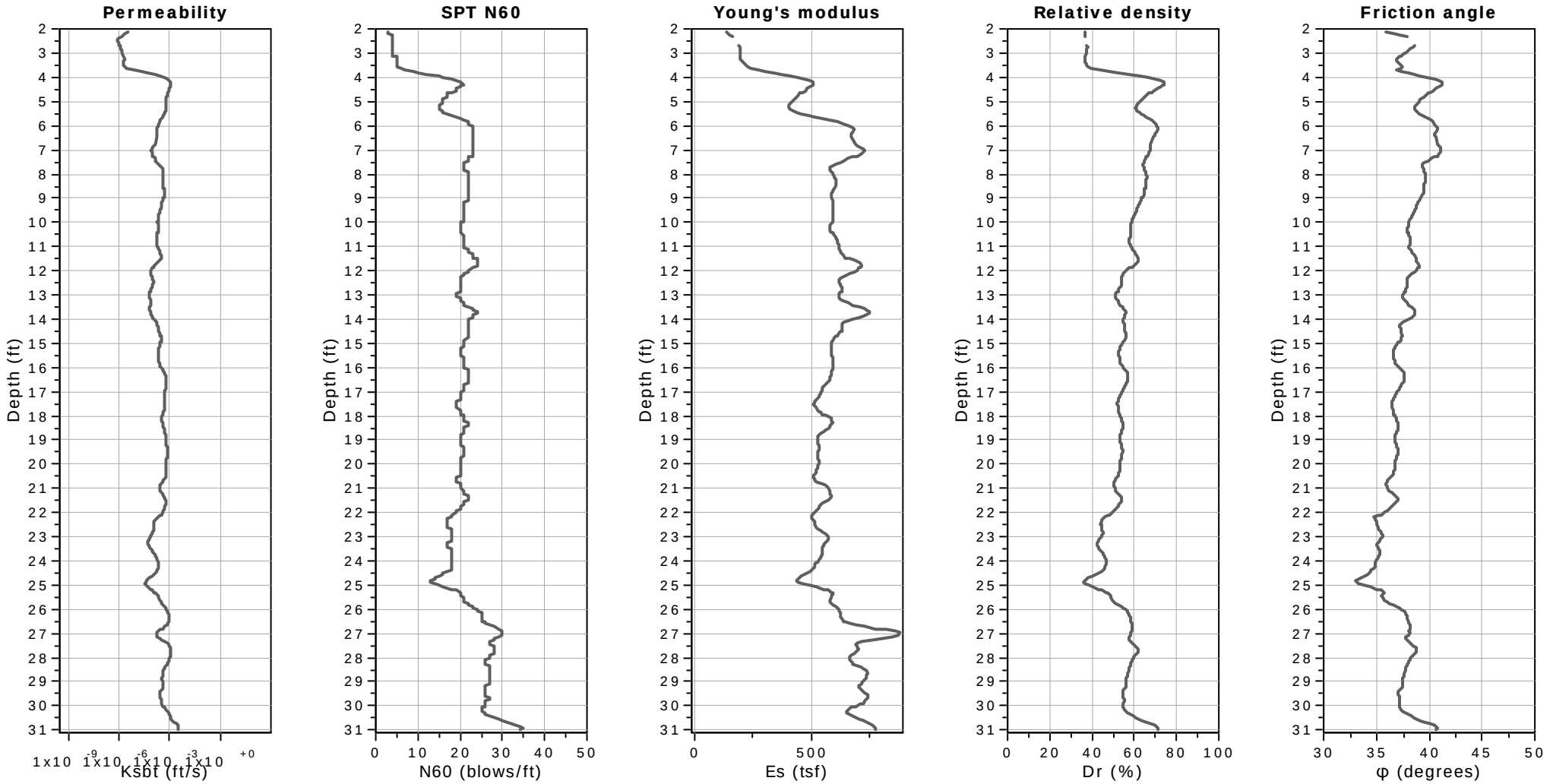
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
CD: Clay-like - Dilative
TC: Transitional - Contractive
TD: Transitional - Dilative
SC: Sand-like - Contractive
SD: Sand-like - Dilative

K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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CPT: CPT-17
Total depth: 30.98 ft, Date: 12/20/2022
Surface Elevation: 83.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



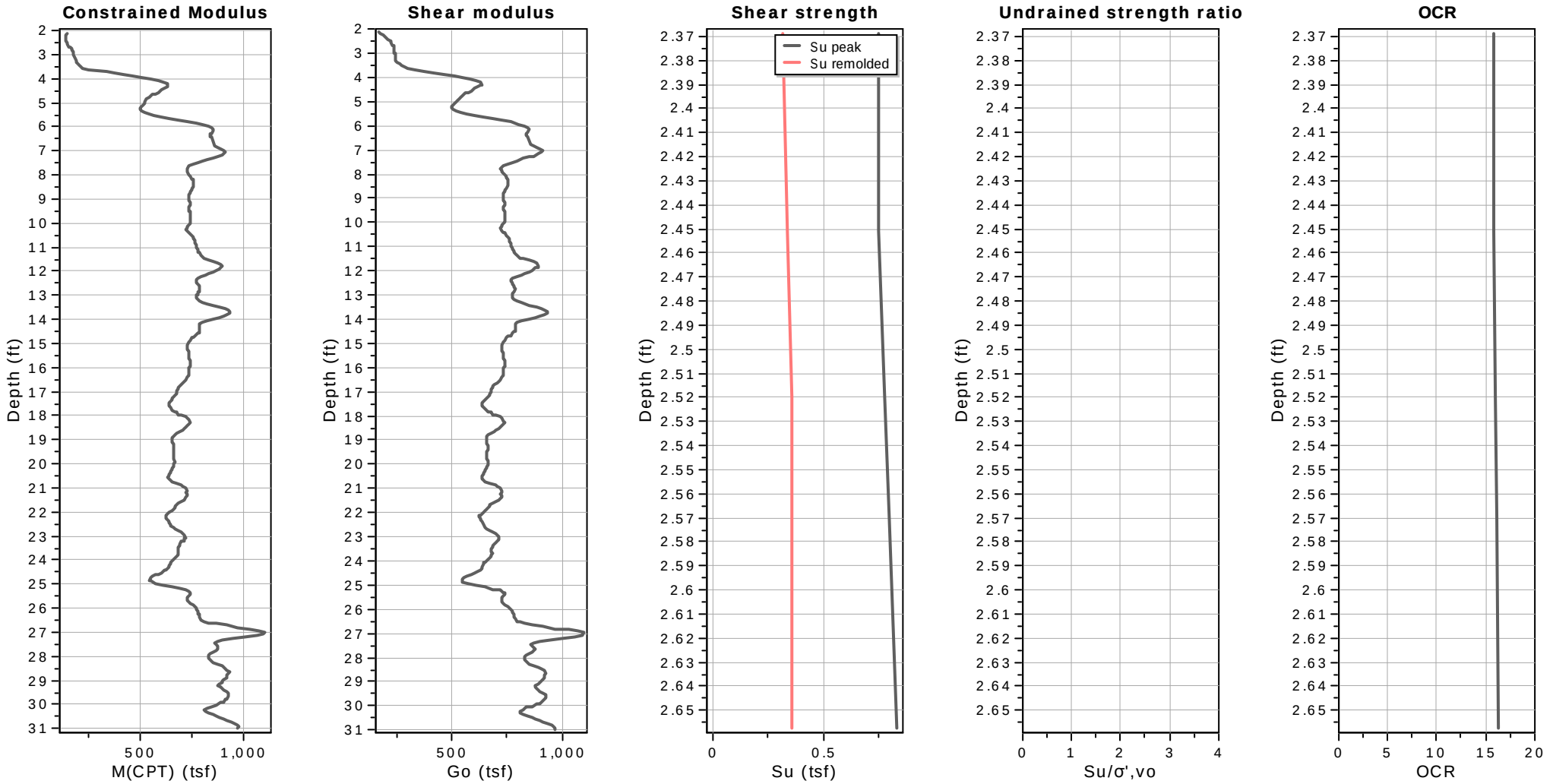
Calculation parameters

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)
User defined estimation data

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CPT: CPT-17
Total depth: 30.98 ft, Date: 12/20/2022
Surface Elevation: 83.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



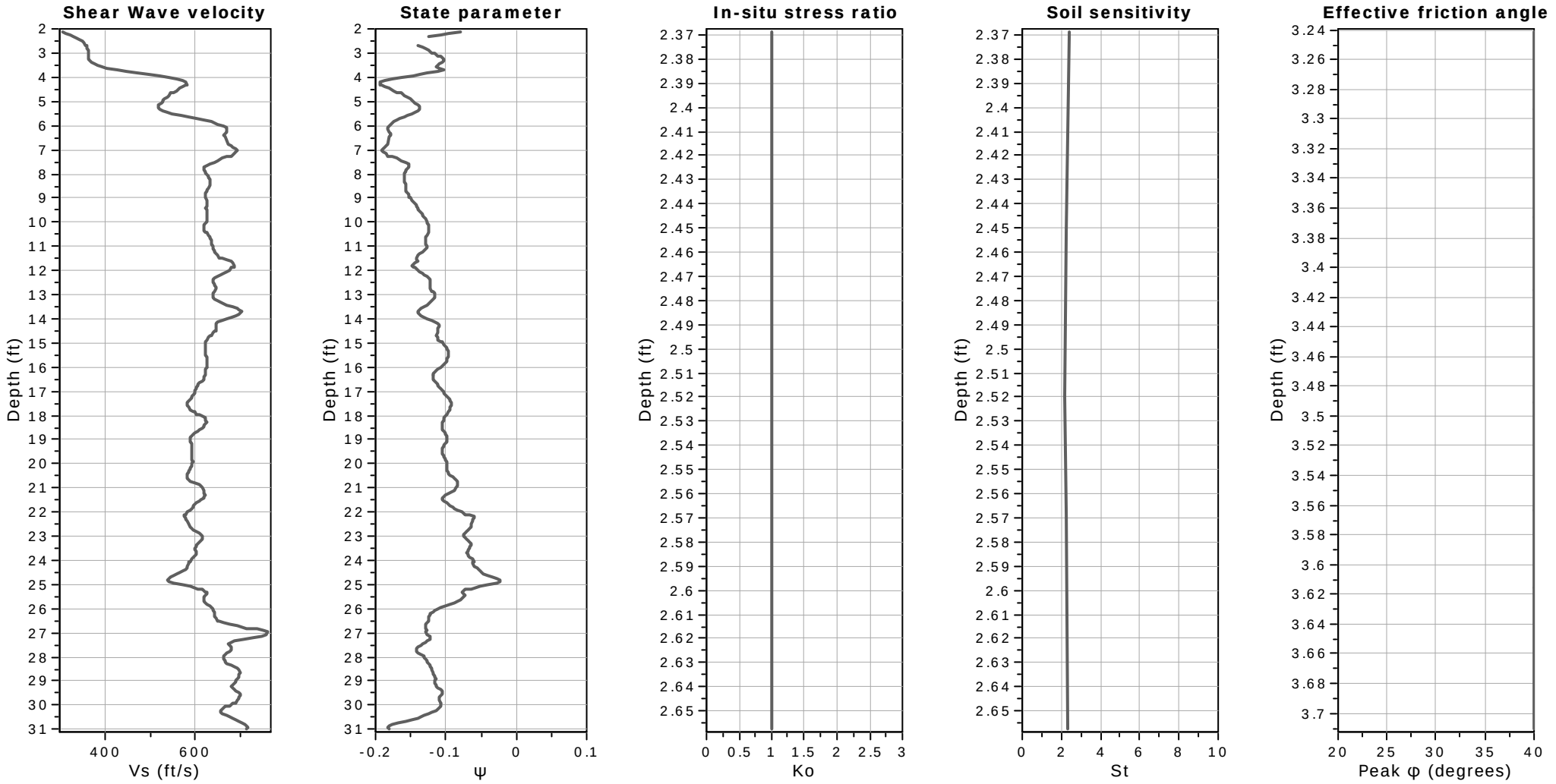
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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CPT: CPT-17
Total depth: 30.98 ft, Date: 12/20/2022
Surface Elevation: 83.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

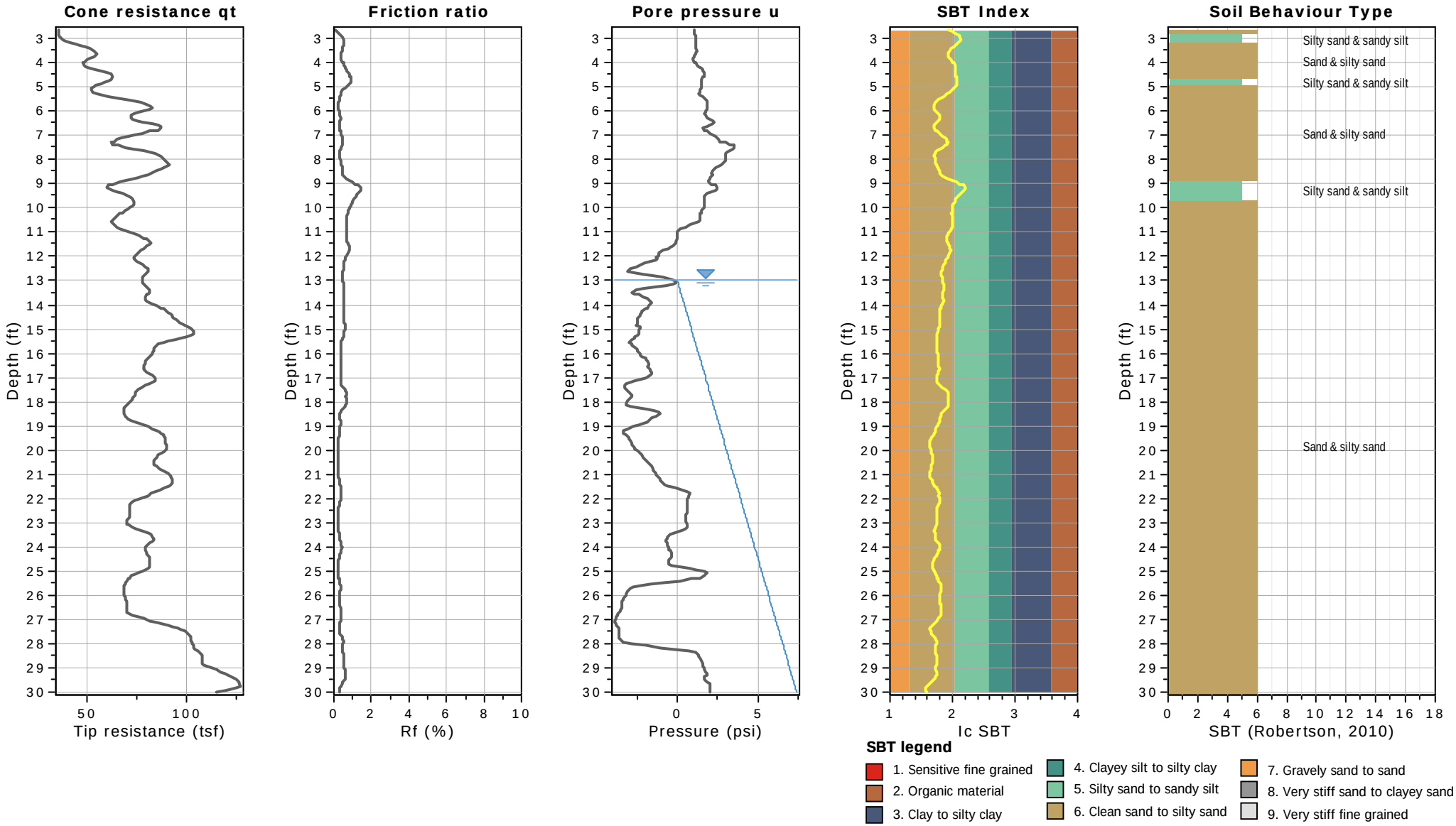
User defined estimation data

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CPT: CPT-18
Total depth: 30.00 ft, Date: 12/21/2022
Surface Elevation: 82.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

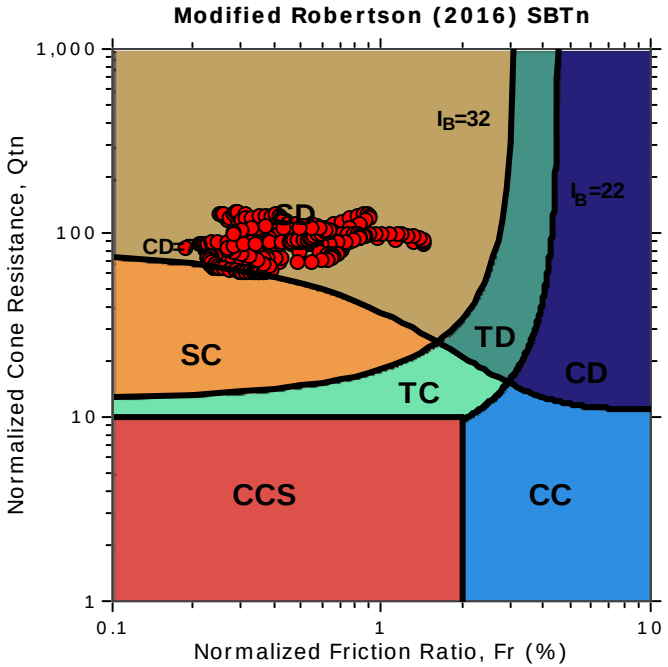


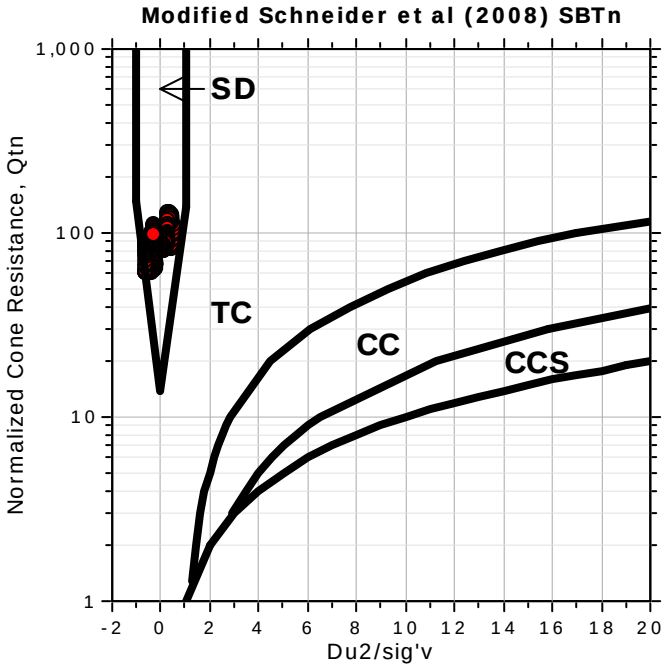
GEO-TECHNOLOGY ASSOCIATES, INC.
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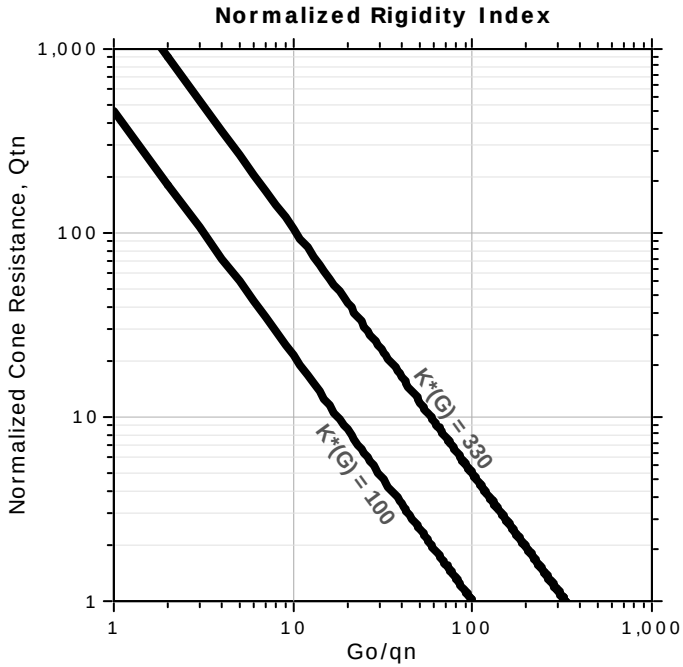
CPT: CPT-18
Total depth: 30.00 ft, Date: 12/21/2022
Surface Elevation: 82.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

Updated SBTn plots







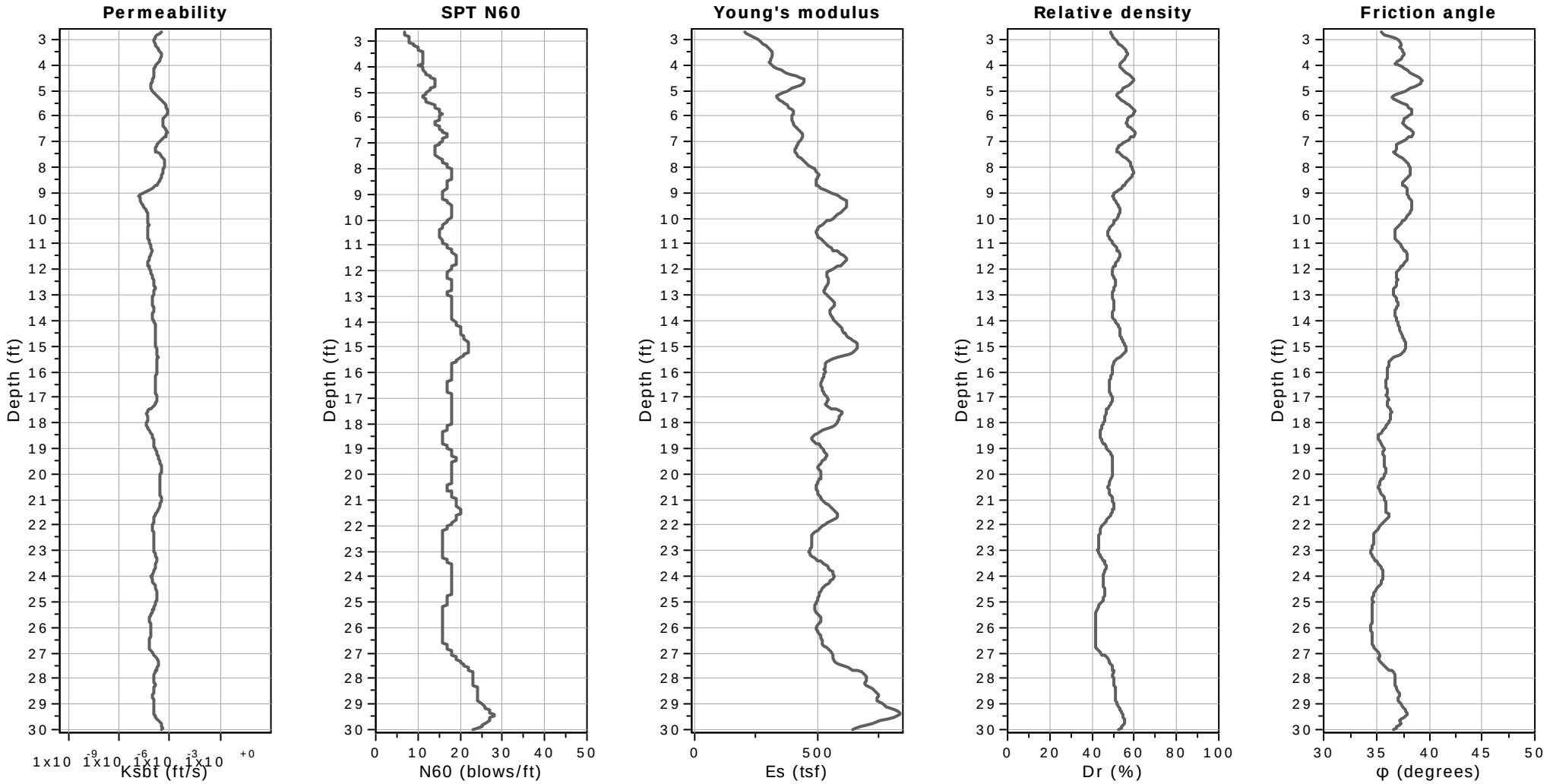
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
CD: Clay-like - Dilative
TC: Transitional - Contractive
TD: Transitional - Dilative
SC: Sand-like - Contractive
SD: Sand-like - Dilative

K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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CPT: CPT-18
Total depth: 30.00 ft, Date: 12/21/2022
Surface Elevation: 82.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



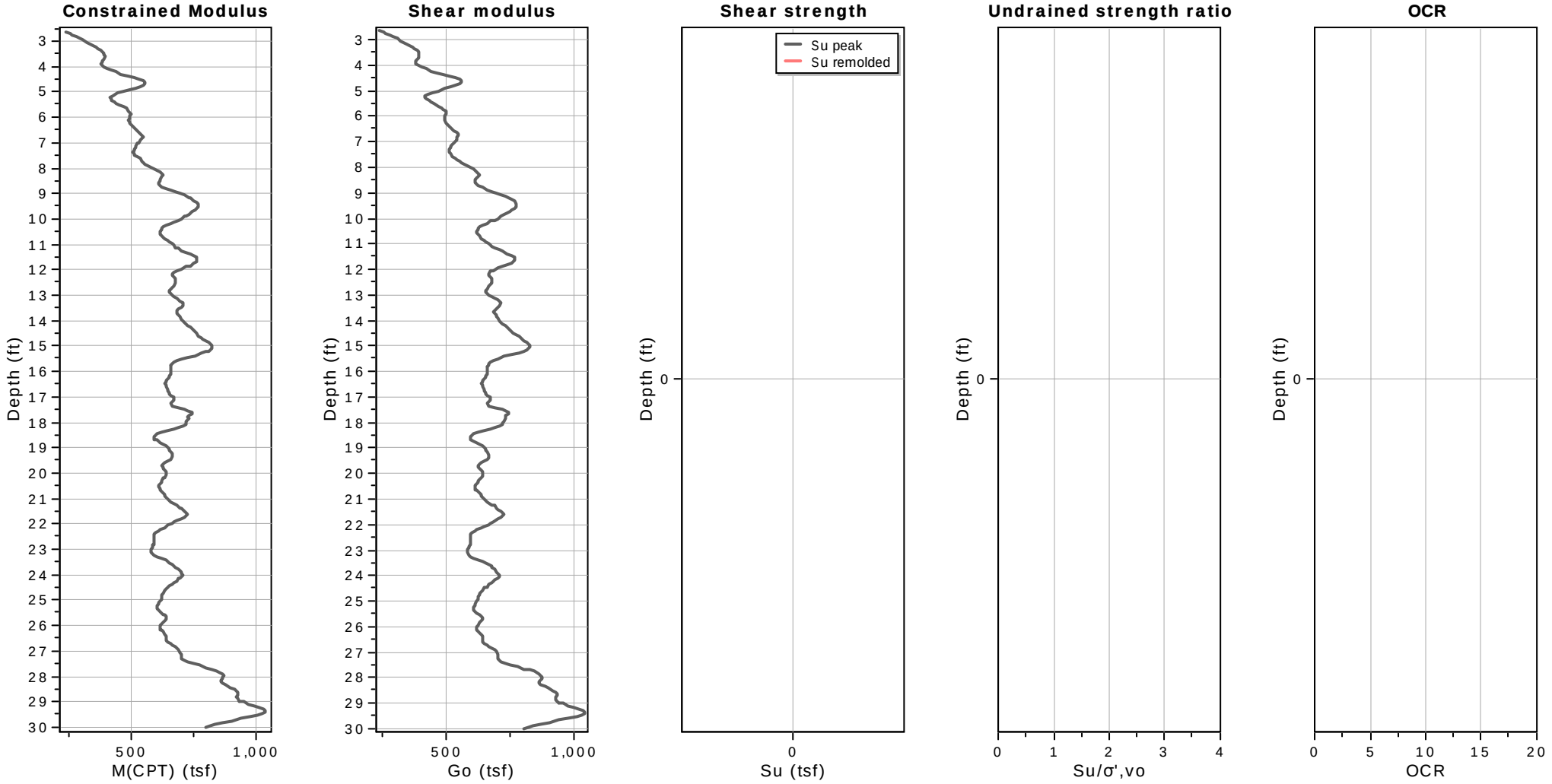
Calculation parameters

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)
User defined estimation data

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CPT: CPT-18
Total depth: 30.00 ft, Date: 12/21/2022
Surface Elevation: 82.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



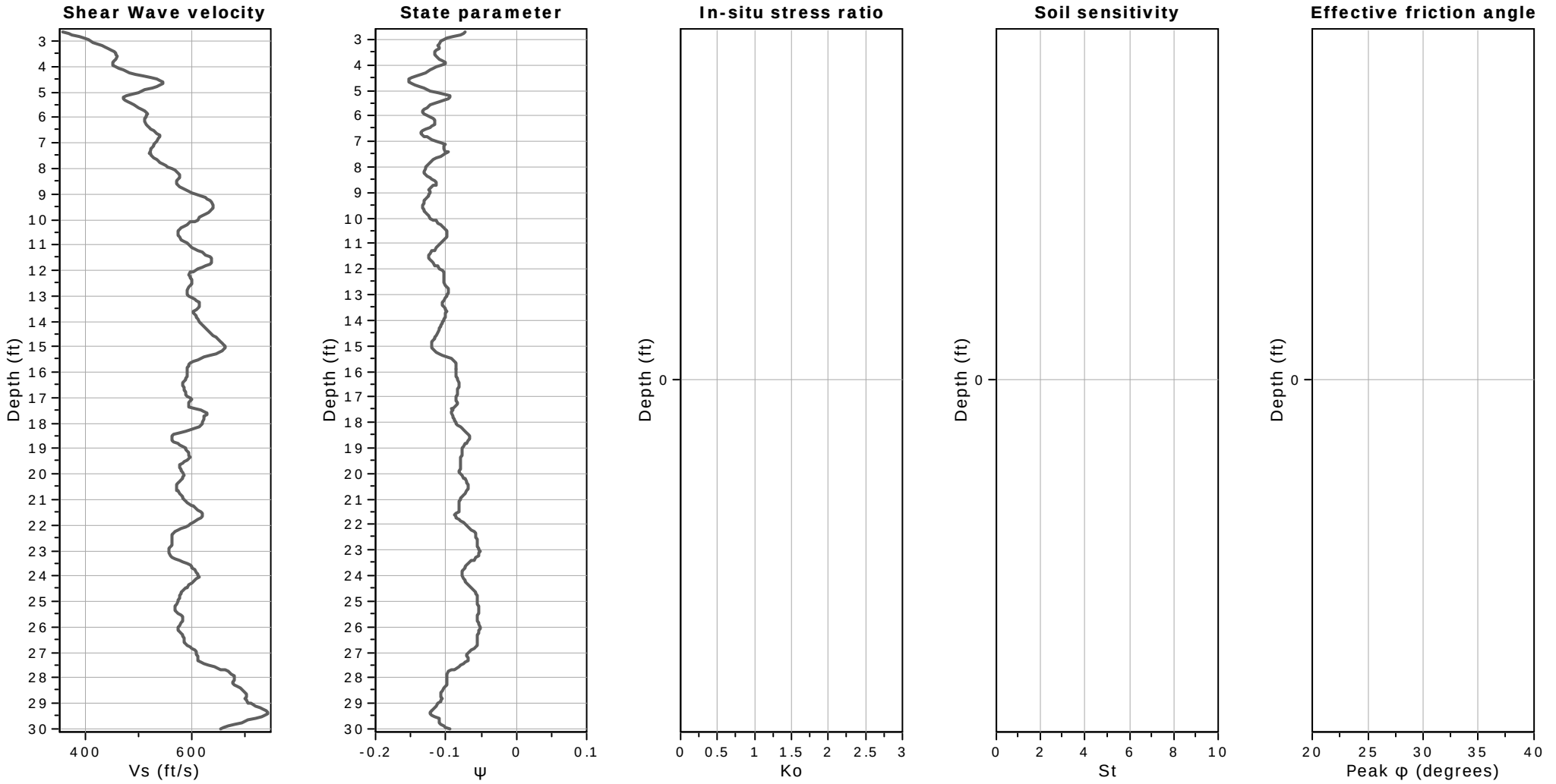
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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CPT: CPT-18
Total depth: 30.00 ft, Date: 12/21/2022
Surface Elevation: 82.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



Calculation parameters

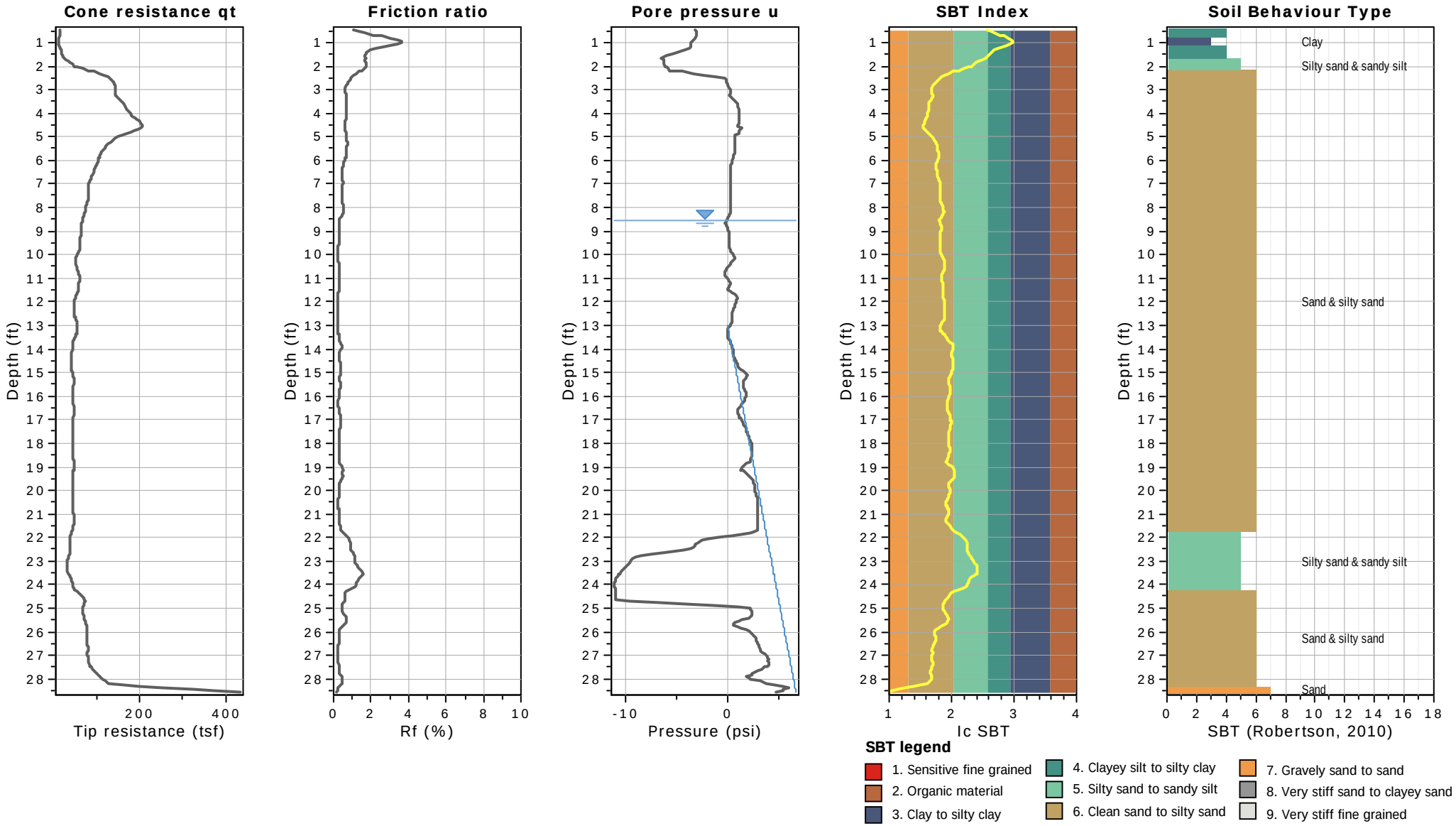
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

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18 Boulden Circle, Suite 36
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(302) 326-2100
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CPT: CPT-19
Total depth: 28.56 ft, Date: 12/20/2022
Surface Elevation: 80.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

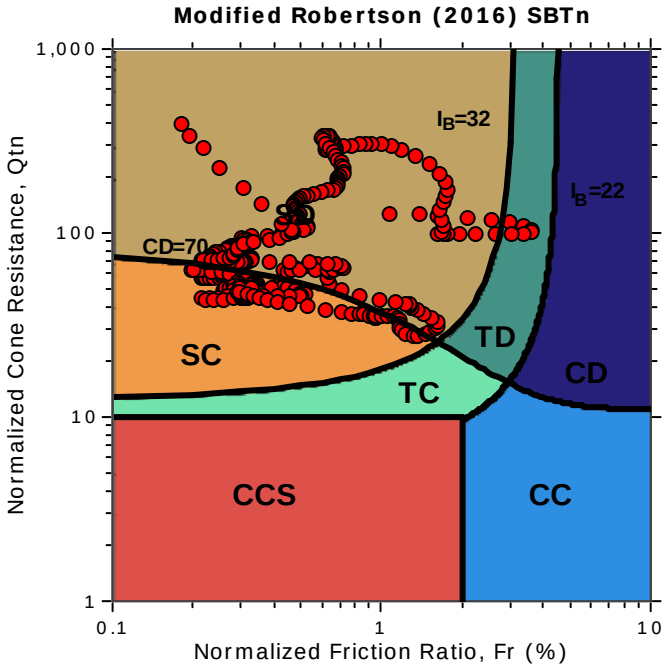


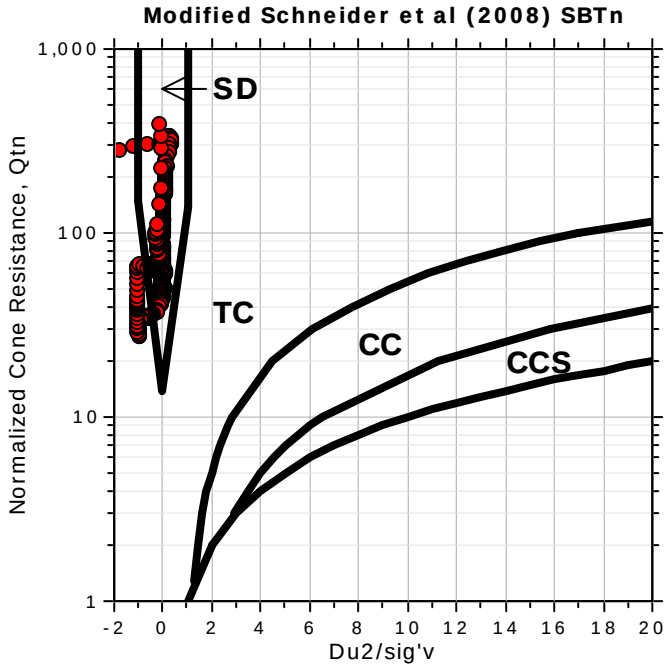
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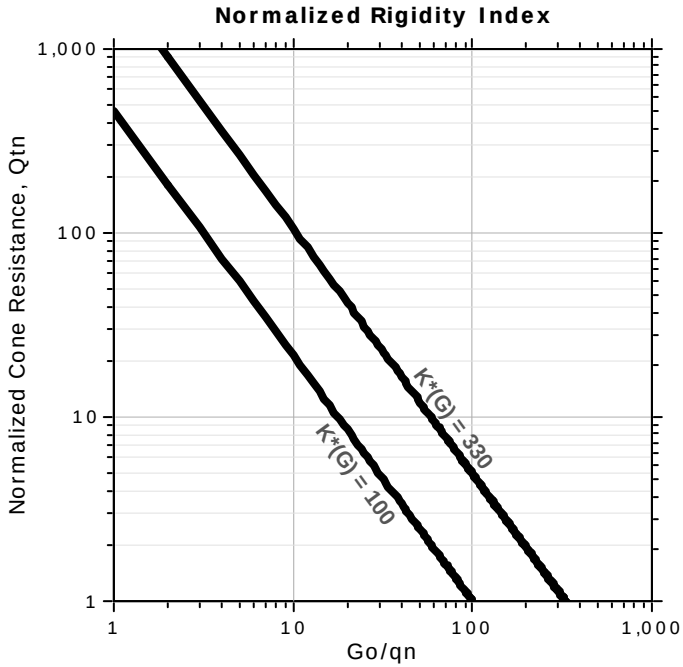
CPT: CPT-19
Total depth: 28.56 ft, Date: 12/20/2022
Surface Elevation: 80.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**

Updated SBTn plots







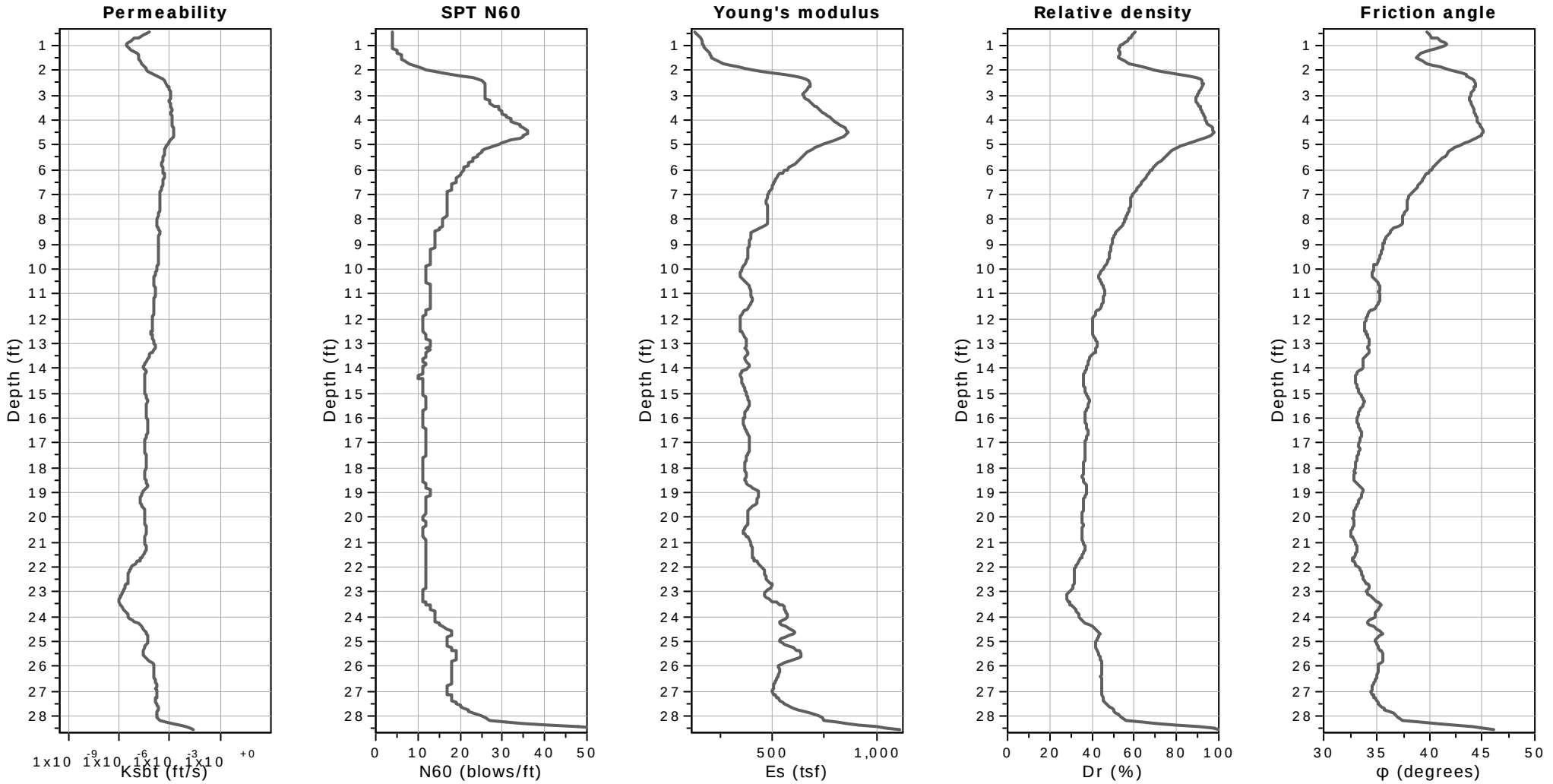
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
CD: Clay-like - Dilative
TC: Transitional - Contractive
TD: Transitional - Dilative
SC: Sand-like - Contractive
SD: Sand-like - Dilative

K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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CPT: CPT-19
Total depth: 28.56 ft, Date: 12/20/2022
Surface Elevation: 80.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



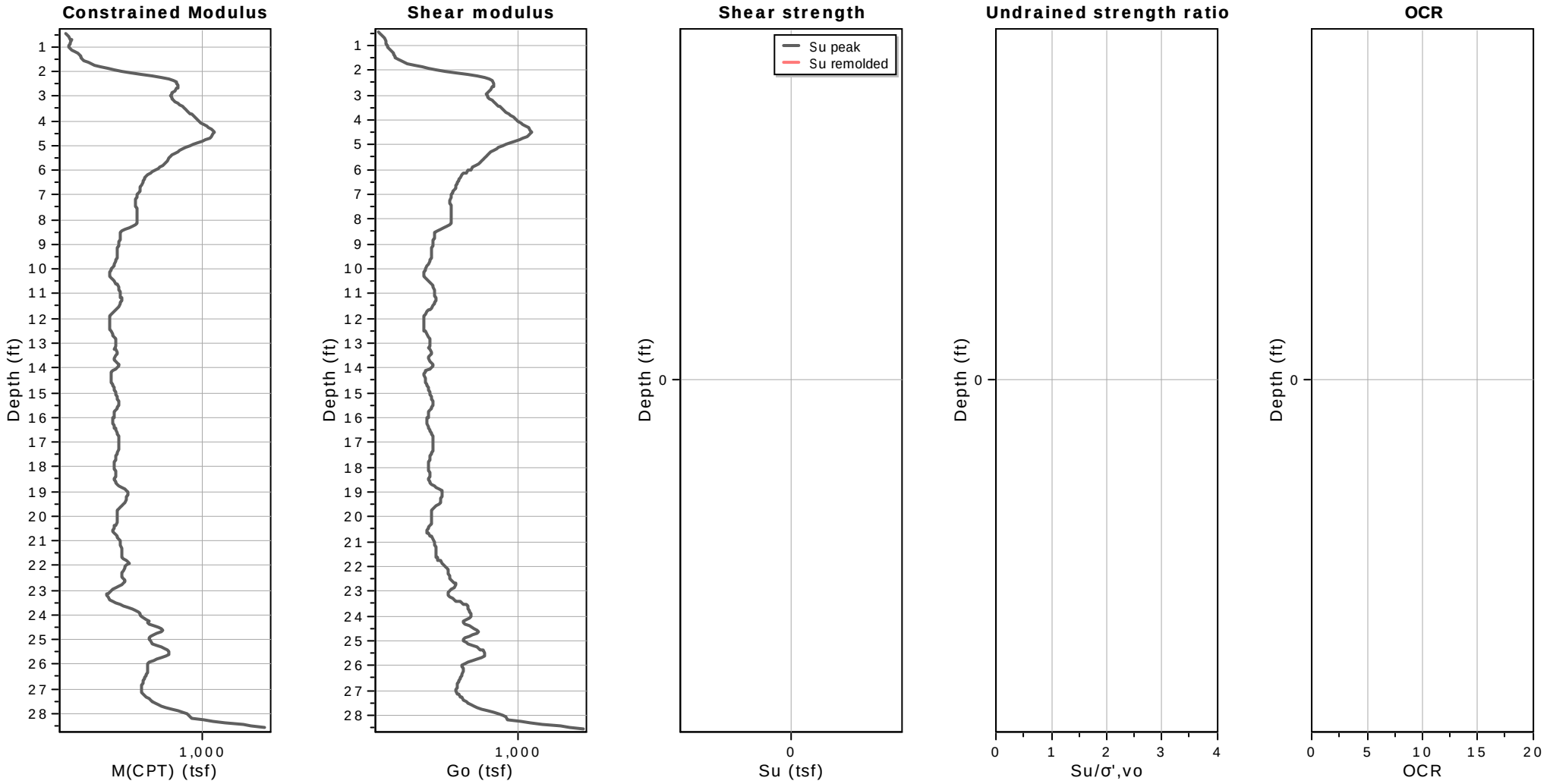
Calculation parameters

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)
User defined estimation data

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CPT: CPT-19
Total depth: 28.56 ft, Date: 12/20/2022
Surface Elevation: 80.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



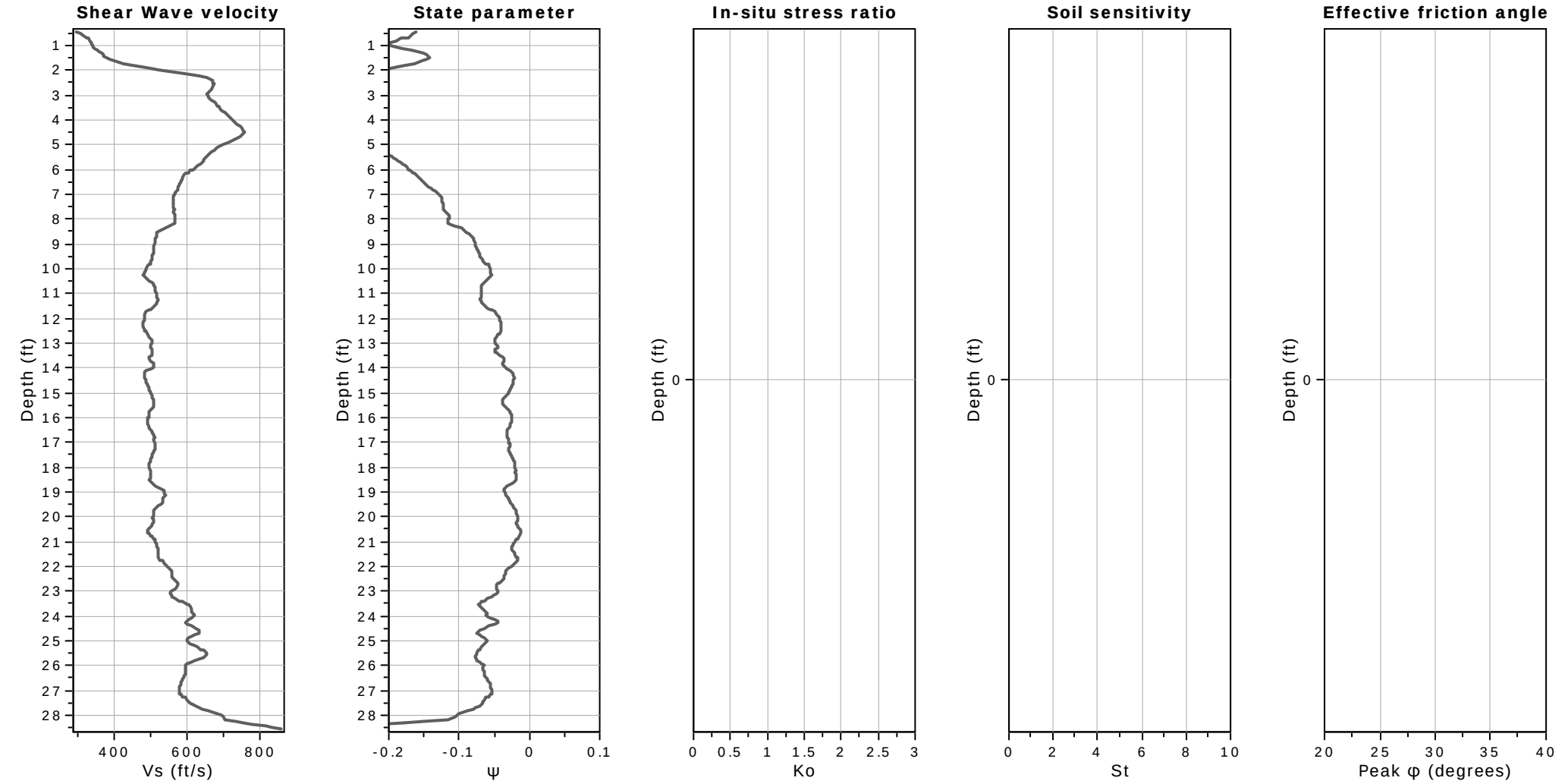
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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CPT: CPT-19
Total depth: 28.56 ft, Date: 12/20/2022
Surface Elevation: 80.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **New Hodgson Vo-Tech School**
Location: **New Castle County, Delaware**



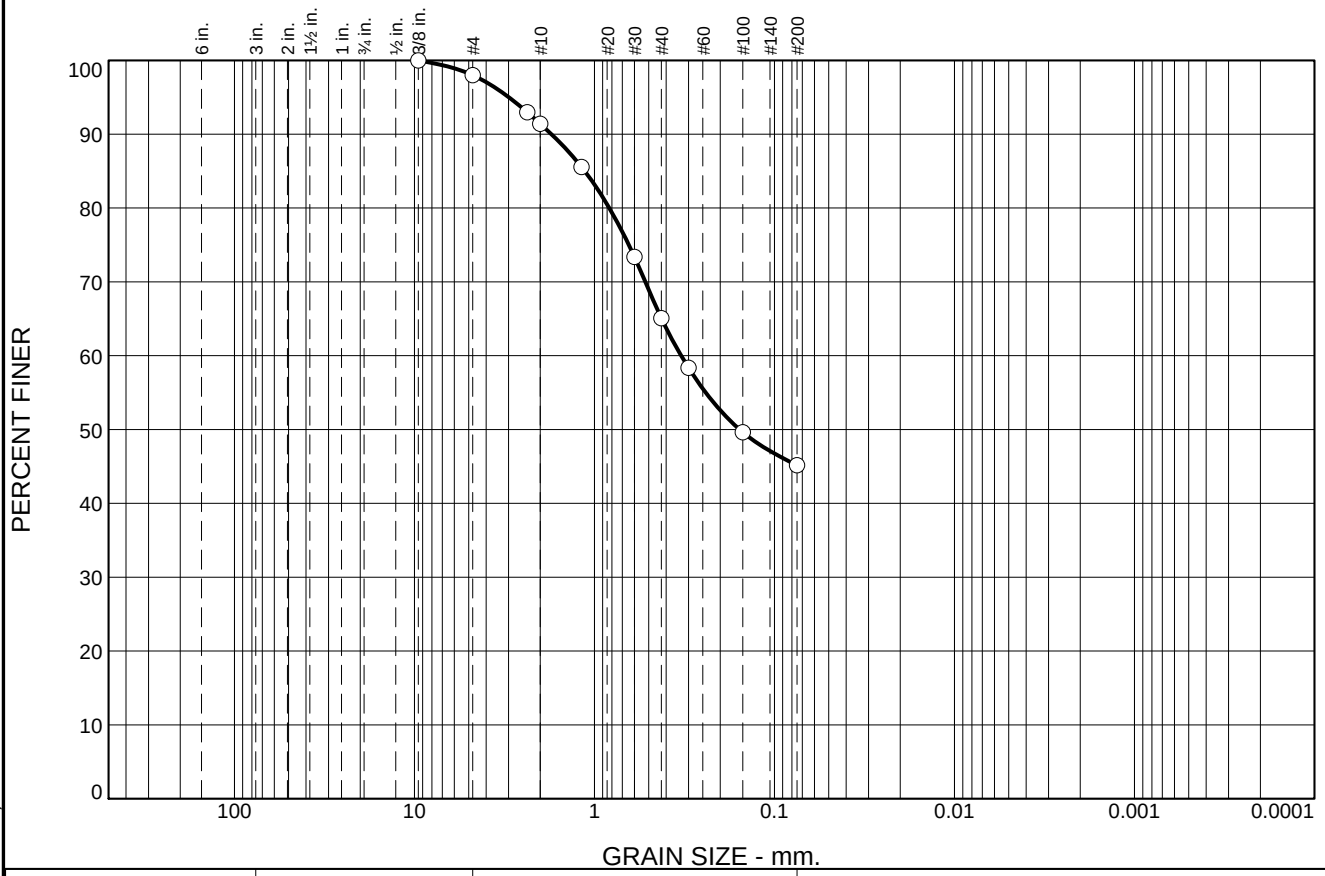
Calculation parameters

Soil Sensitivity factor, N_S: 7.00

User defined estimation data

APPENDIX C

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.0	6.6	26.3	19.9	45.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	98.0		
#8	93.0		
#10	91.4		
#16	85.6		
#30	73.4		
#40	65.1		
#50	58.4		
#100	49.6		
#200	45.2		

* (no specification provided)

Soil Description

Brown, Clayey SAND

Atterberg Limits

PL= 17 LL= 29 PI= 12 NM= 15.0

Coefficients

D_{90}= 1.7349 D_{85}= 1.1320 D_{60}= 0.3301
D_{50}= 0.1562 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

Source of Sample: B-10 **Depth:** 4.0
Sample Number: S-3

Date: 01/13/2023

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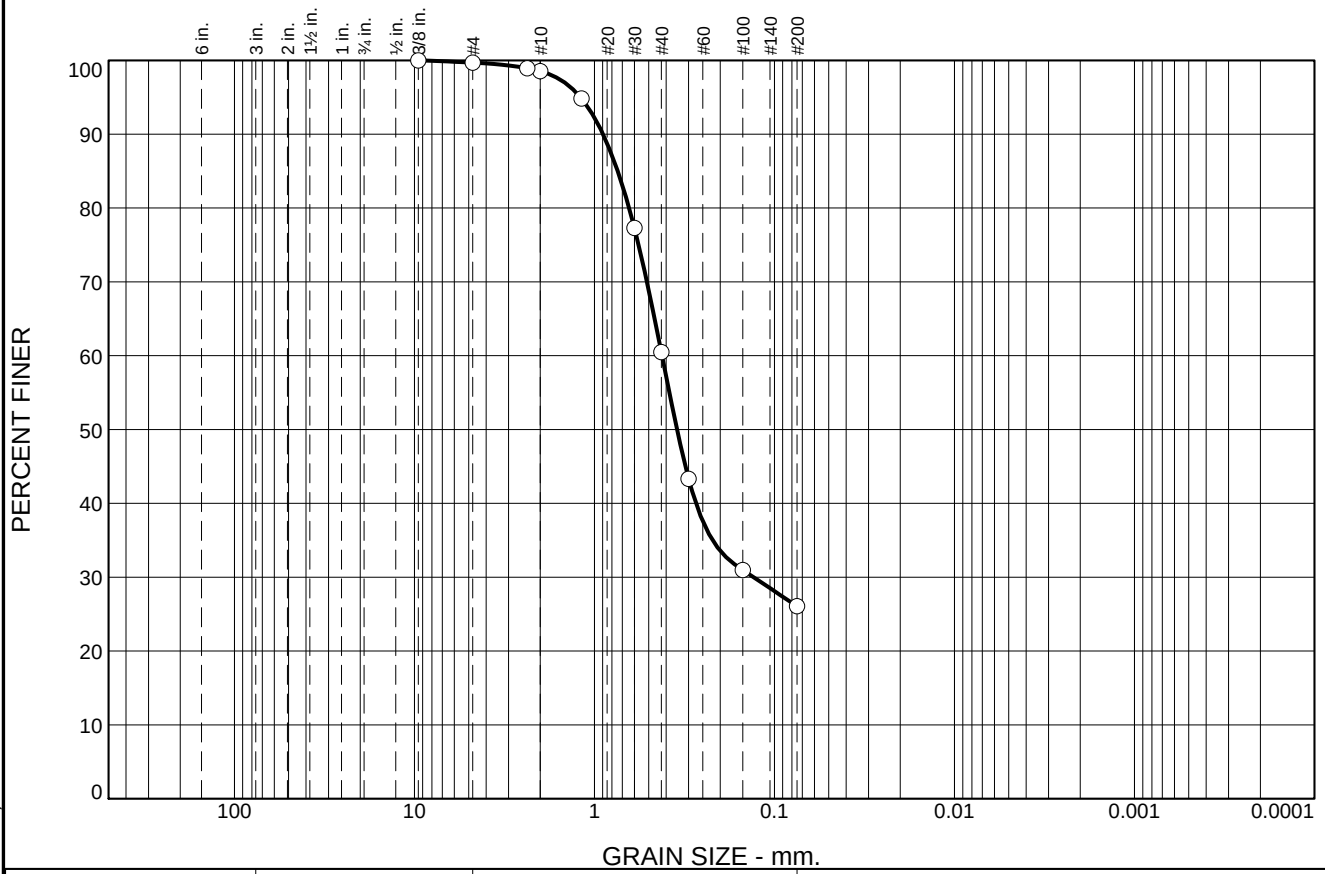
Client: New Castle County Vo-Tech School District
Project: NCCVT New Hodgson Vo-Tech High School

Project No: 220791 **Figure** 3

ASTM Specifications performed may include D422, D421, D6913, D2216, D2217, and D4318.

Tested By: A. Veith **Checked By:** M. McDonough

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.2	38.0	34.4	26.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#8	98.9		
#10	98.5		
#16	94.8		
#30	77.3		
#40	60.5		
#50	43.3		
#100	31.0		
#200	26.1		

* (no specification provided)

Soil Description

Orange, Clayey SAND

Atterberg Limits

PL= 20 LL= 32 PI= 12 NM= 15.0

Coefficients

D_{90}= 0.8960 D_{85}= 0.7425 D_{60}= 0.4212
D_{50}= 0.3480 D_{30}= 0.1308 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(0)

Remarks

Source of Sample: B-14 **Depth:** 2.0
Sample Number: S-2

Date: 01/13/2023

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New Castle, DE 19720

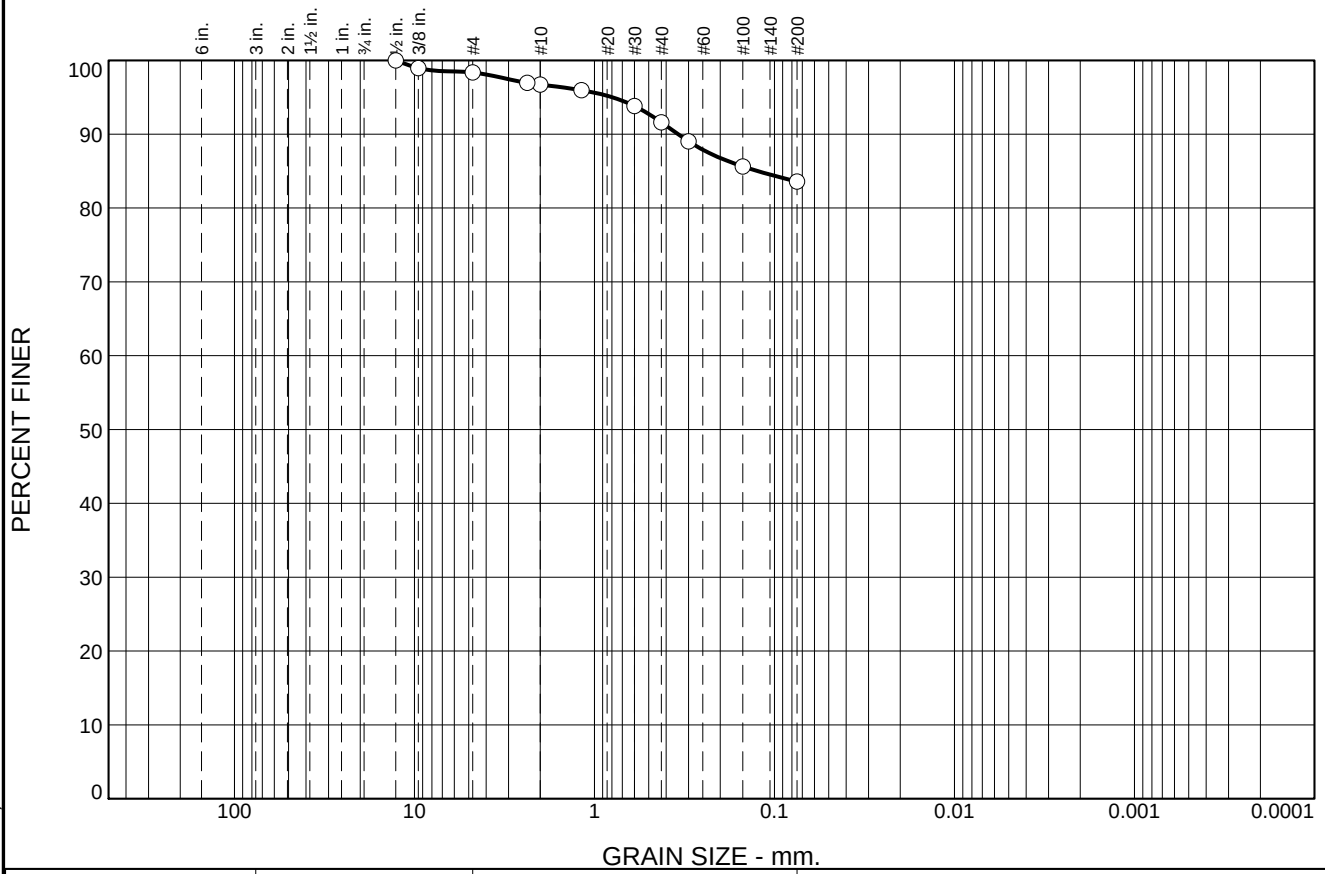
Client: New Castle County Vo-Tech School District
Project: NCCVT New Hodgson Vo-Tech High School

Project No: 220791 **Figure** 4

ASTM Specifications performed may include D422, D421, D6913, D2216, D2217, and D4318.

Tested By: A. Veith **Checked By:** M. McDonough

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.6	1.7	5.1	8.0	83.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.0		
#4	98.4		
#8	97.0		
#10	96.7		
#16	96.0		
#30	93.8		
#40	91.6		
#50	89.0		
#100	85.6		
#200	83.6		

* (no specification provided)

Soil Description

Brown, Lean CLAY with sand

Atterberg Limits

PL= 19 LL= 29 PI= 10 NM= 18.2

Coefficients

D_{90}= 0.3433 D_{85}= 0.1239 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-4(7)

Remarks

Source of Sample: INF-15 Bulk **Depth:** 0.0 to 5.0 feet

Date: 02/07/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: New Castle County Vo-Tech School District
Project: NCCVT New Hodgson Vo-Tech High School

Project No: 220791 **Figure** 5

ASTM Specifications performed may include D422, D421, D6913, D2216, D2217, and D4318.

Tested By: A. Veith **Checked By:** M. McDonough

MOISTURE DENSITY RELATIONSHIP REPORT
ASTM D 698 Method B Standard

Project No.: 220791 **Date:** 02/07/2023

Project: NCCVT New Hodgson Vo-Tech High School

Client: New Castle County Vo-Tech School District

Source of Sample: INF-15 Bulk **Depth:** 0.0 to 5.0 feet

Remarks:

MATERIAL DESCRIPTION

Description: Brown, Lean CLAY with sand

Classifications - **USCS:** CL **AASHTO:** A-4(7)

Nat. Moist. = 18.2 % **Sp.G. =** 2.6

Liquid Limit = 29 **Plasticity Index =** 10

% < No.200 = 83.6 %

TEST RESULTS
Maximum dry density = 114.6 pcf
Optimum moisture = 14.6 %

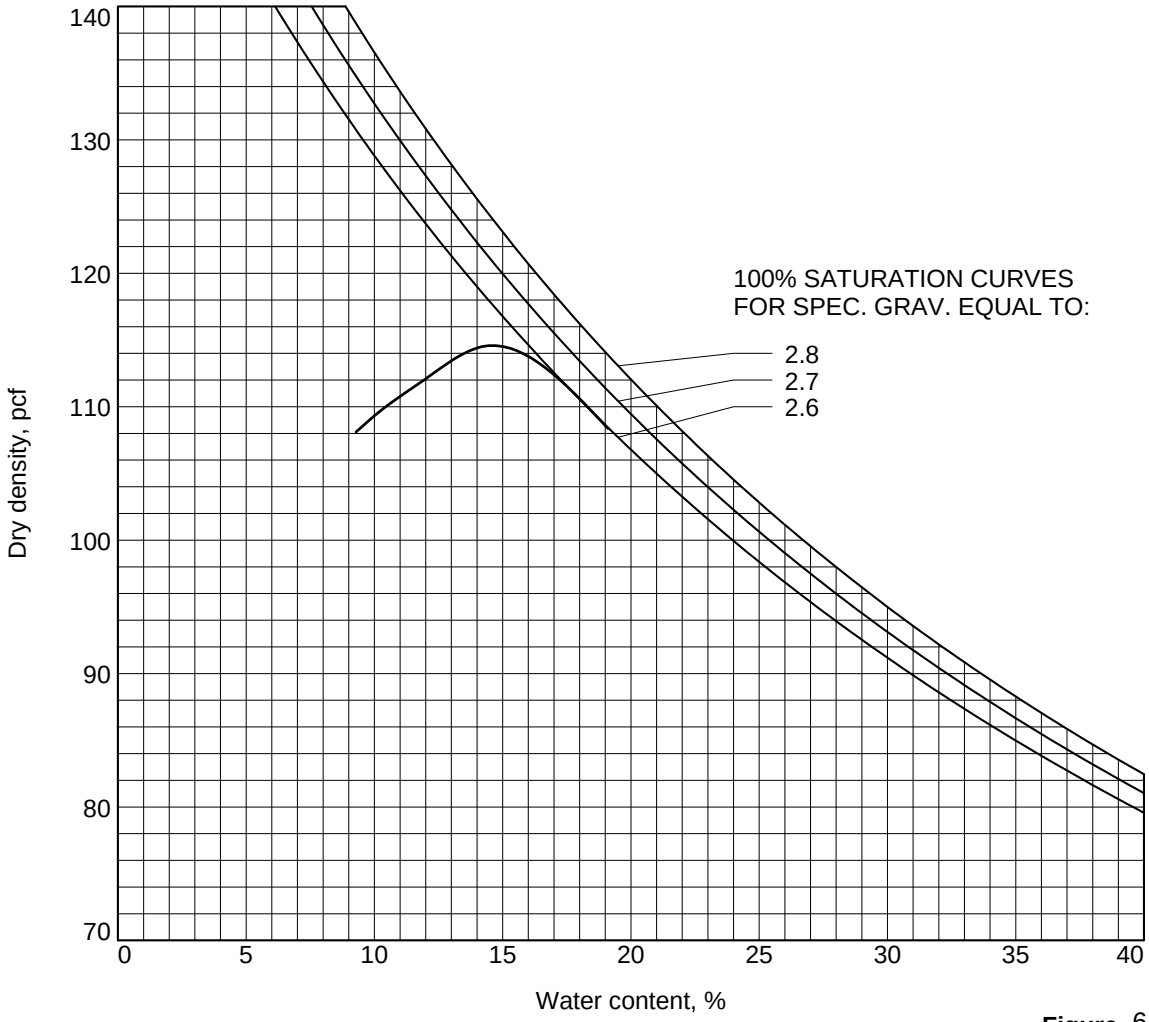


Figure 6

Geo-Technology Associates, Inc.

Tested By: A. Veith **Checked By:** M. McDonough

ASTM Specifications performed may include D422, D421, D6913, D2216, D2217, and D4318.

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm

January 10, 2023

New Castle County Vo-Tech School District
1703 School Lane
Wilmington, DE 19808

Attn: Mr. Al Schrum; Supervisor of Facilities and Special Projects

Re: Report of Geotechnical Exploration
NCCVT New Hodgson Vo-Tech High School SWM Facilities
New Castle County, Delaware

Dear Al:

In accordance with our agreement dated April 5, 2022 Geo-Technology Associates, Inc. (GTA) has performed a geotechnical exploration for proposed Hodgson Vo-Tech High School development located at 2575 Glasgow Avenue in New Castle County, Delaware. Provided herein are the results of the subsurface exploration, infiltration testing, and recommendations for design and construction of the proposed stormwater management (SWM) facilities at this site. The results of our subsurface exploration and analysis related to the proposed building and pavements will be provided under separate cover. GTA was provided with an untitled site layout plan prepared by Landmark Science and Engineering which indicates the locations of existing and proposed features, as well as existing site grading. As you are aware, GTA preformed a preliminary geotechnical exploration at the site, which is summarized in our report dated June 17, 2022. The preliminary exploration included 4 Standard Penetration Test (SPT) borings, 9 Cone Penetration Test (CPT) soundings, and 4 borehole infiltration tests.

Site Description and Proposed Construction

The approximate 65-acres project site is located at 2575 Glasgow Avenue in New Castle County, Delaware, as shown on the *Site Location Map, Figure 1*. The site contains an existing 123,465 square-foot school on the north half of the property and athletic fields and facilities on the south half of the property. Additional existing features include paved access drive and parking lot areas and sidewalks. The site is bound by Glasgow Avenue to the west, Summit Bridge Trail and an undeveloped wooded area to the north, Summit Bridge Road to the east and south.

The north half of the site is relatively flat, with existing grades ranging between approximate elevation (EL) 83 to EL 80, with isolated mounded areas within landscaped areas which grade as high as EL 86. Along the east side of the site, east of parking lot areas, the site grades to EL 74 to EL 73. In the south half of the site, the grading is variable to

accommodate drainage across the various athletic fields. Grades in this area range between EL 84 to EL 73.

Proposed construction will consist of redeveloping the existing high school campus to include a new 2-story high school building as well as proposed parking lots and access drives, a field house building, athletic fields, and associated SWM facilities. The proposed building is to be located within an area of the site currently occupied by athletic fields and the proposed athletic facilities are located within an area of the existing building. At this time, there are five locations where SWM facilities are proposed throughout the campus with areas ranging between approximately 0.1 and 0.3 acres each.

Geology

According to the *Geologic Map of New Castle County Delaware* (GM13, 2005), published by the Delaware Geological Survey, the site vicinity is situated in the Coastal Plain. Physiographic Province. The Coastal Plain is characterized by undifferentiated and interlayered sedimentary deposits derived from eroded rock formations to the north and west. Specifically, the site is mapped as underlain by a 30-to-50-foot thickness of the Pleistocene Age Columbia Formation. The Pleistocene deposits generally consist of quartz sand and gravel, with lenses of silt and clay. Beneath the surficial sediments of the Columbia Formation, the geologic map indicates the soils of the Potomac Formation are present.

According to the U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Web soils Survey (reviewed on June 6, 2013), the site is underlain by the Fallsington, Elkton, Ingleside-Hammonton-Fallsington, Pineyneck and Unicorn Soil Series. Refer to the enclosed mapping.

- Fallsington, Elkton: severely or moderately high season high groundwater levels, poorly drained soil
- Pineyneck: moderately well-drained, with depth to water table of 20 to 40 inches
- Unicorn: well-drained, depth to water table 40 to 72 inches

Subsurface Exploration and Subsurface Conditions

Test Pit ID, identified at INF-5, INF-5a, INF-6 through INF-9, INF-9a, INF-10, INF-11, INF-11a, INF-12, INF-13, INF-13a, INF-14, INF-15, INF-15a and INF-16 were located in the field by GTA utilizing existing site features and hand-held GPS. The test pits were performed on December 27 and 28, 2022 and were excavated to depths ranging between approximately 6 to 10½ feet below existing grade. The approximate locations are indicated on the enclosed *Figure 2: Exploration Location Plan*. Descriptions on the field logs were based on visual classifications in accordance with ASTM D2488 (Unified Soil Classification System). The classification system is summarized in Notes for Explorations Logs. The samples retrieved from the test pits were brought to GTA's laboratory for review by engineering personnel.

Topsoil thicknesses ranged between approximately 4 to 10 inches. In locations INF-9, INF-10, INF-11, and INF-11A, a layer of existing fill materials was observed to depths ranging between approximately 1½ to 3½ feet below grade Beneath the topsoil and fill a layer of fine-grained soils underlain by granular soils was observed to the extent of the test pits. The natural fine-grained soils consisted of silt and lean clay to depths ranging between approximately 1½ to 8 feet below existing grades. The underlying granular materials consisted of silty sand, clayey sand, and poorly-graded sand with silt to the extent of the excavations.

Groundwater was encountered in several of the test pits depths ranging between approximately 5 to 10½ feet below grade, corresponding to an elevation range of EL 66 to EL 77. Based on regional groundwater mapping provided by the Delaware Geologic Information Resource (DGIR), groundwater levels at the site during wet seasonal conditions will be 9 to 16 feet below grade throughout the north and west most area of the site, with an area along the south half of the site with groundwater levels of 6 to 9 feet. During normal and dry seasonal conditions groundwater levels will be 9 to 16 feet throughout the majority of the site, with areas within the north side of the site with water levels between 16 and 20 feet deep.

Infiltration Testing

After observing the soil conditions to evaluate any limiting zones within the soil profile, 12 single-ring infiltration tests were performed in excavations offset from the exploratory test pits. The testing was performed in general accordance with the procedures outlined in ASTM D5126, *Standard Guide for Comparison of Field Methods for Determining Hydraulic Conductivity in Vadose Zone*. The test consisted of seating a single-ring about 2 to 4 inches into the subgrade. The testing procedure consisted of a saturation period of one-hour or 12 inches of head drop. A falling head test was performed with water added in no more than 6-inch increments. Water level measurements were taken at approximately maximum 15-minute intervals. The unfactored field infiltration rates at each location are provided in the table below.

UNFACTORED FIELD INFILTRATION RATES

Location	Depth/Approx. Test Elevation	Unfactored Field Infiltration Rate	USCS Classification
INF-5	6.0 feet/ EL 76	No discernable rate	Clayey SAND (SC)
INF-6	5.5 feet/ EL 76.5	No discernable rate	Sandy SILT (ML)
INF-7	6.5 feet/ EL 71.5	2-inches per hour	Silty SAND (SM)
INF-8	6.0 feet/ EL 71	3-inches per hour	Silty SAND (SM)

Location	Depth/Approx. Test Elevation	Unfactored Field Infiltration Rate	USCS Classification
INF-9	6.0 feet/ EL 70	3-inches per hour	Silty SAND (SM)
INF-10	4.0 feet/ EL 76	4-inches per hour	Silty SAND (SM)
INF-11	5.0 feet/ EL 75	No discernable rate	SILT with Sand (ML)
INF-12	3.8 feet/ EL 71	10+ inches per hour	Silty SAND (SM)
INF-13	2.8 feet/ EL 71	10+ inches per hour	Silty SAND (SM)
INF-14	5.5 feet/ EL 75.5	2-inches per hour	Silty SAND (SM)
INF-15	4.5 feet/ EL 76.5	½-inch per hour	Silty SAND (SM)
INF-16	3.3 feet/ EL 79	No discernable rate	Lean CLAY with Sand (CL)

Conclusions and Recommendations

The guidelines established in the Delaware Sediment and Stormwater program technical Document Article 3.06, Appendix 3.06.2. *A-1 Soil Investigation Procedures* indicate that the minimum infiltration rate for all runoff reduction and infiltration practices is 1-inch per hour. Also, a vertical separation of two (2) feet from a limiting layer, such as clay or the seasonal high water table (SHWT) elevation is required for all infiltration practices unless an underdrain is provided.

The following table provides recommendations and comments related to the facilities:

SWM FACILITY RECOMMENDATIONS

Location	Recommended Design Infiltration Rate	Estimated SHWT EL	Additional Comments/ Recommendations
SWM-1 (INF-10 to INF-11A)	0 inches per hour	74	Infiltration into granular soils may be feasible; however, this area had variable depths of fine-grained soils. Location could be adjusted and/or additional exploration and testing should be performed

Location	Recommended Design Infiltration Rate	Estimated SHWT EL	Additional Comments/ Recommendations
SWM-2 (INF-5 to INF-6)	0 inches per hour	74	Fine-grained soils present in test pits not feasible for infiltration
SWM-3 (INF-7 to INF-9A)	1- inch per hour	69	Provided design rate is applicable for granular soils between EL 71 and EL 72.
SWM-4 (INF-12 to INF-13A)	5- inches per hour	70	Provided design rate is applicable for granular soils between EL 72 and EL 73.
SWM-5 (INF-14 to INF-16)	1- inch per hour	73	Provided design rate is applicable for granular soils between EL 75 and EL 77.

General Construction Recommendations

To preserve the infiltration capability, GTA recommends that the facilities be excavated using a track-mounted excavator, which will generally eliminate the need to operate equipment directly on the subgrade. This recommendation is based on the inherent problems associated with these systems as they become less permeable due to densification during construction and partial clogging or siltation occurring over time. The inverts of the facilities subgrade should be in natural granular soils, and should be hand cleaned to remove any disturbed soil prior to placing the fabric and/or stone.

If fine-grained materials are observed in the facility subgrade, they should be over-excavated and backfilled with AASHTO No. 57 stone or ASTM C-33 sand.

Once the design of the facilities has been completed, GTA should be provided the opportunity to review the plans to evaluate if the geotechnical issues have been addressed. Also, GTA should be provided the opportunity to review the facility subgrade during construction and perform additional field-testing. This is to observe compliance with the design concepts, specifications, or recommendations, and to allow for field changes in the event that the soils conditions differ from that anticipated prior to that start of construction.

Limitations

This report, including all supporting logs, field data, field notes, calculations, estimates and other documents prepared by GTA in connection with this Project have been prepared in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are

incorporated herein by reference. No warranty, express or implied, is made herein. Use and reproduction of this report by any other person without the expressed written permission of GTA is unauthorized and such use is at the sole risk of the user.

The analysis and recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Test pit excavations and infiltration tests indicate soil conditions only at specific locations and times and only at the depths excavated. They do not necessarily reflect strata or variations that may exist between exploration locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Geo-Technology Associates, Inc.

We appreciate the opportunity to be of assistance on this project. Should you have questions, please contact our office at (302) 326-2100.

Very truly yours,
GEO-TECHNOLOGY ASSOCIATES, INC.

Alison R. Schoch, P.E.
Senior Geotechnical Engineer

Meghan McDonough, P.E.
Principal

MEGHAN MCDONOUGH LICENSE 13632 DELAWARE PROFESSIONAL ENGINEER

ARS/MM/mt
220791
Attachments:

GBA Important Information Regarding Your Geotechnical Engineering Report
Figure 1: Site Location Map
Figure 2: Exploration Location Plan
Test Pit Logs (INF-5 to INF-16)
USDA Soil Mapping
Infiltration Test Data
Checklist

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

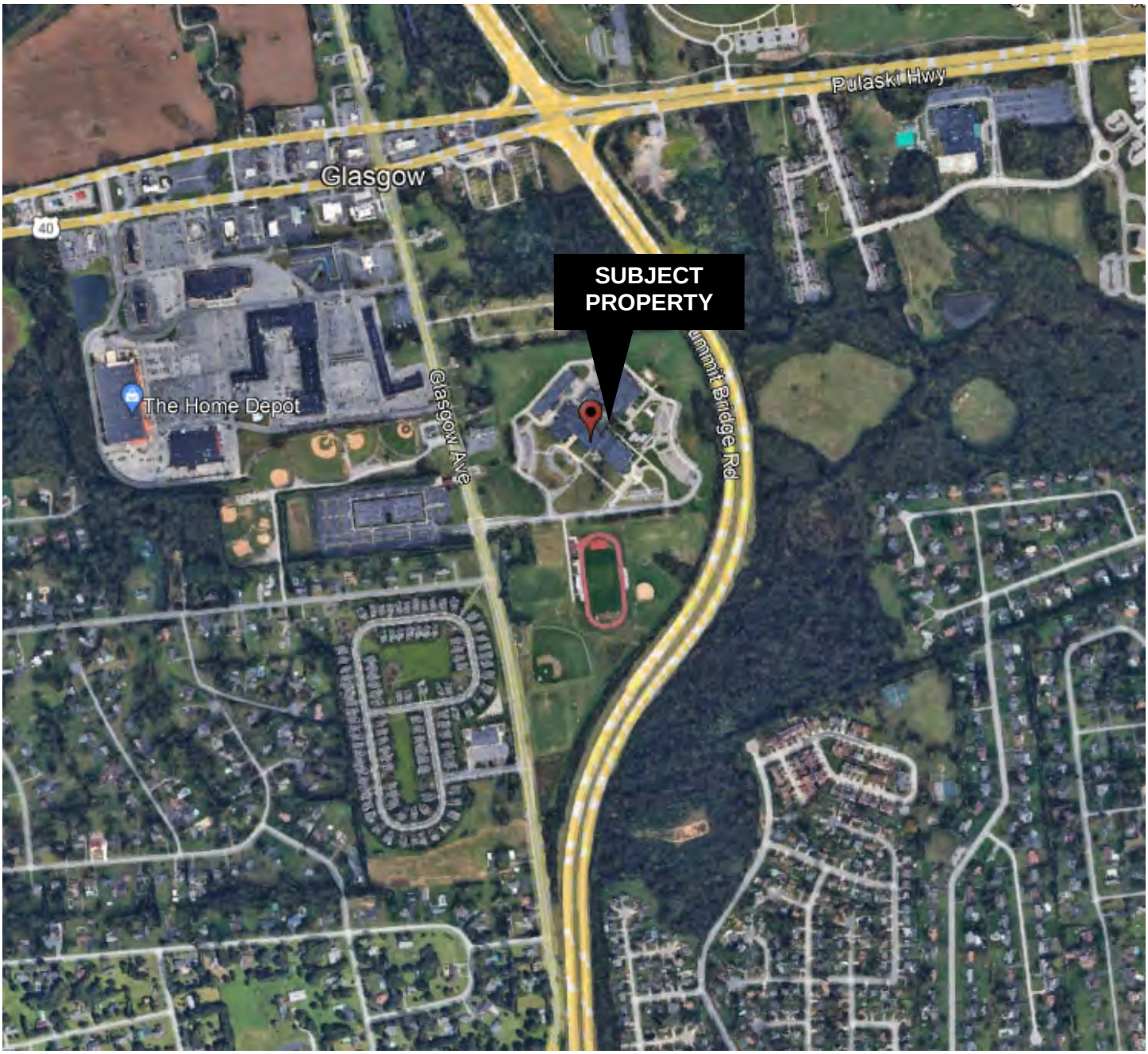
Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

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Notes:

1) Base map obtained from Google Earth Imagery, Inc. from September 20, 2020.
2) Site Location Map should be reviewed in conjunction with GTA Report NCCVT New Hodgson Vo-tech High School, Job No.220791

N

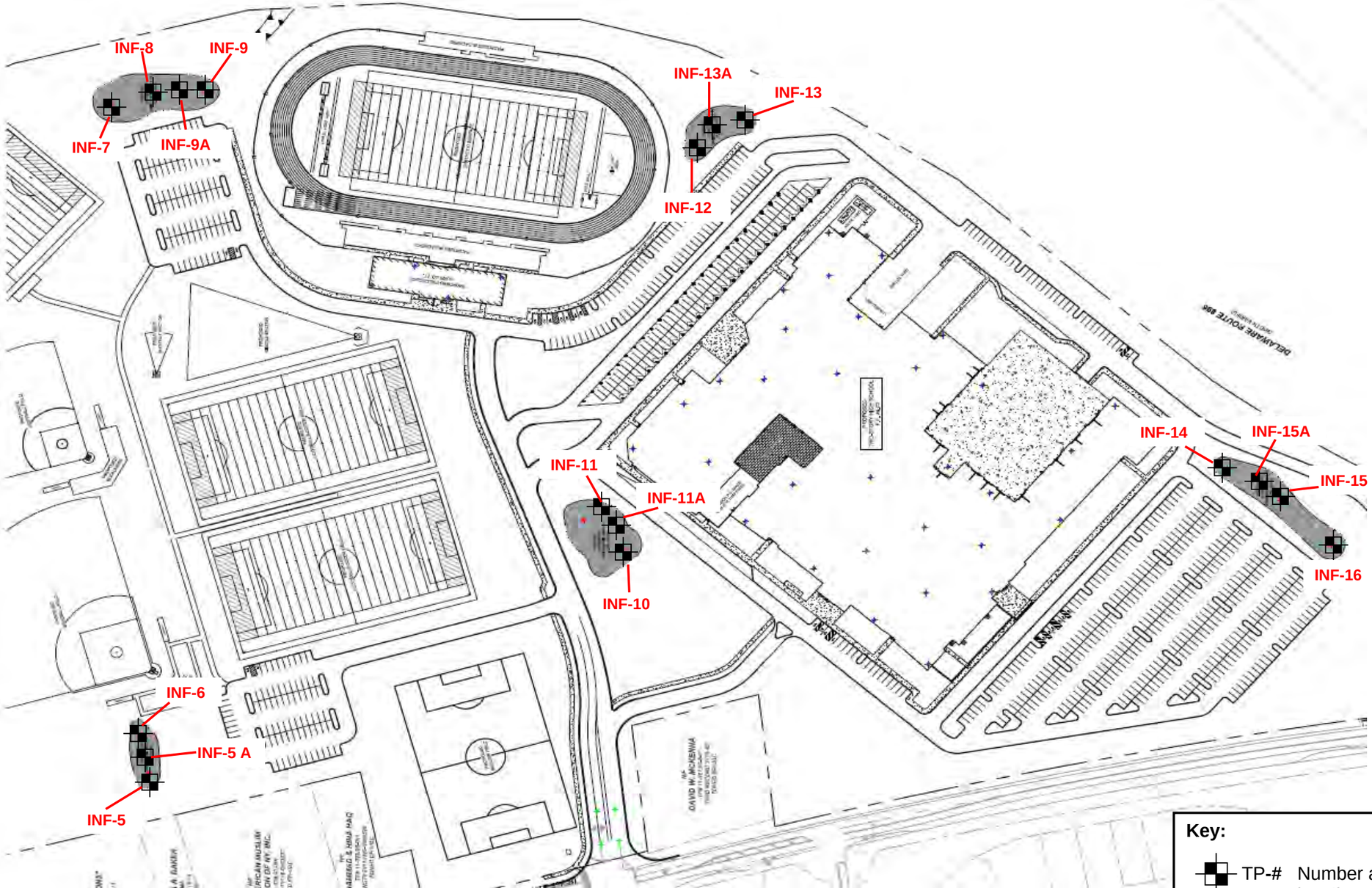
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New Castle, Delaware 19720
(302) 326-2100

SITE LOCATION MAP

NCCVT
NEW HODGSON VO-TECH SCHOOL

NEW CASTLE COUNTY, DELAWARE

SCALE	DATE	DRAWN BY	REVIEW BY	JOB NO.	FIGURE NO.
NTS	JAN 2023	GOOGLE	MM	220791	1



Key:

TP-# Number and approximate location of Test Pits/Infiltration Tests performed for this study

Notes: (1) Base plan prepared by Landmark Science and Engineering and use of this diagram by GTA is limited illustration of the approximate locations of our explorations.
(2) Exploration Location Plan should be read together with GTA Report NCCVT New Hodgson Vo-Tech High School Job No. 220791 for complete evaluation. Use of the diagram is limited illustration of the approximate locations of the explorations.
(3) The approximate locations of the explorations were measured from site features and should be considered accurate to the degree implied by this method.

JOB NUMBER.:
220791

FIGURE:
2

REVIEW BY:
MM

SCALE:
NTS

DATE:
JAN 2023

EXPLORATION LOCATION PLAN
NCCVT NEW HODGSON VO-TECH HIGH
SCHOOL SWM FACILITIES
NEW CASTLE COUNTY, DELAWARE

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NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)			SYMBOLS GRAPHIC	SYMBOLS LETTER
COARSE - GRAINED SOILS	GRAVEL AND GRAVELY SOILS	CLEAN GRAVELS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		GW
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE			GP
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GM
				GC
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		SW
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE			SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SM
				SC
FINE - GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		ML
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CL
		SANDY OR GRAVELY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OL
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		MH
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CH
		SANDY OR GRAVELY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OH
HIGHLY ORGANIC SOILS				PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS CONTAINING AN ESTIMATED 10% FINES BY VISUAL CLASSIFICATION OR WHEN THE SOIL HAS BETWEEN 5 AND 12 PERCENT FINES FROM LABORATORY TESTS; AND FOR FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSSHATCHED AREA. RESULTS OF LABORATORY TESTING ARE USED TO SUPPLEMENT THE CLASSIFICATION OF THE SOILS BASED ON THE VISUAL-MANUAL PROCEDURES OF ASTM D2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

	DESCRIPTION		GRAPHIC SYMBOLS
ADDITIONAL DESIGNATION	TOPSOIL		
	MAN-MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATION	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" PENETRATION, AUGER PENETRABLE	

COARSE-GRAINED SOILS
(GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D1586

FINE-GRAINED SOILS
(SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SPLIT-SPOON	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	▽
UPON COMPLETION OF DRILLING	▼
24 HOURS AFTER COMPLETION	⧩

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF TEST PIT NO. INF-5

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **Dry**
GROUND SURFACE ELEVATION: **82**
DATUM: **Topo**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 5 Inches	
81.6		ML		Brown, moist, Sandy SILT	
	2				
79.7		SC		Orange, moist, Clayey SAND, contains gravel	
	4				
	6				
	8				
73.5				Test pit terminated at 8.5 feet.	
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF TEST PIT NO. INF-5

LOG OF TEST PIT NO. INF-5A

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **Dry**
GROUND SURFACE ELEVATION: **82**
DATUM: **Topo**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 4 Inches	
81.7		ML		Brown, moist, Sandy SILT	
80.0	2	SM		Orange, moist, Silty SAND, contains gravel	
	4				
	6				
	8				
72.9				Test pit terminated at 9.1 feet.	
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF TEST PIT NO. INF-5A

LOG OF TEST PIT NO. INF-6

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **Dry**
GROUND SURFACE ELEVATION: **82**
DATUM: **Topo**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 4 Inches	
81.7		ML		Brown, moist, Sandy SILT	
	2				
	4				
	6				
75.3		SM		Orange, moist, Silty SAND	
	8				
73.2				Test pit terminated at 8.8 feet.	
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-6

LOG OF TEST PIT NO. INF-7

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **Dry**
GROUND SURFACE ELEVATION: **78**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 10 Inches	
77.1		ML		Brown, moist, Sandy SILT, contains gravel	
	2				
75.5		SC		Orange, moist, Clayey SAND, contains gravel	
74.5		ML		Gray and orange, moist, SILT with sand, contains gravel	
	4				
72.0	6	SM		Orange, moist, Silty SAND, contains gravel	
71.2		SP-SM		Orange, moist, Poorly-graded SAND with silt contains gravel	
	8				
68.2	10			Test pit terminated at 9.8 feet.	
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-7

LOG OF TEST PIT NO. INF-8

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

PROJECT NO.: **220791**

GROUNDWATER ENCOUNTERED: **10.3**
GROUND SURFACE ELEVATION: **77**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 8 Inches	
76.3		ML		Brown, moist, Sandy SILT, contains gravel	
	2			Gray and orange, moist, SILT with sand, contains gravel	
	4				
71.7		SM		Orange, moist, Silty SAND, contains gravel	
	6				
70.2		SP-SM		Orange, moist, Poorly-graded SILT with sand, contains gravel	
	8				
	10			Same, wet	▼
66.5				Test pit terminated at 10.5 feet. Groundwater encountered at 10.3 feet upon excavation.	
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-8

LOG OF TEST PIT NO. INF-9

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **9.3**
GROUND SURFACE ELEVATION: **76**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 5 Inches	
75.6		FILL		Brown, moist, clayey sand FILL, contains gravel and organic material	
	2			Brown, moist, silt with sand FILL, contains gravel, organic material and brick	
72.7		ML		Gray and orange, moist, SILT with sand, contains gravel	
	4				
70.5		SM		Orange, moist, Silty SAND, contains gravel	
69.8	6	SP-SM		Light brown, moist, Poorly-graded SAND with silt, contains gravel	
	8			Same, wet	▼
66.1	10			Test pit terminated at 9.9 feet. Groundwater encountered at 9.3 feet upon excavation.	
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-9

LOG OF TEST PIT NO. INF-9A

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **7.5**
GROUND SURFACE ELEVATION: **77**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 9 Inches	
76.2		ML		Brown, moist, Sandy SILT	
	2			Gray and orange, moist, SILT with sand, contains gravel	
	4				
72.5		SM		Orange, moist, Silty SAND, contains gravel	
	6				
	8				
67.5				Same, wet	
	10			Test pit terminated at 9.5 feet. Groundwater encountered at 9.5 feet upon excavation. Groundwater observed at 7.5 feet at the end of day.	
	12				

NOTES: **Elevation and location should be considered approximate.**

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LOG OF TEST PIT NO. INF-9A

LOG OF TEST PIT NO. INF-10

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/27/22**
DATE COMPLETED: **12/27/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **6.5**
GROUND SURFACE ELEVATION: **80**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 6 Inches	
79.5		FILL		Dark brown, moist, clayey sand FILL, contains asphalt, brick and gravel	
78.5		CL		Brown, moist, Sandy Lean CLAY, contains gravel	
	2				
76.0	4	SM		Orange, moist, Silty SAND, contains gravel and clay	
	6			Same, wet	▼
73.0				Test pit terminated at 7.0 feet. Groundwater encountered at 6.5 feet upon excavation.	
	8				
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-10

LOG OF TEST PIT NO. INF-11

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

DATE STARTED: **12/27/22**
DATE COMPLETED: **12/27/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

PROJECT NO.: **220791**

GROUNDWATER ENCOUNTERED: **Dry**
GROUND SURFACE ELEVATION: **80**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 6 Inches	
79.5		FILL		Light brown, moist, sandy silt FILL, contains brick and gravel Brown, moist, silty sand FILL, contains brick	
78.0	2	CL		Light brown, moist, Clayey SAND, contains gravel Same, orange	
75.5	4	ML		Gray and orange, moist, SILT with sand, contains gravel	
73.5	6	SM		Orange, moist, Silty SAND, contains gravel	
71.7	8			Test pit terminated at 8.3 feet.	
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-11

LOG OF TEST PIT NO. INF-11A

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/27/22**
DATE COMPLETED: **12/27/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **9.5**
GROUND SURFACE ELEVATION: **80**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 8 Inches	
79.3		FILL		Brown, moist, sandy silt FILL, contains brick and gravel	
	2				
77.7		SM		Light brown, moist, Silty SAND, contains gravel	
	4				
75.5		ML		Gray and orange, moist, SILT with sand	
	6				
72.0	8	SM		Orange, moist, Silty SAND, contains gravel	
70.0	10			Same, wet Test pit terminated at 10.0 feet. Groundwater encountered at 10.0 feet upon excavation. Groundwater observed at 9.5 feet at the end of day.	
	12				

NOTES: **Elevation and location should be considered approximate.**

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LOG OF TEST PIT NO. INF-11A

LOG OF TEST PIT NO. INF-12

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

DATE STARTED: **12/27/22**
DATE COMPLETED: **12/27/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

PROJECT NO.: **220791**

GROUNDWATER ENCOUNTERED: **6.0**
GROUND SURFACE ELEVATION: **75**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 7 Inches	
74.4		SM		Brown, moist, Silty SAND, contains organic material and gravel	
	2			Gray and orange, moist, Silty SAND, contains gravel	
	4				
	6			Same, wet	▼
68.0				Test pit terminated at 7.0 feet. Groundwater encountered at 6.0 feet upon excavation.	
	8				
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-12

LOG OF TEST PIT NO. INF-13

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/27/22**
DATE COMPLETED: **12/27/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **6.0**
GROUND SURFACE ELEVATION: **74**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 5 Inches	
73.6		SM		Brown, moist, Silty SAND, contains gravel	
	2			Gray and orange, moist, Silty SAND, contains gravel	
	4				
	6				▼
67.0				Test pit terminated at 7.0 feet. Groundwater encountered at 6.0 feet upon excavation.	
	8				
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-13

LOG OF TEST PIT NO. INF-13A

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/27/22**
DATE COMPLETED: **12/27/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **5.3**
GROUND SURFACE ELEVATION: **74**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 6 Inches	
73.5		ML		Tan, moist, Sandy SILT, contains gravel	
72.7		SM		Orange, moist, Silty SAND, contains gravel	
	2				
	4				
				Same, wet	
	6				
67.7				Test pit terminated at 6.3 feet. Groundwater encountered at 5.8 feet upon excavation. Groundwater observed at 5.3 feet at the end of day.	
	8				
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-13A

LOG OF TEST PIT NO. INF-14

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **Dry**
GROUND SURFACE ELEVATION: **81**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 5 Inches	
80.6		CL		Brown, moist, Sandy Lean CLAY. contains organic material and gravel	
79.6		SM		Brown, moist, Silty SAND, contains gravel	
	2				
	4			Same, orange-brown	
	6				
74.0				Test pit terminated at 7.0 feet.	
	8				
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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LOG OF TEST PIT NO. INF-14

LOG OF TEST PIT NO. INF-15

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **Dry**
GROUND SURFACE ELEVATION: **81**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 4 Inches	
80.7		ML		Gray and orange, moist, SILT with sand	
	2				
77.7		SM		Orange, moist, Silty SAND, contains gravel and silt lenses	
	4				
	6				
73.5				Test pit terminated at 7.5 feet.	
	8				
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

LOG OF TEST PIT NO. INF-15

LOG OF TEST PIT NO. INF-15A

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

PROJECT NO.: **220791**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

GROUNDWATER ENCOUNTERED: **8.3**
GROUND SURFACE ELEVATION: **80**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 7 Inches	
79.4		ML		Gray and orange, moist, SILT with sand, contains organic material and gravel	
	2				
	4				
75.5		SM		Orange, moist, Silty SAND, contains gravel	
	6				
	8			Same, wet	▼
71.0				Test pit terminated at 9.0 feet. Groundwater encountered at 8.3 feet upon excavation. Groundwater observed at 8.3 feet at the end of day.	
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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18 Boulden Circle, Suite 36
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LOG OF TEST PIT NO. INF-15A

LOG OF TEST PIT NO. INF-16

PROJECT: **NCCVT New Hodgson Vo-Tech High School**
PROJECT LOCATION: **New Castle County, Delaware**
CLIENT: **New Castle County Vo-Tech School District**

DATE STARTED: **12/28/22**
DATE COMPLETED: **12/28/22**
CONTRACTOR: **Cavan Construction**
EQUIPMENT: **Kubota U35 Mini Excavator**

PROJECT NO.: **220791**

GROUNDWATER ENCOUNTERED: **5.0**
GROUND SURFACE ELEVATION: **82**
DATUM: **Topo**
LOGGED BY: **M.DiBartolomeo**
CHECKED BY: **M.McDonough**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 7 Inches	
81.4		CL		Brown, moist, Lean CLAY. contains gravel	
	2			Gray and orange, Lean CLAY with sand, contains gravel	
	4			Same, wet	▼
76.0	6	SM		Orange, moist, Silty SAND, contains gravel	
74.7				Test pit terminated at 7.3 feet. Groundwater encountered at 5.0 feet upon excavation.	
	8				
	10				
	12				

NOTES: **Elevation and location should be considered approximate.**

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LOG OF TEST PIT NO. INF-16

Soil Map—New Castle County, Delaware
(Hodgson Vo-Tech)



Map Scale: 1:4,820 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: New Castle County, Delaware
Survey Area Data: Version 16, Aug 26, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 25, 2020—Sep 5, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EmA	Elkton silt loam, 0 to 2 percent slopes	5.0	7.5%
FgaA	Fallsington loams, 0 to 2 percent slopes, Northern Coastal Plain	4.9	7.3%
ImB	Ingleside-Hammonton-Fallsington complex, 0 to 5 percent slopes	0.5	0.7%
PyB	Pineyneck loam, 2 to 5 percent slopes	36.5	54.8%
UlB	Unicorn loam, 2 to 5 percent slopes	9.9	14.9%
Up	Urban land	9.9	14.8%
Totals for Area of Interest		**66.6**	**100.0%**

Job Name: New Hodgson Vo-tech High School Date: 12/28/2022 Employee Name: M. DiBartolomeo

Job No.: 220791 Weather: Sunny/45 Site Location: New Castle County, Delaware

Location		INF-5		
Test Depth		6.0 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
11:30	S	4 3/4	--	--
11:45	E	4 3/4	0	0.0
12:00	E	4 3/4	0	0.0
12:15	E	4 3/4	0	0.0
12:30	E	4 3/4	0	0.0

Soil Description: Clayey SAND (SC)

Location		INF-6		
Test Depth		5.5 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
11:39	S	5	--	--
11:54	E	5	0	0.0
12:09	E	5	0	0.0
12:24	E	5	0	0.0
12:39	E	5	0	0.0

Soil Description: Sandy SILT (ML)

Job Name: New Hodgson Vo-tech High School Date: 12/28/2022 Employee Name: M. DiBartolomeo

Job No.: 220791 Weather: Sunny/45 Site Location: New Castle County, Delaware

Location		INF-7		
Test Depth		6.5 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
9:23	S	4 3/4	--	--
10:12	E	0	4 3/4	7.3
10:12	S	4 3/4	--	--
10:23	E	3 1/2	1 1/4	6.8
10:23	S	4 3/4	--	--
10:38	E	3	1 3/4	7.0
10:38	S	3	--	--
10:53	E	1 1/2	1 1/2	6.0
10:53	S	1 1/2	--	--
11:08	E	1/2	1	4.0
11:08	S	1/2	--	--
11:15	E	0	1/2	2.0
11:24	S	4 3/4	--	--
11:39	E	3 1/2	1 1/4	5.0
11:39	S	3 1/2	--	--
11:54	E	2 1/4	1 1/4	5.0
11:54	S	2 1/4	--	--
12:09	E	1 1/2	3/4	3.0
12:09	S	1 1/2	--	--
12:24	E	3/4	3/4	3.0
12:24	S	3/4	--	--
12:39	E	0	3/4	3.0

Soil Description: Silty SAND (SM)

Location		INF-8		
Test Depth		6.0 ft.		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
9:00	S	5 1/2	--	--
9:43	E	0	5 1/2	7.7
9:44	S	5 1/2	--	--
10:00	E	3	2 1/2	9.4
10:19	S	5 1/2	--	--
10:34	E	3 3/4	1 3/4	7.0
10:34	S	3 3/4	--	--
10:49	E	2	1 3/4	7.0
10:49	S	2	--	--
11:04	E	1 1/4	3/4	3.0
11:04	S	1 1/4	--	--
11:19	E	1/2	3/4	3.0
11:19	S	5 1/2	--	--
11:34	E	4 1/4	1 1/4	5.0
11:34	S	4 1/4	--	--
11:49	E	3	1 1/4	5.0
11:49	S	3	--	--
12:04	E	2	1	4.0
12:04	S	2	--	--
12:19	E	1 1/4	3/4	3.0

Soil Description: Silty SAND (SM)

Job Name: New Hodgson Vo-tech High School Date: 12/28/2022 Employee Name: M. DiBartolomeo

Job No.: 220791 Weather: Sunny/45 Site Location: New Castle County, Delaware

Location		INF-9		
Test Depth		6.0 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
8:23	S	4 1/2	--	--
8:40	E	0	4 1/2	15.9
8:40	S	4 1/2	--	--
8:58	E	0	4 1/2	15.0
8:58	S	4 1/2	--	--
9:16	E	0	4 1/2	33.8
11:01	S	3 1/4	--	--
11:16	E	2 1/4	1	4.0
11:16	S	2 1/4	--	--
11:31	E	1 1/4	1	4.0
11:31	S	1 1/4	--	--
11:46	E	1/4	1	4.0
11:46	S	3 1/4	--	--
12:01	E	2 1/4	1	4.0
12:01	S	3 1/4	--	--
12:16	E	2 1/4	1	4.0
12:16	S	2 1/4	--	--
12:31	E	1 1/4	1	4.0
12:31	S	1 1/4	--	--
12:46	E	1/2	3/4	3.0
12:46	S	3 1/4	--	--
1:01	E	2 1/2	3/4	3.0

Soil Description: Silty SAND (SM)

Location		INF-10		
Test Depth		4.0 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
8:32	S	5 1/2	--	--
9:32	E	2	3 1/2	3.5
9:34	S	5 1/2	--	--
9:49	E	4 1/2	1	4.0
9:49	S	4 1/2	--	--
10:04	E	3 1/2	1	4.0
10:04	S	3 1/2	--	--
10:19	E	2 1/2	1	4.0
10:19	S	2 1/2	--	--
10:34	E	1 1/4	1 1/4	5.0
10:36	S	5 1/2	--	--
10:51	E	4 1/4	1 1/4	5.0
10:51	S	4 1/4	--	--
11:06	E	3 1/4	1	4.0
11:06	S	3 1/4	--	--
11:21	E	2	1 1/4	5.0
11:21	S	2	--	--
11:36	E	1	1	4.0

Soil Description: Silty SAND (SM)

Job Name: New Hodgson Vo-tech High School Date: 12/27/2022 Employee Name: M. DiBartolomeo

Job No.: 220791 Weather: Sunny/35 Site Location: New Castle County, Delaware

Location		INF-11		
Test Depth		5.0 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
8:43	S	4 1/2	--	--
9:43	E	4 3/8	0	0.1
9:45	S	4 1/2	--	--
10:00	E	4 1/2	0	0.0
10:00	S	4 1/2	--	--
10:15	E	4 1/2	0	0.0
10:15	S	4 1/2	--	--
10:30	E	4 1/2	0	0.0
10:30	S	4 1/2	--	--
10:45	E	4 3/8	1/8	0.1
10:45	S	4 1/2	--	--
11:00	E	4 1/2	0	0.0
11:00	S	4 1/2	--	
11:15	E	4 1/2	0	0.0
11:15	S	4 1/2	--	
11:30	E	4 1/2	0	0.0
11:30	S	4 1/2	--	
11:45	E	4 1/2	0	0.0

Soil Description: Silty SAND (SM)

Location		INF-12		
Test Depth		3.8 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
10:08	S	5 1/4	--	--
10:19	E	0	5 1/4	28.6
10:21	S	5 1/4	--	--
10:32	E	0	5 1/4	28.6
10:33	S	5 1/4	--	--
10:44	E	0	5 1/4	28.6
11:49	S	5 1/4	--	--
12:02	E	0	5 1/4	24.2
12:03	S	5 1/4	--	--
12:17	E	0	5 1/4	22.5
12:18	S	5 1/4	--	--
12:32	E	0	5 1/4	22.5
12:34	S	5 1/4	--	--
12:48	E	0	5 1/4	22.5
12:51	S	5 1/4	--	--
13:05	E	0	5 1/4	22.5
13:06	S	5 1/4	--	--
13:20	E	0	5 1/4	22.5
13:20	S	5 1/4	--	--
13:35	E	0	5 1/4	21.0
13:37	S	5 1/4	--	--
13:51	E	0	5 1/4	22.5

Soil Description: SILT with Sand (ML)

Job Name: New Hodgson Vo-tech High School Date: 12/27/2022 Employee Name: M. DiBartolomeo

Job No.: 220791 Weather: Sunny/35 Site Location: New Castle County, Delaware

Location		INF-13		
Test Depth		2.8 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
9:53	S	4 1/2	--	--
10:03	E	0	4 1/2	27.0
10:09	S	4 1/2	--	--
10:21	E	0	4 1/2	22.5
10:21	S	4 1/2	--	--
10:32	E	0	4 1/2	24.5
11:48	S	4 1/2	--	--
12:03	E	0	4 1/2	18.0
12:03	S	4 1/2	--	--
12:16	E	0	4 1/2	20.8
12:17	S	4 1/2	--	--
12:31	E	0	4 1/2	19.3
12:32	S	4 1/2	--	--
12:46	E	0	4 1/2	19.3
12:47	S	4 1/2	--	--
13:02	E	0	4 1/2	18.0
13:03	S	4 1/2	--	--
13:17	E	0	4 1/2	19.3
13:21	S	4 1/2	--	--
13:35	E	0	4 1/2	19.3
13:38	S	4 1/2	--	--
13:52	E	0	4 1/2	19.3

Soil Description: Silty SAND (SM)

Location		INF-14		
Test Depth		5.5 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
13:32	S	4 1/2	--	--
13:44	E	0	4 1/2	22.5
13:46	S	3 1/4	--	--
14:46	E	1 1/4	2	2.0
14:47	S	3 1/4	--	--
15:02	E	2 3/4	1/2	2.0
15:02	S	2 3/4	--	--
15:17	E	2 1/4	1/2	2.0
15:17	S	2 1/4	--	--
15:32	E	1 3/4	1/2	2.0
15:32	S	1 3/4	--	--
15:47	E	1 1/4	1/2	2.0
15:47	S	3 1/4	--	--
16:02	E	2 3/4	1/2	2.0
16:02	S	2 3/4	--	--
16:17	E	2 1/4	1/2	2.0
16:17	S	2 1/4	--	--
16:32	E	1 3/4	1/2	2.0
16:32	S	1 3/4	--	--
16:47	E	1 1/4	1/2	2.0

Soil Description: Silty SAND (SM)

Job Name: New Hodgson Vo-tech High School Date: 12/28/2022 Employee Name: M. DiBartolomeo

Job No.: 220791 Weather: Sunny/45 Site Location: New Castle County, Delaware

Location		INF-15		
Test Depth		4.5 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
13:22	S	4 1/4	--	--
13:42	E	0	4 1/4	12.8
13:43	S	3 1/4	--	--
14:48	E	2 1/2	3/4	0.8
14:49	S	3 1/4	--	--
15:04	E	3 1/8	1/8	0.5
15:04	S	3 1/8	--	--
15:19	E	3	1/8	0.5
15:19	S	3	--	--
15:34	E	2 7/8	1/8	0.5
15:34	S	2 7/8	--	--
15:49	E	2 3/4	1/8	0.5
15:49	S	3 1/4	--	--
16:04	E	3 1/8	1/8	0.5
16:04	S	3 1/8	--	--
16:19	E	3	1/8	0.5
16:19	S	3	--	--
16:34	E	2 7/8	1/8	0.5
16:34	S	2 7/8	--	--
16:49	E	2 3/4	1/8	0.5

Soil Description: Silty SAND (SM)

Location		INF-16		
Test Depth		3.3 feet		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
13:26	S	4 1/4	--	--
13:41	E	4 1/4	0	0.0
13:56	E	4 1/4	0	0.0
14:11	E	4 1/4	0	0.0
14:26	E	4 1/4	0	0.0

Soil Description: Lean CLAY with Sand (CL)

DNREC Division of Watershed Stewardship
285 Beiser Boulevard, Suite 102
Dover, DE 19904
(302) 739-9921

Soil Investigation Report Submittal Checklist

DATE RECEIVED: _____ **PROJECT NUMBER:** _____

PROJECT NAME: NCCVT New Hodgson Vo-Tech High School SWM Facilities

The items contained on this checklist are necessary to properly evaluate and determine the completeness of any Soil Investigation Report submitted under subsection 12.1 of the Delaware Sediment and Stormwater Regulations. Complete all items. It is understood not all items will be applicable to all projects and as such marking an item "N/A" is acceptable.

I. √ **General Soil Investigation Reports.** The following information, as applicable, should be submitted for all projects.

1) √ The signature, seal and date of a professional engineer or professional geologist experienced in soils licensed in the State of Delaware.

2) √ General description of the project, project elements, and project background.

3) √ Project site surface conditions and current use.

4) √ Regional and site geology. An initial screening of readily available data to determine feasibility of infiltration practices, if applicable, including:

a) √ Site topography

b) √ Soil characteristics as defined in the USDA NRCS Web Soil Survey

c) √ Depth to groundwater and seasonal high water table

d) √ Historical groundwater level data from the nearest Delaware Geological Survey (DGS) monitoring well or wells

5) √ Minimum number of borings or test pits conducted in accordance with the following:

a) √ Surface area BMPs:

i) √ Two (2) borings or pits for the first 8,000 square feet

ii) √ Three (3) borings or pits for up to 16,000 square feet

iii) n/a Four (4) borings or pits for up to 25,000 square feet

iv) n/a One (1) additional boring or pit for each additional 25,000 square feet beyond the first 25,000 square feet

v) √ Boring or pit locations distributed within the facility and sufficient to determine soil variability

b) n/a Linear BMPS:

i) n/a Two (2) borings or pits up to 500 linear feet, and

ii) n/a One (1) additional boring or pit per additional 500 linear feet of trench

iii) n/a Boring or pit locations distributed and sufficient to determine soil variability

Soil Investigation Report Submittal Checklist

6) √ Borings or test pits advanced to the depth of the limiting layer or a minimum of three (3) feet below bottom of the proposed facility, whichever is encountered first.

7) √ Borehole or test pit logs including the following information:

a) √ Project name

b) √ Name of individual collecting the field data

c) √ Date field data was collected

d) √ Type of boring or test pit excavation method and equipment used

e) √ Air temperature and precipitation, including significant precipitation prior to investigation

f) √ Elevation of ground at boring location based on site benchmark

g) √ Visual description of soil profile layers, and depths below grade encountered

h) √ Sample numbers

i) √ Depths to any indications of instability such as cave in, sloughing, flowing sands, or obstructions

j) n/a Blow counts if Standard Penetration Test (SPT) borings are performed

k) √ Depth of seasonal high water table indicators such as mottling

l) √ Depth of encountered free water during and after excavation

m) n/a Depth to bedrock if encountered

n) √ General observations

o) √ Testing standards

8) √ Depth and type of field testing performed. A summary of the laboratory testing conducted, if applicable.

9) √ Project soil and rock conditions including a description of the soil and rock units encountered, and how the units tie into the site geology.

10) √ Description of groundwater conditions, including the identification of any of the following:

a) n/a Confined aquifers

b) n/a Artesian pressures

c) √ Perched water tables

d) √ Potential seasonal variations, if known

e) n/a Any influences on the ground water levels observed

f) n/a Direction and gradient of groundwater, if known

11) n/a Discussion of rock structure, if applicable, including but not limited to:

a) n/a The results of any field structure mapping using photographs as needed,

b) n/a Joint condition

c) n/a Rock strength

d) n/a Potential for seepage.

12) n/a Summary of geological hazards identified and their impact on the project design, if any. Description of the location and extent of the geological hazard.

13) n/a For analysis of unstable slopes including existing settlement areas, cuts, and fills, include background regarding the analysis approach, assessment of failure mechanisms, and determination of design parameters. Include a description of any back-analyses conducted, the results of those analyses, comparison of those results to any laboratory test data obtained, and the conclusions made regarding the parameters to be used for final design.

14) n/a Geotechnical recommendations for structural earthwork including:

a) n/a Embankment design recommendations, as applicable, including but not limited to the following:

i) n/a Slope required for stability

ii) n/a Need and extent of removal of any unsuitable materials beneath the proposed fills

iii) n/a Any other measures that need to be taken to provide a stable embankment

iv) n/a Embankment settlement magnitude and rate

b) n/a Cut design recommendations, as applicable, including but not limited to the following:

i) n/a Slope required for stability

ii) n/a Seepage and piping control

iii) n/a Erosion control measures

iv) n/a Any special measures required to provide a stable slope

c) n/a Determination of adequacy of excavated material for use as structural fill or spoil

d) n/a Data for structural designs of BMP outlet works

15) n/a Long-term or construction monitoring needs, if applicable.

a) n/a Recommendation for types of instrumentation needed to evaluate long-term performance or to control construction

b) n/a Specify the reading schedule required

c) n/a Specify how the data should be used to control construction or to evaluate long-term performance

d) n/a Specify the zone of influence for each instrument.

16) n/a Address issues of construction staging, shoring needs and potential installation difficulties, temporary slopes, potential foundation installation problems, earthwork constructability issues, and dewatering, as applicable.

17) n/a Appendices to support geotechnical recommendations.

Soil Investigation Report Submittal Checklist

II. √ **Infiltration Test Reports.** The following information, as applicable, should be submitted for all stormwater management BMPs that rely upon infiltration.

18) √ Description of approved infiltration testing method.

a) √ Field Permeability Testing conducted in accordance with ASTM-D5126 "Comparison of Field Methods for Determining Hydraulic Conductivity in the Vadose Zone".

b) √ Single Ring or Double Ring Infiltrometer test method

c) n/a Cased Borehole Permeameter test method

i)____ Department or Delegated Agency approval granted prior to conducting the test

ii) ___ Minimum four (4) inch diameter casing used

d) n/a Any deviation from infiltration testing procedures approved by the Department or Delegated Agency noted in the report.

19) √ Summary table of location of test, depth of test, elevation of test if available and field verified infiltration rate.

20) √ The minimum number of field measured infiltration tests are based on the proposed facility's dimensions as follows:

a) n/a For an infiltration trench with less than 10,000 square feet of impervious drainage area:

i)____ One (1) test up to 500 linear feet, and

ii) ___ One (1) additional test per 250 linear feet of trench, and

iii)____ Sufficient to determine variability.

b) n/a For an infiltration trench with greater than 10,000 square feet of impervious drainage area:

i)____ One (1) test up to 250 linear feet, and

ii) ___ One (1) additional test per 250 linear feet of trench, and

iii)____ Sufficient to determine variability.

c) n/a For an infiltration trench used with roadway perforated pipe layouts:

i)____ One (1) test up to 500 linear feet, and

ii) ___ One (1) additional test per 500 linear feet of trench, and

iii)____ Sufficient to determine variability.

d) √ For an infiltrating bioretention system:

i) √ One (1) test for the first 8,000 square feet

ii) √ Two (2) tests for up to 16,000 square feet

iii) n/a Three (3) tests for up to 25,000 square feet

iv) n/a One (1) additional test for each additional 25,000 square feet beyond the first 25,000 square feet

v) √ Test locations distributed within the facility and sufficient to determine variability.

e) √ For a surface infiltration basin:

i) √ One (1) test for the first 8,000 square feet

ii) √ Two (2) tests for up to 16,000 square feet

iii) n/a Three (3) tests for up to 25,000 square feet

iv) n/a One (1) additional test for each additional 25,000 square feet beyond the first 25,000 square feet.

v) √ Test locations distributed within the facility and sufficient to determine variability.

f) n/a For a subsurface infiltrating practice:

i) ____ One (1) test per infiltration area

ii) ___ One (1) additional test for every 8,000 square feet of infiltration area

iii) ____ Test locations distributed within the facility and Sufficient to determine variability

21) √ Infiltration test log, including:

a) √ Name and license number of individual performing test. Individuals in responsible charge of infiltration testing possesses a Class D On-Site License issued by DNREC Division of Water Groundwater Discharges Section or be licensed in the State of Delaware as a Professional Engineer or Professional Geologist.

b) √ Date test was performed

c) √ Type of test method

d) √ Air temperature and precipitation

e) √ Depth of test below ground surface and elevation. Separation to a limiting layer such as bedrock or groundwater of at least two (2) feet maintained.

f) √ Diameters of boring and casing

g) √ Depth of casing penetration

h) √ Time and depth from reference point for each time increment.

i) √ A saturation period of one hour or a drop of 12 inches or 30.5 centimeters achieved. Saturation period not used in determining field verified infiltration rate.

ii) √ After the saturation period, a minimum of two (2) test periods completed or until at least two (2) consecutive test periods are consistent and achieve a stabilized infiltration rate. Each test period has a maximum reading interval of 15 minutes and meets one (1) of the following criteria:

(1) √ A minimum of one hour as determined by the sum of the interval times

(2) ____ A drop of at least 12 inches in 15 minutes or less for a minimum of 30 minutes as determined by the sum of the interval times

iii) √ Stabilized infiltration rate met as defined as one of the following:

(1) √ A difference of 0.25 inches or less of drop between the highest and lowest reading of four (4) consecutive readings for infiltration rates greater than two (2.0) inches per hour

(2) √ A difference of 0.125 inches or less of drop between the highest and lowest reading of four (4) consecutive readings for infiltration rates equal to or less than two (2.0) inches per hour.

iv) n/a When using the constant head test method, water level inside the casing maintained at a constant level or refilled to the starting level after each reading throughout the test period at no more than 15 minute intervals.

v) √ When using the falling head test method each test period starts with the same initial head.

22) √ Infiltration rate graph for each test charting the field verified infiltration rate versus elapsed time of test. Append to each graph a table of the testing results. The field verified infiltration rate is the final steady state reading of the test performed.

23) √ Geotechnical recommendations for each stormwater management facility, including the following:

a) √ Recommended design infiltration rate based on the following:

i) √ Apply a minimum factor of safety of 2.0 to field results from Single Ring or Double Ring Infiltrometer testing

ii) n/a Apply a minimum factor of safety of 2.5 to field results from Cased Borehole Permeameter testing.

iii) √ Provide an elevation range over which the recommended design rates are applicable.

iv) √ The maximum design infiltration rate is less than or equal to 15 inches per hour.

b) n/a Impact of infiltration on adjacent facilities

c) n/a Effect of infiltration on slope stability

d) n/a If the facility is located on a slope, stability of slopes within the facility

e) n/a Foundation bearing resistance

f) n/a If steady state conditions for a given test are not achieved, provide an explanation as to why steady state could not be achieved and the professional's opinion regarding the use of the results for design purposes. If steady state is not achieved for a given test and a reasonable professional opinion is not provided, the Department or Delegated Agency may require additional testing.

Soil Investigation Report Submittal Checklist

III.n/a_____ **Geotechnical Reports for Embankments.** The following information, as applicable, should be submitted for all stormwater management BMPs containing an embankment.

24)____ The signature, seal and date of a professional engineer licensed in the State of Delaware.

25)____ Subsurface Exploration

a) ____ Explorations every 200 feet on center along the length of the embankment.

b) ____ Unless bedrock is encountered at a shallower depth, explorations at a depth twice the proposed height from bottom of pond to top of embankment.

c) ____ If bedrock is encountered, a minimum five (5) foot rock core performed. If organic, plastic, or soils with an actual or estimated N-value less than four (4) are encountered, extended exploration to a depth of four (4) times the proposed embankment height.

d) ____ If there is a potential for a significant groundwater gradient beneath an embankment or surface water levels are significantly higher on one side of the embankment than the other, the effect of reduced soil strength caused by water seepage has been evaluated.

e) ____ Seepage effects considered when an embankment is placed on or near the top of a slope that has known or potential seepage through it.

26)____ Summary of design analyses, which provide the project description and basis of the design recommendations.

27)____ Summary of stability analyses, which provide the results of the stability analyses performed for the given embankment dimensions.

28)____ Summary of settlement analyses, including design assumptions and settlement results for above-grade embankments.

29)____ Design recommendations for embankment construction identifying the following actions:

a) ____ Construction procedures for placement of material in embankment widening areas

b) ____ Embankment cut-off and core trench materials for above-grade embankments

c) ____ Special notes for excavation of unsuitable material, with specific backfill requirements

d) ____ Specific measures required prior to placing embankment material

e) ____ Installation of appropriate erosion control and vegetative cover

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm

June 17, 2022

New Castle County Vo-tech School District
1703 School Lane
Wilmington, Delaware 19808

Attn: Mr. Al Schrum; Supervisor of Facilities and Special Projects

Re: Report of Geotechnical Exploration
NCCVT New Hodgson Vo-tech High School
New Castle County, Delaware

Dear Mr. Schrum:

In accordance with our agreement dated April 5, 2022, Geo-Technology Associates, Inc. (GTA) has performed a geotechnical exploration for the new construction related to the stormwater basin, athletic stadium, and building foundations for the NCCVT New Hodgson Vo-tech High School located in New Castle County, Delaware. The exploration consisted of performing Standard Penetration Test borings and Cone Penetration Test borings across the site, evaluating the encountered materials for engineering properties, and performing infiltration testing. The results of the field testing and preliminary geotechnical recommendations regarding design and construction of the proposed improvements are included in this report. GTA appreciates the opportunity to have been of assistance to you on this project. Should you have questions or require additional information, please contact our office at (302) 326-2100.

Sincerely,
GEO-TECHNOLOGY ASSOCIATES, INC.

Anthony J. Carta, P.E.
Staff Engineer

Meghan McDonough, P.E.
Principal

MEGHAN MCDONOUGH LICENSED No. 13632 DELAWARE PROFESSIONAL ENGINEER

AJC/MM/mt
220791
Attachments

REPORT OF GEOTECHNICAL EXPLORATION

NCCVT NEW HODGSON VO-TECH HIGH SCHOOL

New Castle County, Delaware

JUNE 2022

Prepared For:

NEW CASTLE COUNTY VO-TECH SCHOOL DISTRICT
1703 School Lane
Wilmington, Delaware 19808

Attn: Mr. Al Schrum

Prepared By:

GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
18 Boulden Circle, Suite 36
New Castle, Delaware 19720
(302) 326-2100

GTA Job No: 220791

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REPORT OF GEOTECHNICAL EXPLORATION

NCCVT NEW HODGSON VO-TECH HIGH SCHOOL
NEW CASTLE COUNTY, DELAWARE
JUNE 2022

INTRODUCTION

This report presents the results of the geotechnical exploration performed for the proposed construction for the New Hodgson Vo-tech High School, located in New Castle, Delaware. GTA was provided with an untitled aerial plan that was marked-up with the proposed boring locations. No civil or structural drawings were provided.

Geo-Technology Associates, Inc. (GTA) was retained to perform a geotechnical exploration for the new construction. GTA performed 4 Standard Penetration Test (SPT) borings, 9 Cone Penetration Test (CPT) borings, and 4 infiltration tests throughout the site to evaluate the subsurface conditions to depths of 6 to 20 feet. Conclusions and recommendations regarding design and construction of the proposed stormwater basin, athletic stadium, and building foundations were derived from engineering analysis of fieldwork.

SITE CONDITIONS

The approximate 65.0± acre site is located at 2575 Glasgow Avenue in New Castle County, Delaware as shown on the *Site Location Map, Figure 1*, included in Appendix A. The site is located within the NCCVT New Hodgson Vo-tech High School and consists of a one-story building, athletic fields, open grass areas, parking lots, and drive aisles. The exploration areas were located within the existing athletic fields, open grass areas, and the east parking lot. Based on the Delaware Geological Information Resource (DGIR) map viewer http://maps.dgs.udel.edu/dgir/, an unnamed tributary spans the site from the west perimeter through the center and exits towards the southeast perimeter. The site is bound by Glasgow Avenue to the west, Summit Bridge Trail and an undeveloped wooded area to the north, Summit Bridge Road to the east and south.

Based on topography from Google Earth Imagery, Inc., the general topography of the site is relatively flat. The topography indicates high areas located toward the south portion of the site have

a ground surface elevation of elevation (EL) 84. The topography indicates a low area located toward the east perimeter have a ground surface elevation of EL 70.

PROPOSED CONSTRUCTION

GTA was provided a Concept Plan overlain on aerial imagery. We understand proposed construction consists of a new school in the area of the existing football field and grandstand. We understand the construction will include classrooms, gymnasium, auditorium, a bus drop-off area, and other related infrastructure as outlined on the refenced plans. We understand that the proposed structure will be a 2-story, masonry and steel frame, slab-on-grade building. Preliminary building loads were assumed to be 3 to5 kips per linear foot (klf) for load bearing walls and 100 kips for building interior columns.

Preliminary information indicates that four stormwater management facilities are proposed. The type and size of facilities have not been finalized; and final locations may be dependent on this results of this study. In addition to the proposed infrastructure, new light duty and moderate duty pavements will be required.

SITE GEOLOGY

According to the *Geologic Map of New Castle County Delaware* (GM13, 2005), published by the Delaware Geological Survey, the site vicinity is situated in the Coastal Plain. Physiographic Province. The Coastal Plain is characterized by undifferentiated and interlayered sedimentary deposits derived from eroded rock formations to the north and west. Specifically, the site is mapped as underlain by a 30-to-50-foot thickness of the Pleistocene Age Columbia Formation. The Pleistocene deposits generally consist of quartz sand and gravel, with lenses of silt and clay. Beneath the surficial sediments of the Columbia Formation, the geologic map indicates the soils of the Potomac Formation are present.

According to the U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Web soils Survey (reviewed on June 6, 2013), the site is underlain by the Fallsington, Elkton, Ingleside-Hammonton-Fallsington, Pineyneck and Unicorn Soil Series. Refer to the mapping in Appendix C.

- Fallsington, Elkton: severely or moderately high season high groundwater levels, poorly drained soil (Soil Group C/D)
- Pineyneck: moderately well-drained, with depth to water table of 20 to 40 inches (Soil Group C)
- Unicorn: well-drained, depth to water table 40 to 72 inches (Soil Group A)

The Delaware Geologic Information Resource (DGIR) Map Viewer << http://maps.dgs.udel.edu/dgir/>> indicates the water levels are typically 16 feet below existing grades during the dry and normal seasons, and as shallow as 11 feet during the wet season.

SUBSURFACE EXPLORATION

The field exploration consisted of drilling 4 Standard Penetration Test (SPT) borings at locations across the site, designated as B-1 through B-4. In addition to SPT borings, GTA performed 9 Cone Penetration Test (CPT) soundings at the designated locations, identified as CPT-1 through CPT-9.

Standard Penetration Testing was performed in the boreholes, with nearly continuous sampling performed in the upper 10 feet of drilling and at 5-foot intervals thereafter. Standard Penetration Testing involves driving a 2-inch outside diameter (O.D.), 1⅜-inch inside diameter (I.D.) split-spoon sampler with a 140-pound hammer free-falling 30 inches. The number of blows required to drive the sampler was recorded in intervals of 6 inches. The total number of hammer blows required to drive the sampler from the 6- to 18-inch interval is the SPT N-value. Split spoon samples retrieved from the test borings were returned to GTA's laboratory for limited testing.

The CPT soundings were performed using a 20-ton, 15 cm² single-element cone capable of measuring pore pressures at the u_2 position. The soundings were performed by pushing an electronically instrumented cone shaped probe into the soil with the hydraulic system of a track-mounted reaction device. The cone is equipped with an instrumented tip and friction sleeve that measures tip resistance and soil-to-steel friction, respectively, as the cone is being pushed. In addition, the pore water pressure response to cone penetration is measured. Measurements of tip resistance, sleeve friction, and pore pressure were taken at approximately 1-inch depth intervals.

This data was transmitted to recording devices at the ground surface. Graphical cone sounding logs were constructed to show the variations of tip resistance, local friction, friction ratio, and pore pressure with depth. These values can be correlated to soil strength, compressibility, and classification. The tip resistance profile graphically presents the relative strength of the soil strata. The friction ratio, the numerical ratio of the local friction to the tip resistance, was computed for each depth interval. This ratio is an indicator of the material type, i.e. sand, silt, or clay. The friction, friction ratio, and pore pressure profiles are used primarily to interpret soil type. Refer to the attached CPT sounding logs for detailed graphical interpretation of the subsurface conditions.

The explorations were field located by GTA, with the approximate locations indicated on the *Exploration Location Plan, Figure 2*, included in Appendix A. An instrument survey for elevation or location was not performed and the elevations indicated on the logs were interpolated from the site topography indicated on the referenced plan. Therefore, it should be understood that all elevations, as well as transitions in soil strata indicated on the logs are approximate.

SUBSURFACE CONDITIONS

Borings

In agreement with the published geology and our knowledge of previous development activities at the site, the SPT borings typically encountered existing fill and natural soils consistent with the Columbia Formation descriptions to the completion depths of the borings. Topsoil was encountered at the ground surface and measured 4 to 7 inches think. Fill materials were present in the borings to depths ranging from about 1 to 4 feet. Fill materials generally consisted of silty sand with varying percentages of gravel. Underlying the surficial materials (topsoil and pavement section) and limited fill, Borings B-1 and B-3 encountered predominantly fine-grained soils in the top 6 to 8 feet. These soils were visually classified as sandy silt, and sandy lean clay. Uncorrected SPT N-values for the encountered fine-grained soils ranged from 3 to 12 blows per foot (bpf), averaging 7 bpf, indicating these soils are generally medium stiff. The fine-grained soils were underlain by predominantly granular materials visually classified as silty sand, and poorly-graded sand with silt, with interlayered clay lenses to the termination depth. Borings B-2 and B-4 encountered granular materials throughout the depths of drilling. Uncorrected SPT N-values for the

granular materials ranged from 6 to 12 bpf, with an average value of 9 bpf, indicating the soils are generally loose to medium dense.

Cone Penetrometer Testing (CPT)

Topsoil was encountered at the ground surface of soundings and measured about 4 to 9 inches thick. The CPT soundings were advanced to depths of about 25 to 31 feet below the existing ground surface. Based on review of the CPT soundings, and the SPT borings, the soils encountered are consistent with material encountered in the SPT borings. Surficial fine-grained soils were encountered to depths of 8 to 10 feet below the ground surface, underlain by more granular materials consisting of silty sand and poorly-graded sand with sily.

Cone tip resistances typically ranged from approximately 50 to 100 tons per square foot in the upper 25 feet indicating medium dense to dense granular materials. Based on the seismic CPT data and the site geologic profile, average shear wave velocities of more than 400 feet per second and less than 1,200 feet per second are estimated for the upper 100 feet of materials at the site. Accordingly, the site can be assigned to Site Class D – Stiff Soil Profile.

Groundwater was encountered during drilling in borings B-1 through B-4 at depths of about 8 to 13 feet below existing grades, corresponding to EL 64 to 73. The borings were grouted or backfilled after the water levels were recorded. The water table will fluctuate several feet due to variations in precipitation and surface runoff.

INFILTRATION TESTING

Four SPT borings, designated Borings B-1 through B-4, were drilled near the locations of the proposed SWM facilities, to evaluate the depth to hydraulically limiting layers. After evaluating the limiting zones in the deeper exploratory SPT borings, offset boreholes were advanced to depths of about 6 feet in order to set casing for borehole infiltration tests. Four infiltration tests identified as INF1 through INF-4 were performed adjacent to the corresponding SPT boring.

The borehole infiltration testing consisted of installing a solid 4-inch diameter casing to depths of 6 feet below the ground surface. The casing was driven a few inches into the natural soils.

A two- to four-inch gravel layer was placed at the bottom of the casing to protect the subgrade soils from scouring and sediment. The holes were pre-soaked for a minimum of one hour or a 12-inch water drop. After the pre-soak period, water was added in 6-inch increments and water level measurements were taken with time. The tests were conducted for a minimum of 2 hours, and water level measurements were taken at approximately 10- to 15-minute intervals. The steady-state values ranged from 1½ inches per hour to 10-inches per hour as tabulated below. It should be noted that infiltration rates can vary widely with variations in soil texture and gradation.

UNFACTORED FIELD INFILTRATION RATES

Location	Depth (feet)	Unfactored Field Infiltration Rate	USCS Soil Classification
INF-1	6	10-inches per hour	Silty SAND (SM)
INF-2	6	3-inches per hour	Silty SAND (SM)
INF-3	6	1½-inches per hour	Silty SAND (SM)
INF-4	6	6-inches per hour	Clayey SAND (SC)

CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of this exploration, it is our opinion that the proposed construction is generally feasible, given that the geotechnical recommendations are followed, and that the standard level of care is maintained during construction. The potential geotechnical issues related to site development will be demolition of existing site features and impact on new construction, moisture sensitive fine-grained soils, existing fill and obstructions, and perched water. A discussion of these issues, as well as general foundation design parameters, are included in the following paragraphs.

Demolition and Earthwork Considerations

As previously mentioned, portions of the development area are currently occupied by the existing buildings and various underground utilities. Redevelopment of the site will include demolition and removal of these features. Pavements will require removal and replacement or retrofit to accompany the new construction. Asphalt millings should be segregated from the graded-aggregate base course, and should not be used as structural fill. Graded aggregate base course (GABC) can be removed and stockpiled for future use. The GABC can remain in-place in proposed

parking and drive areas. GTA recommends the complete removal of all obstructions, foundations/slabs, and retaining walls from the proposed construction area. Alternately, these elements can remain in place if they are at least 20 feet from any proposed structure and removed to a minimum depth of 2 feet below final grading, provided their location does not conflict with utility installation, foundation construction or retaining wall construction. This will need to be further evaluated as design progresses.

GTA recommends that the existing utilities be removed and/or relocated to areas outside of the planned construction zone. The base of all excavations resulting from the removal of existing features and utilities, if situated below the proposed finished floor elevation, should be evaluated by the representative of the Geotechnical Engineer of Record to confirm stabilization prior to backfilling. Following confirmation of a stable subgrade, the excavations should be backfilled as specified in the *Site Grading* section of this report.

A portable crushing plant capable of handling a variety of materials of non-uniform size or composition will be required to process the building materials for re-use as structural fill. Metal and waste materials must be detected and removed at the start of processing by manual or magnetic separation. If the concrete contains steel reinforcement it will be necessary to remove this reinforcement. All reinforcing steel should be removed from the salvaged concrete either before or during the crushing operation. Any reinforcing steel not removed previously must be separated from the recycled concrete after it is processed through the primary crusher.

The recycling of the building rubble waste consists of concrete, asphalt, wood, fixtures, rebar, metals, drywall, roofing, and other materials. Appropriately labeled cans should be provided by the demolition contractor for the various materials. The concrete, masonry, brick and rebar shall be segregated and stockpiled separately. Proper separation of unsuitable materials from the crushed aggregate feedstock is important. We recommend that the feedstock slabs be processed to slabs measuring no more than 4 feet by 4 feet.

The recycled concrete aggregate shall consist of Portland Cement Concrete or other concrete containing pozzolanic binder material from only on-site sources. The recycled concrete material

shall be free of reinforcing steel, expansion material, gypsum, organic substances (wood, textile fabric, paper, joint sealants, paints, etc.), chlorides, and glass. The recycled concrete aggregate for re-use as structural fill should consist of at least 70 percent, by weight, Portland cement concrete, with the following materials making up the remaining 30 percent; wood shall be no more than 0.1 percent maximum, and brick, glass, concrete masonry units, on-site soils, or other friable materials shall be no more than 29.9 percent maximum.

The percentage of wood, brick, glass, concrete masonry units, on-site soils, and other friable materials shall be determined by weighing that material retained on the No. 4 sieve, and dividing by the total weight of recycled concrete aggregate material retained on the No. 4 sieve. Fine aggregate passing the No. 4 (4.75-mm) sieve shall consist of fines from the operation of crushing the recycled concrete aggregate. The processed materials should have a unit weight of at least 110 pounds per cubic foot.

Recycled concrete aggregate samples for preliminary testing shall be furnished by the Contractor prior to the start of backfill. Samples of recycled concrete aggregate shall be furnished by the Contractor at the start of production and at intervals during production. The sampling points and intervals will be designated by the Engineer. The samples will be the basis of approval of specific lots of recycled concrete aggregate for the quality requirements.

Additionally, if any foundations fall within a sloped excavation, the foundation bearing level be lowered below the excavation support grade, or supported on compacted structural fill after completion of the foundation walls.

Site Preparation

Initial site preparation should include the stripping of all vegetation and other deleterious material from within and a minimum of 10 feet beyond the proposed construction limits following demolition. Topsoil thicknesses averaged 6 inches; however actual stripping thickness will be dependent on localized topsoil development, precipitation, soil moisture, construction traffic disturbance and contractor care. The topsoil may be stockpiled for future use in landscaped areas but would not be suitable for reuse in structural areas.

Existing fill was encountered within the upper 2 to 4 feet of the ground surface. The fill materials primarily consisted of medium stiff to very stiff fine-grained materials or loose to medium dense granular materials. We recommend that GTA further evaluate the fill at the time of construction to confirm its suitability to support the proposed construction. Fill containing organic material may not be used in structural areas. If additional new fill is required in areas where existing fill materials exist or new cuts do not fully extend through the existing fill materials, a thorough evaluation of the existing fill should be performed before leaving this material in place. The further evaluation should consist of a minimum of excavating test pits, proof-rolling with a loaded tri-axle dump truck, and/or performing in-place density testing. Upon satisfactory evaluation of the subgrade, structural fill or backfill should be placed in lifts and compacted in accordance with the specifications included in this report.

Following removal of the surface materials the exposed subgrade soils within the proposed construction/structural areas should be evaluated. Evaluation should include proof-rolling with a loaded tri-axle or off-road dump truck. Any below grade components or existing fills from previous development or structures from within the building and stormwater management areas will need to be removed completely and replaced with compacted structural fill. It may be acceptable to leave these materials in place in non-structural areas or below pavements. Under suitable weather conditions, soft/loose or unstable areas which are the result of excessive moisture can be aerated and dried in-place. Alternately, any loose or soft zones of soil can be removed and replaced with structural fill in accordance with the specifications included in this report. The lateral extent, depth, and method of stabilization will be dependent on actual site conditions and should be determined at the time of construction by a representative of the Geotechnical Engineer of Record.

Site Grading

Upon satisfactory evaluation of the subgrade, structural fill should be placed in lifts and compacted in accordance with the specifications included in this report. Fill materials will typically need to be within 2 to 3 percentage points of the optimum moisture content before compactive effort is applied. Moisture conditioning of the soils should be anticipated in order to obtain the recommended degree of compaction and to provide stable subgrades. Excavated soil materials will generally need to be within 2 to 3 percentage points of the optimum moisture content before

compactive effort is applied. The contractor should be prepared to moisture condition soils by discing and aerating if the moisture content of the excavated soil material is above the working range of optimum for compaction.

We recommend that positive drainage be maintained across the site during construction to minimize ponding of water, since the exposed subgrades could destabilize in combination with construction traffic and precipitation. Furthermore, heavy construction traffic should generally be run on designated haul roads during periods of wet weather to reduce the potential for destabilization of more subgrade areas than necessary. If the subgrade is disturbed by construction traffic and becomes unstable, undercutting and replacement of these surficial materials will likely be required.

Structural fill should meet USCS designation CL, ML, SM, SC, GP-GM, GM, or GW-GM and be approved by the Geotechnical Engineer prior to use. All structural fill should be constructed in maximum 8-inch thick, loose lifts and be compacted to the following specifications:

COMPACTION SPECIFICATIONS

Structure / Fill Location	Compaction / Moisture Specification
Below foundations, floor slabs, and within wall backfill or slopes steeper than 5H:1V	95 percent of ASTM D698 Moisture: ± 3% of optimum
Top 1-foot of pavement subgrade	98 percent of ASTM D698 Moisture: ± 2% of optimum
Fills below 1-foot of pavement subgrade	95 percent of ASTM D698 Moisture: ± 3% of optimum

Backfill placed in confined areas, such as foundation and utility excavations, should be spread in thinner layers and compacted to the same degree using manually operated compaction equipment.

All compactive effort should be verified by in-place density testing by a representative of GTA. The 2018/2021 IBC requires that fill subgrades and each lift of fill be observed and tested. New fills constructed on slopes steeper than 5H:1V should be keyed into existing slopes for stability

considerations. All fill slopes steeper than 5H:1V should generally be placed as controlled fill and be compacted to minimum densities as specified above.

Foundations

The proposed structure may be supported on shallow spread footings designed for a maximum net allowable bearing pressure of 3,000 pounds per square foot (psf). Minimum widths for wall footings of 24 inches and column footings of 36 inches are recommended when design based on 3,000 psf results in a narrower footing. Settlement on the order of 1-inch total and ½-inch differential can be anticipated, based on the assumed loads of 3 to 5 kips per linear foot for walls and maximum column loads of 100 kips. Exterior footings should be founded a minimum of 32 inches below the final exterior grades to provide protection from frost action.

Footings should be supported on new compacted structural fill or medium dense/stiff natural soils. If loose or soft natural soils or existing fill are encountered at the footing subgrade elevation, these soils should be undercut to suitable materials. The undercut volume should be backfilled with compacted structural fill, AASHTO No. 57 aggregate, or additional concrete. The aggregate should be placed in 1- to 2-foot-thick layers and be tamped with the equipment bucket with the last lift compacted with a small walk behind vibratory roller or large vibra-plate. GTA recommends that footing excavations be filled with concrete the same day the excavations are performed to prevent destabilization and softening of the subgrade soils.

Detailed foundation excavation evaluations should be performed in each footing excavation prior to the placement of crushed stone, reinforcing steel, or concrete. These evaluations should be performed by a representative of the registered Geotechnical Engineer to confirm that the design allowable soil bearing pressure is available. The foundation bearing surface evaluations should be performed using a combination of visual observation, hand-rod probing, comparison with the borings, and Dynamic Cone Penetrometer (DCP) testing, as applicable.

Seismic Information

Based on the SPT data, and the site geologic profile, the site should be assigned to Site Class D, in accordance with *Chapter 20 of the American Society of Civil Engineers (ASCE) Standard 7-20*

Minimum Design Loads for Buildings and Other Structures and *2018/2021 International Building Code*. This categorization is based on the near surface test boring results, general geologic information for the region, and the information contained in the standard.

Floor Slabs

Where floor slab loads are 100 psf or less, the floor slab can be designed as a concrete slab on-grade using a design modulus of subgrade reaction (k) of 175 pounds per cubic inch (pci). GTA recommends that the concrete floor slabs supported on grade be founded on a 6-inch (minimum) thickness coarse granular layer. A vapor retarder should be used in occupied spaces with moisture sensitive floor finished to interrupt the rise of capillary moisture through the slab. Crushed stone or washed gravel meeting the gradation of AASHTO Size No. 57 or dense-graded aggregate can be used for the granular layer. The slabs may bear on footing projections; however, they should be jointed so that the foundations can settle without affecting the slab.

Utility and footing backfill below floor slabs should meet the compaction requirements specified herein. Depending on depth of trench and bedding and cover over pipe, light weight hand operated compaction equipment may need to be utilized. Lifts within these trenches should not exceed 6 to 8-inch loose thickness. If the specified compaction can not be achieved, then the soil should be replaced with open-graded aggregate similar to AASHTO #57 stone.

Construction activities and exposure to weather often cause deterioration of slab subgrades. The contractor should exercise care during floor slab preparation to limit disturbance to exposed subgrades. We recommend that the slab subgrade soils be evaluated by a representative of the Geotechnical Engineer immediately prior to stone and concrete placement. This evaluation may include a combination of visual observations, proofrolling, hand-rod probing, and field density tests to verify that the subgrade soils have been prepared properly. If soft or loose soils are encountered, recommendations for remedial measures should be provided by the Geotechnical Engineer at the time construction is performed.

Subsurface Utilities

The natural soils are considered suitable for support of the subsurface utilities. However, if

loose/soft soils are encountered, it may be necessary to undercut the subgrade and provide a minimum 6-inch-thick granular bedding to provide uniform support, as dictated by site conditions. Backfill for the new structures should be free of organic material, rubble, and other deleterious materials. New subsurface utilities that run parallel to foundations should be set so that they fall outside of the zone of influence of the foundations (1H:1V) and conform to the plumbing code specifications.

Water was encountered at depths ranging from approximately 8 to 13 feet below existing grades within the explorations and is not anticipated to impact construction of shallower utilities. However, seepage may impact utility construction especially during the wet season or periods of prolonged precipitation. Problems associated with seepage into the excavation include loss of stability, sidewall collapse, and sloughing of soils. These problems can be reduced through the use of dewatering techniques. Dewatering through the use of "sump and pump" techniques may be required in some areas to remove perched or trapped water seepage.

All construction excavations should be sloped and shored in accordance with OSHA excavation regulations or stricter local governing safety codes. It is our opinion that the undisturbed natural soils would generally be classified as "Type C" soils under the OSHA excavation regulations. Significantly flatter excavation side-slopes will be required where groundwater seepage occurs. Utility pipe systems below pavement and other structural areas should be backfilled using controlled fill compacted in accordance with the *Site Grading* section of this report.

Retaining Wall Considerations

Site retaining walls were not indicated on the referenced plans; however, assuming the use of on-site soils (PI<15) placed and compacted as structural fill, we recommend these walls be designed using the values tabulated below. Walls that are free to rotate at the top can be designed using active earth pressures. Walls that are braced at the top to prevent rotation should use at-rest earth pressures. Hydrostatic pressure is not included in the above values since it is assumed that adequate drainage will be provided as described below.

LATERAL EARTH PRESSURE SUMMARY

Soil Property	Recommended Values
Unit Weight, γ	117 pcf
Angle of Internal Friction, Φ	32º
Coefficient of Active Earth Pressure (Ka)	0.31
Coefficient of Passive Earth Pressure (Kp)	3.25
Coefficient of Earth Pressure at Rest (Ko)	0.47
Base Friction, tan δ	0.4
Equivalent Fluid Pressure (Unrestrained Top of Wall)	36 psf/ft
Equivalent Fluid Pressure (Restrained Top of Wall)	55 psf/ft

Wall backfill should be free of organic material, rocks greater than 3 inches in diameter, and construction debris. Backfill should be placed and compacted in lifts in a manner that does not damage the foundation. Additionally, foundation wall backfill should not be placed until the concrete has achieved adequate strength and the structure is braced per the design requirements.

Additionally, we recommend that only light weight hand operated compaction equipment is allowed within 5 feet of the back face of the wall, and that lifts within this zone not exceed 6 to 8-inch loose thickness. If the specified compaction can not be achieved within 5 feet of the back of the retaining wall, then the soil should be replaced with open-graded aggregate similar to AASHTO #57 stone.

Pavements

GTA recommends that the upper 12 to 18 inches of roadway subgrade be constructed with the following characteristics if possible:

PAVEMENT SUBGRADE SPECIFICATIONS

Liquid Limit	35 percent or less
Plasticity Index	15 percent or less
Maximum Dry Density	110 pcf or greater
California Bearing Ratio	5 or greater

The fine-grained surface soils and on-site material to be used for fill are relatively weak and some of the materials are not expected to be suitable as pavement subgrade. Therefore, all pavement subgrade areas should be proof-rolled and evaluated for stability and to determine if they meet the specifications above. Soils that are unstable or unsuitable, will need to be stabilized for pavement support. Soils can be selectively excavated, and the resultant excavations backfilled with controlled, compacted fill or reworked, dried, and recompacted.

Prepared subgrades soils may become disturbed and softened from excess moisture and construction equipment traffic. Contractors should anticipate that remedial work could be required to achieve a stable subgrade prior to paving, even if the subgrade soils had previously been compacted to the required densities. Prudent planning and earthwork procedures will reduce the potential necessity for remedial work.

Heavy construction traffic should not be allowed on partial pavement sections since such traffic can damage the pavement. The paving contractor should be advised that they must control construction traffic to limit disturbance of previously approved subgrade, stone base course, or completed asphalt. Some patching and repair may be necessary prior to placement of the final wearing surface layer of asphalt due to construction traffic.

Proper drainage will be an important consideration for the overall performance of the pavement. Proper grading should be provided for suitable runoff from the pavement surface and beyond the limits of the paved areas. Underdrains should be considered to extend the life of the bituminous concrete pavements.

Stormwater Management

Based on our observations made during the subsurface exploration, it is our opinion that managing stormwater through the use of infiltration is considered feasible, but will be limited given the variable rates. The guidelines established in the Delaware Sediment and Stormwater program technical Document Article 3.06, Appendix 3.06.2. *A-1 Soil Investigation Procedures* indicate that the minimum infiltration rate for all runoff reduction and infiltration practices is 1-inch per hour.

Also, a vertical separation of two (2) feet from the seasonal high groundwater elevation is required for all infiltration practices unless an underdrain is provided.

The unfactored field measured infiltration rates ranged from 1½ to 10 inches per hour. A factor of safety of at least 2.5 should be applied to the field measured rates since borehole infiltration tests were performed. Infiltration testing performed for this study is considered preliminary. Additional infiltration testing will be required based on the square footage and type of facility per DNREC regulations.

General Construction Recommendations

To preserve the infiltration capability, GTA recommends that the facilities be excavated using a track-mounted excavator, which will generally eliminate the need to operate equipment directly on the subgrade. This recommendation is based on the inherent problems associated with these systems as they become less permeable due to densification during construction and partial clogging or siltation occurring over time. The inverts of the facilities should be in natural granular soils, and should be hand cleaned to remove any disturbed soil prior to placing stone.

Once the design of the facilities has been completed, GTA should be provided the opportunity to review the plans to evaluate if the geotechnical issues have been addressed and to perform the required testing for final design. Also, GTA should be provided the opportunity to review the facility subgrade during construction and perform confirmation field-testing. This is to observe compliance with the design concepts, specifications, or recommendations, and to allow for field changes in the event that the soils conditions differ from that anticipated prior to that start of construction.

ADDITIONAL SERVICES

We recommend that during final design and construction of the subject project, a geotechnical engineer be retained to provide services for the following items.

- Perform supplemental testing including infiltration testing to confirm with local, and state regulations.

- Review final site, structural plans, and specifications to evaluate if they conform with the intent of this report.
- Review excavated footings for compliance with the project drawings and the intent of this geotechnical report.
- Provide observation and testing services during wall construction to evaluate if the earthwork is being performed in accordance with the intent of this report and project plans and specifications.
- Provide other Special Inspections as required by the project specifications and the New Castle County Department of Land Use.

LIMITATIONS

This report, including all supporting exploration logs, field data, field notes, calculations, estimates and other documents prepared by GTA in connection with this Project have been prepared for the exclusive use of New Castle County Vo-tech School District (Client) pursuant to agreements between GTA and Client in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are incorporated herein by reference. No warranty, express or implied, is made herein. Use and reproduction of this report by any other person without the expressed written permission of GTA and Client is unauthorized and such use is at the sole risk of the user.

The analysis and recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Test borings indicate soil conditions only at specific locations and times, and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between test boring locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology

Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Geo-Technology Associates, Inc.

The scope of our services for this geotechnical exploration did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the logs regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our Client.

This report and the attached logs are instruments of service. The subject matter of this report is limited to the facts and matters stated herein. Absence of a reference to any other conditions or subject matter shall not be construed by the reader to imply approval by the writer.

220791 **GEO-TECHNOLOGY ASSOCIATES, INC.**

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

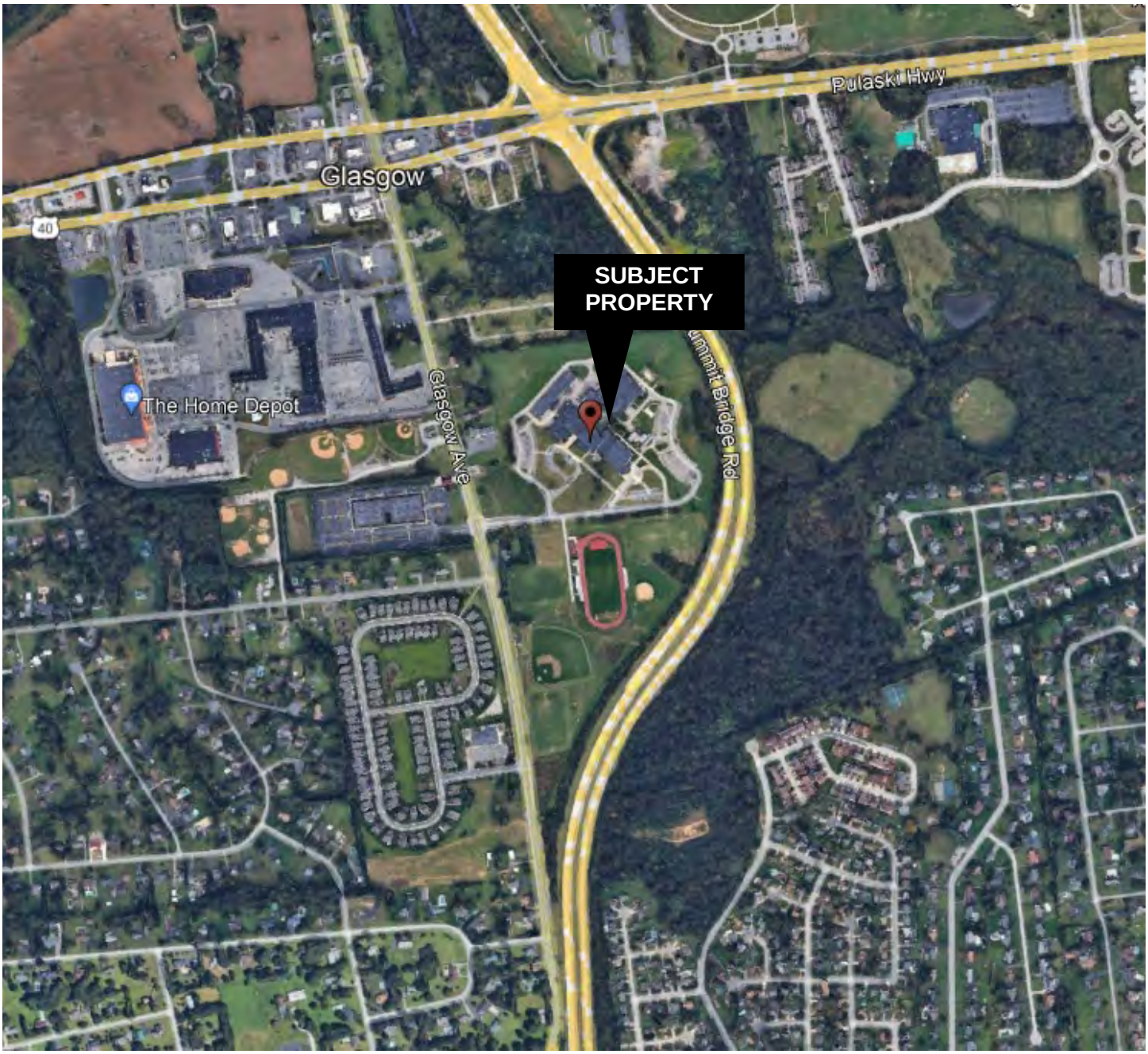
While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

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APPENDIX A



Notes:

1) Base map obtained from Google Earth Imagery, Inc. from September 20, 2020.
2) Site Location Map should be reviewed in conjunction with GTA Report NCCVT New Hodgson Vo-tech High School, Job No.220791

N

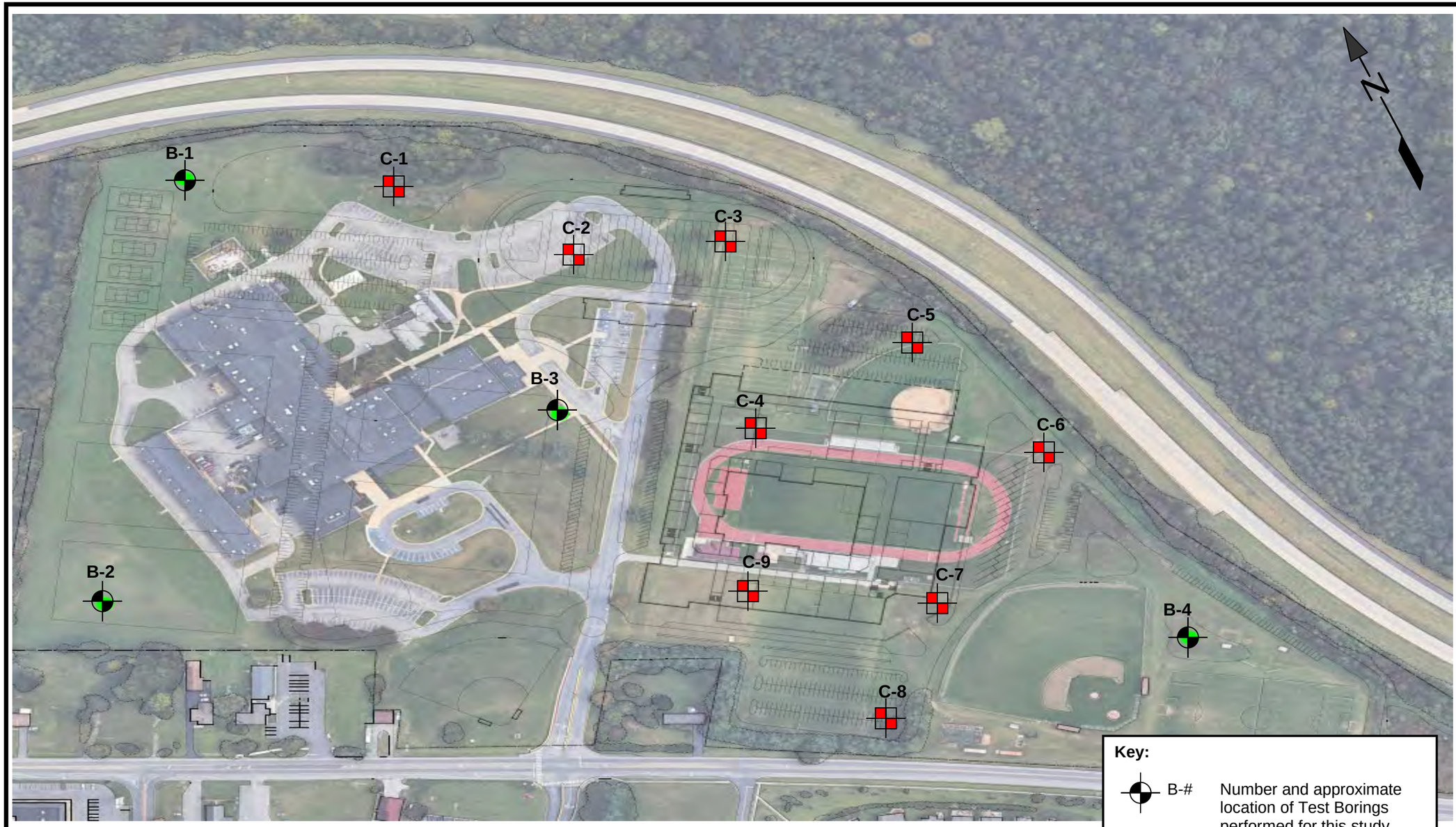
GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
18 Boulden Circle, Suite 36
New Castle, Delaware 19720
(302) 326-2100

SITE LOCATION MAP

NCCVT
NEW HODGSON VO-TECH SCHOOL

NEW CASTLE COUNTY, DELAWARE

SCALE	DATE	DRAWN BY	REVIEW BY	JOB NO.	FIGURE NO.
NTS	JUNE 2022	GOOGLE	MM	220791	1



Key:

- B-# — Number and approximate location of Test Borings performed for this study
- C# — Number and approximate location of CPT Tests performed for this study

Notes: (1) Base map obtained from provided New Castle County Vo-Tech.
(2) Exploration Location Plan should be read together with GTA Report NCCVT New Hodgson Vo-tech High School, Job No. 220791 for complete evaluation. Use of the diagram is limited illustration of the approximate locations of the explorations.
(3) The approximate locations of the explorations were measured from site features and should be considered accurate to the degree implied by this method.

JOB NUMBER.:
200791

FIGURE:
2

REVIEW BY:
MM

SCALE:
NTS

DATE:
JUNE 2022

EXPLORATION LOCATION PLAN
NCCVT
NEW HODGSON VO-TECH HIGH SCHOOL
NEW CASTLE COUNTY, DELAWARE

GEO-TECHNOLOGY ASSOCIATES, INC.
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APPENDIX B

NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)			SYMBOLS GRAPHIC	SYMBOLS LETTER
COARSE - GRAINED SOILS	GRAVEL AND GRAVELY SOILS	CLEAN GRAVELS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		GW
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE			GP
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GM
				GC
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		SW
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE			SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SM
				SC
FINE - GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		ML
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CL
		SANDY OR GRAVELY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OL
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		MH
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CH
		SANDY OR GRAVELY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OH
HIGHLY ORGANIC SOILS				PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS CONTAINING AN ESTIMATED 10% FINES BY VISUAL CLASSIFICATION OR WHEN THE SOIL HAS BETWEEN 5 AND 12 PERCENT FINES FROM LABORATORY TESTS; AND FOR FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSSHATCHED AREA. RESULTS OF LABORATORY TESTING ARE USED TO SUPPLEMENT THE CLASSIFICATION OF THE SOILS BASED ON THE VISUAL-MANUAL PROCEDURES OF ASTM D2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

	DESCRIPTION		GRAPHIC SYMBOLS
ADDITIONAL DESIGNATION	TOPSOIL		
	MAN-MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATION	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" PENETRATION, AUGER PENETRABLE	

COARSE-GRAINED SOILS
(GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D1586

FINE-GRAINED SOILS
(SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SPLIT-SPOON	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	▽
UPON COMPLETION OF DRILLING	▼
24 HOURS AFTER COMPLETION	⧩

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF BORING NO. B-1

PROJECT: **NCCVT New Hodgson Vo-tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	12.7	Dry	BOC
DATE:	4/20/22	4/20/22	
CAVED (ft):	In Augers	9.0	

DATE STARTED: **4/20/22**
DATE COMPLETED: **4/20/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **77.0**
DATUM: **Google Earth**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					77.0	0			Topsoil +/- 6 Inches	
S-1	0.0	10	1-2-1-2	3	76.5		FILL		Dark brown, moist, soft, sandy silt FILL	
S-2	2.0	19	3-6-5-4	11	75.0	3.5	ML		Light brown, moist, stiff, Sandy SILT	
S-3	4.0	19	1-2-1-2	3	73.0		CL		Tan, moist, soft, Sandy Lean CLAY	
S-4	6.0	19	2-3-5-5	8	71.0	7	SM		Light tan, moist, loose, Silty SAND, contains gravel	
S-5	8.0	16	1-3-4-4	7					Same	
						10.5				
S-6	13.0	21	2-4-3-3	7		14			Same, wet	
						17.5				
S-7	18.0	20	2-3-5-5	8					Brown, moist, loose, Silty SAND, contains gravel	
					57.0				Boring terminated at 20.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. B-1

LOG OF BORING NO. B-2

PROJECT: **NCCVT New Hodgson Vo-tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	12.7	Dry	BOC
DATE:	4/20/22	4/20/22	
CAVED (ft):	In Augers	9.0	

DATE STARTED: **4/20/22**
DATE COMPLETED: **4/20/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **78.0**
DATUM: **Google Earth**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					78.0	0			Topsoil +/- 7 Inches	
S-1	0.0	18	1-2-3-5	5	77.4		FILL		Brown, moist, sandy SILT FILL	
S-2	2.0	14	4-4-3-3	7	76.0	3.5	SC		Tan, moist, loose, Clayey SAND, contains gravel	
S-3	4.0	19	3-5-5-6	10	74.0		SM		Tan, moist, loose, Silty SAND	
S-4	6.0	17	3-5-5-6	10		7			Tan, moist, loose, Silty SAND	
S-5	8.0	21	4-5-5-4	10					Dark orange, moist, loose, Silty SAND, contains gravel	
						10.5				
S-6	13.0	16	2-3-5-4	8	65.0	14	SP-SM		Dark orange, wet, loose, Poorly-graded SAND with SILT, contains gravel	
						17.5				
S-7	18.0	24	2-3-3-4	6	60.0		SM		Dark orange, moist, loose, Silty SAND	
					58.0				Boring terminated at 20.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

GEO-TECHNOLOGY ASSOCIATES, INC.
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New Castle, DE 19720

LOG OF BORING NO. B-2

LOG OF BORING NO. B-3

PROJECT: **NCCVT New Hodgson Vo-tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft): 13.0 (4/20/22) | Dry (4/20/22) | BOC
CAVED (ft): In Augers | 7.9

DATE STARTED: **4/20/22**
DATE COMPLETED: **4/20/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **13.0**
GROUND SURFACE ELEVATION: **78.0**
DATUM: **Google Earth**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					78.0	0			Topsoil +/- 6 Inches	
S-1	0.0	16	1-1-2-3	3	77.5		FILL		Dark brown and brown, moist, sandy SILT FILL	
S-2	2.0	22	3-6-9-11	15					Dark brown and brown, moist, stiff, sandy silt FILL, contains gravel	
						3.5				
S-3	4.0	19	1-5-3-4	8	74.0		ML		Tan, moist, medium stiff, Sandy SILT	
S-4	6.0	22	3-5-7-7	12		7			Same, stiff	
S-5	8.0	16	3-6-6-5	12	70.0		SM		Brown, moist, medium dense, Silty SAND, contains gravel	
						10.5				
S-6	13.0	18	2-3-4-4	7					Dark brown and brown, wet, looses, Silty SAND, contains gravel	▽
						14				
						17.5				
S-7	18.0	14	2-4-6-7	10					Brown, moist, loose, Silty SAND, contains gravel	
					58.0				Boring terminated at 20.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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18 Boulden Circle, Suite 36
New Castle, DE 19720

LOG OF BORING NO. B-3

LOG OF BORING NO. B-4

PROJECT: **NCCVT New Hodgson Vo-tech High School**
PROJECT NO.: **220791**
PROJECT LOCATION: **New Castle County, Delaware**

WATER LEVEL (ft):	7.2	5.7	BOC
DATE:	4/20/22	4/20/22	
CAVED (ft):	In Augers	5.9	

DATE STARTED: **4/20/22**
DATE COMPLETED: **4/20/22**
DRILLING CONTRACTOR: **GTA**
DRILLER: **D. Hans, Jr.**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Split Spoon**

WATER ENCOUNTERED DURING DRILLING (ft) **8.0**
GROUND SURFACE ELEVATION: **81.0**
DATUM: **Google Earth**
EQUIPMENT: **Diedrich D50**
LOGGED BY: **A. Carta**
CHECKED BY: **M.McDonough**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					81.0	0			Topsoil +/- 4 Inches	
S-1	0.0	20	1-2-6-5	8	80.7		SC		Tan, moist, loose, Clayey SAND	
S-2	2.0	18	2-4-6-8	10					Same	
						3.5				
S-3	4.0	20	3-3-5-6	8					Same, brown	
S-4	6.0	21	5-7-6-6	13		7			Brown, moist, medium dense, Clayey SAND, contains gravel	▽
					73.0		SM		Brown, wet, loose, Silty SAND, contains gravel	▽
S-5	8.0	20	2-3-3-3	6						
						10.5				
					68.0		SP-SM		Brown, moist, loose, Poorly-graded SAND with SILT, contains gravel	
S-6	13.0	24	1-4-5-5	9		14				
						17.5				
S-7	18.0	24	2-3-3-3	6					Same	
					61.0				Boring terminated at 20.0 feet.	

NOTES: **Elevation and location should be considered approximate.**

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New Castle, DE 19720

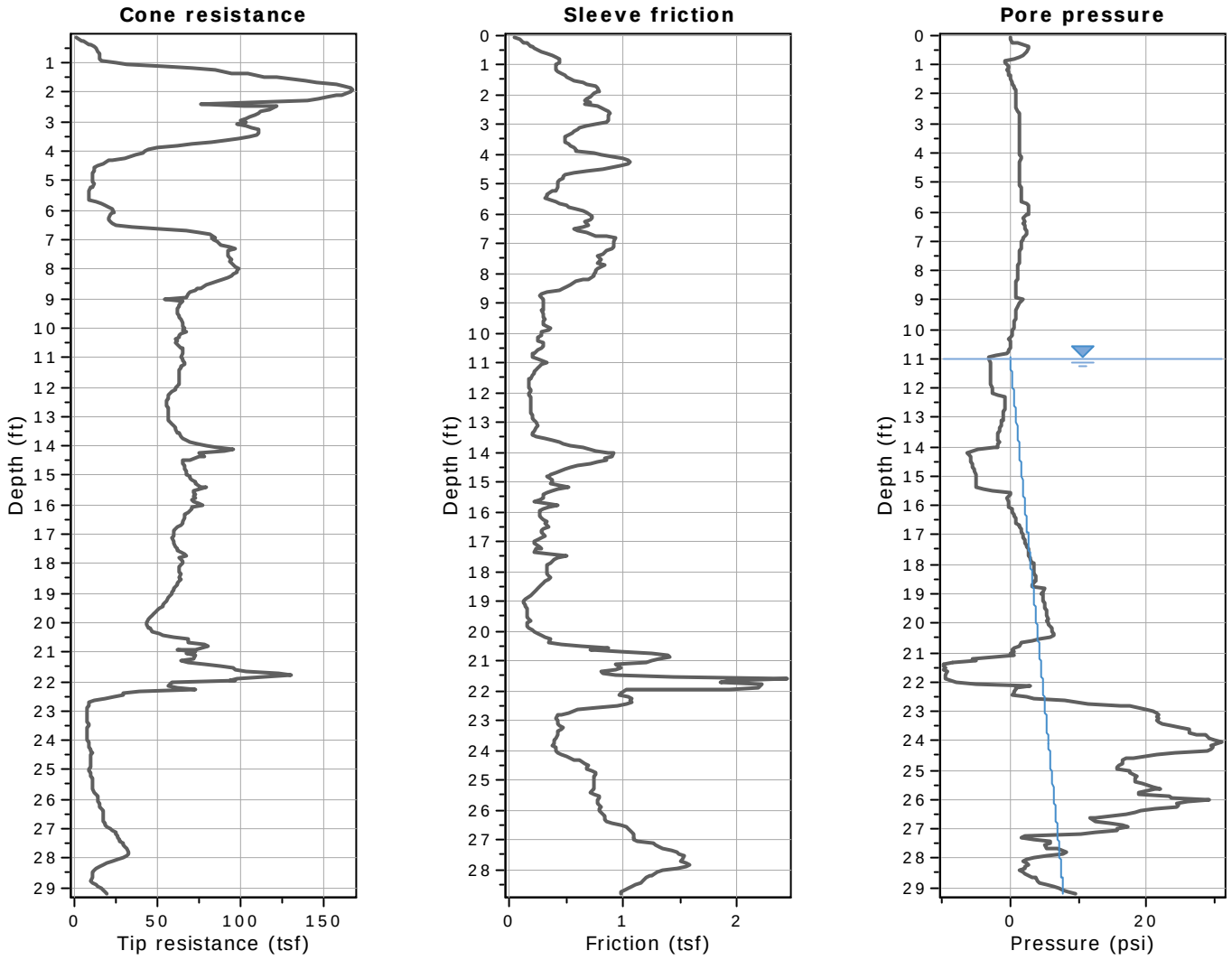
LOG OF BORING NO. B-4

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS

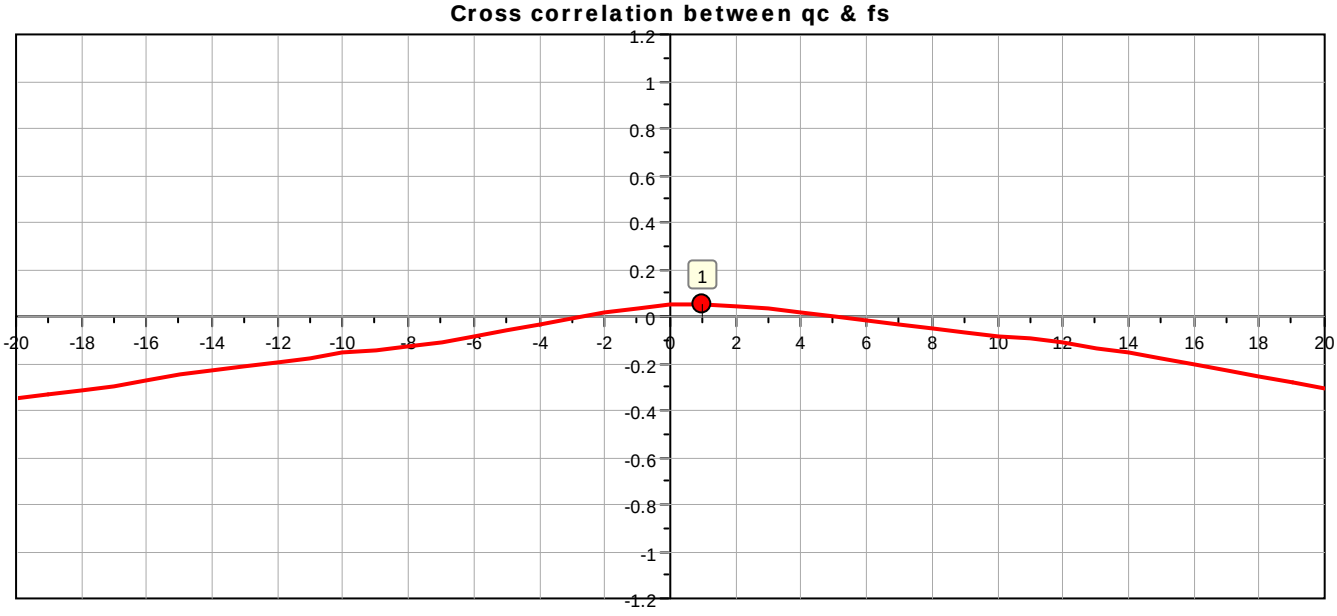
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 1
Total depth: 29.20 ft, Date: 4/20/2022
Surface Elevation: 76.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



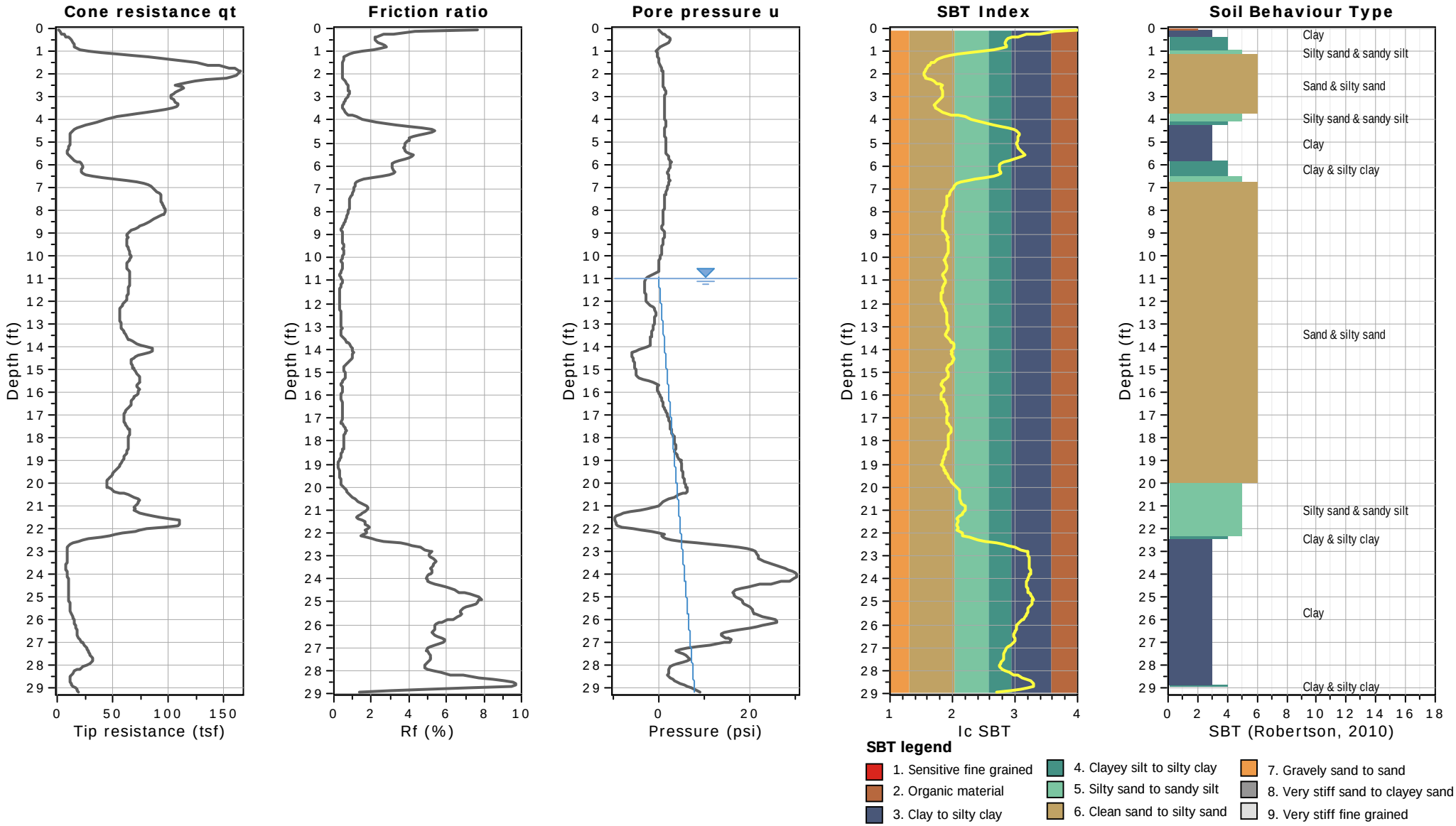
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GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 1
Total depth: 29.20 ft, Date: 4/20/2022
Surface Elevation: 76.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**

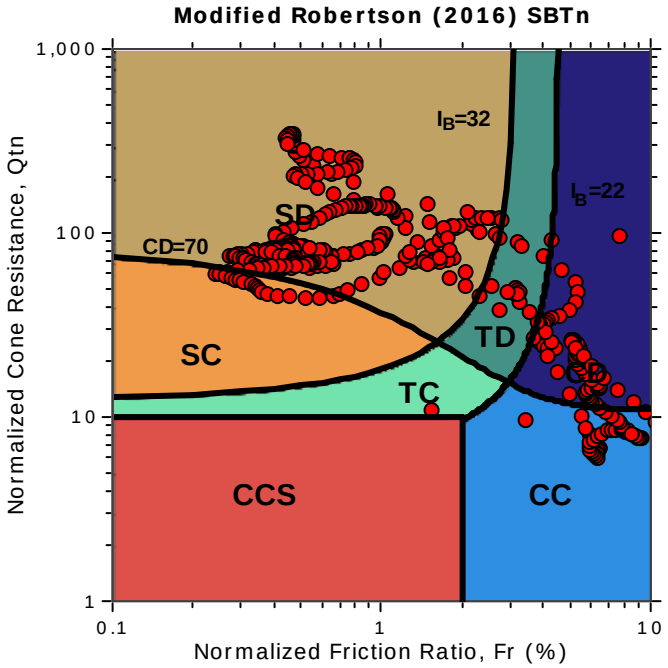


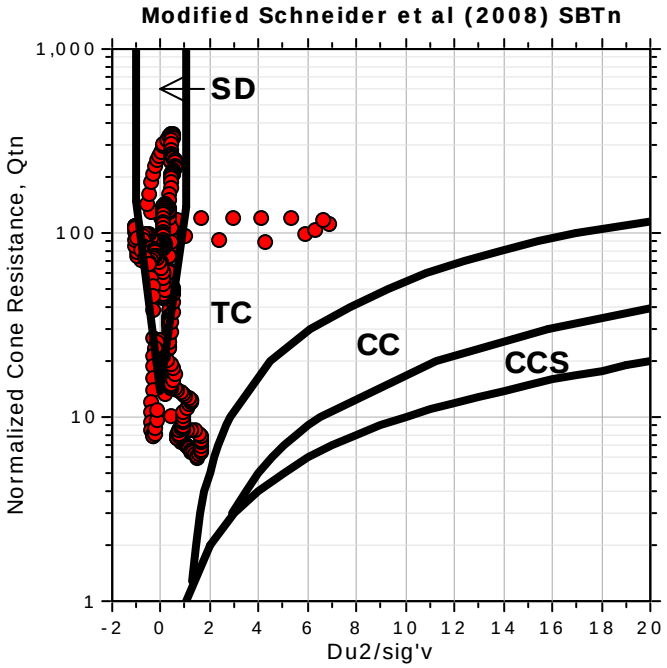
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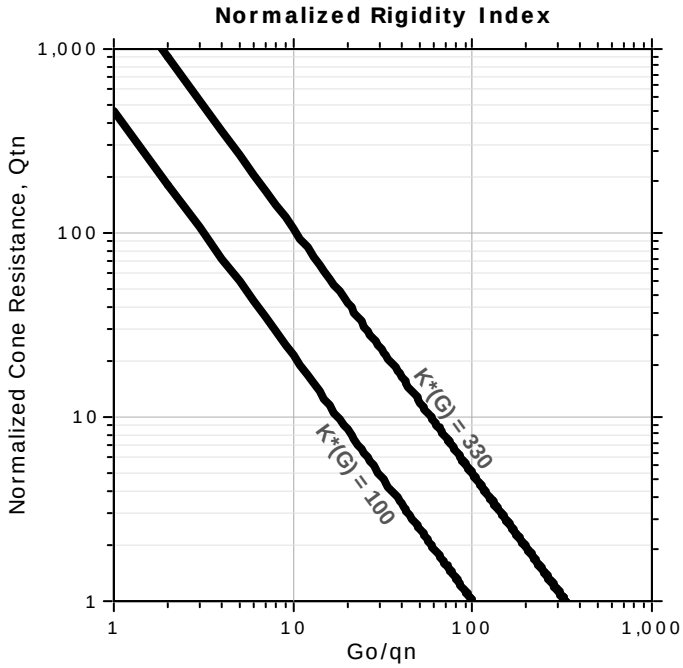
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Updated SBTn plots







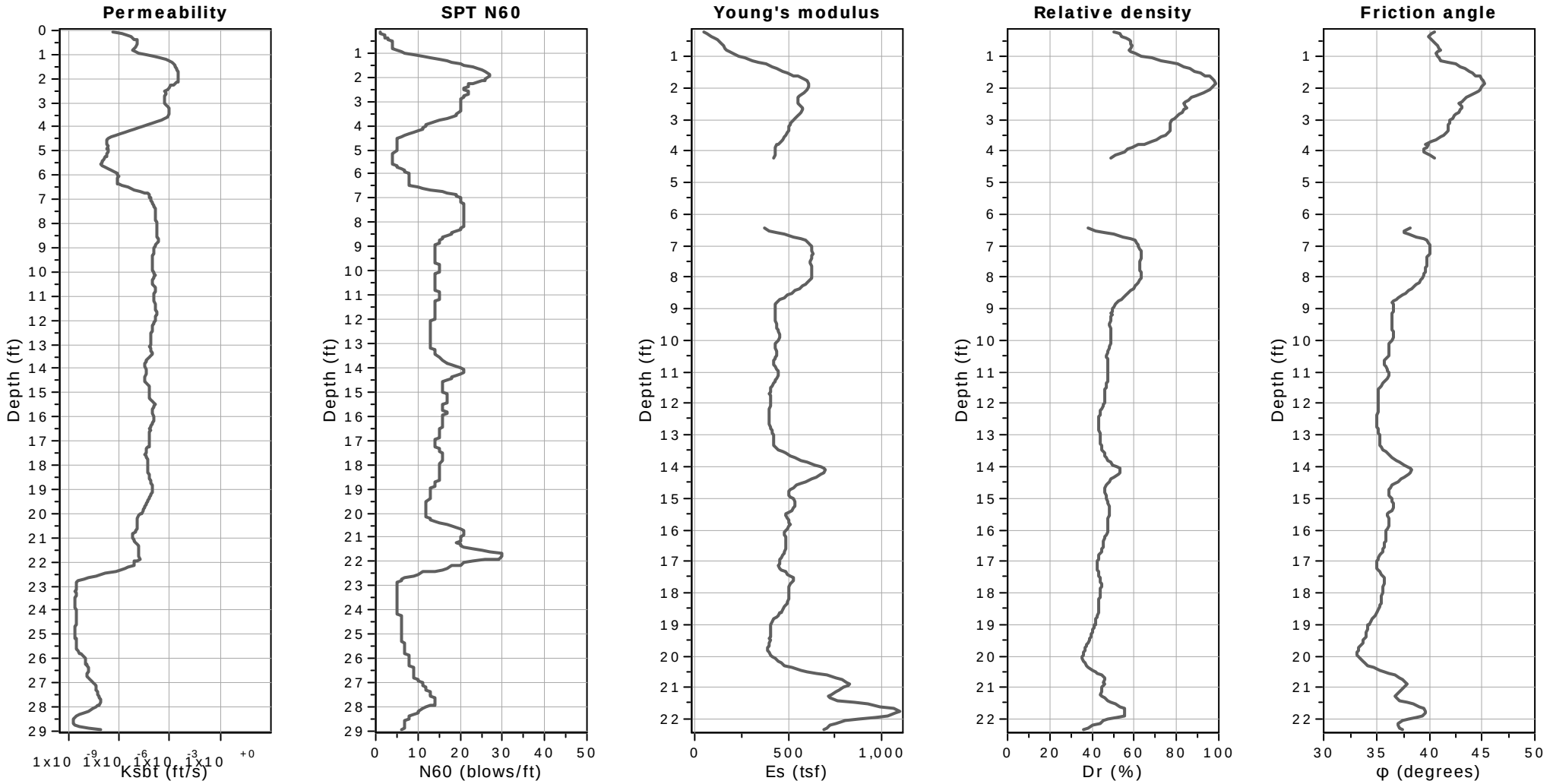
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CC: Clay-like - Contractive
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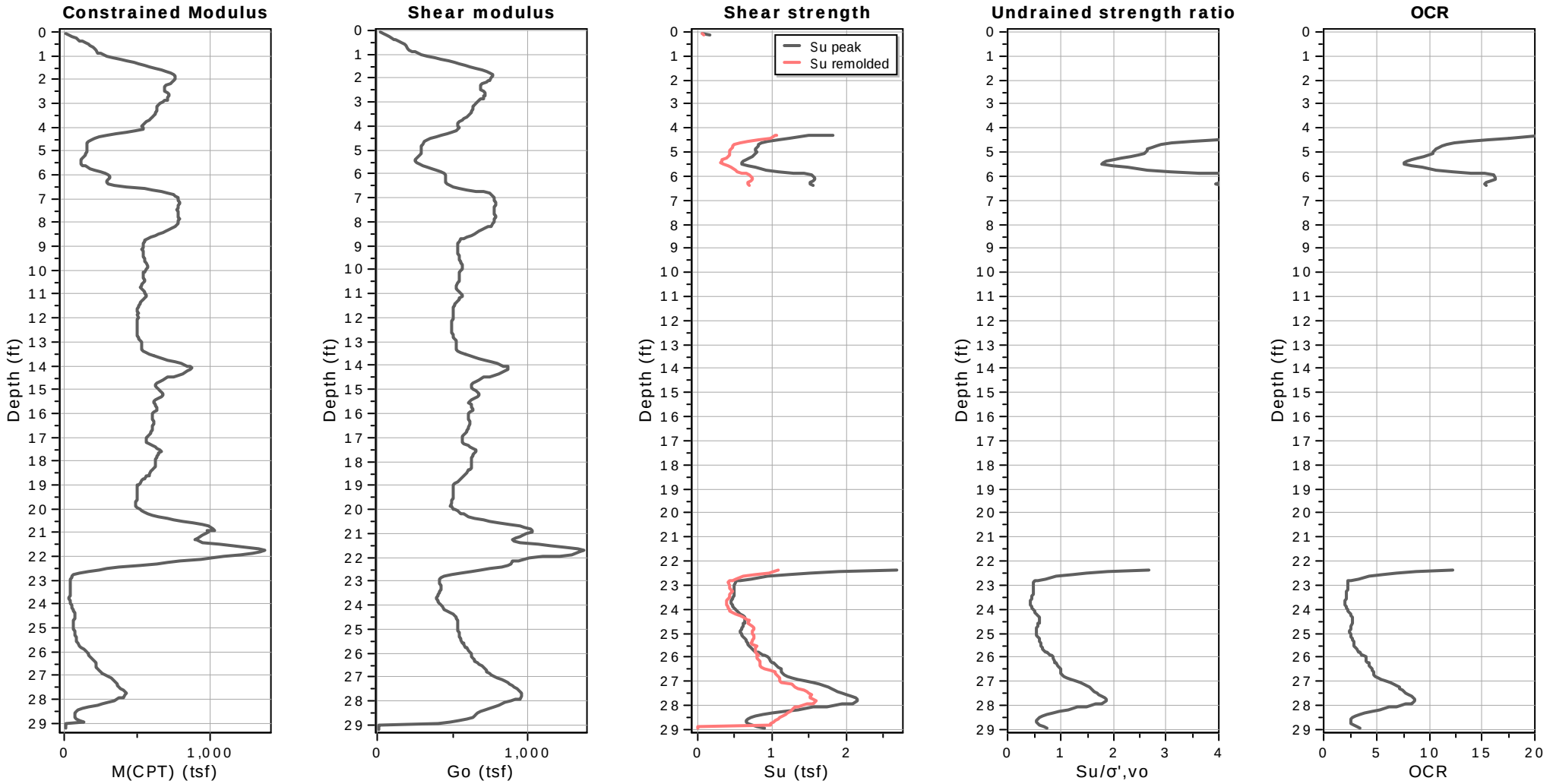
Calculation parameters

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
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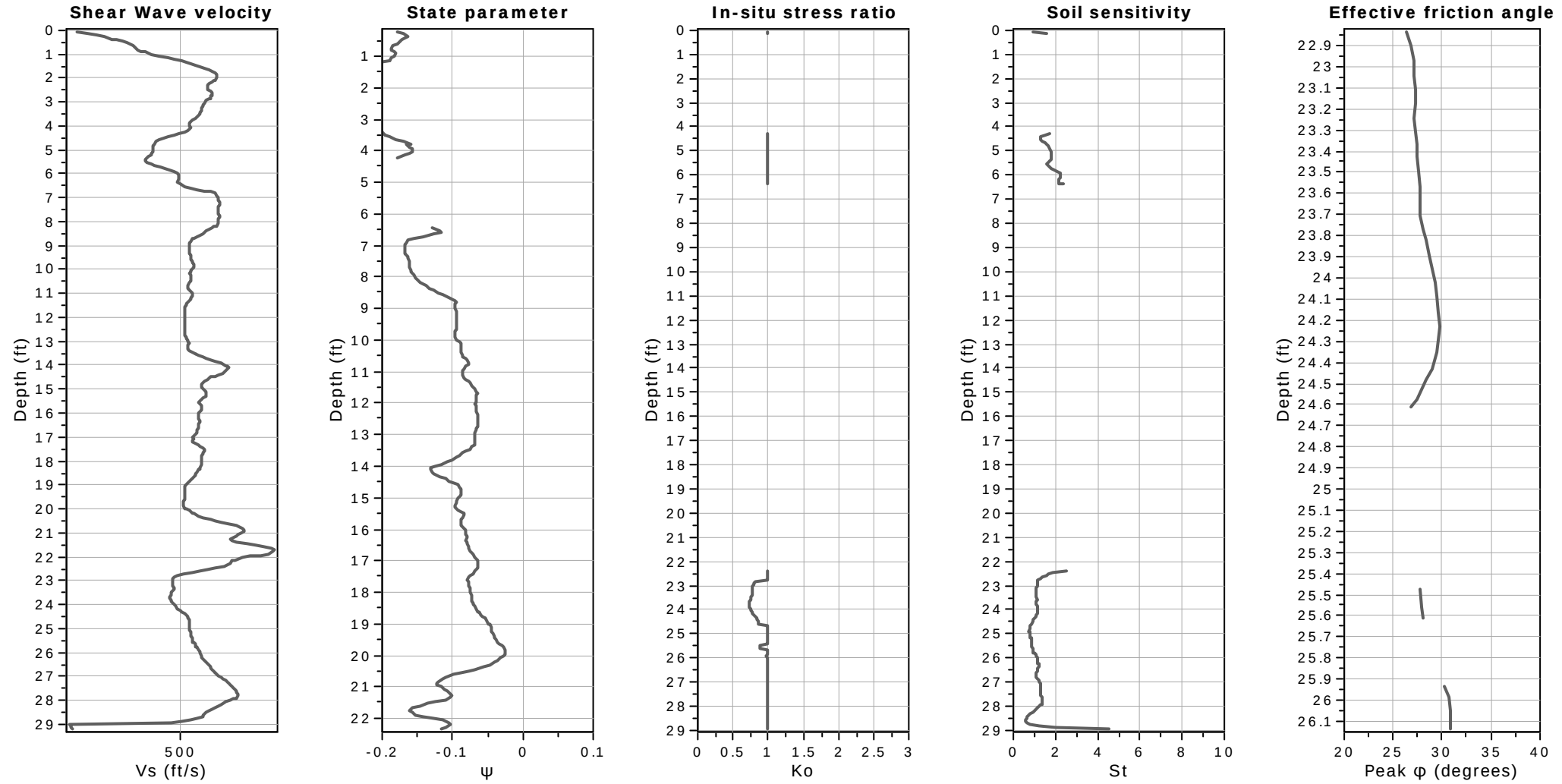
Calculation parameters

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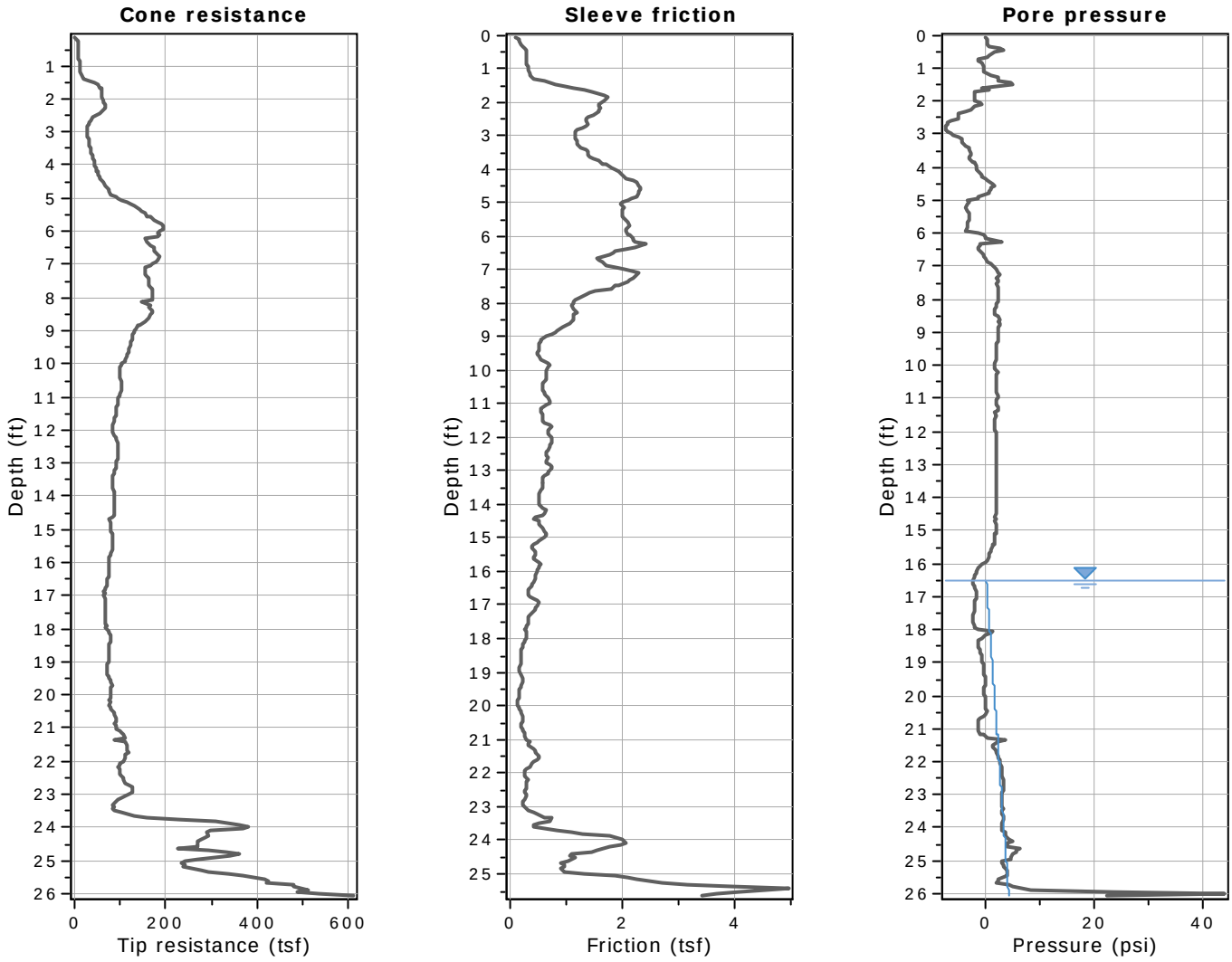
Calculation parameters

Soil Sensitivity factor, N_S: 7.00
User defined estimation data

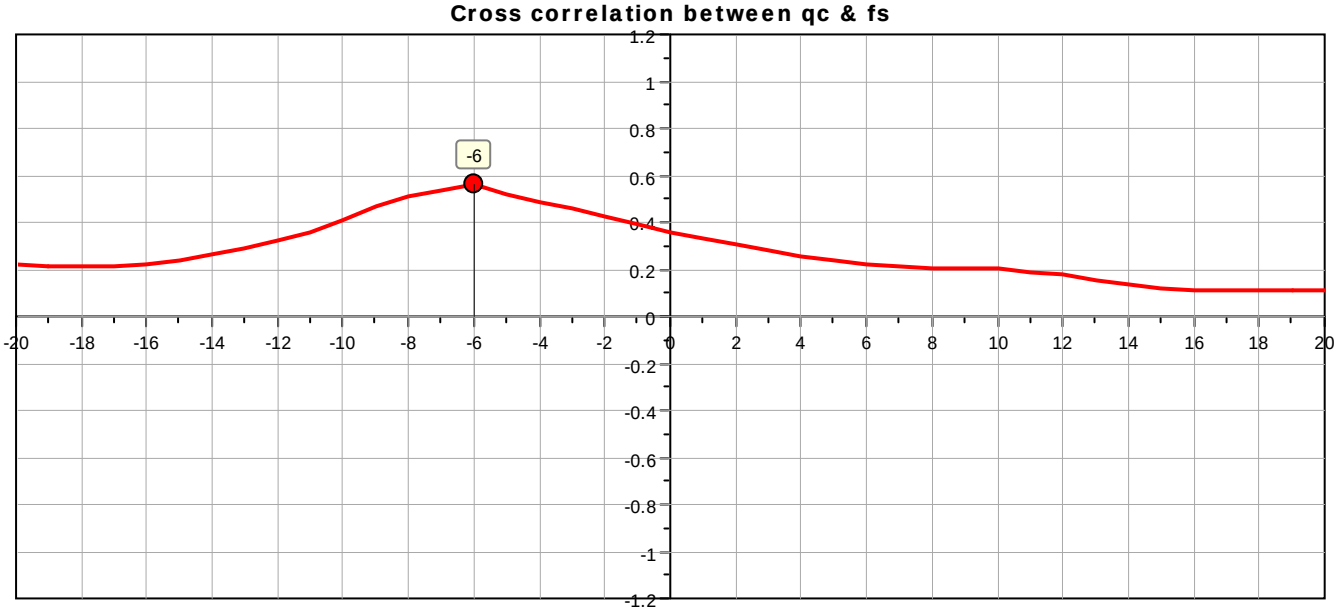
GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
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CPT: 2
Total depth: 26.06 ft, Date: 4/20/2022
Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



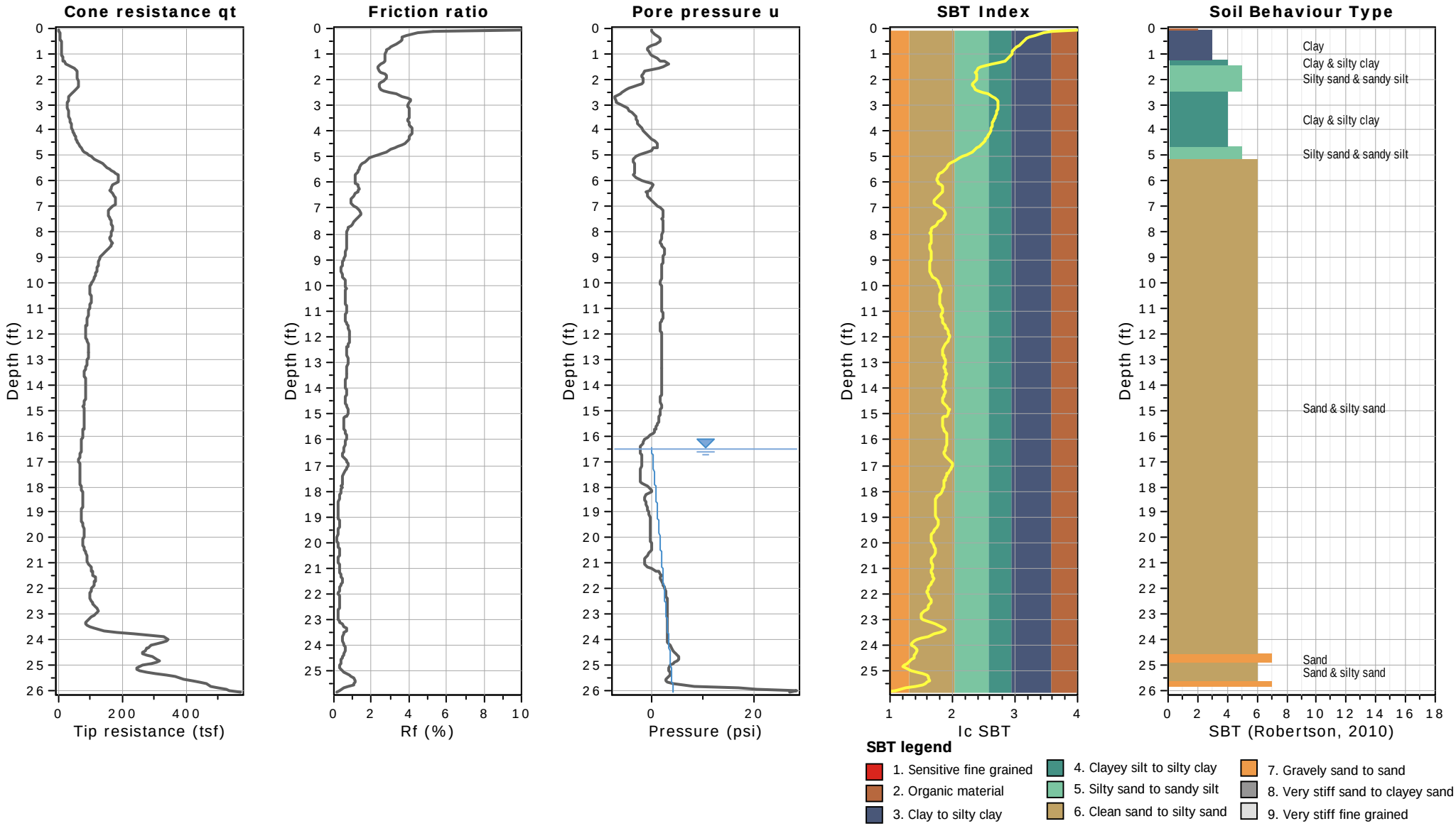
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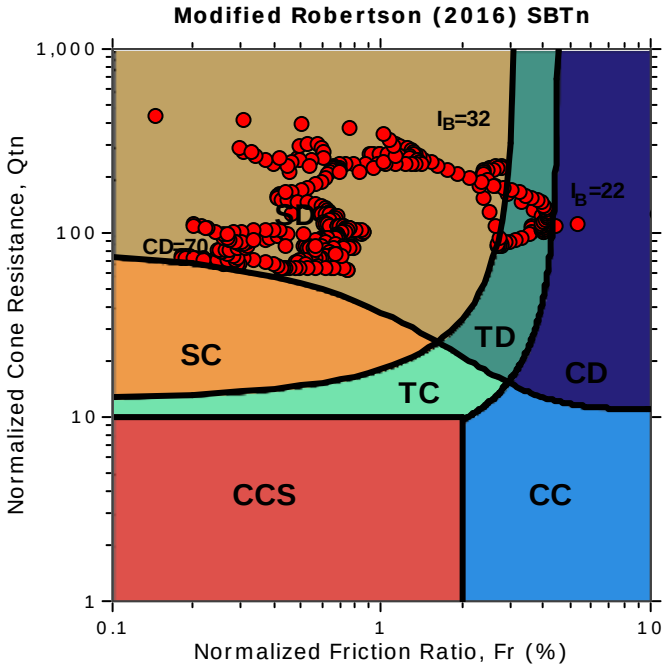


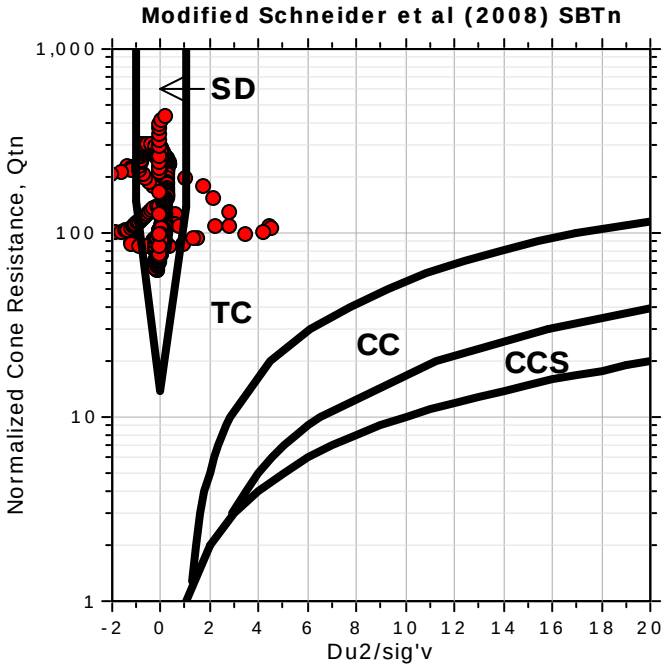
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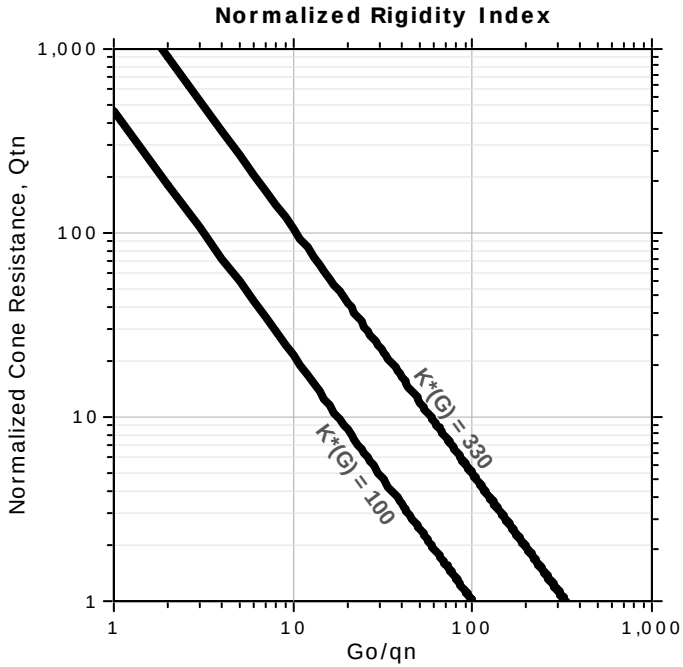
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Updated SBTn plots







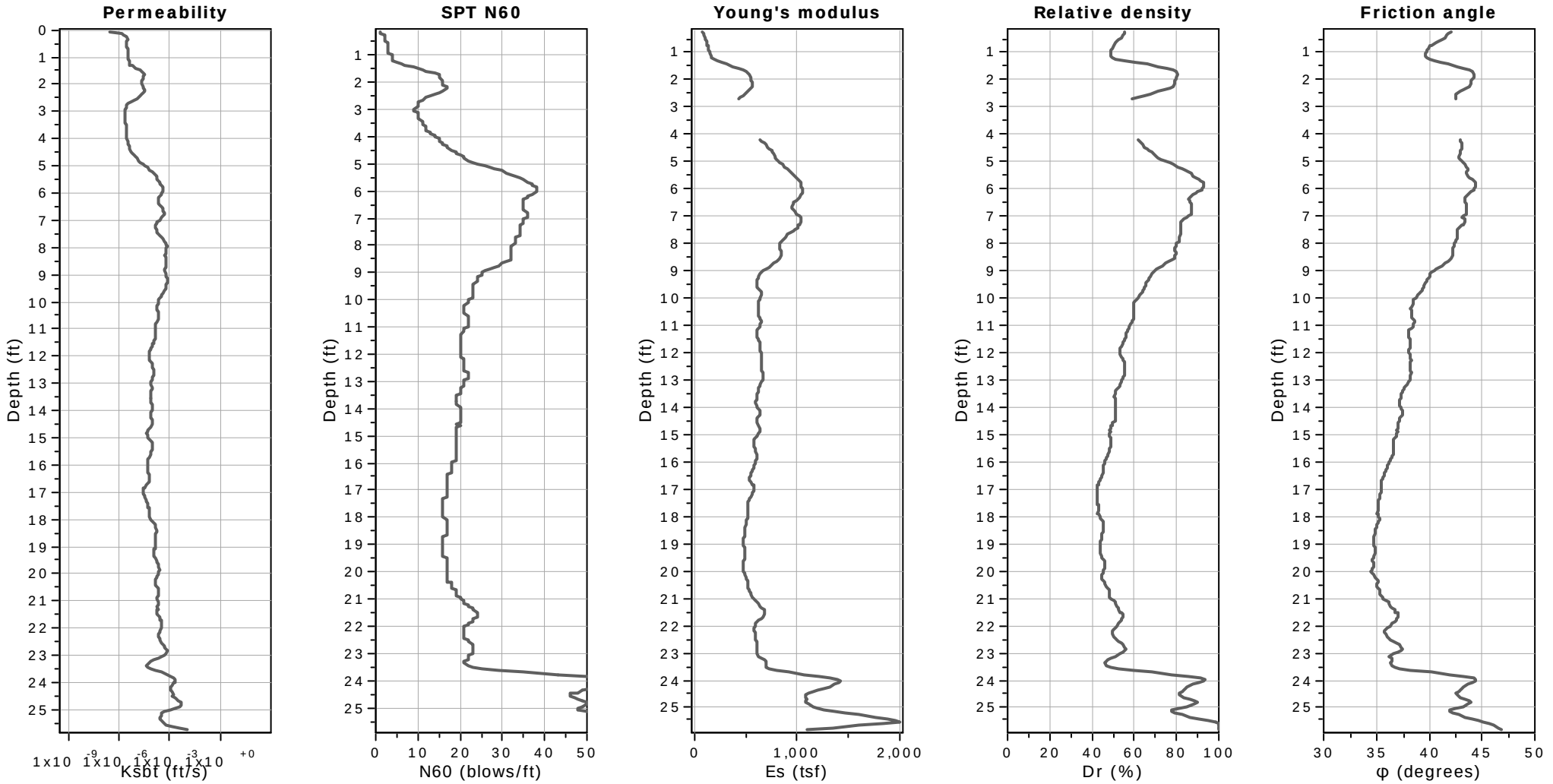
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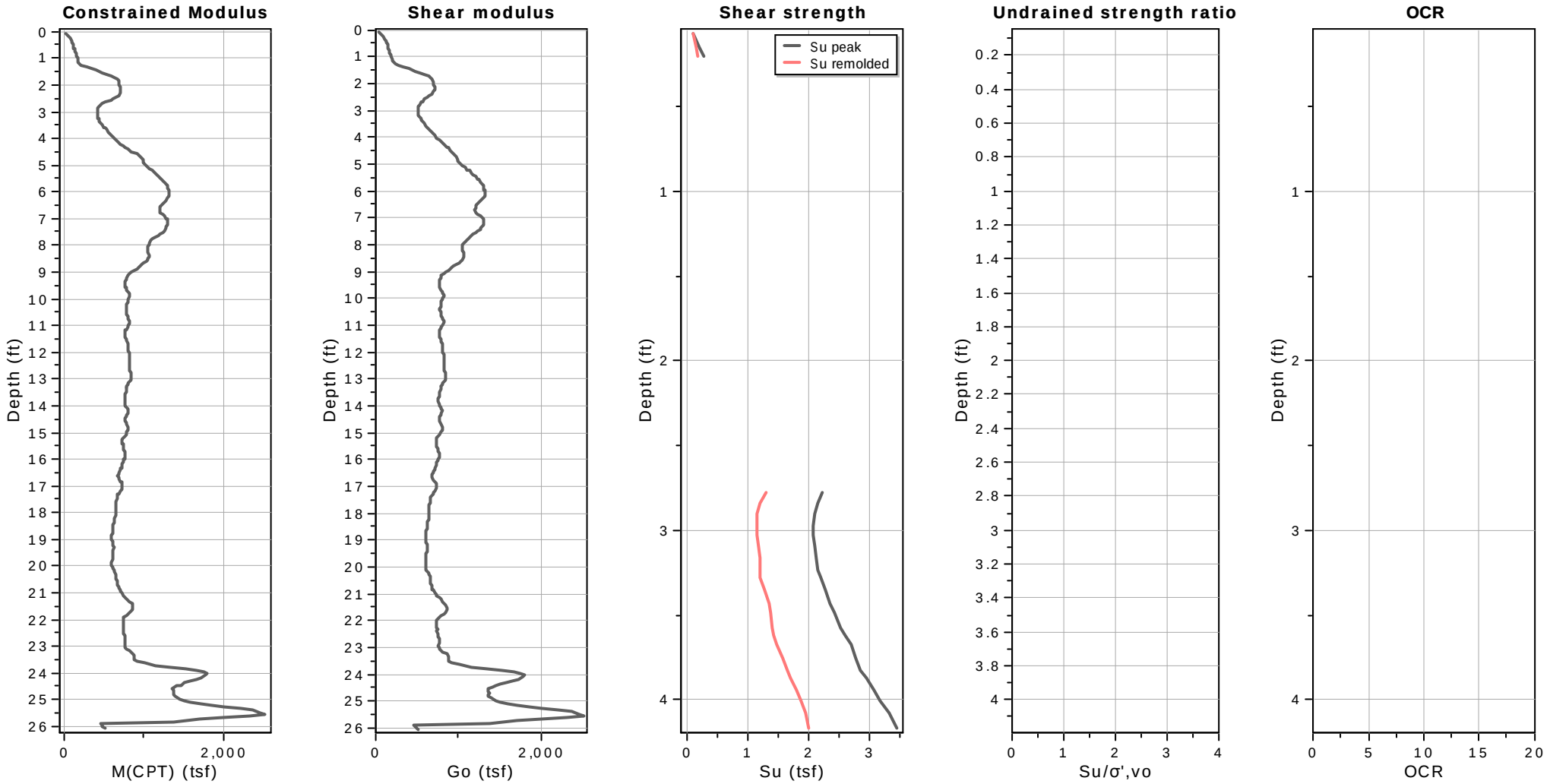
Calculation parameters

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
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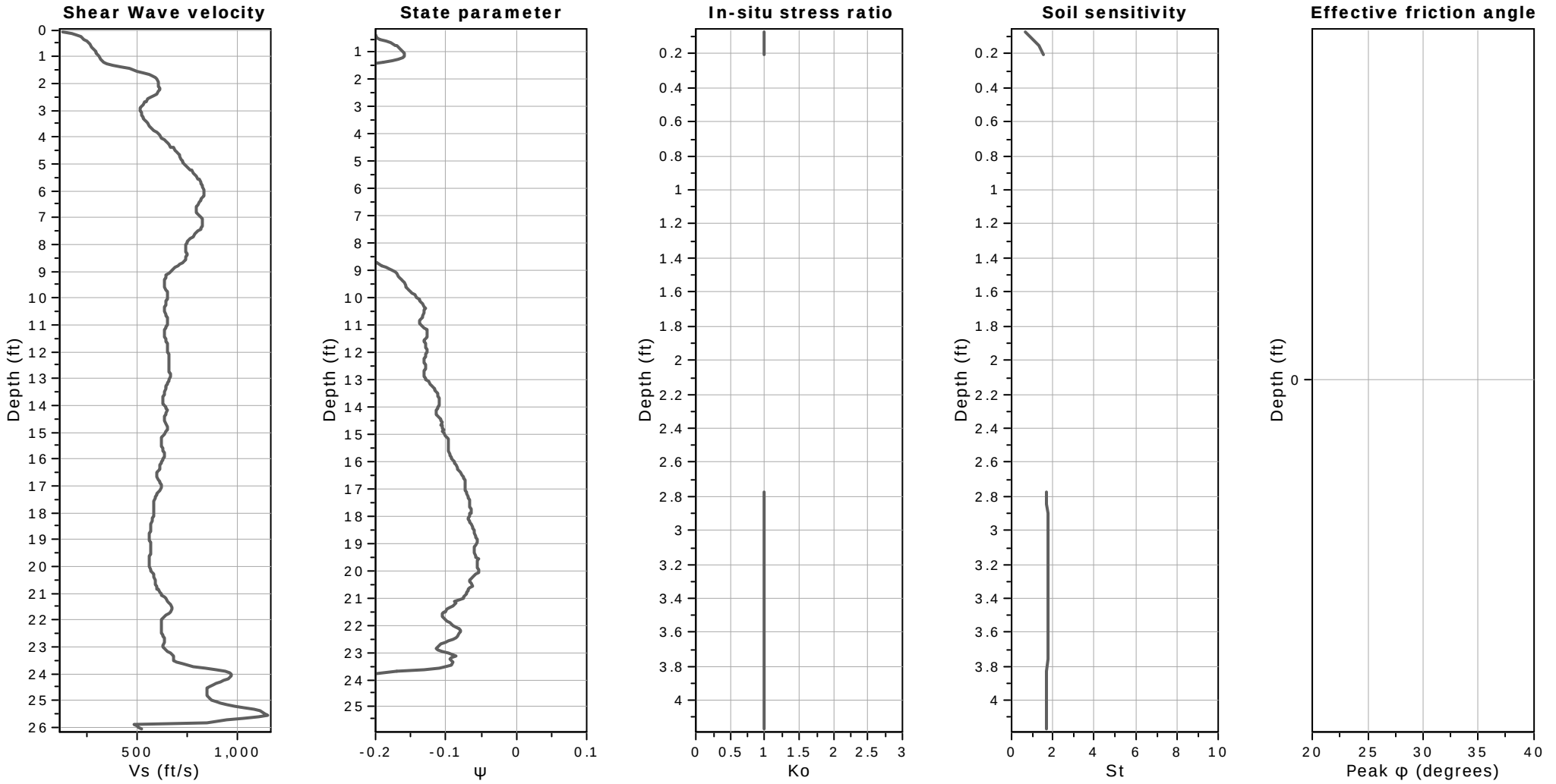
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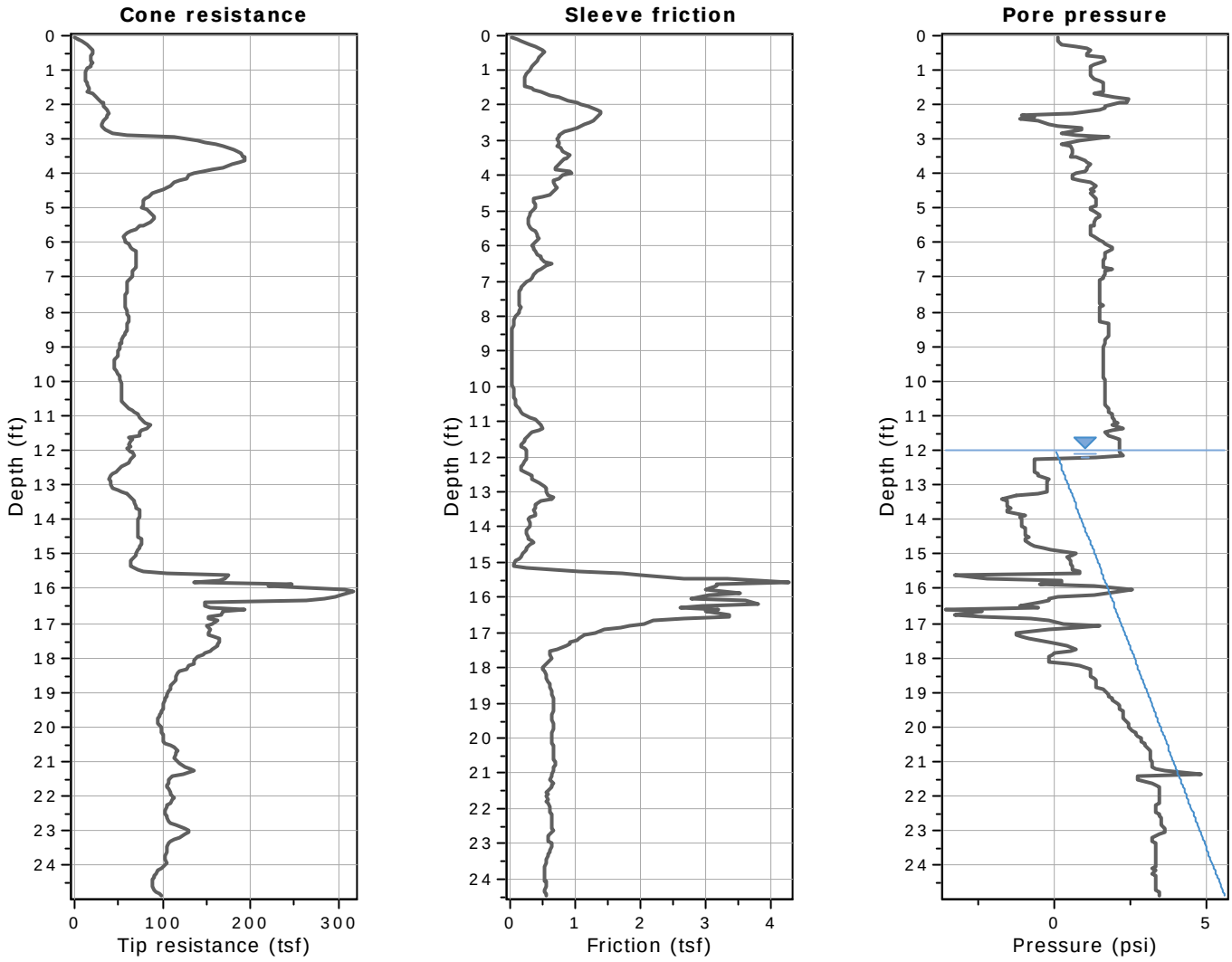
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

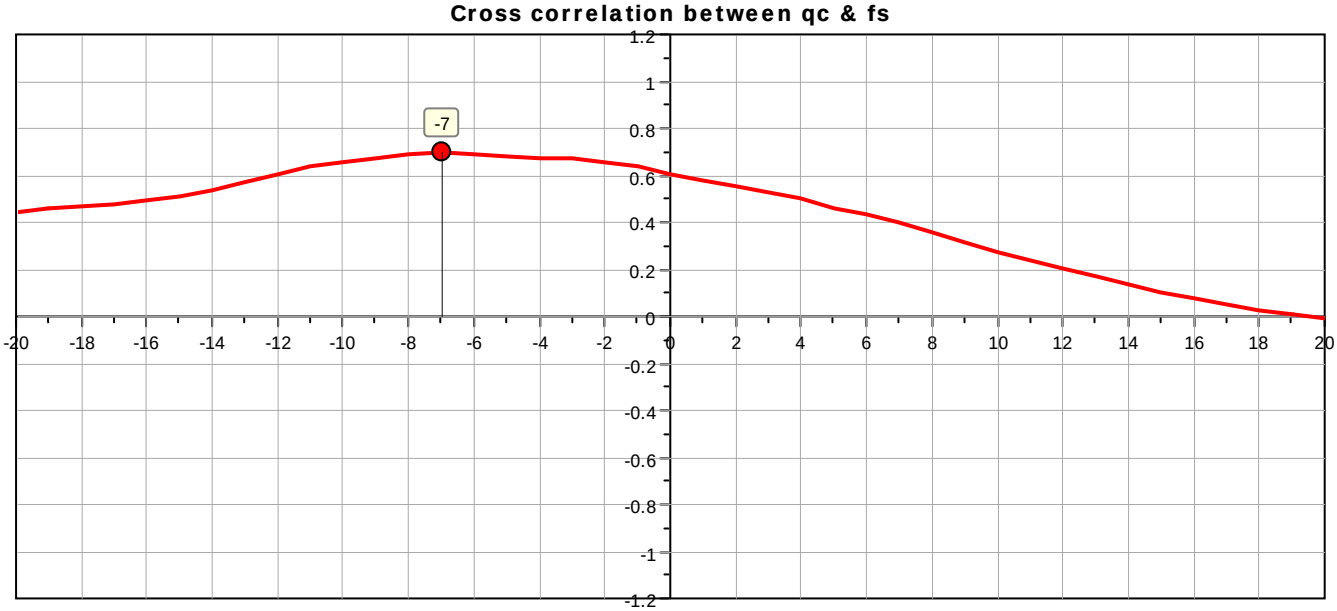
GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 3
Total depth: 24.87 ft, Date: 4/20/2022
Surface Elevation: 71.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



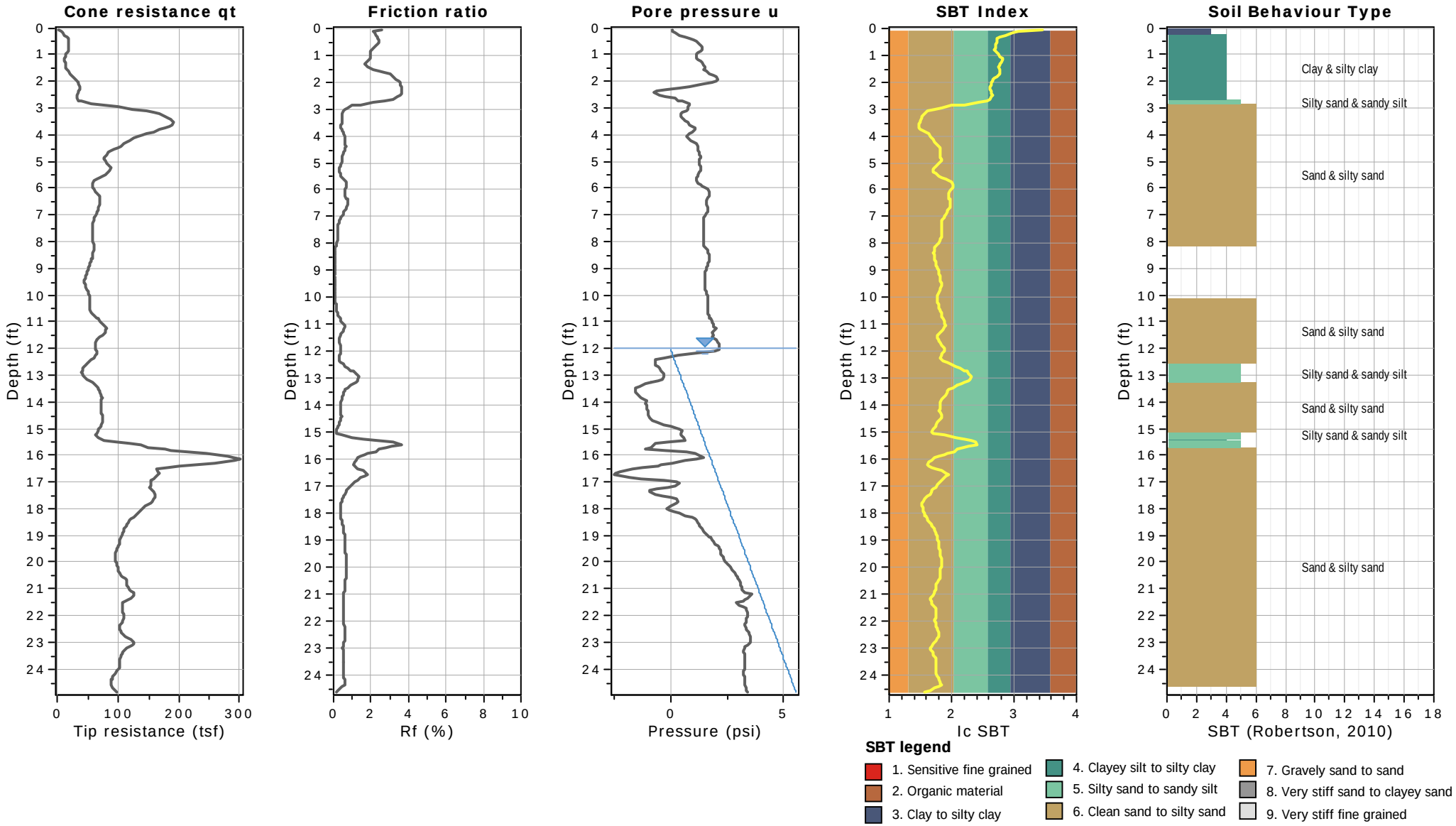
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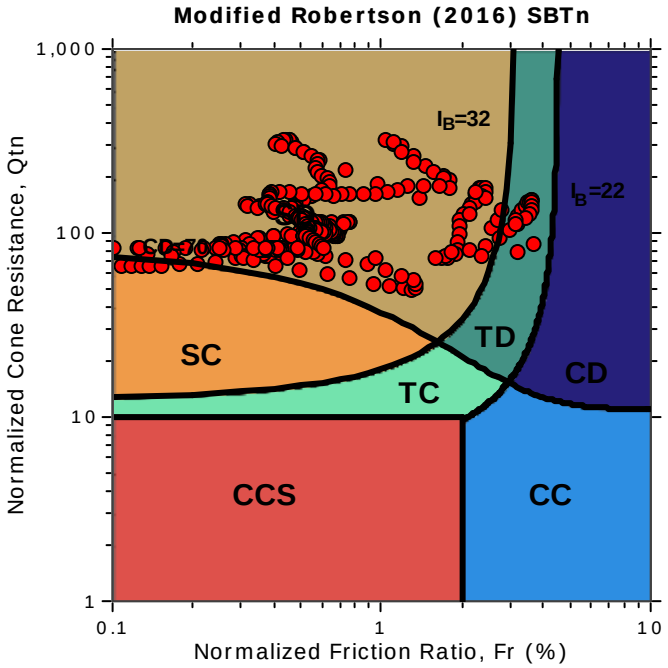


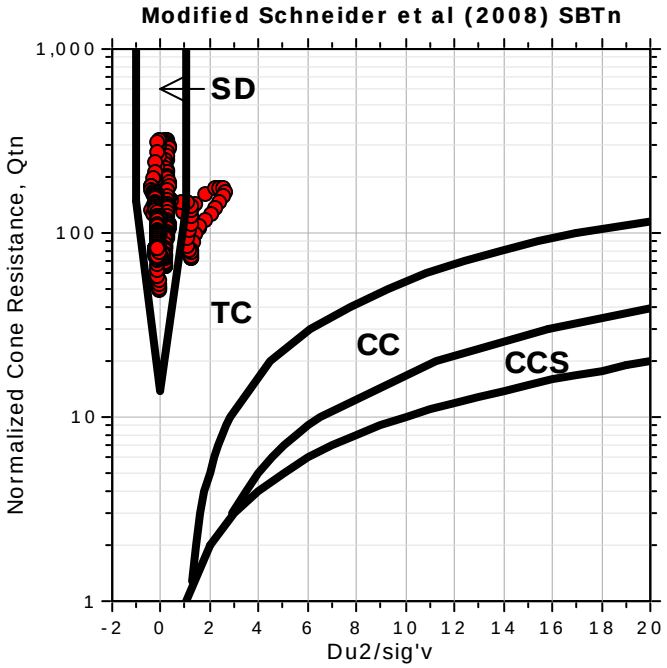
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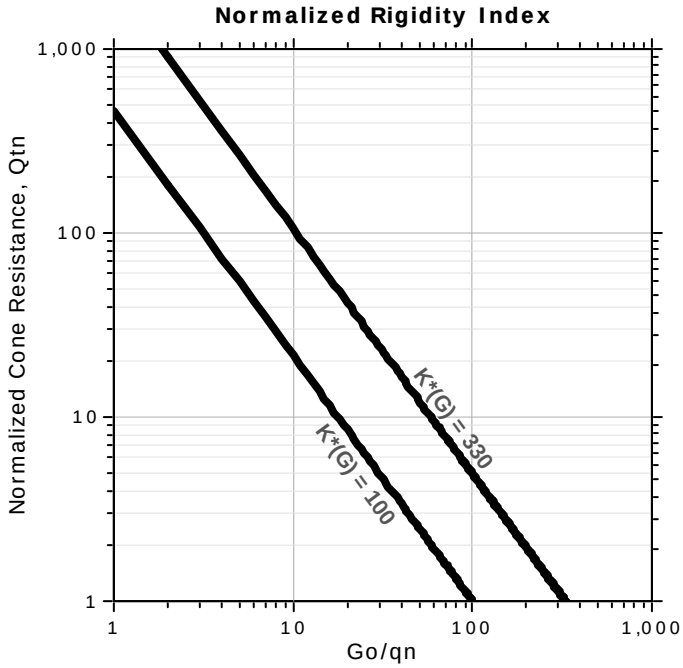
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Updated SBTn plots







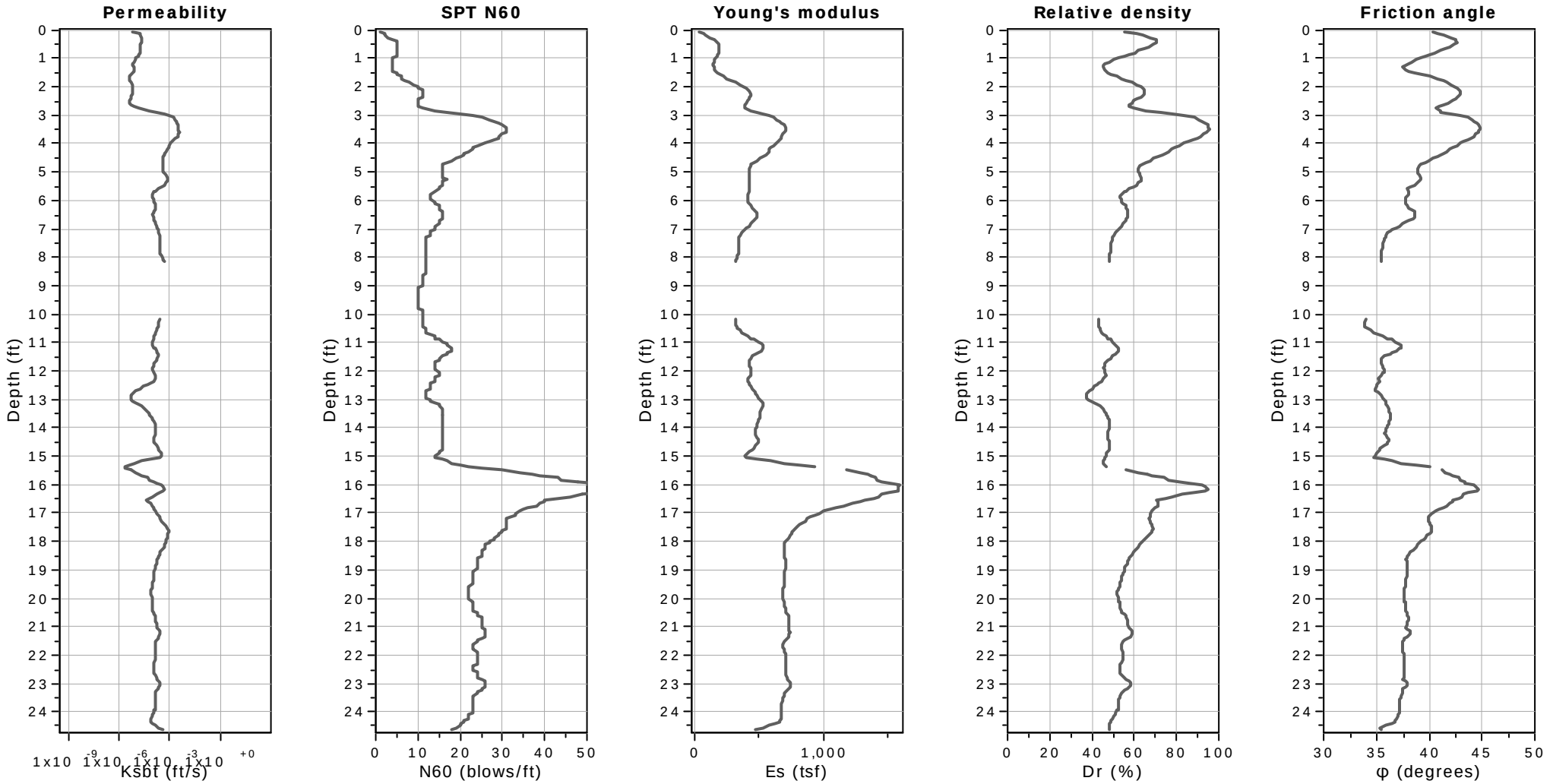
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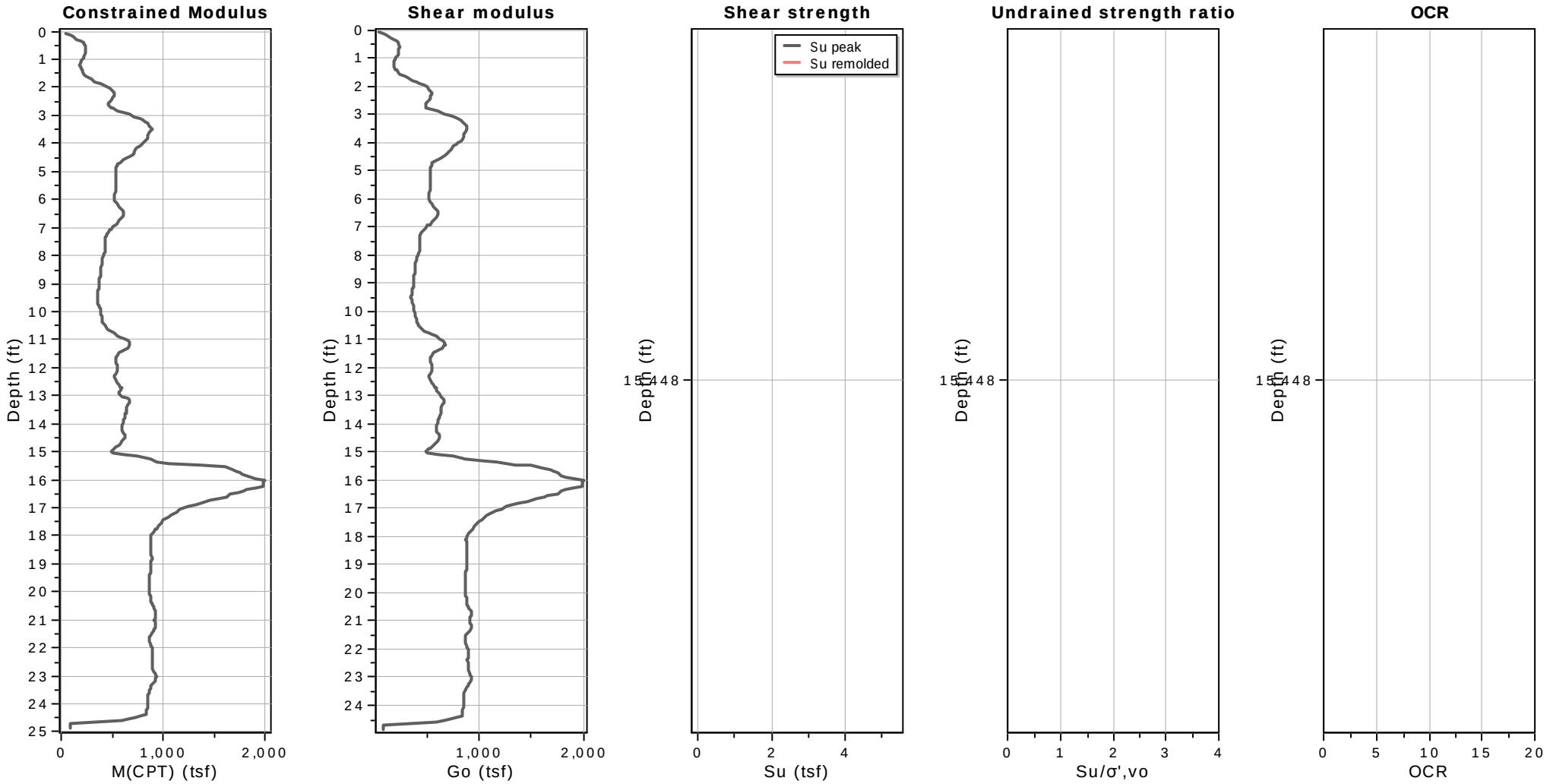
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SPT N_{60}: Based on I_c and q_t
Young's modulus: Based on variable alpha using I_c (Robertson, 2009)
Relative density constant, C_{Dr}: 350.0
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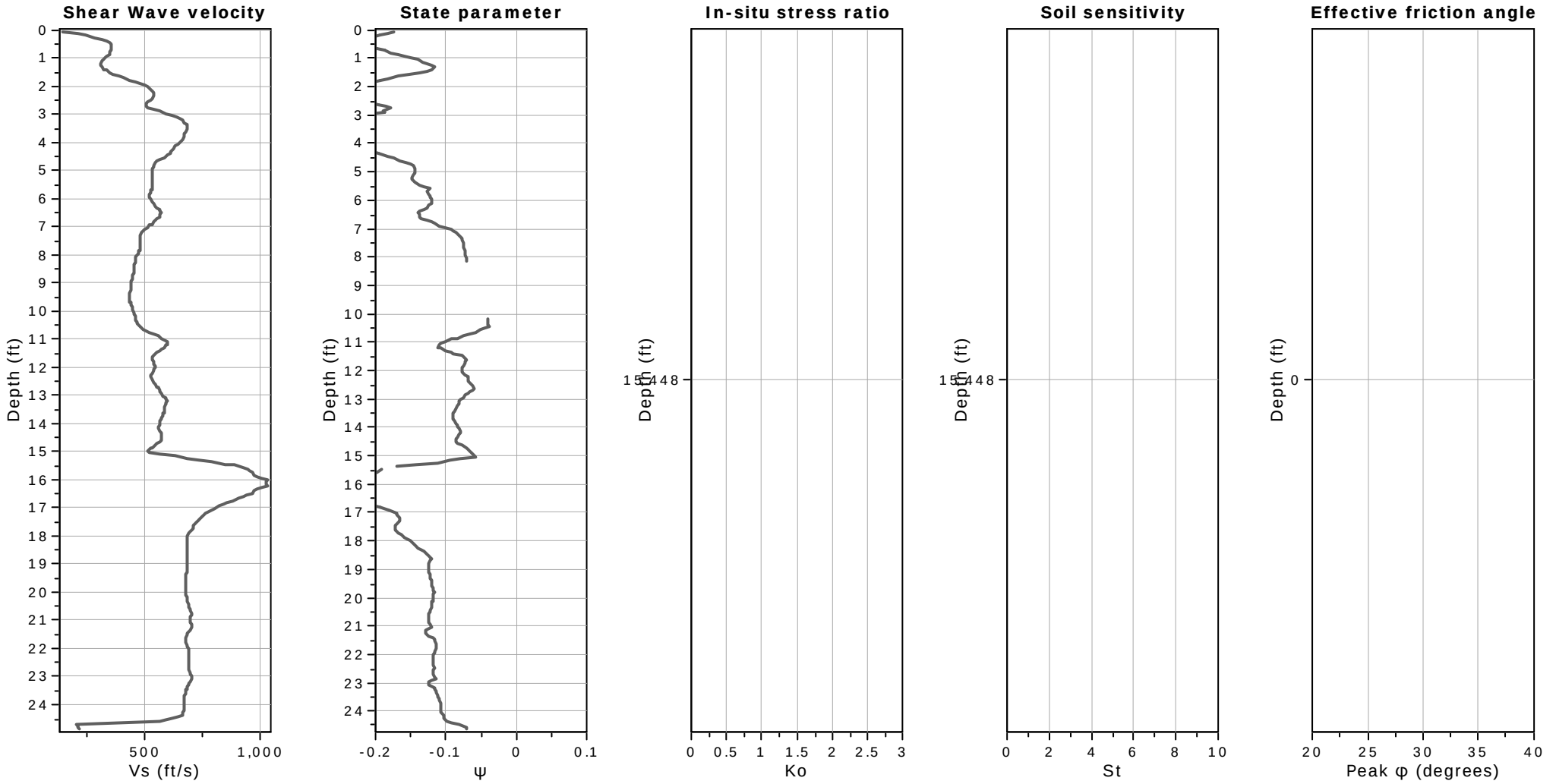
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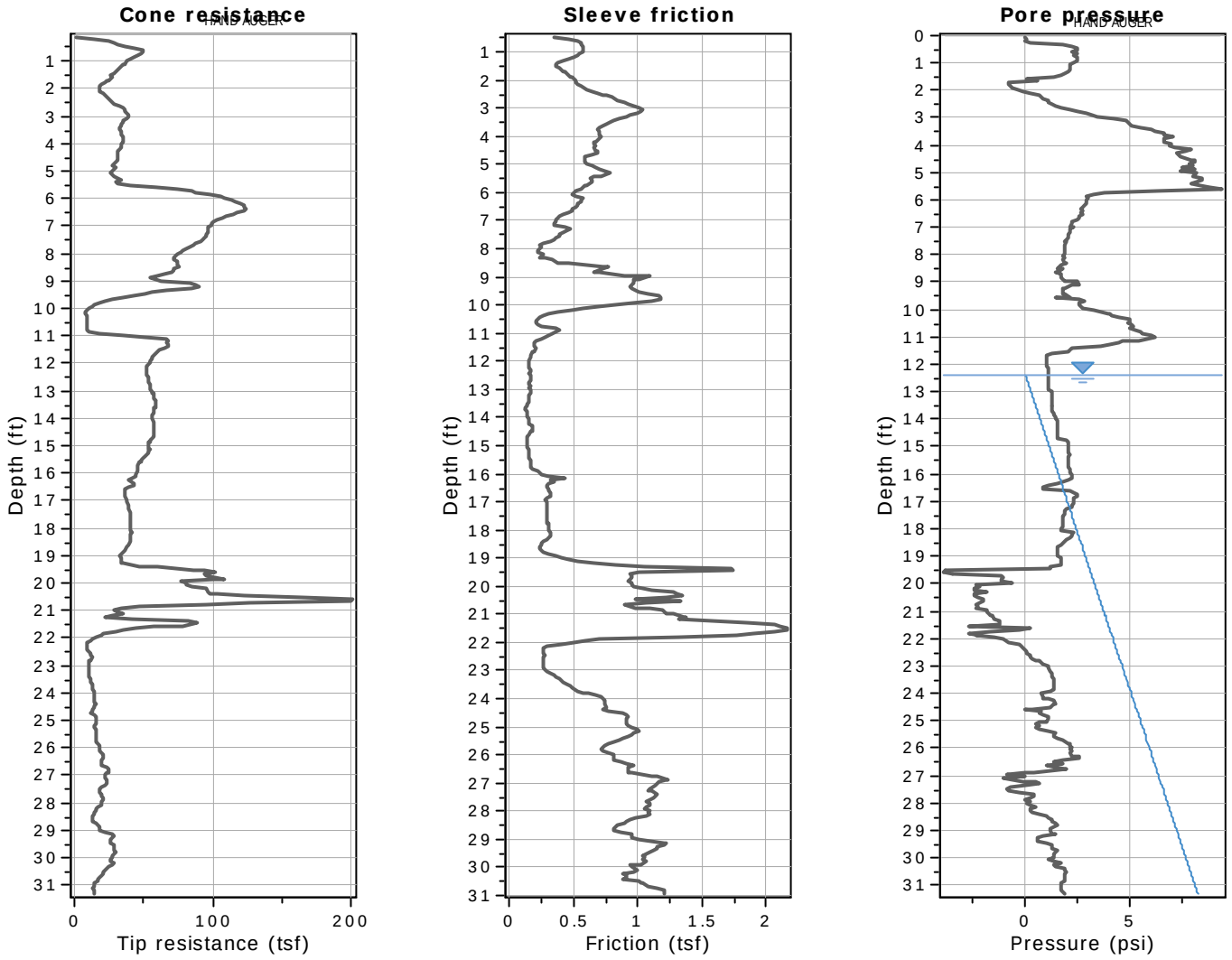
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

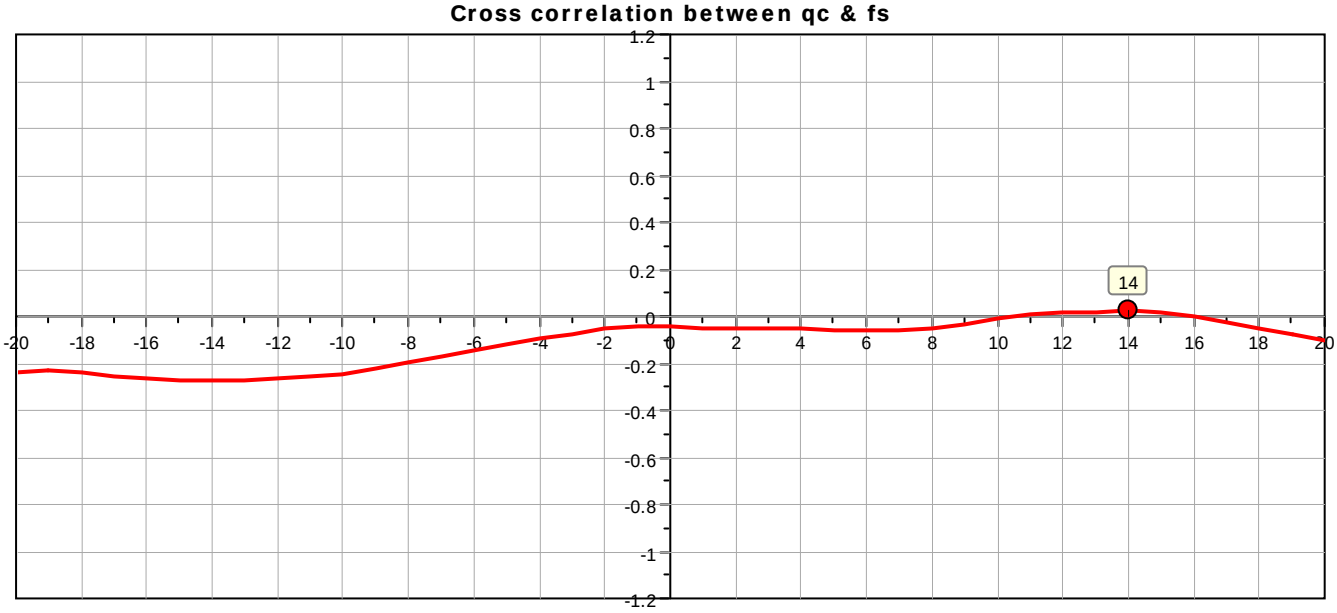
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CPT: 4
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Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

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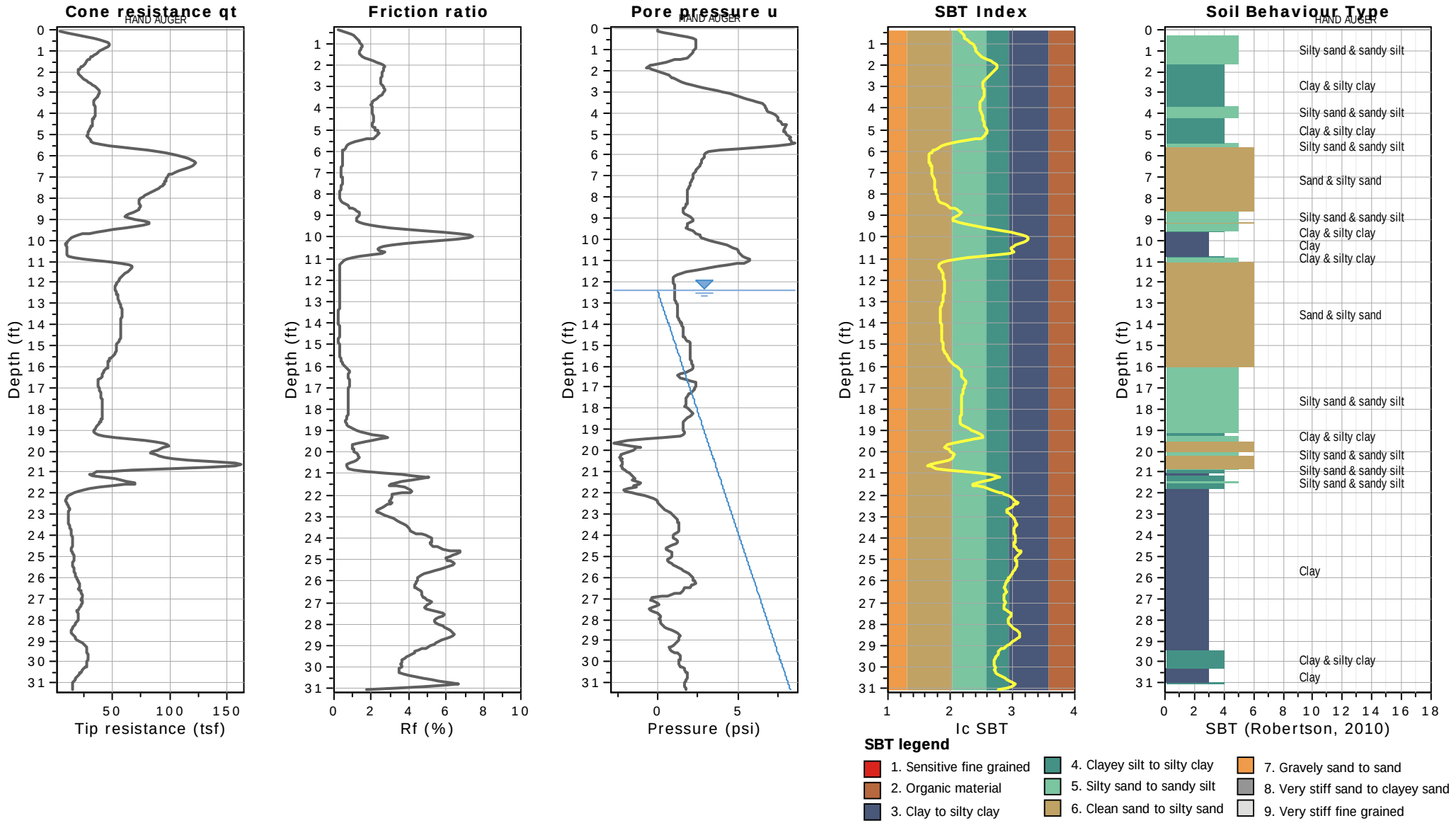
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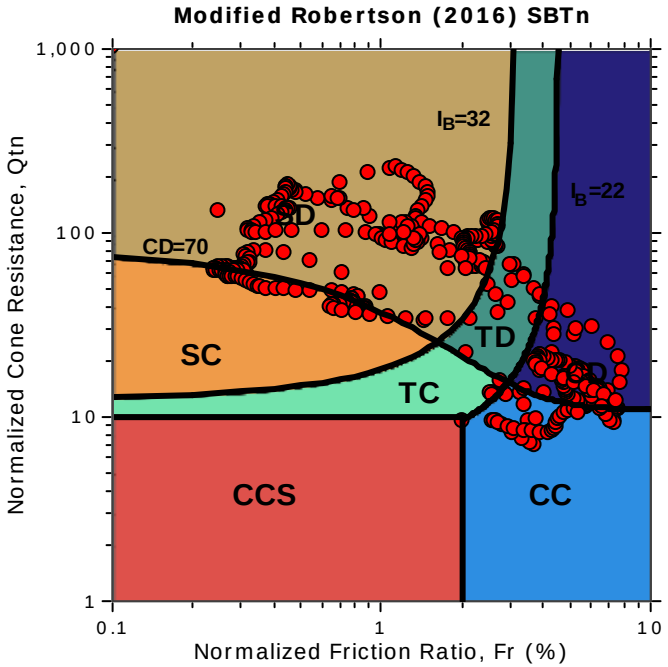


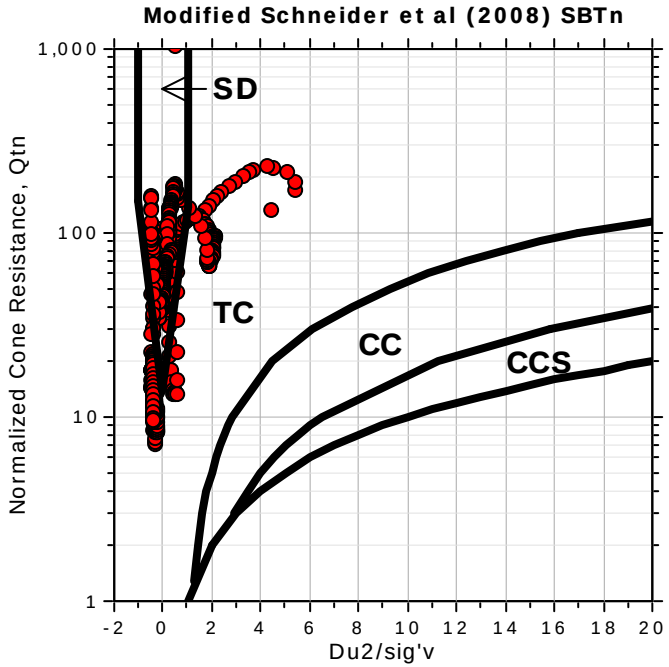
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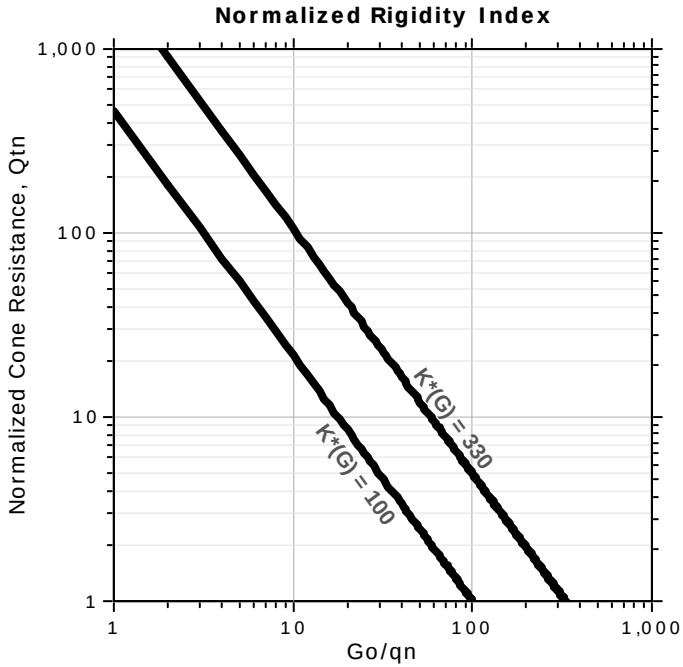
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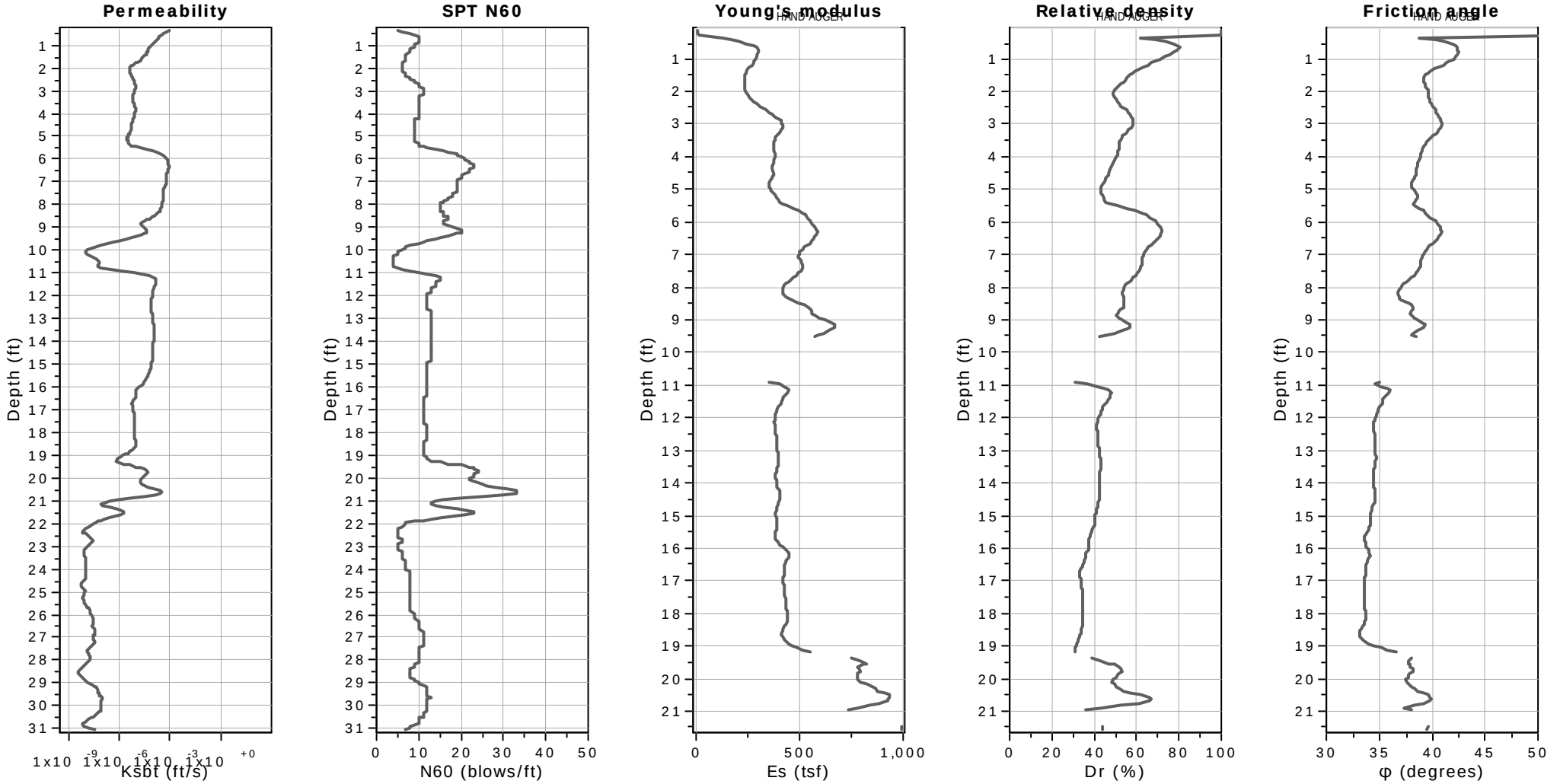
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K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 4
Total depth: 31.31 ft, Date: 4/20/2022
Surface Elevation: 75.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



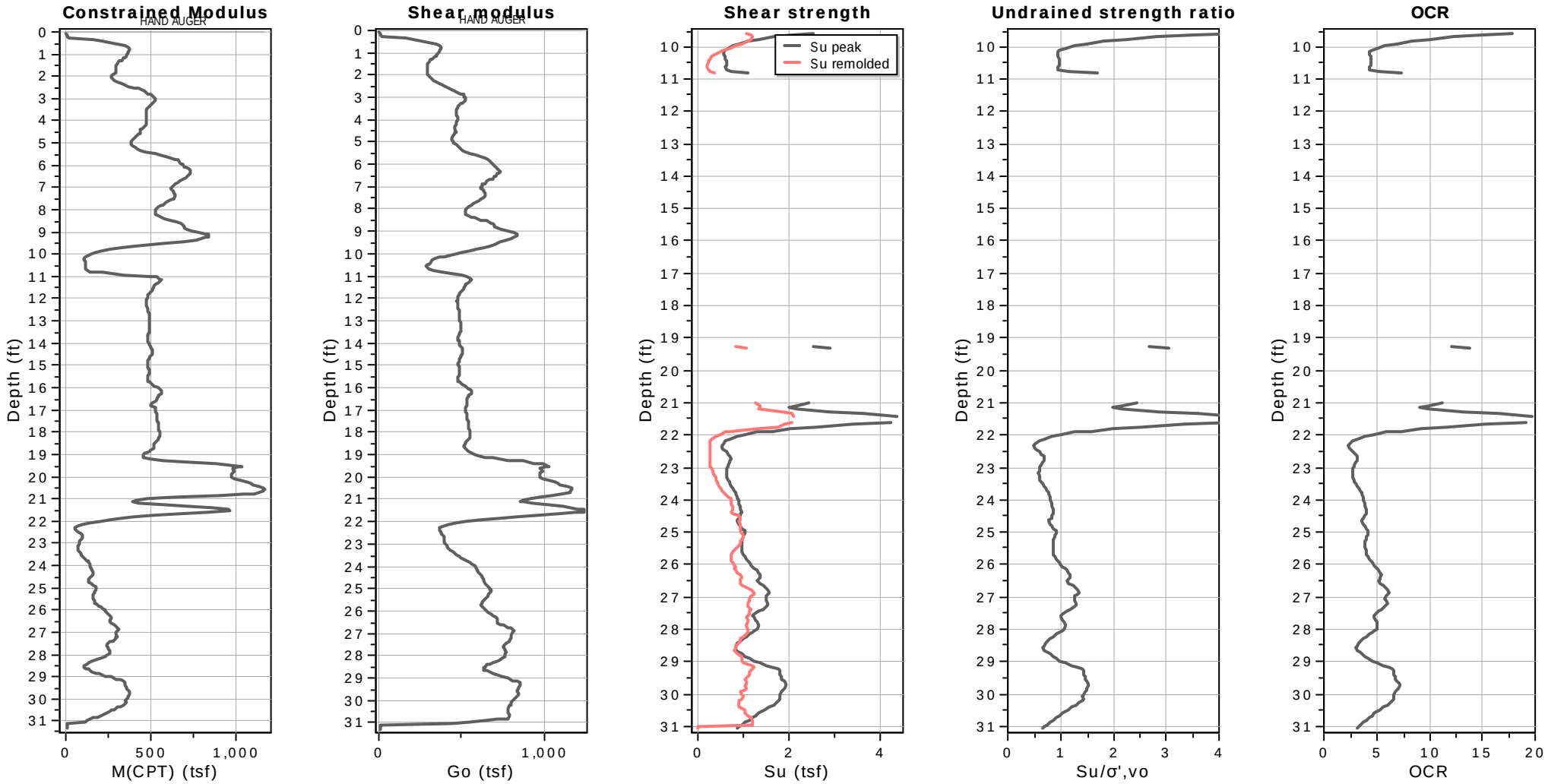
Calculation parameters

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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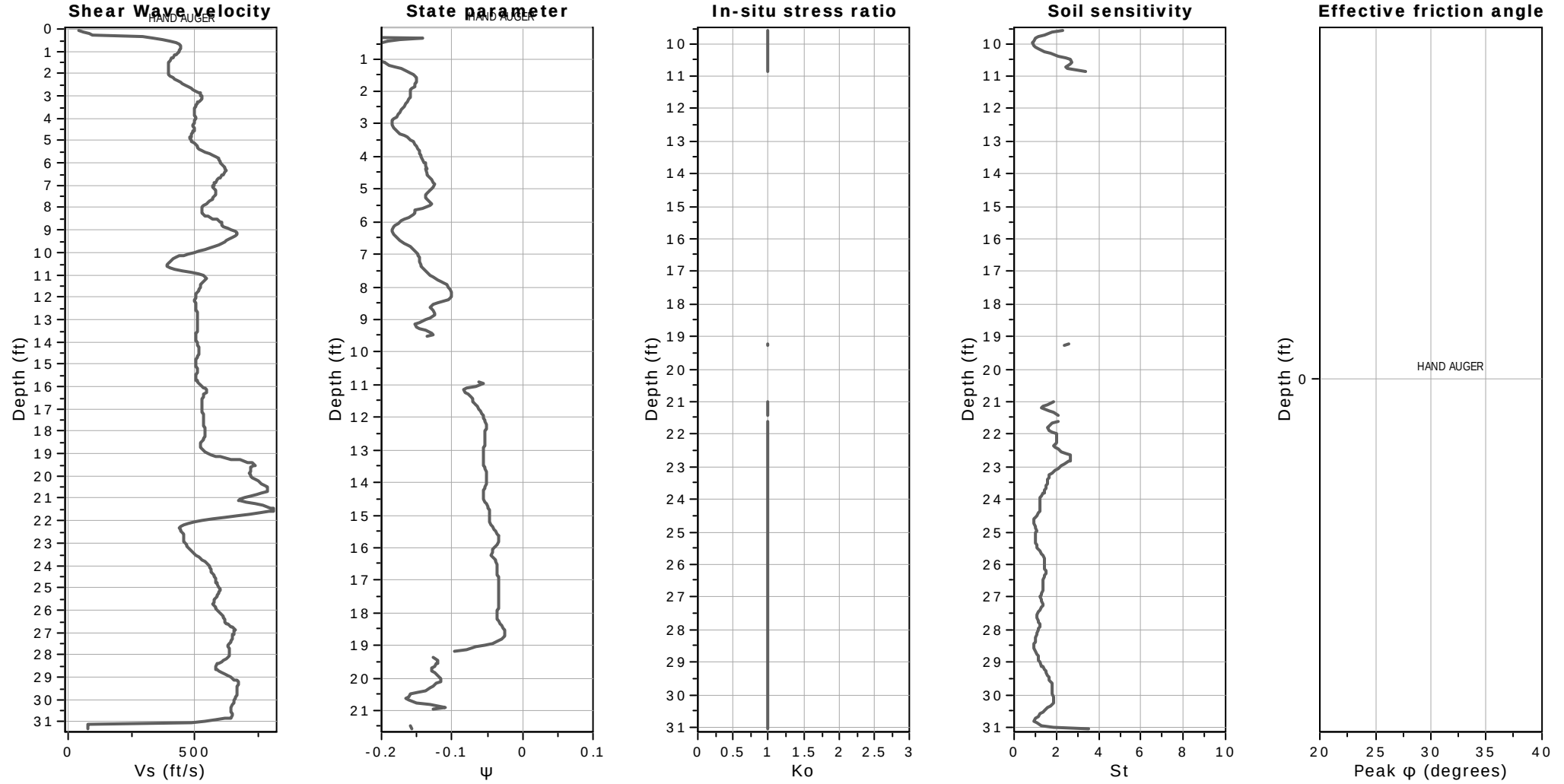
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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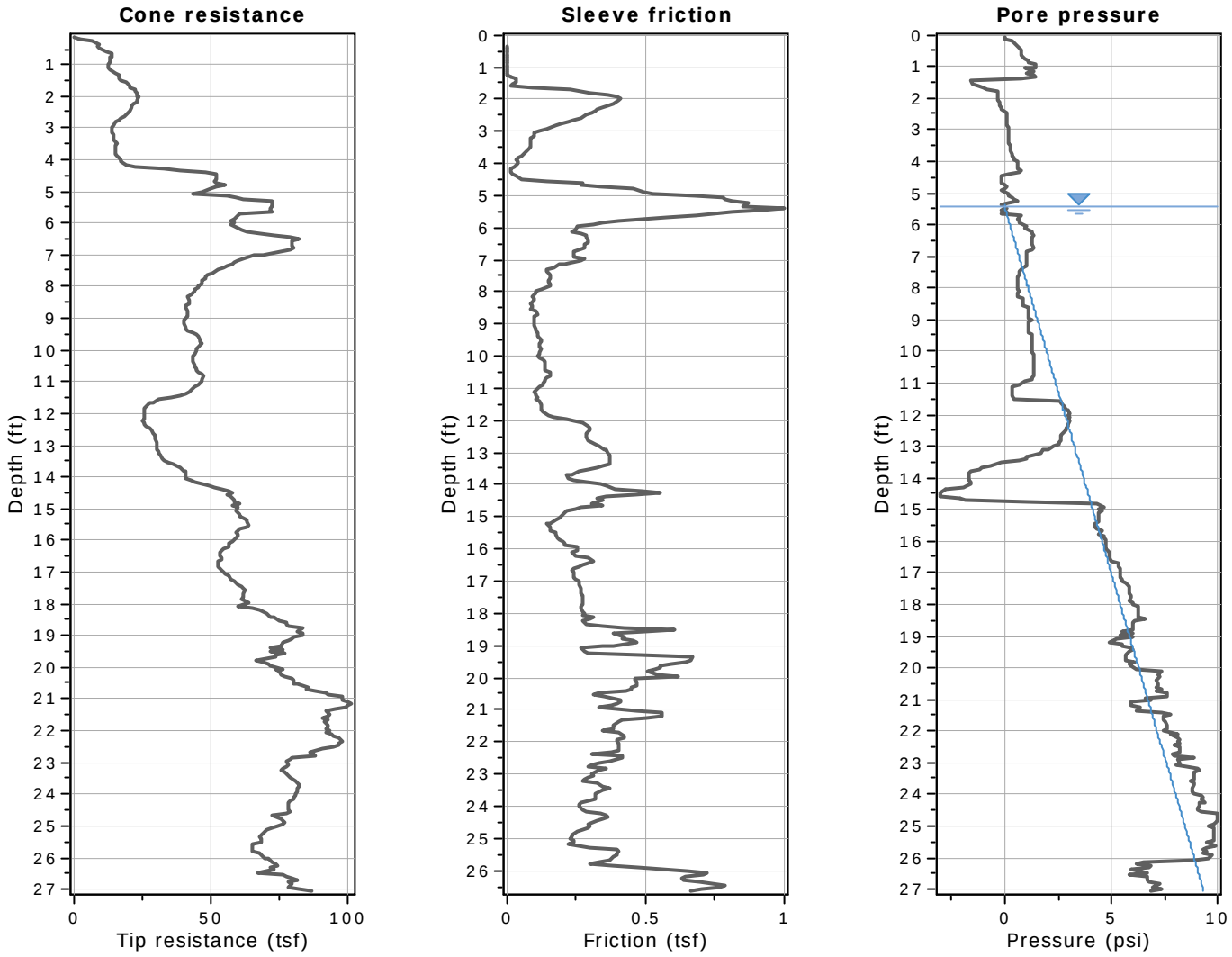
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

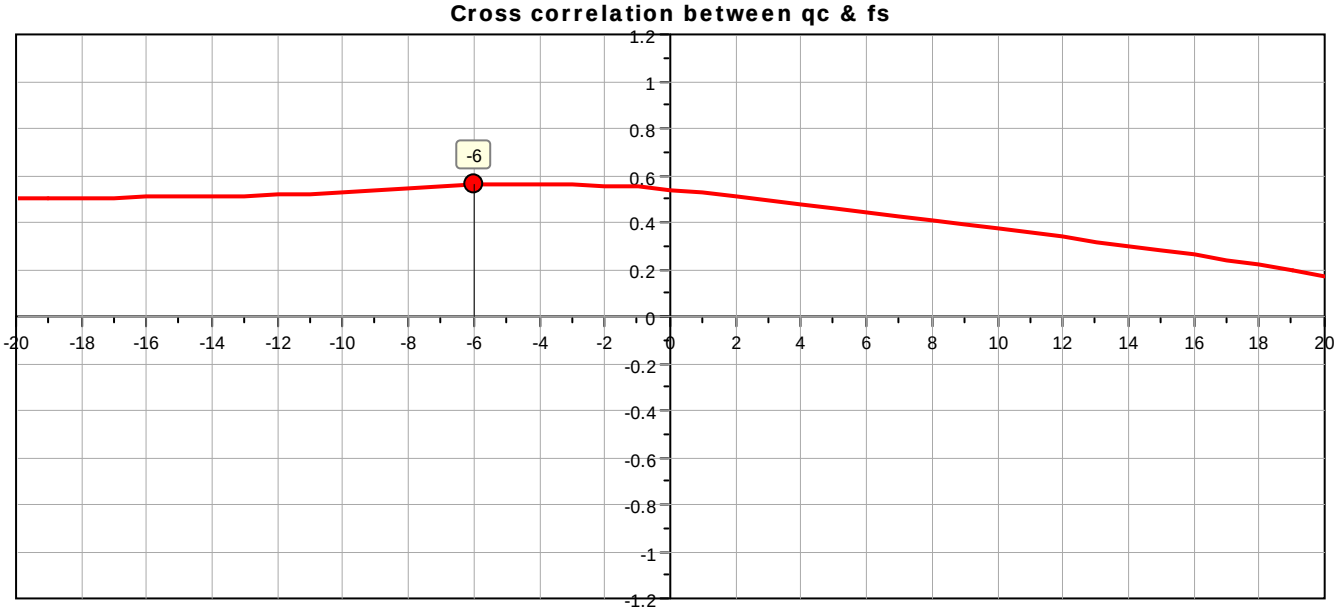
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CPT: 5
Total depth: 27.05 ft, Date: 4/20/2022
Surface Elevation: 73.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



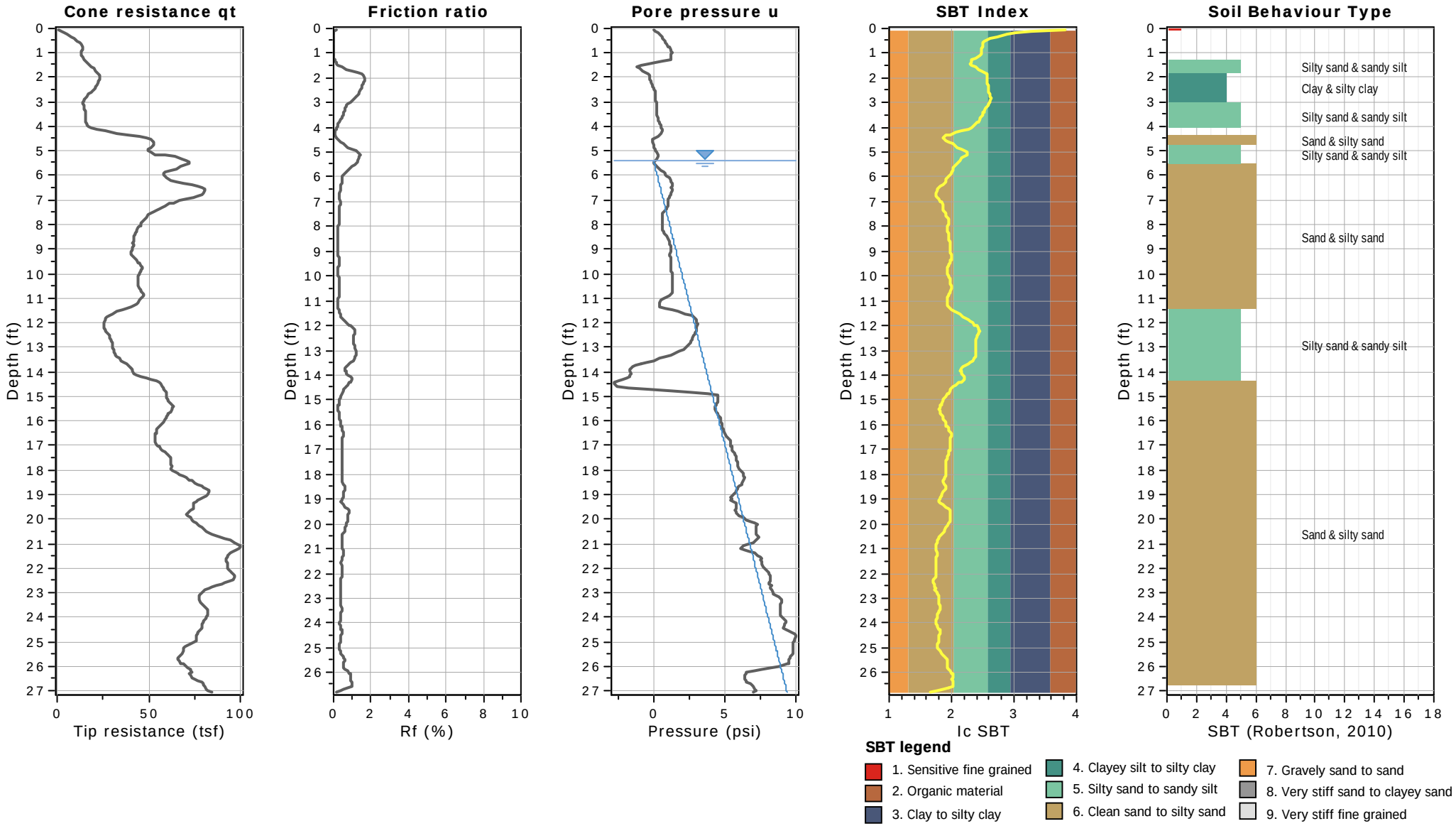
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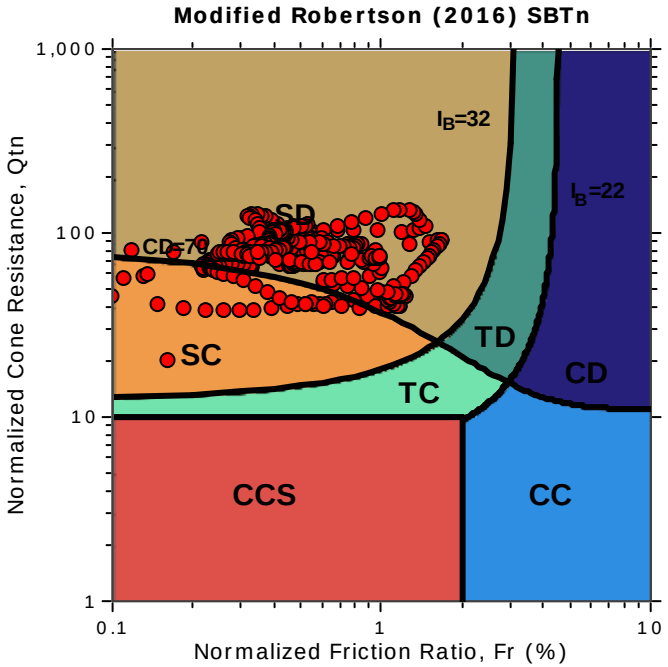


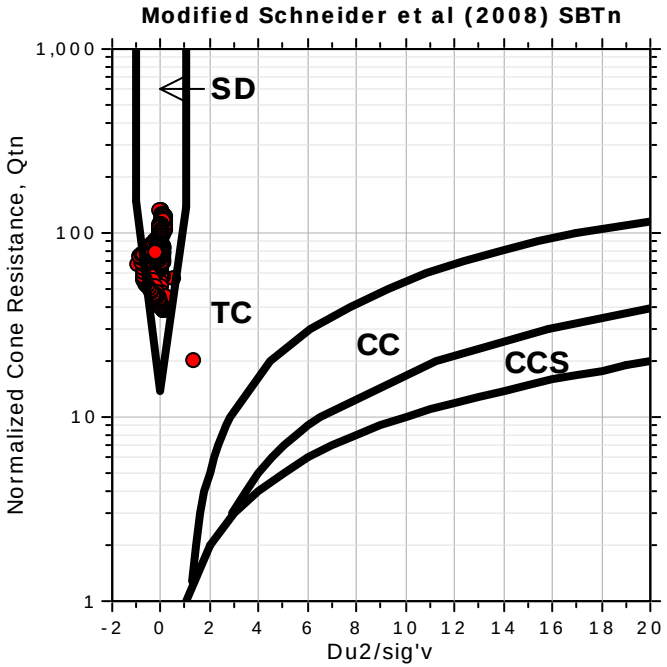
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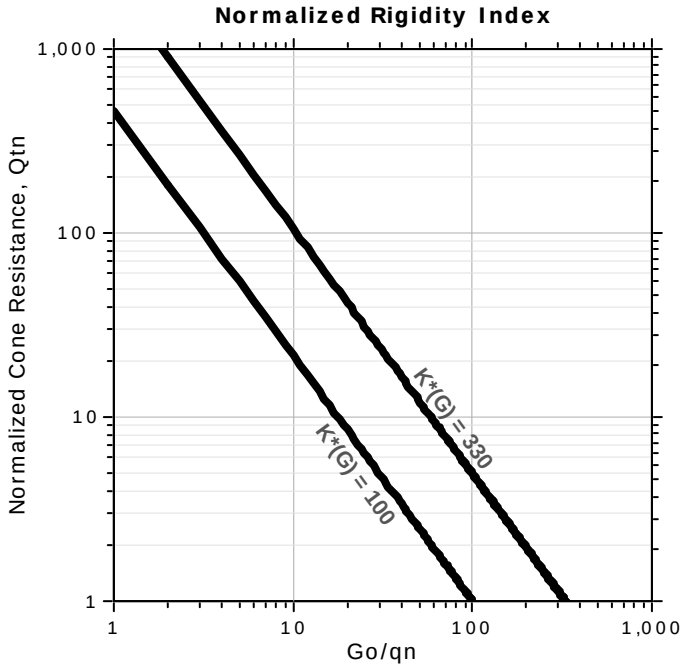
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Updated SBTn plots







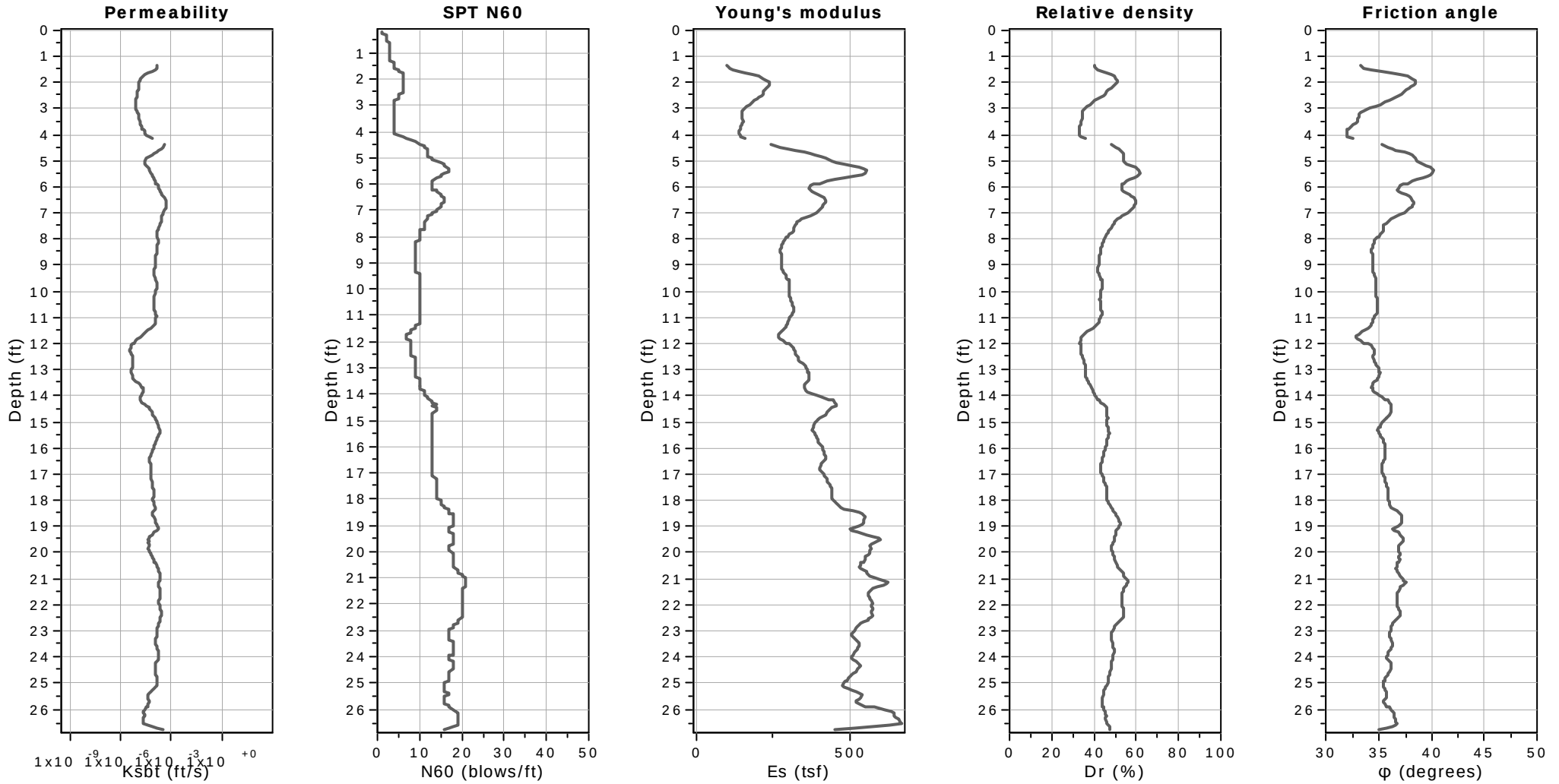
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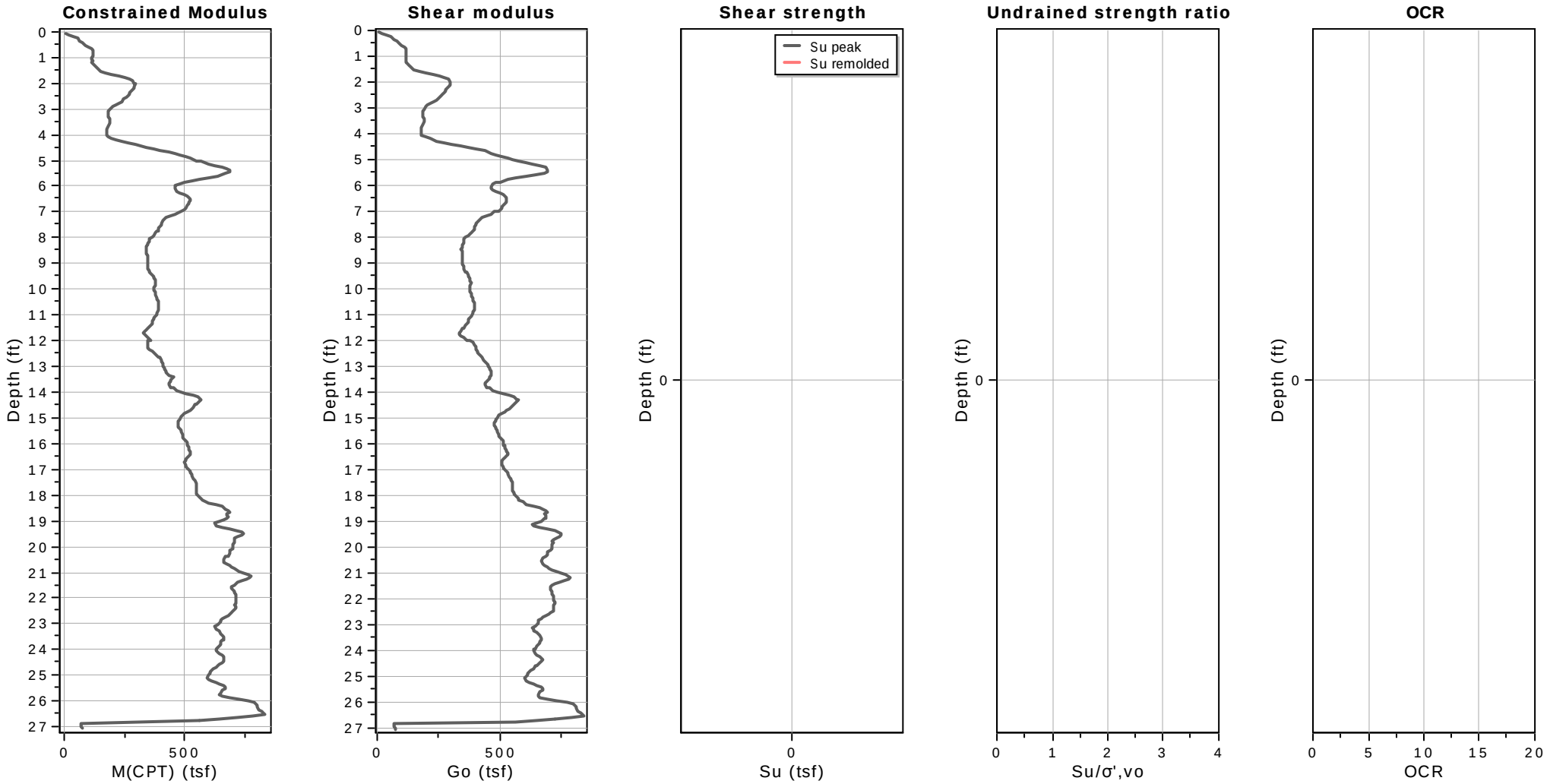
Calculation parameters

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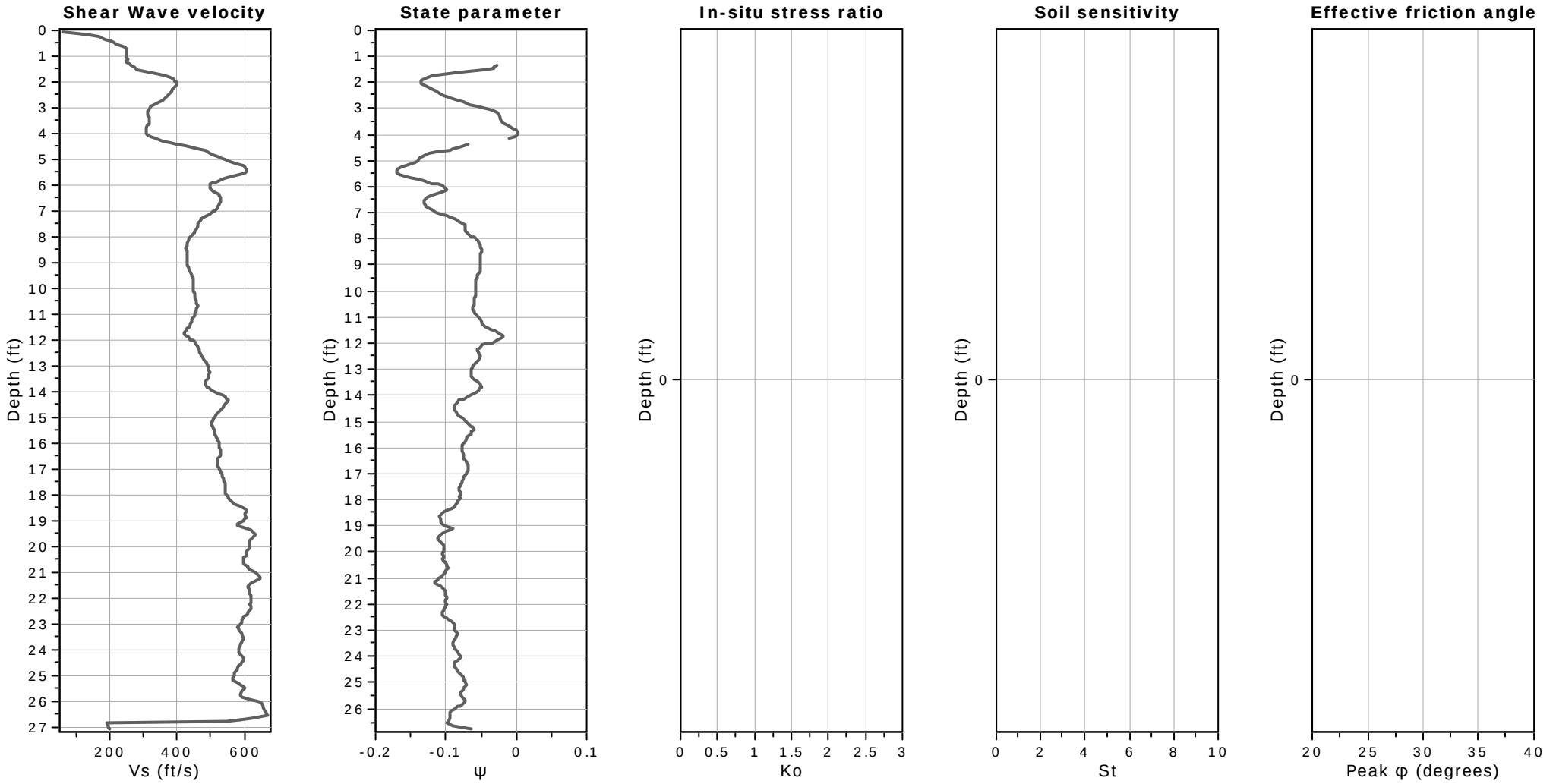
Calculation parameters

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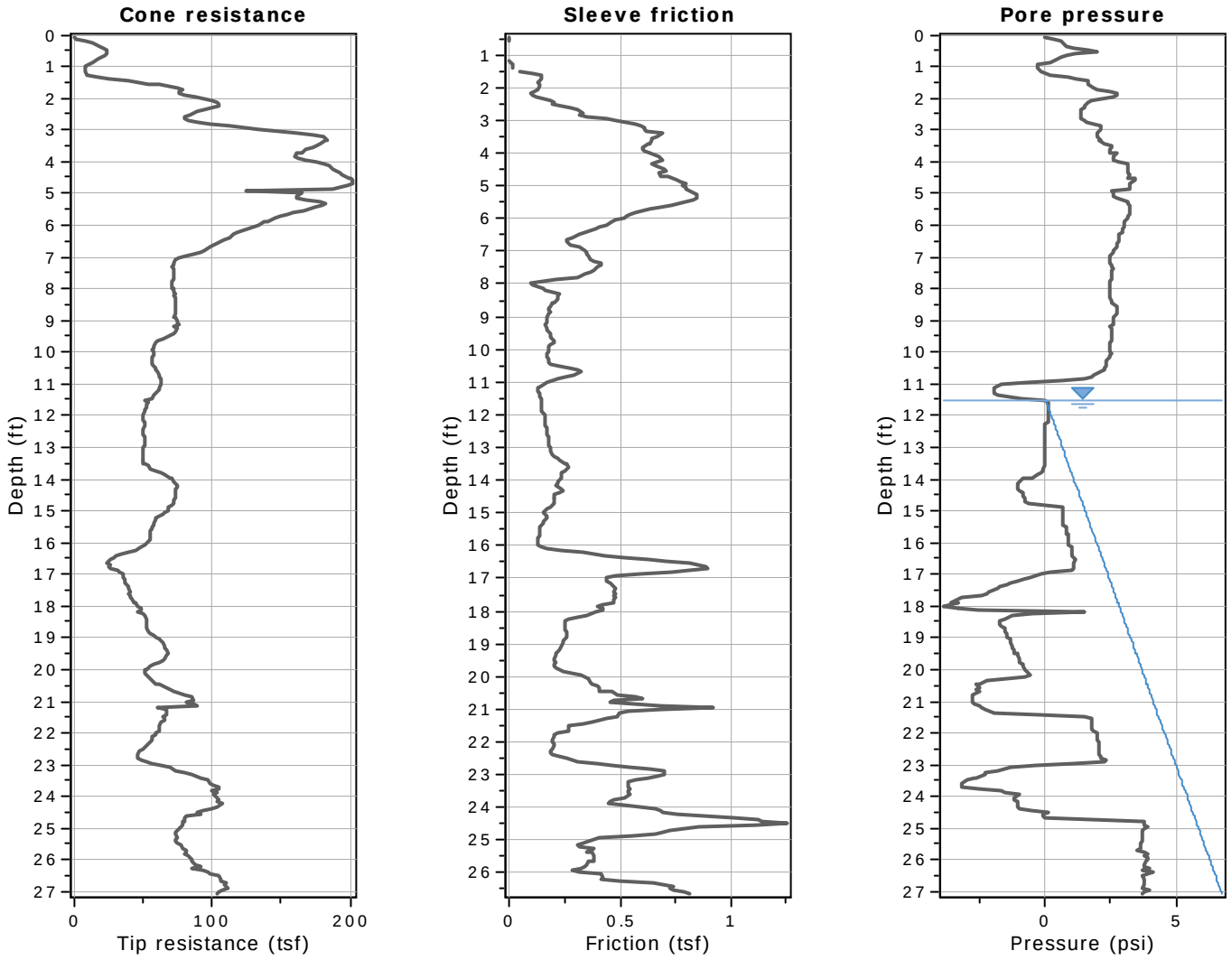
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

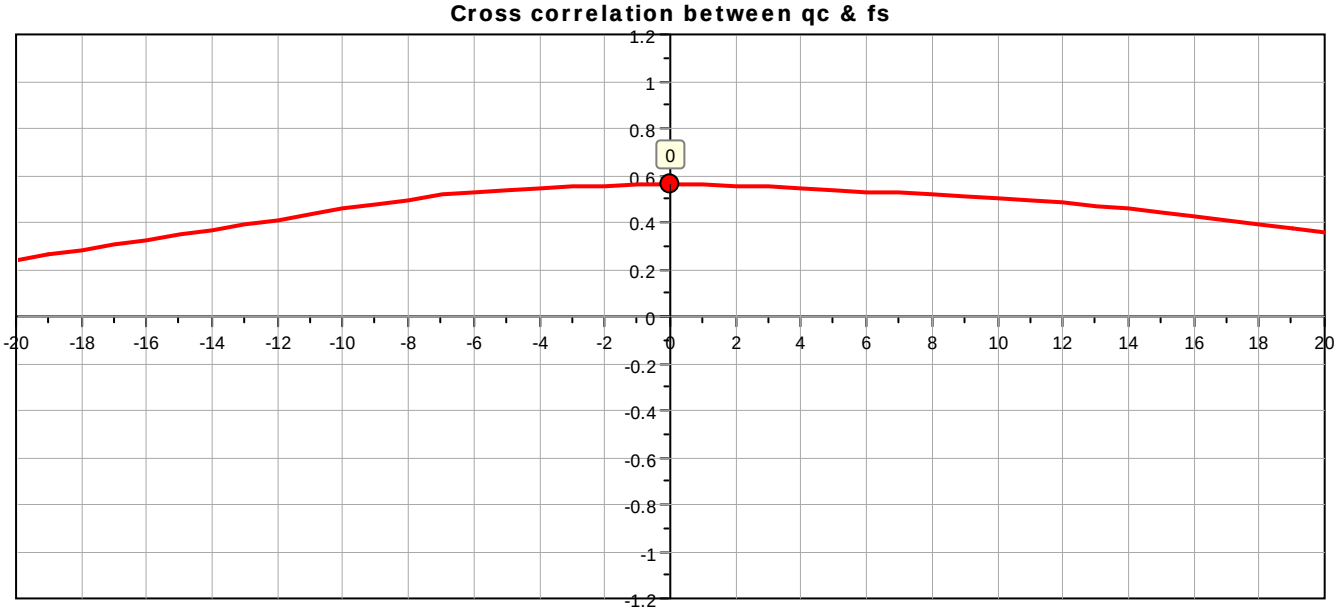
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18 Boulden Circle Suite 36
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CPT: 6
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Surface Elevation: 78.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



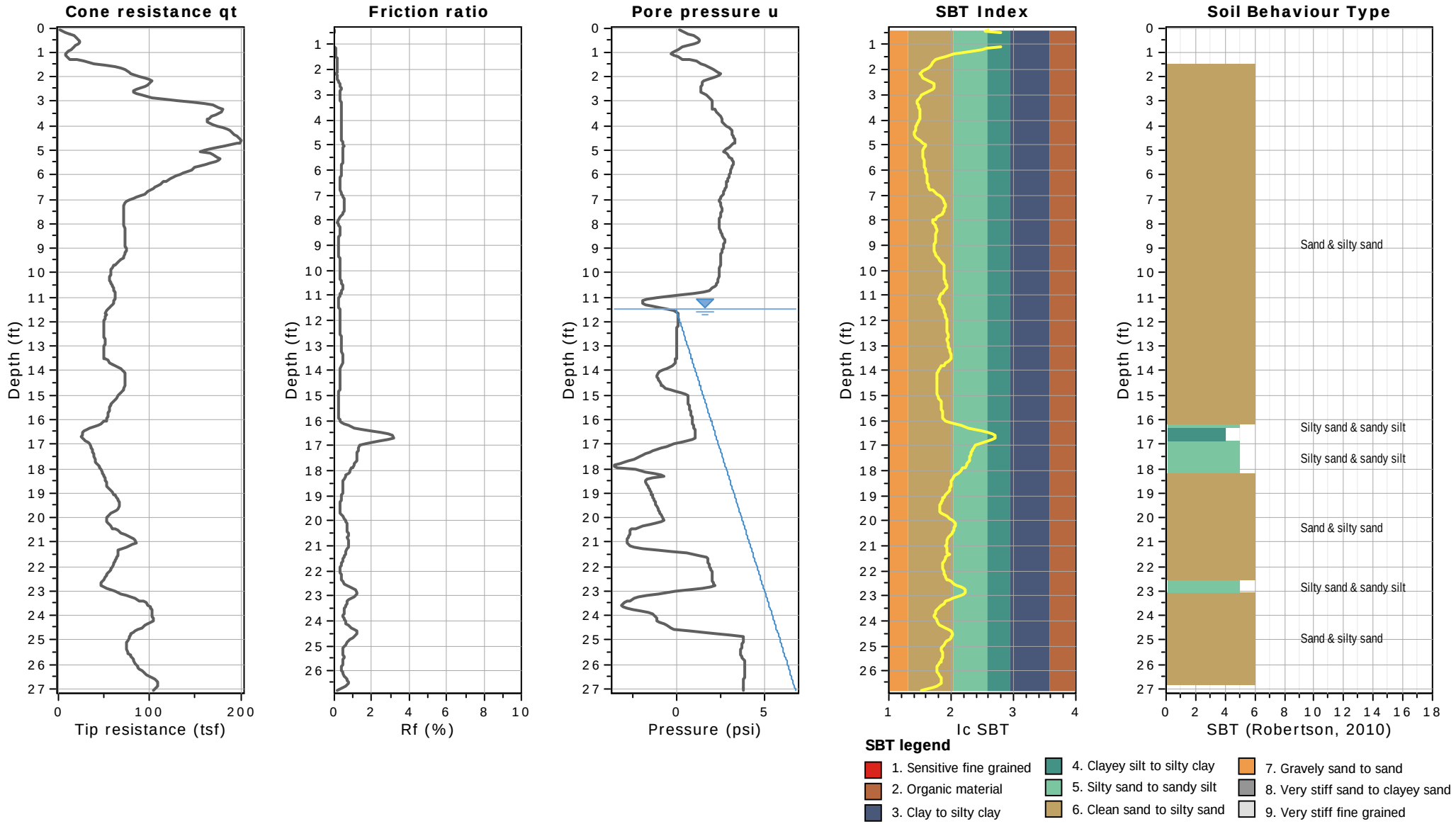
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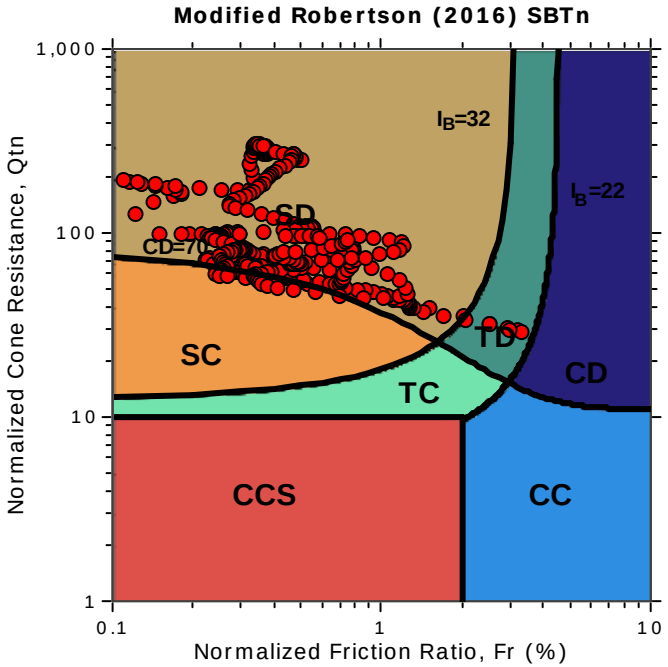


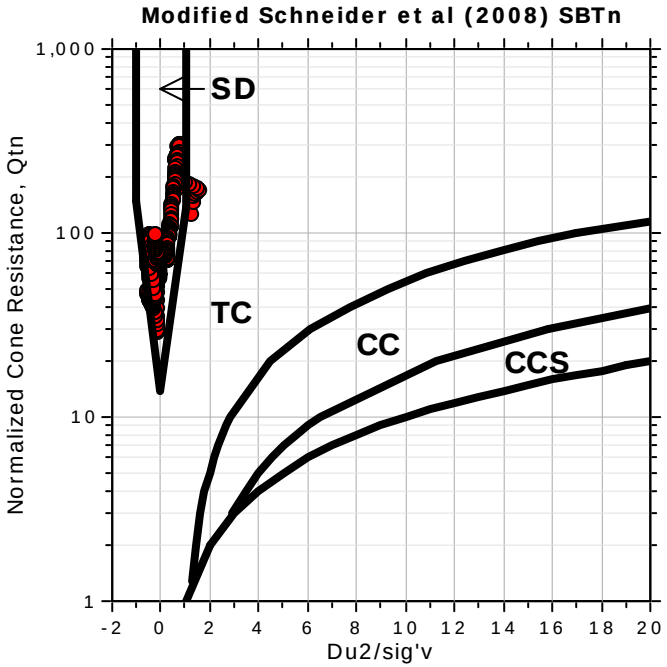
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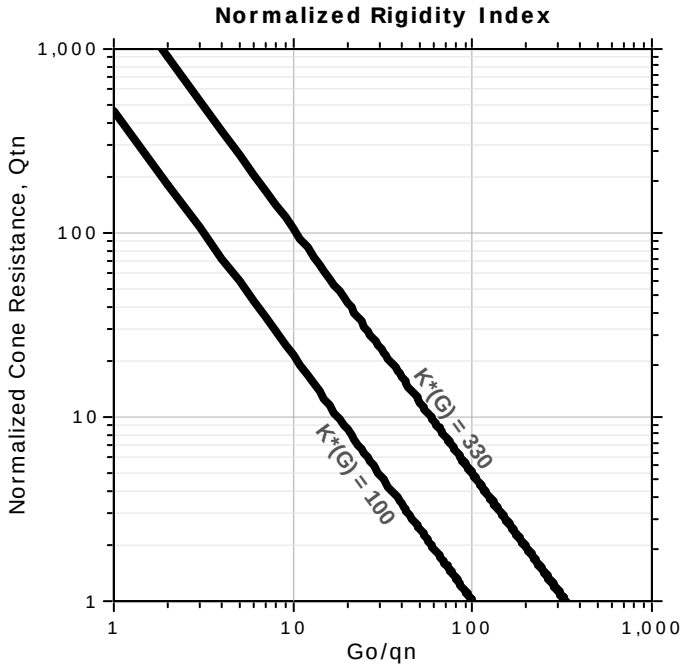
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Updated SBTn plots







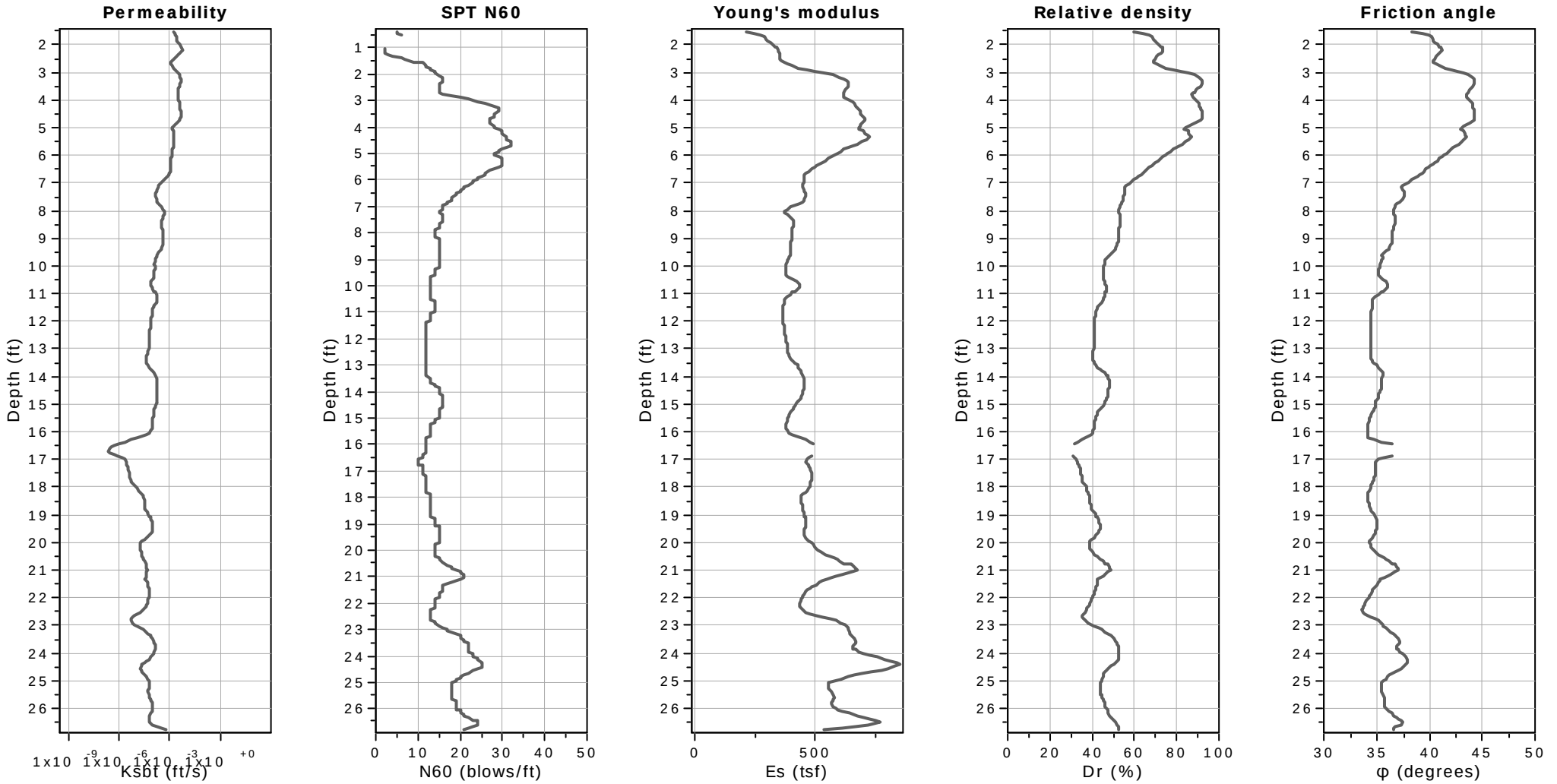
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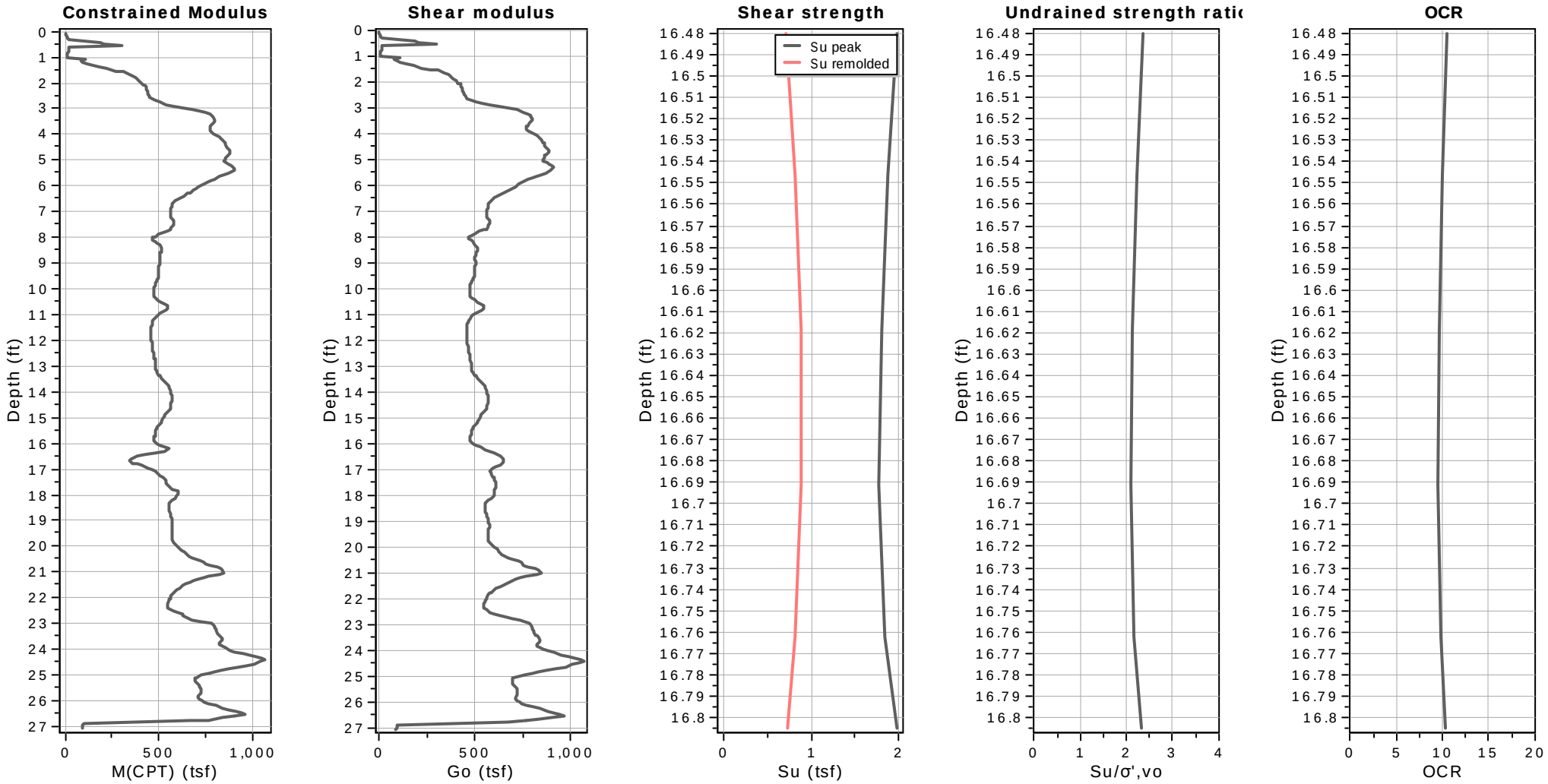
Calculation parameters

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)
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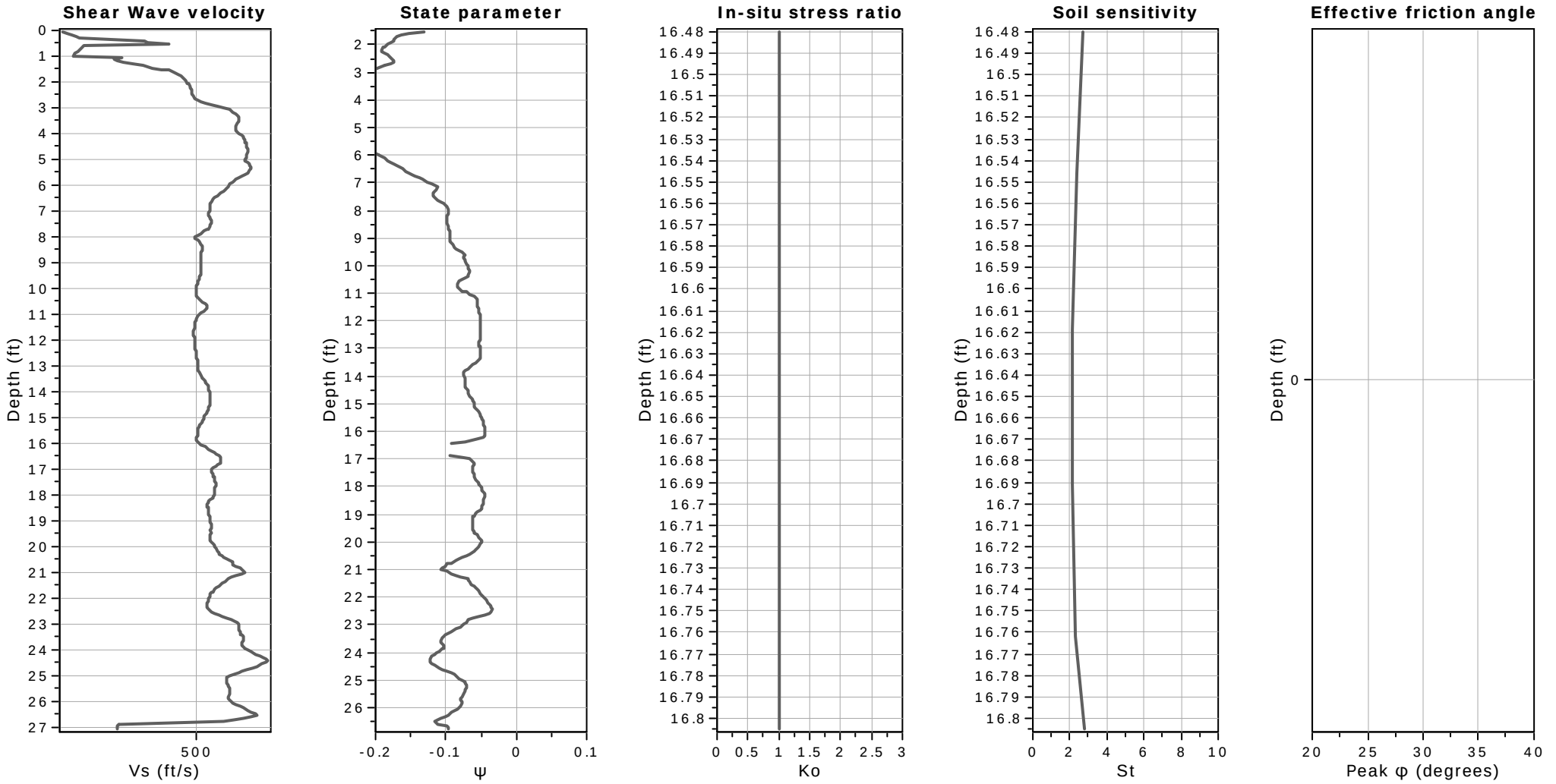
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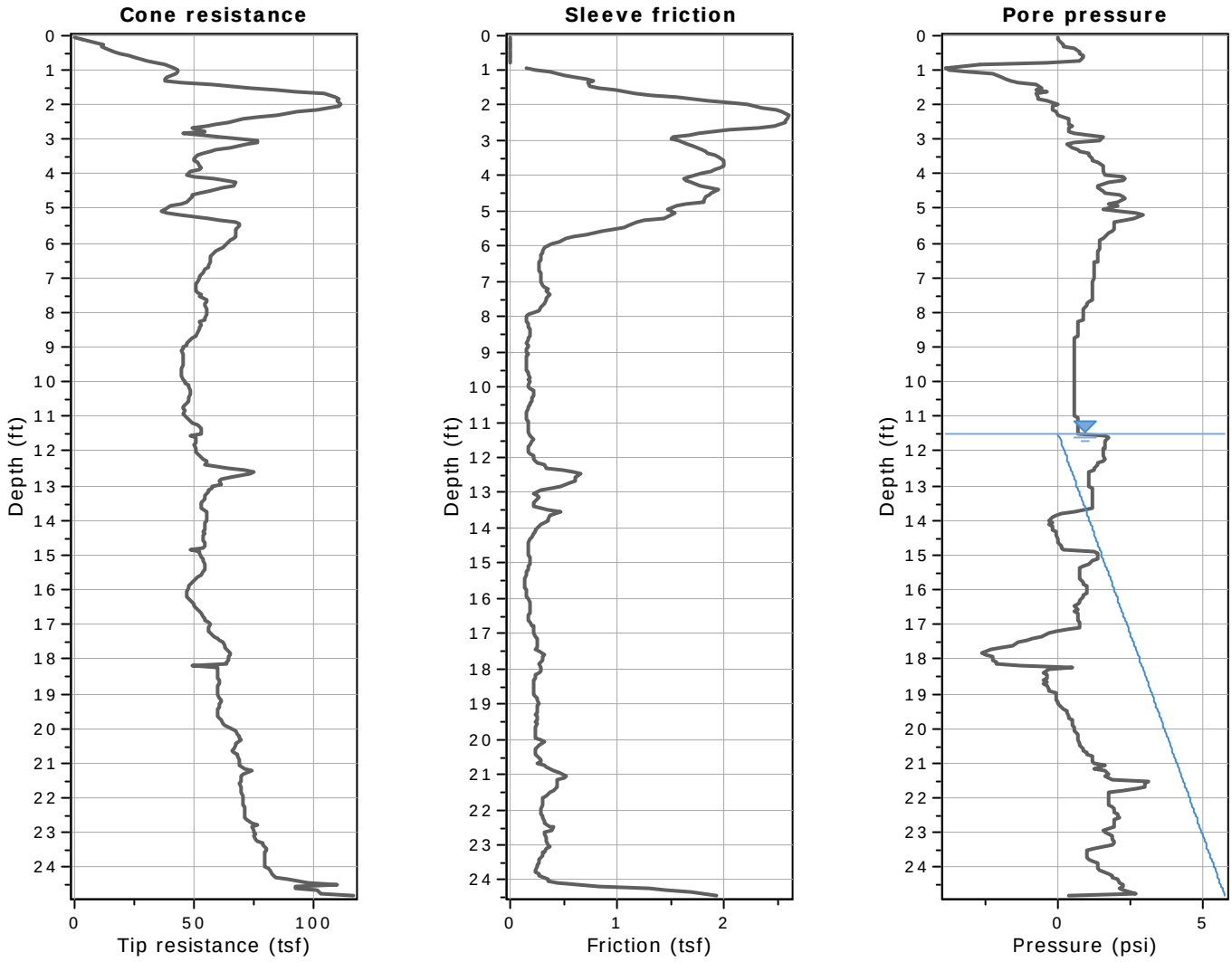
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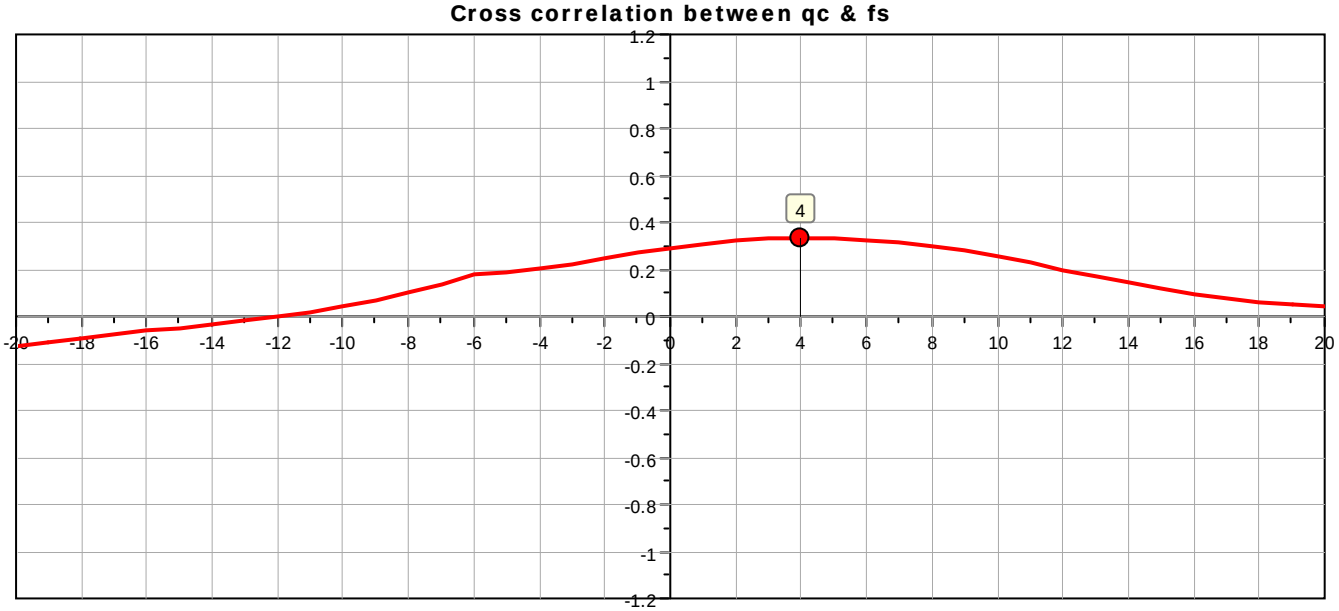
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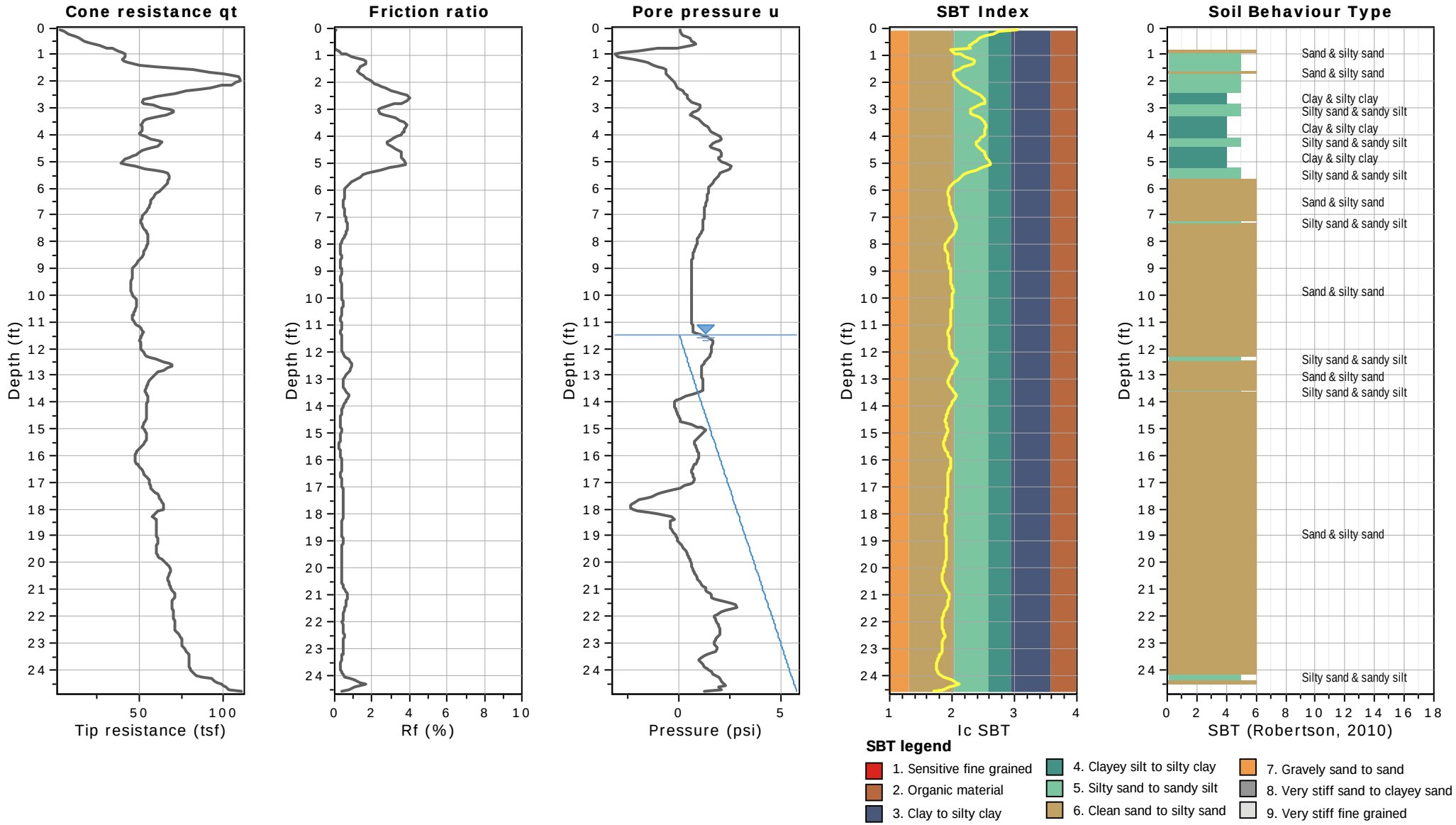
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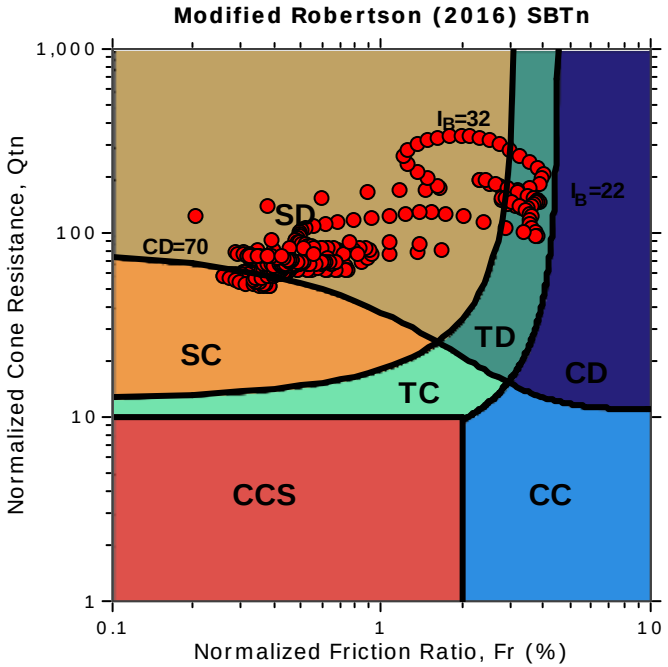


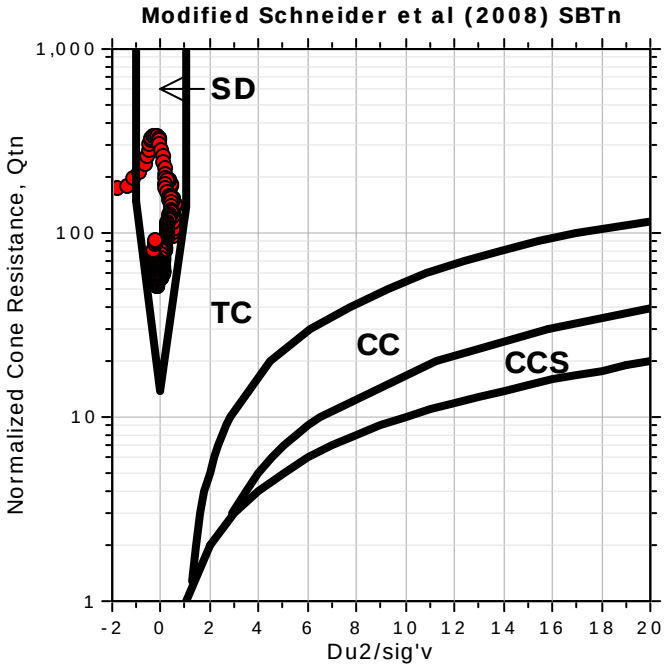
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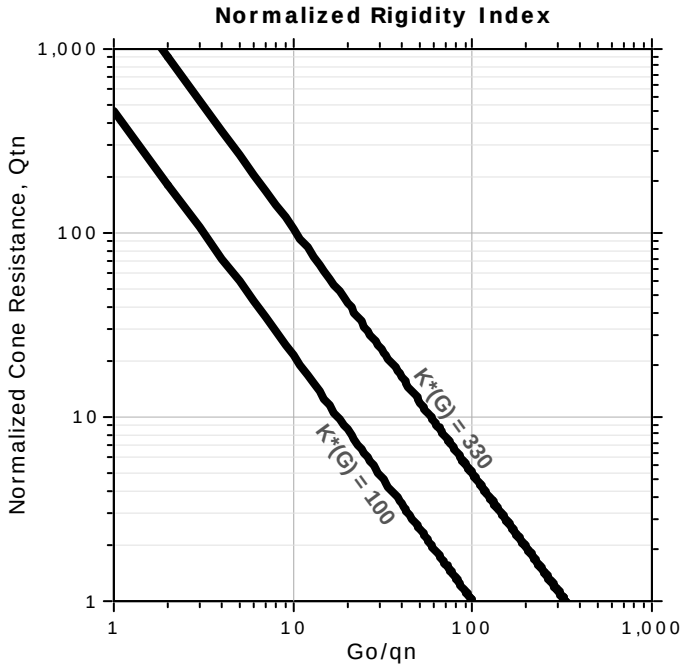
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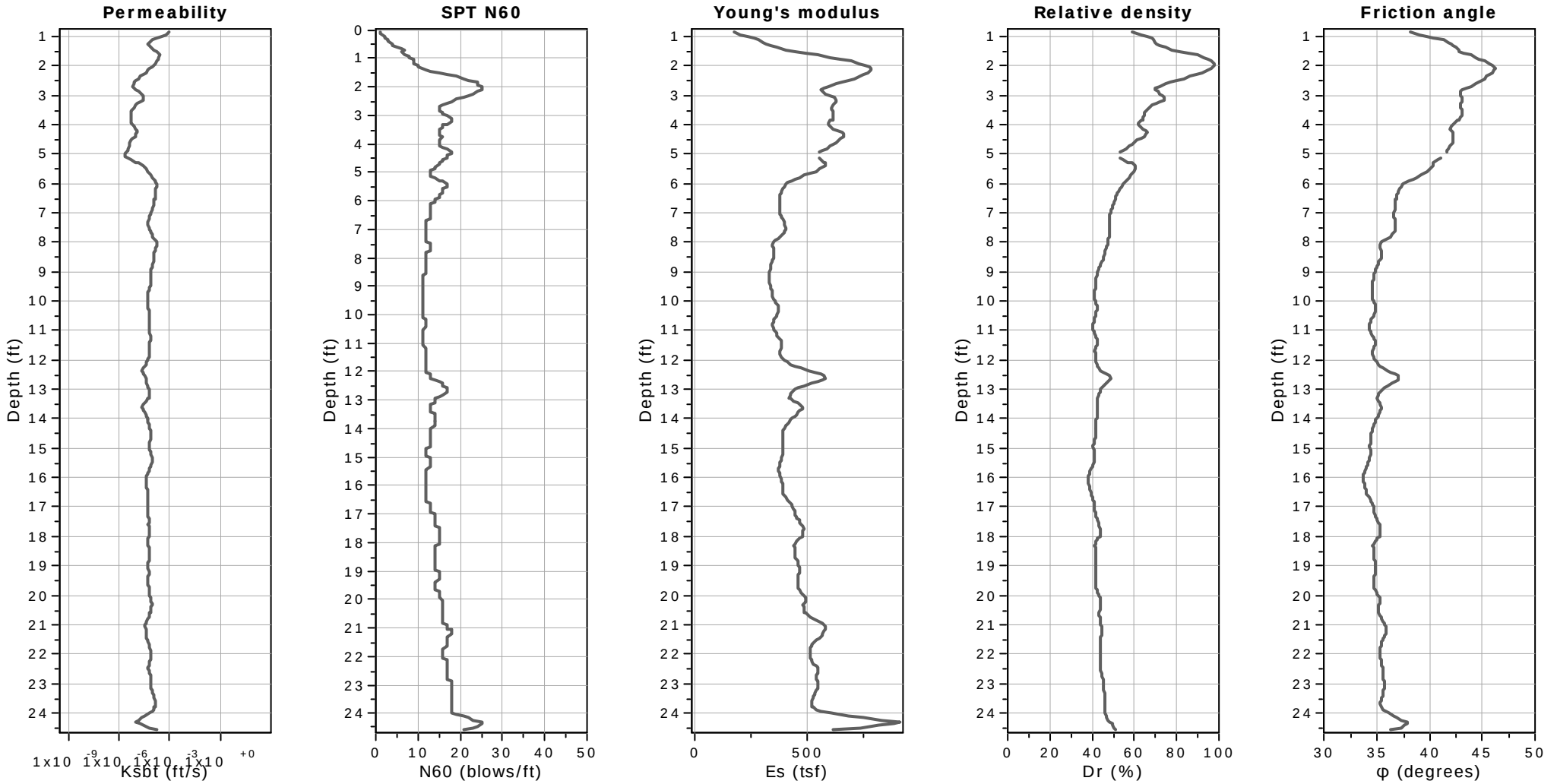
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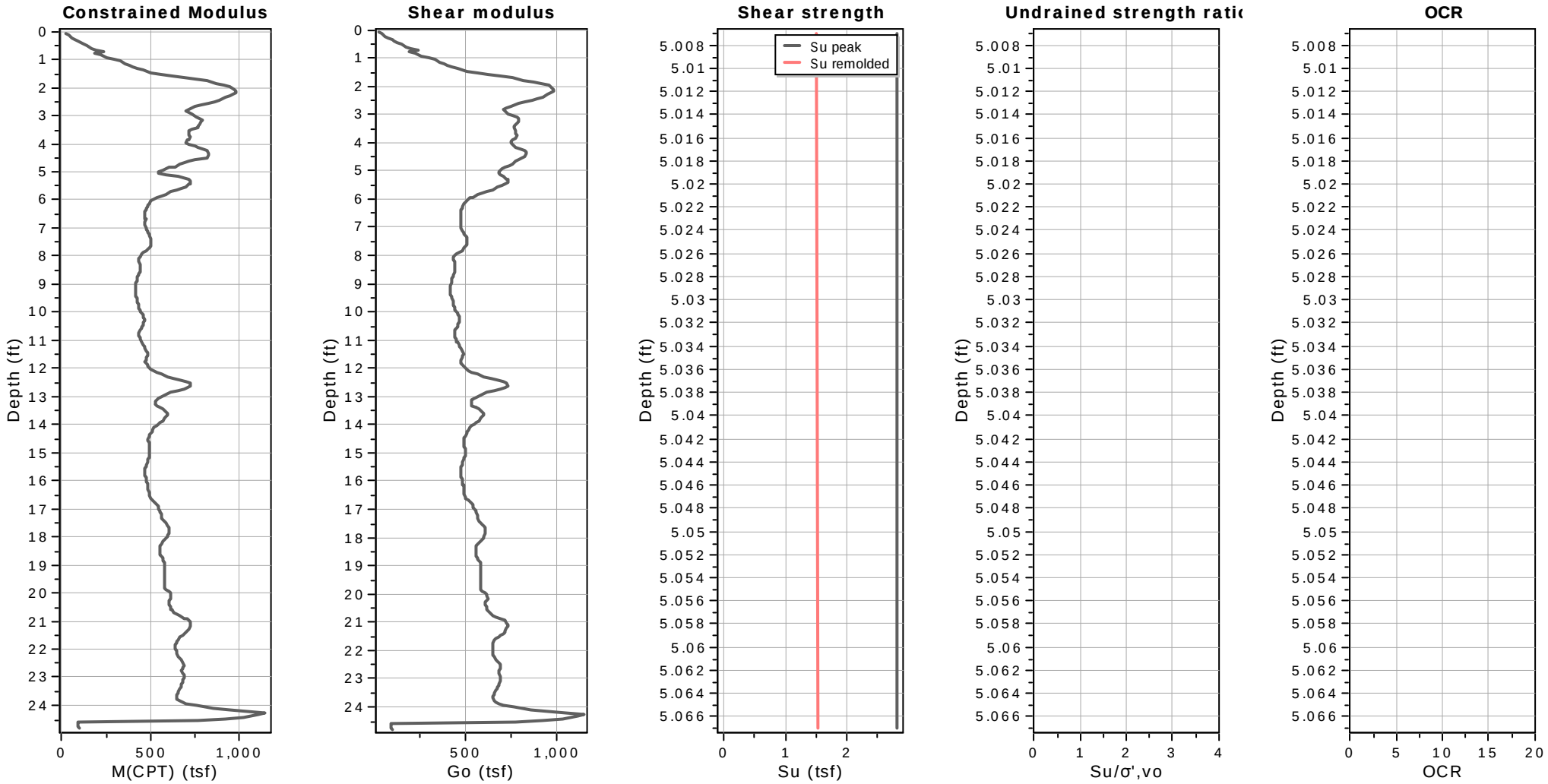
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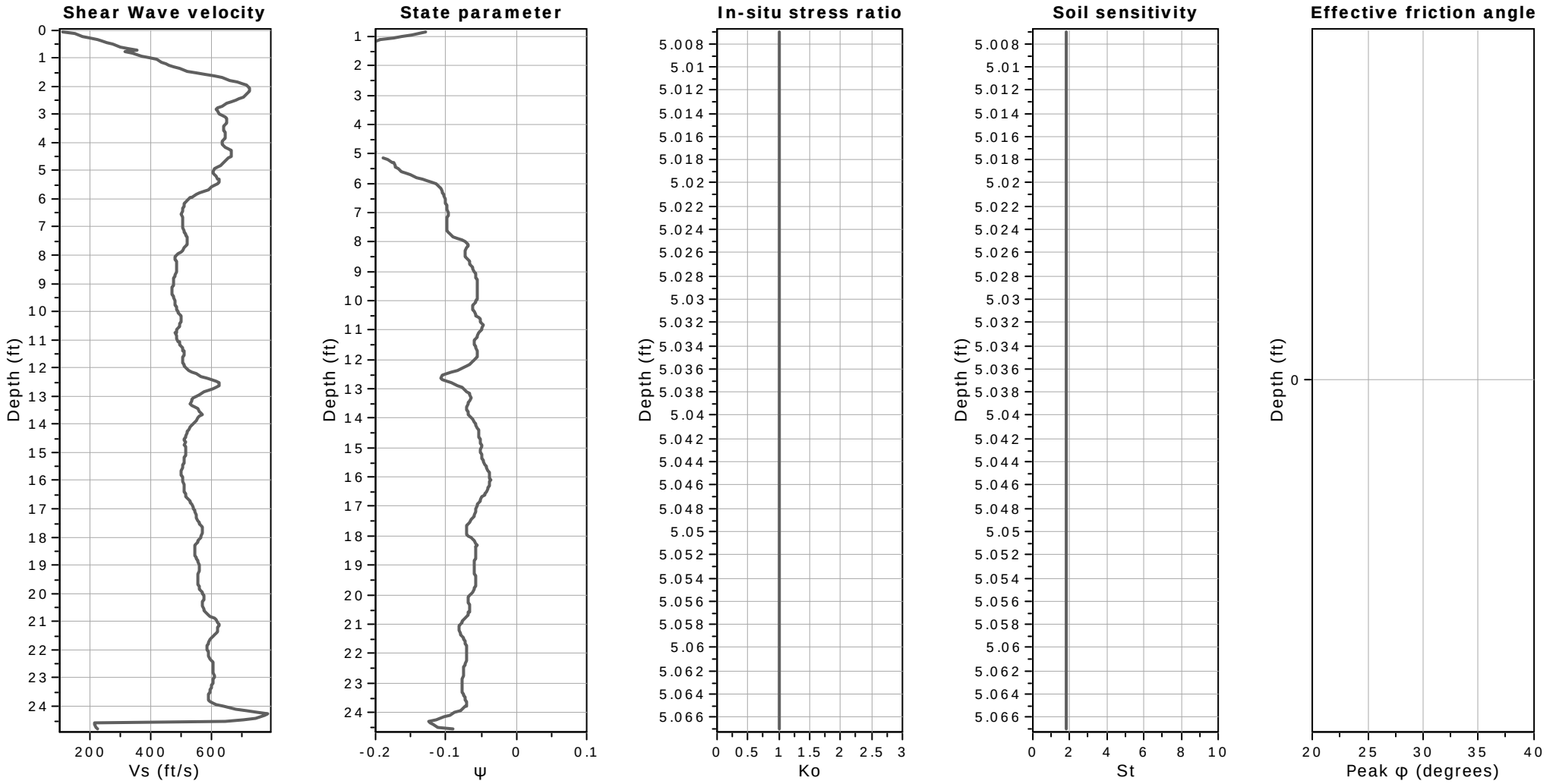
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Location: **New Castle County, Delaware**



Calculation parameters

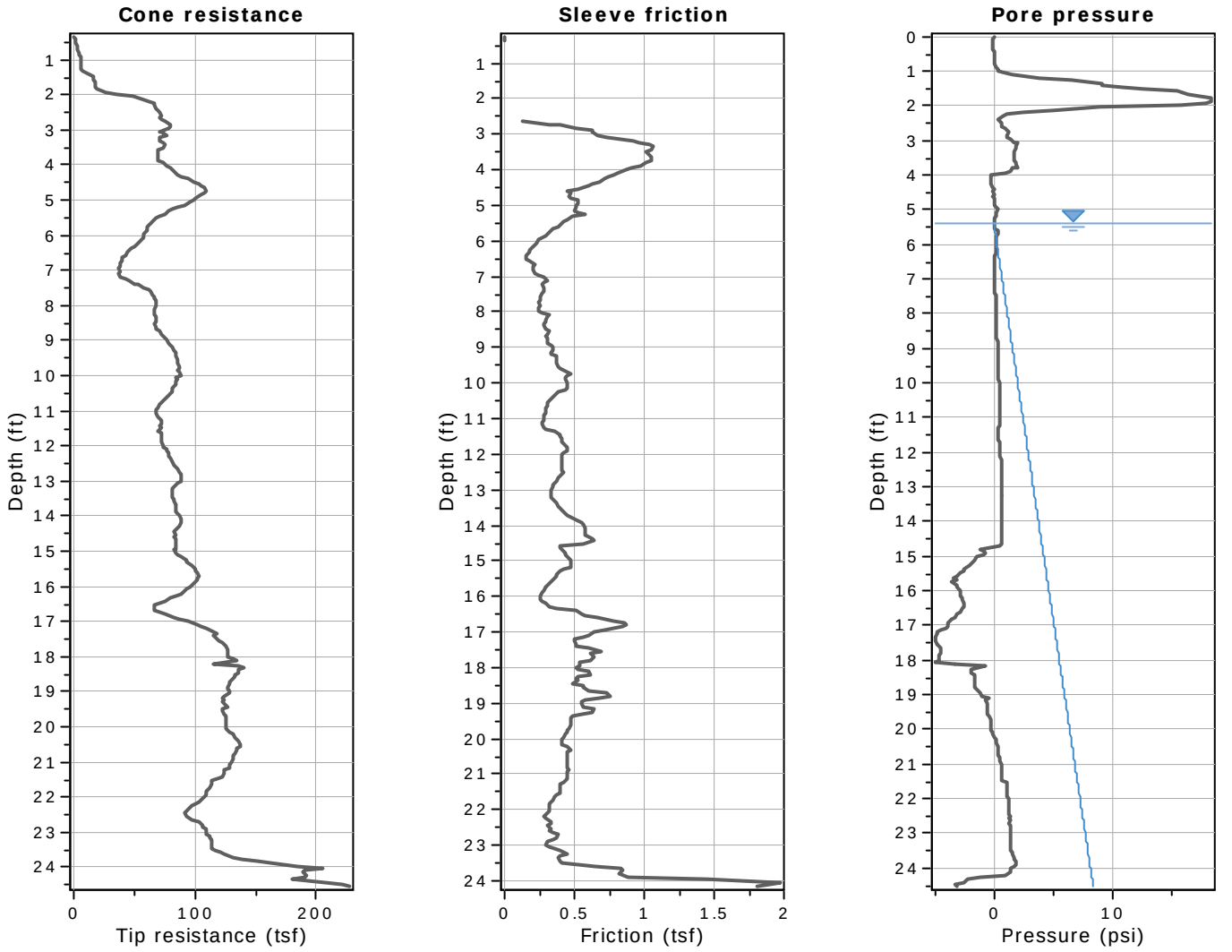
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

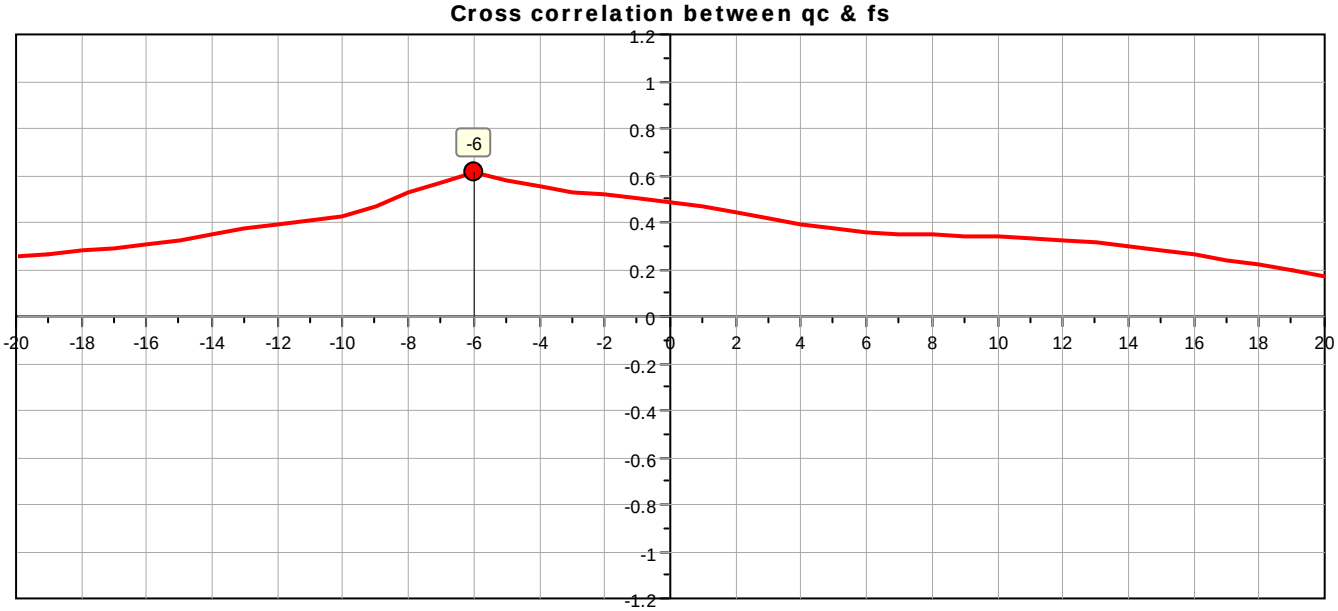
GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
18 Boulden Circle Suite 36
New Castle DE 19720
302 326 2100

CPT: 8
Total depth: 24.54 ft, Date: 4/20/2022
Surface Elevation: 84.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



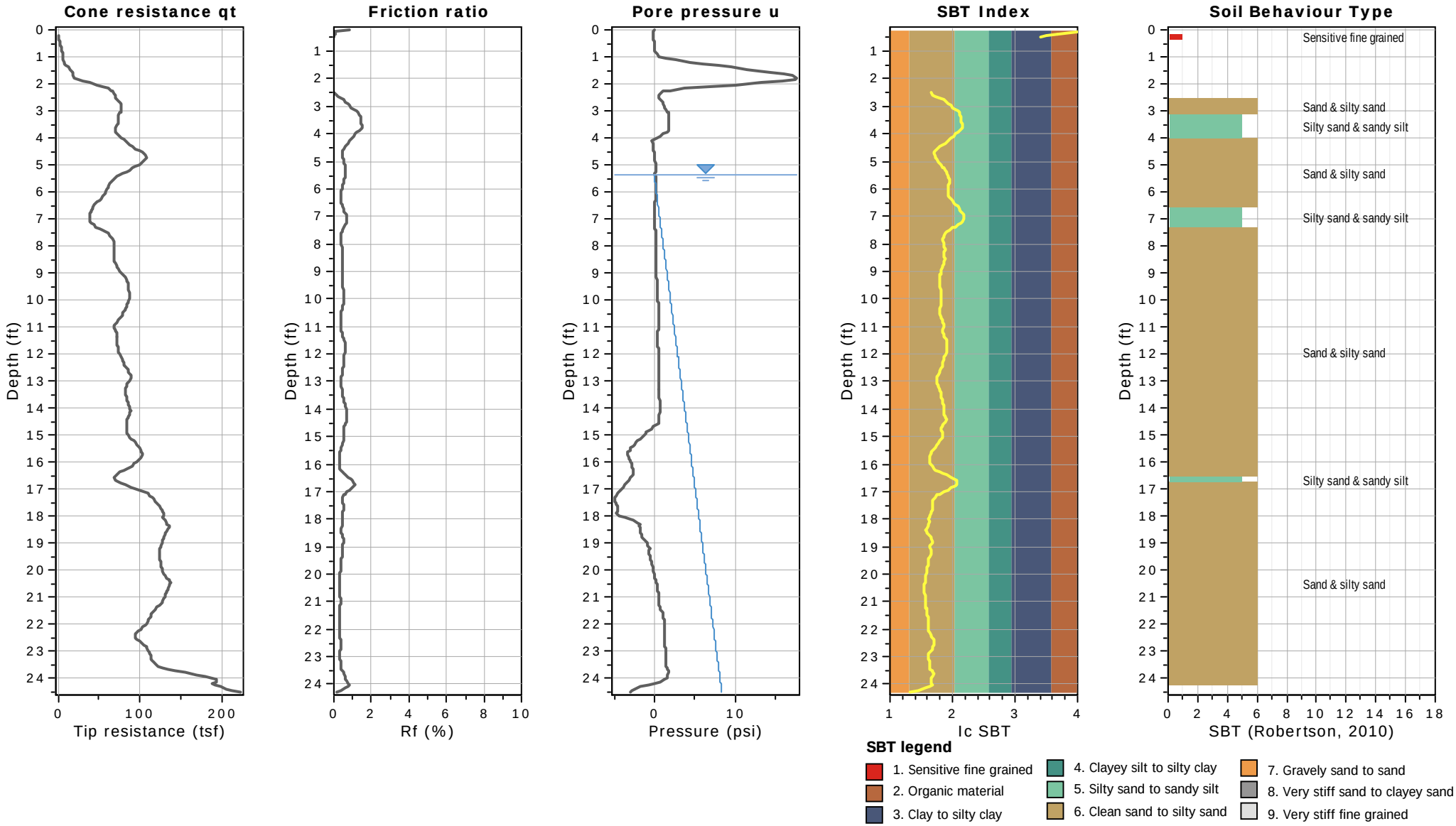
The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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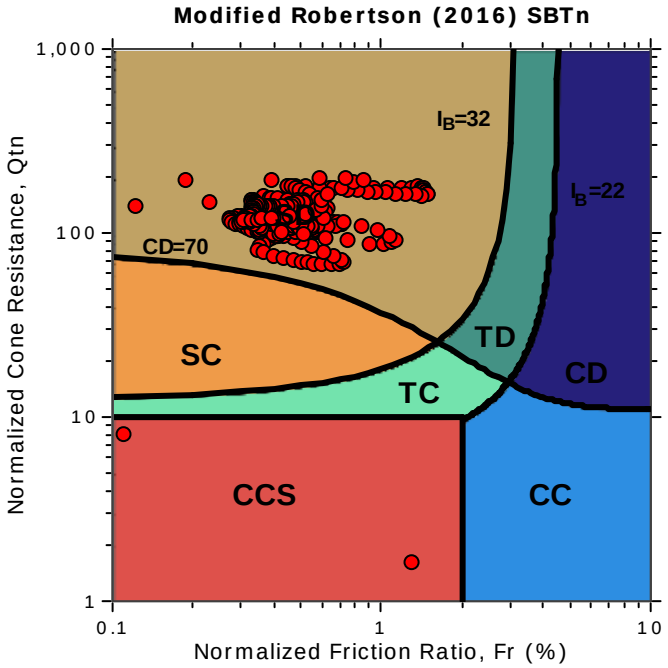


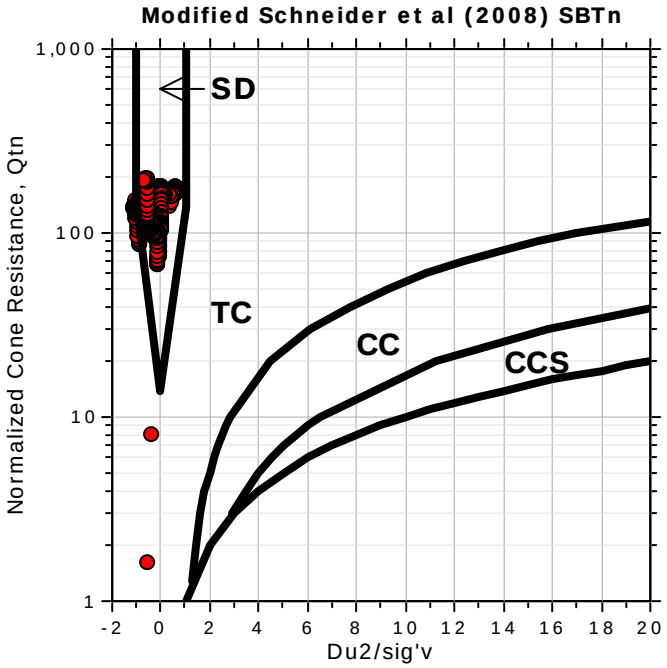
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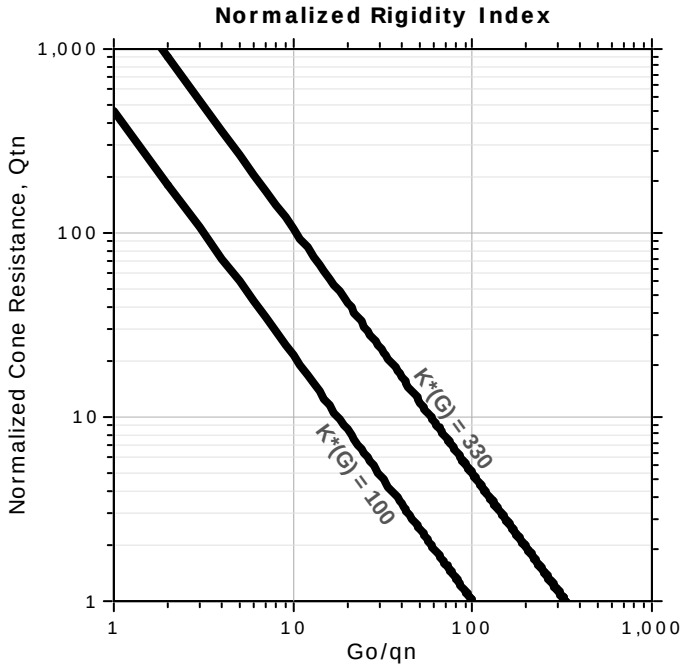
CPT: 8
Total depth: 24.54 ft, Date: 4/20/2022
Surface Elevation: 84.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**

Updated SBTn plots







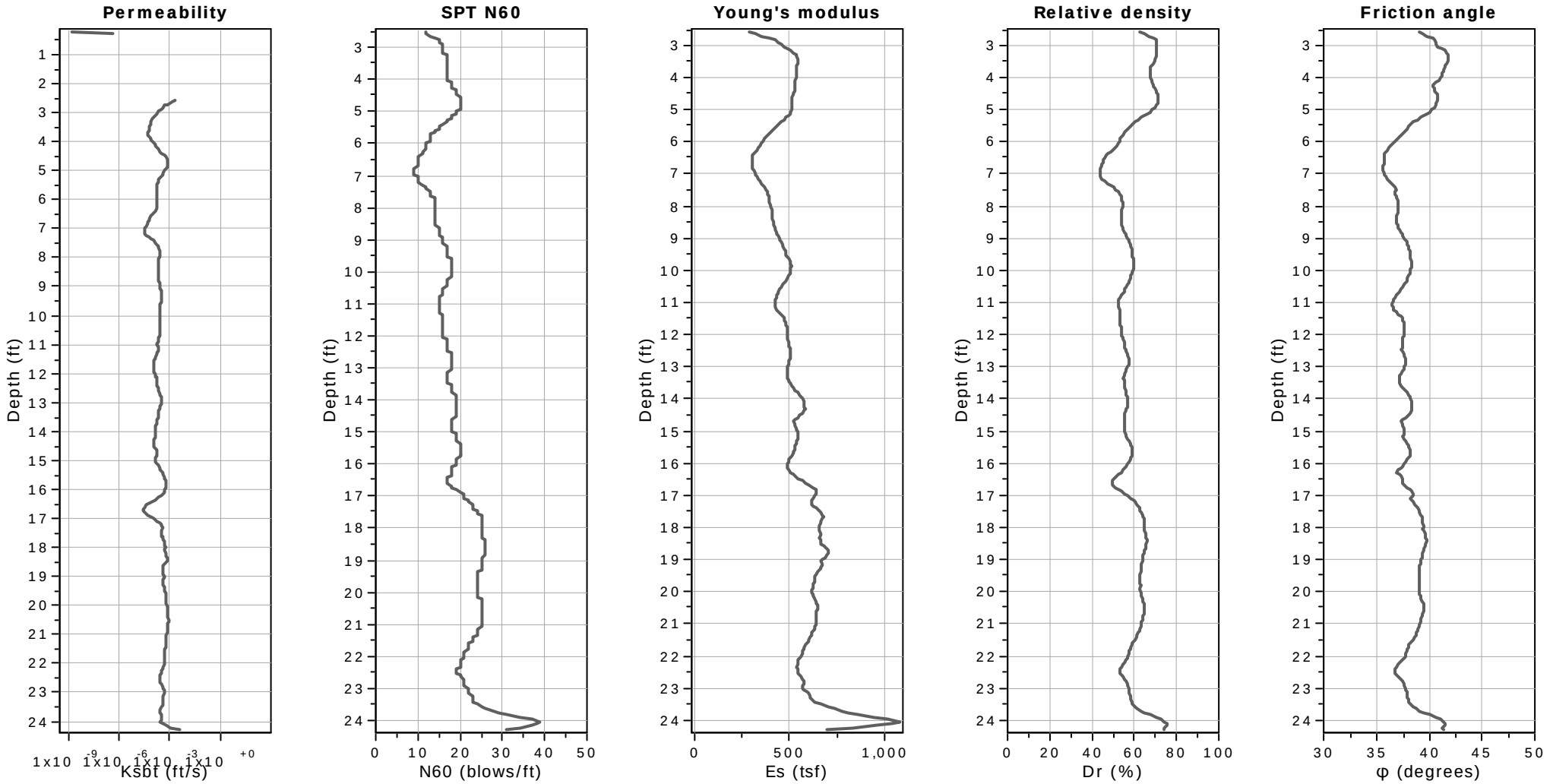
CCS: Clay-like - Contractive - Sensitive
CC: Clay-like - Contractive
CD: Clay-like - Dilative
TC: Transitional - Contractive
TD: Transitional - Dilative
SC: Sand-like - Contractive
SD: Sand-like - Dilative

K(G) > 330: Soils with significant microstructure (e.g. age/cementation)

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Surface Elevation: 84.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



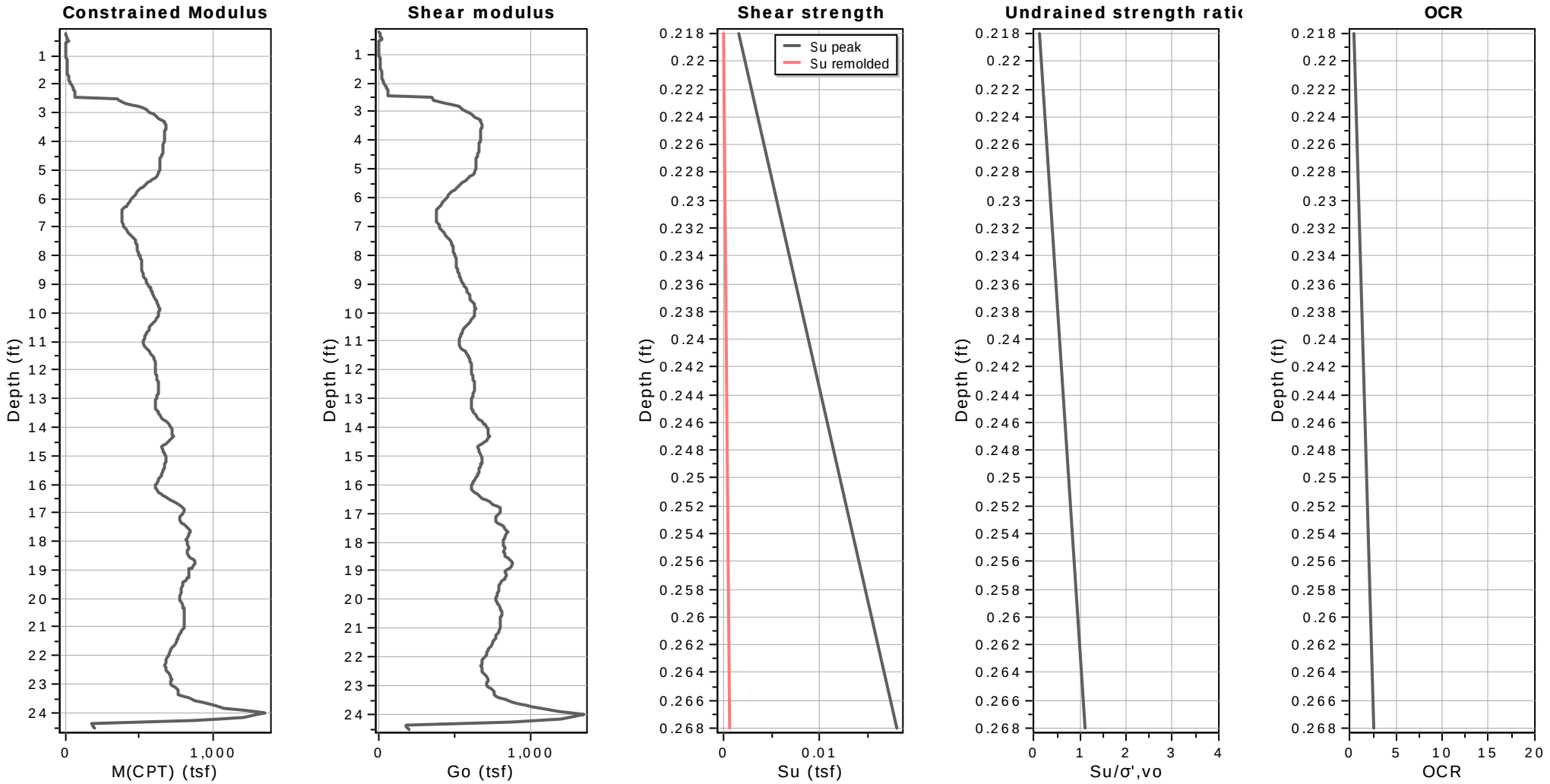
Calculation parameters

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)
User defined estimation data

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Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



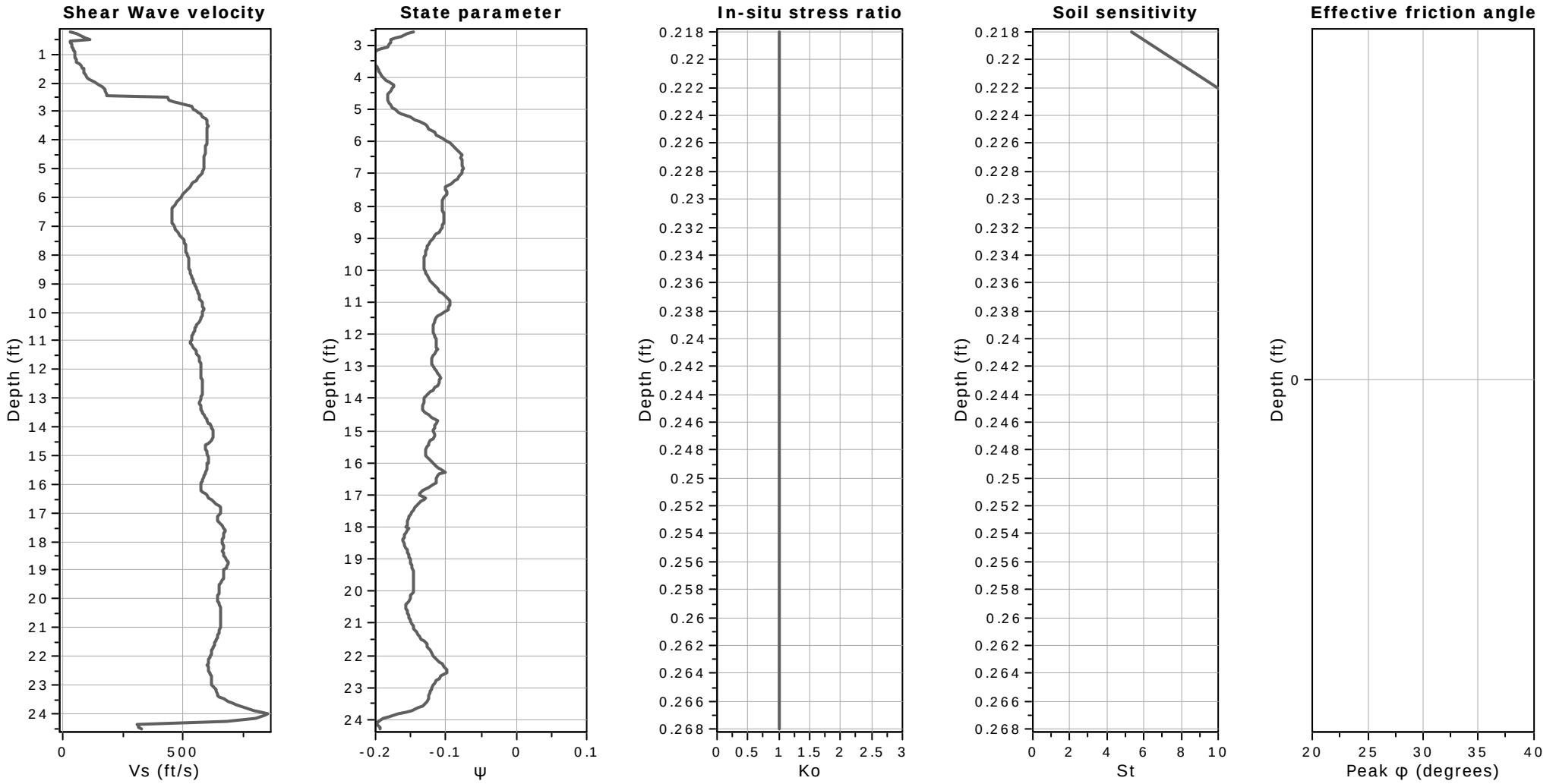
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



Calculation parameters

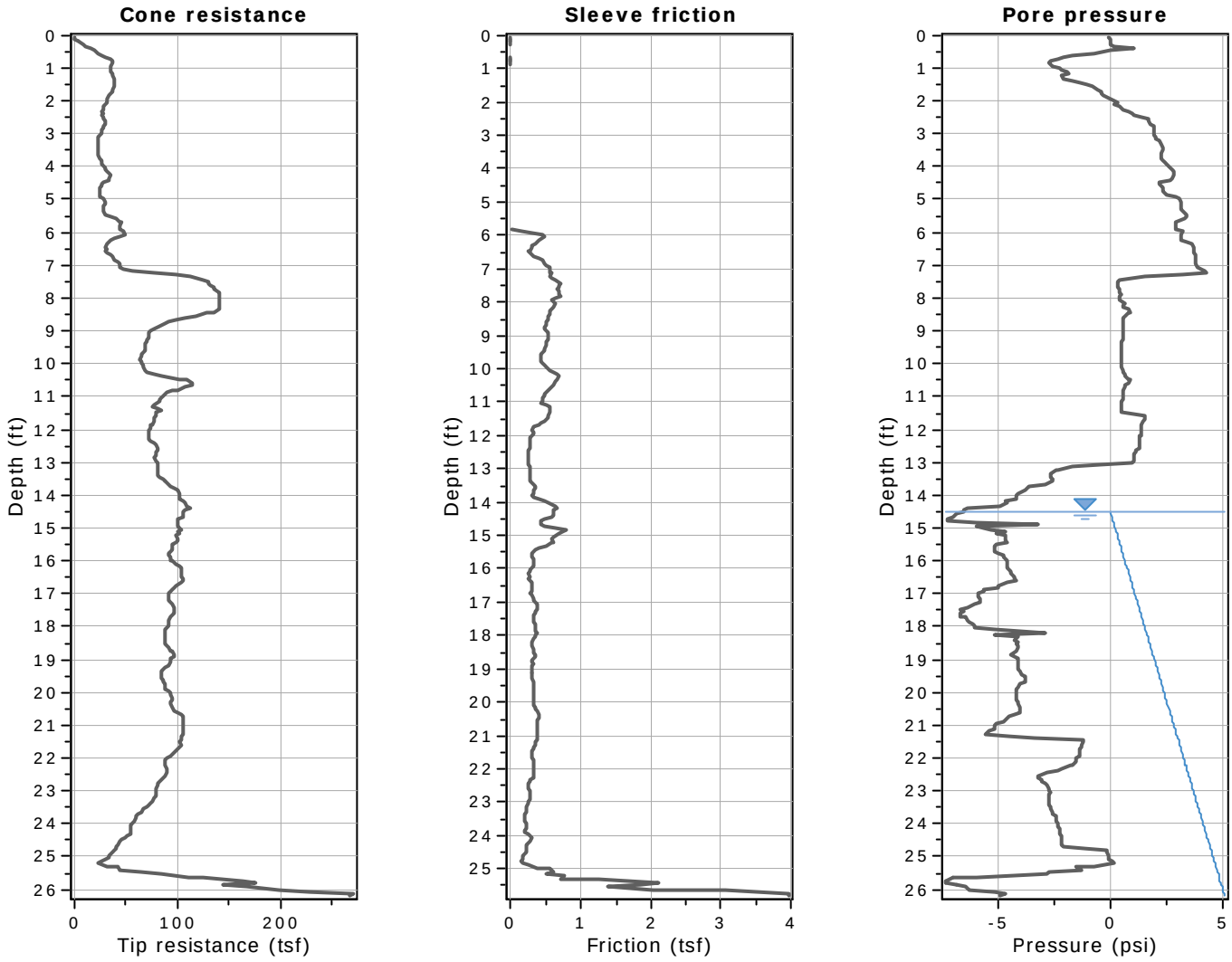
Soil Sensitivity factor, N_S: 7.00

User defined estimation data

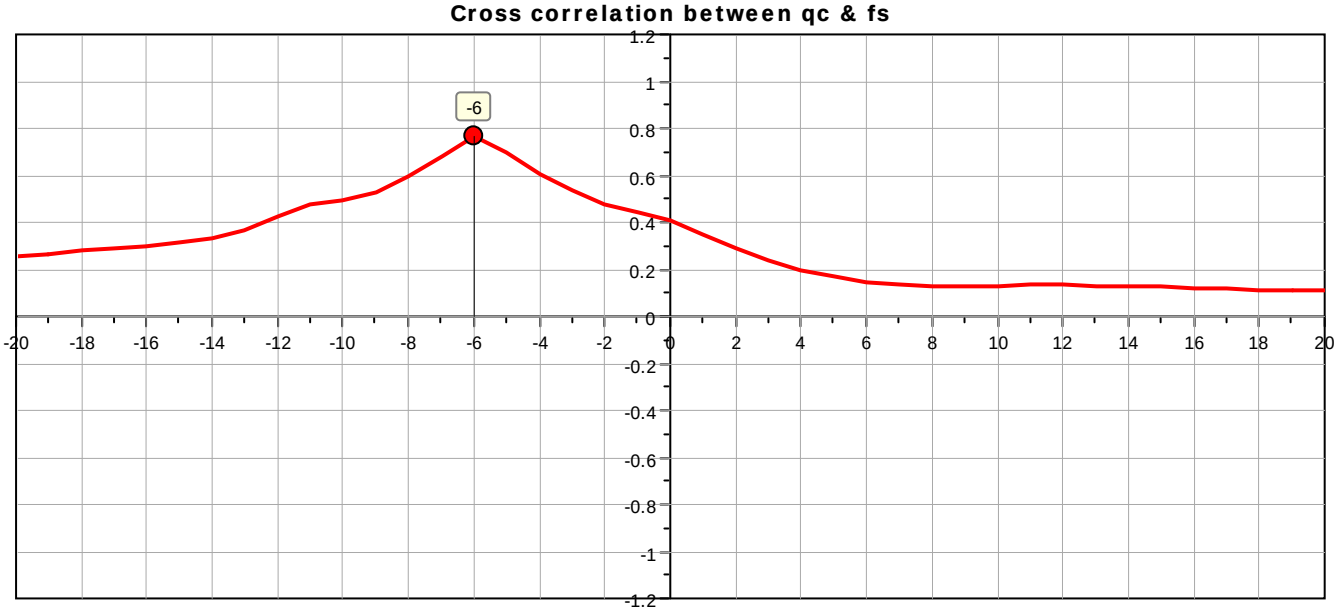
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New Castle DE 19720
302 326 2100

CPT: 9
Total depth: 26.19 ft, Date: 4/20/2022
Surface Elevation: 79.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



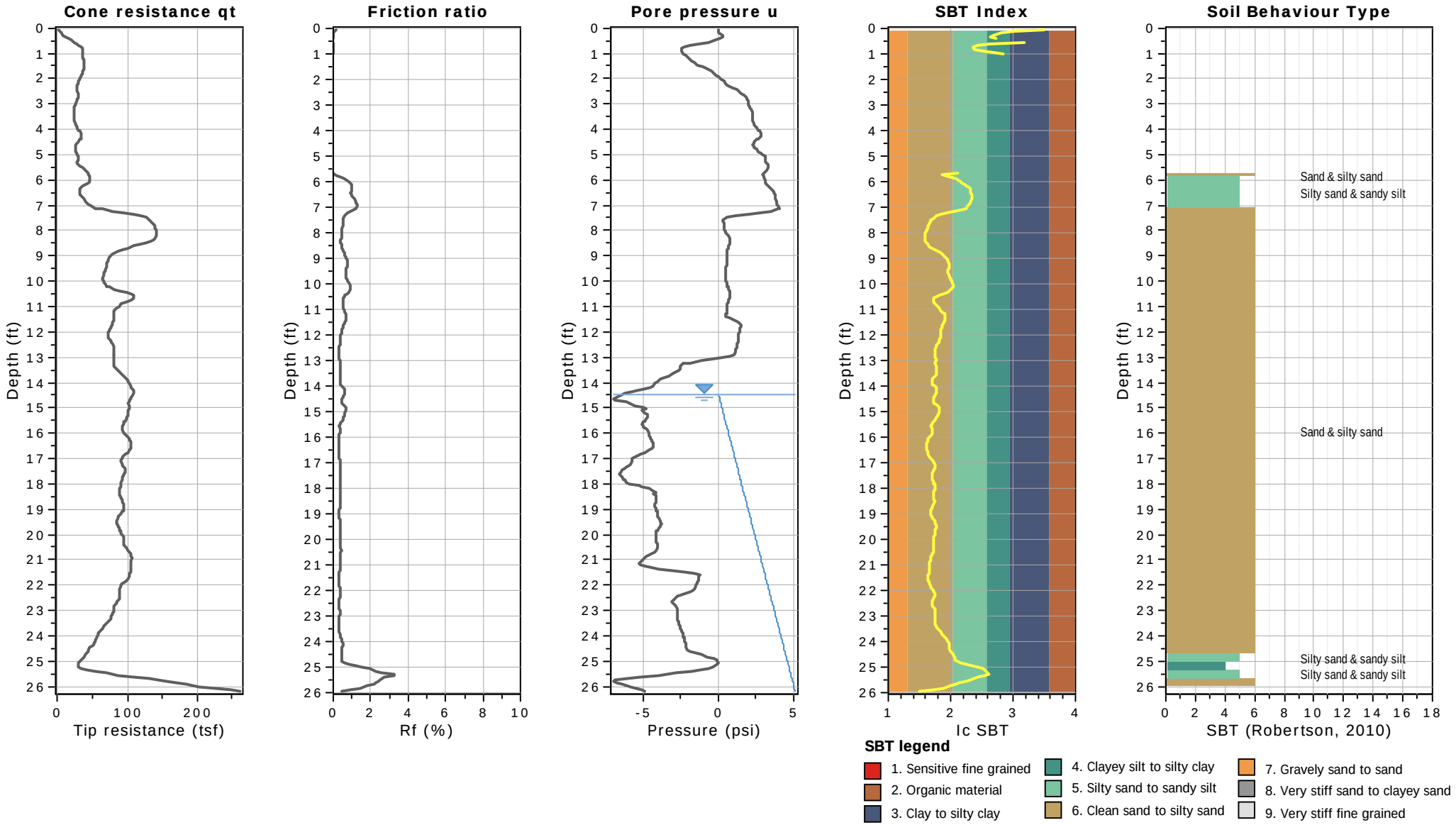
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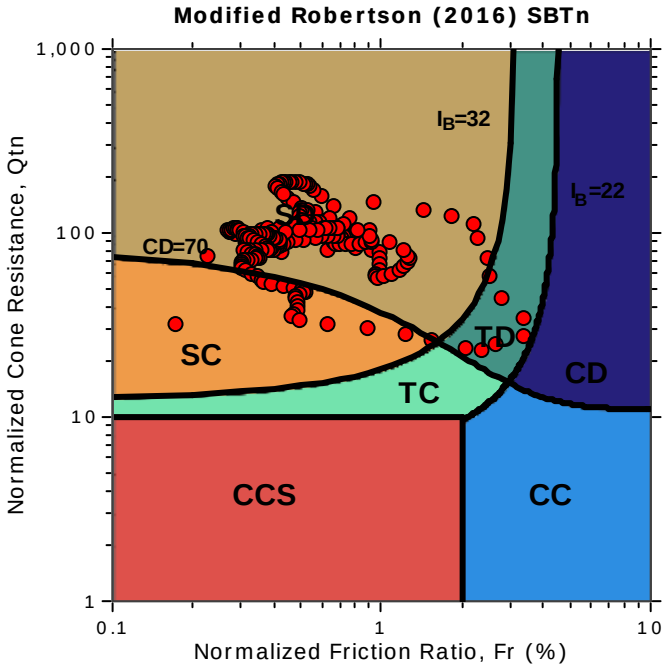


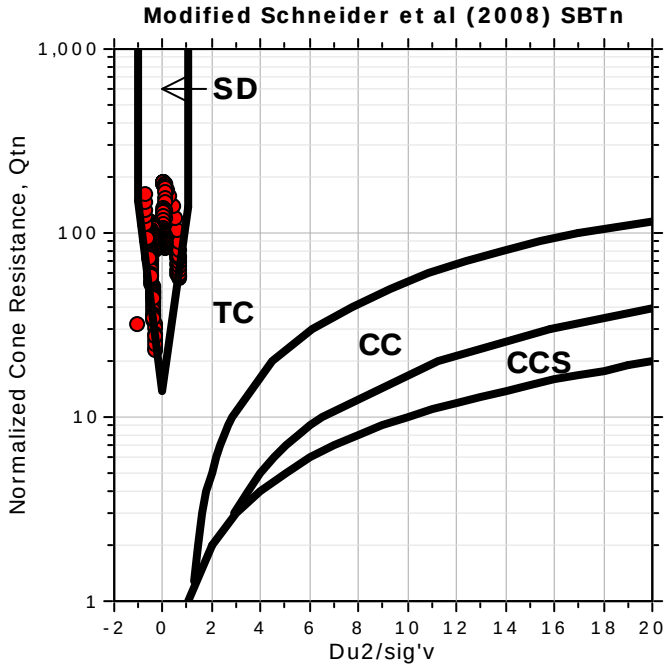
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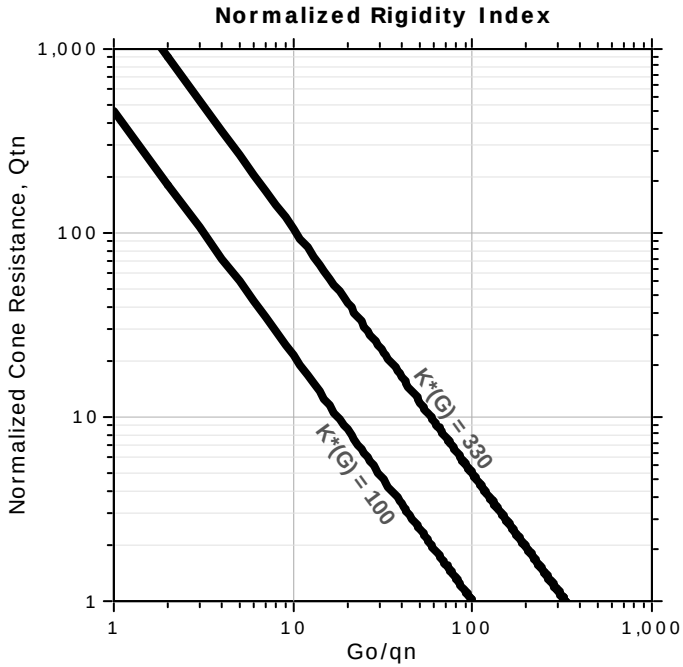
CPT: 9
Total depth: 26.19 ft, Date: 4/20/2022
Surface Elevation: 79.00 ft
Cone Type: Hogentogler
Cone Operator: D. Hans

Project: Hodgson Vo-Tech New Campus
Location: New Castle County, Delaware

Updated SBTn plots







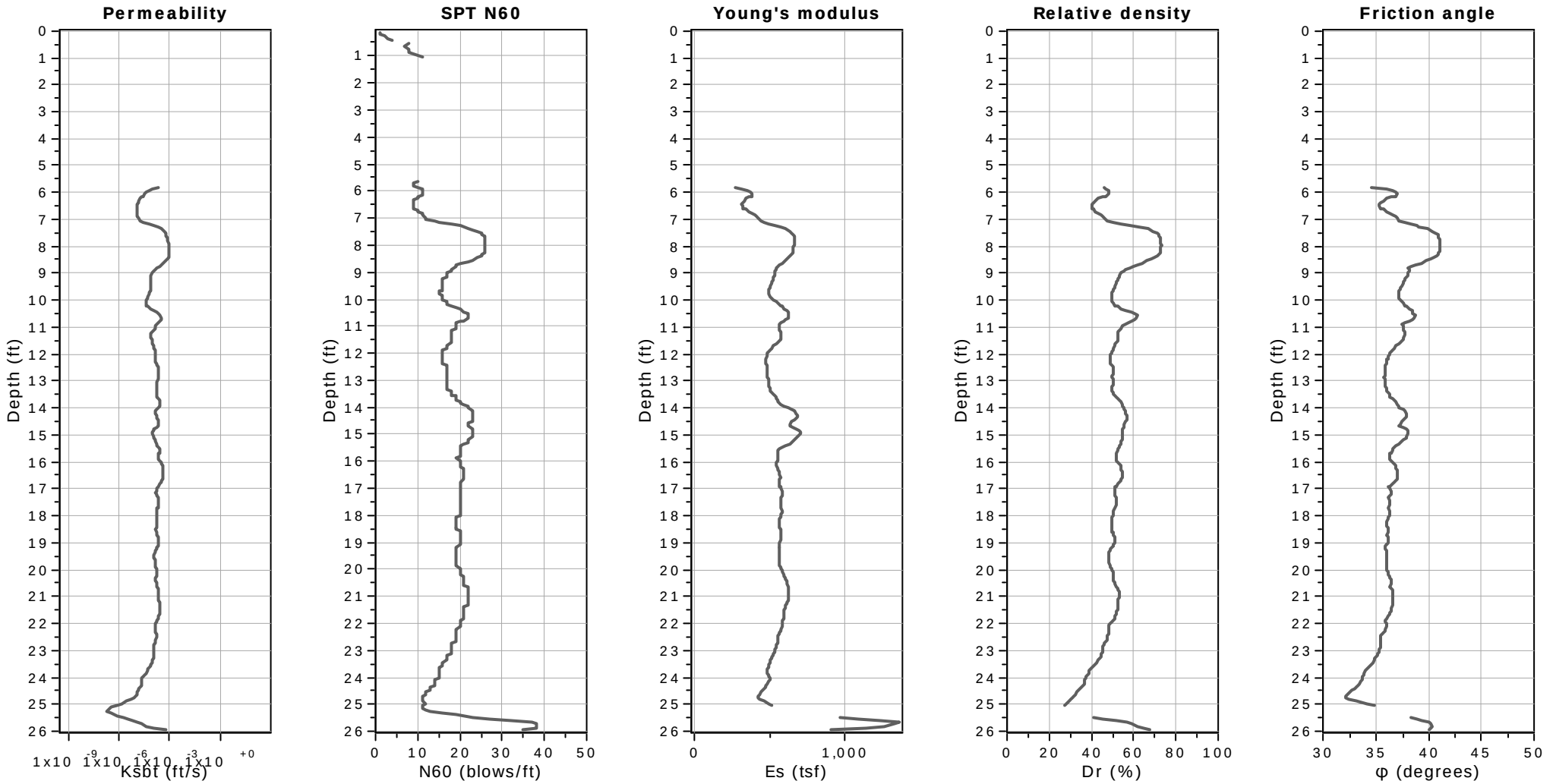
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CC: Clay-like - Contractive
CD: Clay-like - Dilative
TC: Transitional - Contractive
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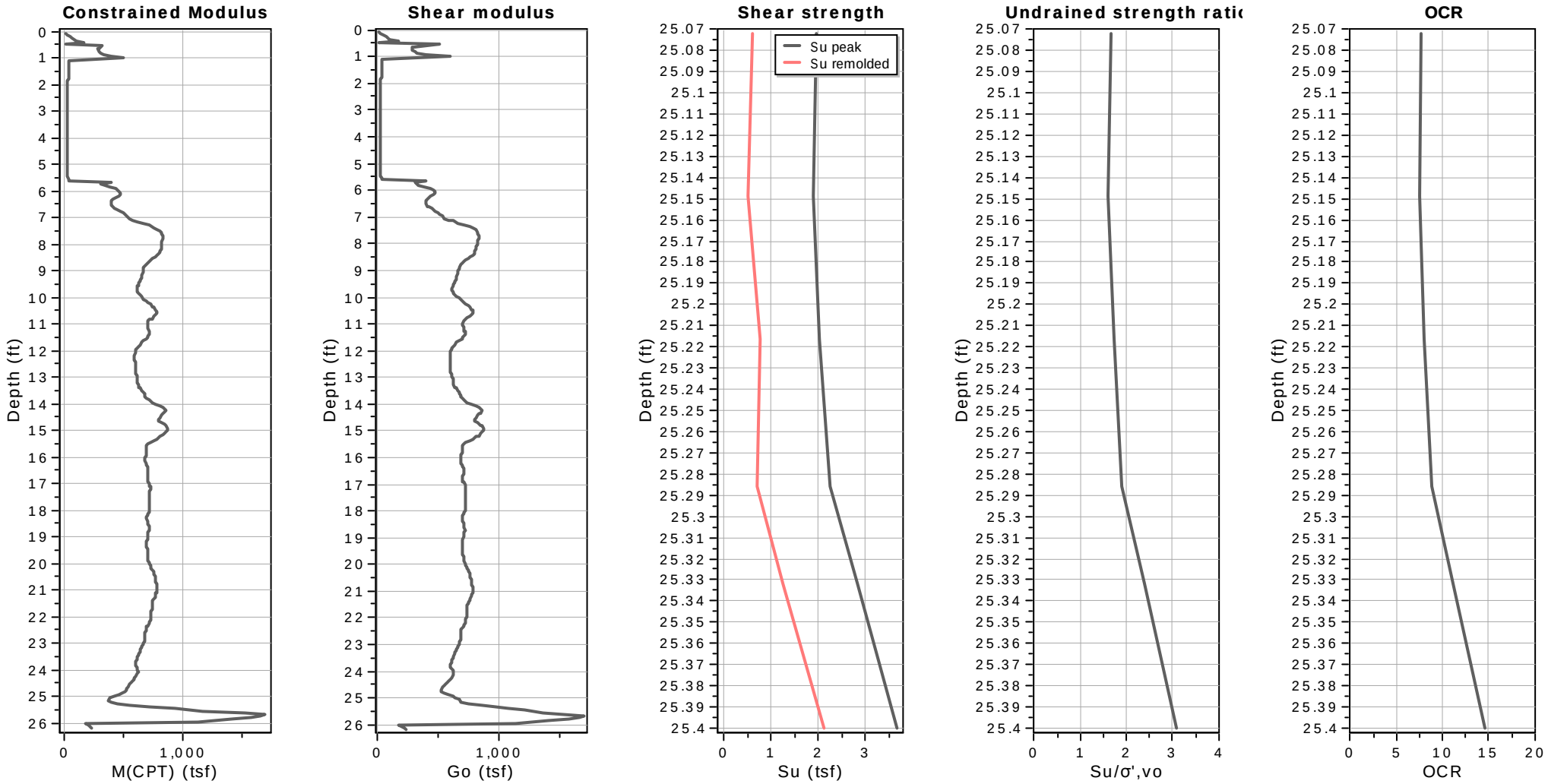
Calculation parameters

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)
User defined estimation data

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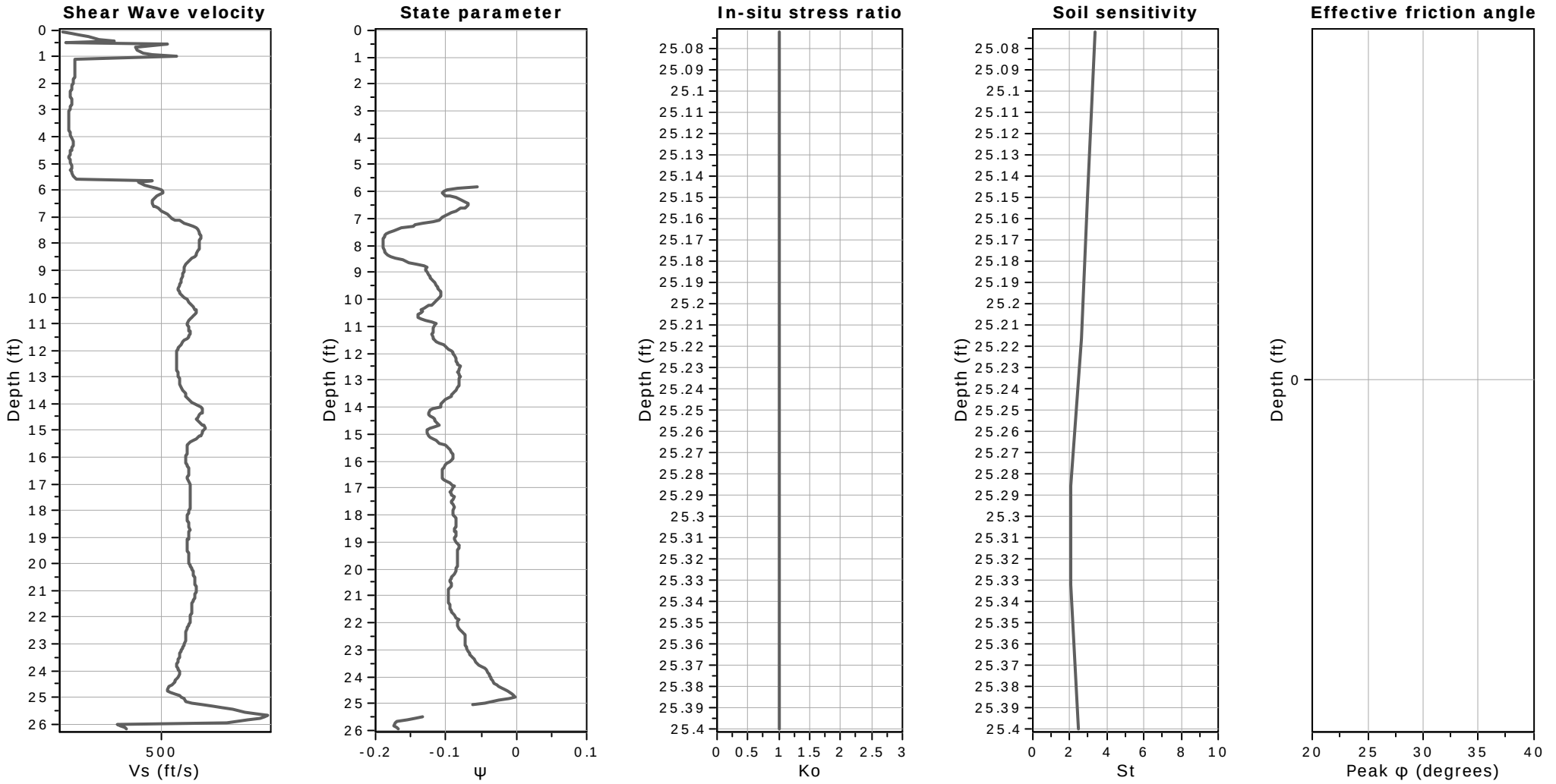
Calculation parameters

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
User defined estimation data
Flat Dilatometer Test data

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Cone Type: Hogentogler
Cone Operator: D. Hans

Project: **Hodgson Vo-Tech New Campus**
Location: **New Castle County, Delaware**



Calculation parameters

Soil Sensitivity factor, N_S: 7.00

User defined estimation data

APPENDIX C

Soil Map—New Castle County, Delaware
(Hodgson Vo-Tech)



Map Scale: 1:4,820 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: New Castle County, Delaware
Survey Area Data: Version 16, Aug 26, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 25, 2020—Sep 5, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EmA	Elkton silt loam, 0 to 2 percent slopes	5.0	7.5%
FgaA	Fallsington loams, 0 to 2 percent slopes, Northern Coastal Plain	4.9	7.3%
ImB	Ingleside-Hammonton-Fallsington complex, 0 to 5 percent slopes	0.5	0.7%
PyB	Pineyneck loam, 2 to 5 percent slopes	36.5	54.8%
UlB	Unicorn loam, 2 to 5 percent slopes	9.9	14.9%
Up	Urban land	9.9	14.8%
Totals for Area of Interest		**66.6**	**100.0%**

Job Name: NCCVT New Hodgson Vo-tech High School Date: 4/29/2022 Employee Name: AJC

Job No.: 220791 Weather: Sunny, 65°F Site Location: New Castle County, DE

Location		INF-1		
Test Depth		6.0 feet		
Test Elevation		EL 71.0		
Test Type		Borehole		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
1:56	S	6	--	--
2:11	E	0	6	24
2:11	S	6	--	--
2:26	E	3/4	5 1/4	21
2:26	S	3/4	--	--
2:28	E	0	3/4	22 1/2
2:28	S	6	--	--
2:43	E	1	5	20
2:43	S	1	--	--
2:46	E	0	1	20
2:46	S	6	--	--
3:01	E	1	5	20
3:01	S	1	--	--
3:04	E	0	1	20
3:04	S	6	--	--
3:29	E	1	5	20
3:29	S	1	--	--
3:32	E	0	1	20
3:33	S	6	--	--
3:48	E	1	5	20
3:48	S	1	--	--
3:51	E	0	1	20
3:51	S	6	--	--
4:06	E	1	5	20
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			

Soil Description: Silty SAND (SM)

Location		INF-2		
Test Depth		6.0 feet		
Test Elevation		EL 72.0		
Test Type		Borehole		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
2:00	S	6	--	--
2:15	E	5	1	4
2:15	S	5	--	--
2:30	E	4	1	4
2:30	S	4	--	--
2:45	E	3	1	4
2:45	S	3	--	--
3:00	E	2 1/8	7/8	3 1/2
3:00	S	6	--	--
3:15	E	5 1/8	7/8	3 1/2
3:15	S	5 1/8	--	--
3:30	E	4 3/8	3/4	3
3:30	S	4 3/8	--	--
3:45	E	3 5/8	3/4	3
3:45	S	3 5/8	--	--
4:00	E	2 7/8	3/4	3
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			

Soil Description: Silty SAND (SM)

Job Name: NCCVT New Hodgson Vo-tech High School Date: 4/21/2022 Employee Name: JVH

Job No.: 220791 Weather: Sunny, 65°F Site Location: New Castle County, DE

Location		INF-3		
Test Depth		6.0 feet		
Test Elevation		EL 72.0		
Test Type		Borehole		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
10:00	S	6	--	--
10:10	E	4 7/8	1 1/8	6 3/4
10:10	S	4 7/8	--	--
10:20	E	3 7/8	1	6
10:20	S	3 7/8	--	--
10:30	E	3 1/8	3/4	4 1/2
10:30	S	3 1/8	--	--
10:40	E	2 5/8	3/4	4 1/2
10:40	S	2 5/8	--	--
10:50	E	2 1/8	1/2	3
10:50	S	2 1/8	--	--
11:00	E	1 7/8	1/4	1 1/2
11:00	S	6	--	
11:10	E	5 1/4	3/4	4 1/2
11:10	S	5 1/4	--	--
11:20	E	4 1/2	3/4	4 1/2
11:20	S	4 1/2	--	--
11:30	E	4	1/2	3
11:30	S	4	--	--
11:40	E	3 1/4	3/4	4 1/2
11:40	S	3 1/4	--	--
11:50	E	2 3/4	1/2	3
11:50	S	2 3/4	--	--
12:00	E	2	3/4	4 1/2
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			

Soil Description: Silty SAND (SM)

Location		INF-4		
Test Depth		6.0 feet		
Test Elevation		EL 75.0		
Test Type		Borehole		
Time	Start/End	Depth to water (inches)	Drop (inches)	Rate (inches per hour)
10:07	S	6	--	--
10:17	E	2	4	24
10:17	S	2	--	--
10:27	E	0	2	12
10:27	S	6	--	--
10:37	E	1 1/2	4 1/2	27
10:37	S	1 1/2	--	--
10:47	E	0	1 1/2	9
10:47	S	6	--	--
10:57	E	4 3/4	1 1/4	7 1/2
10:57	S	4 3/4	--	--
11:07	E	3 1/2	1 1/4	7 1/2
11:07	S	6	--	--
11:17	E	4 3/4	1 1/4	7 1/2
11:17	S	4 3/4	--	--
11:27	E	3 1/2	1 1/4	7 1/2
11:27	S	3 1/2		
11:37	E	2 1/2	1	6
11:37	S	2 1/2	--	--
11:47	E	1 1/2	1	6
11:47	S	1 1/2	--	--
11:57	E	1/2	1	6
11:57	S	6	--	--
12:07	E	5	1	6
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			
	S		--	--
	E			

Soil Description: Clayey SAND (SC)

CONTRACT NO: C-01 CONCRETE AND REINFORCING

BID FORM

For Bids Due: _____

To: NCCVT School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder:_____

Bidder Address:_____

_____

Contact Name: _____E-Mail Address: _____

Delaware Business License No.:_____ Taxpayer ID No.: _____

(Other License Nos.): _____
(A copy of Bidder's Licenses must be attached to this form.)

Phone No.: (_____) _____ - _____ Fax No.: (_____) _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____ ($_____)

ALLOWANCES
We/I confirm that an Allowances in the amount of $150,000.00 have been included in the Base Bid price listed above. This allowance is to be used at the Owner's discretion. All remaining allowance shall be returned to the Owner at completion.

ALTERNATES
Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed-out part that does not apply.

Alternate No. 2: Add Future CTE Shop Expansion (approx. 12,340 SF)

Add/Deduct _____($_____)

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for sixty (60) days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am/We are an Individual/a Partnership/a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ By: _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS
Sub-Contractor List
Non-Collusion Statement
Bid Bond

Consent of Surety
Affidavit of Employee Drug Testing Program
Affidavit of Contractor Qualifications
DBE Subcontractor List
New Castle County Contractor License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

Subcontractor Category	Subcontractor	Address (City & State)	Subcontractors tax-payer ID # or Delaware Business license #
1. Concrete			
2. Waterproofing			
3.			
4.			
5.			

6. NO ADDITIONAL ENTRIES REQUIRED

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract: _____ have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

CONSENT OF SURETY

DATE_____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Gentlemen:

We, the _____

_____
(Surety Company's Address)

_____

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

_____
(Contractor)

_____
(Address)

_____

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of_____ 20_____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

AFFIDAVIT
OF
CONTRACTOR QUALIFICATIONS

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

DBE SUBCONTRACTOR LIST

DBE Name	DBE Address	DBE Phone Number	DBE Email address	DelDOT or OSD Registration Number	DBE Percentage of Contract	Description of Work

Total DBEs on project: _____

END OF SECTION

CONTRACT NO: C-02 FOUNDATION MASONRY

BID FORM

For Bids Due: _____

To: NCCVT School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder:_____

Bidder Address:_____

_____

Contact Name: _____E-Mail Address: _____

Delaware Business License No.:_____ Taxpayer ID No.: _____

(Other License Nos.): _____
(A copy of Bidder's Licenses must be attached to this form.)

Phone No.: (_____) _____ - _____ Fax No.: (_____) _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____ ($_____)

ALLOWANCES
We/I confirm that an Allowances in the amount of $70,000.00 have been included in the Base Bid price listed above. This allowance is to be used at the Owner's discretion. All remaining allowance shall be returned to the Owner at completion.

ALTERNATES
Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed-out part that does not apply.

Alternate No. 2: Add Future CTE Shop Expansion (approx. 12,340 SF)

Add/Deduct _____($_____)

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for sixty (60) days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am/We are an Individual/a Partnership/a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ By: _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS
Sub-Contractor List
Non-Collusion Statement

Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program
Affidavit of Contractor Qualifications
DBE Subcontractor List
New Castle County Contractor License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

	Subcontractor Category	**Subcontractor**	**Address (City & State)**	**Subcontractors tax-payer ID # or Delaware Business license #**
1.	Masonry			
2.				
3.				
4.				
5.				
6.	NO ADDITIONAL ENTRIES REQUIRED			

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract: _____ have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

CONSENT OF SURETY

DATE_____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Gentlemen:

We, the _____

_____
(Surety Company's Address)

_____

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

_____
(Contractor)

_____
(Address)

_____

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of_____ 20_____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

AFFIDAVIT
OF
CONTRACTOR QUALIFICATIONS

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

DBE SUBCONTRACTOR LIST

DBE Name	DBE Address	DBE Phone Number	DBE Email address	DelDOT or OSD Registration Number	DBE Percentage of Contract	Description of Work

Total DBEs on project: _____

END OF SECTION

CONTRACT NO: C-03 STRUCTURAL STEEL, JOISTS, AND DECK

BID FORM

For Bids Due: _____

To: NCCVT School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder:_____

Bidder Address:_____

_____

Contact Name: _____E-Mail Address: _____

Delaware Business License No.:_____ Taxpayer ID No.: _____

(Other License Nos.): _____
(A copy of Bidder's Licenses must be attached to this form.)

Phone No.: (_____) _____ - _____ Fax No.: (_____) _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____ ($_____)

ALLOWANCES
We/I confirm that an Allowances in the amount of $120,000.00 have been included in the Base Bid price listed above. This allowance is to be used at the Owner's discretion. All remaining allowance shall be returned to the Owner at completion.

ALTERNATES
Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed-out part that does not apply.

Alternate No. 2: Add Future CTE Shop Expansion (approx. 12,340 SF)

Add/Deduct _____($_____)

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for sixty (60) days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am/We are an Individual/a Partnership/a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ By: _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS
Sub-Contractor List
Non-Collusion Statement

Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program
Affidavit of Contractor Qualifications
DBE Subcontractor List
New Castle County Contractor License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

	Subcontractor Category	**Subcontractor**	**Address (City & State)**	**Subcontractors tax-payer ID # or Delaware Business license #**
1.	Steel			
2.				
3.				
4.				
5.				

6. NO ADDITIONAL ENTRIES REQUIRED

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract: _____ have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

CONSENT OF SURETY

DATE_____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Gentlemen:

We, the _____

_____
(Surety Company's Address)

_____

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

_____
(Contractor)

_____
(Address)

_____

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of_____ 20_____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

AFFIDAVIT
OF
CONTRACTOR QUALIFICATIONS

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

DBE SUBCONTRACTOR LIST

DBE Name	DBE Address	DBE Phone Number	DBE Email address	DelDOT or OSD Registration Number	DBE Percentage of Contract	Description of Work

Total DBEs on project: _____

END OF SECTION

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

BID BOND

KNOW ALL MEN BY THESE PRESENTS That: _____ _____of _____ in the County of _____ and State of _____as **Principal**, and _____ of _____ in the County of _____ and State of _____ as **Surety**, legally authorized to do business in the State of Delaware ("**State**"), are held and firmly unto the **State** in the sum of _____ Dollars ($_____ _____), or _____ percent not to exceed _____ _____ Dollars ($_____) of amount of bid on Contract No. _____ _____, to be paid to the **State** for the use and benefit of New Castle County Vocation Technical School District, 1417 Newport Road, Wilmington, DE 19804 for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bonded **Principal** who has submitted to the New Castle County Vocation Technical School District, 1417 Newport Road, Wilmington, DE 19804 a certain proposal to enter into this contract for the furnishing of certain material and/or services within the **State**, shall be awarded this Contract, and if said **Principal** shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the New Castle County Vocation Technical School District, 1417 Newport Road, Wilmington, DE 19804 this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this _____day of _____ in the year of our Lord two thousand and _____ (20____).

SEALED, AND DELIVERED IN THE
Presence of

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____

_____
Title

_____
Name of Surety

Witness:_____ By: _____

_____
Title

SECTION 005200 - AGREEMENT

1. SUMMARY

A. The Agreement Form for this Project is the American Institute of Architects Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, AIA Document A132 – 2019 as modified by the Owner's standard amendment to the A132.

B. A copy of AIA Document A132 - 2019 Edition is bound into this Project Manual following this page.

1. Under Article 5.1.4.4 add the following:

"Upon completion of the work under the Contract, the Owner may release 60% of the amount then retained. The balance of the amount retained will be held until:

a. All reports required of the Contract are received;
b. All Subcontractors in trades listed on the Bid Form are paid by the Contractor, unless the amount owed to the Subcontractor is disputed, in which case the Owner may withhold 150% of the amount withheld by the Contractor in its dispute with the Subcontractor; and
c. Final payment is authorized by the Owner."

END OF SECTION

DRAFT

AIA® Document A132® – 2019

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month, and year.)

BETWEEN the Owner:
(Name, legal status, address, and other information)

New Castle County Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

and the Contractor:
(Name, legal status, address, and other information)

TBD

for the following Project:
(Name, location, and detailed description)

Hodgson Vocational Technical High School
2575 Glasgow Avenue
Newark, DE 19702

The Construction Manager:
(Name, legal status, address, and other information)

EDiS Company
110 South Poplar Street, Suite 400
Wilmington, DE 19801

The Architect:
(Name, legal status, address, and other information)

Joint Venture:
ABHA
1621 North Lincoln Street
Wilmington, DE 19806

BSA+A
954 Justison Street
Wilmington, DE 19801

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An ***Additions and Deletions Report*** that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

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User Notes: (1246710833)

TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS
EXHIBIT B DETERMINATION OF THE COST OF THE WORK

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[« »] The date of this Agreement.

[« »] A date set forth in a notice to proceed issued by the Owner.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

« »

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:
(Insert the date of Substantial Completion of the Work of all Contractors for the Project.)

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« »

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of all of the Contractors for the Project are to be completed prior to Substantial Completion of the entire Work of all of the Contractors for the Project, the Contractors shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:
(Check one of the following boxes and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« »] By the following date: « »

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:
(Check the appropriate box.)

[«X»] Stipulated Sum, in accordance with Section 4.2 below

[« »] Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below

[« »] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)

§ 4.2 Stipulated Sum

§ 4.2.1 The Contract Sum shall be « » ($ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

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Item	Price	Conditions for Acceptance

§ 4.2.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.2.4 Unit prices, if any:
(Identify the item and state the unit price, and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.3 NOT USED - Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price
§ 4.3.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.

§ 4.3.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

« »

§ 4.3.3 The method of adjustment of the Contractor's Fee for changes in the Work:

« »

§ 4.3.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

« »

§ 4.3.5 Rental rates for Contractor-owned equipment shall not exceed « » percent (« » %) of the standard rental rate paid at the place of the Project.

§ 4.3.6 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.3.7 The Contractor shall prepare and submit to the Construction Manager, within 14 days of executing this Agreement, a written Control Estimate for the Owner's review and approval. The Control Estimate shall include the items in Section B.1 of Exhibit B, Determination of the Cost of the Work.

§ 4.4 NOT USED - Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price
§ 4.4.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.

§ 4.4.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

« »

§ 4.4.3 The method of adjustment of the Contractor's Fee for changes in the Work:

« »

§ 4.4.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

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« »

§ 4.4.5 Rental rates for Contractor-owned equipment shall not exceed « » percent (« » %) of the standard rental rate paid at the place of the Project.

§ 4.4.6 Unit Prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.4.7 Guaranteed Maximum Price
§ 4.4.7.1 The Contract Sum is guaranteed by the Contractor not to exceed « » ($ « »), subject to additions and deductions by Change Order as provided in the Contract Documents. This maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.

§ 4.4.7.2 Alternates
§ 4.4.7.2.1 Alternates, if any, included in the Guaranteed Maximum Price:

Item	Price

§ 4.4.7.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.4.7.3 Allowances, if any, included in the Guaranteed Maximum Price:
(Identify each allowance.)

Item	Price

§ 4.4.7.4 Assumptions, if any, upon which the Guaranteed Maximum Price is based:
(Identify each assumption.)

« »

§ 4.4.8 To the extent that the Contract Documents are anticipated to require further development, the Guaranteed Maximum Price includes the costs attributable to such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes, or equipment, all of which, if required, shall be incorporated by Change Order.

§ 4.4.9 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in Section 4.4.7.4. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner and Architect of any inconsistencies between the agreed-upon assumptions contained in Section 4.4.7.4 and the revised Contract Documents.

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any, to be assessed in accordance with Section 3.4.)

« »

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§ 4.6 Other:
(Insert provisions for bonus, cost savings or other incentives, if any, that might result in a change to the Contract Sum.)

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and Certificates for Payment issued by the Construction Manager and Architect, the Owner shall make progress payments on account of the Contract Sum, to the Contractor, as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the « » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « » day of the « » month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « » (« ») days after the Construction Manager receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.4.2 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 The amount of each progress payment shall first include:

- **.1** That portion of the Contract Sum properly allocable to completed Work;
- **.2** That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- **.3** That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.4.3.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- **.4** For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and
- **.5** Retainage withheld pursuant to Section 5.1.7.

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§ 5.1.5 NOT USED -

Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price

§ 5.1.5.1 With each Application for Payment, the Contractor shall submit the cost control information required in Exhibit B, Determination of the Cost of the Work, along with payrolls, petty cash accounts, receipted invoices, or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor, plus payrolls for the period covered by the present Application for Payment, less that portion of the payments attributable to the Contractor's Fee.

§ 5.1.5.2 Applications for Payment shall show the Cost of the Work actually incurred by the Contractor through the end of the period covered by the Application for Payment and for which the Contractor has made or intends to make actual payment prior to the next Application for Payment.

§ 5.1.5.3 In accordance with AIA Document A232–2019 and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.5.3.1 The amount of each progress payment shall first include:

.1 The Cost of the Work as described in Exhibit B, Determination of the Cost of the Work;

.2 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and

.3 The Contractor's Fee computed upon the Cost of the Work described in the preceding Section 5.1.5.3.1.1 at the rate stated in Section 4.3.2; or if the Contractor's Fee is stated as a fixed sum in Section 4.3.2 an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work included in Section 5.1.5.3.1.1 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

§ 5.1.5.3.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;

.5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.5.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and

.6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.5.4 The Owner, Construction Manager and Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.5.5 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor, and such action shall not be deemed to be a representation that (1) the Construction Manager and Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Article 5 or other supporting data; (2) that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager and Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 5.1.5.6 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

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§ 5.1.5.7 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232–2019.

§ 5.1.6 NOT USED -

Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price

§ 5.1.6.1 With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Contractor's Fee.

§ 5.1.6.2 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed Maximum Price among: (1) the various portions of the Work; (2) any contingency for costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order; and (3) the Contractor's Fee.

§ 5.1.6.2.1 The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.6.2.2 The allocation of the Guaranteed Maximum Price under this Section 5.1.6.2 shall not constitute a separate guaranteed maximum price for the Cost of the Work of each individual line item in the schedule of values.

§ 5.1.6.2.3 When the Contractor allocates costs from a contingency to another line item in the schedule of values, the Contractor shall submit supporting documentation to the Architect and Construction Manager.

§ 5.1.6.3 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work and for which the Contractor has made payment or intends to make payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

§ 5.1.6.4 In accordance with AIA Document A232–2019, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.4.1 The amount of each progress payment shall first include:

- **.1** That portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the most recent schedule of values;
- **.2** That portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction or, if approved in writing in advance by the Owner, suitably stored off the site at a location agreed upon in writing;
- **.3** That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and
- **.4** The Contractor's Fee, computed upon the Cost of the Work described in the preceding Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work included in Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

§ 5.1.6.4.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

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~~.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;~~

~~.5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.6.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and~~

~~.6 Retainage withheld pursuant to Section 5.1.7.~~

~~**§ 5.1.6.5** The Owner and the Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.~~

~~**§ 5.1.6.6** In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and such action shall not be deemed to be a representation that (1) the Construction Manager or Architect have made a detailed examination, audit, or arithmetic verification of the documentation submitted in accordance with Section 5.1.6.1 or other supporting data; (2) that the Construction Manager or Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager or Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.~~

~~**§ 5.1.6.7** Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.~~

~~**§ 5.1.6.8** If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232–2019.~~

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« »

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

« »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to when the entire Work of this Contract is substantially complete, including modifications for completion of portions of the Work as provided in Section 3.4.2, insert provisions for such modifications.)

« »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, when the Work of this Contract is substantially complete, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted when the Work of this Contract is substantially complete shall not include retainage as follows:
(Insert any other conditions for release of retainage when the Work of this Contract is substantially complete, or upon Substantial Completion of the Work of all Contractors on the Project or portions thereof.)

« »

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§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect.

§ 5.2.1.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

« »

§ 5.2.2 NOT USED - Final Payment Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price

~~**§ 5.2.2.1** Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when~~

~~**.1** the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment;~~

~~**.2** the Contractor has submitted a final accounting for the Cost of the Work, pursuant to Exhibit B, Determination of the Cost of the Work and a final Application for Payment; and~~

~~**.3** a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect in accordance with Exhibit B, Determination of the Cost of the Work.~~

~~**§ 5.2.2.2** The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:~~

~~« »~~

§ 5.3 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

« » % « »

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« »
« »
« »
« »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A232–2019, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« »] Arbitration pursuant to Article 15 of AIA Document A232–2019.

[« »] Litigation in a court of competent jurisdiction.

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[« »] Other: *(Specify)*

« »

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

« »

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019.

§ 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price

§ 7.2.1 Termination

§ 7.2.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.2.1.2 Termination by the Owner for Cause

§ 7.2.1.2.1 If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232–2019, the Owner shall then only pay the Contractor an amount as follows:

.1 Take the Cost of the Work incurred by the Contractor to the date of termination;

.2 Add the Contractor's Fee, computed upon the Cost of the Work to the date of termination at the rate stated in Section 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion;

.3 Subtract the aggregate of previous payments made by the Owner; and

.4 Subtract the costs and damages incurred, or to be incurred, by the Owner under Article 14 of AIA Document A232–2019.

§ 7.2.1.2.2 When the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, if the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232-2019, the amount, if any, to be paid to the Contractor under Article 14 of AIA Document A232-2019 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.1.2.1.

§ 7.2.1.2.3 The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 7.2.1.2.1.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 7, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders. All Subcontracts, purchase orders and rental agreements entered into by the Contractor will contain provisions allowing for assignment to the Owner as described above.

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§ 7.2.1.3 Termination by the Owner for Convenience

If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of or method for determining the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

« »

§ 7.3 Suspension

The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019; in such case, the Contract Sum and Contract Time shall be increased as provided in Article 14 of AIA Document A232–2019, except that the term "profit" shall be understood to mean the Contractor's Fee as described in Section 4.3.2 or 4.4.2, as applicable, of this Agreement.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:

(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

§ 8.3 The Contractor's representative:

(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A132™–2019, Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

« »

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§ 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Contractor's skill and judgment in furthering the interests of the Owner; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner's interests. The Owner agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

« »

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

.2 AIA Document A132™–2019, Exhibit A, Insurance and Bonds Exhibit

.3 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

« »

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

~~[« »] AIA Document A132™–2019, Exhibit B, Determination of the Cost of the Work~~

[« »] AIA Document E235™–2019, Sustainable Projects Exhibit, Construction Manager as Adviser Edition, dated as indicated below:
(Insert the date of the E235-2019 incorporated into this Agreement.)

« »

[« »] The Sustainability Plan:

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Title	Date	Pages

[« »] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232–2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

This Agreement is entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
« »« »	« »« »
(Printed name and title)	*(Printed name and title)*

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DRAFT AIA® Document A132® – 2019 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the « » day of « » in the year « »
(In words, indicate day, month, and year.)

for the following **PROJECT**:
(Name and location or address)

«Hodgson Vocational Technical High School»
«2575 Glasgow Avenue
Newark, DE 19702»

THE OWNER:
(Name, legal status, and address)

«New Castle County Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804»

THE CONTRACTOR:
(Name, legal status, and address)

« »« »
« »

TABLE OF ARTICLES

A.1 GENERAL

A.2 OWNER'S INSURANCE

A.3 CONTRACTOR'S INSURANCE AND BONDS

A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A232™–2019, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An ***Additions and Deletions Report*** that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A232™–2019, General Conditions of the Contract for Construction. Article 11 of A232™–2019 contains additional insurance provisions

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§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to false work and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's, Construction Manager's, and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

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§ A.2.4 Optional Extended Property Insurance.

The Owner shall purchase and maintain the insurance selected and described below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[« »] **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance**, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

« »

[« »] **§ A.2.4.2 Ordinance or Law Insurance**, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

« »

[« »] **§ A.2.4.3 Expediting Cost Insurance**, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

« »

[« »] **§ A.2.4.4 Extra Expense Insurance**, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

« »

[« »] **§ A.2.4.5 Civil Authority Insurance**, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

« »

[« »] **§ A.2.4.6 Ingress/Egress Insurance**, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

« »

[« »] **§ A.2.4.7 Soft Costs Insurance**, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

« »

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

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[« »] **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

« »

[« »] **§ A.2.5.2 Other Insurance**
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect and the Architect's consultants, and the Construction Manager and the Construction Manager's consultants, as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, and the Construction Manager and the Construction Manager's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than « » ($ « ») each occurrence, « » ($ « ») general aggregate, and « » ($ « ») aggregate for products-completed operations hazard, providing coverage for claims including

.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;

.2 personal injury and advertising injury;

.3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;

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.4 bodily injury or property damage arising out of completed operations; and
.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

.1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
.2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
.3 Claims for bodily injury other than to employees of the insured.
.4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
.5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
.6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
.7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
.8 Claims related to roofing, if the Work involves roofing.
.9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
.10 Claims related to earth subsidence or movement, where the Work involves such hazards.
.11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than « » ($ « ») per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than « » ($ « ») each accident, « » ($ « ») each employee, and « » ($ « ») policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

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§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[« »] **§ A.3.3.2.1** If there is only one Contractor performing the Work on the Project, property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:

(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

« »

[« »] **§ A.3.3.2.2 Railroad Protective Liability Insurance**, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate, for Work within fifty (50) feet of railroad property.

[« »] **§ A.3.3.2.3 Asbestos Abatement Liability Insurance**, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[« »] **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[« »] **§ A.3.3.2.5** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

[« »] **§ A.3.3.2.6 Other Insurance**

(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits

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§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	« »
Performance Bond	

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

« »

DRAFT

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STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

SECTION 00 54 13

SUPPLEMENT TO AGREEMENT BETWEEN OWNER AND CONTRACTOR A132-2019

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor, Construction Manager as Advisor Edition" AIA Document A132-2019. Where a portion of the Standard Form of Agreement is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement shall remain in effect.

ARTICLE 3: DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

3.1 Delete paragraph 3.1 in its entirety and replace with the following:

"The date of Commencement of the Work shall be a date set forth in a notice to proceed issued by the Owner."

3.3.1 In the space provided, insert "As defined in Article 9.8 of AIA Document A232-2019 and amended by the Owner's 'Supplementary General Conditions A232-2019'"

ARTICLE 4: CONTRACT SUM

4.1 Delete paragraph 4.1 in its entirety and replace with the following:

"The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be a Stipulated Sum, in accordance with Section 4.2 below.

4.3 Delete paragraph 4.3 in its entirety.

4.4 Delete paragraph 4.4 in its entirety.

ARTICLE 5: PAYMENTS

5.1 PROGRESS PAYMENTS

5.1.3 Delete paragraph 5.1.3 in its entirety and replace with the following:

"Provided that a valid Application for Payment is received by the Architect that meets all requirements of the Contract, payment shall be made by the Owner not later than 30 days after the Owner receives the valid Application for Payment."

5.1.5 Delete paragraph 5.1.5 in its entirety.

5.1.6 Delete paragraph 5.1.6 in its entirety.

5.2.2 Delete paragraph 5.2.2 in its entirety.

5.3 Insert the interest rate of "1% per month not to exceed 12% per annum."

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

ARTICLE 6: DISPUTE RESOLUTION

6.2 BINDING DISPUTE RESOLUTION

Check the box “Other” – and add the following sentence:

"Any remedies available in law or in equity."

ARTICLE 7: TERMINATION or SUSPENSION

7.1.1.1 Delete paragraph 7.1.1.1 in its entirety.

7.2 Delete paragraph 7.2 in its entirety.

ARTICLE 8: MISCELLANEOUS PROVISIONS

8.4 Delete paragraph 8.4 in its entirety and replace with the following:

“The Contractor’s representative shall not be changed without ten days written notice to the Owner.”

8.7 Delete paragraph 8.7 in its entirety.

ARTICLE 9: ENUMERATION OF CONTRACT DOCUMENTS

9.1.9 Insert “Supplement to Agreement Between Owner and Contractor A132-2019”

9.1.9 Insert “Supplementary General Conditions A232-2019”

END OF SECTION

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

SECTION 00 54 14

SUPPLEMENT TO A132-2019 – EXHIBIT A - INSURANCE AND BONDS

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor, *Construction Manager as Adviser Edition*" AIA Document A132-2019 Exhibit A Insurance and Bonds. Where a portion of the Standard Form of Agreement, Exhibit A is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement, Exhibit A shall remain in effect.

ARTICLE A.2 OWNER'S INSURANCE

A.2.1 General

Delete paragraph A.2.1 in its entirety.

A.2.2 Liability Insurance

Delete paragraph A.2.2 in its entirety, except in the case of school projects this paragraph shall remain.

A.2.3 Required Property Insurance

Delete paragraph A.2.3 in its entirety.

A.2.4 Optional Extended Property Insurance

Delete paragraph A.2.4 in its entirety.

A.2.5 Other Optional Insurance

Delete paragraph A.2.5 in its entirety.

ARTICLE A.3 CONTRACTORS INSURANCE AND BONDS

A.3.1.1 Strike the last sentence of the paragraph.

A.3.1.3 Additional Insured Obligations

In the first sentence after "coverage to include (1)" delete "(1) the Owner,".

Strike the remainder of the first sentence beginning at the semicolon "; and (2) the Owner" through the end of the sentence.

Delete the second sentence in its entirety.

A.3.2.2.1 Insert "$1,000,000.00" in the blank for each occurrence.
Insert "$3,000,000.00" in the blank for general aggregate.
Insert "$3,000,000.00" in the blank for aggregate for products-completed operations hazard.

A.3.2.3 Insert “$1,000,000.00” in the blank for per accident.

A.3.2.6 Insert “$500,000.00” in the blank for each accident.
Insert “$500,000.00” in the blank for each employee.
Insert “$500,000.00” in the blank for policy limit.

A.3.2.8 Insert “$1,000,000.00” in the blank for per claim.
Insert “$3,000,000.00” in the blank for in the aggregate.

A.3.2.9 Insert “$1,000,000.00” in the blank for per claim.
Insert “$3,000,000.00” in the blank for in the aggregate.

A.3.2.10 Insert “$2,000,000.00” in the blank for per claim.
Insert “$4,000,000.00” in the blank for in the aggregate.

A.3.2.11 Strike in its entirety.

A.3.2.12 Strike in its entirety.

A.3.3.2.1 Delete paragraph 3.3.2.1 in its entirety

A.3.3.2.2 Strike in its entirety.

A.3.3.2.3 Insert “$1,000,000.00” in the blanks for per claim.
Insert “$3,000,000.00” in the blanks for in the aggregate.

A.3.4 Insert the actual contract price in both the Payment Bond and the Performance Bond Penal Sum blanks. It must be 100% of the contract price.

Strike the last sentence in this section and replace with “Payment and Performance Bonds shall be in the standard form issued by the Delaware Office of Management and Budget.”

END OF SECTION

SECTION 006113 – PERFORMANCE AND PAYMENT BONDS

1. PERFORMANCE AND PAYMENT BONDS

1.1 Bonds must be in the following form:

1. Form of Performance Bond (006113.13 attached).
2. Form of Payment Bond (006113.16 attached).

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

PERFORMANCE BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of _____, as surety ("**Surety**"), are held and firmly bound unto the New Castle County Vocational Technical School District 1417 Newport Road Wilmington, DE 19804 ("**Owner**"), in the amount of _____ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

.

Sealed with our seals and dated this _____ day of _____, 20___.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. _____ dated the _____ day of _____, 20__ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly provide and furnish all materials, appliances and tools and perform all the work required under and pursuant to the terms and conditions of the Contract and the Contract Documents (as defined in the Contract) or any changes or modifications thereto made as therein provided, shall make good and reimburse **Owner** sufficient funds to pay the costs of completing the Contract that **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, hereby stipulates and agrees, if requested to do so by **Owner**, to fully perform and complete the work to be performed under the Contract pursuant to the terms, conditions and covenants thereof, if for any cause **Principal** fails or neglects to so fully perform and complete such work.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers,

assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____ (SEAL)
Name: Name:
Title:

(Corporate Seal)

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

PAYMENT BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of _____, as surety ("**Surety**"), are held and firmly bound unto the New Castle County Vocational Technical School District 1417 Newport Road Wilmington, DE 19804 ("**Owner**"), in the amount of _____ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

Sealed with our seals and dated this _____ day of_____, 20__.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No._____ _____dated the _____ day of _____, 20__ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly pay all and every person furnishing materials or performing labor or service in and about the performance of the work under the Contract, all and every sums of money due him, her, them or any of them, for all such materials, labor and service for which **Principal** is liable, shall make good and reimburse **Owner** sufficient funds to pay such costs in the completion of the Contract as **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SECTION 006216 – CERTIFICATE OF INSURANCE

In conjunction with Insurance Requirements AIA General Conditions, Article 11, the Contractor shall be bound by the following limits of liability insurance (for Contracts under this Bid Pac). The Contractor shall use the standard "ACCORD" for titled "Certificate of Insurance" in submitting his liability insurance limits. The required limits to be inserted in accordance with the sample "ACCORD" form in this section:

GENERAL NOTES

1. Other Insurance

    A. Contractor shall carry any necessary insurance required to cover Owned and Rental equipment that may be necessary for them to use in the performance of the Work.

2. Contractor shall have the following additional items added to his required "ACCORD" form Certificate of Insurance:

    A. Name and Address of Insured (Contractor).

    B. Description of Operations/Locations – Hodgson Vocational Technical High School 2575 Glasgow Avenue, Newark, DE 19702

3. Added Insured – New Castle County Vocational Technical School District and EDiS Company

4. Certificate Holder – New Castle County Vocational Technical School District
    1415 Newport Road
    Wilmington, Delaware 19804

Contractors shall note that although not a part of AIA Document A232 - 2019 Edition, these additional articles apply as noted to this Project.

A sample certificate is bound into the Project Manual immediately following this Document.

END OF SECTION

ACORD CERTIFICATE OF LIABILITY INSURANCE

Date (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER **SAMPLE CERTIFICATE**	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	PRODUCER CUSTOMER ID #:	
	INSURER(S) AFFORDING COVERAGE	NAIC #
INSURED	INSURER A:	
	INSURER B:	
	INSURER C:	
	INSURER D:	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
X	**GENERAL LIABILITY** X COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR [ ] _____ [ ] _____ GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PROJECT [ ] LOC	X	X	XXXXXXX	XX/XX/XXXX	XX/XX/XXXX	EACH OCCURENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS – COMP/OP AGG	**$1,000,000** **$100,000** **$10,000** **$1,000,000** **$3,000,000** **$2,000,000**
X	**AUTOMOBILE LIABILITY** X ANY AUTO [ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS	X	X	XXXXXXX	XX/XX/XXXX	XX/XX/XXXX	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	**$1,000,000**
X	X **UMBRELLA LIAB** [X] OCCUR [ ] **EXCESS LIAB** [ ] CLAIMS-MADE [ ] DEDUCTIBLE [ ] RETENTION $	X	X	XXXXXXXX	XX/XX/XXXX	XX/XX/XXXX	EACH OCCURRENCE AGGREGATE EACH OCCURRENCE AGGREGATE	**$5,000,000** **$5,000,000**
X	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER / MEMBER EXCLUDED? [ ] If yes, describe under DESCRIPTION OF OPERATIONS below		X	XXXXXXXX	XX/XX/XXXX	XX/XX/XXXX	X WC STATUTORY LIMITS [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EACH EMPLOYEE E.L. DISEASE - POLICY LIMIT	 **$500,000** **$500,000** **$500,000**
X	**POLLUTION LIABILITY (For Hazardous material, site excavation/utility, and building envelope subcontractors)** X CLAIMS MADE FORM	X	X	XXXXXXXX	XX/XX/XXXX	XX/XX/XXXX	EACH CLAIM POLICY AGGREGATE	**$2,000,000** **$2,000,000**
X	**PROFESSIONAL LIABILITY (for all Design and Professional Service subcontractors)** X CLAIMS MADE FORM			XXXXXXXX	XX/XX/XXXX	XX/XX/XXXX	EACH CLAIM POLICY AGGREGATE	**$2,000,000** **$2,000,000**

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Project: Hodgson Vocational Technical High School

Added Insured: New Castle County Vocational Technical School District and EDiS Company, as well as any other party as required by contract are listed as additional insureds under all policies (except Workers Compensation and Professional Liability) for all work performed by the named insured. The General Liability and Umbrella/Excess Liability aggregate shall apply on a per-project basis and all policies shall be primary and non-contributing with respects to any insurance maintained by the additional insureds. Umbrella policy follows form as respects to Additional Insured status on the CGL, Employers Liability and Automobile Liability policies. A waiver of subrogation applies in favor of the additional insureds under all policies.

In addition to the above language, please provide the General Liability, On-going and Completed Operations Additional Insured endorsements with all required additional insureds listed in the Schedule box (if not a blanket policy), the Primary and Non-Contributory Endorsements, and the Waiver of Subrogation endorsements for all policies with all required additional insured entities listed (if not a blanket policy). Provide evidence of no EIFS exclusions, if within scope of work.]

CERTIFICATE HOLDER	CANCELLATION
New Castle County Vocational Technical School District 1417 Newport Road Wilmington, DE 19804	**SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.** AUTHORIZED REPRESENTATIVE

SAMPLE

SECTION 007200 – GENERAL CONDITIONS

1. SUMMARY

   A. The General Conditions for this Project are the American Institute of Architects General Conditions of the Contract for Construction, Construction Manager as Advisor Edition, AIA Document A232 - 2019 Edition.

   B. A copy of AIA Document A232 - 2019 Edition is bound into this Project Manual following this page

END OF SECTION

AIA® Document A232® – 2019

General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

for the following PROJECT:
(Name, and location or address)

Hodgson Vocational Technical High School
2575 Glasgow Avenue
Newark, DE 19702

THE CONSTRUCTION MANAGER:
(Name, legal status, and address)

EDiS Company
110 South Poplar Street, Suite 400
Wilmington, DE 19801

THE OWNER:
(Name, legal status, and address)

New Castle County Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

THE ARCHITECT:
(Name, legal status, and address)

Joint Venture:
ABHA
1621 North Lincoln Street
Wilmington, DE 19806

BSA+A
954 Justison Street
Wilmington, DE 19801

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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User Notes:
(1832333410)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents. The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

§ 1.1.3 The Work. The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors, and by the Owner's own forces and Separate Contractors.

§ 1.1.5 Contractors. Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.

§ 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

§ 1.1.7 The Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.8 The Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.9 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.10 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

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§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building

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Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work, and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements,

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assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise provided under the Contract Documents, the Owner, assisted by the Construction Manager, shall secure and pay for the building permit.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

§ 2.3.5 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.6 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.7 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to review by the Construction Manager and prior approval of the Architect, and the Construction Manager or Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction

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where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.5, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and Architect any nonconformity discovered by or made known to the Contractor as a request for information submitted to Construction Manager in such form as the Construction Manager and Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner, the Construction Manager, and the Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

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§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of the Project already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner, Construction Manager, and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices, and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner, assisted by the Construction Manager, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or

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(2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect and Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner, Construction Manager, and Contractor, stating the reasons. If the Owner or Contractor disputes the Architect's determination or recommendation, either party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager, and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents:

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect, through the Construction Manager, of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor, stating whether the Owner, the Construction Manager, or the Architect (1) has reasonable objection to the proposed superintendent or (2) require additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager, or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

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§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager, and the Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager, and Architect, and incorporated into the approved Project schedule.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Construction Manager, Architect, and Owner, and delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data, and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract

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Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been reviewed and approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Construction Manager and Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Construction Manager and Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner, the Architect, and the Construction Manager shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Construction Manager and Architect at the time and in the form specified by the Architect.

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§ 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner, Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate Contractors. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner, Construction Manager, and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, Construction Manager, and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner, Architect, or Construction Manager. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect through the Construction Manager.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Construction Manager, Architect, Construction Manager's and Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

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§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.

§ 4.1.3 Duties, responsibilities, and limitations of authority of the Construction Manager and Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Construction Manager, Architect, and Contractor. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be the Owner's representatives during construction until the date the Architect issues the final Certificate for Payment. The Construction Manager and Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of, or be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

§ 4.2.6 Communications. The Owner shall communicate with the Contractor and the Construction Manager's consultants through the Construction Manager about matters arising out of or relating to the Contract Documents. The Owner and Construction Manager shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Construction Manager otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with other Contractors shall be

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through the Construction Manager. Communications by and with the Owner's own forces and Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents, and will notify each other about the rejection. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, upon written authorization of the Owner, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

§ 4.2.10 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data, and Samples. Where there are other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

§ 4.2.11 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Construction Manager and Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

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§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

§ 4.2.17 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Construction Manager of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.18 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of the Construction Manager, Owner, or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.19 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions so rendered in good faith.

§ 4.2.20 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing, through the Construction Manager, to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or Separate Contractors or the subcontractors of other Contractors or Separate Contractors.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Construction Manager, for review by the Owner, Construction Manager and Architect, of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor whether the Owner, the Construction Manager or the Architect (1) has reasonable objection to any such proposed person or entity or, (2) requires additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

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§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, that the Contractor, by these Contract Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

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§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

§ 6.1.3 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner's own forces, Separate Contractors, Construction Manager and other Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor or other Contractors that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of delays, improperly timed activities, damage to the Work or defective construction by the Owner's own forces, Separate Contractors, or other Contractors.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor. A Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

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§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

A Change Order is a written instrument prepared by the Construction Manager and signed by the Owner, Construction Manager, Architect, and Contractor, stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner, Construction Manager and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Construction Manager and Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

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§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner, Architect, Construction Manager, or an employee of any of them, or of the Owner's own forces, Separate Contractors, or other Contractors; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section

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15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts and the Architect, based on the recommendation of the Construction Manager, determines justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Construction Manager, before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Construction Manager and the Architect. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. The Construction Manager shall forward to the Architect the Contractor's schedule of values. Any changes to the schedule of values shall be submitted to the Construction Manager and supported by such data to substantiate its accuracy as the Construction Manager and the Architect may require, and unless objected to by the Construction Manager or the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least fifteen days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner, Construction Manager or Architect require, such as copies of requisitions, and releases of waivers of lien from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all

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Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 Where there is only one Contractor, the Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Certificate for Payment, in the full amount of the Application for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

§ 9.4.2 Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

§ 9.4.2.1 Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

§ 9.4.3 The Construction Manager's certification of an Application for Payment or, in the case of more than one Contractor, a Project Application and Certificate for Payment, shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.4 The Architect's issuance of a Certificate for Payment or, in the case of more than one Contractor, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality

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or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment or Project Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.3 and 9.4.4 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and 9.4.2. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment or a Project Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment or Project Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of

.1 defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor or other Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment or Project Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor

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fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner, Construction Manager nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Construction Manager and Architect do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Construction Manager and Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion.

§ 9.8.4 When the Architect, assisted by the Construction Manager, determines that the Work of all of the Contractors, or designated portion thereof, is substantially complete, the Construction Manager will prepare, and the Construction

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Manager and Architect shall execute, a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Construction Manager, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a notice that the Work is ready for final inspection and acceptance, and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendations to the Architect when the Work of all of the Contractors is ready for final inspection, and shall then forward the Contractors' notices and Application for Payment or Project Application for Payment, to the Architect, who will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6), if required by the Owner, other data

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establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and
- **.4** construction or operations by the Owner, Separate Contractors, or other Contractors.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

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§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner, Construction Manager and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner, Construction Manager and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor, the Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the Owner. If the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor, the Construction Manager and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect, their consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of

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tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Construction Manager and Construction Manager's consultants, and the Architect and Architect's consultants, shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the

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Contract Documents, the Owner shall inform both the Contractor and the Construction Manager, separately and in writing, prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice directly to the Contractor, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, other Contractors, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor, Architect, and Construction Manager for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to

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requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Construction Manager, Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Construction Manager, Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Construction Manager's or Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by either, be uncovered for their examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Construction Manager or Architect has not specifically requested to examine prior to its being covered, the Construction Manager or Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Construction Manager or Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion, and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, Construction Manager or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

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§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner, Separate Contractors, or other Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Construction Manager, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become

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requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Construction Manager, Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.

§ 13.4.5 If the Construction Manager or Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- **.3** Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

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§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees, or any other persons performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, after consultation with the Construction Manager, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall, upon application, be certified by the Initial Decision Maker after consultation with the Construction Manager, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and the Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

- **.1** that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- **.2** that an equitable adjustment is made or denied under another provision of this Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- **.1** cease operations as directed by the Owner in the notice;
- **.2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

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.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost. If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

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§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties, the Construction Manager, and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation

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within 30 days of receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

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§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

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STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

SECTION 00 73 13

SUPPLEMENTARY GENERAL CONDITIONS A232-2019

The following supplements modify the "General Conditions of the Contract for Construction, Construction Manager as Advisor Edition." AIA Document A232-2019. Where a portion of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

TABLE OF ARTICLES

1. GENERAL PROVISIONS
2. OWNER
3. CONTRACTOR
4. ARCHITECT AND CONSTRUCTION MANAGER
5. SUBCONTRACTORS
6. CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7. CHANGES IN THE WORK
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13. MISCELLANEOUS PROVISIONS
14. TERMINATION OR SUSPENSION OF THE CONTRACT
15. CLAIMS AND DISPUTES

ARTICLE 1: GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

Delete the last sentence in its entirety and replace with the following:

"The Contract Documents also include Advertisement for Bid, Instructions to Bidder, sample forms, the Bid Form, the Contractor's completed Bid and the Award Letter."

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following Paragraphs:

1.2.4 In the case of an inconsistency between the Drawings and the Specifications, or within either document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect's interpretation.

1.2.5 The word "PROVIDE" as used in the Contract Documents shall mean "FURNISH AND INSTALL" and shall include, without limitation, all labor, materials, equipment, transportation, services and other items required to complete the Work.

1.2.6 The word "PRODUCT" as used in the Contract Documents means all materials, systems and equipment.

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

Delete Paragraph 1.5.1 in its entirety and replace with the following:

"All pre-design studies, drawings, specifications and other documents, including those in electronic form, prepared by the Architect under this Agreement are, and shall remain, the property of the Owner whether the Project for which they are made is executed or not. As for the Project for which the Architect is hired, the Architect still remain liable for any claim relating to the design that arises from the Project.

However, such documents may be used by the Owner to construct one or more like projects without the approval of, or additional compensation to, the Architect. The Contractor, Subcontractors, Sub-subcontractors and Material or Equipment Suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or Material and Equipment Supplier on other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and Architect's consultants.

The Architect shall not be liable for injury or damage resulting from the re-use of drawings and specifications if the Architect is not involved in the re-use Project."

1.6 NOTICE

1.6.1 Insert the following sentence at the end of the paragraph:

"Electronic mail, also known as email, is an acceptable form of electronic transmission of notices under this Agreement."

ARTICLE 2: OWNER

2.1 General

2.1.2 Delete Paragraph 2.1.2 in its entirety.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 Delete the second sentence in this paragraph and replace with the following: "The Contractor shall have no obligation to commence the Work until the Owner issues a Purchase Order for the Project."

2.2.2 Delete the last three sentences in this paragraph.

ARTICLE 3: CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.4 Delete the third sentence in Paragraph 3.2.4.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following Paragraphs:

3.3.2.1 The Contractor shall immediately remove from the Work, whenever requested to do so by the Owner, any person who is considered by the Owner or Architect to be incompetent or disposed to be disorderly, or who for any reason is not satisfactory to the Owner, and that person shall not again be employed on the Work without the consent of the Owner or the Architect.

3.3.4 The Contractor must provide suitable storage facilities at the Site, or an alternative site as approved by the Owner, for the proper protection and safe storage of their materials. Consult the Owner and the Architect before storing any materials.

3.3.5 When any room is used as a shop, storeroom, office, etc., by the Contractor or Subcontractor(s) during the construction of the Work, the Contractor making use of these areas will be held responsible for any repairs, patching or cleaning arising from such use.

3.4 LABOR AND MATERIALS

3.4.1.1 Add a new section 3.4.1.1:

"The Contractor, at their expense shall bear the costs to accurately identify the location of all underground utilities in the area of their excavation and shall bear all cost for any repairs required, out of failure to accurately identify said utilities."

Add the Following Paragraphs:

3.4.4 Before starting the Work, each Contractor shall carefully examine all preparatory Work that has been executed to receive their Work. Check carefully, by whatever means are required, to insure that its Work and adjacent, related Work, will finish to proper contours, planes and levels. Promptly notify the General Contractor/Construction Manager of any defects or imperfections in preparatory Work which will in any way affect satisfactory completion of its Work. Absence of such notification will be construed as an acceptance of preparatory Work and later claims of defects will not be recognized.

3.4.5 Under no circumstances shall the Contractor's Work proceed prior to preparatory Work having been completely cured, dried and/or otherwise made satisfactory to receive this Work. Responsibility for timely installation of all materials rests solely with the Contractor responsible for that Work, who shall maintain coordination at all times.

3.5 WARRANTY

Add the following Paragraphs:

3.5.3 The Contractor will warrant all materials and workmanship against original defects, except injury from proper and usual wear when used for the purpose intended, for two years after Substantial Completion of the project in accordance with Section 9.8.4 of this Agreement, and will maintain all items in condition that conforms with the Contract Documents during the period of warranty.

3.5.4 Non-conforming work during the period of warranty will be corrected by the Contractor at its expense upon demand of the Owner, it being required that the Work conforms to the Contract Documents at the expiration of the warranty period.

3.5.5 In addition to the General Warranty there are other warranties required for certain items for different periods of time than the two years as above and are particularly so stated in that part of the specifications referring to same. The said warranties will commence at the same time as the General Warranty.

3.5.6 If the Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the Owner will have the right to replace, repair, or otherwise remedy the failure, defect or damage at the Contractor's expense.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following Paragraphs:

3.11.1 During the course of the Work, the Contractor shall maintain a record set of drawings on which the Contractor shall mark the actual physical location of all piping, valves, equipment, conduit, outlets, access panels, controls, actuators, including all appurtenances that will be concealed once construction is complete, etc., including all invert elevations.

3.11.2 At the completion of the project, the Contractor shall obtain a set of reproducible drawings from the Architect, and neatly transfer all information outlined in 3.11.1 to provide a complete record of the as-built conditions.

3.11.3 The Contractor shall provide two (2) prints of the as-built conditions, along with the reproducible drawings themselves, to the Owner and one (1) set to the Architect. In addition, attach one complete set to each of the Operating and Maintenance Instructions/Manuals.

3.15 CLEANING UP

3.15.2 Strike sentence in its entirety and replace with the following:

"If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall withhold the amount that reflects the cost of the cleanup from any moneys owed the Contractor. If the cost of cleanup exceeds the moneys owed to the Contractor, the Owner shall be entitled to reimbursement from the Contractor for the amount exceeding what is withheld.

3.17 In the second sentence of 3.17, insert "indemnify and" between "shall" and "hold".

ARTICLE 4: ARCHITECT AND CONSTRUCTION MANAGER

4.2 Administration of the Contract

Delete the first sentence of Paragraph 4.2.11 and replace with the following:

The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples for the purpose of checking for conformance with the Contract Documents.

Delete the second sentence of Paragraph 4.2.11 and replace with the following:

The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work in the activities of the Owner, Contractor or separate Contractors, while allowing sufficient time in the Owner's professional judgment to permit adequate review.

Add the following to Paragraph 4.2.17:

There will be no full-time Project representative provided by the Owner or Architect on site for this Project.

Add to Paragraph 4.2.20 “and in compliance with all applicable codes, regulations and ordinances.” to the end of the sentence.

ARTICLE 5: SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

Delete Paragraph 5.2.3 in its entirety and replace with the following:

5.2.3 If the Owner, Architect or Construction Manager has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Architect or Construction Manager has no reasonable objection, subject to the statutory requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4.

ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER’S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 Delete “and waiver of subrogation” from the last sentence.

6.1.3 Delete Paragraph 6.1.3 in its entirety and replace with the following:

“When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term “Contractor” in the Contract Documents in each case shall mean the Constructor who executes each separate Owner-Contractor Agreement.”

6.2 MUTUAL RESPONSIBILITY

6.2.3 In the second sentence, strike the word “shall” and insert the word “may”.

ARTICLE 7: CHANGES IN THE WORK

(SEE ARTICLE 7: CHANGES IN WORK IN THE GENERAL REQUIREMENTS)

ARTICLE 8: TIME

8.2 PROGRESS AND COMPLETION

Add the following Paragraphs:

8.2.1.1 Refer to Specification Section SUMMARY OF WORK for Contract time requirements.

8.2.4 If the Work falls behind the Progress Schedule as submitted by the Contractor, the Contractor shall employ additional labor and/or equipment necessary to bring the Work into compliance with the Progress Schedule at no additional cost to the Owner.

8.3 DELAYS AND EXTENSION OF TIME

8.3.1 Strike “binding dispute resolution” and insert “remedies at law or in equity”.

Add the following Paragraph:

8.3.2.1 The Contractor shall update the status of the suspension, delay, or interruption of the Work with each Application for Payment. (The Contractor shall report the termination of such cause immediately upon the termination thereof.) Failure to comply with this procedure shall constitute a waiver for any claim for adjustment of time or price based upon said cause.

Delete Paragraph 8.3.3 in its entirety and replace with the following:

8.3.3 Except in the case of a suspension of the Work directed by the Owner, an extension of time under the provisions of Paragraph 8.3.1 shall be the Contractor’s sole remedy in the progress of the Work and there shall be no payment or compensation to the Contractor for any expense or damage resulting from the delay.

Add the following Paragraph:

8.3.4 By permitting the Contractor to work after the expired time for completion of the project, the Owner does not waive its rights under the Contract.

8.3.5 The parties agree that Paragraph 8.3.3 of the Supplementary General Conditions does not apply to the Construction Manager in the event of a delay caused by a party other than the Construction Manager.

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.2 Strike Section 9.1.2 in its entirety.

9.2 SCHEDULE OF VALUES

Add the following Paragraphs:

9.2.1 The Schedule of Values shall be submitted using AIA Document G732, Continuation Sheet to G703.

9.3 APPLICATIONS FOR PAYMENT

Add the following Paragraph:

9.3.1.3 Application for Payment shall be submitted on AIA Document G732 “Application and Certificate for Payment”, supported by AIA Document G703 “Continuation Sheet”. Said Applications shall be fully executed and notarized.

Add the following Paragraphs:

9.3.4 Until Closeout Documents have been received and outstanding items completed the Owner will pay 95% (ninety-five percent) of the amount due the Contractor on account of progress payments.

9.3.5 The Contractor shall provide a current and updated Progress Schedule to the Architect with each Application for Payment. Failure to provide Schedule will be just cause for rejection of Application for Payment.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Add the following to 9.5.1:

.8 failure to provide a current Progress Schedule;
.9 a lien or attachment is filed;
.10 failure to comply with mandatory requirements for maintaining Record Documents.

9.6 PROGRESS PAYMENTS

Delete Paragraph 9.6.1 in its entirety and replace with the following:

9.6.1 After the Architect and the Construction Manager have approved and issued a Certificate for Payment, payment shall be made by the Owner within 30 days after Owner's receipt of the Certificate for Payment.

9.6.8 Strike "Provided the Owner has fulfilled its payment obligations under the Contract Documents, the" and replace with "The".

9.7 FAILURE OF PAYMENT

In first sentence, strike the first reference to "seven" and insert "thirty (30)". Also strike "binding dispute resolution" and insert "remedies at law or in equity".

9.8 SUBSTANTIAL COMPLETION

9.8.5 In the second sentence, strike "shall" and insert "may".

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Paragraphs:

10.1.1 Each Contractor shall develop a safety program in accordance with the Occupational Safety and Health Act of 1970. A copy of said plan shall be furnished to the Owner and Architect prior to the commencement of that Contractor's Work.

10.1.2 Each Contractor shall appoint a Safety Representative. Safety Representatives shall be someone who is on site on a full-time basis. If deemed necessary by the Owner or Architect, Contractor Safety meetings will be scheduled. The attendance of all Safety Representatives will be required. Minutes will be recorded of said meetings by the Contractor and will be distributed to all parties as well as posted in all job offices/trailers etc.

10.2 SAFETY OF PERSONS AND PROPERTY

Add the following Paragraph:

10.2.4.1 As required in the Hazardous Chemical Act of June 1984, all vendors supplying any material that may be defined as hazardous must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a caution warning on the label relating to a potential physical or health hazard, if it is known to be present in the workplace, and if employees may be exposed under normal conditions or in foreseeable emergency situations. Material Safety Data Sheets shall be provided directly to the Owner or its designee, along with the shipping slips that include those products.

10.3 HAZARDOUS MATERIALS

Delete Paragraph 10.3.3 in its entirety.

Delete Paragraphs 10.3.6 in its entirety.

ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTOR'S INSURANCE AND BONDS

11.1.1 Strike "Owner," at the beginning of the third sentence.

11.1.2 Add the following sentence at the end of the paragraph: "The bonds will conform to those forms approved by the Office of Management and Budget."

11.2 OWNER'S INSURANCE

Delete Paragraph 11.2 in its entirety and replace with the following:

11.2 The Owner will not provide Builder's All Risk Insurance for the Project. The Construction Manager will provide Builder's All Risk Insurance for the Project. The Contractor and all Subcontractors shall provide coverage for materials, fixtures and/or equipment being used in the construction or renovation of a building or structure should those items sustain physical loss or damage from a covered cause.

11.3 WAIVERS OF SUBROGATION

Delete Paragraph 11.3 and its subparagraphs in their entirety. Substitute the following:
The Construction Manager and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, consultants and employees, each of the other; (2) the Architect and Architect's consultants; (3) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (4) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Article shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property. For clarity, the Owner does not waive any of its subrogation rights.

11.4 LOSS OF USE, BUSINESS INTERRUPTION, AND DELAY IN COMPLETION INSURANCE

Delete Paragraph 11.4 in its entirety.

11.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSS

Delete Paragraph 11.5 in its entirety. Substitute the following:

A loss insured under the property insurance required by the Agreement shall be adjusted by the Construction Manager and made payable to the Construction Manager. The Construction Manager shall pay the Architect and Contractor their just shares of insurance proceeds received by the Construction Manager, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner. Prior to settlement of an insured loss, the Construction Manager shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Construction Manager shall settle the loss and the Contractor shall be bound by the settlement and allocation. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Construction Manager may proceed to settle the insured loss, and any dispute between the Construction Manager and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant remedies at law and in equity. For clarity, the Owner shall be listed as an Additional Insured to protect the Owner's property interest on the Project under the Builder's Risk Insurance.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 In the first sentence, strike "within one year after the date of Substantial Completion of the Work or designated portion thereof" and replace with "within two years after the date of Substantial Completion of the Project in accordance with Section 9.8.4 of this Agreement or designated portion thereof".

12.2.2.1 In the third sentence of the paragraph, strike "one year period" and replace it with "two year period".

Add the following Paragraph:

12.2.2.1.1 At any time during the progress of the Work, or in any case where the nature of the defects will be such that it is not expedient to have corrected, the Owner, at its option, will have the right to deduct such sum, or sums, of money from the amount of the Contract as it considers justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

12.2.2.2 Strike "one" and insert "two".

12.2.2.3 Strike "one" and insert "two".

12.2.5 In second sentence, strike "one" and insert "two".

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

13.1 Strike the second sentence in its entirety.

13.5 INTEREST

13.5 Strike 13.5 in its entirety and replace with the following:
"Payments are due 30 days after receipt of a valid Application for Payment. After that 30 day period, interest may be charged at the rate of 1% per month not to exceed 12% per annum."

Add the following Paragraph:

13.6 CONFLICTS WITH FEDERAL STATUTES OR REGULATIONS

13.6.1 If any provision, specifications or requirement of the Contract Documents conflict or is inconsistent with any statute, law or regulation of the government of the United State of America, the Contractor shall notify the Architect and Owner immediately upon discovery.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

Delete Paragraph 14.4.3 in its entirety and replace with the following:

14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and cost incurred by reason of such termination along with reasonable overhead.

ARTICLE 15: CLAIMS AND DISPUTES

15.1.2 TIME LIMITS ON CLAIMS.

15.1.2 Strike "in accordance with the requirements of the binding dispute resolution method selected in the Agreement and" from the first sentence.
Strike the second sentence in its entirety.

15.1.4 CONTINUING CONTRACT PERFORMANCE

15.1.4.2 Strike in its entirety.

15.1.7 CLAIMS FOR CONSEQUENTIAL DAMAGES

Delete Paragraph 15.1.7 and its subparagraphs in their entirety.

15.2 INITIAL DECISION

15.2.1 Delete "and binding dispute resolution"

15.2.5 Delete in its entirety and replace with the following:

15.2.5 The Architect will approve or reject Claims by written decision, which shall state the reasons therefore and shall notify the parties of any change in the Contract

Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be subject to mediation and other remedies at law or in equity.

Delete Paragraph 15.2.6 and its subparagraphs in their entirety.

15.3 MEDIATION

15.3.1 Strike “binding dispute resolution” and insert “any or all remedies at law or in equity”.

15.3.2 In the first sentence, delete “administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedure in effect on the date of the Agreement,”. Also strike “binding dispute resolution” and insert “remedies at law and in equity”.

15.3.3 Strike in its entirety.

15.4 ARBITRATION

Delete Paragraph 15.4 and its subparagraphs in their entirety.

END OF SECTION

SECTION 007343 – WAGE RATE REQUIREMENTS

1. SUMMARY

A. In accordance with Delaware Code, Title 29, Chapter 69, Section 6912, all laborers and mechanics of the Contractor and all subcontractors employed to perform work directly upon the site of the work shall be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account the full amounts accrued at the time of payment computed at wage rates not less than those determined by the Division of Industrial Affairs, Department of Labor, State of Delaware, as the prevailing rates in this area.

B. This approved scale of wages must be posted by the Contractor in a prominent and easily accessible place at the site of the work.

C. It is further stipulated that there may be withheld from the Contractor such accrued payment as may be considered necessary by the contracting officer to pay laborers and mechanics employed by the Contractor or any subcontractors on the work the difference between the rates of wages required and the rate of wages received by such laborers and mechanics and not refunded to the Contractor, subcontractor or their agents.

D. Where wage rates are published in this Manual they are issued by the State Department of Labor on the date indicated and are included for the convenience of Bidders. The Owner, the Architect, and the Construction Manager, accept no responsibility for the accuracy or applicability of any rates included herein. The actual wage rate determinations which will apply to the work will be those in effect on the first day of public advertisement for bids as determined by the State Department of Labor. It will be the responsibility of each bidder to contact the State Department of Labor and to incorporate these rates in his bid.

E. "In accordance with Delaware Code, Title 29, Section 6912, as amended July 5, 1994, contractors shall furnish sworn payroll information to the Department of Labor on a weekly basis for each contract which exceeds $15,000 for renovation work and $100,000 for new construction. The construction contract amount is based on a cumulative total of all contracts bid for a specific project. Payroll forms for submission may be obtained from the Department of Labor."

1. A Payroll Report, available from the Department of Labor is to be used to provide this information.

F. A copy of the Prevailing Wages for the project is attached hereto.

G. For this pilot project, all contracts that include students from the New Castle County Vocational Technical School District shall pay the assigned students the OMB Pilot Program Coop Student Rate. This rate is calculated as 70% of the applicable apprentice wage rate, but the rate cannot be lower than the existing minimum wage at the time the work was done.

END OF SECTION

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
4425 NORTH MARKET STREET
WILMINGTON, DELAWARE 19802

TELEPHONE (302) 761-8200

RECEIVED
APR 28 2023
EDis Co.

Via Electronic and Regular Mail

April 25, 2023

Mr. Kevin Lucas
EDiS Company
110 S. Poplar Street
Suite 400
Wilmington, DE 19801

Re: NCCVT HS Hodgson - BP-B and BP-C - New Castle County, DE

Dear Mr. Lucas:

I am responding to your request for a category determination for the BP-B and BP-C NCCVT HS Hodgson - BP-B and BP-C, which is a state funded construction project located in New Castle County, DE. The work consists of BP-B includes construction entrance, demo of existing structures in PH 1, site preparation, utility installation and building pad. BP - C and D includes the construction of the building ready for occupancy. You estimate the total cost of construction for this project to be $142,000,000.00.

Based upon the information you provided the Department of Labor has determined that this project is a Building Construction project.

Delaware's Prevailing Wage Regulations provide that the rates applicable to a project are the rates in effect on the date of publication of the specifications for that project. I have enclosed a certified copy of the March 15, 2023, prevailing wage rates for Building Construction to be included in your bid specification. However, please be advised that, in the event that a contract for a project is not executed within one hundred and twenty (120) days from the earliest date the specifications were published, the rates in effect at the time of the execution of the contract shall be the applicable rates for the project.

This determination is directed solely to the parties identified herein. It is based on the unique facts relevant to this matter. It does not constitute precedent and should not be cited as such by future parties.

Pursuant to 19 Del. Chapter 36, All contractors must obtain their Contractor Registration Certificate prior to performing construction services or maintenance work throughout Delaware. Contractors can submit an application by visiting the Delaware One Stop https://onestop.delaware.gov/Operate_Contractors.

Lastly, please see the enclosed debarment list. Entities/individuals listed shall not be permitted to bid on, be awarded or work on Delaware State funded construction projects, in the timeframe specified, as provided for under 29 Del.C.6960 or other applicable State statutes.

If you have any questions or I can provide any additional assistance, please do not hesitate to contact me at (302) 761- 8174.

Sincerely,

Francis Chudzik Administrator
Delaware Department of Labor
francis.chudzik@delaware.gov

Enclosures

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 761-8327

Mailing Address:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

Located at:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

PREVAILING WAGES FOR **BUILDING CONSTRUCTION** EFFECTIVE MARCH 15, 2023

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	27.88	34.33	49.97
BOILERMAKERS	83.46	42.35	62.25
BRICKLAYERS	63.49	63.49	63.49
CARPENTERS	59.56	59.56	47.80
CEMENT FINISHERS	88.04	62.61	27.02
ELECTRICAL LINE WORKERS	55.44	47.54	36.25
ELECTRICIANS	79.17	79.17	79.17
ELEVATOR CONSTRUCTORS	109.83	78.64	99.36
GLAZIERS	81.60	81.60	69.08
INSULATORS	65.34	65.34	65.34
IRON WORKERS	73.31	73.31	73.31
LABORERS	53.65	53.65	53.65
MILLWRIGHTS	82.08	82.08	65.93
PAINTERS	56.66	56.66	56.66
PILEDRIVERS	85.37	47.99	38.81
PLASTERERS	36.39	36.39	26.97
PLUMBERS/PIPEFITTERS/STEAMFITTERS	75.55	77.38	68.46
POWER EQUIPMENT OPERATORS	79.29	79.29	83.48
ROOFERS-COMPOSITION	28.01	28.25	30.56
ROOFERS-SHINGLE/SLATE/TILE	22.42	26.67	20.97
SHEET METAL WORKERS	82.28	82.28	82.28
SOFT FLOOR LAYERS	58.52	58.52	58.52
SPRINKLER FITTERS	68.00	68.00	68.00
TERRAZZO/MARBLE/TILE FNRS	70.42	70.42	76.40
TERRAZZO/MARBLE/TILE STRS	78.27	78.27	84.73
TRUCK DRIVERS	53.07	33.45	26.04

CERTIFIED: 04/25/2023 BY: _____
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 761-8327.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: BP-B and BP-C NCCVT HS Hodgson - BP-B and BP-C, New Castle County

PREVAILING WAGE DEBARMENT LIST

The following contractors have been debarred for violations of the prevailing wage law 29Del.C. §6960 or other applicable State statutes.

Therefore, no public construction contract in this State shall be bid on, awarded to, or received by contractors and individuals on this list for a period of (3) three years from the date of the judgment or as deemed by a court of competent jurisdiction.

Contractor	Address	Date of Debarment
Mullen Brothers, Inc. and Daniel Mullen, individually	3375 Garnett Road, Boothwyn, PA 19060	Indefinite/ Civil Contempt
State Contractors Corporation, and Jose Oscar Rivera, individually	13004 Hathaway Drive Silver Spring, MD 20906	Indefinite/ 19 Del.C. 2374(f)
Green Granite and Jason Green, individually	604 Heatherbrooke Court Avondale, PA 19311	Indefinite/ Civil Contempt
Pro Image Landscaping, Inc. and Owner(s) individually	23 Commerce Street Wilmington, DE 19801 and/or 2 Cameo Road Claymont, DE 19703	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)
Liberty Mechanical, LLC and Owner(s), individually	2032 Duncan Road Wilmington, DE 19801	Indefinite/ 19 Del.C. 2374(f)
Integrated Mechanical and Fire Systems Inc. and Allison Sheldon, individually	4601 Governor Printz Boulevard Wilmington, DE 19809	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)
ACH 1, INC.	873 Salem Church Road Newark, DE 19702	Indefinite/19 Del.C.6960

Updated: July 6, 2022

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

SECTION 00 81 13

GENERAL REQUIREMENTS

TABLE OF ARTICLES

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STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

ARTICLE 1: GENERAL

1.1 CONTRACT DOCUMENTS

1.1.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary and what is required by one shall be as binding as if required by all. Performance by the Contractor shall be required to an extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

1.1.2 Work including material purchases shall not begin until the Contractor is in receipt of a bonafide State of Delaware Purchase Order. Any work performed or material purchases prior to the issuance of the Purchase Order is done at the Contractor's own risk and cost.

1.2 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

1.2.1 For Public Works Projects financed in whole or in part by state appropriation the Contractor agrees that during the performance of this contract:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take positive steps to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

1.3 PILOT PROGRAM FOR DISADVANTAGED BUSINESS ENTITIES (DBE)

This is a pilot project in which goals are set to increase the participation of DBEs in capital projects. A DBE is a for-profit business in which at least 51% of the business is owned by one or more individuals who are both socially and economically disadvantaged; and whose daily operations are managed by one or more individuals who are both socially and economically disadvantaged. OMB has developed the DBE goals based on an analysis of the opportunities available on the project and qualified DBE firms available for participation. The DBE pilot has a cooperative program ("coop") requirement which will allow students in the Vo-Tech School District to work on the project.

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

ARTICLE 2: OWNER

(NO ADDITIONAL GENERAL REQUIREMENTS – SEE SUPPLEMENTARY GENERAL CONDITIONS A232-2019)

ARTICLE 3: CONTRACTOR

3.1 Schedule of Values: The successful Bidder shall within twenty (20) days after receiving notice to proceed with the work, furnish to the Owner a complete schedule of values on the various items comprising the work, including a list of all subcontractors and materialmen and their DBE status.

3.2 Subcontracts: Upon approval of Subcontractors, the Contractor shall award their Subcontracts as soon as possible after the signing of their own contract and see that all material, their own and those of their Subcontractors, are promptly ordered so that the work will not be delayed by failure of materials to arrive on time.

3.3 Before commencing any work or construction, the General Contractor is to consult with the Owner as to matters in connection with access to the site and the allocation of Ground Areas for the various features of hauling, storage, etc.

3.4 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions.

3.5 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.6 The Contractor warrants to the Owner that materials and equipment furnished will be new and of good quality, unless otherwise permitted, and that the work will be free from defects and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved, may be considered defective. If required by the Owner, the Contractor shall furnish evidence as to the kind and quality of materials and equipment provided.

3.7 Unless otherwise provided, the Contractor shall pay all sales, consumer, use and other similar taxes, and shall secure and pay for required permits, fees, licenses, and inspections necessary for proper execution of the Work.

3.8 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on performance of the Work. The Contractor shall promptly notify the Owner if the Drawings and Specifications are observed to be at variance therewith.

3.9 The Contractor shall be responsible to the Owner for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work under contract with the Contractor.

3.10 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project all waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials. The Contractor shall be responsible for returning all damaged areas to their original conditions.

3.11 STATE LICENSE AND TAX REQUIREMENTS

3.11.1 Each Contractor and Subcontractor shall be licensed to do business in the State of Delaware and shall pay all fees and taxes due under State laws. In conformance with Section 2503, Chapter 25, Title 30, Delaware Code, "the Contractor shall furnish the Delaware Department of Finance within ten (10) days after entering into any contract with a contractor or subcontractor not a resident of this State, a statement of total value of such contract or contracts together with the names and addresses of the contracting parties."

3.12 The Contractor shall comply with all requirements set forth in Section 6962, Chapter 69, Title 29 of the Delaware Code.

3.13 During the contract Work, the Contractor and each Subcontractor, shall implement an Employee Drug Testing Program in accordance with OMB Regulation 4104 - "Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on "Large Public Works Projects". "Large Public Works" is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.1 CONTRACT SURETY

4.1.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

4.1.2 All bonds will be required as follows unless specifically waived elsewhere in the Bidding Documents.

4.1.3 Contents of Performance Bonds – The bond shall be in the form approved by the Office of Management and Budget. The bond shall be conditioned upon the faithful compliance and performance by the successful bidder of each and every term and condition of the contract and the proposal, plans, specifications, and bid documents thereof. Each term and condition shall be met at the time and in the manner prescribed by the Contract, Bid documents and the specifications, including the payment in full to every person furnishing materiel or performing labor in the performance of the Contract, of all sums of money due the person for such labor and materiel. (The bond shall also contain the successful bidder's guarantee to indemnify and save harmless the State and the agency from all costs, damages and expenses growing out of or by reason of the Contract in accordance with the Contract.)

4.1.4 Invoking a Performance Bond – The agency may, when it considers that the interest of the State so requires, cause judgement to be confessed upon the bond.

4.1.5 Within twenty (20) days after the date of notice of award of contract, the Bidder to whom the award is made shall furnish a Performance Bond and Labor and Material Payment Bond, each equal to the full amount of the Contract price to guarantee the faithful performance of all terms, covenants and conditions of the same. The bonds are to be issued by an acceptable Bonding Company licensed to do business in the State of Delaware and shall be issued in duplicate.

4.1.6 Performance and Payment Bonds shall be maintained in full force (warranty bond) for a period of two (2) years after the date of the Certificate for Final Payment. The Performance Bond shall guarantee the satisfactory completion of the Project and that the Contractor will make good any faults or defects in his work which may develop during the period of said guarantees as a result of improper or defective workmanship, material or apparatus, whether furnished by themselves or their Sub-Contractors. The Payment Bond shall guarantee that the Contractor shall pay in full all persons, firms or corporations who furnish labor or material or both labor and material for, or on account of, the work included herein. The bonds shall be paid for by this Contractor. The Owner shall have the right to demand that the proof parties signing the bonds are duly authorized to do so.

4.2 FAILURE TO COMPLY WITH CONTRACT

4.2.1 If any firm entering into a contract with the State, or Agency that neglects or refuses to perform or fails to comply with the terms thereof, the Agency which signed the Contract may terminate the Contract and proceed to award a new contract in accordance with this Chapter 69, Title 29 of the Delaware Code or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond. Nothing herein shall preclude the Agency from pursing additional remedies as otherwise provided by law.

4.3 CONTRACT INSURANCE AND CONTRACT LIABILITY

4.3.1 In addition to the bond requirements stated in the Bid Documents, each successful Bidder shall purchase adequate insurance for the performance of the Contract and, by submission of a Bid, agrees to indemnify and save harmless and to defend all legal or equitable actions brought against the State, any Agency, officer and/or employee of the State, for and from all claims of liability which is or may be the result of the successful Bidder’s actions during the performance of the Contract.

4.3.2 The purchase or nonpurchase of such insurance or the involvement of the successful Bidder in any legal or equitable defense of any action brought against the successful Bidder based upon work performed pursuant to the Contract will not waive any defense which the State, its agencies and their respective officers, employees and agents might otherwise have against such claims, specifically including the defense of sovereign immunity, where applicable, and by the terms of this section, the State and all agencies, officers and employees thereof shall not be financially responsible for the consequences of work performed, pursuant to said contract.

4.4 RIGHT TO AUDIT RECORDS

4.4.1 The Owner shall have the right to audit the books and records of a Contractor or any Subcontractor under any Contract or Subcontract to the extent that the books and records relate to the performance of the Contract or Subcontract.

4.4.2 Said books and records shall be maintained by the Contractor for a period of seven (7) years from the date of final payment under the Prime Contract and by the Subcontractor for a period of seven (7) years from the date of final payment under the Subcontract.

ARTICLE 5: SUBCONTRACTORS

5.0 PILOT PROGRAM REQUIREMENTS
The goal set for this pilot program is for 7% of the contract value shall be provided by DBEs. To achieve that goal, the Contractor shall use best efforts to hire subcontractors or purchase material from DBEs to reflect at least 7% of the contract value.

5.1 SUBCONTRACTING REQUIREMENTS

5.1.1 All contracts for the construction, reconstruction, alteration or repair of any public building (not a road, street or highway) shall be subject to the following provisions:

1. A contract shall be awarded only to a Bidder whose Bid is accompanied by a statement containing, for each Subcontractor category, the name and address (city or town and State only – street number and P.O. Box addresses not required) of the subcontractor whose services the Bidder intends to use in performing the Work and providing the material for such Subcontractor category.

2. A Bid will not be accepted nor will an award of any Contract be made to any Bidder which, as the Prime Contractor, has listed itself as the Subcontractor for any Subcontractor unless:

   A. It has been established to the satisfaction of the awarding Agency that the Bidder has customarily performed the specialty work of such Subcontractor category by artisans regularly employed by the Bidder's firm;

   B. That the Bidder is duly licensed by the State to engage in such specialty work, if the State requires licenses; and

   C. That the Bidder is recognized in the industry as a bona fide Subcontractor or Contractor in such specialty work and Subcontractor category.

5.1.2 The decision of the awarding Agency as to whether a Bidder who list itself as the Subcontractor for a Subcontractor category shall be final and binding upon all Bidders, and no action of any nature shall lie against any awarding agency or its employees or officers because of its decision in this regard.

5.1.3 After such a Contract has been awarded, the successful Bidder shall not substitute another Subcontractor for any Subcontractor whose name was set forth in the statement which accompanied the Bid without the written consent of the awarding Agency.

5.1.4 No Agency shall consent to any substitution of Subcontractors unless the Agency is satisfied that the Subcontractor whose name is on the Bidders accompanying statement:

A. Is unqualified to perform the work required;

B. Has failed to execute a timely reasonable Subcontract;

C. Has defaulted in the performance on the portion of the work covered by the Subcontract; or

D. Is no longer engaged in such business.

5.1.5 Should a Bidder be awarded a contract, such successful Bidder shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.1.6 The Contractor may employ additional Subcontractors on the jobsite only after submitting a copy of the Subcontractor's Employee Drug Testing Program to the Owner for approval. A Contractor or Subcontractor shall not commence work until the Owner has concluded its review and determined that the submitted Employee Drug Testing Program complies with OMB Regulation 4104.

5.2 PENALTY FOR SUBSTITUTION OF SUBCONTRACTORS

5.2.1 Should the Contractor fail to utilize any or all of the Subcontractors in the Contractor's Bid statement in the performance of the Work on the public bidding, the Contractor shall be penalized in the amount of (project specific amount*). The Agency may determine to deduct payments of the penalty from the Contractor or have the amount paid directly to the Agency. Any penalty amount assessed against the Contractor may be remitted or refunded, in whole or in part, by the Agency awarding the Contract, only if it is established to the satisfaction of the Agency that the Subcontractor in question has defaulted or is no longer engaged in such business. No claim for the remission or refund of any penalty shall be granted unless an application is filed within one year after the liability of the successful Bidder accrues. All penalty amounts assessed and not refunded or remitted to the contractor shall be reverted to the State.

For the purpose of this pilot project, any substitution of a listed subcontractor whether requested in compliance with Title 29. Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code or in violation of that statue will not change the DBE requirement. It remains at 7% of the contract value.

*one (1) percent of contract amount not to exceed $10,000

5.3 ASBESTOS ABATEMENT

5.3.1 The selection of any Contractor to perform asbestos abatement for State-funded projects shall be approved by the Office of Management and Budget, Division of Facilities Management pursuant to Chapter 78 of Title 16.

5.4 STANDARDS OF CONSTRUCTION FOR THE PROTECTION OF THE PHYSICALLY HANDICAPPED

5.4.1 All Contracts shall conform with the standard established by the Delaware Architectural Accessibility Board unless otherwise exempted by the Board.

5.5 CONTRACT PERFORMANCE

5.5.1 Any firm entering into a Public Works Contract that neglects or refuses to perform or fails to comply with its terms, the Agency may terminate the Contract and proceed to award a new Contract or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond.

ARTICLE 6: CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS

6.1 The Owner reserves the right to simultaneously perform other construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other Projects at the same site.

6.2 The Contractor shall afford the Owner and other Contractors reasonable opportunity for access and storage of materials and equipment, and for the performance of their activities, and shall connect and coordinate their activities with other forces as required by the Contract Documents.

ARTICLE 7: CHANGES IN THE WORK

7.1 The Owner, without invalidating the Contract, may order changes in the Work consisting of Additions, Deletions, Modifications or Substitutions, with the Contract Sum and Contract completion date being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Professional, as the duly authorized agent, the Contractor and the Owner.

7.2 The Contract Sum and Contract Completion Date shall be adjusted only by a fully executed Change Order.

7.3 The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Contractor and the Architect. In all cases, this cost or credit shall be based on the ‘DPE’ wages required and the “invoice price” of the materials/equipment needed.

7.3.1 "DPE" shall be defined to mean "direct personnel expense". Direct payroll expense includes prevailing wage rates plus a maximum multiplier of 1.35 times DPE. For example, if the prevailing wage rate is $50/hour, the DPE would be $67.50/hour (50 x 1.35).

7.3.2 "Invoice price" of materials/equipment shall be defined to mean the actual cost of materials and/or equipment that is paid by the Contractor, (or subcontractor), to a material distributor, direct factory vendor, store, material provider, or equipment leasing entity. Rates for equipment that is leased and/or owned by the Contractor or subcontractor(s) shall not exceed those listed in the latest version of the "Means Building Construction Cost Data" publication.

7.3.3 In addition to the above, the General Contractor is allowed a fifteen percent (15%) markup for overhead and profit for additional work performed by the General Contractor's own forces. For additional subcontractor work, the Subcontractor is allowed a fifteen (15) percent overhead and profit on change order work above and beyond the direct costs stated previously. To this amount, the General Contractor will be allowed a mark-up not exceeding seven and one half percent (7.5%) on the subcontractors work. These mark-ups shall include all costs including, but not limited to: overhead, profit, bonds, insurance, supervision, etc. No markup is permitted on the work of the subcontractors subcontractor. No additional costs shall be allowed for changes related to the Contractor's onsite superintendent/staff, or project manager, unless a change in the work changes the project duration and is identified by the CPM schedule. There will be no other costs associated with the change order.

ARTICLE 8: TIME

8.1 Time limits, if any, are as stated in the Project Manual. By executing the Agreement, the Contractor confirms that the stipulated limits are reasonable, and that the Work will be completed within the anticipated time frame.

8.2 If progress of the Work is delayed at any time by changes ordered by the Owner, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions, unavoidable casualties or other causes beyond the Contractor's control, the Contract Time shall be extended for such reasonable time as the Owner may determine.

8.3 Any extension of time beyond the date fixed for completion of the construction and acceptance of any part of the Work called for by the Contract, or the occupancy of the building by the Owner, in whole or in part, previous to the completion shall not be deemed a waiver by the Owner of his right to annul or terminate the Contract for abandonment or delay in the matter provided for, nor relieve the Contractor of full responsibility

8.4 SUSPENSION AND DEBARMENT

8.4.1 Per Section 6962(d)(14), Title 29, Delaware Code, "Any Contractor who fails to perform a public works contract or complete a public works project within the time schedule established by the Agency in the Invitation To Bid, may be subject to Suspension or Debarment for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the Project."

8.4.2 "Upon such failure for any of the above stated reasons, the Agency that contracted for the public works project may petition the Director of the Office of Management and Budget for Suspension or Debarment of the Contractor. The Agency shall send a copy of the petition to the Contractor within three (3) working days of filing with the Director. If the Director concludes that the petition has merit, the Director shall schedule and hold a hearing to determine whether to suspend the Contractor, debar the Contractor or deny the petition. The Agency shall have the burden of proving, by a preponderance of the evidence, that the Contractor failed to perform or complete the public works project within the time schedule established by the Agency and failed to do so for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or c) poor performance on the project. Upon a finding in favor of the Agency, the Director may suspend a Contractor from Bidding on any project funded, in whole or in part, with public funds for up to 1 year for a first offense, up to 3 years for a second offense and permanently debar the Contractor for a third offense. The Director shall issue a written decision and shall send a copy to the Contractor and the Agency. Such decision may be appealed to the Superior Court within thirty (30) days for a review on the record."

8.5 RETAINAGE

8.5.1 Per Section 6962(d)(5) a.3, Title 29, Delaware Code: The Agency may at the beginning of each public works project establish a time schedule for the completion of the project. If the project is delayed beyond the completion date due to the Contractor's failure to meet their responsibilities, the Agency may forfeit, at its discretion, all or part of the Contractor's retainage.

8.5.2 This forfeiture of retainage also applies to the timely completion of the punchlist. A punchlist will only be prepared upon the mutual agreement of the Owner, Architect and Contractor. Once the punchlist is prepared, all three parties will by mutual agreement, establish a schedule for its completion. Should completion of the punchlist be delayed beyond the established date due to the Contractor's failure to meet their responsibilities, the Agency may hold permanently, at its discretion, all or part of the Contractor's retainage.

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 APPLICATION FOR PAYMENT

9.1.1 Applications for payment shall be made upon AIA Document G702. There will be a five percent (5%) retainage on all Contractor's monthly invoices until completion of the project. This retainage may become payable upon receipt of all required closeout documentation, provided all other requirements of the Contract Documents have been met.

9.1.2 A date will be fixed for the taking of the monthly account of work done. Upon receipt of Contractor's itemized application for payment, such application will be audited, modified, if found necessary, and approved for the amount. Statement shall be submitted to the Owner.

9.1.3 Section 6516, Title 29 of the Delaware Code annualized interest is not to exceed 12% per annum beginning thirty (30) days after the "presentment" (as opposed to the date) of the invoice.

9.2 PARTIAL PAYMENTS

9.2.1 Any public works Contract executed by any Agency may provide for partial payments at the option of the Owner with respect to materials placed along or upon the sites or stored at secured locations, which are suitable for use in the performance of the contract.

9.2.2 When approved by the agency, partial payment may include the values of tested and acceptable materials of a nonperishable or noncontaminative nature which have been produced or furnished for incorporation as a permanent part of the work yet to be completed, provided acceptable provisions have been made for storage.

9.2.2.1 Any allowance made for materials on hand will not exceed the delivered cost of the materials as verified by invoices furnished by the Contractor, nor will it exceed the contract bid price for the material complete in place.

9.2.3 If requested by the Agency, receipted bills from all Contractors, Subcontractors, and material, men, etc., for the previous payment must accompany each application for payment. Following such a request, no payment will be made until these receipted bills have been received by the Owner.

9.3 SUBSTANTIAL COMPLETION

9.3.1 When the building has been made suitable for occupancy, but still requires small items of miscellaneous work, the Owner will determine the date when the project has been substantially completed.

9.3.2 If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, and without terminating the Contract, the Owner may make payment of the balance due for the portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment that it shall not constitute a waiver of claims.

9.3.3 On projects where commissioning is included, the commissioning work as defined in the specifications must be complete prior to the issuance of substantial completion.

9.4 FINAL PAYMENT

9.4.1 Final payment, including the five percent (5%) retainage if determined appropriate, shall be made within thirty (30) days after the Work is fully completed and the Contract fully performed and provided that the Contractor has submitted the following closeout documentation (in addition to any other documentation required elsewhere in the Contract Documents):

9.4.1.1 Evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work have been paid,

9.4.1.2 An acceptable RELEASE OF LIENS,

9.4.1.3 Copies of all applicable warranties,

9.4.1.4 As-built drawings,

9.4.1.5 Operations and Maintenance Manuals,

9.4.1.6 Instruction Manuals,

9.4.1.7 Consent of Surety to final payment.

9.4.1.8 The Owner reserves the right to retain payments, or parts thereof, for its protection until the foregoing conditions have been complied with, defective work corrected and all unsatisfactory conditions remedied.

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take all reasonable precautions to prevent damage, injury or loss to: workers, persons nearby who may be affected, the Work, materials and equipment to be incorporated, and existing property at the site or adjacent thereto. The Contractor shall give notices and comply with applicable laws ordinances, rules regulations, and lawful orders of public authorities bearing on the safety of persons and property and their protection from injury, damage, or loss. The Contractor shall promptly remedy damage and loss to property at the site caused in whole or in part by the Contractor, a Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

10.2 The Contractor shall notify the Owner in the event any existing hazardous material such as lead, PCBs, asbestos, etc. is encountered on the project. The Owner will arrange with a qualified specialist for the identification, testing, removal, handling and protection against exposure or environmental pollution, to comply with applicable regulation laws and ordinances. The Contractor and Architect will not be required to participate in or to perform this operation. Upon completion of this work, the Owner will notify the Contractor and Architect in writing the area has been cleared and approved by the authorities in order for the work to proceed. The Contractor shall attach documentation from the authorities of said approval.

10.3 As required in the Hazardous Chemical Information Act of June 1984, all vendors supplying any materials that may be defined as hazardous, must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a warning caution on the label relating to a potential physical or health hazard, if it is known to be present in the workplace, and if employees may be exposed under normal conditions or in any foreseeable emergency situation. Material Safety Data Sheets must be provided directly to the Owner along with the shipping slips that include those products.

10.4 The Contractor shall certify to the Owner that materials incorporated into the Work are free of all asbestos. This certification may be in the form of Material Safety Data Sheet (MSDS) provided by the product manufacturer for the materials used in construction, as specified or as provided by the Contractor.

ARTICLE 11: INSURANCE AND BONDS

11.1 The Contractor shall carry all insurance required by law, such as Unemployment Insurance, etc. The Contractor shall carry such insurance coverage as they desire on their own property such as a field office, storage sheds or other structures erected upon the project site that belong to them and for their own use. The Subcontractors involved with this project shall carry whatever insurance protection they consider necessary to cover the loss of any of their personal property, etc.

11.2 Upon being awarded the Contract, the Contractor shall obtain a minimum of two (2) copies of all required insurance certificates called for herein, and submit one (1) copy of each certificate, to the Owner, within 20 days of contract award.

11.3 Bodily Injury Liability and Property Damage Liability Insurance shall, in addition to the coverage included herein, include coverage for injury to or destruction of any property arising out of the collapse of or structural injury to any building or structure due to demolition work and evidence of these coverages shall be filed with and approved by the Owner.

11.4 The Contractor's Property Damage Liability Insurance shall, in addition to the coverage noted herein, include coverage on all real and personal property in their care, custody and control damaged in any way by the Contractor or their Subcontractors during the entire construction period on this project.

11.5 Builders Risk (including Standard Extended Coverage Insurance) on the existing building during the entire construction period, may be provided by the Contractor under this contract. The Owner shall insure the existing building and all of its contents and all this new alteration work under this contract during entire construction period for the full insurable value of the entire work at the site. Note, however, that the Contractor and their Subcontractors shall be responsible for insuring building materials (installed and stored) and their tools and equipment whenever in use on the project, against fire damage, theft, vandalism, etc.

11.6 Certificates of the insurance company or companies stating the amount and type of coverage, terms of policies, etc., shall be furnished to the Owner, within 20 days of contract award.

11.7 The Contractor shall, at their own expense, (in addition to the above) carry the following forms of insurance:

11.7.1 Contractor's Contractual Liability Insurance

Minimum coverage to be:

Bodily Injury		
	$1,000,000	for each occurrence
	$3,000,000	aggregate
Property Damage	$1,000,000	for each occurrence
	$3,000,000	aggregate

11.7.2 Contractor's Protective Liability Insurance

Minimum coverage to be:

Bodily Injury		
	$1,000,000	for each occurrence
	$3,000,000	aggregate
Property Damage	$1,000,000	for each occurrence
	$3,000,000	aggregate

11.7.3 Automobile Liability Insurance

Minimum coverage to be:

Bodily Injury	$1,000,000	for each person
	$1,000,000	for each occurrence
Property Damage	$500,000	per accident

11.7.4 Prime Contractor's and Subcontractors' policies shall include contingent and contractual liability coverage in the same minimum amounts as 11.7.1 above.

11.7.5 Workmen's Compensation (including Employer's Liability):

11.7.5.1 Minimum Limit on employer's liability to be as required by law.

11.7.5.2 Minimum Limit for all employees working at one site.

11.7.6 Certificates of Insurance must be filed with the Owner guaranteeing fifteen (15) days prior notice of cancellation, non-renewal, or any change in coverages and limits of liability shown as included on certificates.

11.7.7 Social Security Liability

11.7.7.1 With respect to all persons at any time employed by or on the payroll of the Contractor or performing any work for or on their behalf, or in connection with or arising out of the Contractor's business, the Contractor shall accept full and exclusive liability for the payment of any and all contributions or taxes or unemployment insurance, or old age retirement benefits, pensions or annuities now or hereafter imposed by the Government of the United States and the State or political subdivision thereof, whether the same be measured by wages, salaries or other remuneration paid to such persons or otherwise.

11.7.7.2 Upon request, the Contractor shall furnish Owner such information on payrolls or employment records as may be necessary to enable it to fully comply with the law imposing the aforesaid contributions or taxes.

11.7.7.3 If the Owner is required by law to and does pay any and/or all of the aforesaid contributions or taxes, the Contractor shall forthwith reimburse the Owner for the entire amount so paid by the Owner.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.1 The Contractor shall promptly correct Work rejected by the Owner or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed, and shall correct any Work found to be not in accordance with the requirements of the Contract Documents within a period of two years from the date of Substantial Completion, or by terms of an applicable special warranty required by the Contract Documents. The provisions of this Article apply to work done by Subcontractors as well as to Work done by direct employees of the Contractor.

12.2 At any time during the progress of the work, or in any case where the nature of the defects shall be such that it is not expedient to have them corrected, the Owner, at their option, shall have the right to deduct such sum, or sums, of money from the amount of the contract as they consider justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 CUTTING AND PATCHING

13.1.1 The Contractor shall be responsible for all cutting and patching. The Contractor shall coordinate the work of the various trades involved.

13.2 DIMENSIONS

13.2.1 All dimensions shown shall be verified by the Contractor by actual measurements at the project site. Any discrepancies between the drawings and specifications and the existing conditions shall be referred to the Owner for adjustment before any work affected thereby has been performed.

13.3 LABORATORY TESTS

13.3.1 Any specified laboratory tests of material and finished articles to be incorporated in the work shall be made by bureaus, laboratories or agencies approved by the Owner and reports of such tests shall be submitted to the Owner. The cost of the testing shall be paid for by the Contractor.

13.3.2 The Contractor shall furnish all sample materials required for these tests and shall deliver same without charge to the testing laboratory or other designated agency when and where directed by the Owner.

13.4 ARCHAEOLOGICAL EVIDENCE

13.4.1 Whenever, in the course of construction, any archaeological evidence is encountered on the surface or below the surface of the ground, the Contractor shall notify the authorities of the State Historic Preservation Office and suspend work in the immediate area for a reasonable time to permit those authorities, or persons designated by them, to examine the area and ensure the proper removal of the archaeological evidence for suitable preservation by the Division of Historical and Cultural Affairs.

13.5 GLASS REPLACEMENT AND CLEANING

13.5.1 The General Contractor shall replace without expense to the Owner all glass broken during the construction of the project. If job conditions warrant, at completion of the job the General Contractor shall have all glass cleaned and polished.

13.6 WARRANTY

13.6.1 For a period of two (2) years from the date of substantial completion, as evidenced by the date of final acceptance of the work, the contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material or workmanship performed by the contractor or any of his subcontractors or suppliers. However, manufacturer's warranties and guarantees, if for a period longer than two (2) years, shall take precedence over the above warranties. The contractor shall remedy, at his own expense, any such failure to conform or any such defect. The protection of this warranty shall be included in the Contractor's Performance Bond.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 If the Contractor defaults or persistently fails or neglects to carry out the Work in accordance with the Contract Documents or fails to perform a provision of the Contract, the Owner, after seven days written notice to the Contractor, may make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. Alternatively, at the Owner's option, and the Owner may terminate the Contract and take possession of the site and of all materials, equipment, tools, and machinery thereon owned by the Contractor and may finish the Work by whatever method the Owner may deem expedient. If the costs of finishing the Work exceed any unpaid compensation due the Contractor, the Contractor shall pay the difference to the Owner.

14.2 “If the continuation of this Agreement is contingent upon the appropriation of adequate state, or federal funds, this Agreement may be terminated on the date beginning on the first fiscal year for which funds are not appropriated or at the exhaustion of the appropriation. The Owner may terminate this Agreement by providing written notice to the parties of such non-appropriation. All payment obligations of the Owner will cease upon the date of termination. Notwithstanding the foregoing, the Owner agrees that it will use its best efforts to obtain approval of necessary funds to continue the Agreement by taking appropriate action to request adequate funds to continue the Agreement.”

END OF SECTION

QUARTERLY DBE REPORT

DBE Name	DBE Address	DBE Phone Number	DBE email address	DelDOT or OSD Registration number	DBE Percentage of Contract Value	Description of Work	Status of DBE's work: complete or in progress

Total DBEs on project: _____

SECTION 008114 – DRUG TESTING PROGRAM AND FORMS

1. SUMMARY

A. Pursuant to 4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds submit with their bid an Affidavit of Employee Drug Testing Program. A copy of the current Regulation is attached hereto.

B. Each Contractor shall provide two (2) business days prior to contract execution, copies of the Employee Drug Testing Program for the Contractor and all Subcontractors.

C. Initial Drug Testing - Employees commencing work on a Jobsite must be tested within the past 180 days from the date of commencing work, with the exception that an Employee who has passed a random or scheduled drug test within that time frame, or an Employee who passed a pre-employment drug test administered pursuant to a Contractor's or Subcontractor's Program and is subject to testing as part of a Contractor's or Subcontractor's ongoing Program or as part of a Consortium shall be permitted to work at the Jobsite without further testing; however, the Employee is still subject to random testing.

D. A Contractor or Subcontractor's Program shall provide that no less than 5% of a Contractor’s or Subcontractor’s employees shall be randomly selected each month for drug testing and no less than 2.5% of a Contractor or Subcontractor's employees be randomly selected for alcohol testing. Test results must be kept by a Contractor or Subcontractor for a minimum of 1 year subsequent to the date of close out of the Public Works project. See the form attached hereto.

E. The Contractor will notify the Owner in writing of any positive results of random drug testing. See the form attached hereto. The results must be reported to the Owner within 24 hours of receipt of the test results.

EMPLOYEE DRUG TESTING REPORT FORM
Period Ending:_____

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds maintain testing data that includes but is not limited to the data elements below.

Project Number: _____
Project Name: _____
Contractor/Subcontractor Name: _____
Contractor/Subcontractor Address: _____

_____

_____

Number of employees who worked on the jobsite during the report period:_____

Number of employees subject to random testing during the report period:_____

Number of Negative Results_____Number of Positive Results _____

Action taken on employee(s) in response to a failed or positive random test:

_____

_____

_____

Date: _____

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

This form is not required to be submitted to the Owner. Included as a reference to show information required to be maintained by the Contractor. The Owner shall have the right to periodically audit all Contractor and Subcontractor test results at the Contractor's or Subcontractor's offices (or by other means to make the data available for inspection by the Owner).

EMPLOYEE DRUG TESTING
REPORT OF POSITIVE RESULTS

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds to notify the Owner in writing of a positive random drug test.

Project Number: _____
Project Name: _____
Contractor/Subcontractor Name: _____
Contractor/Subcontractor Address: _____

_____

_____

Name of employee with positive test result:_____

Last 4 digits of employee SSN:_____

Date test results received:_____

Action taken on employee in response to a positive test result:

_____

_____

_____

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

This form shall be sent by mail to the Owner within 24 hours of receipt of test results.

Enclose this test results form in a sealed envelope with the notation "Drug Testing Form – DO NOT OPEN" on the face thereof and place in a separate mailing envelope.

END OF SECTION

(PROJECT NAME),
(PROJECT LOCATION)
(PROJECT OR CONTRACT NUMBER)

AFFIDAVIT OF
CRAFT TRAINING COMPLIANCE

We, the contractor, hereby certify that we and all applicable subcontractors will abide by the contractor and subcontractor craft training requirements outlined below for the duration of the contract. Craft training must be provided by a contractor and/or subcontractor for each craft on a project for which there are Delaware Department of Labor approved and registered training programs or, if the contractor and/or subcontractor meets the requirements under Title 29, Chapter 69, Section 6960A.(b)(1)c.1.-3., payment may be made in accordance with Title 29, Chapter 69, Section 6960A.(b)(1)d. A list of crafts for which there are approved and registered training programs is maintained by the Delaware Department of Labor and can be found at: https://laborfiles.delaware.gov/main/det/apprenticeship/DE%20Craft%20Training%20Occupation%20List%20Effective%20March%201%202022.pdf. If you have questions regarding craft training programs, please submit all questions in writing to the Delaware Department of Labor at: apprenticeship@delaware.gov. ***This Affidavit of Craft Training Compliance must be submitted prior to contract execution***.

In accordance with Title 29, Chapter 69, Section 6960A.(a)(1), a contract relating to a public works project under § 6962 of Title 29 must include a craft training program for each craft in the project if at the time the contractor executes a public works contract, all of the following apply:

a. A project meets the prevailing wage requirement under Section 6960 of Title 29.
b. The contractor employs 10 or more total employees.
c. The project is not a federal highway project, except for the project under Section 6962(c)(11) of Title 29.
d. There is an apprenticeship program for a craft in the project on the list of crafts under Section 204(b)(2) of Title 19.

Pursuant to Title 29, Chapter 69, Section 6960A.(a)(2), ***a contractor must commit that all subcontractors provide craft training*** if paragraph (a)(1) of this section applies to the subcontractor. Failure to provide required craft training or payment on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6960A.(d)(1)-(3).

Craft(s): _____

Contractor Name: _____

Contractor Address: _____

_____

_____

Contractor Program Registration Number(s) _____
On this line also indicate whether DE, Other State (identify) or US Registration Number

Or

☐ **A payment has been made in the amount established under Section 204(b)(2)b.2. of Title 19, for the craft into the Delaware Department of Labor's Apprenticeship and Training Fund.**

Or

☐ **Craft Training requirements are not applicable because:**

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

State of Delaware)
) ss:
County of _____)

Before me, a notary public, in and for said county and state, personally appeared, _____, who acknowledged to me that she/he did execute the foregoing instrument on behalf of _____.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this ____ day of _____ 20___.

_____
Notary Public
Commission Expires _____

THIS PAGE MUST BE SIGNED AND NOTARIZED TO BE CONSIDERED.

SECTION 011100 - SUMMARY OF WORK

1. RELATED DOCUMENTS

   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to work of this Section.

2. CONTRACTS

   A. The work will be performed under separate prime contracts managed by the Construction Manager.

3. ALTERATIONS & COORDINATION

   A. Contractor shall be responsible to coordinate their work with the work of others, including, but not limited to, the preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from the beginning of activity, through project close-out and warranty periods.

4. KNOWLEDGE OF CONTRACT REQUIREMENTS

   A. The Contractor and his Subcontractors, Sub-subcontractors and material men shall consult in detail the Contract Documents for instructions and requirements pertaining to the Work, and at his and their cost, shall provide all labor, materials, equipment and services necessary to furnish, install and complete the work in strict conformance with all provisions thereof.

   B. The Contractor will be held to have examined the site of the Work prior to submitting his proposal and informed himself, his Subcontractors, Sub-subcontractors and material men of all existing conditions affecting the execution of the Work.

   C. The Contractor will be held to have examined the Contract Documents and modifications thereto, as they may affect subdivisions of the Work and informed himself, his Subcontractors, Sub-subcontractors and material men of all conditions thereof affecting the execution of the Work.

   D. The Scope of Work for the Contract is not necessarily limited to the description of each section of the Specifications and the illustrations shown on the Drawings. Include all minor items not expressly indicated in the Contract Documents, or as might be found necessary as a result of field conditions, in order to complete the Work as it is intended, without any gaps between the various subdivisions of work.

   E. The Contractor will be held to be thoroughly familiar with all conditions affecting labor in the area of the Project including, but not limited to, Unions, incentive pay, procurements, living, parking and commuting conditions and to have informed his Subcontractors and Sub-subcontractors thereof.

5. CONTRACT DOCUMENTS INFORMATION

A. The Contract Documents are prepared in accordance with available information as to existing conditions and locations. If, during construction, conditions are revealed at variance with the Contract Documents, notify the Construction Manager immediately, but no more than three (3) days from the day the variance is first known. Failure to give timely notice shall operate to waive any claim Contractor might otherwise have for an adjustment to Contract Time or Sum as a consequence of such variance.

B. The Specifications determine the kinds and methods of installation of the various materials, the Drawings establish the quantities, dimensions and details of materials, the schedules on the Drawings give the location, type and extent of the materials.

C. Dimensions given on the Drawings govern scale measurements and large scale drawings govern small scale drawings, except as to anything omitted unless such omission is expressly noted on the large scale drawings.

D. The techniques or methods of specifying to record requirements varies throughout text, and may include “prescriptive”, “open generic/descriptive”, “compliance with standards”, “performance”, “proprietary”, or a combination of these. The methods used for specifying one unit of work has no bearing on requirements for another unit of work.

E. Whenever a material, article or piece of equipment is referred to in the singular number in the Contract Documents, it shall be the same as referring to it in the plural. As many such materials, articles or pieces of equipment shall be provided as are required to complete the Work.

F. Whenever a material, article or piece of equipment is specified by reference to a governmental, trade association of similar standard, it shall comply with the requirements of the latest publication thereof and amendments thereto in effect on the bid date.

G. In addition to the requirements of the Contract Documents, Contractor’s work shall also comply with applicable standards of the construction industry and those industry standards are made a part of Contract Documents by reference, as if copied directly into Contract Documents, or as if published copies were bound herein.

H. Where compliance with two (2) or more industry standards, contract requirements, or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, then the most stringent requirements, which are generally recognized to be also the most costly, is intended and will be enforced, unless specifically detailed language written into the Contract Documents clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently equal but different requirements, and uncertainties as to which level of quality is more stringent, to Architect for decision before proceeding.

I. Reference standards referenced directly in Contract Documents or by governing regulations have precedence over non-reference standards which are recognized in industry for applicability of work.

J. Contractor's bid is based on the complete set of Contract Documents including documents not specifically issued as part of the bid pack but referenced in same.

6. SCOPE OF WORK/GENERAL INFORMATION

A. A Scope of Work for each contract to be awarded on the project follows in this section. When a Contract has been awarded to a Contractor, the successful Contractor will be listed after the title of the Contract. When no Contract has yet been awarded, no Contractor's name will be listed. Previous Scopes of Work include addendum changes.

B. Contractor is responsible for performing the work listed in the Summary of Work for his contract. Contractor is also responsible for knowing the work that has been assigned to preceding contracts. No additional compensation or extension of time will be allowed a Contractor due to his ignorance of the work assigned to his Contract or to other contracts which may affect his work. The Contractor is responsible, however, for all items which are covered in the Specifications and Drawings relating to their Contract if not specifically mentioned in the Summary of Work.

C. The Construction Manager will provide on-site a source for temporary electric, temporary water and portable sanitation facilities only. It is each Contractor's responsibility to make the necessary connections, including all material for temporary electric and water. Please note that utility charges for office trailers will be the responsibility of the individual Contractors.

D. A dumpster will be provided on site for free use by Contractors to dispose of non-hazardous, common, work-related refuse. Clean-up is the responsibility of each Contractor. Clean up shall be performed on a daily basis. Contractors not complying will be advised in writing and back charged for all costs associated with the cleanup of their work.

E. Contractors are reminded that there are limited storage areas available on site. Off-site storage will be the responsibility of each individual Contractor.

F. Office trailer permits off site will be the responsibility of each individual Contractor. On site Contractor's field offices, one (1) per Contractor, if required, will be located as directed by the Construction Manager.

G. Contractor will be prepared to discuss and submit a detailed project schedule seven (7) days after receipt of Notice to Proceed and to begin its submittal process. The Project Schedule is an integral part of this contract. Certain construction sequences and priorities must take place in order to meet the target dates. Concentrated work periods will occur and each Contractor is responsible to staff the project as required by the

current Construction Schedule or as directed by the Construction Manager. Contractor will cooperate with the Construction Manager in planning and meeting the required sequences of work and Project Schedule as periodically updated by the Construction Manager.

H. All bids must include insurance limits in accordance with Article 11 of the Section 007300 SUPPLEMENTARY CONDITIONS.

I. Hoisting, scaffolding and material handling is the responsibility of each Contractor, unless otherwise noted.

J. Contractor will be responsible for layout of its own work. The Construction Manager will provide benchmark and layout of the building line.

K. Contractor will be responsible to keep clean public roadways soiled by construction traffic on a daily basis. If cleaning is not done, the Construction Manager may perform the cleaning on an overtime basis and backcharge the Contractor responsible.

L. Contractor Scopes of Work and Schedule are interrelated. Familiarity with each is required.

M. The Construction Manager will provide testing services for soil, concrete and steel. Other testing as required by the Contract Documents will be in accordance with the technical specifications and/or the individual scope of work. Refer to Specification Section 004500 - QUALITY CONTROL.

N. Safety is the responsibility of each individual Contractor. The project will be governed under the guidelines of OSHA.

O. Inter-Contractor shop drawing distribution will be performed by the Construction Manager. Contractor is individually responsible for either coordinating his work with these distributed drawings or notifying the Construction Manager, in writing, of any discrepancies.

P. Coordination with other trades will be required. The Contractor will be required to attend periodic coordination meetings with other trades where requirements, conflicts and coordination issues will be discussed and resolved. Attendance when requested will be mandatory. If inter-Contractor coordination is not satisfactorily performed, the conflicting Contractors shall mutually share the cost to relocate and/or reinstall their work.

Q. Contractor shall submit a schedule of values to the Construction Manager prior to the submission of their first invoice for approval through Building Blok.

R. Contractor is expected to review and coordinate its Work with the complete set of Contract Documents, including all items noted as by his trade whether or not shown on

that particular set of drawings. Documents are available at the site for review.

S. Contractor is responsible for obtaining all necessary permits required for his work, including street permits. Unless otherwise noted, building permit shall be secured by the Construction Manager. Any subcontractor who will be restricting access to street, right of way or adjacent property must notify the Construction Manager 48 hours in advance.

T. Contractor's License: Submit a copy of all business licenses required by local and state agencies.

U. Contractor shall absorb, without additional compensation, any and all costs of working beyond normal hours to maintain job progress in accordance with the current construction schedule.

V. No asbestos or PCB's in or on any material or equipment will be accepted or allowed on this project. All hazardous materials will be treated in accordance with all State and Federal regulations.

W. Daily cleanup of the work is the responsibility of each individual Contractor which includes broom cleaning of their debris as required. Contractor will be individually back charged by the Construction Manager for clean up not satisfactorily performed by the Contractor.

X. In the event asbestos is uncovered, the Contractor shall notify the Construction Manager of the areas requiring removal of asbestos. The Construction Manager shall then coordinate the removal with the Owner.

Y. This project is to be constructed adjacent to existing buildings. Contractor shall exercise all due precautions to minimize noise, air pollution and any other construction hazards which in any way would cause discomfort or danger to the occupants of the existing building in the area.

Z. The Safety Cable System shall not be altered or removed without a written request submitted to the Project Manager with a copy to the Field Manager. It shall be the responsibility of each and every Contractor that is removing or altering the Safety Cable System to maintain the fall protection safety provided by the safety cable and not leave the area unprotected. Each and every Contractor shall be responsible to re-install the Safety Cable System immediately after work is completed. Each and every Contractor shall be responsible to re-install the Safety Cable System in accordance to OSHA standards.

AA. Normal work hours for this project are from 7:00 a.m. to 3:30 p.m. Any work to be performed outside of these hours must receive prior approval from the Construction Manager. Requests to work beyond normal work hours shall be submitted at least 48 hours prior.

AB. Contractor is responsible for having a competent project superintendent/foreman on-site during all work performed under its contract.

AC. In the event the Contractor has non-English speaking employees or subcontractors on the project, they shall have a superintendent or foreman on site, at all times, who speaks English and can communicate with Contractor's employees. Should the Contractor fail to meet this requirement, at any time, Construction Manager may direct all Work to stop until the proper supervision is on site. The Contractor will be responsible for maintaining the project work schedule and make up at its own expense, any delay to the Schedule resulting from the work stoppage.

AD. Punch List Procedures: Contractor shall be given a copy of the punch list with his appropriate work identified. Contractor shall have nine (9) calendar work days to complete its punch list work. On the 10th day or as determined by the Construction Manager, the Construction Manager shall employ other contractors, as required, to complete any incomplete punch list work and retain from the appropriate Contractors retainage all costs incurred.

AE. Contractor shall provide the necessary safety barricades and railings required to complete their work and comply with all OSHA, local code and contract specifications.

AF. **Prohibition of Using Photographs on EDiS Projects**: The Contractor and all associated subcontractors agrees to not issue any news release or advertising pertaining to the Work or the Project, including references to the Project on the Contractor's/subcontractor website or other social media outlets, without obtaining EDiS' prior written approval, in each instance. The Contractor, for itself, its employees, vendors and subcontractors, agrees to not use the name of the Owner, the Project, EDiS or any photographs, videos, or other images of the Project in connection with any of Contractor's business promotion activities, advertising, website, social media outlets, or operations, without EDiS' prior written approval in each instance.

CONTRACT NO. C-01 CONCRETE AND REINFORCING

A. Work included in this contract consists of, but is not necessarily limited to, all labor, materials and equipment for:

- Technical Specification Sections:

Division 0	Bidding and Contract Requirements
Division 1	General Requirements
Division 2	Sitework
Section 312300	Excavation and Backfill for pipeline and structures
Section 033000	Concrete
Section 071300	Sheet Waterproofing
Section 072100	Thermal Insulation
Section 072600	Under-Slab Vapor Barrier
Section 079200	Joint Sealants

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide concrete footings, foundations, foundation walls, piers, wall footings, grade beams, elevator pit walls and slab, slabs on grade, slabs on deck, structural pads, equipment pads, dumpster pads etc. and all excavation, backfill, stone subbase, forms, and reinforcing required.

2. This Contractor will be responsible for laying out all concrete work as shown on the structural and architectural drawings and certifying the layout.

3. This Contractor to furnish and install reinforcing steel, admixtures, curing compound, sealers, accessories, bolsters, ties and braces as required in the Contract Documents and for the performance of the work of this contract.

4. Provide Preformed Joint Seal systems and all Joint Sealants related to work of your contract.

5. This contractor shall provide installation of sleeves required for MEP lines, under footings, below frost walls, under thickened slabs, etc. This includes all excavation and backfill required for these installations. (sleeves will be supplied by the contractor installing the services, future BP-D) Coordinate with Arch and MEP documents for extent of this work.

6. Provide all door stoops, pads, entrance/exit concrete complete as detailed on the structural drawings. This will be out of sequence work, contractor to include 7 re-mobilization to perform work out of sequence, this shall include premium costs for short load concrete pours as well.

7. Provide exterior concrete slabs, turndown slabs, equipment foundations and pads as shown

on the structural drawings. This will be out of sequence work, contractor to include 8 re-mobilization to perform work out of sequence, this shall include premium costs for short load concrete pours as well.

8. Provide thickened slab footings at all interior CMU walls as required on the structural drawings and notes. This contractor owns the coordination and verification of all thickened slabs, haunches etc. whether identified on structural or architectural documents, including the contract specifications.

9. Underslab vapor barrier, insulation, reglets, waterstops, control and construction joints (including required caulking at control and construction joints).

10. Provide foundation wall insulation and insulation under slabs. Include backfill of all foundation walls as detailed. Stone under slab to be provided by this contractor. Include re-dressing the stone after the MEP contractors have installed their UG work.

11. Placement of related items furnished under other Specification Sections.

12. Anchor bolts and leveling plates to be installed by this Contractor and furnished by the Structural Steel contractor. Installation within required tolerances. Anchor bolt assemblies to be placed with templates only.

13. Contractor shall supply signed/sealed engineered drawing as-builts to steel the erector for coordination prior to steel placement. Steel erector must sign off that the placements are accurate and accepted.

14. All blockouts and embedments required by plans and specifications.

15. This Contractor is responsible for grouting all structural steel base or leveling plates and elevator sill angles.

16. Include all weather, frost protection, and water pumping as required. This Contractor is also responsible for the premiums required for hot water, heated aggregate and admixtures for cold weather concrete.

17. Coordinate the “Notch” in the concrete slabs to allow for a future Contractor to easily install expansion joint details.

18. Provide concrete fill at steel pan stair treads, landings and associated items. Include 5 additional mobilizations to allow this work to be performed at the direction of the CM. This shall include all costs associated with premium costs of concrete and short load charges.

19. Provide dewatering after acceptance from Sitework Contractor until re-acceptance by the Sitework Contractor.

20. The sitework contractor is to provide a flat, compacted surface at subgrade prior to the start of foundation layout and installation. This contractor shall furnish, install and maintain the stone underslab for the SOG area and structural pads. Written acceptance of the building pad condition will be provided by the concrete contractor before foundation work proceeds. Once the Concrete Contractor has accepted this work it will be the responsibility of the Concrete Contractor to maintain and dewater the building pad and all excavations until the concrete work is complete and backfilled. The Concrete contractor is to provide access to foundation excavations for the Masonry contractor. Concrete contractors own dewatering during masonry and waterproofing work and backfill after foundation masonry work is complete. Spoils left after backfilling of foundations is complete are to be left outside the building perimeter by the concrete contractor in stock piles in accessible areas that will be gathered by the sitework contractor and spread on site. Concrete Contractor will also be responsible for additional excavation and backfilling within the building as may be required to accommodate the sloped floors in the auditorium, varying slab thicknesses, depressed slabs and grade changes. Close coordination with the Sitework, Masonry, Mechanical and Electrical Contractors is required.

21. This contractor shall provide all de-watering measures as required to perform the work of their contract. Refer to Geo-Tech reports for estimated ground water depths and prepare your bid accordingly.

22. Additionally over and above de-watering for your course of work, provide (8) 2'x2' crocks, stone infill and sloping of graded area to allow for general de-watering as directed by CM. Areas of use to be coordinated with Superintendent on site.

23. This contractor shall provide all excavation to depths and areas required to allow proper forming, pouring and stripping of the elevator pit walls and slabs.

24. **Provide and maintain perimeter fall protection at excavated area per OSHA standards. Flags shall be installed immediately after cable is installed.**

25. Provide certified anchor bolt verification drawings to the Construction Manager for review prior to steel erection.

26. Equipment bases and foundations shall be the responsibility of the Contractor providing the equipment.

27. Asphalt concrete paving and Portland cement concrete paving, sidewalks and curbs shall be provided by others.

28. All concrete testing will be completed by the Construction Manager, however, it will be the responsibility of this Contractor to furnish all samples.

29. Provide off site disposal of all unsuitable excavated materials.

30. CM Note: Construction Manager to ensure that FF/FL compliance is verified by an independent testing agency within 48 hours of completion of pour, per ACI (Section 8.15.4). Also, a report must be provided to the concrete contractor within 72 hours of pour per ACI. This contractor to communicate and schedule the concrete pours and timing with the CM.

31. Provide specified sloping for floor drains/trenches in kitchen, showers, as detailed (Drains to be furnished by Mechanical Contractor.) This contractor to communicate and review drain sloping with CM before each pour.

32. This Contractor shall include the finishing of concrete slabs around a minimum of (fill in) floor penetrations throughout the first and second floor slab areas. These penetrations will consist of electrical boxes, stubbed conduits, mechanical piping and electrical and technology conduit stubs, etc.

33. This Contractor shall also include all work included in finishing the concrete floors to a minimum of (75) floor drains and or trench drains. Include all sloping and beveling to create a positive flow to the drains. Sloping to be reviewed with the CM prior to each pour.

34. This Contractor shall provide written documentation that all concrete slabs are within the tolerance required by the contract documents. Testing and analysis to be paid for by this Contractor.

35. This Contractor shall include a minimum of (15) additional out of sequence remobilizations for concrete slab installation.

36. There shall be no minimum number of square feet required or mandated by the contractor for S.O.G or elevated deck pours.

37. This contractor shall include an allowance amount of $150,000 within the base bid for work to be identified by NCCVT and the CM.

38. Provide concrete infill slab **inside the** walk-in freezers and refrigerators after freezers and refrigerators have been set in place. **Also grout the space between the freezers and refrigerator and the surrounding concrete.** Coordinate requirements with the architectural drawings for BP-C and technical specifications.

39. Provide all foundation and below slab waterproofing. Provide waterproofing at elevator pit walls and blind-side of concrete footings and all foundations. (sheet waterproofing included) Include all testing as specified. This contractor shall provide de-watering of the areas to receive waterproofing as well as cleaning and drying of the surfaces prior to application.

40. This contractor owns coordinating all slab depressions identified on the documents with the products, flooring, insulation etc. shop drawings and layout drawings for each material that will be installed in the recess. A pre-install meeting will be held to review this

information before each depressed pour.

41. This contractor shall own infill of concrete at floor drains and boxouts not completed at the time of slab pour. Include concrete, joint materials, short load concrete costs associated with (35) drains infill areas 2'X2 square 5' deep.

42. Provide Column diamond protection after floor pours are completed at all recessed columns to meet OSHA Requirements.

43. Provide all means of transporting concrete including, but not limited to pump trucks, cranes, ramps, chutes, buggies.

44. Provide at least 48 hours' notice prior to any delivery. All deliveries are to be between 7:00 AM and 3:30 PM.

45. Provide all means of transporting concrete including, but not limited to pump trucks, cranes, ramps, chutes, buggies.

46. This is not a secure site. All contractors are responsible for concealing, locking and/or removing any materials on a daily basis. NCCVT and EDiS will not be responsible for any lost tools, materials or equipment.

47. This contractor must provide a silica exposure plan that meets or exceeds the silica OSHA requirements before any work can commence. At a minimum, it must be implemented into the company safety plan, include all monitoring, testing, limits exposure, provide respiratory plan and/or equipment modifications such as adding water to equipment during exposed work and keep records of exposure.

48. Provide daily fine cleanup of the work is the responsibility of each individual Contractor which includes broom cleaning of their debris as required. Daily Fine clean up, on a daily basis, shall be defined as those means/methods utilized to perform the daily cleaning tasks without producing dust, noise and stacking of stored materials. Furnish fine clean up on a daily basis. All debris must be removed from the work area at the end of each work day to the appropriate dumpster. Cleaning of roadways shall be included and performed daily while this contractor is on site performing work of this contract.

49. Provide generators and other means for temporary services for the completion of your work.

50. All materials excavated for installation of footings and foundations shall immediately be protected with appropriate moisture protection. This Contractor owns protecting excavated backfill material from exposure to wet conditions.

51. Provide all BIM services as specified in Section 013700 BIM Execution Plan.

CONTRACT NO. C-02 FOUNDATION MASONRY

A. Work included in this contract consists of, but is not necessarily limited to, all labor, materials and equipment for:

- Technical Specification Sections:

Division 0	Bidding and Contract Requirements
Division 1	General Requirements
Section 042000	Unit Masonry
Section 072100	Thermal Insulation
Section 079200	Joint Sealers

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide masonry units, reinforcing, grouting and accessories related to the foundation assembly, up to and coordinate with the Slab on Grade. Coordinate foundation coursing with the elevations as detailed on the structural drawings. Standard details identified on sheet S502 are typical of the conditions required by this contract. Detail F-S502, GS502.

2. Provide the masonry stair towers and elevator tower complete. Include in the base bid out of sequence remobilization costs to accommodate the concrete slab pours as detailed.

3. Provide masonry and accessories as associated with the Elevator tower and masonry stair tower assemblies.

4. Caulking of masonry to masonry joints at foundations

5. This contractor shall provide installation of sleeves required to go through any masonry walls. (sleeves will be supplied by the contractor installing the services, future BP-D) Coordinate with Arch and MEP documents for extent of this work.

6. Weather protection and temporary heat as required to perform the work and maintain the project schedule.

7. Dewatering of work areas is the responsibility of this contractor. Clean up and of footings prior to starting block work should be anticipated and accounted for in your base bid. This shall include shoveling/scraping footings clean.

8. Layout of the work including responsibility for all elevations and dimensions as they affect other Contractor's work.

9. Furnish and install concrete masonry lintels required by this Contract and install loose lintels furnished by others. This contract includes lintels at the foundation wall areas.

10. Masonry (grout) fill at hollow concrete masonry units.

11. Setting of reinforcing steel in block walls and grouting.

12. All flashing as required for installation of your work.

13. Cutting, fitting and building into masonry work, embedment's provided by others.

14. Bond beams, include reinforcing and fill.

15. At elevator entrance, tooth outside walls and add additional temporary lintel above elevator door frame.

16. Furnish and install all masonry veneer anchors where required. Hoist beam install and infill to be included in this contract.

17. This contractor shall own and coordinate the dumpsters required for all masonry materials related to the work of this contract.

18. Provide all scaffolding required to complete the work of this contract.

19. This is not a secure site. All contractors are responsible for concealing, locking and /or removing any materials on a daily basis. EDiS will not be responsible for any lost tools, materials or equipment.

20. Provide generators and services as required to provide temp power, water etc. as needed for your course of work.

21. This contractor shall own all waterproofing of the foundation walls and footings as indicated on the contract documents.

22. This contractor shall include within their bid the incorporation of **750 hours of COOP participation** by a NCCVT student. Contractor to comply with project documents and requirements set forth in 19 del. C.ch.5

23. Provide all BIM services as specified in Section 013700 BIM Execution Plan

24. This contractor must provide a silica exposure plan that meets or exceeds the new 2017silica OSHA requirements before any work can commence. At a minimum, it must be implemented into the company safety plan, include all monitoring, testing, limits exposure, provide respiratory plan and/or equipment modifications such as adding water to equipment during exposed work and keep records of exposure.

25. Provide installation, maintenance and removal of mixing stations as per DNREC requirements and direction from CM.

26. Provide all acoustical sealants, fire safing/fire stopping, and continuous fire sealant at top and bottom of masonry walls as shown on the contract documents. Also include these sealants at all steel penetrations through the provided masonry.

27. This contractor shall include an allowance of $70,000 for work to be determined by the owner and CM.

CONTRACT NO. C-03 STRUCTURAL STEEL, JOISTS AND DECK

A. Work included in this contract consists of, but is not necessarily limited to, all labor, materials and equipment for:

- Technical Specification Sections:

Division 0	Bidding and Contract Requirements
Division 1	General Requirements
Section 051200	Structural Steel
Section 052100	Steel Joist
Section 053100	Metal Decking

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide structural steel, joists and metal floor and roof decking, including all acoustical decking with insulation complete. This shall include unloading and storing on site in a dry protected manner until installation is required by this contract.

2. Furnish anchor bolts and leveling plates to the Concrete Contractor for placement in concrete piers.

3. This Contractor shall include a $20,000 allowance for the maintenance portion of the perimeter cables. All other items remain the responsibility of the Steel Contractor. The allowance will be allocated by the Construction Manager on a time and material basis. All remaining allowance shall be returned to the Owner at completion.

4. Field check all anchor bolts prior to beginning erection and sign the anchor bolt survey drawing provided by the concrete contractor.

5. Roof sump pans and related work, including supporting steel frames, braces, brackets etc.

6. Framing out for openings (roof drains, mechanical openings, access hatches, skylight, stairs, etc.). Assume opening frames will be field installed. This contractor shall provide “all” floor opening and roof deck opening frames, angles, reinforcing, clips, welding etc. as indicated on the contract documents.

7. Prime paint systems, galvanizing, and related finishing of steel items, including touch up. Pay close attention to any steel that is identified to receive sprayed fireproofing and/or Intumescent paint, as these sections of steel may require special preparations, such as no primer paint or sandblasting.

8. Masonry or precast anchors welded to steel columns and beams.

9. Provide elevator hoist beams and elevator sill angles

10. Supply and install shear studs and shear stud testing.

11. Furnish, install, maintain and remove perimeter safety steel cables at all floor levels to conform with all OHSA standards for all trades. Install flagging on cabling at time of installation.

12. The Steel Contractor will own all connections to masonry whether they are field welds or shop welds. Conditions that require in field welding and assembly are the responsibility of this Contractor. Field coordination with the masonry installer will be this Contractor's responsibility.

13. All steel testing will be the responsibility of the Construction Manager, however, this Contractor will cooperate with the testing agency in the inspection at the fabrication shop and in the field.

14. Layout, installation and alignment of attachments at the slab edge condition.

15. No electrical power for this contractors equipment or welders will be provided. Electrical power to be provided as needed by this contractor.

16. Provide data and submittal information related to the Scope of this Contract signed and sealed by a Professional Engineer as required by the Contract Documents.

17. This Contractor shall fabricate, weld and install all reinforcing anchors that connect the structural steel to the masonry systems. Provide all shop fabrication, field installation and field welding regardless of the weld symbols.

18. This Contractor shall include all necessary staging, rigging, matting and remobilizations to accommodate this erection sequence. Sequencing of work will need to be coordinated with CM and other trades.

19. This contractor will be required to coordinate work of this contract with the Misc steel, stairs and railing contract to be issued within the scope of BP-D Building and Fitout.

20. Remove, modify, and replace the plywood covers installed by the concrete contractor at all Diamonds during the erection of steel, as required to meet OSHA requirements.

21. This is not a secure site. All contractors are responsible for concealing, locking and/or removing any materials on a daily basis. EDiS will not be responsible for any lost tools, materials or equipment.

22. This contract shall include in their bid the necessary crews to complete the work as per the project schedule. Provide additional crews as required to maintain schedule at no additional cost to the project.

23. Provide and install adjustable edge angle and pour stop as required.

24. Provide all BIM services as specified in Section 013700 BIM Execution Plan

25. This contractor shall include an allocation of $120,000 for work to be identified and assigned by the owner/CM.

END OF SECTION

SECTION 012100 - ALLOWANCES

1. RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

B. Refer to provisions in AIA Document A232 – 2019 EDITION, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER AS ADVISOR EDITION, for requirements in addition to those specified in Division 1.

C. Refer to Scope Information Sheets for all contracts bound in the Project Manual under Section 011100 - SUMMARY OF WORK. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.

D. For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

E. Include in the Contract Sum all lump sum and unit cost allowances stated in the Contract Documents.

F. Designate in the construction progress schedule the delivery dates for products specified under each allowance.

G. Designate in the Schedule of Values the quantities of materials required under each unit cost allowance.

2. ALLOWANCES FOR PRODUCTS

A. The amount of each allowance includes:

1. The cost of the product or labor to the Contractor or Subcontractor, less any applicable trade discounts.

2. Delivery to the site.

3. Labor required under the allowance, only when labor in specified to be included in the allowance. If labor is not specified to be included in the allowance, it shall be included in the Contractor's bid and in the resulting Contract Sum.

4. Applicable taxes.

5. Profit and overhead.

B. In addition to the amount of each allowance, include in the Contract Sum the Contractor's costs

for:

1. Handling at the site; including unloading, uncrating and storage.

2. Protection from the elements and from damage.

3. Labor for installation and finishing, except where labor is specified to be a part of the allowance.

4. Other expenses required to complete the installation.

5. Contractor's and Subcontractor's overhead and profit.

C. Refer to Scope Information Sheets under Section 011100 - SUMMARY OF WORK for the amount of each lump sum allowance and for work specified in the specification sections listed below.

1. Section 011100 Contract C-01: Concrete and Reinforcing: Provide a $150,000 allowance for potential work to be used at the discretion of the Owner.

2. Section 011100 Contract C-02: Foundation Masonry: Provide a $70,000 allowance to be used at the discretion of the Owner.

3. Section 011100 Contract C-03: Structural Steel, Joists, and Deck: Provide a $120,000 allowance to be used at the discretion of the Owner.

3. ADJUSTMENT OF COSTS

A. Should the net cost be more or less than the specified amount of the allowance, the Contract Sum will be adjusted accordingly by Change Order.

1. For products and labor specified under a unit cost allowance, the unit cost shall apply to the quantities actually used with a nominal allowance for waste, as determined by receipted invoices, or by field measurement.

B. At Contract closeout, reflect all approved changes in Contract amounts in the final statement of accounting.

END OF SECTION

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

ALLOWANCE AUTHORIZATION

Project:

Architect: **Project No.**

Contractor:

AAA No.: **Initiation Date:**

The Allowance is allocated as follows:

Total original Contract Allowance was:	$
Amount of Contract Allowance Access previously authorized:	$
Adjusted Contract Allowance prior to this authorization is:	$
The amount of available Allowance will Decrease by this Access Authorization:	$
The remaining Contract Allowance, after this Access Authorization will be:	$

Recommended by:
Architect

By (Signature): _____
Date: _____

Accepted by:
Contractor

By (Signature): _____
Date: _____

Approved by:
Owner

By (Signature): _____
Date: _____

SECTION 012200 - UNIT PRICES

1. GENERAL PROVISIONS

   A. The general provision of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

   B. Refer to provisions in AIA Document A232 – 2019 EDITION, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER AS ADVISOR EDITION, for requirements in addition to those specified in Division 1.

   C. For work being constructed under separate prime contract, provisions of this Section apply to each contract being bid.

2. BASE BID

   A. The Base Bid shall consist of all work shown or specified in the Contract Documents, exclusive of any Additive Unit Prices specified herein.

   B. The Base Bid shall include all work in any Subtractive Unit Prices specified herein.

3. UNIT PRICES

   A. State in the Bid Form the amount to be added to (or subtracted from) the Base Bid per unit of measurement for each Unit Price specified. State this amount to include all overhead and profit. No surcharge in addition to the Unit Price listed will be permitted.

   B. See Section 002113, INSTRUCTIONS TO BIDDERS for related information.

   C. For description of Unit Prices requested, refer to the specification. The method of stating the Unit Prices is described in the Bid Form.

   D. Where both add and deduct unit prices are requested, there shall not be more that a 10% variation between the two.

4. APPLICATION OF UNIT PRICES

   A. Unit prices stated in the Bid Form will apply from the time the Bid is submitted until Contract completion.

5. MEASUREMENT OF QUANTITIES

   A. Quantities shall be determined by field measurement by contractor personnel and as verified by the Construction Manager.

B. At the Contractor's option, and at his expense, measurement may be made by a registered surveyor.

6. LIST AND DESCRIPTION OF UNIT PRICES – N/A

END OF SECTION

SECTION 012300 - ALTERNATES

1. GENERAL PROVISIONS

   A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

   B. Refer to provisions in AIA Document A232 – 2019 Edition, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER AS ADVISOR EDITION, for requirements in addition to those specified in Division 1.

   C. For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

2. BASE BID

   A. The Base Bid shall consist of all Work shown or specified in the Contract Documents, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids (if any are required to be stated in the bid).

   B. The Base Bid shall include all work in any Subtractive Alternates specified herein.

3. ALTERNATES

   A. State in the Bid Form, where applicable, the amount to be added to or deducted from the amount of the Base Bid for each Alternate specified.

   B. See Section 002113 - INSTRUCTIONS TO BIDDERS for related information.

   C. The description of Alternates contained herein is in summary form. Detailed requirements for materials and execution shall be as specified in other sections and as shown on drawings.

      Alternate No. 2: Add Future CTE Shop Expansion (approx. 12,340 SF)
      1. Base Bid: Include all work identified on the contract documents as it applies to the scope of your contract course of work.

END OF SECTION

SECTION 012600 - CHANGE ORDER PROCEDURES

1. GENERAL

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

B. Refer to provisions in AIA Document A232 – 2019 EDITION, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER AS ADVISOR EDITION, for requirements in addition to those specified in Division 1.

C. The Construction Manager is responsible for processing all change orders. Each request will be assigned a change order request (COR) number. The Change Order Request & Execution Form will be initiated via the web-based project management system (Building Blok) used by the CM.

D. It is to be clearly understood that no extra work shall commence without an approved written and executed change order from the Owner.

2. INITIATING A CHANGE ORDER

A. Specific changes initiated by the Owner, Architect, Construction Manager (CM) or Contractor will be processed as follows:

1. The Owner will authorize the Architect to prepare sufficient documents to establish an accurate price. These documents to be forwarded to the Construction Manager and Owner "for pricing only, not authorized for construction." The Construction Manager will develop the estimate (within 2 weeks) showing a breakdown by trades with all trade contractor quotes. The Owner will approve or reject the change request within two (2) weeks. If the Owner elects to proceed with the change, the Construction Manager will prepare formal change orders to the various trade contractors involved in the change and reference in all formal change orders the original change order request number.

2. Field Change: Contractor shall immediately notify the Construction Manager of a change due to field conditions or site conditions. If documents cannot be prepared for pricing due to schedule constraints, the Construction Manager will make every effort in estimating the field change. If the Owner and Construction Manager agree that certain field changes should be handled on a time and material basis, the Construction Manager will closely monitor the Contractor's labor and material affecting this change. At the completion of the work a formal change order will be issued.

3. Contractor Change: If a Contractor initiates a change order for work not included in the Contract, the Construction Manager and Architect will research the validity of the request, verify quantities and pricing and submit to the Owner for approval on a change order request.

B. The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Contractor, Construction Manager and the Architect.

3. PROCESSING A CHANGE ORDER

A. The Contractor will fill in the Change Order Request & Execution Form (COREF) with a brief description of the change, any time extension, and cost changes.

B. The Contractor will attach to the COREF copies of the written quotations from the trade contractors, Contractors, and suppliers. The Labor Detail Sheet and the Change Order Detail forms must be added as an attachment to the COREF. The Contractor and each sub-tier contractor (as applicable) must fill out the Labor Detail Sheet and Change Order Detail Sheet. Samples of these forms are attached.

C. In all cases, this cost or credit shall be based on the "DPE" wages required and the "invoice price" of the materials/equipment needed.

D. "DPE" shall be defined to mean "direct personnel expense". Direct payroll expense includes direct salary plus customary fringe benefits (prevailing wage rates) and documented statutory costs such as workman's compensation insurance, FICA, and unemployment insurance.

1. "Fringe Benefit" is any medical, life or disability insurance, paid time off, etc.

2. "Worker's Compensation" is the insurance required for injuries including medical leave, etc.

3. "FICA" is the costs association with Social Security and Medicare insurance.

4. "Unemployment insurance" is the cost associated with the governmental assessment for employee's unemployment benefits.

E. "Invoice price" of materials/equipment shall be defined to mean the actual cost of materials and/or equipment that is paid by the Contractor (or Subcontractor) to a material distributor, direct factory vendor, store, material provider, or equipment leasing entity.

F. In addition to the above, the Contractor is allowed markup for overhead and profit on additional work performed as outlined in Specification Section 012613, Contractor Compensation.

G. Building Blok Procedures: The Contractor will submit all change order requests and supporting documentation via the Building Blok web-based project management system. Each Contractor will be issued a unique login and password. Each contractor must submit the information as follows:

1. Create a new change order, from your "To-Do List" by clicking on the "Create Issue" tab in the upper right corner and select "Change Order Request".

2. The Contractor will enter a brief description of the change in the "Summary" block. A detailed description of the change will be entered in the "Description of Change" block, to include any

changes to documents or time extension. The cost of the change will be entered in the "Total Cost Change" block.

3. The Labor Detail Sheet and the Change Order Detail forms must be added as an attachment to the request. The Contractor and each sub-tier contractor (as applicable) must fill out the Labor Detail Sheet and Change Order Detail Sheet. Samples of these forms are included behind this section. In addition to these forms, the Contractor also must attach any material and equipment rental quotations. All of these documents should be scanned and saved as a PDF file. Click on the "Browse" box to upload the file. Be sure to wait until Building Blok tells you the file was "Uploaded Successfully".

4. Once the information is entered on the form and the proper attachments are uploaded, the contractor will click "Save". The Contractor will be prompted to enter their password to approve an electronic signature. Once you save the request you will have an opportunity to check it before submitting it to the CM. After you verify the COREF is correct click "Recommend Approval" to submit the change request to the CM. The Contractor will then be prompted to re-enter the password to approve an electronic signature and complete the submission request. Click on "Home" in the upper left corner to make sure the change order does not appear on your To-Do List.

5. The Change Order Request will then be reviewed by the CM Project Manager and Recommended for Approval, Rejected, or returned to the Contractor for additional information. Once the Construction Manager, Owner, and Architect have approved the request all parties will receive an email from Building Blok notifying them that a fully executed Change Order and Contract Recalculation Form can be downloaded from Building Blok. Hard copies of the executed change order and recalculation form will not be provided by the CM.

It is to be clearly stated that no extra work shall commence without an approval from the Owner or Construction Manager or Owner's representative.

END OF SECTION

CHANGE ORDER DETAIL FORM

(Provided by contractor, subcontractor or sub tier contractor)

DATE SUBMITTED:

CONTRACT:

CONTRACTOR:

PROJECT NAME:

CHANGE ORDER REQUEST #:

LABOR SECTION

TRADESMAN(s):	LABOR HOURS	RATE (per schedule)	SUBTOTAL
Subtotal			

MATERIAL SECTION

MATERIAL:	QUANTITY	UNIT COST	SUBTOTAL
Subtotal			

EQUIPMENT SECTION

EQUIPMENT:	QUANTITY	UNIT COST	SUBTOTAL
Subtotal			

SUBTOTAL	
SUBCONTRACTOR/ SUB TIER*	
OH & PROFIT (10% on sub/sub tier only))	
BOND COST	
OH & PROFIT (15% on own work)	
GRAND TOTAL	

LABOR DETAIL FORM

(Provided by contractor, subcontractor, or sub-tier contractor)

DATE:

CONTRACT:

CONTRACTOR:

PROJECT NAME:

CHANGE ORDER REQUEST #:

CLASSIFICATION:			
Base Wage Rate:			
Health Insurance			
Holidays			
Sick Days			
Life Insurance			
Disability Insurance			
Dental Insurance			
Company Vehicle			
401K			
Education			
Other (*specify below*)			
Subtotal			
Posted Prevailing Rate			
FICA (Social Security & Medicare)			
SUTA (State Unemployment)			
FUTA (Federal Unemployment)			
General Liability Insurance			
Worker's Compensation			
Total Wage Rate			

SECTION 012613 - CONTRACTOR COMPENSATION

1. GENERAL

A. The Contractor agrees to perform any additional Work, for the net cost of materials and labor (including wages paid, payroll taxes, and all insurance) plus the following percentage for all of his overhead and profit, which includes Field Supervision:

The percentages to be added or allowed for any Work change involving both added Work and omitted Work shall be applied only to the net difference in cost.

1. 15% mark-up (10% overhead and 5% profit) by the Contractor on Work performed by his own forces.

2. For work done by a Subcontractor, 10% for subcontractor overhead and 5% for subcontractor profit to which the Contractor may add 7.5% for his overhead and profit combined.

3. Contractor mark-up shall include supervision, home and field overhead, all self-owned small tools and equipment.

B. When the Contractor is directed to perform overtime work at the CM (Owner) expense to accelerate contractual work, the cost for same shall only be the actual premium costs incurred by the Contractor.

END OF SECTION

SECTION 012900 - PAYMENT PROCEDURES

1. GENERAL PROVISIONS

   A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

   B. Refer to provisions in AIA Document A232 - 2019 Edition, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER AS ADVISOR EDITION, for requirements in addition to those specified in Division 1.

   C. For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

2. REQUIREMENTS INCLUDED

   A. Submit Applications for Payment to Construction Manager in accordance with the schedule and procedures established in the Contract Documents.

3. RELATED REQUIREMENTS

   A. Owner-Contractor Agreement.

   B. Conditions of the Contract: Article 9 PAYMENTS AND COMPLETION.

   C. Section 01 31 13: Project Coordination Meetings

   D. Section 01 33 00: Submittal Procedures

   E. Section 01 77 00: Closeout Procedures

4. FORMAT AND DATA REQUIRED

   A. Submit itemized applications typed on AIA Document G702/CMa, Application and Certificate for Payment, and Continuation Sheet G703, examples of which will be furnished to the Contractor at the Pre-Construction meeting.

   B. Provide itemized data on Continuation Sheet

      1. Format, schedules, line items and values: Duplicates of those of the schedule of values previously accepted by the Construction Manager.

5. PREPARATION OF APPLICATIONS FOR PROGRESS PAYMENTS

   A. Form: AIA Document G702/CMa

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.

2. Fill in summary of dollar values to agree with respective totals indicated on Continuation Sheets.

B. Continuation Sheets

1. Line items of components of Work will be subject to Owner's review and approval under the Provisions of Section 013300 - SUBMITTALS, and the General Conditions. Continuation Sheets shall follow Schedule of Values submitted at the start of the job.

2. Fill in total list of all scheduled components of Work, with item number and scheduled dollar value for each item. Fill in values of work completed in the period.

3. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored; round off values to nearest dollar.

4. List each Change Order executed prior to date of submission, at the end of the Continuation Sheets; list by Change Order Number, and description, as for an original component item of work.

5. Contractor is to include a line item for "Closeout Documents" equaling 3.5% of their contract value.

6. PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form as specified in progress payments.

7. SUBMITTAL PROCEDURES

A. Complete Invoice:

1. Submit completed Application to the Construction Manager by the date stipulated in the Project Manual.

B. Number: Submit 3 copies of each invoice.

END OF SECTION

SECTION 013113 - PROJECT COORDINATION MEETING

1. PROJECT COORDINATION MEETING

   A. An on-site project coordination meeting will be held on a biweekly basis throughout the project construction period.

2. ATTENDANCE

   A. Attendance at the project coordination meeting is mandatory of each Contractor or major supplier on the project.

   B. The representative of the Contractor shall be the Project Manager and field superintendent unless a substitute representative has been approved by the Construction Manager.

   C. Contractor will begin attending the Project Coordination Meetings at least 4 weeks prior to mobilization on site and will continue until the Contractor has fulfilled the obligations of his Contract.

3. AGENDA

   A. The Construction Manager will set the agenda for the biweekly Project Coordination Meeting.

   B. At a minimum, the Contractor shall be prepared to discuss the following:

      1. Actual vs. as planned progress for the prior two-week period.

      2. Planned construction activities for the next four weeks.

      3. Contract document clarifications.

      4. Coordination items with other contractors.

      5. Quality Control.

      6. Recently issued change orders.

      7. Potential change orders.

      8. Submittals and shop drawings.

      9. Other items requiring Construction Manager's attention.

END OF SECTION

SECTION 013119 – PRE-INSTALLATION MEETINGS

1. PRE-INSTALLATION MEETINGS

   A. An on-site pre-installation meeting will be held at least two weeks prior to commencement of installation of work.

2. ATTENDANCE

   A. Attendance at the pre-installation meeting is mandatory of each Contractor and/or major supplier as required for each specific meeting listed below.

   B. The following individuals shall attend these meetings:
      - Contractors' Project Manager
      - Contractors' Field Superintendent
      - Contractors' Safety Representative (as needed)
      - Key Subcontractors, Suppliers, and Vendors
      - EDiS Project Manager
      - EDiS Field Manager
      - EDiS Safety Director (as needed)
      - EDiS MEP Specialist (as needed)
      - Owner's Representative (as needed)
      - Architect/Engineer (as needed)
      - Governmental Agency Representatives (as needed)
      - Testing/Inspection Agency Representatives (as needed)
      - Utility Company Representatives (as needed)

3. SUBMITTALS

   A. Each contractor is responsible to have all submittals and mock-ups, as related to the pre-installation meeting scope of work, submitted and approved prior to commencement of the pre-installation meeting.

4. LIST OF REQUIRED MEETINGS

   - Selective Demolition
   - Doors/Frames/Hardware
   - Interior Glass and Glazing
   - Finish Carpentry & Millwork
   - Acoustical Ceilings/Acoustical Wall Panels
   - Paint and VWC
   - Flooring (VCT, Carpet)
   - Operable Partitions
   - Partition Walls
     - Metal Studs

- Drywall
- Insulation
- Doors/Frames/Hardware

- Fire Protection
  - Fire Sprinkler Systems
  - Fire Alarm Systems
- MEP Coordination
  - Mechanical Piping Roughin
  - Plumbing Roughin
  - Insulation
  - Electrical Roughin
  - Electrical – Bonding, grounding, lightning protection
  - Automatic Temperature Controls
  - Commissioning
- Voice/Data Low Voltage Wiring
- Security System
- Audio-Visual Equipment
- Owner Furnished Equipment
- Final Cleaning

5. AGENDA

   A. At a minimum, the Contractor shall be prepared to discuss the items as listed on the agenda template shown on the following page:

PROJECT: NCC HODGSON VOTECH HIGH SCHOOL

PRE-INSTALLATION MEETING: _____
(Insert Phase of Work)

A. ATTENDEES:

NAME	COMPANY	WORK ITEM	CONTRACT

B. TESTING & INSPECTION REQUIREMENTS
(THESE REQUIREMENTS COME FROM THE PROJECT MANUAL)

C. REVIEW CONTRACT DRAWINGS AND SPECIFICATIONS

Drawing / Spec No.	Comments / Conflicts

D. REVIEW SCOPES OF WORK *(SEE SECTION 011100 IN THE PROJECT MANUAL)*

E. REVIEW RELEVANT RFI'S

F. REVIEW SUBMITTALS *(SEE THE SUBMITTAL REGISTER)*

G. REVIEW MATERIALS AND DELIVERIES

H. REVIEW SCHEDULE AND SEQUENCE OF WORK

I. JOB SITE SAFETY *(SEE THE CONTRACTOR'S SAFETY PROGRAM OR OSHA)*

- Safety Plans must be submitted before the start of work
- Certificates of Insurance need to be submitted before the start of work
- Minimum PPE – Hardhats, steel toe boots, safety glasses
- Lock-out, Tag, Test and Try ALL utilities is critical before the start of demolition
- Signage & HAZCOM Requirements
- Potential Hazards
  - Excavations >4 ft
  - Slips/trips/falls
  - Existing utilities to remain and protected
  - Overhead debris
  - Power tools
  - Heavy equipment

J. COORDINATION WITH OTHER TRADES

K. ACTION ITEMS AND RESPONSIBILITY

END OF SECTION

SECTION 013125– WEB-BASED PROJECT MANAGEMENT SYSTEM

1. GENERAL PROVISIONS

   A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

   B. Refer to provisions in AIA Document A232 – 2019 EDITION, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, for requirements in addition to those specified in Division 1.

   C. Refer to Scope Information Sheets for all contracts bound in the Project Manual under Section 011100 - SUMMARY OF WORK. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.

   D. All Contractors shall use Internet/Web-based project management software to transmit documents, track, and otherwise manage this project.

   E. Use of this project management software will not change any contractual responsibilities of the construction team members.

2. DEFINITIONS

   A. System: A real time web-based software that shares data, translates data, organizes data, facilitates communication, archives actions, and offers scheduling prompts to identified Users.

   B. Users: Authorized participants of this project furnished with a unique password and authorized to access the system to view/input/export data. Owner, Construction Manager, Architect, and the Contractors are all Users. Other Users may be added as necessary.

   C. Contacts: Entities identified to automatically receive specific transmissions or entities selected to receive specific information sent by the system through to an e-mail address.

   D. Signees: Those individuals identified, by the Contractors, authorized to sign change orders and payment applications via electronic signature. This electronic signature is as contractually binding as an original signature on paper.

3. USE OF SYSTEM

   A. The use of the system is mandatory for the documentation of the transmittal of all non-oral information, even if the actual transmission of the information is by another means.

   B. The use of the system will be mandatory by the Contractors to send, retrieve, and respond to data.

   C. In addition to this web-based project management system, the Contractors will be required to use electronic mail (email) for day-to-day communication and correspondence. Email will be the

primary means of transmitting written communication (i.e. meeting minutes, draft pay applications, etc.).

4. QUALITY ASSURANCE

   A. A three-hour training session in the use of the software for this project will be offered by the Construction Manager at a location convenient to the project site. Attendance by one member of each Contractor's organization is mandatory. Additional attendees may enroll based on availability of training space. All attendees must have a working knowledge of computers. Training can not begin until three working days after the receipt of the submittals indicated below.

   B. Technical assistance will be provided by on-line help, email, or telephone for all Users through-out the life of the project.

5. SUBMITTALS

   A. Submit to the Construction Manager, within 5 days following the receipt of the letter of intent to award, in an electronic template, the following:

      1. Electronic logo of organization (as needed)
      2. Names, mailing address and electronic address of its Users and Contacts.
      3. Designation the role/responsibility for each User

6. SOFTWARE AND HARDWARE REQUIREMENTS

   A. Each User shall provide and maintain a computer with high-speed internet access and an email address. The computer shall have a high-speed internet browser (Internet Explorer 8.0 or higher, Firefox version 3.6.12 or higher, Google Chrome or Safari version 5.0 or higher) and a high speed cable Internet access, high speed DSL or T1 line.

   B. License(s) to Use System - Each Contractor will be provided unlimited licenses to use the system for this project. Each license will allow secure unlimited usage from the notice to proceed until the original contract completion date.

7. SYSTEM DESCRIPTION

   A. The web-based project management system is a "secure, real-time, interactive, centralized database" specifically established and maintained for the management of this construction project. The product is designed to facilitate communication and improve the time management of its users by facilitating the sharing of information. Information will be available 24/7, from any computer meeting the specifications listed above. The information is fully protected. The electronic platform allows information to be transmitted across the internet reducing printing and postage costs and the time associated with such activities.

   B. The system contains a directory of the project participants.

C. The system includes templates, with the CM's letterhead, for each document created inside the system. The template allows the use of "pull down" menus to complete significant portions of each document.

D. The system allows the templates (and attached documents created outside the system) to be distributed to Users and Contacts.

E. The System contains "translation software" to permit the viewing (and marking) of documents created outside the system. The system can view documents created by different software programs and can deliver images of its translation to any computer meeting the criteria listed above.

F. The system can be personalized by the Construction Manager to automatically send e-mail notices upon issuance of certain documents if such a practice facilitates the User's business needs.

G. The system is the product of ***Building Blok, LLC*** (www.buildingblok.com) and will be continuously updated.

H. The Construction Manager will administer the Building Blok User accounts for this project.

8. DOCUMENTS CREATED INSIDE THE SYSTEM

A. The following documents shall be created on templates inside the system.

1. Transmittals for submittals processed in the system. The transmittals are automatically created by the system when the submittal is uploaded.
2. Submittal Register showing all of the submittals required of the contract, assigned to each Contractor.
3. Submittal Log: The CM will maintain submittal log after it is initialized.
4. RFI (Requests for Information)
5. Change Orders
6. RFP (Requests for Proposal)
7. ASI (Architect's Supplemental Instructions)
8. Tasks & Memos as determined by the CM
9. Payment Applications
10. Closeout Tracking Log

B. The following documents may, at each Users option, be created on the system.

1. Morning & Afternoon Activity Reports generated by the system
2. E-mails: Contacts that do not have access to the system may be sent information from the system, by the system.
3. Reports of information on the system
4. Project Notices: "Broadcast" messages can be sent to other Users system entry screen.

9. DOCUMENTS CREATED OUTSIDE THE SYSTEM AND DISTRIBUTED BY THE SYSTEM

   A. The following documents are expected to be created outside the system and distributed through the system. The actual documents may be scanned or electronically attached to the transmittal.

      1. Technical Submittals: Shop drawings, product data, testing reports, certifications, installation instructions, operation & maintenance manuals, will be submitted and distributed through the system. The Architect will return all submissions through the system electronically. The Construction Manager will distribute submittals (after Architect's action) electronically. Contractors may download and distribute submittals to their subcontractors and suppliers or elect to print paper copies for distribution, or both.
      2. Photographs: Digital photographs and scanned images can be loaded onto the system and shared.
      3. Schedule of Values/ Payment Applications: (The "pencil" review of these documents can occur inside the system).
      4. Change Orders: (The "pencil" review of these documents can occur inside the system.)
      5. Schedules: The schedule document(s) will be available for review on the system.
      6. Data created in other software may be uploaded to the system electronically.

10. DOCUMENTS CREATED OUTSIDE THE SYSTEM AND DISTRIBUTED OUTSIDE THE SYSTEM

   A. The following documents are expected to be created outside the system and distributed outside the system. The actual documents may be scanned or electronically attached to the transmittal.

      1. Schedules: The Construction Manager will develop the Master Schedule through Microsoft Project 2003. The schedule will be distributed either through hard copies at meetings or through email.
      2. Product samples, color samples, physical samples are still required to be provided per the technical specifications, however, the transmittal documenting the distribution shall be done inside the system and submitted electronically and printed to accompany the actual submission.
      3. Meeting minutes will be created using Microsoft Word 2003 and distributed through hard copies at meetings or through email.
      4. AIA closeout documents, which require an "original" signature, will created and distributed outside the system.

END OF SECTION

SECTION 013216 - CONSTRUCTION SCHEDULE

1. PRE-BID CONSTRUCTION SCHEDULE

A. Time is a critical element of this Project. By entering a bid, the Contractor agrees to adhere to the intermediate Milestone Dates and Dates of Substantial and Final Completion established herein. The Contractor also understands that all work must be performed in an orderly and closely coordinated sequence in order to achieve the specified Milestones and Completion Dates, and the Contractor hereby agrees to perform his work in conformance with the Pre-Bid Construction Schedule established herein, or with the then current and approved Project Construction Schedule as amended from time to time by the Construction Manager.

B. The Pre-Bid Construction Schedule is a milestone schedule with durations that identify portions of the project that must be completed. This schedule includes allowances for time lost due to adverse and abnormal weather conditions, other than floods, hurricanes, tornadoes, lightening and other like acts of God. The Contractor understands and agrees that it shall not be entitled to any extensions of the Contract Time or adjustment to the Contract Sum, except as allowed in the General Conditions of the Contract for Construction. The Contractor further acknowledges that the Work may be required to be performed during the winter season, that conditions during this season may be adverse and abnormal, but that such conditions will not be the basis for an extension of the Contract Time or adjustment to the Contract Sum. By submitting a bid, each Contractor is certifying that they can complete their work within the durations, or less time, outlined in the milestone schedule and its bid includes any and all costs associated with the schedule. This includes one Contractor completing their work in conjunction with another Contractor's work (i.e. electrical conduits installed in CMU walls). Each Contractor agrees to provide sufficient labor, crew size, equipment and/or work overtime, weekends, or shiftwork as necessary to meet the activity durations on this schedule and subsequently the latest coordinated Project Construction Schedule.

2. SCHEDULING OF THE WORK AFTER AWARD OF CONTRACT

A. After award of Contract, or issuance of a Notice to Proceed, the Contractor will meet with the Construction Manager to review the Pre-Bid Construction Schedule, and the overall project plan for construction. Following the above review, the Contractor will meet with each subcontractor and supplier to view the detailed plans for performing his Work. Following these meetings and within fourteen (14) days after award of the Contract or issuance of a Notice to Proceed, the Contractor shall prepare and submit for the Construction Manager's approval a Work Schedule providing for the expeditious, timely and practical execution of the Work. The Contractor's Work Schedule shall include activity descriptions and durations for shop drawings, fabrication, delivery, and installation. The Contractor's Work Schedule shall be organized by Area, Building, Phase, and/or Floor as required by the Construction Manager. If the Construction Manager so requests, the Contractor shall provide adequate explanation regarding crew sizes, production rates and similar data used to arrive at the durations and sequences. If the Contractor fails to provide a work schedule for their activities then they will be held to the Project Construction Schedule developed and updated by the Construction Manager.

B. The Construction Manager shall review the Contractor's Work Schedule, coordinate it with the

separate work by other contractors, the Owner, and the Construction Manager, and after coordination, shall incorporate it into the approved Project Construction Schedule.

C. After all Contractors submit their Work Schedules and the schedules have been incorporated into the overall Project Construction Schedule a Schedule Charrette will be held by the Construction Manager. Each Contractor is required to participate in the Schedule Charrette in order to produce a coordinated Project Construction Schedule. The Construction Manager will have the final authority concerning the sequence of work, priorities or work, and activity durations. The approved coordinated Project Construction Schedule shall be issued to the Contractors and each Contractor shall perform their Work in conformity therewith.

C. The Contractor shall submit proposed schedule revisions and obtain the written approval of the Construction Manager therefore before deviating from the Project Construction Schedule.

D. The Construction Manager will incorporate approved schedule revisions into the Project Construction Schedule and shall otherwise update and revise the Project Construction Schedule as the Construction Manager, at his sole discretion, deems necessary. Each Contractor acknowledges that Construction Manager may modify, change, or alter the sequence, duration, start dates, completion dates to maintain the progress of the work. Contractor agrees to perform the work in accordance with the revised schedules and that modification of the schedule or sequence of the work by the Construction Manager shall not be the basis of any claim by the Contractor for damages or costs.

E. Weather Delays: The project substantial completion date, shall only be adjusted due to extreme weather conditions that are above and beyond the following "Adverse Weather Days" already accounted for in the Pre-Bid Construction Schedule. These adverse weather days are based on a seven day week and come from the DelDOT Standards:

a. January (12), February (10), March (5), April (5), May (4), June (2), July (4), August (3), September (4), October (3), November (2), and December (6).
b. Time extension due to weather must be related to critical path activities.
c. Delays due to weather must be reported by the Contractor on the day they occur on the Contractor's daily report.
d. Any time lost during the work week must be made up the same week by overtime and/or working weekends. The Owner will not be responsible for additional costs for overtime.

3. ADHERENCE TO THE SCHEDULE

A. The Contractor shall start each part of its Work on the date designated for start in the approved Project Construction Schedule unless advised by the Construction Manager. The Contractor shall carry the Work forward expeditiously with adequate forces, equipment, and materials, and shall complete each part of his work on or before the date designated in the approved Project Construction Schedule.

B. If the Construction Manager determines that the Contractor is behind schedule, the Construction Manager shall have the right to require that the Contractor take steps, at the Contractor's expense,

to accelerate its Work. Such steps shall include increases in manpower, equipment, and materials and/or overtime as the Construction Manager may deem necessary. If any work is not started or completed within five (5) calendar days of the schedule date in the latest Project Construction Schedule, the Construction Manager shall have the right to direct the Contractor to expedite their work by whatever means the Construction Manager deems necessary to regain the schedule, without additional compensation to the Contractor. If any work falls behind schedule more than ten (10) days, the Construction Manager shall have the right to perform the work or have the work performed by whatever means the Construction Manager deems necessary. The costs incurred by the Construction Manager in order to "maintain the Project Construction Schedule" shall be reimbursed by the Contractor or Contractors causing the delay. If the Contractor fails to comply with the Construction Manager's instructions relating to improved rate of progress, the Contractor may be held in default under the appropriate provisions of the General Conditions of the Contract.

C. Each Contractor shall, if directed by the Construction Manager, provide the Construction Manager a two-week look ahead of anticipated manpower showing the number of men, classification, and anticipated work.

D. Each Contractor must schedule their manpower to work on all available work at a given time. Contractors must not assume that they have an entire work area available at one time or exclusive to their work. Working simultaneously in and around other trades is required. Therefore, if an area of the building is ready for the Contractor's work to begin or continue the Contractor must have manpower onsite working.
While working on site, each Contractor is to have their foreman attend weekly pull planning coordination meetings in the EDiS site trailer to review and update the 2-week lookahead schedule.

E. If a Contractor misses any portion of a workday due to weather, manpower, lack of materials, failure to plan, or scheduling conflicts, they must make-up this lost time on overtime or Saturday. If two or more days are lost in the same work week, the Contractor must work overtime, the immediate Saturday and the Saturdays following the week to make up the lost days. Failure to provide sufficient manpower during the normal week days may result in charges for supervision by EDiS Company, at the discretion of EDiS Company.

F. All punchlist work and project closeout documentation shall be completed within twenty-one (21) calendar days of the Substantial Completion date. Any open punchlist items after this date will be completed by EDiS Company and back charged to the responsible Contractor.

END OF SECTION

SECTION 013219 - SUBMITTAL REGISTER

1. SUBMITTALS/SUBMITTAL REGISTER

A. The Contractor shall submit all items listed or specified within the sections of the Specifications included in its Work. Submittals shall include such items as: contractor's, manufacturer's or fabricator's drawings; descriptive literature including, but not limited to, catalog cuts, diagrams, operation charts or curves; test reports; samples, operations and maintenance manuals, including parts lists; certifications; warranties and other required submittals. Submittals pertinent to materials and equipment which are subject to advance approval shall be scheduled and made prior to the acquisition or the delivery thereof.

B. The Contractor shall carefully control procurement operations to assure that each individual submittal is made on or before the dates required for timely performance of its Work.

C. Within seven (7) days after award of Contract or issuance of Notice to Proceed, the Contractor shall execute and submit to the Construction Manager, seven (7) copies of the Submittal Register, on a form to be provided by the Construction Manager, on which shall be listed each item of equipment and material of each type for which fabricator's drawings and/or related descriptive data, test reports, samples, spare parts, operation and maintenance manuals, or other types of submittals required by the Specifications. The Submittal Register form shall be reproduced by the Contractor. The order of listing of items on the Register shall conform to the sequence of the items as they occur within the divisions. Drawings of component items forming a system or that are interrelated shall be scheduled to be correlated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time shall be allowed for review and approval and possible resubmittal of any item subject to approval, because no delay damages or time extensions will be allowed for time lost in late submittals or resubmittals. The Construction Manager and Architect/Engineer will review the Submittal Register for approval action. The approved Register will become a part of the Contract and Contractor will be subject to requirements thereof. The Contractor shall revise and/or update the Register monthly to take into account all changes in the Contract. Each such revised edition and/or revision to the Register shall be resubmitted to the Construction Manager. This Register shall be coordinated with related submittals of other Contractors.

2. SAMPLES

A. Submit tagged or labeled samples in triplicate, unless another quantity is otherwise specified by the Construction Manager.

B. Tags or labels shall be securely affixed and contain as a minimum the following information: Project Name, Contractor's Name, Contract Title and Number, Date, Transmittal Number, Product Manufacturer's or Fabricator's Name and Product Identifier.

END OF SECTION

SECTION 013226 - CONTRACTOR DAILY REPORTS

1. CONTRACTOR DAILY REPORTS

   A. The Subcontractor shall submit a Daily Report to the Construction Manager on the forms provided covering the following subjects:

      1. Work in Progress, including areas where work is being performed, nature of the operations in progress, and the manpower assigned.

      2. Extra Work (Time and Material) in progress.

      3. Materials Received.

      4. Trade labor breakdown including identification of all workers on site and the number of hours (or portions thereof) worked by each.

      5. Inspection Checklist (performed daily).

   B. The Subcontractor shall submit the Daily Report to the Construction Manager by 9:00 AM on the next workday following the workday covered in the Daily Report.

2. DAILY EXTRA WORK REPORT

   A. The Subcontractor shall submit on the form provided a Daily Extra Work Report on each day he performs authorized Extra Work on a time and material basis.

   B. A separate Daily Extra Work Report shall be submitted for each separate authorized Extra Work item done on a time and material basis.

   C. The Subcontractor shall submit his Daily Extra Work Report as an attachment to his Daily Report by 9:00 AM on the next workday following the workday covered in the Daily Extra Work Report.

3. SAMPLE DAILY REPORT

   A. A sample daily report follows this section for your reference.

END OF SECTION

EDiS COMPANY

CONTRACTOR'S DAILY REPORT

Project Name: Hodgson Vocational Technical High School

Date:

Contractor:

Contract No. & Description:

Weather:

Foreman's Name (Print)

TRADE	*CLASS	MANPOWER COUNT	TOTAL MAN HOURS	TODAY'S DESCRIPTION / LOCATION OF WORK
	TOTAL			

* *INDICATE: F = FOREMAN; J = JOURNEYMAN; A = APPRENTICE*

Work Status/Work Planned:

Construction Equipment:

Qualified Operator(s)

Deliveries or Materials:

Machinery, tools, material, and equipment to be used:

Inspection of work area, machinery, tools, material, or equipment

The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement Is prohibited. Such machine, tool, material or equipment shall either be identified as unsafe by tagging or locking The controls to render them inoperable or shall be physically removed from its place of operation.

Please See Other Side

Below is a general checklist of requirements on this project. Contractors will check off items that pertain to their contract and project tasks. Notify EDiS Field Manager of any issues. This checklist is not meant to be all inclusive. Please refer to additional OSHA regulations for compliance.

House Keeping

- ☐ Material Storage Area's Orderly
- ☐ Trash Containers Available and Emptied daily
- ☐ Fire Hazards
- ☐ Lighting and ventilation
- ☐ Exits and Stair clear passage
- ☐ Walkways, corridors clear passage
- ☐ Daily debris /trash removal
- ☐ _____

Personal Protective Equipment

- ☐ Hard Hats being worn
- ☐ Safety Glasses with side shields being worn
- ☐ Secondary Eye/Face protection
- ☐ Respirators as required
- ☐ Hand protection when needed
- ☐ Ear protection when needed
- ☐ Inspected & Maintained
- ☐ _____

Fire Prevention

- ☐ Fire extinguishers inspected
- ☐ Flammable / Combustibles properly store
- ☐ Approved Fuel cans used and labeled
- ☐ Oxygen / Acetylenes stored properly
- ☐ _____

Electrical

- ☐ GFI in use
- ☐ Three prong insulated extension cords used
- ☐ Extension cords in good condition
- ☐ Lockout / Tag-out program in use
- ☐ _____

Excavations

- ☐ Miss Utility been contacted
- ☐ Properly Barricaded
- ☐ Ladders in use at depths over 4'-0"
- ☐ Ladders every 25'-0" distance
- ☐ Shored, sloped, benched as required
- ☐ Dewatering as needed
- ☐ _____

Ladders

- ☐ Good condition
- ☐ Correct pitch
- ☐ Extends 3'-0" above landing
- ☐ Open and secured / tied off
- ☐ _____

Scaffolds

- ☐ Certified Scaffold Installer
- ☐ Guardrails, toe boards, and planking secured
- ☐ Appropriate signage
- ☐ Adequate cross bracing
- ☐ Secured to building over 25'-0" in height
- ☐ _____

Cranes

- ☐ Rated Load Capacity available in cab
- ☐ Swing Radius barricaded
- ☐ Appropriate certificates / decals / hand signals
- ☐ Daily safety inspection log completed
- ☐ _____

Fall Protection

- ☐ Fall protection plan on file
- ☐ Full harness / shock absorbing lanyard used
- ☐ Anchoring points secured
- ☐ Perimeter barricades
- ☐ Open sided floor protection
- ☐ 6'-0" Tie-off utilized
- ☐ _____

Paperwork

- ☐ MSDS Information
- ☐ Contractors Safety Program
- ☐ Hazardous Communications Training
- ☐ Hazardous Communications Program
- ☐ Contractor Qualified Representation
- ☐ _____

Other

- ☐ _____
- ☐ _____

Foreman / Competent Person:

Print Name_____

SECTION 013300 – SUBMITTAL PROCEDURES

1. GENERAL PROVISIONS

   A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

2. ITEMS TO BE SUBMITTED AT START OF WORK

   A. Performance/Labor and Material Payment Bond(s): One (1) copy of each bond simultaneously with the signed Agreement. See General Conditions Article 11.4 and Supplementary Conditions.

   B. Policies or Certificates of Insurance: Two (2) copies simultaneously with the signed Agreement. See General Conditions Article 11 and Supplementary Conditions.

   C. Contractor's License: Submit a copy of all business licenses required by local and state agencies.

   D. Contractor's Schedule of Values: Two (2) copies for approval within 21 days after the Agreement is signed. See General Conditions Article 9.2 and provisions in this Section.

   E. Contractor's Progress Schedule: Two (2) copies for review and reference within 21 days after the Agreement is signed. See General Conditions Article 3.10 and provisions in this Section.

   F. Submittal Schedule: Two (2) copies for review and reference within 21 days after the Agreement is signed. See provisions in this Section.

   G. Products List: Two (2) copies for approval within 30 days after the Agreement is signed. See provisions in Section 016200 - MATERIAL AND EQUIPMENT.

3. NON-RESIDENT CONTRACTOR & SUBCONTRACTORS BONDS

   A. Refer to requirements in Section 011100 - INSTRUCTIONS TO BIDDERS for filing of Surety Bonds with the Division of Revenue.

   B. If such bonds are required on this project, it will be the responsibility of the Contractor to produce evidence to the Construction Manager that they have been filed, or if not required, to supply a notarized statement that they are not required. This must be done within seven (7) days after award of Contract and in any event before construction starts.

4. RELATED REQUIREMENTS

   A. See Section 017700 - CONTRACT CLOSE OUT: for submittal requirements for Contract Close out.

5. SUBMITTALS

A. All submittals shall be directed to the Construction Manager in the manner directed by the Construction Manager, and paragraph 9 of this section. Contractor shall use the Contractor Submittal Form appended to this section.

B. Prepare a Submittal's Schedule for Shop Drawings, Product Data and Samples. Show:

1. The dates for Contractor's submittals.

2. The dates submittals will be required for Owner-furnished products.

3. The date approved submittals will be required from the Architect.

C. Should the Architect or Construction Manager elect to omit any items from the list of items to be reviewed, it shall not relieve the Contractor from compliance with the Contract Documents with regard to that item. In such instance, the Contractor may still elect to have submittals prepared for his own use without review by the Architect or Construction Manager.

6. SHOP DRAWINGS

A. Conform to provisions in General Conditions applying to Shop Drawings.

B. Present in a clear and thorough manner.

1. Identify details by reference to sheet and details, schedule or room numbers shown on Contract Drawings.

2. Maximum sheet size: 30" x 42".

7. PRODUCT DATA

A. Conform to provisions in General Conditions applying to Product Data.

B. Preparation:

1. Clearly mark each copy to specifically identify products or models pertinent to project.

2. Show performance characteristics and capacities.

3. Show dimensions and clearances required.

4. Show wiring or piping diagrams and controls.

C. Manufacturer's standard schematic drawings and diagrams:

1. Modify drawings and diagrams to delete information which is not applicable to the Work.

2. Supplement standard information to provide information specifically applicable to the Work.

8. SAMPLES

A. Conform to provisions in General Conditions applying to Samples.

B. Provide samples of sufficient size and quantity to clearly illustrate:

1 .Functional characteristics of the project, with integrally related parts and attachment devices.

2. Full range of color, texture and pattern.

C. Field samples and mock-ups; See requirements, if any, in other specification Sections.

9. SUBMITTAL REQUIREMENTS

A. Make submittals promptly through the Construction Manager in accordance with published schedule, and in such sequence as to cause no delay in the Work or in the Work of any other contractor.

B. Number of submittals required.

1. Shop drawings: Submit eight (8) copies for each submittal. Copies will be marked up with corrections and comments, stamped and returned. Any additional copies required by the Contractor shall be made by him.

2. Product Data: Submit eight (8) copies. Four (4) will be retained by the Architect, the Construction Manager and the Consultants. Four (4) will be reviewed, marked and stamped by the Architect and returned to the Contractor by the Construction Manager. Any additional copies required by the Contractor shall be made by him from the stamped copy.

3. Samples: Submit four (4) each. When approved it will be returned to the Construction Manager to be retained at the site for reference use.

C. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.

2. The Project title and number.

3. Contract identification.

4. The names of the Contractor, Supplier and Manufacturer.

5. Identification of the product, with the specification section number.

6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features of the Work or materials.

8. Applicable standards, such as ASTM or Federal Specification numbers.

9. Identification of deviations from Contract Documents.

10. Identification of revisions on resubmittals.

11. An 8 inch x 3 inch blank space for Contractor and Architect's stamps.

12. Contractor's stamp, initialed or signed, certifying review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of Contract Documents. Submittals which have not been stamped with this stamp or its approved equivalent will be returned without being reviewed.

D. Shop Drawing coordination and interface with work of other Contracts and adjacent work is the responsibility of each individual Contractor.

E. All submittals shall be accompanied by the contractor's submittal form, a copy of which is part of this section. The contractor's submittal form must be completed in its entirety by the contractor.

10. RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by the Architect and resubmit until approved.

B. Shop drawings and Product Data:

1. Revise initial drawings or data, and resubmit as specified for the initial submittal.

2. Indicate any changes which have been made other than those requested by the Architect.

C. Samples: Submit new samples as required for initial submittal.

11. FINAL DISTRIBUTION OF APPROVED SUBMITTALS

A. The Construction Manager will receive and log submittals and forward to Architect after processing.

B. The Construction Manager will distribute copies of Shop Drawings and Product Data which carry the Architect's stamp to:

1. Contractor that made submittal.
2. Jobsite File.
3. Record Document File.
4. Other Contractors, as required for coordination.

C. The Construction Manager will distribute samples as required.

D. The Contractor will distribute copies of Shop Drawings and Product Data which carry the Architect's stamp to:

1. Subcontractors.
2. Suppliers.
3. Fabricators.

12. SCHEDULE OF VALUES

A. Use AIA Document G703, Continuation Sheet to G702.

13. PROGRESS SCHEDULE

A. Prepare schedules in the form of a horizontal bar chart.

1. Provide separate horizontal bar chart for each trade or operation.
2. Horizontal time scale: Identify the first work day of each week.
3. Scale and spacing: To allow space for notations and future revisions.
4. Minimum sheet size 11 inches by 17 inches.

B. Format of listings: The chronological order of the start of each item of work.

C. Show the complete sequence of construction by activity.

D. Show the dates for the beginning, and completion of, each major element of construction such as:

1. Site clearing.
2. Site utilities.

3. Foundation work.

4. Structural framing.

5. Subcontractor work.

6. Equipment installation.

E. Show projected percentage of completion for each item as of the first day of each month.

F. Update Progress Schedule monthly and submit with Application for Payment and Schedule of values.

G. Indicate progress of each activity to date of submission.

H. Show changes occurring since previous submission of schedule:

1. Major changes in scope.

2. Activities modified since previous submission.

3. Revised projections of progress and completion.

4. Other identifiable changes.

I. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays and the impact of the schedule.

2. Corrective action recommended, and its effect.

3. The effect of changes on schedules of other prime contractors.

J. Submit one reproducible transparency.

K. After review, distribute copies of the schedule to:

1. Jobsite File.

2. Subcontractors.

3. Architect.

4. Owner.

L. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

END OF SECTION

SECTION 013523 - SAFETY PROGRAM

1. GENERAL

A. The Contractor shall be responsible for initiating, maintaining, and supervising all safety activities and programs in connection with their Work.

B. Contractor shall be responsible for the safety of their personnel as well as their subcontractors.

C. Hard hats and safety glasses must be worn by all personnel on the jobsite, except in contractor's administrative office/trailer. All equipment must comply with OSHA standards. All job site personnel shall wear long pants, shirts (no tank tops), high visibility garments worn on the outer layer of clothing, and work boots.

2. SAFETY PROGRAM

A. Prior to commencing the work, the Contractor shall submit to the Construction Manager (1) electronic copy and (1) bound copy of its safety program and one (1) copy of SDS information in a 2" ringed notebook. One paper copy of the safety program and SDS will be retained by the Construction Manager in the field office.

B. The safety program shall outline those hazards peculiar to the Contractor's Work, and the steps to be taken to eliminate or reduce the risk of injury or loss due to those hazards. The program shall be project and site specific. Every Contractor shall implement and enforce its safety program, in accordance with all OSHA, Federal, State, and local laws.

C. Crystalline Silica Exposure Control Plan - Affected Contractors must provide a Written Exposure Control Plan for Respirable Crystalline Silica, meeting Subpart Z of the OSHA Construction Industry Regulations, that ensures each employee covered by this section of the Regulations can demonstrate knowledge and understanding meeting the requirements of the regulation, identify the competent person designated by the employer in accordance with the section, and otherwise comply with the requirements of this section of the Regulations.

D. Every Contractor shall designate a qualified Safety Supervisor and Alternate to implement the safety program. If during the progress of the work the Safety Supervisor is not performing their duties in a manner satisfactory to the Construction Manager the Contractor will designate a new qualified Safety Supervisor.

E. Every Contractor shall furnish the names and qualifications of the Primary and Alternate competent persons and qualified persons who may be required for their scope of work by the Contractor's safety procedures, and by federal, state and/or local regulations. Examples include competent persons and/or qualified persons for steel erection, excavation, scaffold erection, confined space entry, crane and rigging operations, annual crane inspections, fall protection including horizontal lifeline systems, etc.

F. The employer shall verify compliance by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior

to the effective date of this section, the certification record shall include the date the employer determined the prior training was adequate rather than the date of actual training.

G. Copies of any and all documents, including information stored electronically, such as safety and health program handbooks and training certification records shall be provided when necessary.

1. The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury. Please forward certification (document) of training for each employee on an EDiS project. The latest training certificate shall be maintained.

H. Contractor Daily Reports with Safety Inspection Checklist will be submitted daily to the Superintendent, verifying inspection of work area, machinery, equipment, and tools.

I. Prior to starting work on-site, the Contractor shall arrange with the on-site Superintendent to have their employees complete the EDiS Company Zero Accidents Safety Orientation program.

J. Every Contractor shall hold, at a minimum, weekly safety toolbox talks with all its employees every Monday at 12:30 PM. Every Contractor shall designate a responsible, qualified, and capable person to conduct these meetings. Contractor's safety supervisor or superintendent must submit to the Construction Manager weekly toolbox talks attendance sheets and the topics discussed.

3. SUBSTANCE ABUSE POLICY STATEMENT

A. The Construction Manager is committed to providing a safe work site environment for its employees and Contractors' employees. The Construction Manager does not condone or permit employees and Contractors' employees to use or be under the influence of drugs or alcohol while they are on any of the Construction Manager work sites. The Policy is as follows:

1. It is a violation of the Construction Manager's policy for employees and Contractors' employees to use, possess, sell, trade, or otherwise engage in the use of illegal drugs and alcohol.

2. It is a violation for employees and Contractors' employees to report to work while influenced by illegal drugs or alcohol.

3. It is a violation for employees and Contractors' employees to use prescription drugs illegally (i.e., to use prescription drugs that have not been legally obtained) and to use prescription drugs in a manner other than the prescribed intentions.
4. Employees and Contractors' employees who are taking medication, which is prescribed by their physician, are expected to discuss potential side effects with their prescribing physician, as it relates to the work requirements.

B. Violations of this policy will require disciplinary action. If any employees or Contractors' employees are observed or suspected of being influenced by drugs or alcohol, they will be instructed to stop work and may be required to leave the work site.

4. EXECUTION

A. Every Contractor shall comply with all applicable federal, state and local laws, regulations and orders relating to occupational safety and health, and related procedures, and shall, to the extent permitted by law, indemnify and hold Construction Manager, Owner and Architect, and their respective directors, officers, or agents and employees, harmless from any and all liability, public or private, penalties, contractual or otherwise, losses, damages, costs, attorney's fees, expenses, causes of action, claims or judgments resulting from a claim filed by anyone in connection with the aforementioned acts, or any rule, regulation or order promulgated thereunder, arising out of the Contractor's Work, this Agreement or any subcontract executed in prosecution of the Work. Every Contractor further agrees in the event of a claim of violation of any such laws, regulations, orders, or procedures arising out of or in any way connected with the performance of this agreement, Construction Manager may immediately take whatever action is deemed necessary by Owner and/or Construction Manager to remedy the claim or violation. Any and all costs or expenses paid or incurred by Owner and/or Construction Manager in taking such action shall be borne by the Contractor and may be deducted from any payments due Contractor.

B. The Contractor agrees to (1) take all necessary steps to promote safety and health on the job site; (2) cooperate with Owner and/or Construction Manager and other Contractors in preventing and eliminating safety and health hazards: (3) train, instruct and provide adequate supervision to ensure that its employees are aware of, and comply with, applicable Federal and State safety and health laws, standards, regulations and rules, safe healthful work practices and all applicable safety rules, regulations and work practices and procedures (4) not create any hazards or expose any of its employees, employees of the Owner and/or Construction Manager or employees of Contractors to any hazards; and (5) where the Contractor is aware of the existence of a hazard not within its control, notify the Construction Manager of the hazard as well as warn exposed persons to avoid the hazard.

C. The Contractor's Superintendent or Safety Supervisor shall immediately, verbally report, and promptly thereafter confirm in writing to the Construction Manager any unsafe conditions or practices that are observed, or violations of job safety which are not within the Contractor's control.

D. Contractors shall immediately, verbally report, and promptly thereafter confirm in writing, to the Construction Manager any unsafe practices or conditions that are observed which are not under the Contractor's control.

E. The Contractor's Superintendent or Safety Supervisor shall ensure that adequate first aid supplies are available, and that personnel are qualified to administer first aid/CPR, as required by State and/or Federal regulations.

F. Every Contractor shall promptly notify Construction Manager of any personal injury requiring medical treatment of any of the Contractor's employees at the Project site; or of significant damage to property arising in connection with Contractor's performance, as promptly as possible after the occurrence of such injury or damage. Within twenty-four hours of such occurrence, Contractor shall furnish to Construction Manager a complete written report of such injury or damage.

G. Contractor certifies that the forgoing terms shall be made applicable to all Contractors' subcontractors, suppliers, materialmen, or anyone furnishing labor and/or materials to the site.

H. Every Contractor shall continue to educate their job Safety Supervisor or Superintendent of their responsibilities, which shall include:

1. Instructing workers and subcontractors under its supervision in safe work practices and work methods at the time they are given work assignments.

2. Ensuring that its workers and subcontractors have and use the proper protective equipment and suitable tools for the job.

3. Continuously checking to see that no unsafe practices or conditions are allowed to exist on any part of his job.

4. Acquainting its workers and subcontractors with all applicable safety requirements and ensuring that they are enforced.

5. Setting a good example for their workers.

6. Making a complete investigation of incidents to determine facts necessary to take corrective action.

7. Promptly completing an "Incident Investigation Form" with his Supervisor's assistance and distributing as required.

8. Holding weekly "tool box" safety meetings with their employees to:

   a. Discuss observed unsafe work practices or conditions including a review of current foreman meeting and progress meeting reports.

   b. Review each incident with their employees and discuss correction of incident root causes.

   c. Encourage safety suggestions from his men.

9. Seeing that prompt medical treatment is administered to an injured employee.

10. Correcting or reporting immediately to project superintendent any observed unsafe conditions, practices or violations of job safety or security.

11. Making all reports required by these Contract Documents to the Construction Manager in a full and timely fashion.

5. SAFETY MEETINGS

A. The Contractor's Project Manager or Superintendent shall attend weekly or biweekly supervisory job meetings. The first topic of these meetings will be job site safety. The weekly safety reports will be reviewed, and violations must be corrected immediately. Contractors will be encouraged to participate in the on-going jobsite safety.

6. TOOL BOX SAFETY MEETINGS

   A. The Contractor shall schedule weekly "tool box" safety sessions to be held by their project safety supervisor or competent person / superintendent for all their employees.

   B. A member of the Contractor's management staff shall periodically attend "tool box" safety sessions to evaluate their effectiveness and offer any appropriate suggestions for improvement.

7. REPORTS

   A. Contractors shall report all accidents or injuries on a timely basis in accordance with all applicable regulations.

   B. Contractors shall promptly complete an incident investigation report of all incidents.

   C. A record of all "tool box" safety sessions shall be made and submitted to the Construction Manager.

8. SAFETY REPRESENTATIVE

   A. The Construction Manager (CM) may employ the services of a Safety Representative on the project.

   B. The CM Safety Representative will visit the job site on a weekly basis, or as necessary, to determine if the work is being performed in a safe manner and in accordance with OSHA, State and Local safety regulations. The CM Safety Representative is not responsible for observing and documenting all possible safety violations. The Contractors' Safety Representatives, Safety Supervisors, or Superintendents shall attend job site safety inspections with the CM Safety Representative.

   C. The CM Safety Representative will prepare a written report at the end of each inspection listing the safety violations observed during the inspection. This report will be distributed to all Contractors. Contractors will immediately correct all safety violations and provide written documentation to the CM verifying that all hazards have been corrected.

9. RIGHT TO STOP THE WORK DUE TO SAFETY VIOLATIONS

   A. The Construction Manager, in its sole discretion, may order the Contractor to stop the work due to safety violations under the following circumstances:

      1. If the Construction Manager observes the Contractor is violating safety regulations and the Contractor takes no immediate action to correct the violation.

      2. If the Contractor has been notified by the Construction Manager in writing that he is in violation of safety regulations and fails to take action to correct the violation within 24 hours of the notice.

   B. If the Construction Manager directs the Contractor to stop the work due to safety violation, it will be done in accordance with the General Conditions of the Contract. Contractor shall not be permitted an adjustment of the Contract Time or Sum for the days lost to any suspension of work.

C. If the Construction Manager or Safety Representative observes Contractor's employee violating this safety program or OSHA Standards in a habitual manner, or creating a serious life safety violation, the Construction Manager or Safety Representative may instruct the Contractor's superintendent or foreman to remove the violator from the work site for failure to comply with the safety program and the contract.

10. EMERGENCY PROCEDURES

A. The Construction Manager shall establish a central meeting location for the assembly of all Contractors' employees in the event of a job site emergency.
B. Contractors shall assemble all their personnel and account for all employees. Contractors must immediately report to the Project Superintendent with the status of their employees.

11. FALL PROTECTION PROCEDURES

A. Contractors are responsible, in accordance with federal, state, local laws and regulations including OSHA. to provide and enforce their own site specific fall protection program and equipment. The following fall protection procedures shall be enforced by all Contractors as a minimum standard.

1. All workers on walking/working surfaces with unprotected sides or edges six feet (6') or higher above the next lower level must be protected from falls by the use of guardrail systems, net systems, fall arrest systems or control access zone programs. It is intended that when fall protection is required, it is required 100% of the time. All contractors are reminded that relevant industry regulations require that contractors comply with the following standards.

a. Workers constructing or working near leading edges must be protected.

b. Workers on the face of formwork or reinforcing steel must be protected at a height of 6 feet (6') or greater.

c. Employees working from scaffolds shall be guarded / protected from falling 6 feet (6') above next lower level.

d. Brick layers performing overhand bricklaying and related work six feet (6') or higher above lower levels must be protected from falls.

e. Roofers must comply with OSHA regulations for roof work.

f. The Contractor's controlled access zone plan shall be included in their site-specific safety program and shall be submitted prior to the start of work. Contractors are responsible for assuring programs are OSHA compliant.

g. Guidelines for Residential Construction or any interpretations will not be accepted in lieu of 1926 Standards.

h. Contractors must provide certification per OSHA CFR29 § 1926.503(b) of employee training and retraining on fall protection upon request.

B. Contractor shall provide their own fall protection. Fall protection may be provided by guardrail systems, net systems, or personal fall arrest systems. All fall protection systems must comply with OSHA regulations.

C. Stepladders, exposed to shafts or edges of the building, greater than six feet (6') above the next lower level, must be tied off or otherwise secured. Employee must wear fall protection, i.e., harness/lanyard.

D. The Safety Cable System shall not be altered or removed without a written request submitted to the Project Manager with a copy to the Superintendent. It shall be the responsibility of each Contractor that is removing or altering the Safety Cable System to maintain the fall protection safety provided by the safety cable and not leave the area unprotected. Each Contractor shall be responsible to re-install the Safety Cable System immediately after work is completed. Each Contractor shall be responsible to re-install the Safety Cable System in accordance with OSHA regulations.

E. Fall protection will be enforced for Structural Steel Erectors.

1. Contractors engaged in structural steel erection are specifically advised that structural steel erectors shall comply with all protection requirements for all work at a height of six feet (6') or greater above the next lower level, 100 percent of the time, by any of the following means.

a. Standard guardrail system.

b. Personal Fall Arrest System (PFAS) – full body harness with shock absorbing lanyard. PFAS must meet the requirements of CFR 1926 subpart M.

c. Access to work area shall be provided by ladders or other safe methods. There shall be sufficient number of ladders, or other safe methods, available to reduce the amount of "beam walking." When it is absolutely necessary to traverse a beam, 100% fall protection must be utilized.

d. Steel erection Contractors must, at all times, be able to certify in writing that each of their employees have been properly trained in both OSHA fall protection standards and the Contractor's site specific project fall protection procedures.

e. Prior to the erection of the steel, the Contractor shall meet with the Project Manager and Safety Representatives to review and document site specific procedures.

12. AIRBORNE CONTAMINENTS PROCEDURES

A. Contractors must provide and use equipment furnished with Exhaust Purifiers / Scrubbers when any equipment produces airborne containments and will be used in an enclosed building.

B. The Contractor shall verify air quality by the use of air monitoring equipment and document such verified air quality on the daily report. The monitoring equipment shall, at a minimum, be

designed with an auditory alarm and shall provide continuous monitoring of these four gases: Oxygen, Hydrogen Sulfide, Carbon Monoxide and Combustible gases.

C. The Contractor must provide administrative or engineering controls to protect its workers from exposure to occupational health, environmental or other hazards to be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed by local, state, and federal regulations. Any equipment and technical measures used for this purpose must first be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with 1926.103.

13. CELL PHONE AND RADIO USE POLICY

A. Use of cell phones on EDiS Company projects should be limited to non-construction type activity areas and away from active construction areas (i.e., project office). This includes both cell phone use and the review of data, information, texts, and the internet. Except in an emergency circumstance, phones should only be used in the designated areas. Anyone observed using a cell phone outside of these designated areas without regard to maintaining a safe focus on their surroundings can be subject to discipline, up to and including removal from the project. Use of ear buds, ear phones, and portable radios are absolutely prohibited on EDiS Company project sites. Anyone using ear buds, ear phones, or any other device that would prevent the wearer from receiving auditory cues about the surrounding environment will be subject to discipline, up to and including removal from the project.

14. EXCAVATION PROCEDURES

A. Before ANY excavation work is to commence, the Contractor/Excavator shall contact the utility companies or utility owners and advise them of the proposed work and ask them to mark the location of the underground utility installations. This notification shall be done within established or customary local response times. If the work is on private property and the utility company will not mark out the utilities, the Contractor/Excavator will hire a private locating service to mark the utilities. Once the utilities are located and marked, the Contractor/Excavator will excavate by hand or use a vacuum truck to expose the utilities and record the exact location and elevation of the utilities.

B. The Contractor/Excavator must submit the Excavation Permit to EDiS Company verifying their assurance of communication with the utility companies or utility owners. The Contractor/Excavator must follow State, Local, and Federal Guidelines prior to proceeding with excavations. The Contractor/Excavator will have these marks restored as long as there is work to perform.

C. Once the Contractor has installed new utilities, they will provide to EDiS Company an as-built drawing, within 7 days, showing the exact location and elevation of the utilities. The installing Contractor will be responsible for locating and marking these utilities for other contractors that may have work in the same area.

D. Definition: "Excavator" shall mean any person, including those acting either as an employer or

employee, intending to perform or performing excavation or demolition work.

E. Definition: "Excavate" or "Excavation" shall mean any operation in which earth, rock or other material in the ground is moved, removed, or otherwise displaced or disturbed by means of any tools, equipment or explosives and includes, without limitation, grading, trenching, digging, dredging, ditching, drilling, auguring, tunneling, boring, backfilling, post pounding, driving objects into the ground, installation of form pins, hammering, scraping, cable or pipe plowing or driving.

15. TRAFFIC CONTROL PROCEDURES: **Manual on Uniform Traffic Control Devices (MUTCD)**

A. Traffic control plan(s) for the work may be required by the Authorities Having Jurisdiction (AHJ). Traffic control plans, if required, shall be prepared per AHJ standards, at the Contractor's expense, for review and approval by the AHJ. (Note: anything on a public right of way controlled by the state will require an engineer's stamp.) The implementation of the traffic control plan and any associated maintenance shall be performed at the Contractor's expense in accordance with the requirements of the AHJ. All warning signs and safety devices used by the Contractor to perform the work shall conform to the requirements contained in the State where the work is being performed, and the Department of Transportation's current edition of "Manual on Uniform Traffic Control Devices". The Contractor shall also be responsible for all traffic control required by the AHJ over the Project on the intersecting streets.

B. Contractors must submit a traffic control plan to the AHJ over the project for approval within fourteen (14) calendar days of Contract award. The approved traffic plan must be submitted prior to the commencement of work in a public street. The Contractor's representative on the site responsible for traffic control shall produce evidence that he/she has completed training acceptable to the Department of Transportation for safety through construction zones. All of the streets in which the work will occur shall remain open to traffic and one lane of traffic maintained at all times unless otherwise directed by the AHJ. Businesses and residences adjacent to the work shall be notified forty- eight (48) hours in advance of closing of streets, roadways, driveways, etc. The Contractor shall make every effort to minimize the amount of public parking temporarily eliminated due to construction in areas fronting businesses. No stockpiles of pipe or other material will be allowed in traveled right-of- ways unless otherwise approved. These requirements shall not authorize any extension of time for performance of this Contract.

16. SCAFFOLDING PROCEDURES

A. A written project specific scaffold inspection checklist must be completed by the Contractor's competent person responsible for inspecting the scaffolding before each work shift, and after any occurrence which could affect a scaffold's structural integrity. A copy of the documented scaffold inspection checklist must be maintained by each company performing work on a scaffold and a second copy provided for record to the EDiS project office.

B. Contractors are required to ensure that all employees working on or around scaffolding are properly trained. Contractors shall provide documented verification of scaffold training upon request.

C. Scaffold erectors and dismantlers are required to wear fall protection during the erecting, modifying and dismantling scaffolds. In cases where fall protection is infeasible or creates a greater hazard, the competent person shall document their decision at each specific location of scaffold assembly. At minimum, the scaffold erectors and dismantlers shall wear a fall protection harness during the erection, modification and dismantling of scaffolds.

D. Contractors shall utilize a scaffold tag system. The scaffold tag system shall be color coded and visible. The competent person shall sign and date the scaffold tag.
   1. Green tags are reserved for complete systems.
   2. Red tags are reserved for erection/dismantling activities and for scaffolds with deficiencies in the system.
   3. Yellow tags are reserved for systems that require the use of both PFAS and guardrail systems for incomplete scaffold systems or platforms.

END OF SECTION

CONTRACTOR

COMPETENT / QUALIFIED PERSON DESIGNATION LOG

Project: **Field Manager:**

Contract: Contrctor:	Applicable to Subcontractor (yes / no)		Foreman	Competent Person (if not foreman)
Subpart C-General Provisions				
1926-20 General Safety				
Subpart D - Health and Environmental Controls				
1926-53 Ionizing Radiation				
1926-55 Gases, Vapors, Fumes, Dusts, Mists				
1926-57 Ventilation				
1926.59 Hazard Communication				
1926.62 Lead				
Subpart E - Personal Protective Equipment				
1926.101 Hearing				
1926.103 Respirator Protection				
Subpart H - Materials Handling, Storage				
1926.251 Rigging Equipment for Material Handling				
Subpart J - Welding and Cutting				
1926.354 Welding, Cutting and Heating				
Subpart K - Electrical				
1926.404 Wiring Design and Protection				
Subpart L - Scaffolding				
1926.451 Scaffolding				
Subpart M - Fall Protection				
1926.502 Fall Protection Criteria and Practices				
1926.503 Training				
Subpart N - Cranes, Derrick -Redesignated 1926.1501				
Subpart O - Motor Vehicles and Equipment				
1926.601 Motor Vehicles				
Subpart P - Excavations				
1926.651 Specific Excavation Requirements				
1926.652 Requirements to Protective Systems				
Subpart S - Tunnels, Shafts, Caissons				
1926.800 Tunnels, Shafts, Caissons				
1926.803 Compressed Air				
Subpart T - Demolition				
1926.850 Preparatory Operations				
1926.852 Chutes				
1926.859 Mechanical Demolition				
Subpart V - Power Transmission and Distribution				
1926.955 Overhead Lines				

Contract: Contrctor:	Applicable to Subcontractor (yes / no)		Foreman	Competent Person (if not foreman)
Subpart X - Stairways and Ladders				
1926.1053 Ladders				
1926.1060 Training Requirements				
Subpart Z - Toxic and Hazardous Substances				
1926.1101 Asbestos				
1926.1101 thru 1926.1148 Toxic and Hazardous Substances				

I certify that the listed employees are competent persons, as defined and required by specific OSHA standards. They are capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Name (print)

Contractor Signature

Date

PU19, Revised 07/2021

Certification of Training Documents to be Submitted with Safety Policy/Program

Provide a certification of training for employees on your safety program.

Certification of training must include: Employee's name, date of training, person conducting the training, topics covered, and a statement that the student has successfully completed the course.

In addition, Contractor shall provide certification of training on the following programs, as they pertain to your contract and project tasks. This list is not meant to be all inclusive: please refer to OSHA regulations for applicable safety requirements.

a. ☐ Scaffold: 1926.454

b. ☐ Fall Protection 1926.503

c. ☐ Crane Operator: 1926.1427

d. ☐ Signal person (this is for any persons connecting material or equipment for lifting): 1926.1428

e. ☐ Crane maintenance: 1926.1429

f. ☐ Steel erection fall protection: 1926.761

g. ☐ Respiratory protection (medical clearance and training records complying with 1910.134

h. ☐ Powder-actuated tools: 1926.302

i. ☐ Motor Vehicles (are those vehicles that operate within an off-highway jobsite, not open to public traffic): 1926.21

BIM PROJECT EXECUTION PLAN

FOR

NCC VOTECH SCHOOL DISTRICT
PAUL M. HODGSON
VOCATIONAL TECHNICAL HIGH SCHOOL
2575 GLASGOW AVENUE
NEWARK, DE 19702

DEVELOPED BY AMP CONSULTING

AUGUST 4, 2023



Please direct any questions about this Plan to AMP Consulting: Chris Donahue (cdonahue@ampconsulting.build)

BIM PROJECT EXECUTION PLAN
FOR
HODGSON HIGH SCHOOL
DEVELOPED BY AMP CONSULTING
AUGUST 4, 2023

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1.0 BIM PROJECT EXECUTION PLAN OVERVIEW

A BIM Project Execution Plan outlines the overall vision along with implementation details for the team to follow throughout the project. To effectively integrate BIM into a project, it is important for the project team to develop a detailed execution plan for BIM implementation. The overarching goal for a BIM Project Execution Plan is to stimulate and direct additional communication and coordination by the team members during all phases of a building project.

The BIM Project Execution Plan for this project will be developed using the BIM Project Execution Plan Template provided in the early design phase of the project and then submitted to the for approval. The BIM Project Execution Plan will work in conjunction with the BIM Addendum; any revisions to the BIM Addendum should be reflected within the project specific BIM Project Execution Plan (BIM Plan).

Purpose:

- To successfully implement Building Information Modeling (BIM) on the project.
- To define uses for BIM on the project (e.g. building systems analysis, cost estimating, and design coordination).
- To describe the process for executing BIM throughout the project lifecycle.
- To ensure Hodgson High School receives the end product they expect and are able to put it to use in the future.

Goals for BIM Process:

- Sharing of the Revit model between all parties of the design and construction team for review every two weeks after the middle of the Design Development Phase.
- Use of the ICon lab in the middle to end of the Design Development phase and in the beginning of the Construction Documents phase for the purpose of immersing the Hodgson High School user group in to proposed modelled spaces for review of space and materials.
- Ownership and Use of BIM Model and Database
- The BIM model is the property of ABHA|BSA+A and will be shared with the Design-Build team.

This BIM Model is an instrument of service and is considered to be a component of Design and Construction Documents without exception. In addition, each Model Element Author (MEA) contributing to the BIM model(s) and database agrees to provide all project stakeholders and Hodgson High School (Owner) a non-revocable, exclusive license to utilize any and all intellectual property provided by each MEA contained within this BIM for the sole purpose of completing the design, construction and other uses as stipulated and/or implied by the executed Owner/ Professional Agreement and Owner/Contractor Agreement for this project.

1.1 RECORD MODEL & AS-BUILT MODEL DEVELOPMENT PROCESS

The following process is defined for the Record Model and the As-Built Model. Specific details to be confirmed by the project team:

- ABHA|BSA+A is responsible for the initial Design Intent Model. AMP Consulting is responsible for the initial Means & Methods Model.

- ABHA|BSA+A is to provide the coordinated Design Intent Model to AMP Consulting to be used for the creation of the Means & Methods Model.
- AMP Consulting will update the Means & Methods Model with all as-built conditions to form the As-Built Model deliverable in Revit.
- ABHA|BSA+A will revise the Design Intent Model with all design revisions (architectural, structural, and MEP) to form the Record Model deliverable in Revit.
- AMP Consulting will transition the Revit Model to Revizto 5.
- All 2D Record and As-Built Documents will be produced from their respective models.

2.0 PROJECT INFORMATION

2.1 PROJECT OVERVIEW INFORMATION

Facility Owner	New Castle County Votech School District
Project Name	Hodgson High School
Project Location	2575 Glasgow Avenue Newark, DE 19702
Contract Type/Delivery Method	

2.2 PROJECT NUMBERS

PROJECT INFORMATION	**PROJECT NUMBER**
Hodgson High School Building Number	
ABHA|BSA+A Job No.	
AMP Consulting Job No.	

2.3 PROJECT DESCRIPTION

EDiS Company retained AMP Consulting to provide BIM/VDC services on Hodgson High School project. AMP Consulting will manage the BIM/VDC work during design and construction. AMP Consulting will provide a full-time in-house BIM manager and BIM Coordination on the project team.

2.4 ADDITIONAL PROJECT INFORMATION

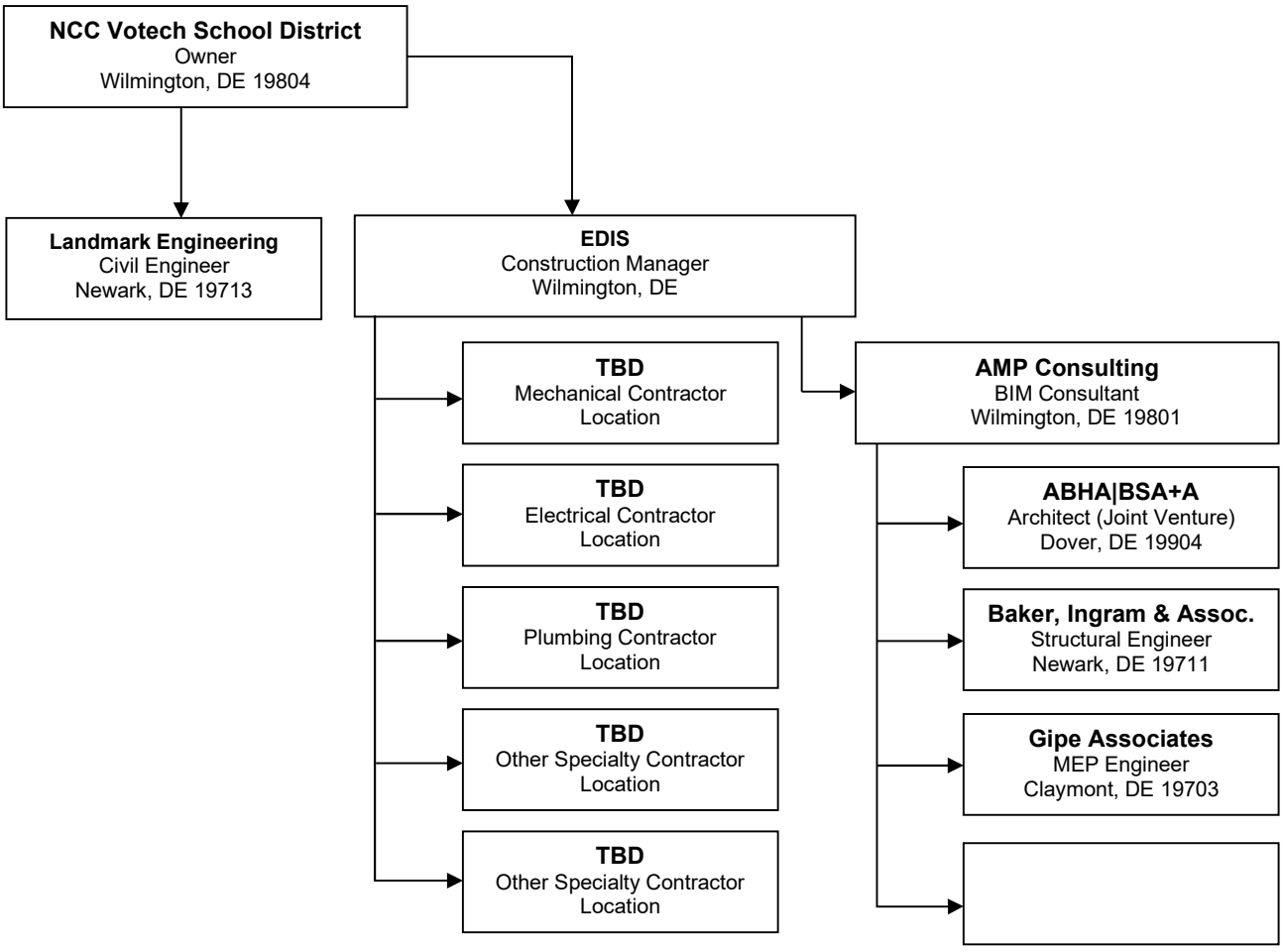
- Operations and Maintenance are under the auspice of Hodgson High School

2.5 PROJECT MILESTONES

PROJECT MILESTONE	ESTIMATED START	ESTIMATED COMPLETION	REVISE BIM PLAN	INVOLVED PROJECT STAKEHOLDERS
Construction	9/27/2023	5/26/26	N/A	EDiS
Project Closeout	9/27/2023	5/26/26	N/A	EDiS

3.0 KEY PROJECT CONTACTS

3.1 ORGANIZATION CHART



3.2 HODGSON HIGH SCHOOL PROJECT STAKEHOLDERS

The following client team staff members are providing leadership for BIM execution on behalf of NCC Votech School District:

ORGANIZATION	ROLE	NAME	EMAIL	PHONE
EDiS Company	Project Manager	Kevin Lucas	klucas@ediscompany.com	302-420-3083
AMP Consulting	BIM Director/ Manager	Christopher Donahue	cdonahue@ampconsulting.build	302-893-0492

3.3 DESIGN TEAM PROJECT STAKEHOLDERS

The following consultants are providing professional services for this project. For each firm, key leadership personnel listed includes Principals, Managers, Architect/Engineers, and Designers. BIM Managers/Coordinators are also listed below. This list will be updated as needed as additional team members are assigned to the project. Members of the Design Team include:

ORGANIZATION	ROLE	NAME	EMAIL	PHONE
Hodgson High School	Representative	Al Schrum, Jr	a.schrum@nccvt.k12.de.us	302-299-9106
EDiS Company	Construction Manager	Kevin Lucas	klucas@ediscompany.com	302-420-3083
AMP Consulting	BIM Consultant	Christopher Donahue	cdonahue@ampconsulting.build	302-893-0492
ABHA|BSA+A	Architect	Kathy Knotts	knotts@simpers.com	302-658-9300
DCI+MacIntosh Engineers	Structural Engineer	Chelsea Collins	ccollins@dci-engineers.com	303-252-9200
Gipe Associates	MEP Engineer	Adam Kegan	akegan@gipe.net	410-832-2420
Landmark Engineering	Civil Engineer	Ted Williams	tedw@landmark-se.com	302-323-7933

3.4 CONSTRUCTION TEAM PROJECT STAKEHOLDERS

The following construction specialists are providing professional services for this project during both the design and construction phases. This list will be updated as needed as additional team members are assigned to the project. Members of the Construction Team include:

ORGANIZATION	ROLE	NAME	EMAIL	PHONE
EDiS Company	Construction Manager	Kevin Lucas	klucas@ediscompany.com	302-420-3083
AMP Consulting	BIM Consultant	Christopher Donahue	cdonahue@ampconsulting.build	302-893-0492

3.5 OWNER CONTRACTED CONSULTANTS

The following construction specialists are providing professional services for this project during the design phase and construction on behalf of EDiS Company as a sole source provider.

ORGANIZATION	ROLE	NAME	EMAIL	PHONE
AMP Consulting	BIM Manager	Christopher Donahue	cdonahue@ampconsulting.build	302-893-0492
AMP Consulting	Senior BIM Tech	Rodger Breeding	rbreeding@ampconsulting.build	302-421-2942

4.0 ORGANIZATIONAL ROLES AND STAFFING

4.1 BIM MODEL MANAGER

The BIM Model Manager shall have sufficient BIM experience for the size and complexity of the project and shall have relevant proficiency in the proposed BIM authoring and coordination software. The BIM Model Manager shall serve as the main point of contact with EDiS Company/AMP Consulting and the project team for BIM related issues.

During each phase of a Hodgson High School project, the model manager is required, but not limited to:

- Ensure completeness and accuracy for BIM Plan
- Ensure completeness and accuracy for overall project model
- Coordinate all updates for individual models, specialized models, and databases

4.1.1 RESPONSIBILITES DURING PLANNING AND DESIGN

- Act as lead contact for BIM related issues with all relevant project stakeholders and manage collaboration between all parties
- Lead the process of BIM Plan development as per requirements of the BIM Addendum
  - Ensure project stakeholder compliance with the EDiS Company/AMP Consulting approved BIM Plan
  - Develop, coordinate, publish, and verify all necessary configurations required for seamless integration of BIM Model(s) and facility data
- Facilitate the transfer of information on the file sharing exchange protocol
  - Assure that the design deliverables specified in the contract are provided in accordance with the required formats
  - Determine the project BIM geo-reference point(s) and assures all technical discipline models are properly referenced
  - Maintain BIM Model(s) and facility data standards and requirements
  - Assure proper BIM derived 2D documents conforms with the Design and Construction Standard

- Coordinate with project team to assure creation of required final BIM deliverables at project turnover
- Coordinate with the for facility management data and file exchange as needed
- Lead meetings with lead BIM technicians and project BIM Team
- Assemble composite design model for coordination meetings
- Facilitate use of composite design models in design coordination/clash detections meetings and generate detection reports by the identification and resolution of all hard and soft collisions within the BIM Model(s)
- Perform design reviews to test design in compliance with functionality and constructability requirements

4.1.2 RESPONSIBILITIES DURING PRECONSTRUCTION AND CONSTRUCTION

- Act as lead contact for BIM related issues with all relevant project stakeholders and manage collaboration between all parties
- Perform model checks and deliver full report on the model/document properly.
- Maintain and revise BIM Plan with additional construction information on an as needed basis
  - Ensure project stakeholder compliance with the EDiS Company/AMP Consulting approved BIM Plan
  - Develop, coordinate, publish, and verify all necessary configurations required for seamless integration of BIM Model(s) and facility data during construction
- Coordinate and maintain the transfer of information on the file sharing exchange protocol
  - Coordinate the exchange of BIM model(s)and facility data between the Design Team and construction trades
  - Coordinate any field revisions that have been documented and updated to the Design Model with the Design Team in a timely manner
  - Coordinate with Lead BIM Technicians to integrate 3D fabrication models with the updated design model to ensure compliance with project deliverables
  - Maintain accurate As-Built/Record Model
  - Coordinate with contractor, design team, and commissioning agent to verify facility data before project turnover
  - Coordinate with the facility management data and file exchange as needed
- Lead meetings with lead BIM technicians and project BIM Team
  - Assemble composite construction model for coordination meetings
  - Facilitate use of composite trade models in construction coordination/clash detections meetings and generate detection reports by the identification and resolution of all hard and soft collisions within the BIM Model(s)
  - Coordinate construction sequencing and scheduling activities and assure they are integrated with the relevant BIM Model(s) and facility data
  - Perform constructability reviews

4.1.3 RESPONSIBILITES DURING POST CONSTRUCTION

- Meet with facilities management group for review of turnover documents
- Finalize BIM As-Built/Record Model and facility data
- Verify model accuracy and completeness in accordance to Owner Requirements
- Facilitate the transfer of information on the file sharing exchange protocol
- Hand over
- BIM As-Built/Record Model(s) and facility data to for use in operations

4.2 DISCIPLINE LEAD BIM TECHNICIANS

Each major design discipline and subcontractor shall assign an individual to the role of lead BIM Technician for the duration of the project. These individuals shall have the relevant BIM experience required by the complexity of the project. As a minimum, the Lead BIM Technician would have the following responsibilities for their discipline:

- Act as Lead BIM contact for the duration of the project
- Maintain and manage integrity of model, including:
  - Coordinate BIM development, standards, data requirements, etc. as required
  - Lead the technical BIM team in its documentation and analysis efforts
  - Exchange files between other disciplines
  - Upload and maintain models to file exchange server
  - Prepare model for review, as required
- Ensure development and documentation of clash resolution
  - Maintain a continuous interface with the BIM Model Manager
  - Participate in coordination and BIM technology meetings
- Coordinate trade items into the Record Model and/or As-built Model, in accordance with project BIM Plan

5.0 PROJECT BIM OBJECTIVES AND PROJECT BIM USES

5.1 PROJECT BIM GOALS/OBJECTIVES

The following goals have been established for BIM execution associated with this project:

PRIORITY (HIGH/MED/LOW)	GOAL DESCRIPTION
Required	Prepare BIM model to be transferred between project stakeholders to minimize duplication of effort
Required	Conduct conflict resolution analysis during design to eliminate design clashes, resulting in a well-coordinated model prior to construction

Required	Utilize model for 3D Design Reviews to assist with equipment clearances and owner design decisions
Required	Conduct coordination review of key systems with construction manager and specialty trade contractors during construction
Required	Develop an accurate Record Model and As-Built Model to be used for integration into EDiS Company/AMP Consultant's facility management system(s) within the traditional standard of care provisions that govern the design and construction of the project. Record Documents should also include all approved submittals, shop drawings, O&M Manuals, building control drawings, construction photos, inspection reports, and commissioning data
Required	Integrate project data into for use in Asset Management after turnover and specific to campus asset management plan
Required	Prepare accurate design documents and construction documents derived from the model to establish basis of design within the traditional standard of care provisions that govern the design of the project
Required	Implement a process in which BIM software utilizes the model and energy attributes to determine the most effective engineering methods based on design specifications
High	Enhance Design Consolidation/ Coordination
Medium	Prepare accurate design model for piping, ductwork, etc. to Facilitate Prefabrication Efforts
Low	Field BIM to provide more immediately available accurate information on changes during construction
Low	Provide Interactive Operations and Maintenance Reference (Asset Management)

5.2 PROJECT BIM USES

BIM Use is defined as a task or procedure on a project which can benefit from the application and integration of BIM technologies and add value to the overall project.

BIM USE CLASSIFICATION	DEFINITION
Mandatory	Required on all Hodgson High School construction projects using the BIM Project Execution Plan
Significant Effort	Project team should make serious attempt to pursue BIM Use. Any reasons for noncompliance must be submitted to Hodgson High School for approval

The following BIM Uses marked **Mandatory** are the minimum requirement for BIM use during all phases of the project, as well as recommended effort for other BIM Uses. Additional uses specific to the project may be added using the table below:



5.2.1 BIM USES DURING PLANNING THROUGH 8.2.4

BIM USE	OBJECTIVE	RESPONSIBLE PARTY	EFFORT
Energy Analysis	Conduct energy assessments for building design, inspect building energy standard compatibility, and optimize proposed design to reduce facility lifecycle costs	ABHA|BSA+A	**Mandatory**
Existing Conditions Modeling	Develop a 3D model of the existing conditions for a site, facilities on a site, or a specific area within an existing facility		**Not Pursued**
Site Analysis	Evaluate site to determine if site meets the required criteria according to project requirements, technical factors and/or financial factors	ABHA|BSA+A	**Significant Effort**
Programming	Analyze spatial program and requirements and accurately assess design performance in regard to space standards and regulations	ABHA|BSA+A	Minimal Effort
Massing	Analyze exterior massing of the building as it relates to the site and surroundings.	ABHA|BSA+A	**Significant Effort**

5.2.2 BIM USES DURING DESIGN

BIM USE	OBJECTIVE	RESPONSIBLE PARTY	EFFORT
Design Intent Model Development	Develop model based on criteria that is important to the translation of the building's design	EDiS Company	**Mandatory**
Design Reviews	Review design development / progress and require feedback based on design	EDiS Company	**Mandatory**
3D Design Coordination	Determine and resolve major system design conflicts prior to construction	EDiS Company	**Mandatory**
Energy Analysis	Analyze model based on energy design specifications (Trane Trace 700)	EDiS Company	**Mandatory**
Model Auditing	Organize and assess asset attribute data into model	EDiS Company	**Mandatory**
Preconstruction Coordination	Coordinate constructability issues with Contractor	AMP Consulting	**Significant Effort**
Structural Analysis	Analyze model based on structural specifications	AMP Consulting	**Significant Effort**
Mechanical Analysis	Analyze mechanical systems based on design specifications	AMP Consulting	**Significant Effort**

Lighting Analysis	Analyze lighting systems based on design specifications	AMP Consulting	**Significant Effort**
LEED Evaluation	Organize information for USGBC	AMP Consulting	Minimal Effort
Cost Estimation & Quantity Takeoff	Supplement model with progress drawings to track quantities and counts	AMP Consulting	Minimal Effort
Code Evaluation	Streamline code review		Not Pursued

5.2.3 BIM USES DURING CONSTRUCTION

BIM USE	OBJECTIVE	RESPONSIBLE PARTY	EFFORT
Means & Methods Model Development	Develop model based on criteria that is important to the translation of the building's construction	AMP Consulting	**Mandatory**
Constructability Reviews	Evaluate construction feasibility	AMP Consulting	**Mandatory**
3D Construction Coordination	Determine and eliminate system conflicts prior to installation	AMP Consulting	**Mandatory**
Model Auditing	Verify asset attribute data into model	AMP Consulting	**Mandatory**
Site Utilization Planning	Visually depict site conditions	AMP Consulting	**Significant Effort**
Cost Estimation	Trend quantities	AMP Consulting	Minimal Effort
Digital Fabrication	Prefabricate objects (CNC, Preassembly, modularization)	AMP Consulting	Minimal Effort
3D Control and Planning	Use model to layout and install equipment, track production		Not Pursued
Construction System Design	Plan and design temporary components and safety systems		Not Pursued

5.2.4 BIM USES PRIOR TO PROJECT TURNOVER

BIM USE	OBJECTIVE	RESPONSIBLE PARTY	EFFORT
Record Model	Compare design intent to installed conditions	AMP Consulting	**Mandatory**
As-Built Model	Capture installed conditions during construction	AMP Consulting	**Mandatory**
Continuous Commissioning	Commission facility based off of end-user requirements	AMP Consulting	**Significant Effort**



Asset Management	Track manufacturer, commissioning, and maintenance records	AMP Consulting	**Significant Effort**
Space Management and Tracking	Identify space use and track use throughout management of facility and movable assets		Not Pursued
BAS System Integration	Integrate model with existing Building Automation System		Not Pursued

6.0 DESIGNING THE BIM EXECUTION PROCESS

6.1 MAPPING THE BIM EXECUTION PROCESS

A process diagram for the overall use of BIM on the project has been developed for the project. The attached diagram summarizes the workflow BIM uses and their associated information exchanges for the project. The BIM Execution Process Diagram for this project can be found in **Attachment 1** of this document.

6.2 DEVELOPING INFORMATION EXCHANGES

The project team should document the information exchanges created as part of the planning process when creating the BIM Plan. The level of development (LOD) for each model element is based on the model content criteria established by the AIA Document E202, Building Information Modeling protocol Exhibit. The LOD will assist in determining the level of involvement for each project stakeholder from project conception through project turnover. The LOD Matrix for the project is located in **AIA Document G204-2022 Model Element Table**.

6.3 BIM INFORMATION EXCHANGE METHODOLOGY

The following section lists the typical procedures for information exchanges, model sharing, and coordination throughout the project. Please validate accordingly for the project.

6.3.1 COORDINATION AND CONFLICT RESOLUTION

This Section shall be utilized in conjunction with the BIM Coordination Protocol. If conflicts exist between the two documents, this document shall govern.

When conflicts are discovered in the model, regardless of project phase or LOD, the discovering party shall promptly notify the Model Element Author. Upon notification, the Model Element Author shall act promptly to mitigate the conflict. All project stakeholders and responsible parties must post their models to the designated shared server on a weekly basis as specified. Before the model(s) are shared and/or transferred, the model should be audited to conform to the following standards:

- Begin coordination process as early as possible

  - Designate the Project Model Manager
  - Designate BIM contact for each project stakeholder
  - Specify LOD for all Model Attributes
  - Create file storage and transfer process (workspace, model naming convention, model protocol)
  - Verify file type, compatibility, and needs
- Create schedule of expectations for model delivery
  - Deadlines for each project stakeholder based on level, area, phase
  - Set file upload dates (weekly) with time for interdisciplinary coordination
- Validate Model
  - Apply construction means and methods to architectural and structural model
  - Ensure model integrity and accuracy
- Establish conceptual placement of components within the architectural space
- Determine coordination hierarchy, for example:
  - Architectural
  - Structural
  - Equipment
  - HVAC Duct
  - Wet Mechanical
  - Gravity Plumbing
  - MEPF Risers
  - HVAC Distribution
  - Plumbing Distribution
  - Electrical Distribution
  - Fire Protection Distribution
- Clash Detection process
  - Project stakeholders access each other's models to work on specific level, area, and phase
  - Clash resolution to be worked out among project stakeholders
  - BIM Model Manager will check models for interference and conflicts
  - BIM Model Manager will distribute composite model in .nwd format showing unresolved clashes and clash report document for project stakeholder review and resolution before next coordination meeting
  - Weekly coordination meetings will take place to address unresolved issues with the composite model
  - BIM Model Manager will distribute meeting minutes and resolution decisions after each meeting to project team
  - Process begins again to address the next level, area, and phase
  - Clash-free model is then distributed to all parties and signed off as per project phase
  - All clash detection is in Revizto

6.3.2 ADDITIONAL BIM METHODOLOGY

- Design Model Reviews Bi-monthly: models will be sent via Dropbox to AMP Consulting for review.

7.0 FACILITY ATTRIBUTE DATA REQUIREMENTS – NOT APPLICABLE

7.1 ASSET ATTRIBUTE INFORMATION
7.2 ASSET DATABASE REQUIREMENTS

8.0 COLLABORATION PROCEDURES

8.1 COLLABORATION STRATEGY OVERVIEW

Our team will collaborate through the use of BIM from the Design Development stage through opening day. We will share the model between the Designers, Construction Managers, and Subcontractors, to work out both pre-construction and field items. The model will be shared with AMP Consulting – EDiS during design at two week intervals to ensure they have the most current information. All meetings for the project will be held on campus at Hodgson High School and our BIM meetings will be organized as follows:

A BIM requirements kickoff meeting will be held during the early planning stages in order to help the Owner (, Housing, other interested campus parties), Construction Manager, Design Assist Subcontractors, and Designers understand the other parties' needs, processes, and the abilities of their hardware and software so the final deliverable will be suitable for Hodgson High School 's needs.

Design Coordination Sessions and Construction over-the-Shoulder Progress reviews will be held throughout all phases of Design and Construction. Participants may include: Owner (individuals as determined by Hodgson High School), Construction Manager, Design Assist Subcontractors, and Designers.

Design Build Team Construction Coordination reviews and Field Change Design Discussions and on site will be held frequently during construction through the use of Revit, Navisworks, and Blue Beam.

8.2 MEETING PROCEDURES

MEETING TYPE	PROJECT STAGE	FREQUENCY	PARTICIPANTS	LOCATION
BIM Requirements Kick-off	Planning	Once	Senior Management, BIM Management Staff	Virtual
BIM Plan Review	ALL	Monthly	Senior Management, BIM Management Staff, Hodgson High School , BIM Coordinator	Virtual
3D Design Coordination	Design Documents Construction Documents	Bi-weekly	Design Team	Virtual

Mechanical Space Review	Design Documents Construction Documents	TBD	Hodgson High School , Work Control Center, Design Team, Construction Team,	Virtual
Model Commissioning Checks	Construction Documents, 75% Submittal Approval	TBD	BIM Management Staff	Virtual
3D Construction Coordination	Construction	Weekly	Construction Team	Virtual

8.3 MODEL DELIVERY/ EXCHANGE SCHEDULE FOR SUBMISSION AND APPROVAL

INFORMATION EXCHANGE	FILE SENDER	FILE RECEIVER	FREQUENCY	START DATE	MODEL FILE	MODEL SOFTWARE	Native File Type	File EXCHANGE TYPE
Design Authoring – 3D Design Coordination	ABHA|BSA+A	ABHA|BSA+A	Sharing			Revit 2023	rvt	Dropbox
	ABHA|BSA+A	ABHA|BSA+A	Sharing			Revit 2023	rvt	Dropbox
	ABHA|BSA+A	AMP Consulting	2 weeks			Revit 2023	rvt	Dropbox
Design	ABHA|BSA+A	AMP Consulting	As needed			Revit 2023	rvt	Dropbox
Prime Contractors – 3D Construction Coordination	AMP Consulting	ABHA|BSA+A	1x/ month			Revit 2023	rvt	Dropbox
	AMP Consulting	ABHA|BSA+A	1x/ month			Revit 2023	rvt	Dropbox
Additional Software								

8.4 FILE TRANSFER PROTOCOL

An electronic workspace of File Transfer Protocol (FTP) will be established for the purpose of efficient and timely transfer of model and database files. This workspace will provide a collaborative location where the current contract CAD/Revit files, coordination files, and fully coordinated submittal files will reside. Each BIM coordination team member stores and obtains data from this location. Project team members are to upload updated copies of their files, provide notification, and to make collaboration comments and annotations as often as necessary to maintain project schedule.

8.5 ELECTRONIC COMMUNICATION PROCEDURES

“hyperlink to model folder”

Contact info for access:

Chris Donahue

AMP Consulting, BIM Manager

302-421-2963

cdonahue@ampconsulting.build

The BIM Model Manager will manage and maintain all user accounts and model access rights that include the creation, deletion, and modification of elements. All project participants will be given view and download rights to the federated model files. The BIM Model Manager will apply access controls to users so that only authorized users of the model can add the files for their respective component model(s). The following table consists of the model and data access rights for the project:

MODEL ACCESS RIGHTS

FTP FILE BREAKDOWN STRUCTURE	Project Stakeholders								
	O	**A/E**	**S**	**M**	**P**	**E**	**FP**	**C**	**SC**
Virtual Construction									
BIM Requirements	D	M	D	D	D	D	D	M	D
BIM Execution Plan	M	M	D	D	D	D	D	M	D
Coordination									
Coordination Key Plans									
Subfolders per Design Aspect	D	D	D	D	D	D	D	M	D
Architect CAD Files	D	M	D	D	D	D	D	M	D
Coordination Background Data Sets	D	V	D	D	D	D	D	M	D
Revizto/Origin	D	M	D	D	D	D	D	M	D
Object Enablers	D	M	M	M	M	M	M	M	M
Component Models									
Subfolders per Design Aspect	D	D/M	D/M	D/M	D/M	D/M	D/M	D/M	D/M
Federated Models/Interference Reports									
Subfolders per Level/Area/Zone	D	D	D	D	D	D	D	M	D
Signed-off Coordination Component Models									
Subfolders per Level/Area/Zone	D	D	V	V	V	V	V	M	V
Asset Database	M	M	V	M	M	M	V	M	M
Construction Submittals	D	D	D	D	D	D	D	M	M
Project Stakeholders: O = Owner, A/E = Architect/Engineer, C = Contractor, SC = Specialty Contractor Permissions: V = View, M = Modify, D =									

Download	

8.6 RIGHT OF RELIANCE

The BIM Model produced by the project stakeholders associated with the Design Team will serve as the basis of design and is considered a **Design Intent Model** only. The model prepared by the Design Team will be used by AMP Consulting/ EDiS to prepare a **Means and Methods Model**. This Right of Reliance pertains to all models and applications associated with the model and associated applications.

The Construction Team may rely on the accuracy of the model(s) prepared by the Design Team in accordance with traditional Standard of Care provisions that apply and govern the design and construction of comparable buildings in two (2) - dimensional design formats and methods.

Conversely, the Design Team may rely on the accuracy of the model(s) prepared by the Construction Team in accordance with traditional Standard of Care provisions that apply and govern the preparation of shop drawings, fabrication drawings, sequencing and other instruments used to convey the means and methods under the control of AMP Consulting, its subcontractors, consultants, and other agents working on this project.

As mutually agreed by all parties including ABHA|BSA+A, AMP Consulting/ EDiS and Owner, nothing shall be construed by the content and/or preparation of the associated model(s) as a warranty or guarantee of accuracy and/or completeness by the Design Team. Standard and traditional procedures for design, documentation, means and methods, shop drawing submittals, verification by the contractor, requests for information in question, etc**. shall apply** to the design, construction and construction administration of the project.

The construction manager, contractors and subcontractors shall be solely responsible for means and methods and the execution of the Design Intent Model through the execution, preparation and management of delegated design, the Means and Methods Model(s), fabrication, installation and construction.

9.0 TECHNOLOGICAL INFRASTRUCTURE

9.1 COMPUTERS / HARDWARE

Recommended Hardware: Quad Core Processor / 8-12 GB RAM / Windows 10

9.2 SOFTWARE

9.2.1 APPLICABLE SOFTWARE APPLICATIONS FOR DESIGN

The following software applications will be utilized by the Team for this project during design:

SOFTWARE	VERSION	PROJECT STAKE HOLDER	TASK TYPE

Revizto	5	AMP Consulting	Design Model/ Record Model
AutoCad	2023	ABHA|BSA+A	Design/ Drafting
Bluebeam	2020	ABHA|BSA+A	Design/ Presentations
RAM Structural System	14.06.01.00	ABHA|BSA+A	Design Calc

9.2.2 APPLICABLE SOFTWARE APPLICATIONS FOR CONSTRUCTION

The following software applications will be utilized by the team for this project during construction:

SOFTWARE	VERSION	PROJECT STAKE HOLDER	TASK TYPE
Revit	2023	AMP Consulting and Subcontractors	As-Built Model
Revit	2023	ABHA|BSA+A	Design Model/ Record Model/ Construction Bulletins
Sketchup	8	ABHA|BSA+A	Design
Adobe Creative Cloud		ABHA|BSA+A	Design/ Presentations
Navisworks Manage	2023	ABHA|BSA+A/Amp Consulting/ Subcontractors	Coordination Review
Revizto	5	Supplied by AMP Consulting	

A variety of software systems will be used by subcontractors, fabricators, and third parties to prepare delegated design elements. In the event these design elements are more accurate than the Construction Documents, the geometric information should be converted into Revit format.

****Revizto license** Subcontractors to allow $1,200 for Revizto license.**

10.0 MODEL AND DATABASE STRUCTURE

10.1 PROJECT NAMING CONVENTIONS

10.1.1 FILE NAMING CONVENTIONS

Files should be named according to the following conventions: **TBD**

10.1.2 ROOM NUMBERING CONVENTIONS

Please refer to Design and Construction Standards for the room numbering convention used for all locations, on both new construction and renovation projects. This system provides a consistent method for identifying and

managing building space and shall be adhered to unless approval for deviation is received from the Signage Administrator. The room numbering convention is as follows:

- **(x)(x)(x)** = x numeric identify floor and room number
- **(x)(x)(x)(A)** = alpha suffix identifies room subdivisions
- **(J)(x)(x)(x)** = alpha prefix identifies a unique room space (J – Janitorial Room)

Room Number Coordination and Validation drawing(s) and report deliverables are noted in Section 12.1: Design Deliverable Requirements and will be reviewed by Hodgson High School at project milestones.

10.2 MODEL STRUCTURE

The success of a BIM enabled project delivery process is highly dependent upon the level at which the entire project team can communicate and work collaboratively for the duration of the project.

- For buildings with a large footprint or multiple floors, the project team may split the model into several zones (or floors) with the corresponding trades
- All trades will be modeled at the correct elevation
- All elements of the building must be represented in only one file and should be modeled by their specific trade. (For example, the architectural model provided for 3D Coordination should not include any of the structural elements contained in the structural model. Lights should be modeled by the electrical engineer, not the architect)
- All 3D model files must strip extraneous 2D and/or 3D elements from the model before submission for clash detection
- The architectural ceilings should contain information for openings for lights, registers, etc. as required by design. (For example, lights are to be centered on a grid with proper spacing)
- All models should include separate 3D representations of required clearances and/or access requirements for equipment access, light clearances, overhead cable tray access, etc. These clearance/access models should be in a separate layer(s)/level(s) per each trade and labeled as such

10.2.1 MEASUREMENT AND COORDINATE SYSTEM

X-reference point will be 0, 0, 0.

10.2.2 MODEL ELEMENT REQUIREMENTS BY DESIGN TEAM DISCIPLINE

The following section lists the typical BIM model and related elements by discipline and/or exclusions. Please refer to the LOD Matrix for responsible party, project phase, and level of detail information.

Every discipline is required to provide all relevant schedules, reports, and intelligent attribute data defined by the project scope and BIM Plan.

SITE/CIVIL MODEL

Model(s) shall contain all site-related features of the project which are not integral with the building envelope:



- Utilities
- Topography
- Water Quality Ponds
- Storm water Detention and Filtration Structures
- Planting Materials
- Paving
- Site stairs, ramps, and railings
- Retaining walls
- Site furnishings
- Erosion Control (Temporary and Permanent)

ARCHITECTURAL MODEL

Model(s) shall contain all architectural features for a building and site-related features extending 5′-0″ beyond the facility footprint:

- Exterior wall systems
- Interior wall systems
- Fire rated walls
- Architectural floor slabs
- Roofing system
- Fire extinguishers and fixed equipment
- Reflected ceiling plans
- Core and vertical systems (including elevators, stairs, escalators, and railings)
- Doors (including frames)
- Glazing (including windows, interior glazing, curtain walls, and storefronts)
- Millwork and Casework
- Furniture
- Finishes
- Toilet Partitions

STRUCTURAL MODEL

Model(s) shall contain all structural features for a building:

- Footings, concrete piers, foundation walls (including areaways), and pits
- Structural slab-on-grade (as solid mass)
- Elevated floor slabs, CMU bearing walls, CMU shear walls
- All structural steel members in their true shape and dimensions
- Exclusions: nuts and bolts
- Column Gridlines
- Primary floor openings (stairs, elevators, mechanical shafts)
- Primary bearing wall openings

- Elevator hoist

MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION MODEL(S)

Model(s) shall contain all MEP features for a building:

Mechanical Model:

- Major mechanical equipment (including energy recovery units, pumps, boilers, chillers, heat exchangers, and control panels)
- Major mechanical equipment requiring service clearance will be model with required clearance indicated.
- Mechanical ductwork and associated components (including flex duct, supply diffusers, and return grilles)
- Ductwork will be modeled using their inside dimensions and will include insulation if applicable and as required for coordination
- Mechanical piping and associated components (including flow meters and isolation valves, check valves and control valves for mains and branch mains)
- Piping will be modeled using their outside dimensions and will include insulation if applicable and as required for coordination

Electrical Model:

- Electrical conduit 1 1/4" and larger (or two or more regardless of size)
- Telecommunication racks and under floor tray(s)
- Safety and security systems
- Electrical equipment including specialty systems and pads
- Power feeds to equipment, transformers, panels, gear, junction boxes, cable trays, distribution boxes, etc
- Hangers and structural supports, unless they do not influence the coordination process of other trades
- Electrical light fixtures and ceiling devices
- Electrical panels and panel schedules
- Clearance requirements for equipment access, service space requirements, gauge reading, valve clearances, panel access, and other operation clearances

Plumbing Model:

- Domestic water piping
- Sanitary waste and vent piping
- Storm drainage piping
- Valves and meters
- Drains, cleanouts, and interceptors
- Plumbing equipment

- Plumbing fixtures
- Vents, valves, meters, cleanouts
- Plumbing equipment and fixtures

Fire Protection Model:

- Fire protection mains/standpipes
- Clearance requirements for equipment access, service space requirements, gauge reading, valve clearances, panel access, and other operation clearances

11.0 QUALITY CONTROL PROCEDURES

11.1 OVERALL STRATEGY FOR QUALITY CONTROL

The purpose of this process is to ensure project teams are using best practices in the development and file exchange of models and facility data. This is an ongoing process, which is to be conducted by the project team and validated by the Project manager at both project milestones and at random intervals to ensure that each model is being constructed in accordance with the BIM Standards and is suitably modeled for its intended use. The goal is to ensure that there are no unresolved issues during construction or any significant loss of data upon transfer of as-built models and record documents at facility turnover.

Each BIM Manager will be responsible for running quality control checks on their model(s) on a consistent and frequent basis. For issues involving other disciplines, the issue shall be made known to the corresponding BIM Manager.

We will perform Navisworks checks periodically to ensure fewer clashes in the model where two building components are overlapping. As we work, our technicians will ensure that the BIM Standard have been followed and that there are no unintended model components present. Our team will validate that the Project Facility Data set is as requested by the Owner is followed. One member of the project team will oversee all of the asset data and export it to a spreadsheet for verification that it has no undefined, incorrectly defined or duplicated elements.

11.2 QUALITY CONTROL CHECKS

CHECKS	DEFINITION	RESPONSIBLE PARTY	RECOMMENDED PROJECT MILESTONES
Standards	Ensure the BIM Standards and Guidelines have been followed	AMP Consulting	Construction Documents Project Closeout
Visual	Ensure there are no unintended model components and the design intent has been followed	AMP Consulting/ ABHA|BSA+A	Design Development Construction Documents 50% Construction

			Project Closeout
Model Integrity	Ensure that the Facility Data set has no undefined, incorrectly defined, or duplicated elements; ensure a reporting process and corrective action plans have been developed for noncompliant elements	AMP Consulting/ ABHA|BSA+A	Construction Documents 50% Construction Project Closeout
Model Commissioning	Provide report verifying model and database compliance with defined quality control procedures for component LOD and stakeholder information	AMP Consulting	Construction Documents 50% Construction Project Closeout

11.3 QUALITY CONTROL PROCEDURES

BIM Managers to define an appropriate quality control procedure for the project. The following is an example of a quality control procedure and must be validated for the project:

- Review random 10% of documented information
- If percent error is less than 3%, document reasons for error and revise throughout remaining model
- If percent error is between 3-5%, review additional 15% of randomly selected documented information.
- If percent error is greater than 3% after 25% review, project team to revise and resubmit information, as to not delay downstream user progress
- If percent error is less than 3% after 25% review, document reasons for error and revise throughout remaining model
- If percent error is greater than 5%, project team is to revise and resubmit information, as to not delay downstream user progress

11.4 MODEL ACCURACY AND TOLERANCES

Model(s) should be developed as accurate as possible. Dimension tolerances should be set at 1/16" to facilitate the accuracy of the model.

12.0 PROJECT DELIVERABLES

The BIM deliverables indicated below are required to be submitted with the standard phase deliverables for each project phase. The BIM Plan should establish the responsible parties and corresponding tasks for each deliverable. The level of development for each BIM deliverable should be, at a minimum, sufficient to fulfill the 2D document submission requirement.

12.1 DESIGN DELIVERABLE REQUIREMENTS

BIM DELIVERABLE	RESPONSIBLE PARTY	DUE DATE	FORMAT	NOTES
BIM Project Execution Plan	EDiS/AMP Consulting		.pdf	
Design Intent Model(s)	ABHA|BSA+A	Design Development	.rvt .nwd native	See information Exchange Worksheet to ensure that the proper information is contained in the model
Design Drawings: Design Development	ABHA|BSA+A	Design Development	.pdf	Documents to be printed directly from model. Documents to be stamped and signed in traditional practice to comply with local permitting requests
Room Number Coordination & Validation (Design Development)	ABHA|BSA+A	Design Development	.pdf	Document and schedule to be printed directly from model for review.
Design Drawings: Construction Documents	ABHA|BSA+A	Construction Documents	.pdf	Documents to be printed directly from model. Documents to be stamped and signed in traditional practice to comply with local permitting requests
Room Number Coordination & Validation (Construction Documents)	ABHA|BSA+A	Construction Documents	.pdf	Document and schedule to be printed directly from model for review.
Interference Check Reports	EDiS/AMP Consulting	Construction Documents	.xls	
Model Attribute Report	AMP Consulting	Post Construction Documents	.xls	
Hodgson High School Facility Attribute Data Compliance Report	AMP Consulting	Post Construction Documents	.pdf .xls	

12.2 CONSTRUCTION DELIVERABLE REQUIREMENTS

BIM DELIVERABLE	RESPONSIBLE PARTY	DUE DATE	FORMAT	NOTES
BIM Project Execution Plan	AMP Consulting	TBD	.pdf	

Interim Means and Methods Model(s) per Discipline	AMP Consulting	.rvt .nwd native	See information Exchange Worksheet to ensure that the proper information is contained in the model
Interference Check Reports	AMP Consulting/ ABHA|BSA+A	.xls	
Construction Submittals	AMP Consulting	.pdf	
Model Attribute Report	AMP Consulting	.pdf	
AMP Consulting Facility Attribute Data Compliance Report	AMP Consulting	.pdf .xls	

12.3 PROJECT CLOSEOUT DELIEVERABLE REQUIREMENTS

BIM DELIVERABLE	RESPONSIBLE PARTY	DUE DATE	FORMAT	NOTES
Record Model	ABHA|BSA+A	30-60 After Completion	.rvt .nwd native	See information Exchange Worksheet to ensure that the proper information is contained in the model
As-Built Model	AMP Consulting	30-60 After Completion	.rvt .nwd native	See information Exchange Worksheet to ensure that the proper information is contained in the model
Record Drawings	ABHA|BSA+A	30-60 After Completion	.pdf	Documents to be printed directly from model. Documents to be stamped and signed in traditional practice to comply with local permitting requests
Hodgson High School Facility Attribute Database	AMP Consulting	30-60 After Completion	.pdf .xls	

13.0 ATTACHMENTS

1. BIM Model LOD Matrix
2. AIA Document G203-2022 BIM Execution Plan
3. AIA Document G204-2022 Model Element Table
4. Exhibit "I" – BIM Coordination

ATTACHMENT 1: BIM MODEL LOD MATRIX

The project team should document the information exchanges created as part of the planning process when creating the BIM Plan. The following table describes the Model Element Author (MEA) referenced by the BIM

Model LOD Matrix:

MODEL ELEMENT AUTHOR		
ACRONYM	**ORGANIZATION**	**ROLE**
City	New Castle County Vocational Technical School District	Owner
HPL	Hodgson High School	Tenant
BMG	ABHA|BSA+A	Design Team
AMP	AMP Consulting	BIM
CMTA	CMTA	Engineer
BIA	Baker, Ingram & Associates	Engineer

The level of development (LOD) for each model element is based on the model content criteria established by the AIA Document E202, Building Information Modeling protocol Exhibit. The LOD will assist in determining the level of involvement for each project stakeholder from project conception through project turnover. The content for the LOD is described as follows:

Level of Development	Description
LOD 100 Schematic Design	The LOD 100 model consists of overall building massing designed to perform whole building type analysis including building orientation, square foot costs. LOD 100 also pertains to 2D representation of elements as required by the 2D Construction Documents which may include drawings, narratives, and hand-built models.
LOD 200 Design Development	The LOD 200 model consists of generalized systems including approximate quantities, sizes, shapes, location, and orientation. The LOD 200 mode(s) are used for analysis of defined systems and general performance objectives. LOD 200 model(s) include attributes and parameters defined by the owner in the Owner Requirements document and BIM Plan.
LOD 300/350 Construction Documentation	Model will include elements equivalent to traditional construction documents and shop drawings. LOD 300/350 models are well suited for estimating as well construction coordination for clash detection, scheduling, and visualization purposes. LOD 300/350 model(s) include attributes and parameters defined by the owner in the Owner Requirements document and BIM Plan.

LOD 400 Construction Administration/ Shop Drawings	Model elements are modeled as specific assemblies which are accurate in terms of quantity, size, shape, location, and orientation. LOD 400 model(s) are virtual representations of the proposed elements and considered to be suitable for construction, fabrication, and assembly. This LOD is most likely used by specialty trade contractors and fabricators to build and fabricate project components including MEP systems.
LOD 500 Project Completion/ Record Drawings/ As-Built Conditions	Model elements represent the project as it has been constructed, including as-built conditions. The model is configured to be the central data storage for integration into the building maintenance and operations system(s). LOD 500 Model(s) will include completed parameters and attributes specified in the Owner Requirements document and BIM Plan. At the completion of construction, the BIM model(s) will be finalized, linked, and cross referenced.
LOD 510, 520, 530, 540	Model elements represent the project as it has been constructed, including as-built conditions. LOD 510, LOD 520, LOD 530, and LOD 540 models will contain LOD 100, LOD 200, LOD 300, LOD 400 facility and geometry data respectively and will be configured to contain the Operations and Maintenance manuals, warranty information, submittal information, and/or any other documents as applicable or required.
LOD 550 Owner Reserved	Owner reserved, LOD 550 model elements will not be generated during planning, design, or construction.
Exhibit 'I'	Contractors LOD Requirement

The BIM LOD Matrix worksheet shall be completed by the project team during BIM Plan development.

EXHIBIT 'I'

BIM COORDINATION

1.0 CONTRACTOR 3-D MODEL RESPONSIBILITY

The purpose of a three-dimensional model is to aid in project review development. Contractor and its sub-contractors, as part of the Hodgson High School project, shall hold all responsibility to adhere to AIA G203-2022 BIM Executive Plan and AIA G204-2022 Model Element Table while creating their BIM model respectively. This BIM model shall reflect the two-dimensional contract drawings provided in bidding package, RFI, and ASI. The Contractor's referenced and shared three-dimensional model is only utilized as a visual aid to begin per matrix LOD required by Contractor.

1.01 Architect and their consultants will Furnish Contractor one set of Revit 2023 Building Information Modeling files (BIM) of Drawing for use in preparing coordination digital data files.

- Architect makes no representations as to the accuracy or completeness of digital data files as they relate to drawings.
- Digital data software program: Drawings are available in Revit 2023 digital data software working on the Windows operating system. Sheet views will be deleted to protect the architect and consultants. Full model will be available for coordination.
- Contractor shall execute a data licensing agreement in the form of the agreement included in the project manual.
- The Contractor and its prime contractors are responsible to execute all licensing for requested software to coordinate the project.

1.02 BIM File Incorporation: Develop and incorporate coordination drawing information into Building Information Model established for Project.

- Each of the Prime Contractors shall model their respective systems in the BIM model that are part of their contract and provide updated files to the HVAC contractor.
- The HVAC contractor (Prime Coordinator) shall perform three-dimensional component conflict analysis as part of the preparation of coordination drawings. Resolve component conflicts with each Prime prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect and obtain approval of Architect.
- HVAC contractor shall revise the BIM model as necessary to reflect the coordination changes. HVAC contractor shall pay for the cost of revisions to the BIM model. HVAC contractor shall include all cost due to the revisions of project changes such as but not limited to RFI, ASI's and owner changes. All modifications, enhancements, additions, and changes to structural, mechanical, electrical, plumbing, fire protection, or HVAC components shall be made by the respective Prime Contractors responsible for that system as part of their contract.

2.0 DEFINITIONS

2.01 **Base Structural Model** – the structural steel mill order drawing file showing all structural elements. This model is not necessarily fully detailed with all connections.

2.02 **Base Architectural Model** – a combination of the Base Structural Model and key architectural elements. This model is to be used by all coordination participants as the background file in which to develop their work. No information within this model will be changed through the coordination process. It is for reference only.

2.03 **Base Composite Model** – this model includes all trade drawing files within the Base Architectural Model as a representation of the completed systems. This model is used to run the intermediate clash reports and is considered a work in progress.

2.04 **Final Coordination Model** – this model shows all trades' systems fully coordinated within the Base Architectural Model. All clashes have been resolved. No further coordination is required. The work shown within this model represents the upcoming installations of each system.

2.05 **Completed Coordination Model** – this model is the close-out submittal to the Owner and includes the information within the Final Coordination Model as well as any project updates that have taken place during installations such as RFI responses, as-built conditions, etc.

2.06 **Building Information Model -** A Building Information Model(s) is a digital representation of the physical and functional characteristics of the Project and is referred to in this document as the "Model(s)," which term may be used herein to describe a Model Element, a single Model or multiple Models used in the aggregate. "Building Information Modeling" means the process and technology used to create the Model.

2.07 **Level of Development** - The Level(s) of Development (LOD) describes the level of completeness to which a Model Element is developed.

2.08 **Model Element** - A Model Element is a portion of the Building Information Model representing a component, system or assembly within a building or building site. Model Elements are represented by the Construction Specifications Institute (CSI) UniFormat™ classification system in the Model Element Table in Exhibit 1 - Article 3.

2.09 **Model Element Author** - The Model Element Author is the party responsible for developing the content of a specific Model Element to the LOD required for a particular phase of the Project. Model Element Authors are identified in the Model Element Table in Exhibit 1 - Article 3.

2.10 **Model User** - The Model User refers to any individual or entity authorized to use the Model on the Project for analysis, estimating, or scheduling.

2.11 **TCD** – Trade contract drawings developed by MEP contractor.

3.0 COORDINATION DRAWING PROCESS–GENERAL REQUIREMENTS.

3.1 The coordination model shall be derived from the design base composite model which shall be in a (Program File Format – Ex: Revit 2023) format and utilized by all coordination participants. The A/E is to provide this base composite model as needed at each plan deliverable for coordination efforts. This model will be utilized to establish field installation sequence, resolve trade coordination issues prior to installation, and to make the most efficient use of installation space without sacrificing system performance for mechanical, electrical, structural, and architectural systems. (Program File Format – Ex: NAVISWORKS or IFC) design review software will be used to document, identify and resolve interferences between all trades.



3.2 Communication is a critical element to the success of this coordination process. All project team members must be in constant communication to keep the process moving forward according to the sign-off schedule (5.1). Constant collaboration is expected of all team participants and each participant should be proactive in identifying and resolving design, engineering, and model interferences. Contractors avoiding the coordination process shall receive liquidated damages for missing meetings and negatively impacting project completion.

3.3 All trade contractors own their respective modeling for their contract work. EDiS Company will facilitate and lead the 3-D coordination modeling process. It is the responsibility of all coordination participants to resolve discrepancies pertaining to their own model. All trades shall be responsible for collisions/clashes/coordination issues involving their respective trade(s) and proposed work. Coordinated work takes precedence over field routed systems. Each Contractor to provide LOD 350 total coordination models for sign off.

3.4 Coordination meetings will occur weekly starting TBD. Selected coordination team members are required to generate a clash-free model inclusive of all systems. The following participants are required to attend the weekly coordination meetings:

3.5 A mandatory coordination kick-off meeting for all participants will review; team collaboration, the execution process, the coordination schedule, establishing zones per system, use of the coordinated elements during construction, project specific information and requirements, and model/document standards.

3.6 Coordination meetings will be held at Virtual Goto Meeting to review the model's progress per the schedule and process indicated.

3.7 Utility corridors and above ceiling space for each trade, will be established by the group at the beginning of the process. These zones will be adjusted through the coordination process to meet installation requirements and feasibility.

3.8 All participants are required to identify the submittals required for accurate detailing of the coordination model (such as equipment, light fixtures, etc.) and to obtain final approval so the information can be incorporated into the modeling process.

3.9 The 3-D coordination modeling process replaces the standard submittal process as a submittal. Exceptions: The submittals issued to reflect the 3-D model content issued to A/E.



3.10 Meeting Procedures:

Meeting Type	Project Stage	Frequency	Participants	Location
EDIS BIM COMPASS	PRE-CON	Once	EDiS Team & Contracts #	EDIS Office
BIM Requirement Kick-off	Construction	Once	EDiS Team & Contracts #	Virtual
BIM Coordination	Construction	Weekly	EDiS Team & Contracts #	Virtual
BIM Clash Detection	Construction	Weekly	EDiS Team Issue to Contracts	Virtual
Field Installation Process Coordination Meetings	Construction	Weekly	EDiS Team & Contracts #	Virtual
TCD Drawings	Construction	Weekly	Contracts Mechanical	Virtual
Sign off on TCD Drawings	Construction	At completion	All Parties w/Contract	Virtual

NOTE: All contracted parties involved with coordination are required to sign off on all coordinated models via sign off TCD drawings. All clash reports issued to subcontractors require completion by next BIM meeting.

3.11 The coordination meeting:

3.11.1 The purpose is to review and resolve items on the current clash report in conjunction with the project coordination schedule. The meetings will focus on clashes that cannot be resolved by internal collaboration. EDiS Company will facilitate the meeting and will make final decisions on clash resolution that are the least impact to the project as a whole. COORDINATION MEETINGS WILL NOT BE USED TO RESOLVE INDIVIDUAL MODELER'S/ENGINEER'S/ARCHITECTURE'S/CONTRACTOR'S WORK. If a Contractor does not post a clash-free system of its own work or that only contains a very limited number of clashes internally (Example: Fire Sprinkler Clashing with Fire Sprinkler), that Contractor will be considered unprepared for the meeting and will be responsible for any delays to the project schedule and any associated costs due to that delay which shall be determined by EDiS Company.

3.11.2 Each team participant will review the clash report prior to the subsequent coordination meeting in order to clean up any clashes that can be made without review by all participants.

3.11.3 All project participants are expected to be prepared for the meeting with new drawing work of the next area to be coordinated per the coordination schedule and any drawing changes based on the published clash report. Each participant will have available any shop model, submittals or other materials required to solve identified or potential conflicts.

3.11.4 The coordination schedule will be maintained, and all identified conflicts addressed and resolved per the construction schedule. The coordination schedule may change as a result of design and/or model changes requested and made by the Owner, Architect or Engineer. In addition, the coordination schedule assumes selection of equipment is made within the time



frame of the construction schedule as needed so it is incorporated into the coordination efforts without delay.

3.11.5 All agreed upon corrections to identified clashes determined by the team at the Coordination Meeting are to be updated and resolved prior to the next meeting.

3.12 When an area of the model is fully coordinated and clash-free, each participant agrees:

3.12.1 That each trades work is fully coordinated and will be installed per the signed off area as reflected in the coordination model. Sign off drawings from each trade are turned over in PDF form with projects title block. EDiS Company will include legend and title block for trade PDF file.

3.12.2 All trades to provide Total Coordination drawings at the time of sign off. TCD's are drawings which include all trades sign off models. Models are submitted for turn over to EDiS Company. The purpose for TCD's is to provide coordinated building models for jobsite coordination. Models from Contractors to include all but not limited to: item elevations, product type and all equipment tags.

3.12.3 During the installation of each trade's work, EDiS Company will refer to the signed off report and the 3-D model to resolve any conflicts. Each installation firm agrees to install all work per the signed off drawings/model, without deviation. If a deviation, during installation, takes place without prior approval from all detailing parties, it will be the responsibility of the installing contractor to tear out the work and install it as shown on the signed off drawings/coordination model. The cost of this work will be evaluated when the issues arise; however, the party responsible for the conflict will be responsible for the cost of the fix, including the additional detailing time of all parties involved.

3.12.4 The model is not considered to be the final coordination model until the BIM Coordinator, EDiS Company's Project Manager, A/E, and Owner has approved all clash free systems and routings and documents are signed off by all parties (contractors).

3.13 Should a conflict arise during installation that was missed during the coordination process, and not a result of deviating from the signed off area, the coordination team will work together to find a solution that is optimal for all trades and the project.

3.14 The final coordination model shall be kept up to date by all participants during construction to include as-built information and any other pertinent data that is essential to the project. The data will be submitted electronically in Revit, AutoCAD, NWC, PDF format. Items to be included are:

3.14.1 RFI responses.

3.14.2 Design change orders or designs that are in addition to the original contract documents.

3.14.3 Equipment will be tagged with all (Owner required) identification information within the model (ex. Equipment schedule information and O&M Manuals). This identification information will be the same and correspond to all other close-out documentation. This close-out documentation including O&M manuals, maintenance information, etc. will be included in PDF form.

3.14.4 EDiS will provide a location for the Contractor to submit the required documentation at a later time. EDiS will generate the completed coordination model based on these documents for turn-over to the owner.

3.14.5 Tekla or Navisworks will be utilized to link PDF closeout documents, select RFI's, select Images, etc., to the closeout model. Contractors need to provide closeout documents in the format requested by EDiS for the closeout model as well as adding smart data to other model type files as determined necessary by EDiS within the time frame A/E dictates. For example, if



Revit files are needed to produce the closeout model, EDiS may direct Contractor to set up certain Revit views for the exporting of files which make up the as-built models. A/E may also request that the Contractor create viewpoints for their equipment in as-built model.

3.15 Data for coordination will be available on Dropbox, to be referenced by the other participants. Models and drawing files will never be tampered with by non-owners of the file. If a mistake occurs and a drawing is inadvertently modified, the responsible party is required to alert the project team.

3.16 The Owner's commissioning agent can attend the coordination meeting to review the detailing effort for commissioning related items.

3.17 All trades will provide Level of Development (LOD) (350) models for weekly coordination meeting.

4.0 REQUIREMENTS OF THE LEAD COORDINATOR

4.01 The Lead Coordinator will be EDiS Company.

4.02 Identification of a common insertion point for all drawing files. (Utilize Revit Models origin)

4.03 A/E to provide Lead Coordinator model exports to 2-D/3-D CAD of each trade component as needed to coordination. Origins to be maintained in exports.

4.04 All coordination files and process is via Revizto 5 file uploads and backgrounds are in Revizto.

4.05 Using the A/E's files, the Lead Coordinator will utilize & maintain the base architectural model.

- The base architectural model is a combination of the base structural model and other architectural elements. These architectural elements will include all elevated 3-D architectural elements including, but not limited to, all walls that extend to the deck, fire and smoke walls, soffits and associated framing, ceiling planes, and finish floor planes.
- This model will consist of cleaned-up floor plans void of any excessive notations, leaders, bubbles, marks, grid lines, etc. that are not required for detailing development and that may potentially cause a conflict in the base composite model.
- In the event of changes to the A/E's contract documents, the A/E must revise the base architectural model/MEP/structural models and distributed to all coordination participants. This will require Contractor participation as needed by A/E to complete the revised models for directive. Revision work will be directed by Owner through an executed change order.
- The base architectural models will be distributed and maintained by EDiS Company.

4.06 Collation of all trades' detailing models as posted to the project's web-based posting site into a Base Composite Model through the use of Navisworks 2023.

- Establish a standard two inch (2″) soft tolerance within the clash detection software. This tolerance will result in a reported clash for any elements drawn closer than two inches (2″) to one another.
- Assess and include most current clash files including the generation of a clash reports and distribution to all project participants per the coordination schedule.
- Collect final as-built files from all trades and generate a Final Coordination Model to submit to CM as part of the close-out requirements.
- Coordination meeting minutes shall be kept by EDiS Company Lead Coordinator or EDiS' Project Manager showing issues and resolution dates.

4.07 Each Trade Subcontractor is required to sign off on all coordinated models and drawings ensuring they are 100% coordinated and clash free fabrication level models and shop drawings.

4.08 All contractors and trades are responsible for using/acquiring a ****REVIZTO license software. The cost is $1,200 per license, per contractor.** **

5.0 REQUIREMENTS OF THE STRUCTURAL STEEL CONTRACTOR

5.01 Obtain from the A/E Structural Revit files to be used in the generation of the base structural model.

5.02 The structural Contractor will develop and provide the base structural model within the time frame dictated by EDiS and provide structural model updates to ensure the coordination team is coordinating the MEP/FP to the most up-to-date structural model.

5.03 All structural framing members in the final sizes and locations (typically referred to as a "mill order" or "procurement" model) will be shown in the model as 3-D objects with surfaces. At the discretion of the lead coordinator, this model may be void of all hardware and secondary structural steel but should include the major components: primary steel, metal decking, slab on metal decking, and gusset plates.

5.04 The structural insertion/datum point must match the architectural insertion/datum location. No detailing work shall take place until the insertion points of the architectural and structural models match.

5.05 The steel Contractor is responsible for resolving their own modeling issues (i.e.: steel not to scale, missing key structural components, missing surface data, and model showing as wire frame data, model exported to proper file format, etc.). The steel Contractor is responsible to provide a steel design model in a usable format for all coordination participants to reference as the base structural model.

5.06 A FINAL 3-D steel model and 2-D shop drawings shall be submitted to the structural engineer of record and used for field erection. It must be completed and submitted in accordance with the BIM schedule. This model shall consist of:

- All primary and secondary steel including metal deck, slab on metal deck, actual gusset plate sizes, connection details, edge of slab details (pour stop), brick relief angles, embeds, anchor bolts, and other miscellaneous metals. Curtain Wall embeds modeled by others.
- Submit final approved files to Lead Coordinator for insertion into the coordinated model, and to the design team in the form of shop drawings and/or Navisworks compatible model.

6.0 DETAILING REQUIREMENTS OF ALL PARTICIPANTS

6.01 File sharing information:

Site Contractor (SIT-1)

- All items which appear in a schedule and has a schedule name will correspond with a 3-D model element including model element data.
- Attend BIM trade coordination meetings.
- Deliver three-dimensional model to coordination team
- Required to deliver items identified in G204 matrix such as
- Develop appropriate tie-in locations of utilities with trades. Site contractor required to deliver main connections in model format
- Site underground items outside direct tie in locations not required in three dimensional models.
- Sanitary piping tie-in
- Storm water tie-in
- Domestic water tie-in

6.02 The in-progress (Coordination Software – Ex: IFC/NWC/Cad) naming convention will be: project-trade-level. Examples:



- Project Designation -MechPipe-1
- Project Designation -HVAC-1
- Project Designation –Fire Protection-1
- Project Designation -Elec-1
- Project Designation -Plumbing-1
- Project Designation -TeleCom-1 or AV-1
- Project Designation –Pneumatic Tube-1, etc.

Additional designations may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.

6.03 Each model posted by the contractor shall contain model elements for the purpose of system identification and isolation during the clash detection process. Example:

HVAC-1 shall contain model elements for:

- All items which appear in a schedule and has a schedule name will correspond with a 3-D model element including model element data.
- Supply
- Return
- Exhaust
- Fire Smoke-Dampers
- VAV clearance
- AC Door Access
- Fan Coil Units
- FCU Access
- Equipment
- Equipment Pads
- Equipment Clearances
- Hangers (designated per system)
- Duct insulation
- Duct model to the outside face of dimensional duct
- Access zones, all equipment

MechPipe-1 shall contain model elements for:

- All items which appear in a schedule and has a schedule name will correspond with a 3-D model element including model element data.
- Hydronic Pipe Supply
- Hydronic Pipe Return
- Chilled Pipe Supply
- Chilled Pipe Return
- Shutoff Access
- Equipment
- Equipment Pads
- Equipment Clearances
- Hangers
- Pipe insulation

Plumbing-1 shall contain model elements for:

- All items which appear in a schedule and has a schedule name will correspond with a 3-D model element including model element data.

- Domestic Water Supply
- Domestic Water Return (with additional layer designations for hot and cold)
- Gas
- Med-Gas
- Shutoff Access (designated per system)
- Sanitary
- Vent
- Roof Drain
- Rain Conductors
- Equipment
- Equipment Pads
- Equipment Clearances
- Hangers (designated per system)

Elec-1 shall contain model elements for:

- All items which appear in a schedule and has a schedule name will correspond with a 3-D model element including model element data.
- Lights
- Light Clearance
- Conduit (with additional layer designation for power and data)
- Cable Tray
- Cable Tray Access Clearance
- Pull Boxes
- Pull Box Access Clearance
- J-Boxes
- Elec. Panels
- Elec. Panel Access Clearance
- Elec. Troughs
- Elec. Trough Access Clearance
- Equipment
- Equipment Clearances
- Equipment Pads
- Hangers

Fire Protection1 shall contain model elements for:

- All items which appear in a schedule and has a schedule name will correspond with a 3-D model element including model element data.
- Mains
- Branches
- Shutoff Access
- Hangers

Pneumatic Tube-1 shall contain model elements for:

- All items which appear in a schedule and has a schedule name will correspond with a 3-D model element including model element data.
- Equipment
- Equipment Access
- Hangers

Concrete PreCast Plank

- All items which appear in a schedule and has a schedule name will correspond with a 3-D model element including model element data.
- Plank w/ camber
- Plank w/ cores and openings
- Plank w/ all conduit or piping as required
- Plank embeds
- Plank rebar
- Plank setting plates or items
- Plank vertical chase requirements must be modeled and coordinated

Additional sub layers may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.

6.04 Clash detection files will be posted to **Revizto** before **12:00 PM**, on **Wednesday and Friday** by each of the trades. The lead coordinator will also post updated coordination models as needed. The lead coordinator will maintain the master coordination files. The weekly coordination model will be name abbreviated Project Name-Floor-Coordination Model-Month-Day-Year.

All coordination participants will maintain a current control copy of their own drawing files outside of the project's web-based posting site. Control drawings are to include all previously posted files.

6.05 Trade Colors in the Coordination environment:

- Duct Supply – Dark Green
- Duct Return- Light Blue
- Duct Exhaust –Light Green
- Mech Pipe- Orange
- Pressure lines/Gas – Tan
- Sanitary/Vent – Brown
- Rain Conductors/Roof Drains – Maroon
- Domestic Water- Blue
- Fire – Red
- Pneumatic – Purple
- Electrical – Yellow
- All Base Architectural Elements (walls, soffits, ceiling & floor planes, etc.) will assume Arch model color scheme saved in the export or Lead Coordinator will modify select color scheme in the coordination model.
- Steel – Dark Grey
- Any hangers and equipment (that is fed per the designated system) will assume the same color of that system it is associated with. Additional color schemes may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.

6.06 When posting drawing files for coordination:

- Posted Contractor coordination files of each trades system should be clash-free with in their respective data. To clarify; trades should refrain from posting data that shows their systems clashing with itself.
- When coordination of an area is completed there should not be any unresolved clashes remaining.
- These files should be void of any text, dimensions or any other notations.

6.07 Each coordination participant is required to submit three (3) complete sets of installation drawings as well as electronic PDF's prior to any work being installed in the field. If A/E spec requires more or less than that will govern over this document. These complete drawings are to be fully dimensioned and notated. Items to be noted in the final, fully coordinated drawing paper and electronic files of each system include:

- Bottom and top elevations of duct, pipe, conduit racks, cable trays etc. must be indicated (where applicable).
- Dimensions shall be shown from the gridlines to the centerline of each element drawn (round duct, pipe, cable tray, etc.) and from finished floor.
- Height to top of light housing assembly must be indicated.
- Labeling of all equipment.

6.08 During the coordination drawing effort, priority will be given to those systems that have the least flexibility. The following list is a descending order of the system priority and shall be used as a general guideline. Throughout the coordination drawing effort, adjustments and deviations to this list can be made with the approval of EDiS Company. (0'- 6") clear above the ceiling shall be maintained for access and construction of the ceiling, whenever possible. Required maintenance and/or code access spaces and set-backs take precedence over all systems.

- Gravity Pipe
- Plumbing Vent
- Ductwork and appurtenances
- Cable tray
- Recessed light fixtures
- Fire protection piping and fixtures
- Electrical conduit over (3/4") in diameter
- Pneumatic tube and other record or material conveying systems
- HVAC piping
- Plumbing, supply and medical gas piping
- Electrical conduit smaller than 3/4" in diameter
- Above ceiling miscellaneous metal supports
- Provide all copper tube routes (racks) for mechanical systems, including valves, clearance zones and hangers.

6.09 Items to be included in the detailed drawing progress include:
[For the following trades HVAC, HVAC piping, electrical, fire protection, building management, carpentry, general works trades and structural]

- All systems must be fully detailed and shown as individual elements including ductwork, all piping 3/4" and larger, pneumatic tubing, exterior wall connections, any piping that is smaller than ½" that is racked or banked, etc.
- Ductwork is to include size, layout and routing of all metal and flex ductwork, re-heat coils, terminal units, filters registers, grilles, diffusers, and similar features; provide notation for diffuser boot sizes and heights and any other special features
- All valves, dampers and VAV's or heat pumps will note any items requiring access for service and maintenance as well as access doors in inaccessible ceilings.
- All piping valves, boxes, supports, etc. are to be fully detailed
- Sprinkler head locations shall be shown on ceiling plans.



- All electrical conduits one and a quarter inches (1 1/4") or more in diameter are to be modeled and shown in addition to smaller diameter conduit that is racked or banked.
- Electrical items such as hangers, supports, electrical fixtures, lights, speakers, detectors, sensors, cable trays, raceways, sleeves, pull boxes, and access space claims, etc. must be shown.
- If an element is not shown, under the lead coordinators approval, it will be assumed to be field routed and to not interfere with the other elements that are shown or within code clearances. Contractors who field route their elements are responsible to ensure their installation will be feasible and void of creating a clash in the field. Coordinated items take precedence over field routing.
- All major hangers and supports (including sway bracing, equipment bracing, hangers, etc.), penetrations, openings must be shown for all systems. Sharing of supports with other systems is discouraged but can be accomplished with prior owner and/or field inspector approval.
- All insulation must be shown with appropriate thicknesses. All insulation & clearance zones will be modeled or accounted for during the clash detection process.
- Sprayed Fire Protection (all methods): If required by your building type, establish a safe thickness from all structural objects with which to run your clashes. Assume fire spray will be two inches (2") thick.
- Engineered stud framing must be modeled for king studs and doors.
- Code clearances and maintenance access clearances must be shown and maintained; these include, but are not limited to access to VAVs, air handling units, egresses around pumps and tanks, smoke FDs, electrical panels, pneumatic tube transfer units, cable tray access, pull boxes, valve access, etc.
- All trades must coordinate and detail their systems with the intent of installing each system at the optimal elevation above ceiling, taking into consideration, access to equipment for maintenance, repairs, connections, filters and removal while eliminating or minimizing the impact to surrounding components.
- All concrete plank modeled by plank installers contract. 3-D model the plank per structural design calculations. Include all but not limited to cores, hollow sections, vertical sleeve locations, rebar, setting embeds and misc. structural attachment items

6.10 Established Clash Files are to be incorporated to ensure proper coordination. List of those files to be provided by the Lead Coordinator.

6.11 Refer to Appendix B – Soft Clash Requirements for additional soft-clash requirements.

7.0 SCHEDULE OF DRAWING COMPLETION AND SIGN-OFF

7.01 The participants must plan on the coordination process taking two to three months. The coordination schedule is as follows:
This table will be populated at the BIM Coordination Kick-off Meeting. OR Schedule to be developed as part of the master construction schedule development (see Section 00230).

Zone	Floor	Coordination Meeting	Sign-Off Date

7.02 At the completion of each floor, the team will determine the specific "priority walls" that will be constructed full-height ahead of other interior partitions and MEP installations.

7.03 D MEP/FP Coordination Team

- The goal of the coordination team will be to integrate the architectural, structural, mechanical, electrical, fire protection, and project specific elements into a collaborative 3-D model to identify and resolve issues pertaining to MEP/FP systems and to ensure succinct and expedited field installations of these systems following the release of each zone/floor after clash free conditions are met. (Filled out at BIM Coordination Kick-off Meeting)

BIM Coordinator	**AMP Consulting**
Main Contact	Chris Donahue
Phone Number	302-893-0492
Email Address	cdonahue@ampconsulting.build
Project Manager	**EDiS Company**
Main Contact	Kevin Lucas
Phone Number	302-420-3083
Email Address	klucas@ediscompany.com
Project Engineer	**EDiS Company**
Main Contact	Olek Kostyszyn
Phone Number	302-559-3454
Email Address	okostyszyn@ediscompany.com
Project Superintendent	**EDiS Company**
Main Contact	Matt Artymenko
Phone Number	302-218-1752
Email Address	martymenko@ediscompany.com
Site Contractor	**TBD**
Main Contact	Kent Construction Company
Phone Number	302-653-6469
Email Address	chad@kentconstructionco.com
HVAC	**TBD**
Main Contact	
Phone Number	

Email Address	
Electrical	**TBD**
Main Contact	
Phone Number	
Email Address	
Concrete	**TBD**
Main Contact	
Phone Number	
Email Address	
Plumbing and Piping	**TBD**
Main Contact	
Phone Number	
Email Address	
Architectural	**TBD**
Main Contact	
Phone Number	
Email Address	
MEP/FP Engineers	**TBD**
Main Contact	
Phone Number	
Email Address	
Structural Steel	**TBD**
Main Contact	
Phone Number	
Email Address	
Miscellaneous Steel	**TBD**
Main Contact	
Phone Number	
Email Address	

LOD REQUIREMENT

ARTICLE 1: GENERAL PROVISIONS

1.1 This document defines protocols, expected levels of development, and authorized uses of Building Information Models on this Project. It assigns specific responsibility for the development of each Model Element to a defined Level of Development at each Project phase. Where a provision in this Exhibit conflicts with a provision in the Agreement into which this Exhibit is incorporated, the provision in this Exhibit will prevail.

1.1.1 The parties agree to incorporate this Exhibit by reference into any other agreement for services or construction for the Project.

ARTICLE 2: LEVEL OF DEVELOPMENT (LOD)

2.1 The following LOD descriptions identify the specific content requirements and associated authorized uses for each Model Element at five progressively detailed levels of completeness. Each subsequent LOD builds on the previous level and includes all the characteristics of previous levels.

2.2 **LOD 350**

2.2.1 **Model Content Requirements**. Overall building massing indicative of area, height, volume, location, and orientation may be modeled in three dimensions or represented by other data.

2.2.2 **Authorized Uses**

2.2.2.1 **Analysis**. The Model may be analyzed based on volume, area and orientation by application of generalized performance criteria assigned to the representative Model Elements.

2.2.2.2 **Cost Estimating**. The Model may be used to develop a cost estimate based on current area, volume or similar conceptual estimating techniques (e.g., square feet of floor area, condominium unit, hospital bed, etc.).

2.2.2.3 **Schedule**. The Model may be used for project phasing and overall duration.

2.3 **LOD 350**

2.3.1 **Model Content Requirements**. Model Elements are modeled as specific assemblies accurate in terms of quantity, size, shape, location, and orientation. Existing building elements are modeled as shown on building record drawings. Non-geometric information such as object description and object tags (door number, equipment number, etc) and quantities should be included with each object. Examples of the details required for systems modeled to LOD 300 include, but are not limited to:

- Show all, but not limited to, unground utilities, plumbing and mechanical, concrete modeled as contract documents.
- Site Utilities (see matrix and 6.1 front end)
- Masonry
- Steel decking
- PRECAST PLANK
- Correct slopes for gravity piping for sanitary, storm or wet fire suppression systems.

- Piping materials specifically called out on documents included with model element attributes (generic manufacturer for system components are acceptable).
- Insulation around Pipe and Ducting.
- Duct dampers included with the duct system.
- Doors/Frames (hollow metal and storefront)
- Owner Furnished Fixtures, Equipment, etc. generically modeled as space claims by the Model Element Author (MEA).
- Concrete
- Anchor bolts
- Structural steel
- Steel stairs, handrails
- Floor/roof penetration steel
- Significantly sized support hangers and sleeves for all systems
- Uni-Strut associated with system components if it is located in a tight overhead space (case by case basis)
- Architectural millwork/casework
- Metal panels and support steel
- Curtainwall system
- Steel stud framing including kickers and trusses at floor penetrations.
- Valve locations (clearance)
- Access panels (these should be modeled with the system they provide access to).
- Conduit racks or other substantially wide / bundled electrical routing. (these can be generically modeled, i.e. extruded boxes, space claims)
- Single conduit runs associated with any system (lighting, power, controls, etc) if needed to coordinate concrete coring.
- Kitchen equipment
- MEP/FP & Low Voltage Equipment
- MEP/FP & Low Voltage Systems
- Pull box locations and any extra space claims for their access.
- Telecom & Data

2.3.2 **Authorized Uses**

2.3.2.1 **Construction**. Suitable for the generation of traditional construction documents. Contractors may utilize this model for coordination purposes and creation of shop drawings.

2.3.2.2 **Analysis**. The Model may be analyzed for performance of selected systems by application of specific performance criteria assigned to the representative Model Elements.

2.3.2.3 **Schedule**. The Model may be used to show ordered, time-scaled appearance of detailed elements and systems.

ARTICLE 3: MODEL ELEMENTS

3.1 **Reliance on EDiS Company's Model Element Matrix**

3.1.1 The EDiS Company Model Element Matrix at the end of this section identifies (1) the LOD required for each Model Element at the end of each Project phase, and (2) the Model

Element Author responsible for developing the Model Element to the LOD identified. Each Model Element Author's content is intended to be shared with subsequent Model Element Authors and Model Users throughout the course of the Project.

3.1.2 It is understood that while the content of a specific Model Element may include data that exceeds the required LOD identified in the Model Element Table for a particular phase, Model Users and subsequent Model Element Authors may rely on the accuracy and completeness of a Model Element consistent only with the content required for a LOD identified in the Model Element Table.

3.1.3 Any use of, or reliance on, a Model Element inconsistent with the LOD indicated in the Model Element Table by subsequent Model Element Authors or Model Users shall be at their sole risk and without liability to the Model Element Author. To the fullest extent permitted by law, subsequent Model Element Authors and Model Users shall indemnify and defend the Model Element Author from and against all claims arising from or related to the subsequent Model Element Author's or Model User's modification to, or unauthorized use of, the Model Element Author's content.

3.2 **Table Instructions**

3.2.1 The Model Element Table at the end of this section indicates the LOD to which each Model Element Author (MEA) is required to develop the content of the Model Element at the conclusion of each phase of the Project. EDiS Company holds the rights of this table and all ownership right for edits are performed via EDiS Company.

3.3 EDiS Company's Model Element Matrix AIA Document G204-2022 (attached).

3.4 Insertion Point (attached).

AIA® Document G203™ – 2022

BIM Execution Plan

BIM EXECUTION PLAN VERSION NUMBER:
DATE: August 31, 2023

PROJECT NAME:
(Name and location or address of the Project)

Paul M. Hodgson Vocational Technical High School
2575 Glasgow Avenue
Newark, DE 19702

PROJECT OWNER:
(Name and address)

New Castle County Vocational Technical School District2575 Glasgow Avenue
Newark, DE 19702

EXHIBIT NAME:
(Identify, by date and full title, the BIM and Digital Data Exhibit for the Project (the "Exhibit"))

Paul M. Hodgson Vocational Technical High School

INTENDED GOALS FOR MODELS ON THE PROJECT:
(Summarize the intended goals for Model documentation, process, and workflow.)

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be incorporated into an agreement between the Parties.

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§ 1.3 Existing Data

(Describe any existing survey files, as-built files, documents, or BIM content. Include any license or usage restrictions.)

Request files from Becker Morgan Group.

ARTICLE 2 DESIGNATED DELIVERY MILESTONES FOR MODEL VERSIONS

Designated Delivery Milestones for Model Versions

(Insert or attach the delivery schedule, identifying Designated Delivery Milestones for Model Versions. State whether a Model Element Table will be included for this purpose as set forth in Article 7.)

ARTICLE 3 SOFTWARE REQUIREMENTS AND FILE EXCHANGE PROTOCOL

§ 3.1 Modeling Software

(Indicate software and version(s) to be used for modeling and any other necessary information.)

Software	Version	Other Information
Revizto	5	
Navisworks		

§ 3.1.1 Modeling Software Updates. All Project Participants agree to coordinate software updates prior to making any Model file upgrades.

§ 3.2 Other Software Tools

(Indicate other software tools to be used to interface with Models, such as for analysis, coordination, quality management, etc. Include version and update restrictions, if any.)

§ 3.3 File Exchange Protocols

§ 3.3.1 The Project Participants agree to share their respective Model Portion updates as follows:
(*Check the appropriate box.*)

[X] **§ 3.3.1.1 Cloud-Based Collaboration.** The Project Participants agree to use a cloud-based Modeling software platform for developing and sharing Models as follows:
(Indicate software, licensing, and other requirements for hosting the Project. Identify the Project Participant responsible for hosting the Project. Indicate the frequency for Model updates, such as daily, identifying the time of day.)

[ ] **§ 3.3.1.2 Separate Model Collaboration.** The Project Participants agree to use file sharing of separately developed Models, and shall develop and share their Model Portions as follows:
(Indicate the requirements for preparation of the Model Portion before it is transmitted, including how to handle links and exclusions of links, auditing, and compacting. Indicate the means of transmission, if appropriate. Indicate the frequency of file exchange for Model updates, such as at milestones, or weekly, identifying the day of the week.)

[ ] **§ 3.3.1.3 Other:**
(Specify the type of Model collaboration, which may include a hybrid of cloud-based and separate Model development.)

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§ 5.6 Design Options
(Indicate any protocols for addressing or exploring design options.)

§ 5.7 File Naming Conventions
(Indicate protocols for naming each type of file.)

§ 5.8 Modeling Standards
(Indicate standards to be used by the Project Participants, or attach and identify a separate document.)

ARTICLE 6 MODEL MANAGEMENT PROTOCOLS

§ 6.1 Responsibility
(Define individual roles and responsibilities for Model management.)

§ 6.2 Meetings
(Indicate meeting types, the stage or phase within which the meeting occurs, and the meeting frequency.)

Meeting Type	Project Stages or Phases	Frequency
Virtual	Prior to begin field work	weekly

§ 6.3 Quality Control and Model Health.
§ 6.3.1 Internal Quality Control. Each Project Participant is responsible for producing quality Model Portions that can be used and opened effectively by all other Project Participants. Project Participants will perform checks on their respective Model Portions pursuant to Section 6.3.1.1.

§ 6.3.1.1 Model Checking. The following checks should be performed by each Model Author to assure Model quality:
(Describe each quality control measure to be implemented throughout the development of Model Portions.)

[ ] **§ 6.3.1.1.1 Visual Check.** Perform a visual check to confirm that there are no unintended Model components and confirm design intent has been followed:
(Indicate the frequency with which Visual Checks will be performed and modify the description if required.)

[X] **§ 6.3.1.1.2 Interference Check.** Detect problems within individual Model Portions and with the interface between Model Portions where two building components clash, including where required clearances clash:
(Indicate the frequency with which Interference Checks will be performed and modify the description if required.)

[X] **§ 6.3.1.1.3 Modeling Protocols Check.** Confirm that the protocols reflected in Article 5 of this BIM Execution Plan have been followed:
(Indicate the frequency with which Modeling Protocols Checks will be performed and modify the description if required.)

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User Notes: (1365468465)

§ 9.2 Identification of Models or Model Portions not Enumerated as a Contract Document
(Describe how the Project Participants will identify a Model or Model Portions that are not enumerated as a Contract Document, such as by file name, by Model Author, through the use of a Model Element Table, or other method.)

ARTICLE 10 OTHER BIM OR MODELING PROVISIONS

Other provisions related to BIM or Modeling are as follows:

All contractors involved with the coordination process are responsible for paying the Revizto license cost. The license cost is $1,200.

ARTICLE 11 EXHIBITS AND ATTACHMENTS

(List here any exhibits and attachments to this BIM Execution Plan.)

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Model Element Table

MODEL ELEMENT TABLE DATE: August 31, 2023

This Model Element Table dated the day and year written above is incorporated into the BIM Execution Plan between the Parties for the following Project:

(Name and location or address of the Project)

NCC Votech School District Paul M. Hodgson Vocational Technical High School
2575 Glasgow Avenue
Newark, DE 19702

BIM EXECUTION PLAN NAME:

(Identify, by date and full title, the BIM Execution Plan into which this LOD Table is incorporated) (the "BIM Execution Plan")

Paul M. Hodgson Vocational Technical High School BIM Project Execution Plan

MOST RECENT BIM EXECUTION PLAN VERSION OR DATE:

EXHIBIT NAME:

(Identify, by date and full title, the BIM and Digital Data Exhibit into which the BIM Execution Plan is incorporated) (the "Exhibit")

Paul M. Hodgson Vocational Technical High School BIM Project Execution Plan

TABLE OF ARTICLES

ARTICLE 1 LEVELS OF DEVELOPMENT

ARTICLE 2 MODEL ELEMENT TABLE

The terms used in this Model Element Table have the same meaning as those in the Exhibit.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be incorporated into an agreement between the Parties.

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ARTICLE 1 LEVELS OF DEVELOPMENT

§ 1.1 Level of Development Definitions. The Level of Development (LOD) descriptions shall be as set forth in the Exhibit.

§ 1.2 Any Model Element that does not have an LOD defined at a phase is not required to be Modeled at that phase. If a Model Element is modeled and no LOD is provided at that phase, the Model Element may not be relied upon.

ARTICLE 2 MODEL ELEMENT TABLE

§ 2.1 Table Instructions. The Model Element Table in Section 2.4 indicates the LOD to which each Model Element shall be developed at each identified Project milestone and the Model Element Author.

§ 2.2 Model Element Table Abbreviations. Abbreviations for each Model Element Author to be used in the Model Element Table are as set forth in the Abbreviations tab.

§ 2.3 Model Element Table Notes. Notes for each Model Element in the Model Element Table are as set forth in the Notes tab. Limitations or qualifications on Model Elements may be described in the Notes.

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§ 2.4 Model Element Table

Identify (1) whether a Model Element will be modeled, (2) the LOD required for each Model Element at each Project milestone, (3) the Model Element Author, and (4) references to any applicable notes found in Section 2.3.

Indicate whether the Model Element is included in the Project by inserting an “x” in the "Modeled' column. If a “Modeled” cell is left blank, the Element in that row will not be included in a Model Portion.

31-Aug-23

Insert abbreviations for each MEA identified in the "Abbreviations" tab.

Project Milestones headings may be modified to identify delivery milestones as defined in the Agreement.

NOTE: LODs must be adapted for the unique characteristics of each Project.

Model Elements Utilizing CSI UniFormat™				Modeled	Bid Package 'C' Construction Manager Construction Coordination			As-Built (TBD)		
					LOD	MEA	Notes	LOD	MEA	Notes
A	**Substructure**									
	A10	**FOUNDATIONS**								
		A1010	**Standard Foundations**							
			A1010.10 Wall Foundations		350	C-01, C-02				
			A1010.30 Column Foundations		350	C-01, C-02				
			A1010.90 Standard Foundation Supplementary Components		350	C-01, C-02				
		A1020	**Special Foundations**							
			A1020.30 Special Foundation Walls		350	C-01, C-02				
			A1020.40 Foundation Anchors (Anchor Bolts)		350	C-01, C-02				
	A40	**SLABS-ON-GRADE**								
		A4010	**Standard Slabs-on-Grade**		350	C-01				
		A4020	**Structural Slabs-on-Grade**		350	C-01				
		A4030	**Slab Trenches**							
		A4040	**Pits and Bases**		350	C-01				
	A60	**WATER AND GAS MITIGATION**								
		A6010	**Building Subdrainage**							
			A6010.10 Foundation Drainage							
			A6010.20 Underslab Drainage							
		A6020	**Off-Gassing Mitigation**							
			A6020.10 Radon Mitigation							
			A6020.50 Methane Mitigation							
B	**Shell**									
	B10	**SUPERSTRUCTURE**								
		B1010	**Floor Construction**							
			B1010.10 Floor Structural Frame		350	C-03				
			B1010.20 Floor Decks, Slabs, and Toppings		350	C-03				
			B1010.30 Balcony Floor Construction		350	C-03				
			B1010.40 Mezzanine Floor Construction		350	C-03				
			B1010.50 Ramps							
			B1010.90 Floor Construction Supplementary Components							
		B1020	**Roof Construction**							
			B1020.10 Roof Structural Frame		350	C-03				
			B1020.20 Roof Decks, Slabs, and Sheathing		350	C-03				
			B1020.30 Canopy Construction		350	C-03				
			B1020.90 Roof Construction Supplementary Components		350	C-03				
		B1080	**Stairs**							
			B1080.10 Stair Construction		350	C-03				
			B1080.30 Stair Soffits		350	C-03				
			B1080.50 Stair Railings		350	C-03				
			B1080.60 Fire Escapes		350	C-03				

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§ 2.4 Model Element Table

Identify (1) whether a Model Element will be modeled, (2) the LOD required for each Model Element at each Project milestone, (3) the Model Element Author, and (4) references to any applicable notes found in Section 2.3.								
Indicate whether the Model Element is included in the Project by inserting an “x” in the "Modeled' column. If a “Modeled” cell is left blank, the Element in that row will not be included in a Model Portion.								
31-Aug-23								
Insert abbreviations for each MEA identified in the "Abbreviations" tab.								
Project Milestones headings may be modified to identify delivery milestones as defined in the Agreement.								
NOTE: LODs must be adapted for the unique characteristics of each Project.								
Model Elements Utilizing CSI UniFormat™		**Modeled**	**Bid Package 'C' Construction Manager Construction Coordination**			**As-Built (TBD)**		
			LOD	MEA	Notes	LOD	MEA	Notes
B1080.70	Metal Walkways		350	C-03				
B1080.80	Ladders		350	C-03				

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§ 2.2 Abbreviations

§ 2.2 Abbreviations for each Model Element Author to be used in the Model Element Table are as follows:
(Provide abbreviations for each Model Element Author)

Abbreviation	Model Element Author (MEA)
NCCVT	New Castle County Vocational Technical School District
HHS	Hodgson High School
EDiS	EDiS Company
AMP	AMP Consulting
ABHA|BSA	ABHA|BSA+A
Gipe	Gipe Associates
LSE	Landmark Engineering
DCI	DCI+MacIntosh
C-01	Concrete and Reinforcing
C-02	Foundation Masonry
C-03	Structural Steel, Joists and Deck
C-01, C-02	

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§ 2.3 Notes

§ 2.3 Model Element Table Notes

Notes:

(List by number shown on table.)

1	Model Element Table is an add on document to all bid package noted above and relating to all contractor's scope of work. The table identifies all bid package requirements to provide Building Information Models (BIM) during the BIM coordination process. In addition, refer to BIM protocol instruction to see LOD descriptions.
2	Contractors are required to attend coordination meetings, submit, and post to BuildingBlok and maintain the BIM schedule production process.

SECTION 014500 - QUALITY CONTROL

1. DESCRIPTION

A. Quality control services include inspections and tests performed by independent agencies and governing authorities, as well as by the Contractor. Inspection and testing services are intended to determine compliance of the work with requirements specified. Specific quality control requirements are specified in individual specification sections.

2. RESPONSIBILITIES

A. Contractor Responsibilities: Except where indicated as being the Owner's responsibility, quality control services are the Contractor's responsibility, including those specified to be performed by an independent agency and not by the Contractor. The Contractor shall employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified.

1. The Owner will engage and pay for services of an independent agency to perform the inspections and tests that are specified as Owner's responsibilities.

B. Retest Responsibility: Where results of inspections or test do not indicate compliance with Contract Documents, retests are the Contractor's responsibility.

C. Responsibility for Associated Services: The Contractor shall cooperate with independent agencies performing inspections or test. Provide auxiliary services as are reasonable. Auxiliary services include:

1. Provide access to the Work.

2. Assist taking samples.

3. Deliver samples to test laboratory.

D. Coordination: The Contractor and independent test agency shall coordinate the sequence of their activities and shall avoid removing and replacing work to accommodate inspections and test. The Contractor is responsible for scheduling time for inspections and tests.

E. Qualifications for Service Agencies: Contractor shall engage only inspection and test service agencies which are pre-qualified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories.

F. Submittals: Contractor shall submit a certified written report of each test, Inspection or similar service, in duplicate to the Construction Manager. Contractor shall submit additional copies of each report to any governing authority, when the authority so directs.

G. Report Data: Written inspection or test reports shall include:

1. Name of testing agency or test laboratory.

2. Dates and locations of samples, tests or inspections.

3. Names of individual present.

4. Complete inspection of test data.

5. Test results.

6. Interpretations.

7. Recommendations.

H. Repair and Protection: Upon completion of inspection or testing, Contractor shall repair damaged work and restore substrates and finishes. Contractor shall comply with requirements for "Cutting and Patching."

I. Special Instructions:

1. Structural tests and special inspections must be conducted by an approved agency (an agency or firm regularly engaged in conducting tests or furnishing inspection services, approved by the authority having jurisdiction.) This means that contractors will no longer be allowed to cast their own test cylinders for example.

2. Continuous special inspection (the full-time observation of work by an approved special inspector who is present until completion of the work) is required for any steel welds and connections. Critical elements may include: all slip critical bolted connections, complete and partial groove welds, multi-pass fillet welds and single pass fillet welds greater than 5/16".

3. Continuous special inspection is required during the placement of all concrete and shotcrete for the proper application techniques with a few exceptions.

4. Periodic special inspection (the part-time observation by an approved special inspector) is required for any steel welds and connections. Critical elements may include: all slip critical bolted connections, complete and partial groove welds, multi-pass fillet welds and single pass fillet welds greater than 5/16".

END OF SECTION

SECTION 015113 - TEMPORARY ELECTRICITY

1. GENERAL

A. RELATED WORK SPECIFIED ELSEWHERE

1. Electrical Basic Materials and Methods, Division 16 or 26.

B. DESCRIPTION OF SYSTEM

1. Power Source

a. Bid Package B Contractor(s) is to supply their own power source for work of this Contract. No temporary or permanent power to be supplied by the Construction Manager or Owner.

END OF SECTION

SECTION 015123 - TEMPORARY HEATING, COOLING AND VENTILATING

1. GENERAL

A. RELATED REQUIREMENTS SPECIFIED ELSEWHERE

1. Temporary Electric: Section 015113

2. Temporary Facilities: Section 015200

3. Heating Requirements for Cold Weather Installation and Protection of Materials: Respective specification section for each item of work.

B. DEFINITIONS

1. Temporary Enclosures: Sufficient preliminary enclosures of an area of structure, or of an entire building, to prevent entrance or infiltration of rainwater, wind, or other elements and which will prevent undue heat loss from within enclosed area.

2. Permanent Enclosure: Stage of construction at which all moisture and weather protection elements of construction have been installed in accordance with Contract Documents, either for a portion of structure, or for an entire building.

C. DESCRIPTION OF SYSTEM

1. Prior to the building or portion of building being permanently enclosed, each Contractor shall provide temporary heat and ventilation and weather protection necessary for their work, as described below. After permanent enclosure, the HVAC Contractor shall provide and maintain temporary heat and ventilation in enclosed areas, coordinated by the Construction Manager, required to:

a. Facilitate progress of Work.

b. Protect Work and products against dampness and cold.

c. Prevent moisture condensation on surfaces.

d. Provide suitable ambient temperatures and humidity levels for installation and curing of materials.
e. Provide adequate ventilation to meet health regulations for safe working environment.

2. Temperatures Required

a. Generally, 24 hours a day: Minimum of 40 degrees F.

b. 24 hours a day during placing, setting, and curing of cementitious materials: As required by specification section for each product.

c. 24 hours a day, seven days prior to, and during, placing of interior finishes: woodwork, resilient floors, painting and finishing: As required by specification section for each product.

d. 24 hours a day after application of finishes, and until Substantial Completion: Minimum of 50 degrees F.

3. Ventilation Required:

a. Contractors shall prevent hazardous accumulations of dusts, fumes, mists, vapors, or gases in areas occupied during construction. Reference OSHA regulations CFR 1926.55 (Gases, vapors, fumes, dusts, and mists). and CFR 1926.57 (Ventilation).

(1) Provide local exhaust ventilation to prevent harmful dispersal of hazardous substances into atmosphere of occupied areas.

(2) Dispose of exhaust materials in manner that will not result in harmful dispersal of hazardous substances into atmosphere of occupied areas.

(3) Continuously ventilate storage spaces containing hazardous or volatile materials.

(4) Contractor/subcontractor must provide and use equipment which is furnished with Exhaust Purifiers/Scrubbers or is electrically power driven when any such equipment produces airborne containments and will be used in an enclosed building.

(5) The Contractor/subcontractor shall verify air quality by the use of air monitoring equipment and document the verified air quality on the daily report. The monitoring equipment shall, at a minimum, be designed with an auditory alarm and shall provide continuous monitoring of those four gasses, Oxygen, Hydrogen Sulfide, Carbon Monoxide and Combustible gasses.

4. Contractors shall provide adequate ventilation for:

a. Curing installed materials.
b. Dispersal of humidity.

c. Temporary sanitary facilities.

5. Duration of Operations:

a. For Personnel:

(1) At all times personnel occupy an area subject to hazardous accumulations of harmful elements.

(2) Continue operation of ventilation and exhaust system for time after cessation of work

process to assure removal of harmful elements.

b. For curing installed materials: As required by specification section for respective materials.

c. For humidity dispersal: Continuously ventilate to provide suitable ambient conditions for work.

d. The HVAC Contractor shall maintain supervision and operation of temporary heating and ventilating equipment in order to:

(1) Enforce conformance with applicable codes and standards.

(2) Enforce safe practices.

(3) Prevent abuse of services.

D. COSTS OF INSTALLATION AND OPERATION

1. The Contractor shall be responsible for all installation and operating costs for any heat and ventilation as required in this section until the permanent HVAC system is in operation.

2. After the permanent HVAC system is operational, the Owner will pay the costs of fuel for temporary heat and ventilation. The Contractor will pay the costs for maintaining the system until final acceptance by the Owner.

3. The HVAC Contractor shall be responsible for all installation and operating costs for any heat required to supplement that which is to be supplied by the Construction Manager in paragraph 1.C.1, above.

E. REQUIREMENTS OF REGULATORY AGENCIES

1. The Construction Manager will obtain and pay for permits as required by governing authorities for those activities required by this Section.

2. Contractor shall comply with Federal, State, and local codes, and utility company regulations.

2. PRODUCTS

A. MATERIALS

1. General

a. Materials may be new or used but must be adequate for purposes intended and must not create unsafe conditions nor violate requirements of applicable codes.

B. EQUIPMENT

1. Standard products, meeting code requirements.

2. Provide required facilities, including piping, wiring and controls.

3. Portable Heaters:

a. Indirect hot air units, located outside with duct entering into the building. Provide a sufficient number of units to meet the temperature and ventilation requirements specified above.

b. Provide Safety Controls against explosion, overheating, and carbon monoxide build up.

c. Provide adequate combustion air.

d. Provide Temperature Controls installed in the building at a location(s) designated by the Construction Manager.

e. Provide temporary barricades around the equipment to protect against damage from other construction equipment.

f. Provide supplementary fans / distribution equipment capable of distributing heated air evenly throughout the space(s).

4. Oil-Fired heaters will not be allowed.

3. EXECUTION

A. GENERAL

1. Comply with applicable sections of Division 26 - Mechanical.

2. Install work in neat and orderly manner.

3. Make structurally, mechanically, and electrically sound throughout.

4. Maintain to give safe, continuous service at required times and to provide safe working conditions.

5. Modify and extend system as work progress requires.

B. INSTALLATION

1. Locate units to provide equitable distribution of heat and air movements.

2. Locate to avoid interference with, or hazards to:

a. Work or movement of personnel.

b. Traffic areas.

c. Materials handling.

d. Storage areas.

e. Work of other Contractors.

f. Finishes.

C. OPERATION OF PERMANENT EQUIPMENT

1. The Construction Manager will coordinate with the HVAC Contractor.

2. The Contractor will place permanent HVAC system in operation only upon written authorization by the Construction Manager.

3. Before operating the permanent HVAC equipment, the Contractor shall confirm to the Construction Manager that:

a. Inspection has been made by proper authorities.

b. Systems, equipment piping, strainers, filters and associated operating items are sufficiently complete, cleaned, and ready for operation.

c. Controls and safety devices are complete and tested, or adequate temporary controls are provided.

d. Before operating the permanent HVAC equipment, the Contractor shall install temporary filters:

(1) For air handling units.

(2) For permanent ducts.

D. REMOVAL

1. The Contractor shall completely remove temporary materials and equipment when no longer required, or on completion of construction.

2. The Contractor shall clean and repair damage caused by temporary installation and restore equipment to specified or original condition.

3. The Contractor shall remove temporary filters and install new filters, or clean permanent

filters, in the permanent HVAC system prior to final acceptance by the Owner.

END OF SECTION

SECTION 015200 - CONSTRUCTION FACILITIES & TEMPORARY CONTROLS

1. GENERAL

A. DESCRIPTION

1. Construction Manager and Contractors shall provide all temporary facilities throughout the construction period unless otherwise indicated in the Contract Documents.

2. Construction Manager and Contractors shall pay all costs for providing, maintaining and removing of all temporary facilities unless otherwise indicated in the Contract Documents.

B. RELATED WORK SPECIFIED ELSEWHERE

1. Temporary Electric: Section 015113.

2. FACILITIES

A. TEMPORARY SANITATION FACILITIES

1. Construction Manager will provide and maintain sanitary facilities for all personnel on the project.

2. The number of sanitary facilities required shall be based on the total number or workers employed on the site and shall be in accordance with the provisions of the applicable code.

3. Construction Manager will maintain sanitary facilities in a sanitary and clean condition at all times.

B. TEMPORARY WATER

1. Drinking Water: Contractor shall provide potable water for drinking purposes for all his personnel on the site. He shall furnish disposable drinking cups at water stations. Each water station shall be equipped with a suitable trash container for disposal of the drinking cups.

2. Construction Water: Construction Manager will provide and maintain tap locations for construction water of sufficiently pure and potable quality to avoid deleterious effect on any materials used. Location of construction water tap locations will be determined by the Construction Manager depending on the stage of construction of the incoming water service. Contractor shall provide and maintain all hoses, piping and valves as required for obtaining construction water from taps provided by the Construction Manager.

C. TEMPORARY TELEPHONES

1. Construction Manager will not provide any telephones or fax machines for Contractor's personnel. Each Contractor is responsible for its own phones and fax machines.

D. FIELD OFFICE

1. During the period of the Work and until final acceptance of the project, the Construction Manager will provide a weatherproof building for the Construction Manager's Field Project Manager(s) and Superintendent(s). Contractor shall make provisions for its own field office, subject to approval by the Construction Manager.

E. FIRE PROTECTION

1. Bid Package B Contractor(s) to provide temporary fire protection as required for their work.

3. Fire extinguishers shall be 10lb, Multi-Purpose (ABC) dry chemical, UL labeled, with a rating of 3a:40bc.

F. ACCESS ROADS AND PARKING AREAS

1. The Construction Manager will provide and maintain access roads on the site.

2. Neither the Construction Manager nor the Owner will provide parking for Contractor's personnel on or about the project site. All parking provisions required for Contractors will be solely the responsibility of the Contractors or their personnel.

G. STORAGE AREAS

1. The Construction Manager will assign storage areas on the site. Storage areas are extremely limited and will be assigned in a manner which will best facilitate the work.

2. Contractor shall provide all other storage space required for its work at off-site locations.

3. All combustible or flammable materials must be safely stored in a secured area in strict accordance with regulations, codes and laws enforced by local, State or Federal agencies, whichsoever is the most stringent.

H. FIRST AID STATION

1. The Contractor's Superintendent or Safety Supervisor shall insure that adequate first aid supplies are available, and that personnel are qualified to administer first aid/CPR, as required by State and/or Federal regulations.

I. SECURITY

1. The Construction Manager will provide the following security measures at the site: security lighting will be provided. (Existing facility lighting only)

2. All other safety and security measures shall be the responsibility of each Contractor. These measures shall include but are not limited to the provision of secured storage for tools, construction equipment, and materials and equipment scheduled for installation in the building.

J. BENCH MARKS AND BASELINE

1. The Construction Manager will lay out and establish and maintain bench marks and baselines.

2. The Contractor shall lay out his own work and shall be responsible for the accuracy of same.

3. Contractor shall check grades, lines, levels and dimensions as shown on the drawings and shall promptly report errors or inconsistencies in same to the Construction Manager before Work proceeds.

4. The Contractor is responsible for damaging or altering the bench marks and baselines established by the Construction Manager and shall bear the costs of replacing same.

K. FIELD OFFICE AND STORAGE TRAILERS

1. Contractor shall provide and maintain its own field office and storage trailers as required.

2. Contractor shall provide temporary heat and power for its field office and storage trailer.

3. Contractor's field offices and storage trailers shall be located as directed by the Construction Manager.

L. PROJECT SIGN – NOT APPLICABLE

1. The Construction Manager will provide a Project Sign naming the major participants, as determined by the Owner.

M. TRASH DISPOSAL

1. Each Contractor shall be responsible for daily clean up and depositing its common trash in the dumpsters provided by the Construction Manager.

2. The Construction Manager will not provide a trash chute.

3. The Construction Manager will provide dumpsters, and will arrange for disposal of common, non-hazardous, work-related trash deposited in these dumpsters.

N. HOISTING

1. Contractor shall provide its own materials hoists and cranes. No personnel hoist will be provided.

O. SCAFFOLDING AND WORKING PLATFORMS

1. No scaffolding shall be provided by the Construction Manager. Each Contractor shall provide all scaffolding required to perform its Work.

P. SAFETY BARRICADES AND RAILINGS

1. The Structural Contractor shall provide barricades **and protective barriers** around elevator, stair, shaft and cut openings in floors and roofs, and edges of floors and roofs. The methods and materials used in barricading shall be in accordance with OSHA and local code regulations. Barricades and protective barriers will be installed immediately after the installation of the floor slab on any level or part of a level on the Building. Until a level has been fully barricaded, the Structural Contractor will be responsible for maintenance of the barricades. When a warning barricade is used to prohibit employees from entering a restricted work area. The "warning barricade" shall meet the requirements of CFR 1926.502 (f)(2). The supported rope, wire, or chain shall be flagged at not more than 6-foot (1.8 m) intervals with high-visibility material and maintain between 34 and 39 inches above the walking/working surface; Warning signs and tags shall be used in accordance with Subpart G of CFR OSHA Construction Industry Regulations.

2. After the barricades and protective barriers are no longer needed, the Structural Contractor will remove the barricades from the site. The Construction Manager will determine the location and scheduling of barriers to be removed.

3. Contractor shall provide for its own barricades at all other trenches, excavations, and locations not specifically identified in Paragraph 1 above.

4. Contractors who remove barricades shall be responsible for replacing them. If, after proper notification, in writing, from the Construction Manager the responsible Contractor does not correct his deficiencies in safety barricade placement, the Construction Manager reserves the right to undertake this work and backcharge the responsible Contractor(s).

5. During the execution of his work, Contractor will provide daily maintenance of, and upon completion of same, restore all barricades in a manner acceptable to prevailing

safety standards enforced by local, State or Federal ordinance, whichsoever is most stringent. The intent is to leave no floor penetration or perimeter opening in an unsafe condition.

6. The Construction Manager shall arrange for temporary ladders required for access to each of the floor levels after the completion of floor slab work, and until the final stairs are ready for use.

Q. PUMPING AND DRAINAGE

1. Contractor shall provide its own pumping and drainage.

2. When an area is released by one Contractor to another, the Contractor releasing an area shall be responsible for leaving it in a drained condition. The incoming Contractor shall assume responsibility for drainage on the day that he is scheduled to start work in the area. If the incoming Contractor is late in starting work, he shall assume responsibility for pumping and drainage arising as a result.

R. TEMPORARY BUILDING ENCLOSURES – NOT APPLICABLE

1. The Construction Manager will equip all temporary exterior doors of the building with self-closing hardware and padlocks.

2. All other temporary enclosures and protection shall be provided by the Contractor requiring the protection.

3. Temporary enclosures required due to late delivery of materials or untimely installation of work shall be the responsibility of the Contractor responsible for the delay.

S. TEMPORARY POWER AND LIGHTING – All power to be provided by Bid Package B Contractor. Refer to Section 015113 - TEMPORARY ELECTRIC.

1. Contractor shall provide all extension cords and outlets as required for obtaining electric power from power centers provided by the Electrical Contractor. Refer to Section 015113 - TEMPORARY ELECTRIC.

2. Contractor shall provide its own additional temporary lighting of sufficient lighting levels to properly install his work.

T. TEMPORARY HEAT– NOT APPLICABLE

1. Contractor shall provide temporary heat as required for its operations. Once a building has reached the “Permanent Enclosure” stage, temporary heat will be provided as specified in Section 015123 - TEMPORARY HEAT AND VENTILATION.

2. Equipment and methods of temporary heating shall be reported to the Construction

Manager.

U. PROTECTION OF ADJACENT MATERIALS

1. Contractor shall protect adjacent materials and finishes from damage as a result of its work.

V. CLEAN UP

1. Contractor shall arrange for clean up and removal of debris resulting from its operations, and shall dispose of debris in accordance with the provisions of Paragraph 2.13 above. Clean up shall be on a continual basis to ensure that building, grounds and public properties are maintained free from accumulations of waste materials and trash.

2. The Contractor will limit use of and ensure that all materials, including waste, that are combustible or flammable will be removed from the building continually, as work progresses, **and at a minimum** at the end of each work day. All trash which is potentially edible or may attract rodents or insects will be disposed of in metal containers and removed by the end of the work day.

3. At completion of its Work, each Contractor shall remove waste materials, rubbish, tools, equipment, and clean up all exposed surfaces in preparation for final cleaning.

4. If, after notification in writing from the Construction Manager, the Contractor does not correct its deficiencies in housekeeping within twenty four (24) hours, the Construction Manager reserves the right to undertake the Work and to backcharge the Contractor.

5. Final clean up and preparation of field and associated work for turnover to the Owner to be provided by Bid Package A Contractor.

X. PROTECTION OF EXISTING CONSTRUCTION

1. Contractor shall be responsible for all damage that it may cause to materials and equipment stored or installed by other Contractors.

Y. OTHER

1. Contractor shall provide any other Temporary Facilities and services that it requires and which are not specifically identified above.

3. PERMITS – (BUILDING PERMIT FROM NCCO NOT REQUIRED FOR THIS CONTRACT)

3.1 The Construction Manager will obtain the Building Permit. **ALL OTHER PERMITS ARE TO BE OBTAINED AND PAID FOR BY THE CONTRACTOR REQUIRING THEM.**

4. EXECUTION

A. GENERAL

1. Contractor shall install all temporary facilities in accordance with applicable codes.

2. Contractor shall maintain temporary facilities for which it is responsible throughout the construction period.

3. Contractor shall remove all temporary facilities for which it is responsible when they are no longer required or when the Construction Manager directs the removal of same.

4. Contractor shall repair all damage to the Project Site caused by the installation of its temporary facilities.

END OF SECTION

SECTION 016200 - MATERIAL AND EQUIPMENT

1. GENERAL CONDITIONS

   A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate apply to the Work specified in this Section.

   B. Where work is to be executed under Separate Prime Contracts, the provisions of this Section apply to each Contract.

2. REQUIREMENTS INCLUDED

   A. All materials and equipment incorporated into the Work shall:

      1. be new;

      2. conform to applicable specifications and standards; and

      3 comply with size, make, type and quality specified, or as specifically approved in writing by the Architect.

   B. Manufactured and Fabricated Products shall conform to the following requirements:

      1. Designed, fabricated and assembled in accord with the best engineering and shop practices.

      2 Manufactured like parts of duplicate units to standard sizes and gauges, to be interchangeable.

      3. Two or more items of the same kind shall be identical, by the same manufacturer.

      4 Products shall be suitable for service conditions.

      5. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

   C. Contractor shall not use materials or equipment for any purpose other than that for which it is designated or is specified.

   D. Materials removed from existing structures shall not be reused in the completed work unless specifically indicated or specified.

   E. For materials and equipment specifically indicated or specified to be reused in the Work:

      1. Contractor shall use special care on removal, handling storage and reinstallation, to assure proper function in the completed Work.

2. Arrange for transportation, storage and handling of products which require off-site storage, restoration or renovation. Pay all costs for such work.

3. MANUFACTURER'S INSTRUCTIONS

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including two copies to Construction Manager.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Contractor shall handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, Contractor shall consult with Construction Manager for further instructions.

2. Contractor shall perform work in accord with manufacturer's instructions. Contractor shall not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

4. TRANSPORTATION AND HANDLING

A. Contractor shall arrange deliveries of Products in accord with construction schedules, coordinate to avoid conflict with work and conditions at the site.

1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Contractor shall immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that Products are properly protected and undamaged.

B. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

5. STORAGE AND PROTECTION

A. Contractor shall store Products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Contractor shall store Products subject to damage by the elements in weathertight enclosures.

2. Contractor shall maintain temperature and humidity within the ranges required by

manufacturer's instructions.

B. Exterior Storage

1. Contractor shall store fabricated Products above the ground, on blocking or skids, to prevent soiling or staining. Cover Products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

2. Contractor shall store loose granular materials in a well-drained area on soiled surfaces to prevent mixing with foreign matter.

C. Contractor shall arrange storage in a manner to provide easy access for inspection. Contractor shall make periodic inspections of stored Products to assure that Products are maintained under specified conditions, and free from damage or deterioration.

D. Contractor shall store flammable materials so as to prevent contact with flames and fire. Conform with manufacturer's recommendations and local laws. Pay particular attention to storage of:

1. Roof insulation.

2. Roofing materials, including solvents.

3. Paint materials.

4. Cleaning and other solvents.

5. Fuels.

E. Protection after Installation:

1. Contractor shall provide substantial coverings as necessary to protect installed Products from damage from traffic and subsequent construction operations. Remove when no longer needed.

6. SUBSTITUTIONS AND PRODUCT OPTIONS

A. Product List.

1. Within 30 days after Contract Date, Contractor shall submit to Construction Manager a complete list of major products proposed to be used, with the name of the manufacturer and the installing Contractor.

B. Contractor's Options.

1. For Products specified only by reference standard, Contractor shall select any Product

meeting that standard.

2. For Products specified by naming several Products or manufacturers, Contractor shall select any one of the Products or manufacturers named which complies with the specifications.

3. For Products specified by naming one or more Products or manufacturers and "or equal", Bidders must, during the bidding period, submit a request for substitutions for any Product or manufacturer not specifically named. See provisions in Paragraph 6.C, below.

4. For Products specified by naming only one Product and manufacturer, there is no option; and Contractor shall provide the precise Product specified.

C. Substitutions.

1. The materials, products and equipment described in the Bidding Documents establish a standard of quality, required function, dimension, and appearance to be met by any proposed substitution. The specification of a particular manufacturer or model number is not intended to be proprietary in any way. Substitutions of products for those named will be considered, providing that the Vendor certified that the function, quality, and performance characteristics of the material offered is equal or superior to that specified. It shall be the Bidder's responsibility to assure that the propose4d substitution will not affect the intent of the design, and to make any installation modifications required to accommodate the substitution.

2. Requests for substitutions shall be made in writing to the Architect at least ten days prior to the date of the Bid Opening. Such requests shall include a complete description of the proposed substitution, drawings, performance and test data, explanation of required installation modifications due the substitution, and any other information necessary for an evaluation. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval shall be final. The Architect is to notify Owner prior to any approvals.

3. Until a date no later than seven (7) days before the date Bids are due, Architect will consider written requests from bidders for substitution of Products. **The contractor will submit any substitution requests to the Construction Manager for transmittal to the Architect. The** architect will review requests and will notify Bidders in an Addendum if the requested substitution is acceptable.

4. Should the Bidder desire a substitution, it shall submit a separate request for each Product, supported with complete data, with drawings and samples as appropriate, including:

   a. Comparison of the qualities of the proposed substitution with that specified.

   b. Changes required in other elements of the Work because of the substitution.

   c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the Product specified.

e. Any required license fees or royalties.

f. Availability of maintenance service, and source of replacement materials.

5. Architect, in its sole discretion, shall be the judge of the acceptability of the proposed substitution.

6. A request for a substitution constitutes a representation that Bidder:

a. has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified;

b. will provide the same warranties or bonds for the substitution as for the Product specified;

c. will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects; and

d. waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

D. Architect will review requests for substitutions with reasonable promptness, and notify Bidders, in writing, through the Construction Manager, of the decision to accept or reject the requested substitution. Any decision to accept a substitution must be confirmed in an Addendum issued during the bidding period in order to be valid. Oral approvals will not be binding.

E. The Architect shall have no obligation to consider any substitutions after the Contract award.

END OF SECTION

SECTION 017123 - FIELD ENGINEERING

1. GENERAL PROVISIONS

   A. The general provisions of the Contract, including the Conditions of the Contract, (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

   B. The provisions of the section apply to all contracts.

2. SURVEY

   A. The Owner has had a site survey prepared by Landmark Science & Engineering This information has been included in this Bid Package.

3. CONSTRUCTION MANAGER

   A. The Construction Manager will establish a bench mark and base line from which structures and grades shall be laid out by Contractors as designated in this section. The total extent of this layout is shown on the site drawings. One bench elevation shall be provided.

END OF SECTION

SECTION 017329 - CUTTING AND PATCHING

1. GENERAL

A. Definition: "Cutting and Patching" includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.

B. Refer to Other Sections of these specifications for specific cutting and patching requirements and limitations applicable to individual units of work.

C. Structural Work: Do not cut and patch structural work in a manner resulting in a reduction of load carrying capacity or load deflection ratio. Submit proposal and request and obtain Architect's/Engineer's approval before proceeding with cut and patch of structural work.

D. Operational/Safety Limitations: Do not cut and patch operational elements and safety components in a manner resulting in decreased performance, shortened useful life, or increased maintenance. Submit proposals and requests and obtain Architect's/Engineer's approval before proceeding with cut and patches of structural work.

E. Visual/Quality Limitations: Do not cut and patch work exposed to view (exterior and interior) in manner resulting in noticeable reduction of aesthetic qualities and similar qualities, as judged by Architect/Engineer.

1. Engage the original Installer/Fabricator, or (if not available) an acceptable equivalent entity, to cut and patch the following categories of exposed work but not limited to

2. Exterior wall materials, ie., curtain wall

3. Finish floor materials, ie., substrate, carpet, ceramic tile

4. Walls

5. Ceilings

F. Limitation on Approvals: Architect's/Engineer's approval to proceed with cutting and patching does not waive right to later acquire removal/replacement of work found to be cut and patched in an unsatisfactory manner, as judged by Architect/Engineer.

2. MATERIALS

A. General: Use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal or better performance characteristics.

3. EXECUTION

A. Inspection: Before cutting, examine surfaces to be cut and patched and conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

B. Temporary Support: To prevent failure provide temporary support of work to be cut.

C. Protection: Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.

1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

2. Take precautions not to cut existing pipe, conduit or duct serving the building but scheduled to be relocated until provisions have been made to bypass them.

D. Cutting: Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible review proposed procedures with the original installer; comply with original installer's recommendations.

1. Where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine such as a carborundum saw or core drill. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. To avoid marring existing finished surfaces, cut and drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.

E. Patching: Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.

1. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and finishing.

END OF SECTION

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes: Administrative and procedural requirements for construction waste management activities.

1.2 DEFINITIONS

A. Construction, Demolition, and Land clearing (CDL) Waste: Includes all non-hazardous solid wastes resulting from construction, remodeling, alterations, repair, demolition and land clearing. Includes material that is recycled, reused, salvaged or disposed as garbage.

B. Salvage: Recovery of materials for on-site reuse, sale or donation to a third party.

C. Reuse: Making use of a material without altering its form. Materials can be reused on-site or reused on other projects off-site. Examples include, but are not limited to the following: Crushing or grinding of concrete for use as sub-base material. Chipping of land clearing debris for use as mulch.

D. Recycling: The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product.

E. Source-Separated CDL Recycling: The process of separating recyclable materials in separate containers as they are generated on the job-site. The separated materials are hauled directly to a recycling facility or transfer station.

F. Co-mingled CDL Recycling: The process of collecting mixed recyclable materials in one container on-site. The container is taken to a material recovery facility where materials are separated for recycling.

G. Approved Recycling Facility: Any of the following:

1. A facility that can legally accept CDL waste materials for the purpose of processing the materials into an altered form for the manufacture of a new product.

2. Material Recovery Facility: A general term used to describe a waste-sorting facility. Mechanical, hand-separation, or a combination of both procedures, are used to recover recyclable materials.

H. Universal waste components (UWC) are as follows: electric motors, PCB ballasts, non PCB ballasts, capacitors, contactors, circuit breakers, elemental and liquid mercury containing articles, transformers, lead acid batteries, fluorescent light bulbs, and all HID light bulbs.

1.3 SUBMITTALS

A. Contractor shall develop a Waste Management Plan: Submit 3 copies of plan within 14 days of date established for the **Notice to Proceed**.

B. Contractor shall provide Waste Management Report: Concurrent with each Application for Payment, submit **3** copies of report.

1.4 PERFORMANCE REQUIREMENTS

A. General: Divert a minimum of **75%** CDL waste, by weight, from the landfill by one, or a combination of the following activities:

1. Salvage
2. Reuse
3. Source-Separated CDL Recycling
4. Co-mingled CDL Recycling

B. CDL waste materials that can be salvaged, reused or recycled include, but are not limited to, the following:

1. Acoustical ceiling tiles
2. Asphalt
3. Asphalt shingles
4. Cardboard packaging
5. Carpet and carpet pad
6. Concrete
7. Drywall
8. Fluorescent lights and ballasts
9. Land clearing debris (vegetation, stumpage, dirt)
10. Metals
11. Paint (through hazardous waste outlets)
12. Wood
13. Plastic film (sheeting, shrink wrap, packaging)
14. Window glass
15. Wood
16. Field office waste, including office paper, aluminum cans, glass, plastic, and office cardboard.

1.5 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements, that employs a LEED Accredited Professional, certified by the USGBC as waste management coordinator.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Conduct construction waste management activities in accordance with hauling and disposal regulations of all authorities having jurisdiction and all other applicable laws and ordinances.

D. Preconstruction Conference: Schedule and conduct meeting at Project site prior to construction activities.

1. Attendees: Inform the following individuals, whose presence is required, of date and time of meeting.

a. Owner
b. Architect
c. Contractor's superintendent
d. Major subcontractors
e. Waste Management Coordinator
f. Other concerned parties.

2. Agenda Items: Review methods and procedures related to waste management including, but not limited to, the following:

a. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
b. Review requirements for documenting quantities of each type of waste and its disposition.
c. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
d. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
e. Review waste management requirements for each trade.

3. Minutes: Record discussion. Distribute meeting minutes to all participants.
Note: If there is a Project Architect, they will perform this role.

1.6 WASTE MANAGEMENT PLAN – Contactor shall develop and document the following:

A. Develop a plan to meet the requirements listed in this section at a minimum. Plan shall consist of waste identification, waste reduction plan and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight throughout the plan.

B. Indicate anticipated types and quantities of demolition, site-cleaning and construction waste generated by the project. List all assumptions made for the quantities estimates.

C. List each type of waste and whether it will be salvaged, recycled, or disposed of in an landfill. The plan should included the following information:

1. Types and estimated quantities, by weight, of CDL waste expected to be generated during demolition and construction.

2. Proposed methods for CDL waste salvage, reuse, recycling and disposal during demolition including, but not limited to, one or more of the following:

a. Contracting with a deconstruction specialist to salvage materials generated,
b. Selective salvage as part of demolition contractor’s work,
c. Reuse of materials on-site or sale or donation to a third party.

3. Proposed methods for salvage, reuse, recycling and disposal during construction including, but not limited to, one or more of the following:

    a. Requiring subcontractors to take their CDL waste to a recycling facility;
    b. Contracting with a recycling hauler to haul recyclable CDL waste to an approved recycling or material recovery facility;
    c. Processing and reusing materials on-site;
    d. Self-hauling to a recycling or material recovery facility.

4. Name of recycling or material recovery facility receiving the CDL wastes.

5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on project site where materials separation will be located.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:

1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
6. Savings in hauling and tipping fees by donating materials.
7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Including cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT, GENERAL

A. Provide containers for CDL waste that is to be recycled clearly labeled as such with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.

B. The collection containers for recyclable CDL waste must contain no more than 10% non-recyclable material, by volume.

C. Provide containers for CDL waste that is disposed in a landfill clearly labeled as such.

D. Use detailed material estimates to reduce risk of unplanned and potentially wasteful cuts.

E. To the greatest extent possible, include in material purchasing agreements a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, that packaging be taken back

for reuse or recycling, and to take back all unused product. Insure that subcontractors require the same provisions in their purchase agreements.

F. Conduct regular visual inspections of dumpsters and recycling bins to remove contaminants.

3.2 SOURCE SEPARATION

A. General: Contractor shall separate recyclable materials from CDL waste to the maximum extent possible.

Separate recyclable materials by type.

1. Provide containers, clearly labeled, by type of separated materials or provide other storage method for managing recyclable materials until they are removed from Project site.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water and to minimize pest attraction. Cover to prevent windblown dust.
3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from weather.

3.3 CO-MINGLED RECYCLING

A. General: Do not put CDL waste that will be disposed in a landfill into a co-mingled CDL waste recycling container.

3.4 REMOVAL OF CONSTRUCTION WASTE MATERIALS

A. Remove CDL waste materials from project site on a regular basis. Do not allow CDL waste to accumulate on-site.

B. Transport CDL waste materials off Owner's property and legally dispose of them.

C. Burning of CDL waste is not permitted.

3.5 UNIVERSAL WASTE DIVERSION

A. Remove all universal waste from fixtures, panels, and related devices for proper diversion and reclamation.

B. Store all universal waste in containers provided by contact person within facilities operations.

C. Store all universal waste in a secured location and request periodic removal from assigned contact person.

D. Exemption: electric motors, circuit breakers, transformers and lighting contactors are exempt from this provision provided the contractor chooses to salvage or reuse the components.

E. No identified universal waste will be discarded into the waste stream.

END OF SECTION

STATE OF DELAWARE

DIVISION OF FACILITIES MANAGEMENT

WASTE MANAGEMENT PROGRESS REPORT

MATERIAL CATEGORY	DISPOSED IN MUNICIPAL SOLID WASTE LANDFILL	DIVERTED FROM LANDFILL BY RECYCLING, SALVAGE OR REUSE		
		Recycled	Salvaged	Reused
1. Acoustical Ceiling Tiles				
2. Asphalt				
3. Asphalt Shingles				
4. Cardboard Packaging				
5. Carpet and Carpet Pad				
6. Concrete				
7. Drywall				
8. Fluorescent Lights and Ballasts				
9. Land Clearing Debris (vegetation, stumpage, dirt)				
10. Metals				
11. Paint (through hazardous waste outlets)				
12. Wood				
13. Plastic Film (sheeting, shrink wrap, packaging)				
14. Window Glass				
15. Field Office Waste (office paper, aluminum cans, glass, plastic, and coffee cardboard)				
16. Other (insert description)				
17. Other (insert description)				
Total (In Weight)		(TOTAL OF ALL ABOVE VALUES – IN WEIGHT)		

Percentage of Waste Diverted	(TOTAL WASTE DIVIDED BY TOTAL DIVERTED)

SECTION 017700 – CONTRACT CLOSEOUT

1. DESCRIPTION OF REQUIREMENTS

   A. Provisions of this section apply to the procedural requirements for the actual close out of the Work, not to the administrative matters such as final payment or the change over of insurance. Close out requirements relate to both substantial and final completion of the Work; they also apply to individual portions of completed work as well as the Total work. Specific requirements contained in other sections have precedence over the general requirements contained in this section.

2. PROCEDURES AT SUBSTANTIAL COMPLETION

   A. Prerequisites: Contractor shall comply with the General Conditions and complete the following before requesting inspection of the Work, or a designated portion of the Work, for certification of substantial completion:

      1. submit executed warranties, workmanship bonds, maintenance agreements, inspection certificates, releases of liens, tax certification and similar required documentation for specific units of work, and documents needed to enable Owner's unrestricted occupancy and use;

      2. submit record documentation, maintenance manuals, tools, spare parts, keys and similar operational items;

      3. complete instructions of Owner's operating personnel, and start up of systems; and

      4. complete final cleaning and remove temporary facilities and tools.

   B. Inspection Procedures: Upon receipt of Contractor's request, Architect/Engineer will either proceed with inspection or advise Construction Manger of prerequisites not fulfilled. Following initial inspection, Architect/Engineer will either prepare certificate of substantial completion, or advise Construction Manager of work which must be performed prior to issuance of certificate. The Architect/Engineer will repeat the inspection when requested and assure that the work has been substantially completed. Results of the completed inspection will form the initial "punch list" for final acceptance.

   C. Punch List Procedures: Each Contractor shall be given a copy of the punch list with its appropriate work identified. Each Contractor shall be given 9 (nine) calendar work days to complete their punch list work. On the 10th day or as determined by the Construction Manager the Construction Manager shall employ other Contractors, as required, to complete any incomplete punch list work and retain from the appropriate Contractors retainage all costs incurred.

3. PROCEDURES AT FINAL ACCEPTANCE

   A. Reinspection Procedure: The Architect/Engineer will reinspect the Work upon receipt of the

Contractor's notice that, except for those items whose completion has been delayed due to circumstances that are acceptable to the Architect/Engineer, the Work has been completed, including punch list items from earlier inspections. Upon completion of reinspection, the Architect/Engineer will either recommend final acceptance and final payment, or will advise the Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, this procedure will be repeated.

4. RECORD DOCUMENTATION

A. Record Drawings: Contractor shall maintain a complete set of either blue or black line prints of the contract documents and shop drawings for record mark-up purposes throughout the Contract Time. Contractor shall mark up these drawings during the course of the Work to show both changes and the actual installation, in sufficient detail to form a complete record for Owner's purposes giving particular attention to work that will be concealed and difficult to measure and record at a later date, and Work which may require servicing or replacement during the life of the project. Require the entities marking prints to sign and date each mark up. Bind prints into manageable sets, with durable paper cover, appropriately labeled.

B. Installation, Operation and Maintenance Manual: Contractor shall provide 3-ring vinyl covered binders containing required maintenance manuals, properly identified and indexed and including operating and maintenance instructions extended to cover emergencies, spare parts, warranties, inspection procedures, diagrams, safety, security, and similar appropriate data for each system of equipment item.

C. State Tax Certification: Contractor shall provide recent Delaware State Tax Certification form as issued by State of Delaware, Department of Finance, Division of Revenue, Carvel State Office Building, 820 N. French Street, Wilmington, Delaware 19801. To obtain this certificate, the contractor will be required to provide the Division of Revenue the completed State Form 8821 DE (attached to this section) along with a processing fee of $40.

D. AIA Documents: Contractors shall provide the following AIA documents with their final payment application submission:
- AIA G732, Application for Payment for 100% Complete
- AIA G732, Final Application for Payment for Retainage
- AIA G734-CMA, Certificate of Substantial Completion – 4 originals
- AIA G706, Affidavit of Payment of Debts & Claims
- AIA G706A, Affidavit of Release of Liens
- AIA G707, Consent of Surety

E. Release of Liens: Contractors shall provide the following release of liens with their final payment application submission:
- Prime Contractor's Release of Liens
- Subcontractors' & Suppliers' Release of Liens (major subs and suppliers)

5. GENERAL CLOSE OUT REQUIREMENTS

A. Operator Instruction: Contractor shall require each Installer of systems requiring continued operation and maintenance by Owner's operating personnel, to provide on location instruction to Owner's personnel, sufficient to ensure safe, secure, efficient, non-failing utilization and operation of systems. Contractor shall provide instructions for the following categories of work:

1. Mechanical/electrical/electronic systems (not limited to work of Division 15 and 16).

2. Roofing, flashing, joint sealers.

3. Floor finishes.

4. Door hardware

6. FINAL CLEANING

A. At the time of project close out Contractor shall clean or re-clean the Work to the condition expected from a normal, commercial building cleaning and maintenance program. Complete the following cleaning operations before requesting the Architect/Engineer's inspection for certification of substantial completion:

1. Bid Package B Contractor(s) to provide all final cleaning and preparation of field and all contract work areas prior to substantial completion.

2. Remove non-permanent protections and labels.

2. Polish glass.

3. Clean exposed finishes.

4. Touch up minor finish damage.

5. Clean or replace mechanical systems filters.

6. Remove debris.

7. Broom clean unoccupied spaces.

8. Sanitize plumbing and food service facilities.

9. Clean light fixtures and replace burned out lamps.

10. Sweep and wash paved areas.

11. Police yards and grounds.

END OF SECTION

New Castle County Vocational Technical School District
Hodgson Votech High School

STATE OF DELAWARE **FORM 8821DE** **DIVISION OF REVENUE**
(March 2006)

Authorization to Release Tax Information

Completion and submission of this form authorizes the Delaware Division of Revenue to release confidential information of the Taxpayer(s) named below to the authorized person(s) or organization named below for the tax type(s) specified below. This form does not give Power of Attorney and does not grant the authorized person(s) or organization any powers of representation. Unauthorized disclosure of tax information is a criminal offense.

Read the instructions below before completing this form.

Print or Type

Your name or name of entity	Social Security or Federal Employer ID number
Spouse's name, if joint (or corporate officer, partner or fiduciary if a business)	Spouse's Social Security number (if a joint return)
Street address	City State Zip code

I authorize the following person or organization to inspect and/or receive private and non-public information in regard to the tax types and periods provided below.

Authorized Person or Organization

Name of person or organization to receive tax information	Name of firm *(if applicable)*
Street address	City State Zip code
Phone Number	Fax Number

The above person or organization is authorized to receive the following tax information *(check all that apply)*:

Tax Information

Type of Tax	Year(s) or Period(s)	Type of Tax	Year(s) or Period(s)
☐ Individual Income	_____	☐ Gross Receipts	_____
☐ Corporate Income	_____	☐ Withholding	_____
☐ Pass-through Return	_____	☐ Other (please specify)	_____

The authorization to release tax information is not valid until it is signed and dated. It will expire 60 days after the information is released. By signing this form, I hereby certify that the Delaware Division of Revenue is authorized to release any and all confidential information concerning the above mentioned Taxpayer under penalty of law. A copy of this form will be mailed to the individual(s) authorizing the release.

Sign Here

Your Signature or that of Corporate Officer, Partner of Fiduciary	Print Name (and Title, if applicable)	Date	Phone
Spouse's signature (if joint)	Print Spouse's name (if joint)	Date	Phone

Mail to: Delaware Division of Revenue, 820 North French Street, Wilmington, DE 19801

Form 8821DE Instructions

Purpose of this form

You must complete, sign and return this form if you want to authorize a person or organization to inspect and/or receive certain private or nonpublic information concerning your state taxes.

By completing and signing this form, you are authorizing the Division of Revenue to release tax information to the person or organization you have indicated.

Revenue *will* accept copies of the form, including those from a FAX machine.

This authorization will expire 60 days after the information is released to the person or organization you have indicated.

Your Signature

The authorization to release tax information is not valid until it is signed and dated. Your spouse must also sign if joint returns are listed.

Your signature at the bottom of this form authorizes the individual or organization you designate to only be able to inspect and/or receive confidential tax information on your behalf.

Questions?

If you have questions on how to complete this form or to fax this form, call (302) 577-8200 for a staff contact who will provide you with a fax number. You must include a Division of Revenue contact name on all faxed authorization forms.

SECTION 03 30 00.00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Foundation walls.
3. Slabs-on-grade.
4. Suspended slabs.

Not Issued For Bidding

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Samples: For waterstops and vapor retarder.

E. Welding certificates.

F. Qualification Data: For Installer, manufacturer, testing agency.

G. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

H. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Waterstops.
6. Curing compounds.
7. Floor and slab treatments.
8. Bonding agents.
9. Adhesives.
10. Vapor retarders.
11. Semirigid joint filler.
12. Joint-filler strips.
13. Repair materials.

I. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.

J. Field quality-control test reports.

K. Minutes of preinstallation conference.

Not Issued For Bidding

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.

2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

E. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete,"
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, [curing procedures, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, vapor-retarder installation, steel reinforcement installation, floor and slab flatness and levelness measurement**,** and concrete protection.

Not Issued For Bidding

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

    a. High-density overlay, Class 1 or better.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

Not Issued For Bidding

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60 (Grade 420) , deformed bars, assembled with clips.

C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I/II, gray. Supplement with the following:

a. Fly Ash: ASTM C 618, Class C.
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Water: ASTM C 94/C 94M and potable.

2.6 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

Not Issued For Bidding

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
4. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C. Provide at exterior concrete slabs.

1. Products:

a. Boral Material Technologies, Inc.; Boral BCN.
b. Euclid Chemical Company (The); Eucon CIA.
c. Grace Construction Products, W. R. Grace & Co.; DCI.
d. Master Builders, Inc.; Rheocrete CNI.
e. Sika Corporation; Sika CNI.

D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete. Provide at exterior concrete slabs.

1. Products:

a. Axim Concrete Technologies; Catexol 1000CI.
b. Boral Material Technologies, Inc.; Boral BCN2.
c. Grace Construction Products, W. R. Grace & Co.; DCI-S.
d. Master Builders, Inc.; Rheocrete 222+.
e. Sika Corporation; FerroGard-901.

E. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

1. Manufacturers:

a. Bayer Corporation.
b. ChemMasters.
c. Conspec Marketing & Manufacturing Co., Inc.; a Dayton Superior Company.
d. Davis Colors.
e. Elementis Pigments, Inc.
f. Hoover Color Corporation.
g. Lambert Corporation.
h. Scofield, L. M. Company.

Not Issued For Bidding

i. Solomon Colors.

2. Color: As selected by Architect from manufacturer's full range.

2.7 WATERSTOPS

A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

1. Products:

a. Colloid Environmental Technologies Company; Volclay Waterstop-RX.
b. Approved equal

2.8 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class C**,** or polyethylene sheet, ASTM D 4397, not less than 15 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.

1. Products:
a. Stego Industries, LLC; Stego Wrap, 15 mils.

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

2.9 FLOOR AND SLAB TREATMENTS

A. Penetrating Liquid Floor Treatment: Provide at all exposed concrete surfaces to be treated to harden, seal and densify exposed concrete. Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.

1. Products:
a. Dayton Superior Corporation; Day-Chem Sure Hard.
b. Euclid Chemical Company (The); Euco Diamond Hard.
c. L&M Construction Chemicals, Inc.; Seal Hard.
d. Meadows, W. R., Inc.; Liqui-Hard.

B. Stained Hardener with matching cure/sealer - Pigmented Mineral Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement. Placing of hardener is followed by manufacturer’s recommended water membrane-forming cure and seal: ASTM C 309

1. Products:

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a. L&M Construction Chemicals, Inc.; Quartz Plate FF Hardener followed by Dress & Seal WB 30 per manufacturer's recommendations and specifications.
b. Scofield, L. M. Company; Lithochrome Color Hardener followed by Lithochrome Colorwax in matching color per manufacturer's recommendations and specifications.

2.10 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products:
a. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Aquafilm.
b. Dayton Superior Corporation; Sure Film.
c. Euclid Chemical Company (The); Eucobar.
d. L&M Construction Chemicals, Inc.; E-Con.
e. Meadows, W. R., Inc.; Sealtight Evapre.
f. Sika Corporation, Inc.; SikaFilm.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products:
a. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
b. Euclid Chemical Company (The); Kurez DR VOX.
c. L&M Construction Chemicals, Inc.; L&M Cure R.
d. Meadows, W. R., Inc.; 1100 Clear.
e. Tamms Industries, Inc.; Horncure WB 30.

2.11 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Reglets: Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

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D. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.12 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.13 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
2. Silica Fume: 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement at exterior conditions and 0.30 percent by weight of cement at interior conditions.

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D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup. Coordinate color and location with Architect.

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2.14 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4500 psi (31.0 MPa) at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 3 inch minimum and 5 inch maximum (at point of concrete placement), plus or minus 1 inch (25 mm).
4. Exposure Class: F2, S0, C1, P0

B. Foundation Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4500 psi (31.0 MPa) at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 3 inch minimum and 5 inch maximum (at point of concrete placement), plus or minus 1 inch (25 mm).
4. Exposure Class: F2, S0, C1, P0

C. Slabs-on-Grade - Interior: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
2. Minimum Cementitious Materials Content: 520 lb/cu. yd. (309 kg/cu. m).
3. Slump Limit: 3 inch minimum and 5 inch maximum (at point of concrete placement), plus or minus 1 inch (25 mm).
4. Exposure Class: F0, S0, C1, P0

D. Slabs-on-Grade – Exterior (Exposed to Exterior Conditions): Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4500 psi (31 MPa) at 28 days.
2. Minimum Cementitious Materials Content: 520 lb/cu. yd. (309 kg/cu. m).
3. Slump Limit: 3 inch minimum and 5 inch maximum (at point of concrete placement), plus or minus 1 inch (25 mm).

4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch (25-mm) nominal maximum aggregate size.
5. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.
6. Exposure Class: F2, S0, C2, P0

E. Suspended Slabs: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3500 psi (24.1 MPa) at 28 days.
2. Minimum Cementitious Materials Content: 470 lb/cu. yd. (309 kg/cu. m).
3. Slump Limit: 3 inch minimum and 5 inch maximum (at point of concrete placement), plus or minus 1 inch (25 mm). For pumpable concrete, slumps may be increased by 3 inches.
4. Exposure Class: F0, S0, C0, P0

2.15 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.16 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

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PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
2. Class C, 1/2 inch (13 mm) for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

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3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR RETARDERS

A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

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B. Bituminous Vapor Retarders: Place, protect, and repair vapor retarders according to manufacturer's written instructions.

C. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch (0 mm) or minus 3/4 inch (19 mm).

3.6 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

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6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

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3.8 WATERSTOPS

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

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1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to be covered with a coating or covering material applied directly to concrete.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

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3.11 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in 1 direction.

1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of

trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated, exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface and per ACI 117 "Specification For Tolerances For Concrete Construction & Materials":

    a. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 25 as a minimum. Coordinate and specify minimum F(F) and F(L) values with flooring manufacturer during concrete pre-installation conference. Note: Flooring manufacturer may require very flat surface classification (F(F) 45; F(L) 35) or super flat surface classification (F(F) 60 ; F(L) 40). Coordinate locations and requirements prior to installation.

    b. Provide maximum floor variation of 1/8" in 10' and 1/16" in 1' for terrazzo floor tile area or requirement as indicated by product manufacturer, whichever is more stringent.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

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3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.13 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
   c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

   a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound

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manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one-part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete, but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

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D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, pop-outs, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.16 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

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1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C 31/C 31M.

    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
    b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

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9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 48 hours of finishing. Values to be documented and provided to Architect and Flooring Manufacturer prior to placing flooring.

END OF SECTION

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SECTION 042000
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Concrete block.
- B. Mortar and grout.
- C. Reinforcement and anchorage.
- D. Accessories.

1.02 RELATED REQUIREMENTS
- A. Section 033000 - Cast-in-Place Concrete: Installation of dovetail slots for masonry anchors.
- B. Section 071113 - Bituminous Dampproofing: Dampproofing parged masonry surfaces.
- C. Section 072100 - Thermal Insulation: Insulation for cavity spaces.
- D. Section 079200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS
- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2016.
- B. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement 2011.
- C. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units 2014.
- D. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units 2011.
- E. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar 2011.
- F. ASTM C150/C150M - Standard Specification for Portland Cement 2015.
- G. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes 2006 (Reapproved 2011).
- H. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2014a.
- I. ASTM C404 - Standard Specification for Aggregates for Masonry Grout 2011.
- J. ASTM C476 - Standard Specification for Grout for Masonry 2010.
- K. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2010.

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1.04 SUBMITTALS
- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- D. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.
- E. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

1.05 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means of that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depths as indicated on drawings for specific locations.
   2. Special Shapes: Provide non-standard blocks configured for corners.
      a. Provide bullnose units for outside corners.
   3. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block, as indicated.
      b. Exposed Faces: Manufacturer's standard color and texture where indicated.

2.02 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

B. Hydrated Lime: ASTM C207, Type S.

C. Mortar Aggregate: ASTM C144.

D. Grout Aggregate: ASTM C404.

E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.

2.03 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa), deformed billet bars; galvanized.

B. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

END OF SECTION

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SECTION 05 12 00.00

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Structural steel.
2. Grout.

B. Related Sections include the following:

1. Division 1 Section "Quality Requirements" for independent testing agency procedures and administrative requirements.
2. Division 5 Section "Steel Deck" for field installation of shear connectors.
3. Division 5 Section "Metal Fabrications" for steel lintels or shelf angles not attached to structural-steel frame miscellaneous steel fabrications and other metal items not defined as structural steel.
4. Division 9 painting Sections for surface preparation and priming requirements.

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1.3 DEFINITIONS

A. Structural Steel: Elements of structural-steel frame, as classified by AISC's "Code of Standard Practice for Steel Buildings and Bridges," that support design loads.

1.4 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand ASD-service loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC's "Manual of Steel Construction, Allowable Stress Design," Part 4

B. Construction: Type 2, simple framing.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.

C. Welding certificates.

D. Qualification Data: For Installer, fabricator, professional engineer, testing agency.

E. Mill Test Reports: Signed by manufacturers certifying that the following products comply with requirements:

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Direct-tension indicators.
4. Tension-control, high-strength bolt-nut-washer assemblies.
5. Shear stud connectors.
6. Shop primers.
7. Nonshrink grout.

F. Source quality-control test reports.

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1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD. If the fabricator does not have the AISC certification they can still bid the project but they are responsible to have a third party inspector inspect the fabrication process to ensure they are meeting AISC guidelines.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

C. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P1 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

D. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."

E. Comply with applicable provisions of the following specifications and documents:

1. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. AISC's "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2."
3. AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."
4. AISC's "Specification for the Design of Steel Hollow Structural Sections."
5. AISC's "Specification for Allowable Stress Design of Single-Angle Members"
6. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

F. Mockups: Build mockups of architecturally exposed structural steel to set quality standards for fabrication and installation.

1. Coordinate finish painting requirements with Division 9 painting Sections.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.

1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.8 COORDINATION

A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

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PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992/A 992M.

B. Channels, Angles, M, S-Shapes: ASTM A 36/A 36M.

C. Plate and Bar: ASTM A 36/A 36M.

D. Corrosion-Resisting Structural Steel: ASTM A 588/A 588M, Grade 50 (345).

E. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.

F. Corrosion-Resisting Cold-Formed Hollow Structural Sections: ASTM A 847, structural tubing.

G. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.

1. Weight Class: Standard, Extra strong, or Double-extra strong, as indicated.
2. Finish: Black, except where indicated to be galvanized.

H. Medium-Strength Steel Castings: ASTM A 27/A 27M, Grade 65-35 (Grade 450-240), carbon steel.

I. High-Strength Steel Castings: ASTM A 148/A 148M,Grade 80-50 (Grade 550-345), carbon or alloy steel.

J. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

1. Finish: Plain.
2. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8,) compressible-washer type.

a. Finish: Plain

B. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.

C. Unheaded Anchor Rods: ASTM F 1554, Grade 36

1. Configuration: Straight or Hooked, as indicated.
2. Nuts: ASTM A 563 (ASTM A 563M) heavy hex carbon steel.
3. Plate Washers: ASTM A 36/A 36M carbon steel.
4. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
5. Finish: Plain

D. Headed Anchor Rods: ASTM F 1554, Grade 36 straight.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
4. Finish: Plain

E. Threaded Rods: ASTM A 36/A 36M

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1. Nuts: ASTM A 563 (ASTM A 563M) heavy hex carbon steel.
2. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
3. Finish: Plain

F. Eye Bolts and Nuts: ASTM A 108, Grade 1030, cold-finished carbon steel.

G. Sleeve Nuts: ASTM A 108, Grade 1018, cold-finished carbon steel.

2.3 PRIMER

A. Primer: SSPC-Paint 25, Type I, iron oxide, zinc oxide, raw linseed oil, and alkyd.

B. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer.

C. Galvanizing Repair Paint: ASTM A 780.

2.4 GROUT

A. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404, Size No. 2. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

B. Metallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design

1. Camber structural-steel members where indicated.
2. Identify high-strength structural steel according to ASTM A 6/ A 6M and maintain markings until structural steel has been erected.
3. Mark and match-mark materials for field assembly.
4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

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E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."

F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

G. Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk, cross-recessed head machine screws, uniformly spaced not more than 10 inches (250 mm) o.c., unless otherwise indicated.

H. Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

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2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.

1. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.

a. Grind butt welds flush.
b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

2.7 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).

2. Surfaces to be field welded.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials.
5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
1. SSPC-SP 3, "Power Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.

D. Painting: Apply a 1-coat, nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

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2.8 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/ A 123M.

1. Fill vent holes and grind smooth after galvanizing.
2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.

2.9 SOURCE QUALITY CONTROL

A. Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1 for stud welding and as follows:

1. Bend tests will be performed if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

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PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."

B. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.

1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.

2. Weld plate washers to top of base plate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel and architecturally exposed structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Remove erection bolts on welded, architecturally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.

G. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1].

H. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

I. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

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3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.

1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design

for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
4. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.

    a. Grind butt welds flush.
    b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Field welds will be visually inspected according to AWS D1.1.

1. In addition to visual inspection, field welds will be tested according to AWS D1.1 and the following inspection procedures, at testing agency's option:

    a. Liquid Penetrant Inspection: ASTM E 165.
    b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
    c. Ultrasonic Inspection: ASTM E 164.
    d. Radiographic Inspection: ASTM E 94.

D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1 for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

Not Issued For Bidding

B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates, and abutting structural steel.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

C. Touchup Painting: Cleaning and touchup painting are specified in Division 9 painting Sections.

END OF SECTION

Not Issued For Bidding

SECTION 05 21 00

STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. K-series steel joists.
2. KCS-type K-series steel joists.
3. LH-series steel joists.
4. Long-span steel joists.
5. Joist accessories.

B. Related Sections include the following:

1. Division 03 Section "Cast-in-Place Concrete" for installing bearing plates in concrete.
2. Division 04 Section "Unit Masonry" for installing bearing plates in unit masonry.

Not Issued For Bidding

1.3 DEFINITIONS

A. SJI "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.

B. Design special joists to withstand design loads with live load deflections no greater than the following:
1. Roof Joists: Vertical live load deflection of 1/240 of the span.

1.5 SUBMITTALS

A. Product Data: For each type of joist, accessory, and product indicated.

B. Shop Drawings: Show layout, designation, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, joist accessories; splice and connection locations and details; and attachments to other construction.

1. Indicate locations and details of bearing plates to be embedded in other construction.
2. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.

C. Welding certificates.

D. Manufacturer Certificates: Signed by manufacturers certifying that joists comply with requirements.

E. Mill Certificates: Signed by bolt manufacturers certifying that bolts comply with requirements.

F. Qualification Data: For manufacturer.

G. Field quality-control test and inspection reports.

H. Research/Evaluation Reports: For joists.

Not Issued For Bidding

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI "Specifications."

1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.

B. SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated.

C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

1.8 SEQUENCING

A. Deliver steel bearing plates to be built into masonry construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.

B. Steel Bearing Plates: ASTM A 36/A 36M.

C. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

1. Finish: Plain, uncoated.

D. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

1. Finish: Plain.

E. Welding Electrodes: Comply with AWS standards.

F. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20, ASTM A 780.

2.2 PRIMERS

A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.3 K-SERIES STEEL JOISTS

A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.

1. Joist Type: K-series steel joists and KCS-type K-series steel joists.

B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

C. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.

D. Provide holes in chord members for connecting and securing other construction to joists.

E. Top-Chord Extensions: Extend top chords of joists a maximum of 1’-6” with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications" and meeting Total Allowable Load of 550 lb/ft and Allowable Live Load of 450 lb/ft.

Not Issued For Bidding

F. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications" and meeting Total Allowable Load of 550 lb/ft and Allowable Live Load of 450 lb/ft.

G. Camber joists according to SJI's "Specifications." or as indicated.

H. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.4 LONG-SPAN STEEL JOISTS

A. Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as follows or as indicated:

1. Joist Type: LH-series steel joists and DLH-series steel joists.
2. End Arrangement: Underslung.
3. Top-Chord Arrangement: Parallel or pitched if indicated.

B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.

C. Provide holes in chord members for connecting and securing other construction to joists.

D. Camber long-span steel joists according to SJI's "Specifications."

E. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.5 JOIST ACCESSORIES

A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability. Provide additional bridging as indicated on structural drawings.

B. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated. Shop prime paint.

C. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface, unless otherwise indicated.

D. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

Not Issued For Bidding

2.6 CLEANING AND SHOP PAINTING

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.

B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

C. Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.

D. Shop priming of joists and joist accessories is specified in Division 09 painting Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.

C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts.

E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.

Not Issued For Bidding

F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

B. Field welds will be visually inspected according to AWS D1.1/D1.1M.

C. In addition to visual inspection, field welds will be tested according to AWS D1.1/D1.1M and the following procedures, as applicable:

1. Radiographic Testing: ASTM E 94.
2. Magnetic Particle Inspection: ASTM E 709.
3. Ultrasonic Testing: ASTM E 164.
4. Liquid Penetrant Inspection: ASTM E 165.

D. Bolted connections will be visually inspected.

E. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts."

F. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.

G. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

Not Issued For Bidding

3.4 REPAIRS AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists, bearing plates, abutting structural steel, and accessories.

1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

D. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION

Not Issued For Bidding

SECTION 05 31 00.00

STEEL DECK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Roof deck.
2. Acoustical cellular roof deck.
3. Composite floor deck.

B. Related Sections include the following:

1. Division 03 Section "Cast-in-Place Concrete" for concrete fill.
2. Division 05 Section "Structural Steel" for shop- and field-welded shear connectors.
3. Division 05 Section "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
4. Division 09 painting Sections for repair painting of primed deck.
5. Division 16 Section "Underfloor Raceways" for preset inserts, activation kits, after set inserts, service fittings, header ducts, and trench header ducts used with cellular floor-deck systems.

Not Issued For Bidding

1.3 SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

C. Product Certificates: For each type of steel deck, signed by product manufacturer.

D. Welding certificates.

E. Field quality-control test and inspection reports.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:

1. Power-actuated mechanical fasteners.
2. Acoustical roof deck.

3. Acoustical floor deck.

G. Research/Evaluation Reports: For steel deck.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.

B. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

C. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations of applicable testing and inspecting agency.
2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

D. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

E. Electrical Raceway Units: Provide UL-labeled cellular floor-deck units complying with UL 209 and listed in UL's "Electrical Construction Equipment Directory" for use with standard header ducts and outlets for electrical distribution systems.

F. FMG Listing: Provide steel roof deck evaluated by FMG and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

Not Issued For Bidding

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

1.6 COORDINATION

A. Coordinate installation of sound-absorbing insulation strips in topside ribs of acoustical deck with roofing installation specified in Division 07 to ensure protection of insulation strips against damage from effects of weather and other causes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Steel Deck:

a. ASC Profiles, Inc.
b. Canam Steel Corp.;The Canam Manac Group.
c. Consolidated Systems, Inc.
d. DACS, Inc.
e. D-Mac Industries Inc.
f. Epic Metals Corporation.
g. Marlyn Steel Decks, Inc.
h. New Millennium Building Systems, LLC.
i. Nucor Corp.; Vulcraft Division.
j. Roof Deck, Inc.
k. United Steel Deck, Inc.
l. Valley Joist; Division of EBSCO Industries, Inc.
m. Verco Manufacturing Co.
n. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

Not Issued For Bidding

2.2 ROOF DECK

A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:

1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 33 minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.

a. Color: Manufacturer's standard

2. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 zinc coating.
3. Deck Profile: As indicated.
4. Profile Depth: As indicated.

5. Design Uncoated-Steel Thickness: As indicated.
6. Span Condition: Triple span or more.
7. Side Laps: Overlapped.

2.3 ACOUSTICAL ROOF DECK

A. Acoustical Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:

1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 33 minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
    a. Color: Manufacturer's standard
2. Galvanized and Shop-Primed Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
    a. Color: Manufacturer's standard
3. Deck Profile: As indicated
4. Cellular Deck Profile: As indicated
5. Profile Depth: As indicated
6. Design Uncoated-Steel Thickness: As indicated
7. Design Uncoated-Steel Thicknesses; Deck Unit/Bottom Plate: As indicated
8. Span Condition: Triple span or more
9. Side Laps: Overlapped
10. Acoustical Perforations: Cellular deck units with manufacturer's standard perforated flat-bottom plate welded to ribbed deck.
11. Sound-Absorbing Insulation: Manufacturer's standard pre-molded roll or strip of glass or mineral fiber.
    a. Installation of sound-absorbing insulation is specified in Division 07
12. Acoustical Performance: NRC 0.95 for 3” roof deck depth, tested according to ASTM C 423 or as indicated on drawings.

Not Issued For Bidding

2.4 COMPOSITE FLOOR DECK

A. Composite Steel Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 30, with the minimum section properties indicated, and with the following:
1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 G60 zinc coating.
2. Profile Depth: As indicated.
3. Design Uncoated-Steel Thickness: As indicated.
4. Span Condition: Triple span or more.

2.5 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 12 (4.8-mm) minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile As indicated.

G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.

H. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.

I. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch (1.52 mm) thick, with factory-punched hole of 3/8-inch (9.5-mm) minimum diameter.

J. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck, with 3-inch- (76-mm-) wide flanges and sloped recessed pans of 1-1/2-inch (38-mm) minimum depth. For drains, cut holes in the field.

K. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.

L. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

M. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

Not Issued For Bidding

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

Not Issued For Bidding

3.3 ROOF-DECK INSTALLATION

A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches (38 mm) long, and as follows:

1. Weld Diameter: 5/8 inch (16 mm) nominal.
2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds 18 inches (450 mm) apart, maximum or as indicated.
3. Weld Washers: Install weld washers at each weld location.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 36 inches (910 mm)], and as follows:

1. Mechanically fasten with self-drilling, No. 12 (4.8-mm-) diameter or larger, carbon-steel screws.
2. Mechanically clinch or button punch.

3. Fasten with a minimum of 1-1/2-inch- (38-mm-) long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

1. End Joints: Lapped 2 inches (51 mm) minimum.

D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld or mechanically fasten flanges to top of deck. Space welds or mechanical fasteners not more than 12 inches (305 mm) apart with at least one weld or fastener at each corner.

1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.

E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.

1. Weld cover plates at changes in direction of roof-deck panels, unless otherwise indicated.

F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

G. Sound-Absorbing Insulation: Installation into topside ribs of deck as specified in Division 07

3.4 FLOOR-DECK INSTALLATION

A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:

1. Weld Diameter: 5/8 inch (16 mm) nominal.
2. Weld Spacing: Weld edge ribs of panels at each support. Space additional welds an average of 12 inches (305 mm) apart, but not more than 18 inches (457 mm) apart.
3. Weld Spacing: Space and locate welds as indicated.
4. Weld Washers: Install weld washers at each weld location.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of half of the span or 36 inches (910 mm), and as follows:

1. Mechanically fasten with self-drilling, No. 12 (4.8-mm-) diameter or larger, carbon-steel screws.
2. Mechanically clinch or button punch.
3. Fasten with a minimum of 1-1/2-inch- (38-mm-) long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm)with end joints as follows:

1. End Joints: Lapped

Not Issued For Bidding

D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.

E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

F. Install piercing hanger tabs at 14 inches (355 mm) apart in both directions, within 9 inches (228 mm) of walls at ends, and not more than 12 inches (305 mm) from walls at sides, unless otherwise indicated.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field welds will be subject to inspection.

C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.

D. Remove and replace work that does not comply with specified requirements.

E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

Not Issued For Bidding

3.6 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on **both surfaces** of prime-painted deck immediately after installation and apply repair paint.

1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
2. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Division 09 Section.

C. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 071300
SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Self-adhered rubberized asphalt sheet membrane.
B. Self-adhered HDPE sheet membrane.

1.02 REFERENCE STANDARDS

A. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course 2012.
B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension 2006a (Reapproved 2013).
C. ASTM D570 - Standard Test Method for Water Absorption of Plastics 1998 (Reapproved 2010).
D. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers 2000 (Reapproved 2012).
E. ASTM D638 - Standard Test Method for Tensile Properties of Plastics 2014.
F. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact 2014.
G. ASTM D751 - Standard Test Methods for Coated Fabrics 2006 (Reapproved 2011).
H. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting 2012.
I. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds 1998 (Reapproved 2010).
J. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test) 2008.
K. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2015a.
L. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers 2009.
M. ASTM D5295/D5295M - Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems 2014.
N. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes 1993 (Reapproved 2014).
O. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2014.
P. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover 2008a (Reapproved 2013).
Q. NRCA (WM) - The NRCA Waterproofing Manual 2005.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data for membrane.
C. Certificate: Certify that products meet or exceed specified requirements.
D. Manufacturer's Installation Instructions: Indicate special procedures.
E. Manufacturer's qualification statement.

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F. Installer's qualification statement.
G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 10 years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least 5 years of documented experience.

1.05 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application and until liquid or mastic accessories have cured.

1.06 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Contractor to correct defective Work within period of five years after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.
C. Provide 10 year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

PART 2 PRODUCTS

2.01 SHEET WATERPROOFING APPLICATIONS

A. Self-Adhered Rubberized Asphalt Sheet Membrane:
   1. Location: Foundations.
   2. Cover with protection board.
B. Self-Adhered HDPE Sheet Membrane:
   1. Location: Elevator Pit, and Automotive Paint Booth Pit.

2.02 SHEET WATERPROOFING MATERIALS

A. Self-Adhered Rubberized Asphalt Sheet Membrane:
   1. Thickness: 63 mil, 0.061 inch (1.6 mm), minimum.
   2. Sheet Width: 3.28 feet (1 m), minimum.
   3. Tensile Strength:
      a. Film: 15,000 psi (103.42 MPa), minimum, measured in accordance with ASTM D882 and at grip-separation rate of 2 inches (50 mm) per minute.
      b. Membrane: 425 psi (2.93 MPa), minimum, measured in accordance with ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches (50 mm) per minute.
   4. Elongation at Break: Greater than 200 percent, minimum, measured in accordance with ASTM D412.
   5. Water Vapor Permeance: 0.05 perm (2.9 ng/(Pa s sq m)), maximum, measured in accordance with ASTM E96/E96M.
   6. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 25 degrees F (minus 32 degrees C), 180 degree bend on 1 inch (25 mm) mandrel.
   7. Peel Adhesion to Concrete: 9 lb/inch (1.02 N/m), minimum, when tested in accordance with ASTM D903.

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8. Lap Adhesion: 9 lb/inch (1.02 N/m), minimum, measured in accordance with ASTM D4541.
9. Puncture Resistance: 60 lb (27.2 kg), minimum, in accordance with ASTM E154/E154M.
10. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
11. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 200 feet (61 m) head of water applied in accordance with test method ASTM D5385/D5385M.
12. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.

B. Self-Adhered HDPE Sheet Membrane: Recommended by manufacturer for placement below concrete slabs and on outside face of below grade walls before placement of concrete.
1. Sheet Thickness: 32 mil, 0.032 inch (0.8 mm), minimum.
2. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F (minus 29 degrees C), 180 degree bend on 1 inch (25 mm) mandrel.
3. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 231 feet (70.4 m) head of water applied in accordance with test method ASTM D5385/D5385M.
4. Elongation at Break: 500 percent, minimum, measured in accordance with ASTM D412.
5. Tensile Strength, Film: 3,500 psi (24 MPa), minimum, measured in accordance with ASTM D412.
6. Adhesion: 150 psi (1.03 MPa), minimum, measured in accordance with ASTM D4541.
7. Water Vapor Permeance: 0.01 perm (0.6 ng/(Pa s sq m)), maximum, measured in accordance with ASTM E96/E96M.
8. Lateral Water Migration Resistance: Resists pressure of 231 ft (70 m) head of water, when tested in accordance with ASTM D5385/D5385M.
9. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.

2.03 ACCESSORIES

A. Seaming Materials: As recommended by membrane manufacturer.
B. Membrane Sealant: As recommended by membrane manufacturer.
C. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.
D. Protection Board: Provide type capable of preventing damage to waterproofing due to backfilling and construction traffic.
E. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.
1. Composition: Dimpled polystyrene, polyethylene, or polypropylene core; polypropylene filter fabric.
F. Self-Adhered Flashing: Composite membrane with top layer consisting of Ketone Ethylene Ester (KEE) reinforced membrane and backed by bottom layer of synthetic butyl adhesive covered with release paper.
G. Preformed Flashing Shapes: Injected or vacuum molded one piece shapes used for detailing of inside and outside corners, protrusions, and transitions.
1. Color: Black.
H. Flexible Flashings: Type recommended by membrane manufacturer.
I. Adhesives: As recommended by membrane manufacturer.

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J. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting work.
B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.
C. Verify that items penetrating surfaces to receive waterproofing are securely installed.
D. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.
E. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect adjacent surfaces from damage not designated to receive waterproofing.
B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.
C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
D. Fill nonmoving joints and cracks with a filler compatible with waterproofing materials.
E. Seal moving cracks with sealant and nonrigid filler, using procedures recommended by sealant and waterproofing manufacturers.
F. Prepare building expansion joints at locations as indicated on drawings.
G. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.
H. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate in accordance with ASTM D5295/D5295M.
    1. Remove substances that inhibit adhesion including form release agents, curing compounds admixtures, laitance, moisture, dust, dirt, grease and oil.
    2. Repair surface defects including honeycombs, fins, tie holes, bug holes, sharp offsets, rutted cracks, ragged corners, deviations in surface plane, spalling and delaminations, as described in reference standard.
    3. Remove and replace areas of defective concrete; see Section 033000.
    4. Prepare concrete for adhesive bonded waterproofing using mechanical or chemical methods described in referenced standard.
    5. Test concrete surfaces as described in referenced standards, and verify surfaces are ready to receive adhesive bonded waterproofing membrane system.

3.03 INSTALLATION - MEMBRANE

A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
B. Roll out membrane, and minimize wrinkles and bubbles.
C. Self-Adhering Membrane: Remove release paper layer, and roll out onto substrate with a mechanical roller to provide full contact bond.
D. Overlap edges and ends, minimum 3 inches (76 mm), seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.
E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.

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F. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.
G. Install building expansion joints at locations as indicated on drawings.
H. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.
I. Seal membrane and flashings to adjoining surfaces.
    1. Install termination bar along edges.
    2. Install counterflashing over exposed edges.

3.04 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD

A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward; scribe and cut boards around projections, penetrations, and interruptions.
B. Place protection board directly against drainage panel; butt joints, and scribe and cut boards around projections, penetrations, and interruptions.
C. Adhere protection board to substrate with compatible adhesive.

3.05 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

3.06 PROTECTION

A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

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SECTION 072100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Board insulation at perimeter foundation wall.

1.02 REFERENCE STANDARDS
- A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation 2022.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board 2016.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
- D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022a.

1.03 SUBMITTALS
- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.04 FIELD CONDITIONS
- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS
- A. Insulation types are:
  1. Type 3 - Perimeter insulation - rigid.
- B. Insulation Type 3 at Perimeter of Foundation: Extruded polystyrene board.

2.02 FOAM BOARD INSULATION MATERIALS
- A. Type 3: Extruded Polystyrene Board Insulation: Extruded polystyrene board; ASTM C578; with either natural skin or cut cell surfaces, and the following characteristics:
  1. Type: ASTM C578, Type VI.
  2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
  3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
  4. R-value (RSI-value); 1 inch (25 mm) of material at 72 degrees F (22 C): 5 (0.88), minimum.
  5. Board Edges: Square.
  6. Water Absorption, Maximum: 0.3 percent, by volume.
  7. Manufacturers:
     a. Dow Chemical Company; STYROFOAM HIGHLOAD 40: www.dowbuildingsolutions.com/#sle.
     b. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.

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c. Substitutions: See Section 016000 - Product Requirements.

2.03 ACCESSORIES

A. Insulation Fasteners: Impaling clip of nylon with washer retainer and clips, to be mechanically fastened to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

B. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of irregularities or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards vertically and/or horizontally on foundation perimeter as shown.

1. Place boards to maximize adhesive contact.
2. Install in running bond pattern.
3. Butt edges and ends tightly to adjacent boards and to protrusions.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

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SECTION 072600
UNDER-SLAB VAPOR BARRIER

PART 1 – GENERAL

1.01 SUMMARY

A. Products supplied under this section:
   1. Vapor barrier and installation accessories for installation under concrete slabs.
B. Related sections:
   1. Section 03 30 00 Cast-in-Place Concrete

1.02 REFERENCES

A. ASTM International:
   1. ASTM E1745-17 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
   2. ASTM E1643-18a Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
B. Technical Reference - American Concrete Institute (ACI):
   1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
   2. ACI 302.1R-15 Guide to Concrete Floor and Slab Construction.
C. SUBMITTALS
D. Quality control/assurance:
   1. Summary of test results per paragraph 9.3 of ASTM E1745.
   2. Manufacturer's samples and literature.
   3. Manufacturer's installation instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643.
   4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

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PART 2 – PRODUCTS

2.01 MATERIALS

A. Vapor barrier shall have the following qualities:
   1. Maintain permeance of less than 0.01 Perms [grains/(ft2 · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
   2. Other performance criteria:
      a. Strength: ASTM E1745 Class A.
      b. Thickness: 20 mils minimum
   3. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1
B. Vapor barrier products:
   1. Basis of Design: Stego Wrap 20-Mil Vapor Barrier by Stego Industries LLC., (877) 464-7834 www.stegoindustries.com.
   2. Substitutions: See Section 01 6000 – Product Requirements.

2.02 ACCESSORIES

A. Seams: Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
B. Sealing Penetrations of Vapor barrier:
   1. Stego Mastic by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
   2. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

C. Perimeter/edge seal:
   1. StegoTack Tape (double-sided sealant tape) by Stego Industries LLC, (877) 464-7834
   2. Stego Term Bar by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

PART 3 – EXECUTION

3.01 PREPARATION

A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.
   1. Level and compact base material.

INSTALLATION

A. Install vapor barrier in accordance ASTM E1643.
   a. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
   2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
      a. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided StegoTack Tape, per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.
   3. Overlap joints 6 inches and seal with manufacturer's seam tape.
   4. Seal all penetrations (including pipes) per manufacturer's instructions.
   5. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.

END OF SECTION

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SECTION 079200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.
B. Self-leveling pourable joint sealants.
C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 071300 - Sheet Waterproofing: Sealing cracks and joints in waterproofing substrate surfaces using materials specified in this section.
B. Section 072500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.
C. Section 078400 - Firestopping: Firestopping sealants.
D. Section 079513 - Expansion Joint Cover Assemblies: Sealants forming part of expansion joint cover assemblies.
E. Section 087100 - Door Hardware: Setting exterior door thresholds in sealant.
F. Section 088000 - Glazing: Glazing sealants and accessories.
G. Section 092116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
H. Section 093000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2006 (Reapproved 2011).
B. ASTM C834 - Standard Specification for Latex Sealants 2014.
C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2012.
D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2014.
E. ASTM C1193 - Standard Guide for Use of Joint Sealants 2013.
F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2008 (Reapproved 2012).
G. ASTM C1311 - Standard Specification for Solvent Release Sealants 2014.
H. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants 2002 (Reapproved 2013).
I. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints 2013.
J. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2005 (Reapproved 2010).

1.04 SUBMITTALS

A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
    1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
    2. List of backing materials approved for use with the specific product.

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3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
4. Substrates the product should not be used on.

B. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

E. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.

F. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

G. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

H. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

D. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.

1. Identification of testing agency.
2. Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
    a. Test date.
    b. Copy of test method documents.
    c. Age of sealant upon date of testing.
    d. Test results, modeled after the sample form in the test method document.
    e. Indicate use of photographic record of test.

E. Field Quality Control Plan:

1. Visual inspection of entire length of sealant joints.
2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
3. Destructive field adhesion testing of sealant joints, except interior acrylic latex sealant.

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a. For each different sealant and substrate combination, allow for one test every 100 feet (30 meters) in the first 1000 linear feet (305 linear meters), and one test per 1000 linear feet (305 meters) thereafter, or once per floor on each elevation.
b. If any failures occur in the first 1000 linear feet (305 linear meters), continue testing at frequency of one test per 500 linear feet (152 linear meters) at no extra cost to Owner.

4. Field testing agency's qualifications.
5. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

F. Field Adhesion Test Procedures:
1. Allow sealants to fully cure as recommended by manufacturer before testing.
2. Have a copy of the test method document available during tests.
3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
4. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
5. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
6. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

G. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.

H. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
1. Sample: At least 18 inch (457 mm) long.
2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch (25 mm) by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
3. If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.

1.06 WARRANTY

A. Correct defective work within a five year period after Date of Substantial Completion.

B. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
a. Wall expansion and control joints.
b. Joints between door, window, and other frames and adjacent construction.
c. Joints between different exposed materials.

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d. Openings below ledge angles in masonry.
e. Other joints indicated below.

2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
   a. Joints between door, window, and other frames and adjacent construction.
   b. Joints between plumbing fixtures and adjacent construction.
3. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
4. Do not seal the following types of joints.
   a. Intentional weepholes in masonry.
   b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
   c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
   d. Joints where installation of sealant is specified in another section.
   e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag non-staining silicone sealant, Type 1, unless otherwise indicated.
   1. Type 3 - Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.

C. Interior Joints: Use non-sag acrylic latex sealant, Type 2, unless otherwise indicated.
   1. Interior Expansion and Control Joints: Polyurethane sealant; Type 1A.
   2. Interior Joints at windows, storefront and curtainwall: Polyurethane sealant; Type 1A.
   3. Fire-rated Construction: ASTM C 834, UL Listed.
   4. In Sound-Rated Assemblies: Acoustical sealant; Type 5.
   5. Type 7 - Narrow Control Joints in Interior Concrete Slabs Exposed to View: Self-leveling polyurea sealant.
   6. Interior Wet Areas: Type 6 - Mildew-Resistant Silicone Sealant: not expected to withstand continuous water immersion or traffic. Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

2.02 JOINT SEALANTS - GENERAL

A. Sealant Types Summary:
   1. Type 1: Non-Staining Silicone.
   2. Type 1A: Polyurethane.
   3. Type 2: Acrylic Emulsion Latex
   4. Type 3: Non-Curing Butyl Sealant
   5. Type 4: Fire resistant foam sealant: Refer to Section 078400 - Firestopping.
   6. Type 5: Acoustical Sealant
   7. Type 6: Mildew-Resistant Silicone Sealant
   8. Type 7: Self-Leveling Polurea Sealant

2.03 NONSAG JOINT SEALANTS

A. Type 1 - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
   2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Color: To be selected by Architect from manufacturer's standard range.

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5. Cure Type: Single-component, neutral moisture curing.
6. Service Temperature Range: Minus 65 to 180 degrees F (Minus 54 to 82 degrees C).
7. Manufacturers:
   a. Dow Chemical Company; 795 Silicone Building Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
   b. Sika Corporation; Sikasil WS-295: www.usa-sika.com/#sle.
   c. Pecora Corporation; 890NST: www.pecora.com.
   d. Substitutions: See Section 016000 - Product Requirements.

B. Type 1A - Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).
5. Manufacturers:
   a. Pecora Corporation; DynaTrol 1-XL: www.pecora.com.
   b. Sika Corporation; Sikaflex-15 LM: www.usa-sika.com/#sle.
   c. Tremco Commercial Sealants & Waterproofing; Dymonic 100: www.tremcosealants.com/#sle.
   d. Substitutions: See Section 016000 - Product Requirements.

C. Type 2 - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.

D. Type 3 - Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, non-sag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.

E. Type 4: Fire resistant foam sealant: Refer to Section 078400 - Firestopping.

F. Type 5 - Acoustical Sealant for Concealed Locations: ASTM C 834, UL Listed.
1. Composition: Acrylic latex emulsion sealant.
2. Applications: Use for concealed locations only:
   a. Acoustical application: Sealant bead between top stud runner and structure and between bottom stud track and floor.
3. Products:
   a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant: www.pecora.com.
   b. Hilti, Inc.; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com.
   c. USG Company; Sheetrock Brand Acoustical Sealant; www.usg.com.

G. Type 6 - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: White.
2. Manufacturers:
   a. Pecora Corporation: www.pecora.com.
   b. Sika Corporation; Sikasil GP: www.usa-sika.com.

2.04 SELF-LEVELING SEALANTS

A. Type 7 - Semi-Rigid Self-Leveling Polyurea Joint Filler: Two-component, 100 percent solids; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.

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1. Durometer Hardness, Type A: 75, minimum, after seven days when tested in accordance with ASTM D2240.
2. Color: To be selected by Architect from manufacturer's standard colors.
3. Joint Width, Minimum: 1/8 inch (3 mm).
4. Joint Width, Maximum: 3/4 inch (19 mm).
5. Joint Depth: Provide product suitable for joints from 1/8 inch (3 mm) to 1 inch (25.4 mm) in depth excluding space for backer rod.
6. Manufacturers:
   a. Adhesives Technology Corporation; Crackbond JF-311: www.atcepoxy.com/#sle.
   b. ARDEX Engineered Cements; ARDEX ARDISEAL RAPID PLUS: www.ardexamericas.com/#sle.
   c. Euclid Chemical Company; EUCO QWIKjoint UVR: www.euclidchemical.com/#sle.
   d. Substitutions: See Section 016000 - Product Requirements.

2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
   1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
   2. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
   3. Manufacturers:
      a. Nomaco, Inc; SOF Rod: www.nomaco.com.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
   1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
   2. Notify Architect of date and time that tests will be performed, at least 7 days in advance.
   3. Record each test on Preinstallation Adhesion Test Log as indicated.
   4. If any sample fails, review products and installation procedures, consult manufacturer, or take whatever other measures are necessary to ensure adhesion; re-test in a different location; if unable to obtain satisfactory adhesion, report to Architect.
   5. After completion of tests, remove remaining sample material and prepare joint for new sealant installation.

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3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.
B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
B. Perform installation in accordance with ASTM C1193.
C. Perform acoustical sealant application work in accordance with ASTM C919.
D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
    1. Width/depth ratio of 2:1.
    2. Neck dimension no greater than 1/3 of the joint width.
    3. Surface bond area on each side not less than 75 percent of joint width.
E. Install bond breaker backing tape where backer rod cannot be used.
F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet (30 linear m), notify Architect immediately.
C. Destructive Adhesion Testing: If there are any failures in first 1000 linear feet (300 linear m), notify Architect immediately.
D. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.
E. Repair destructive test location damage immediately after evaluation and recording of results.

3.05 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION

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SECTION 31 23 00 - EXCAVATION AND BACKFILL FOR PIPELINES AND STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications, apply to this Section.

1.2 SUMMARY

A. Work included in this section shall include furnishing all labor, materials, and equipment necessary for the Contractor to perform all excavation, backfilling, filling, grubbing and grading required for construction and installation of pipelines, pavements, structures and appurtenances and to perform general site grading. Excavation shall include removal of pavement, concrete, rock, earth and debris, regardless of character. Trenches and excavations shall be sheeted, shored and braced by the Contractor, as necessary to allow construction and provide safe working conditions. Additionally, the Contractor shall be responsible for maintaining a dry excavation by dewatering. He shall also locate, support and protect existing utilities and structures encountered in the work, provide traffic control where required, dispose of surplus and unsuitable excavated materials and restore backfilled areas to original condition or as required by the drawings and specifications. All backfilled and restored areas shall be maintained by the Contractor, in a proper condition, for the duration of the project.

B. The Contractor is responsible for direct or indirect damage to existing structures, pipelines, conduits, utility poles, wires and utilities of every description in the vicinity of his work whether above or below ground, or that may be encountered in trench or structure excavation, whether or not such utilities are shown on the Drawings. This responsibility shall include the cost of protection by sheeting, bracing, hand excavation, when warranted, and the expense to repair or replace any existing facility damaged directly or indirectly by construction activities under this contract.

C. The Contractor shall verify the location, size and elevation of all existing utilities at the various points of connection and/or crossings prior to starting any work. Any discrepancies in locations or elevations shall be brought immediately to the attention of the Engineer in order that the designs may be adjusted accordingly. Damages suffered or additional costs incurred by the Contractor as a result of his failure to conform to the requirements of this paragraph shall be the sole responsibility of the Contractor. Connections to existing utilities shall be made by the Contractor at such a time and in such a manner as the Engineer may direct, and the cost shall be included in the price bid for pipeline and structures, unless otherwise defined elsewhere in the proposal.

D. RELATED SECTIONS

1. Section 31 25 00: "Erosion and Sediment Control".

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1.3 DEFINITIONS

A. Excavation consists of the removal of material encountered to sub-grade elevations and the reuse or disposal of materials removed as required.

B. Sub-grade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil materials.

C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.

D. Sub-base Course: The layer placed between the sub-grade and base course in a paving system, or the layer placed between the sub-grade and surface of a pavement or walk.

E. Base Course: The layer placed between the sub-base and surface pavement in a paving system.

F. Unauthorized excavation consists of removing materials beyond indicated sub-grade elevations or dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at the Contractor's expense.

G. Structures: Buildings, footings, foundations, retaining walls, slabs, pump stations, manholes, catch basins, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

H. Utilities include on-site overhead utilities, underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

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1.4 SUBMITTALS

A. Submit for approval certified gradations, plasticity index and soil classification of each type of material proposed for use.

B. Submit copies of all laboratory and field soil test results directly to the Engineer within 24 hours of completion of test.

1.5 QUALITY ASSURANCE

A. Compaction:

1. Top 12" of sub-grade and each 8" loose layer of backfill and fill under structures. Building slabs, steps, and sidewalks shall be compacted to 95 percent maximum density, ASTM D 698, unless otherwise noted.

2. Top 12" of sub-grade and each 8" base layer of backfill and fill under structures. Pavements and wastewater structure base slabs shall be compacted to 95% maximum density, ASTM D 1557, unless otherwise noted.

3. Top 6" of sub-grade and each layer of backfill under lawns or unpaved areas, shall be compacted to 90 percent maximum density, ASTM D 698.

4. Contractor may use ASTM D 1557 in lieu of ASTM D 698 in all cases.

B. Grading Tolerances Outside Building Lines:

1. Lawns, unpaved areas, walks, and embankments, plus or minus 1 inch.

2. Stone and asphalt pavements, plus or minus 1/2 inch.

C. Grading Tolerance for Fill Under Building Slabs: plus or minus 1/4 inch measured with a 10' straightedge.

1.6 PROJECT CONDITIONS

A. Contact the Owner and Miss Utility at 1-800-441-8355 at least 48 hours prior to beginning installations.

B. Existing Utilities: Do not interrupt existing utilities, electrical, yard piping, etc. serving facilities occupied by the Owner or others except when permitted in writing by the Engineer and then only after acceptable temporary utility services have been provided. Provide a minimum 48 hours notice to the Engineer and receive written notice to proceed before interrupting the utility.

C. All soil testing services shall be performed by an independent testing agency coordinated and paid for by the Contractor.

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PART 2 - PRODUCTS

2.1 GENERAL

A. No classification of excavated materials will be made. Excavation and trenching work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the contract work, regardless of the type, character, composition, or condition thereof.

B. Materials used for backfill and fill shall be free of clay clods, rock or gravel larger than 2 inches in any dimension and debris, waste, frozen materials, and other deleterious matter.

2.2 SOIL MATERIALS

A. General: Provide approved satisfactory borrow soil materials from off-site when sufficient approved soil materials are not available from excavations. Materials shall comply with the following specifications and Maryland State Highway Administration Standard Specification.

B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, SC, and SM; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter. Satisfactory soil materials shall conform to Maryland State Highway Administration Section 916.01, Select Borrow.

C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, ML, MH, CL, CH, OL, OH, and PT.

D. Backfill and Fill Materials: Satisfactory soil materials unless otherwise approved by the Engineer.

E. Base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, conforming to Maryland State Highway Administration Section 901 for Graded Aggregate Base.

F. Structural Fill: ASTM D 2487 Soil Classification Groups SM and/or SC.

G. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D448, coarse aggregate grading size 57 conforming to AASHTO M43 type No. 57.

H. Pipe Bedding Material: Artificial foundation using drainage fill.

I. No soil material shall be considered unsatisfactory due to moisture content. Contractor shall dry soils with excess moisture or add additional moisture to any material at no additional cost to the Owner.

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2.3 SUITABLE BACKFILL

All suitable materials removed from the excavation shall be used for backfill and/or sub-grade replacements of unsuitable materials. No excavated material shall be wasted without permission of the Engineer. As material is excavated it shall be separated into suitable and unsuitable material stockpiles for reuse or disposal as the case may be. No payment for select backfill under contingencies will be approved until all suitable soils from excavations have been expended.

2.4 SELECT BACKFILL

A. Should the Contractor encounter unsuitable material during excavation, he shall remove and dispose of such material at a location approved by the Engineer. The cost of such disposal shall be included in the appropriate prices bid.

B. Should sufficient suitable material from excavations on the project not be available for backfill, the Contractor shall furnish Select Backfill upon written approval of the Engineer. Select Backfill shall conform to the requirements for satisfactory soil materials per section 2.2. Contractor shall pay for all testing necessary for approval of the select materials including sampling, sieve analysis, Atterberg limits and classification.

C. Payment for removal of unsuitable sub-grade material and replacement with select backfill as authorized by the Engineer will be made at the unit price bid for the material placed within the payment trench width detailed on the project plans and for the length and depth approved. For backfill around structures, select backfill payment volume will be limited to an area 3'0" outside the foremost edge of the structure on all sides and from the bottom of the structure to the ground surface. This item is for unsuitable sub-grade and backfill material only and does not apply to embankment or fill material required for project construction which is to be included in the lump sum price for the treatment plant.

2.5 ARTIFICIAL FOUNDATION

Artificial Foundation and pipe bedding material shall consist of washed, uniformly graded mixture of uncrushed gravel free from angular edges grading size 57 conforming to Maryland State Highway Administration Section 901.

2.6 TOPSOIL

Topsoil shall mean friable clay loam surface soil suitable for use in grass planting. It occurs as a thin soil layer covering naturally well-drained land covered by a heavy growth of grass or which has been covered with a heavy growth of grass during the latest growing period before start of construction. In addition, the topsoil shall be reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and shall be free from stones, stumps, and other objects larger than 2 inches in any dimension, roots, and other objectionable material.

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PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect sub-grades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.2 STRIPPING

A. Remove all organic material from the roadways and building construction areas. Stockpile all suitable material for reuse as topsoil during final grading and stabilization process. Remove all unsuitable materials from the site at the end of the project.

B. The depth of stripping shall be a minimum of 6 inches or as required by actual field conditions.

3.3 GENERAL EXCAVATION

A. Explosives: The use of explosives shall not be permitted on this project.

B. Unclassified Excavation: Excavation is unclassified and includes excavation to required sub-grade elevations regardless of the character of materials and obstructions encountered.

C. Excavated materials shall be segregated as they are excavated, with the suitable and unsuitable materials and topsoil being piled separately according to designated use specified in Part 2 of this section. All suitable materials shall be used for backfill or embankment. Suitable wet materials shall be dried to optimum moisture content at the Contractor's expense and be used for backfill or embankment. All unsuitable materials shall be removed, at the Contractor's expense and disposed of after the project is completed at a location approved by the Engineer. No excavated material shall be deposited at any time so as to endanger partly finished structures either by direct pressure, or indirectly by overloading banks contiguous to the operation.

D. The Contractor shall employ the services of a soil testing agency acceptable to the Engineer to determine adequacy of excavated material for reuse as backfill or embankment. Submit results of testing to Engineer for approval.

E. Excavation may be moved directly to areas of fill and embankment. However, the Contractor must schedule the work so that all construction areas will remain free-draining, without any ponding of water. Temporary ditches and dewatering operations shall be constructed, if necessary, to accomplish this end. If, at the time of excavation, it is not possible to place material in its proper location as fill or embankment, it shall be stockpiled for later use and shall be stabilized in an approved manner if not to be utilized within 14 calendar days.

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3.4 APPROVAL OF SUBGRADE

A. Notify Engineer when excavations have reached required sub-grade.

B. Proof roll sub-grade areas to receive bituminous paving with a loaded tandem wheel dump truck in the presence of the Engineer or his representative prior to compaction to locate any soft areas. Provide penetrometer testing for building, basin and other structural sub-grades.

C. When Engineer determines that unforeseen unsatisfactory soil or soft areas are present, continue excavation and replace with compacted backfill or fill material as directed.

D. Reconstruct sub-grades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Engineer at no additional cost.

3.5 VERIFICATION OF SOIL BEARING CAPACITY

The Contractor shall be responsible for testing of the available soil bearing capacity below the

foundation of any structure. He shall arrange for such testing by an independent agency approved by the Engineer. The Contractor shall pay the agency for at least two (2) three foot deep penetrometer tests and subsequent bearing capacity evaluation as specified on the drawings per 1000 S.F. area, minimum one (1) per individual structure or basin. If the required value as stated in the structural notes is not reached, the Contractor shall compact the sub-grade by means of vibratory rollers and pay and arrange for retesting until the required values are met.

3.6 UNAUTHORIZED EXCAVATION

Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Engineer. Fill unauthorized excavations under other construction as directed by the Engineer.

3.7 FILL AND EMBANKMENT

A. Contractor shall furnish and place, within the prices bid and at no additional cost to the Owner, all structural fill to meet the construction requirements of the Contract Documents. Only material meeting the specifications will be approved for use. Contractor shall dispose of excess material off site within prices bid.

B. Structural Fill and Embankment

1. Structural Fill and Embankment for roadways, embankment, and structures shall be constructed of friable, compatible material from excavation or borrow. The material shall be free from debris, organic matter or excessive amounts of clay. Soils shall be classified as SM and/or SC (Unified Soils Classification).

2. Structural fills shall be constructed in loose layers not exceeding 8 inches loose thickness for the full width of the cross section. Construction shall proceed in such manner as to keep all areas free-draining, without ponding of water. Construction shall be suspended when satisfactory results cannot be achieved on account of wet or freezing weather.

3. Each layer of fill or embankment shall be compacted to not less than 95 percent of maximum density as determined by ASTM D 698, by means of multiple-wheel pneumatic tired rollers, vibratory rollers or other approved types, unless otherwise noted.

4. Compacting shall be continued until the required compaction has been achieved. Displacement of soil under or ahead of the roller shall be sufficient evidence that required compaction has not been achieved.

5. Fills and embankments shall be carried to the finished grades shown, less the necessary allowance for pavement, topsoiling, etc. Fine grade all areas prior to construction of finishing courses.

6. Frozen materials shall not be placed in fills and embankments. Any materials which freeze after being placed shall not be covered over until it has completely

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thawed.

7. Embankment and fill material which may be lost or displaced as a result of natural causes such as storms, cloudbursts, etc., shall be replaced by the Contractor with acceptable material at no additional cost to the Owner.

3.8 PIPELINE TRENCH EXCAVATION

A. The Contractor shall excavate, maintain and backfill all excavation necessary for completing the work under the contract. Unless otherwise specified or approved, excavation shall be open cut. No extra compensation will be allowed for hand excavation and backfill necessary to complete the work as required by the Engineer.

B. Trenches shall be excavated to the necessary width and depth, as shown on the drawings and as required for the placement and removal of protective sheeting, pull boxes, etc. No extra compensation will be allowed for trenches wider than that detailed on the drawings.

C. The sides of the trenches shall be practically plumb and shall not be sloped unless approved in writing by the Engineer. Trench sides shall be supported or sheeted as required to protect pavement surfaces, curbing, utilities, structures, etc., and required for safety. Safety regulations shall be as required by State safety codes and OSHA. Refer to Part 3.17 of this section for sheeting requirements.

D. In paved areas, the Contractor shall remove the paving only as necessary for the excavation of the trench or as detailed. Pavement edges at the trench shall be saw cut neat, straight, and to the full depth of paving prior to the start of any excavation. Should the Contractor disturb or damage pavement for a greater width than detailed on the drawings or should pavement damage result from cave-ins, settlement, etc., the Contractor shall replace such paving at his own expense.

E. In non-paved areas, strip surface vegetation and suitable topsoil and place in stock piles which are separated from the trench excavated materials. Topsoil shall not be used for general trench refill.

F. The excavation of all trenches shall be fully completed at least twenty (20) feet in advance of pipe laying, unless otherwise authorized or directed. The Engineer may require the backfilling of open trench, over completed pipelines, or ahead of the pipe laying operation, if in his judgment such action is necessary, and the Contractor shall have no claim for extra compensation.

G. Should work be stopped for any reason and any excavation is left open for an unreasonable length of time, the Contractor shall refill the excavation at his own expense if so directed by the Engineer, the Inspector or Owner. He shall not reopen the excavation until he is ready to complete the facility. Should the Contractor refuse or fail to refill any excavation completely within forty-eight (48) hours, or immediately if it poses a safety hazard, after a proper notice has been given by the Engineer or Inspector, the Owner shall be authorized to do the work. The resulting expenses shall be deducted from monies due the Contractor.

H. The Contractor shall complete excavation as nearly as practicable to the lines of the pipeline to be installed as detailed. All cavities in the bottom of the trench shall be filled

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to the required level with compacted crushed stone or gravel. Unless the cavities have been made on direction of the Engineer and classified as "Excavation Below Sub-grade" for unsuitable material, no extra compensation shall be due the Contractor.

I. Excavated materials shall be graded, hauled, stored and protected as such material found suitable will be required for backfilling, or other purposes. Material classified as unsuitable shall be disposed of by the Contractor at a location approved by the Engineer. Hauling of excavated materials for any purpose shall not entitle the Contractor to additional compensation. Only those excavated materials designated by the Owner shall become property of the Contractor.

J. All stockpiled materials shall be placed in such a way to prevent damage to the trench, structures, drainage areas or private property. Excavated materials shall not be placed on private property unless written permission is obtained from the property Owner by the Contractor.

K. The Contractor shall remove, relocate or protect all structures including but not limited to signs, mailboxes, overhead and buried utilities and other structure in the path of work as required for construction whether shown on drawings or not. No extra compensation will be allowed for property damage, injury or loss of time due to obstructions encountered which are not shown on the plans.

L. The Contractor shall be responsible for any damage to curb, gutter, sidewalk, traffic control devices, pavement material, pavement markings and lawns. Any damage resulting directly or indirectly during construction shall be replaced in kind by the Contractor without additional compensation. The reuse of disturbed curb, gutter or sidewalk is prohibited. New sections shall be installed to the nearest undisturbed joint. Cost for replacement shall be included in the appropriate price bid.

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3.9 PIPELINE TRENCH BACKFILL

A. Materials excavated from the trench except topsoil shall be used for trench backfill, provided that, in the opinion of the Engineer, the excavated material is suitable for this purpose. Backfill material shall be free from large lumps, pavement, pieces of concrete and stones.

B. Suitable material, as approved by the Engineer, shall be carefully deposited in the trench by methods which will not damage or disturb the pipeline or structure, and shall be solidly tamped around the pipe or structure. Backfill material shall be placed in 6" loose layers and hand tamped until the top of pipe is covered by at least 12 inches of compacted material. Above this point, backfill material shall be placed in 8" loose layers. Compaction for 8" layers shall be accomplished by mechanical tampers or other approved methods. Care shall be taken in the use of mechanical tampers not to injure or move the pipe or to cause the pipe to be supported unevenly. Each layer shall be mechanically tamped for the full trench width unless an alternative method is approved in writing by the Engineer.

C. Every backfill layer shall be compacted to 95% of maximum density at -2 to +2% of optimum moisture content as determined by the Standard Proctor Test, ASTM D-698. Materials containing an excess of moisture shall be permitted to dry until the moisture

content is within the specified range. Materials too dry shall be wetted uniformly, at the Contractor's expense, until the moisture content is in the specified range.

D. No compacting shall be done when the material is too wet to be compacted properly. At such times, the work shall be suspended until the backfill materials have dried sufficiently to permit proper compaction or such other precautions shall be taken as may be necessary to obtain proper compaction. The Contractor is responsible for hauling, storing and drying of excavated material to be used in backfill operations within the prices bid.

E. The Contractor shall, at his own expense, maintain all refilled excavations in proper condition. Trench surfaces shall be reshaped when necessary. If the Contractor fails to make repairs within forty-eight (48) hours after receipt of written notice from the Owner, the Owner may refill said depression wherever necessary and the cost of so doing will be retained from any monies due or to become due the Contractor under the Contract. The Contractor shall be fully responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time prior to final acceptance.

F. All unauthorized excavations made by the Contractor shall be immediately backfilled in accordance with the requirements of the specifications for trench backfill at the Contractor's expense.

G. After completion of backfilling, all material not used shall be disposed of as approved by the Engineer, and all places on the line of the work shall be left clean and in good condition. This cleaning up shall be done by the Contractor without extra compensation. If he fails to do this work within a reasonable time after receipt of notice, it will be performed by the Owner, and the cost will be retained from the monies due the Contractor under the Contract.

H. No backfilling of pipelines will be allowed until measurements of pipe and an inspection has been performed by the Owner's representative, and until the Engineer has authorized the backfill. Any unauthorized backfill of pipelines shall be uncovered by the Contractor at his expense if required by the Engineer.

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3.10 EXCAVATION FOR STRUCTURES

A. Excavate for structures, walls, foundations, footings, etc., to the depth and width required for construction and stripping of forms. Structural excavation shall consist of the excavation of all earth, rock, boulders, existing concrete and masonry foundations and walls, and all other materials encountered regardless of type, which the Contractor may encounter. No extra compensation will be allowed for excavation greater than 3'0" outside the most exterior point of the structure.

B. The sides of the excavation shall be practically plumb and shall not be sloped unless approved in writing by the Engineer. Sides shall be supported or sheeted as required to protect pavement surfaces, curbing, utilities, structures, etc., and required for safety. Safety regulations shall be as required by State safety codes and OSHA. Refer to Part 3.17 of this section for Sheeting, Shoring, and Bracing.

C. In paved areas, the Contractor shall remove the paving only as necessary for the excavation of the structure or as detailed. Pavement edges at the structure shall be saw cut neat, straight, and to the full depth of paving prior to the start of any excavation. Should the Contractor disturb or damage pavement for a greater width than detailed on the drawings or should pavement damage result from cave-ins, settlement, etc., the Contractor shall replace such paving at his own expense.

D. In non-paved areas, strip surface vegetation and suitable topsoil and place in stock piles which are separated from the trench excavated materials. Topsoil shall not be used for general trench refill.

E. Should work be stopped for any reason and any excavation is left open for an unreasonable length of time, the Contractor shall refill the excavation at his own expense if so directed by the Engineer, the Inspector or the Owner. He shall not reopen the excavation until he is ready to complete the facility. Should the Contractor refuse or fail to refill any excavation completely within forty-eight (48) hours, or immediately if it poses a safety hazard, after a proper notice has been given by the Engineer or Inspector, the Owner shall be authorized to do the work. The resulting expenses shall be deducted from monies due the Contractor.

F. The Contractor shall complete excavation as nearly as practicable to the depths of the structure to be installed as detailed. All cavities in the bottom of the excavation shall be filled to the required level with compacted crushed stone or gravel. Unless the cavities have been made on direction of the Engineer and classified as "Excavation Below Sub-grade" for unsuitable material, no extra compensation shall be due the Contractor.

G. Excavated materials shall be graded, hauled, stored and protected as such material found suitable will be required for backfilling, or other purposes. Material classified as unsuitable shall be disposed of by the Contractor at the end of the project at a location approved by the Engineer. Hauling of excavated materials for any purpose shall not entitle the Contractor to additional compensation. Only those excavated materials designated by the Owner shall become property of the Contractor.

H. All stockpiled materials shall be placed in such a way to prevent damage to the structures, drainage areas or private property. Excavated materials shall not be placed on private property unless written permission is obtained from the property Owner by the Contractor.

I. The Contractor shall remove, relocate or protect all structures including but not limited to signs, mailboxes, overhead and buried utilities and other structure in the path of work as required for construction whether shown on drawings or not. No extra compensation will be allowed for property damage, injury or loss of time due to obstructions encountered which are not shown on the plans.

J. The Contractor shall be responsible for any damage to curb, gutter, sidewalk, traffic control devices, pavement material, pavement markings and lawns. Any damage resulting directly or indirectly during construction shall be replaced in kind by the Contractor without additional compensation. The reuse of disturbed curb, gutter or sidewalk is prohibited. New sections shall be installed to the nearest undisturbed joint. Cost for replacement shall be included in the appropriate price bid.

Not Issued For Bidding

3.11 BACKFILL FOR STRUCTURES

A. Backfill around structures with suitable material from the excavation to the original surface grades shown on the plans or defined by the Engineer. If additional material is needed to backfill around the structure, Special Off-Site Backfill approved by the Engineer shall be furnished and placed by the Contractor within the lump sum price bid.

B. No backfill shall be placed against new concrete or masonry structures until properly cured.

C. Backfill shall be placed in eight (8) inch loose layers and compacted by mechanical tampers or other approved methods. Compaction shall conform to the requirements for compaction already set forth in this specification.

D. The Contractor shall exercise caution in backfill and compaction to prevent damage to structures.

Not Issued For Bidding

3.12 GRADING

A. PREPARATION

1. Prepare subsoil surface for finish grading by dressing and shaping to provide for uniform placement of topsoil or other surface as specified.
2. Cut and fill to within 0.2 foot of the correct sub-grade elevations. Set elevation to top of sub-grade under paved areas to bottom of the pavement base. Set elevation of the top of sub-grade under areas to receive topsoil, 4 inches below finished grades.
3. Furnish additional material required for rough grading, backfill or fill.
4. Remove surface rock or other foreign objects exceeding 2 inches in greater dimension. Dispose of such rock and debris in a lawful manner off-site.
5. Provide smooth transition between existing adjacent grades and new grades.

B. PERFORMANCE

1. Placement of Topsoil: Place topsoil over areas indicated for new grading contours. However, before topsoil construction work in these areas shall have been completed. Observe precautions as follows:

    a. Do not place topsoil over areas indicated to receive paving or sidewalk.
    b. Do not work topsoil or liner material while frozen or wet. Do not work materials in a dusting condition but moisten same to prevent a dust nuisance.
    c. Scarify subsoil to a depth of 2 inches for bonding topsoil with subsoil.
    d. On sloped areas, work topsoil or liner material into subsoil to blend so as to eliminate any semblance of slip-planing between the two soils; but leave a sufficient cover of topsoil to insure seed germination. Perform such blending of soils by ridging or serrating the subsoil on the slopes.
    e. Place topsoil as needed for dressing-up minor depressions due to settling and erosion and to eliminate any other minor regularities.

2. Finished Elevations and Lines of Grassed Areas: Grade topsoiled areas of the site to within a tolerance of 1 inch of the elevations and lines indicated and in accordance with the following.

   a. Grade a uniform longitudinal fall in swales and other surface drainage areas to provide a drainage flow line that can easily be maintained and traversed with normal lawn maintenance equipment.
   b. Establish finish grade of topsoil ½ to 3/4 inches below top of abutting walks or paving to provide positive drainage of same.
   c. Place and grade topsoil to a depth not less than 4 inches nor greater than 12 inches.
   d. Compaction: Compact finish grades as the final operation using a light roller weighing not over 120 pounds per foot-width of roller.
   e. Tillage: Till finish graded soil over areas indicated for lawn regardless of type of lawn work performed. Use equipment and methods common to such work and till soil to a two inch depth minimum.
   f. Seed and mulch in accordance with Section 323400 and the project plans.

Not Issued For Bidding

3.13 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. Compaction and Density testing shall be coordinated by the Contractor with the Engineer and performed by an independent testing agency approved by the Engineer. The Contractor shall pay the testing laboratory for all tests performed inclusive of sample collection, preparation and transportation. Whenever test results indicate compaction densities less than specified, the Contractor shall, at his own expense, secure the specified compaction and subsequent retesting with methods approved by the Engineer. The testing agency, so employed by the Contractor, shall submit a copy of all testing reports directly to the Engineer. Each report shall contain the project identification name and number, name of Contractor, name of testing agency, and location of sample tested by station, location and depth as minimum.

B. Perform field in-place density tests according to ASTM D 1556 (sand cone method) ASTM D 2167 (rubber balloon method) or ASTM D 2937 (drive cylinder method), as applicable.

   1. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.

C. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Engineer.

D. Footing Sub-grade: At footing sub-grades, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing

sub-grades may be based on a visual comparison of each sub-grade with related tested strata when acceptable to the Engineer.

E. Paved and Building Slab Areas: At sub-grade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

F. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 100 feet or less of wall length, but no fewer than two tests along a wall face.

G. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 200 feet or less of trench, but no fewer than two tests.

H. When testing agency reports that sub-grades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

Not Issued For Bidding

3.14 MISCELLANEOUS EXCAVATION AND BACKFILL

A. The Contractor shall do such miscellaneous excavation as may be necessary or directed. Such excavation shall be subject to the same conditions and requirements as specified for trench excavation.

B. Miscellaneous Excavation shall include the digging of test pits, extra width of trench beyond the specified trench payment width made necessary by change in its alignment, or excavation for any special structures outside the trench that may not be shown on the drawings or described in the specifications, where such excavation is done at the direction of the Engineer.

C. Test pits shall be dug by the Contractor whenever directed to determine location, depth or materials of existing utilities. The depth and size of test pits shall be such as required by the Engineer.

D. Test pits shall also be dug by the Contractor, as authorized by the Engineer, along the lines of the trenches as shown on the drawings in advance of the excavation, or prior to use of mechanical moles, for the purpose of satisfying himself as to the location and elevation of underground obstructions or conditions.

E. Test pits dug which are noted on the project plans or in advance of pipe laying operations to verify utility locations or additional excavation required to use sheeting or trench boxes shall be included in the prices bid in the proposal.

3.15 EXCAVATION BELOW SUBGRADE AND GRAVEL REFILL

A. Materials below the excavation limit for pipelines and structures (below sub-grade), which in the judgment of the Engineer should be removed, shall be removed as directed.

All spaces created by the removal of unsuitable material below sub-grade shall be refilled and compacted with crushed stone or gravel, specified in paragraph 2.5 of this section. Payment for Excavation Below Sub-grade and Gravel Refill shall be made at the unit price bid only for the length width and depth authorized.

B. Should the Contractor elect to excavate suitable material below sub-grade and install stone for the purpose of securing a dry trench bottom, in lieu of dewatering by mechanical methods, no payment will be made for Excavation Below Sub-grade and Gravel Refill.

3.16 DEWATERING

A. All excavations must be kept free of water below the sub-grade of the work while work is in progress. This may be accomplished by ordinary pumping methods or by well points, whichever will produce the required results. The Contractor shall obtain all necessary dewatering permits at no additional expense. Upon removal of dewatering equipment, the Contractor shall backfill all holes and restore disturbed areas to their original condition.

B. Dewatering for the structures and pipelines shall commence when groundwater is first encountered and shall be continued until such time as backfill has been completed. No concrete or pipe shall be laid in water nor shall water be allowed to rise over them until the concrete or mortar has set at least eight (8) hours. Groundwater shall not be allowed to rise around the pipe until the trench is backfilled.

C. The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed of in such a manner as not to be a menace to the Public Health.

D. In the event the Contractor's dewatering operations affect any water supplies within the project area, the Contractor shall take whatever steps that may be required to provide uninterrupted water service.

E. The Contractor shall remove any siltation deposits in storm sewer systems, resulting from his dewatering or construction operations. He shall also be responsible for conveyance of dewatering flows and for erosion and sediment control.

Not Issued For Bidding

3.17 SHEETING, SHORING AND BRACING

A. The Contractor shall furnish and install all sheeting, shoring and bracing and other protective systems necessary to insure safe working conditions, to prevent subsidence of earth and caving embankments, and to prevent damage to public and private property and structures. The Contractor is responsible for obtaining proper design of such protective systems. The Contractor shall employ an on-site "Competent Person" as defined by OSHA 1926.650 (b), who is responsible for, but not limited to: the locations and protection of underground installations; recognize and control hazards due to water accumulation; daily inspections of excavations, adjacent areas and protective systems;

determine the impact of distress and/or surcharge loads and adjust the protective systems accordingly.

B. Sheeting, shoring and bracing and other protective systems shall be removed as backfilling progresses, except at such locations as the Engineer may direct or approve it to be left in place.

C. The condition of all excavations made by the Contractor shall be the responsibility of the Contractor. No extra compensation will be allowed for property damage, injury or loss of time, due to excavation slides or cave-ins at any time under any circumstances.

D. The Contractor shall cut off any sheeting left in place, at least eighteen (18) inches below finished grade, and shall remove the material cut off without compensation.

E. Where necessary, in quicksand, soft ground, or for the protection of any structure or property, sheeting shall be driven to such depth below the bottom of the trench as may be required to protect all existing and/or proposed work.

F. The cost for furnishing, placing and removal of sheeting, shoring or bracing shall be included in the prices bid.

G. A trench box is an acceptable alternative for pipeline installation to sheeting, shoring or bracing providing such boxes conform, to safety codes and work is monitored by the Contractor's "Competent Person".

Not Issued For Bidding

3.18 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace material to depth directed by the Engineer; reshape and re-compact at optimum moisture content to the required density.

C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work and eliminate evidence of restoration to the greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

3.20 INSTALLATION OF DETECTABLE WARNING TAPE

Pipeline detectable warning tape shall be installed continuously above all underground utilities including but not limited to underground electrical wiring and duct banks, gas, oil, steam, telephone lines and duct banks, water mains, gravity sewer and force mains, chemical feed piping, stormwater mains, or other utility which may be installed or distributed as part of this project. Detectable tape of the color and label required by the particular utility shall be installed in 2 places, 12 inches above the pipe and 12 inches below the ground surface or as recommended by the tape manufacturer. Detectable tape shall be a minimum of 2" wide and be imprinted with the words "Warning! Underground (Utility Type) Below" continuously along the tape. Provide tape colors to utilities as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

END OF SECTION

Not Issued For Bidding