Guidance on Geotechnical Investigations for SMP Selection and Design

NYC DEP

January 2025

Objective

To provide an overview of geotechnical investigation requirements when designing SMPs in compliance with NYC DEP Stormwater Construction Permit.

- This presentation highlights procedural and technical guidance for various stakeholders throughout the Stormwater Permitting Process to ensure compliance with geotechnical investigation and design requirements.

- While all projects require baseline geotechnical analysis, content of this presentation is focused on the physical investigation for on-site projects that propose stormwater management practices (SMPs).

Overview

- ✓ **Identifying Key Personnel**
- ✓ **Introduction**
- ✓ **Preliminary Analysis**
- ✓ **Testing Requirements**
- ✓ **SWPPP Reporting**
- ✓ **Frequently Asked Questions**
- ✓ **Questions & Answer**

NYC Environmental Protection

Identifying Key Personnel

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NYC DEP STORMWATER PERMITTING PROCESS SUMMARY DIAGRAM

Version: November 12, 2024

Environmental Protection

Perform Geotechnical Investigation HERE

Phase I: SWPPP Application

Determine the need for a SWPPP

Pre-application meeting as necessary

Submit SWPPP Application

Revisions as required

SWPPP Application Review

SWPPP Acceptance Issued

Submit SWPPP Acceptance & NOI to NYSDEC

Phase II: Stormwater Maintenance Easement

Submit Draft Stormwater Maintenance Easement

Revisions as required

Draft Stormwater Maintenance Easement Acceptance

Submit Hard Copy of Final Stormwater Maintenance Easement

Final Stormwater Maintenance Easement Acceptance

File Stormwater Maintenance Easement

Phase III: Pre-Construction

Submit Permit Initiation Form

Revisions as required

Permit Initiation Review & Approval

Submit Permit Request Form

Revisions as required

Permit Request Review & Approval

Submit SWPPP Amendment

Phase IV: Active Construction

Send 7-Day Notification prior to Construction Start

Perform Project Construction

Perform QI Inspections & SMP Certification

Construction Inspections Performed

Address Any Permit Conformance Issues (on a rolling basis)

Complete Construction

Submit Permit Extension or Renewal

Submit Temporary Shutdown Request

Phase V: Construction Close-Out

Perform Final Close-Out Inspection

Prepare As-Built Plans

Submit NOT & Submit Stormwater Maintenance Permit

Final Construction Inspection Performed

NOT Form Signed & Stormwater Maintenance Permit Approval

Submit NOT to NYSDEC

Phase VI: Post- Construction

Perform Routine Inspection & Maintenance

Periodic Inspections Performed

Submit Annual Certification or Permit Renewal

Annual Certification or Permit Renewal Approval

Legend

- **Project Team** Action Item
- **DEP** Action Item
- Step Applicable for SMP Projects
- Step Applicable for MS4 Projects
- Indicates Required Step
- Indicates Supplemental Step (as required)
- Guidance Material in Progress
- Download Approved Documentation

Primary Entity

- Owner/Developer
- Owner
- Qualified Professional
- Contractor
- Qualified Inspector

Note: This summary diagram is not intended to show all potential sub-steps. While the primary entity typically leads a particular step, other entities may also be involved in that step.

Identifying Key Personnel

Personnel Defined

Note:

The Owner and Developer may be the same person or entity. When a responsibility can be performed by *either* the Owner *or* the Developer, the term “Owner/Developer” is used.

Developer

Definition: Person or entity with operational control over the project during construction.

Responsible for: Tracking and complying with Stormwater Construction Permit requirements, such as ensuring geotechnical investigation is performed **prior** to SMP design by the appropriate personnel, as well as coordinating between project personnel.

Owner

Definition: Person or entity with legal title to the property on which the project is being constructed.

Responsible for: Obtaining all applicable permits and approvals related to conducting the geotechnical investigation. Ensuring the operation and maintenance of stormwater systems once constructed via appropriate planning and design.

Identifying Key Personnel

Personnel Defined

SWPPP Preparer

Definition: Qualified Professional knowledgeable in the principles and practices of stormwater management and treatment.

Responsible for: Preparing, signing, and sealing the SWPPP, including determining the geotechnical testing requirements for the project and designing SMP(s) based on findings and NYC DEP Stormwater Manual SMP hierarchy.

Licensure: The SWPPP Preparer must be a licensed Professional Engineer or Registered Landscape Architect (RLA) in the State of New York.

References:

1. *NYC DEP Stormwater Manual (February 2024)*

Identifying Key Personnel

Personnel Defined

Geotechnical Qualified Professional (QP)

Definition: Qualified Professional knowledgeable in the means and methods of a geotechnical investigation.

Responsible for: Supervising geotechnical investigation per NYS DEC requirements.

Qualification: The Geotechnical QP must be a registered Professional Engineer in the State of New York, Soil Scientist, or Geologist that is licensed in the State of New York.

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Introduction

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Introduction

Key Components

- Applicability
  - When is a geotechnical investigation required?
  - Why is a geotechnical investigation important?
- Overview
  - Which standards for geotechnical investigation must be used in NYC when designing a Stormwater Management Practice (SMP)?
  - What type of information is recorded from a geotechnical investigation?

Introduction

Applicability

On-site geotechnical investigations are required* when a stormwater management practices (SMP) is proposed to comply with the NYC DEP Stormwater Construction Permit.

Note:

* Geotechnical investigations are not required when a lot line building is proposed that does not increase impervious surface.

Introduction

Applicability

When a Stormwater Construction Permit is applicable, a Stormwater Pollution Prevention Plan (SWPPP) **must** be prepared. The contents of the SWPPP will depend on which of the following criteria apply:

Erosion & Sediment Control (ESC)

Goal: Designed to minimize discharge of pollutants during construction activities

Water Quality (WQ)

Goal: Aims to manage runoff from small, frequent storm events that can impact water quality

Runoff Reduction (RR)

Goal: Aims to preserve natural hydrologic functions

No-Net Increase (NNI)

Goal: Aims to reduce pollutants of concern in MS4 areas that discharge to an impaired waterbody

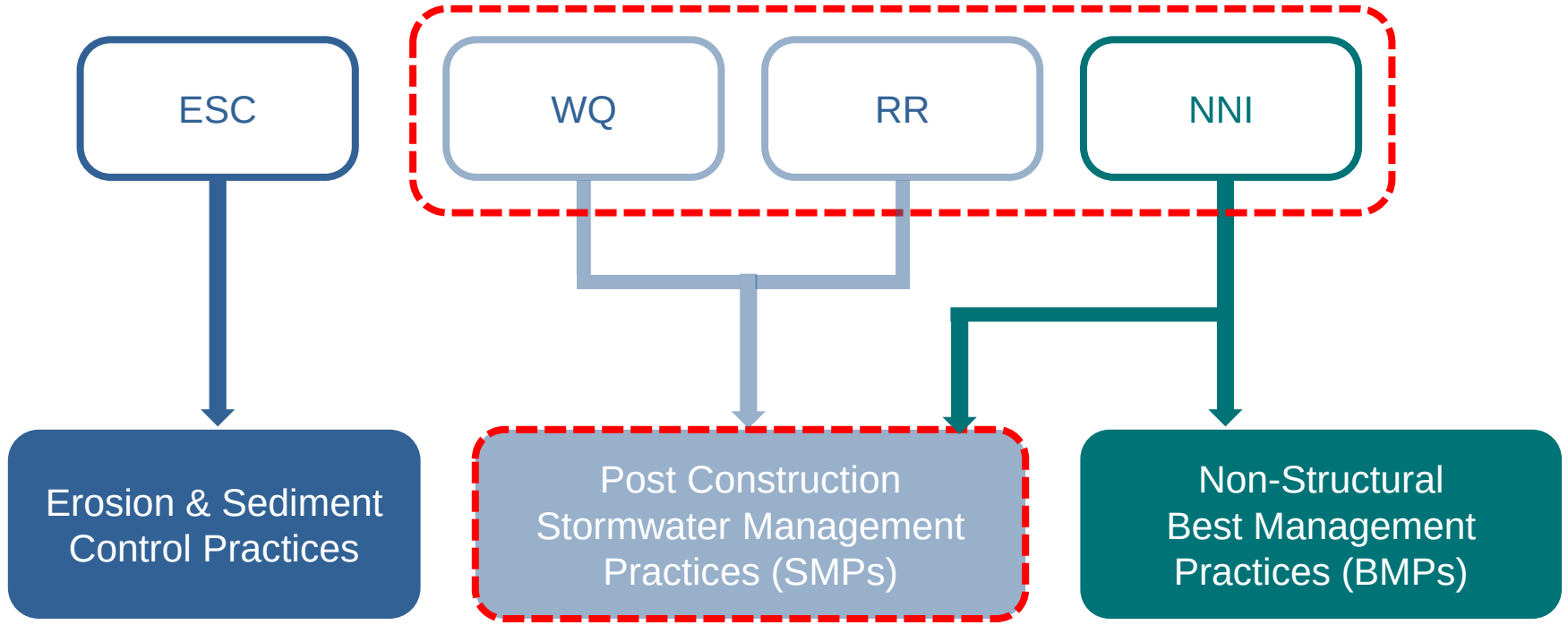
Sewer Operations (V_V & Q_{DRR})

Goal: Aims to manage runoff from larger storm events to maintain optimal flow rates in the City sewer system

Introduction

Applicability

It is the responsibility of the SWPPP Preparer to determine which SWPPP criteria apply based on project scope.

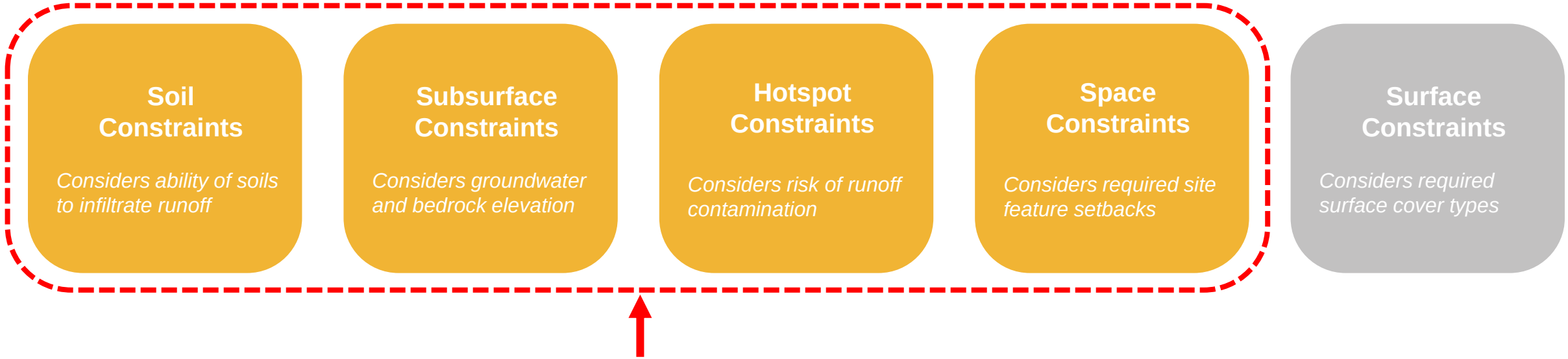


Introduction

Applicability

The type of proposed SMP should be determined based on a constraints analysis.

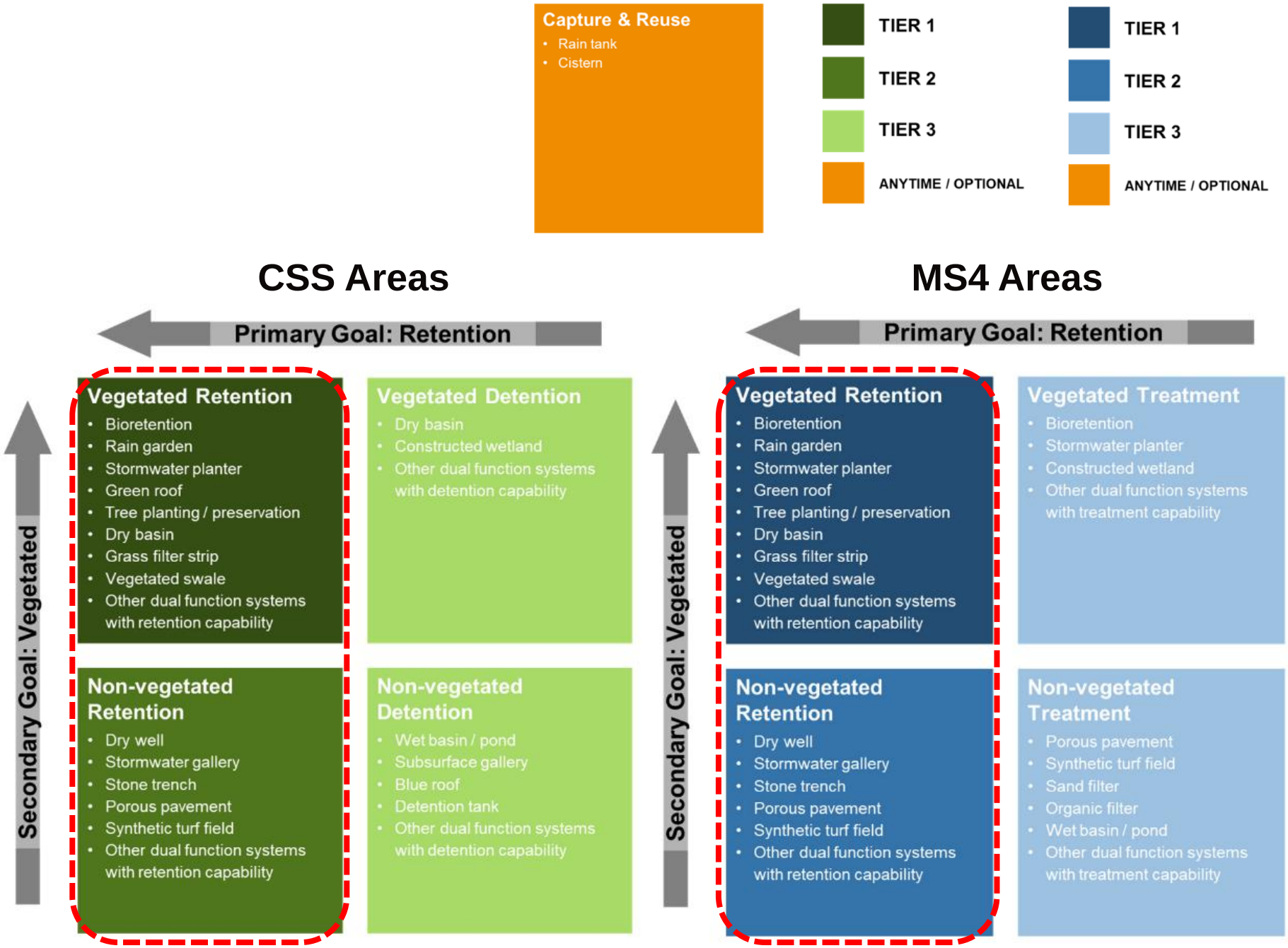
The SWPPP **must** document constraints analyzed that impact SMP selection.



A geotechnical investigation will inform on these constraints, which must be reported in the SWPPP.

Introduction
Applicability

- Higher tier **‘Retention’** systems (1 & 2) must be implemented to the maximum extent practicable before proposing lower tier SMPs
- Implementation of most retention SMPs require sufficient infiltration rates, confirmed through the geotechnical investigation



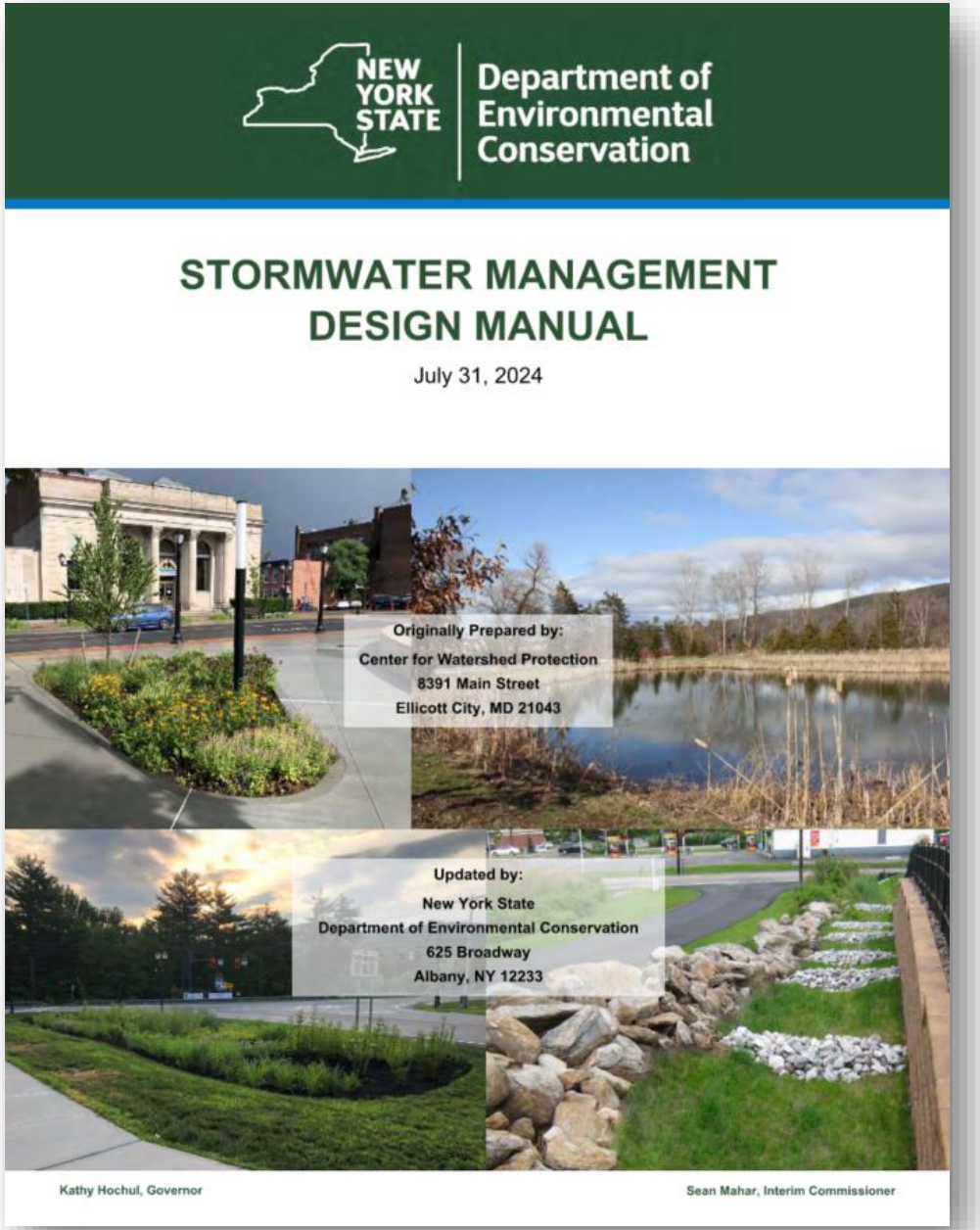
References:

1. *NYC DEP Stormwater Manual (February 2024)*

Introduction

Overview

NYC DEP will accept geotechnical investigation results when performed in accordance with requirements of the NYS Stormwater Management Design Manual Appendix D (July 2024).

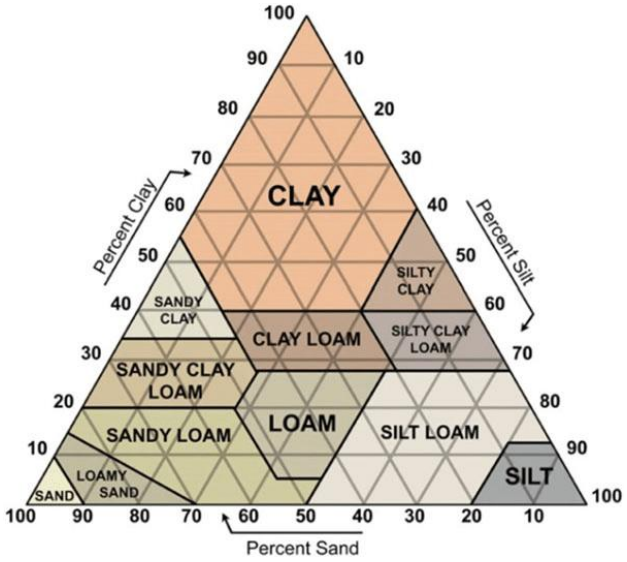


References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Introduction
Overview

- Results from the geotechnical investigation will help determine SMP type and design
- To aid SMP design, the Geotechnical QP must ensure the following information is recorded, at a minimum:
  - ✓ Soil Properties
  - ✓ Infiltration Rates
  - ✓ Depth to Bedrock
  - ✓ Depth to Groundwater



USDA Soil Textural Classes (*NRCS USDA Soil Health Guide*)

Note:

Soil properties should include:

- Soil color
- Soil texture (i.e. sand, silt, clay)
- Soil structure (i.e. granular, platy, angular, etc.)
- Percentage of mottles (if present)
- Percentage of course fragments

Results will be utilized for SMP selection based on design requirements

Table 4.2. General design requirements for infiltration SMPs.

Design Parameter[a]	Bioretention	Rain garden	Stormwater planter	Tree planting/ preservation	Dry basin
MAX. loading ratio, practice-to-contributing area	1:20	1:5	1:20	1:4	1:40
MAX. contributing area	5 acre	1000 sf	15000 sf	400 sf	5 acre
MIN. infiltration rate of underlying soils	0.5 in/hr	0.5 in/hr	0.5 in/hr	0.5 in/hr	0.5 in/hr
Vertical separation from groundwater / bedrock[b]	3' MIN	3' MIN	3' MIN	-	3' MIN

References:

1. *NYC DEP Stormwater Manual (February 2024)*

Preliminary Analysis

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Preliminary Analysis

Key Components

- Process
  - How can multiple geotechnical mobilizations be avoided?
- Existing Conditions Review
  - What historical documents should be reviewed prior to drafting a boring plan?
  - What regulatory guidance should be reviewed prior to drafting a boring plan?
- Preliminary Mapping
  - How can existing documentation analysis be used to create a constraints map?
  - How can a preliminary constraints map be utilized to draft a boring plan?
- Results Review
  - What investigation results would trigger a modification to the boring plan?

Preliminary Analysis

Process

Recommend completing preliminary site assessment before creating a boring plan & conducting a geotechnical investigation.

Preliminary Analysis

Process

Tips to avoid multiple geotechnical investigation mobilizations:

- ✓ **Desktop analysis**
  of existing site conditions
- ✓ **Review regulatory guidance**
  that may impact SMP location & design
- ✓ **Create a preliminary constraints map**
  to determine where SMPs cannot be located
- ✓ **Create a preliminary boring plan**
  to ensure the minimum number of tests will be performed at all feasible SMP locations
- ✓ **Review results as they are performed**
  to confirm current investigation is consistent with historic borings

Note:

Important to consider how seasonal weather can impact groundwater level and permeability tests. Permeability testing should not be performed during freezing temperatures.

- ☑ **Desktop analysis**
- ☑ **Review regulatory guidance**
- ❑ Create a preliminary constraints map
- ❑ Create a preliminary boring plan
- ❑ Review results in the field

Preliminary Analysis

Existing Conditions Review

Existing documentation to review when creating preliminary boring plan related to SMP constraints:

Soil Constraints

Considers ability of soils to infiltrate runoff

Documentation Review:

- Past geotechnical investigation reports to understand existing soil conditions

Subsurface Constraints

Considers groundwater and bedrock elevation

Documentation Review:

- Past geotechnical investigation reports
- Structural test borings performed for foundations

Hotspot Constraints

Considers risk of runoff contamination

Documentation Review:

- Past Environmental Assessment reports identifying locations of potential contamination

Space Constraints

Considers required site feature setbacks

Documentation Review:

- Zoning guidance to delineate required SMP offset dimensions.

Surface Constraints

Considers required surface cover types

Documentation Review:

- Zoning guidance to determine required area of site elements
- Site Concept Plan

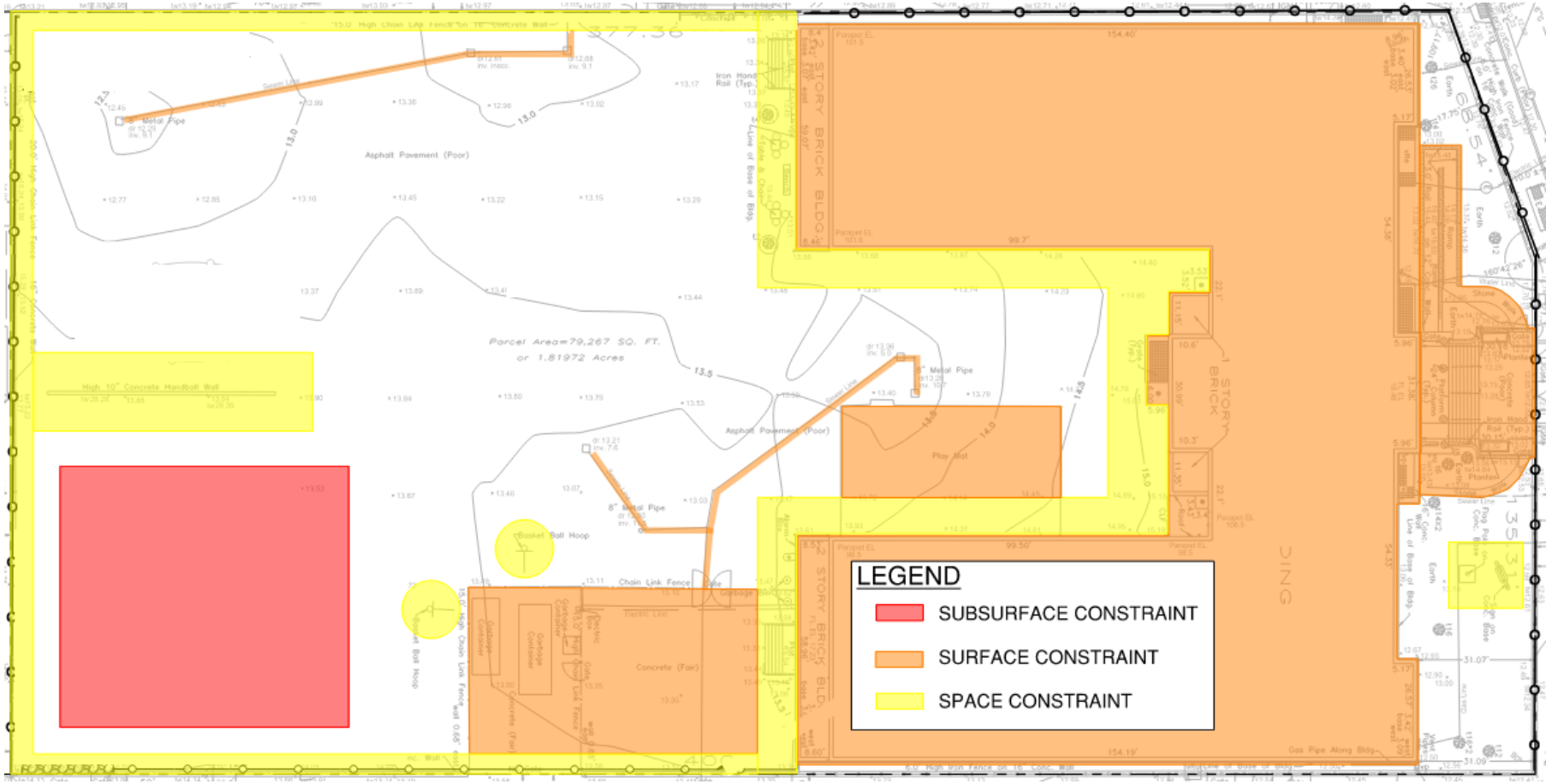
- [x] **Desktop analysis**
- [x] **Review regulatory guidance**
- [x] **Create a preliminary constraints map**
- [ ] Create a preliminary boring plan
- [ ] Review results in the field

Preliminary Analysis

Create a Preliminary Constraints Map

Preliminary Constraints Plan may include, but is not limited to:

- Offset from property lines
- Offset from foundations
- Restricted or required use areas
- Areas of contamination
- Areas of historical high groundwater or bedrock



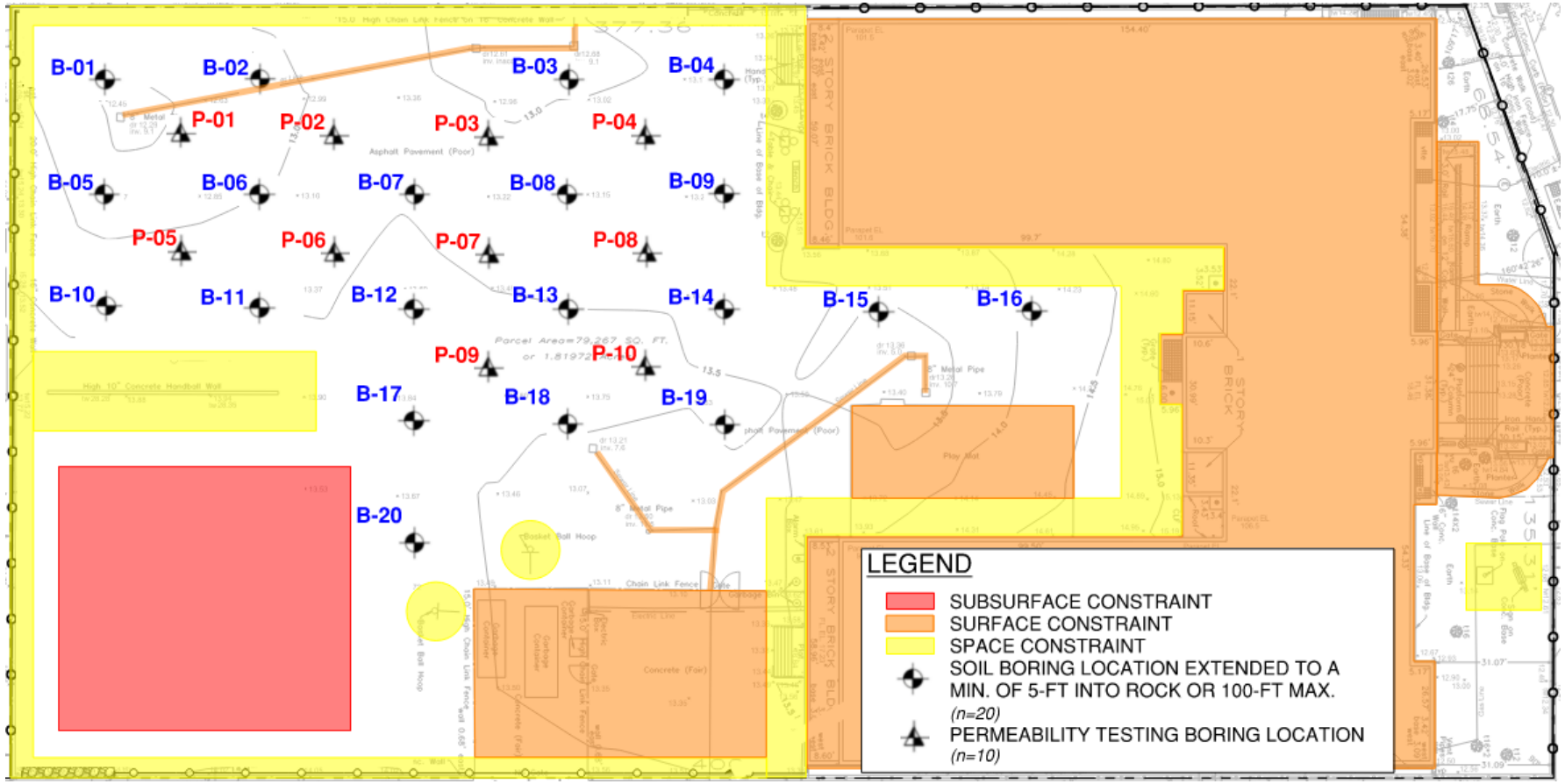
Preliminary Analysis

Create a Preliminary Boring Plan

- ☑ **Desktop analysis**
- ☑ **Review regulatory guidance**
- ☑ **Create a preliminary constraints map**
- ☑ **Create a preliminary boring plan**
- ❑ Review results in the field

Preliminary Boring Plan may include, but is not limited to:

- Soil Boring Locations avoiding existing site constraints
- Permeability Test Locations avoiding existing site constraints



- ☑ Desktop analysis
- ☑ Review regulatory guidance
- ☑ Create a preliminary constraints map
- ☑ Create a preliminary boring plan
- ☑ Review results in the field

Preliminary Analysis

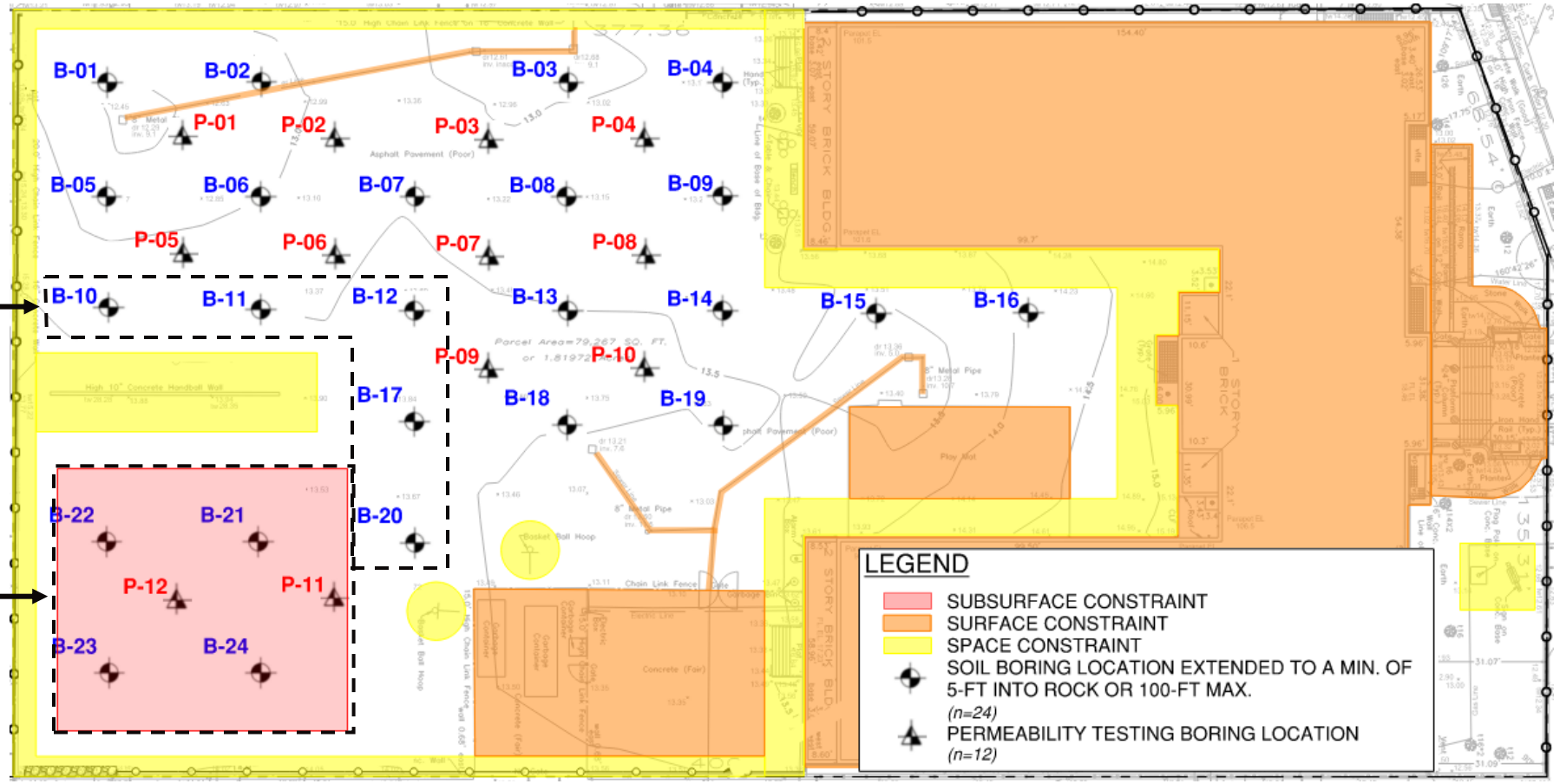
Review Results in the Field

Note #1

Borings results should be reviewed as they are performed to determine whether modification of the boring plan is required

Note #2

If field tests results are inconsistent with historical results, the boring plan will need to be modified to characterize current conditions



Testing Requirements

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Testing Requirements

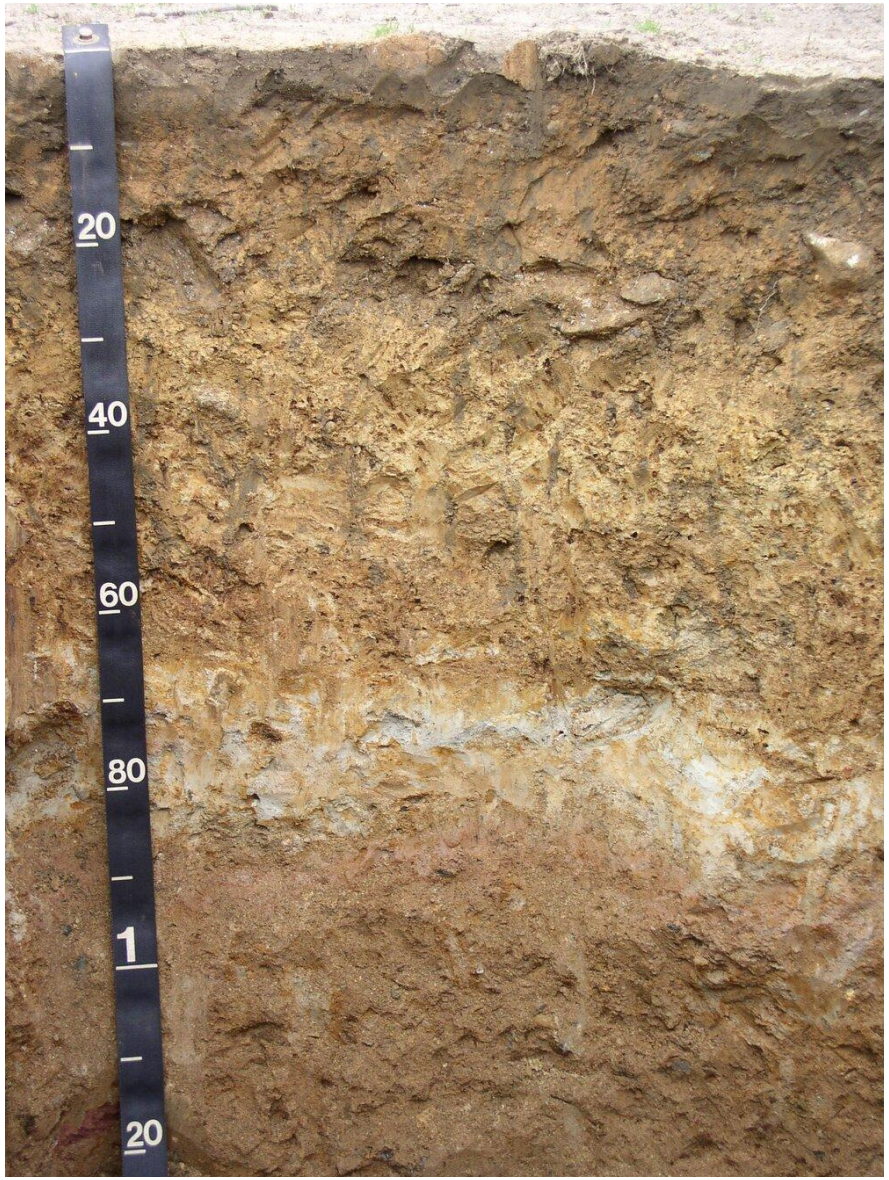
Key Components

- Methods
  - What testing is required during a geotechnical investigation?
- Testing Specifications
  - What are the requirements associated with compliant test pit and borings?
  - What are the requirements associated with compliant field permeability testing?
  - Are there alternative approaches to field permeability testing?

Testing Requirements

Methods

- NYS DEC Stormwater Management Design Manual Appendix D outlines two testing procedures; Feasibility Testing & Design Testing
- NYC DEP will **only accept Design Testing** results as a soil constraint for SMP selection
- Design Testing includes:
  - Test pits & borings which provide detailed information regarding seasonal high water table conditions, boundary (bedrock) conditions, & soil characterization; and
  - Permeability testing which provide infiltration rates



Test Pit Soil Profile

(Reference: https://urbansoils.org/blog-pedosphere/soils-and-the-city)

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

Methods

Type of Testing	Minimum Testing Requirement	Testing Results
Design Testing	Minimum quantity of tests pits/boring and permeability tests is dependent on area of practice.	• If the infiltration rate is ≥ 0.5 inch/hour, then the infiltration rate is **sufficient** to support infiltration practice. • If the infiltration rate is < 0.5 inch/hour, then the infiltration rate is **insufficient** to support infiltration practices. ○ The SMP should be designed as a non-infiltrating practice.

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Test Pit & Boring

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Testing Requirements

Test Pit/Boring Specifications

- Test pit must be excavated, or borings drilled, to:
  - 4-ft below the bottom of the SMP; **OR**
  - Seasonal high-water table or bedrock
- Samples must have a minimum 2” diameter
- Test locations must be staked for inspection and survey
- Soil classification should be in accordance with the USDA or USC classification

Reference: Site Photo

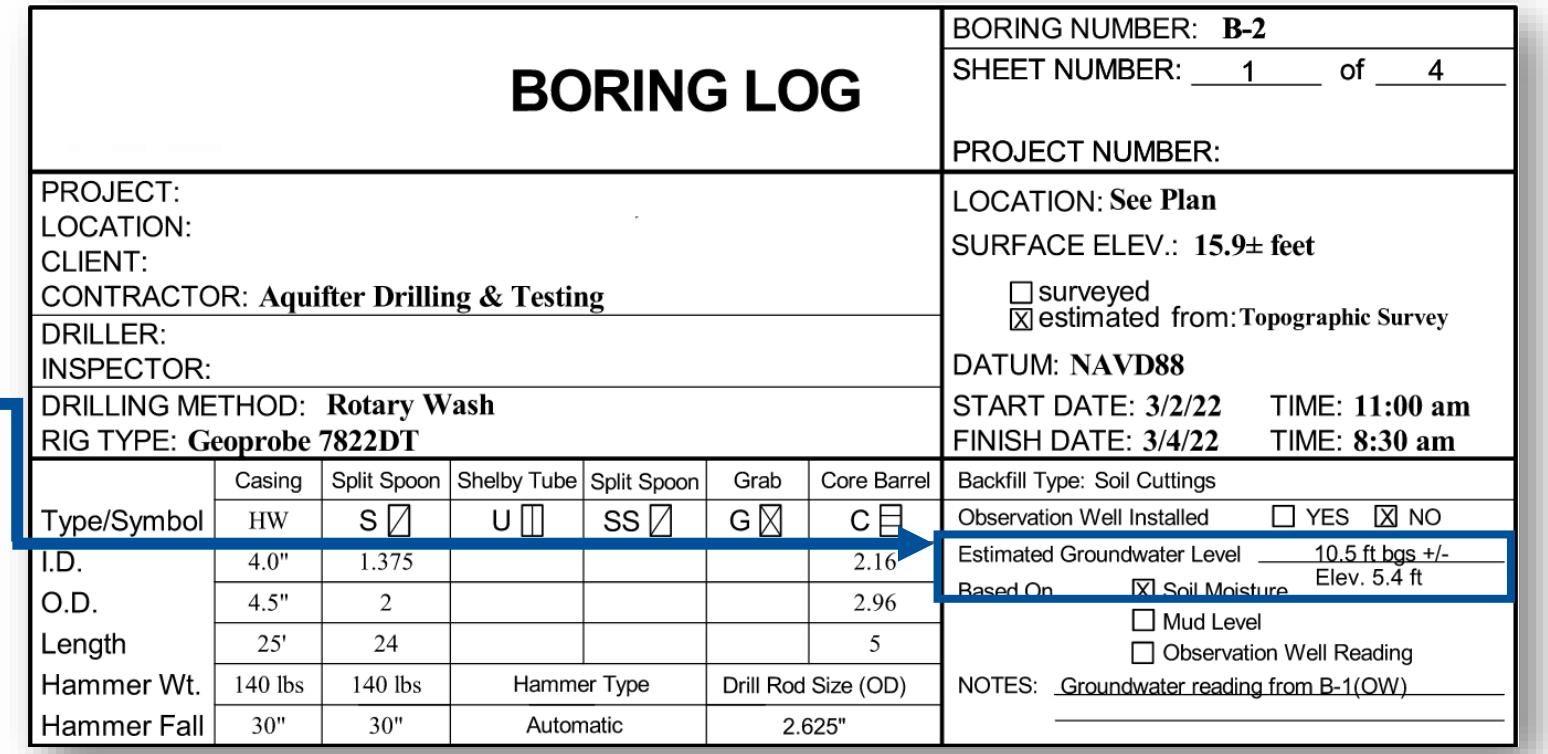
References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

Test Pit/Boring Logs

- Test pit/borings logs must determine the following parameters:
  - ✓ **Depth & Elevation to seasonal high-water table[A]**
  - ✓ USDA or USC System soil textures
  - ✓ Soil horizons and depth to bedrock[A]



BORING LOG

BORING NUMBER: **B-2**
SHEET NUMBER: 1 of 4
PROJECT NUMBER:

PROJECT:
LOCATION:
CLIENT:
CONTRACTOR: **Aquifter Drilling & Testing**
DRILLER:
INSPECTOR:
DRILLING METHOD: **Rotary Wash**
RIG TYPE: **Geoprobe 7822DT**

LOCATION: **See Plan**
SURFACE ELEV.: **15.9± feet**
☐ surveyed
☒ estimated from: **Topographic Survey**
DATUM: **NAVD88**
START DATE: **3/2/22** TIME: **11:00 am**
FINISH DATE: **3/4/22** TIME: **8:30 am**

	Casing	Split Spoon	Shelby Tube	Split Spoon	Grab	Core Barrel
Type/Symbol	HW	S ☒	U ☐	SS ☒	G ☒	C ☐
I.D.	4.0"	1.375				2.16
O.D.	4.5"	2				2.96
Length	25'	24				5
Hammer Wt.	140 lbs	140 lbs	Hammer Type		Drill Rod Size (OD)	
Hammer Fall	30"	30"	Automatic		2.625"	

Backfill Type: Soil Cuttings
Observation Well Installed ☐ YES ☒ NO
Estimated Groundwater Level 10.5 ft bgs +/- Elev. 5.4 ft
Based On ☒ Soil Moisture
☐ Mud Level
☐ Observation Well Reading
NOTES: Groundwater reading from B-1(OW)

Notes:

A. Results for this parameter will only be noted if encountered within the testing depths required.

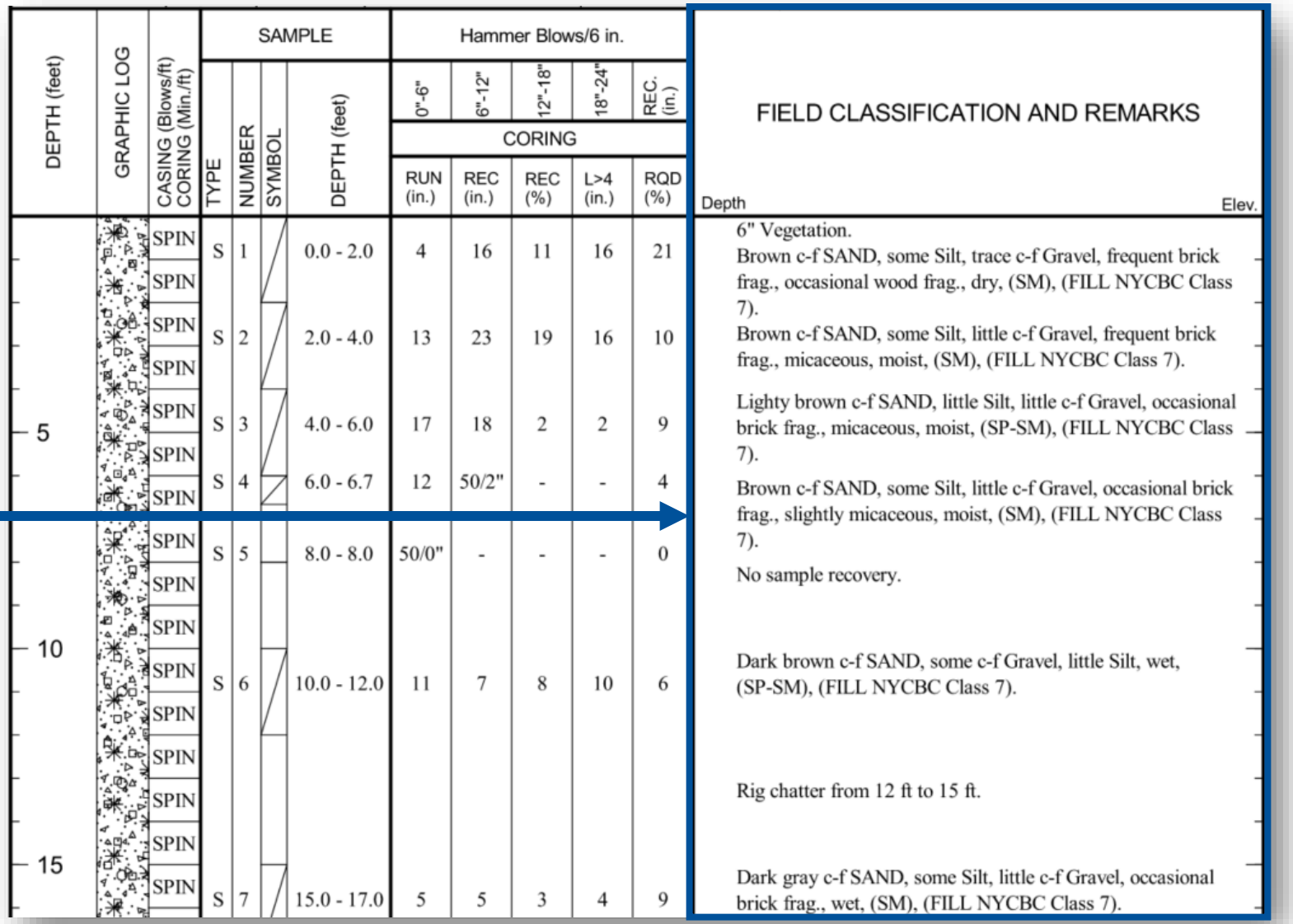
References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

Test Pit/Boring Logs

- Test pit/borings logs must determine the following parameters:
  - ✓ Depth & Elevation to seasonal high-water table[A]
  - ✓ **USDA or USC System soil textures**
  - ✓ Soil horizons and depth to bedrock[A]



DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	Hammer Blows/6 in. 0"-6"	6"-12"	12"-18"	18"-24"	REC. (in.)	FIELD CLASSIFICATION AND REMARKS
							CORING RUN (in.)	REC (in.)	REC (%)	L>4 (in.)	RQD (%)	Depth / Elev.
		SPIN	S	1		0.0 - 2.0	4	16	11	16	21	6" Vegetation. Brown c-f SAND, some Silt, trace c-f Gravel, frequent brick frag., occasional wood frag., dry, (SM), (FILL NYCBC Class 7).
		SPIN										
		SPIN	S	2		2.0 - 4.0	13	23	19	16	10	Brown c-f SAND, some Silt, little c-f Gravel, frequent brick frag., micaceous, moist, (SM), (FILL NYCBC Class 7).
		SPIN										
		SPIN	S	3		4.0 - 6.0	17	18	2	2	9	Lighty brown c-f SAND, little Silt, little c-f Gravel, occasional brick frag., micaceous, moist, (SP-SM), (FILL NYCBC Class 7).
5		SPIN										
		SPIN	S	4		6.0 - 6.7	12	50/2"	-	-	4	Brown c-f SAND, some Silt, little c-f Gravel, occasional brick frag., slightly micaceous, moist, (SM), (FILL NYCBC Class 7).
		SPIN	S	5		8.0 - 8.0	50/0"	-	-	-	0	No sample recovery.
		SPIN										
		SPIN										
10		SPIN	S	6		10.0 - 12.0	11	7	8	10	6	Dark brown c-f SAND, some c-f Gravel, little Silt, wet, (SP-SM), (FILL NYCBC Class 7).
		SPIN										
		SPIN										Rig chatter from 12 ft to 15 ft.
		SPIN										
		SPIN										
15		SPIN	S	7		15.0 - 17.0	5	5	3	4	9	Dark gray c-f SAND, some Silt, little c-f Gravel, occasional brick frag., wet, (SM), (FILL NYCBC Class 7).

Notes:

A. Results for this parameter will only be noted if encountered within the testing depths required.

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

Test Pit/Boring Logs

- Test pit/borings logs must determine the following parameters:
  - ✓ Depth & Elevation to seasonal high-water table[A]
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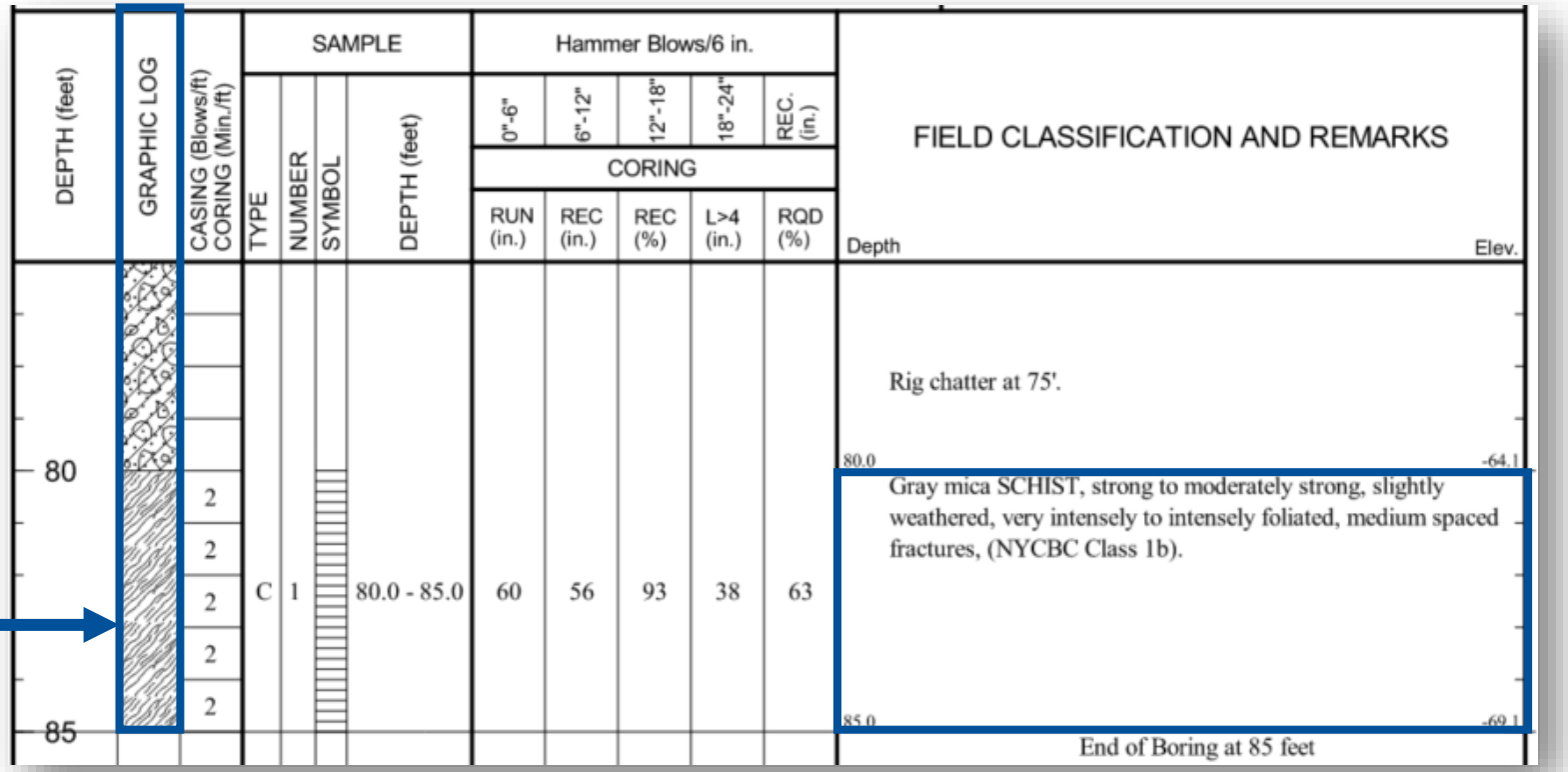

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References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Note:

Graphic logs generally represent the soil horizons.

Field Permeability

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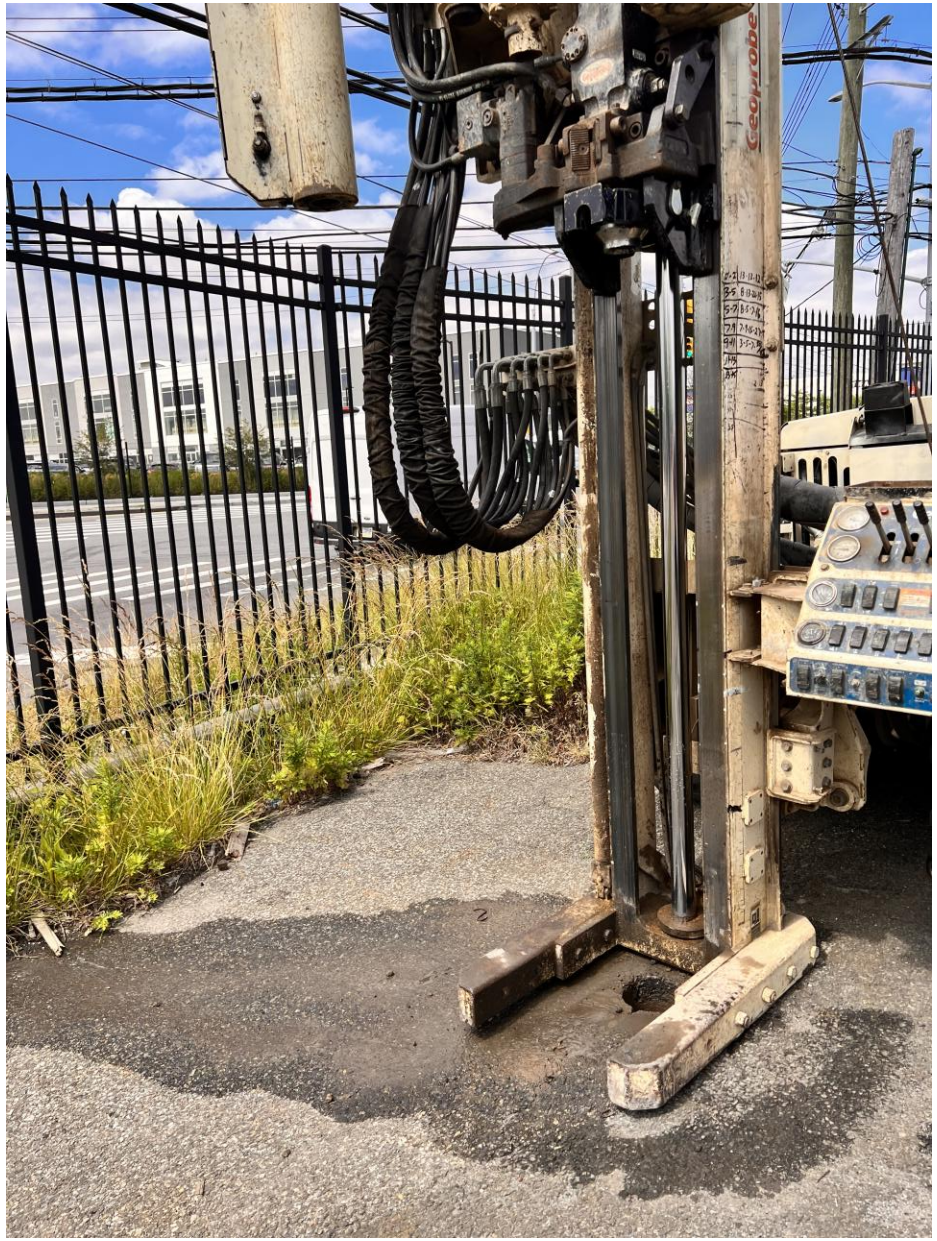
Testing Requirements

Field Permeability Specifications

- Test **only** measures infiltration (i.e. the movement of water into the soil profile)
- Permeability tests must be conducted at a depth 2-ft below the proposed bottom of SMP
  - Refer to NYS DEC Chapter 5 & 6 for separation requirements in areas of fractured bedrock
- Cannot be performed in the same borehole as the test pit/boring used for soil classification
  - Depending on drilling methodology, the test pit/boring procedure may impact infiltration results



Reference: Site Photo

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

Field Permeability Set-Up

1. **Excavate to proposed bottom of SMP**
2. Dig 12” diameter x 24” deep excavation at bottom
3. Insert casing (4” - 6” diameter x 30” length)
4. Fill casing with clean water to depth of 24”
5. Allow a pre-soak for 24 hours[A]

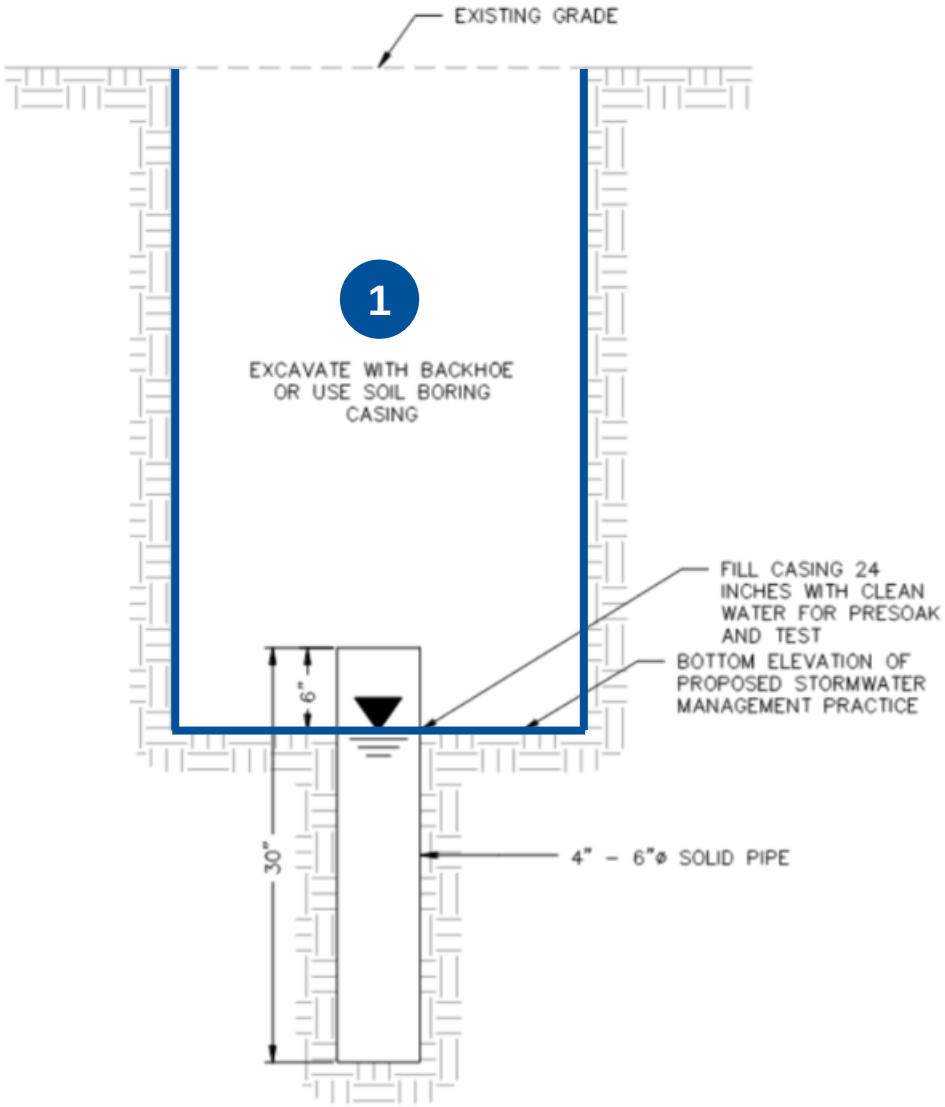


Figure D.1 Permeability Testing Requirements

Notes:

A. 24 hours, or until all water in the casing has infiltrated, whichever is earlier.

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

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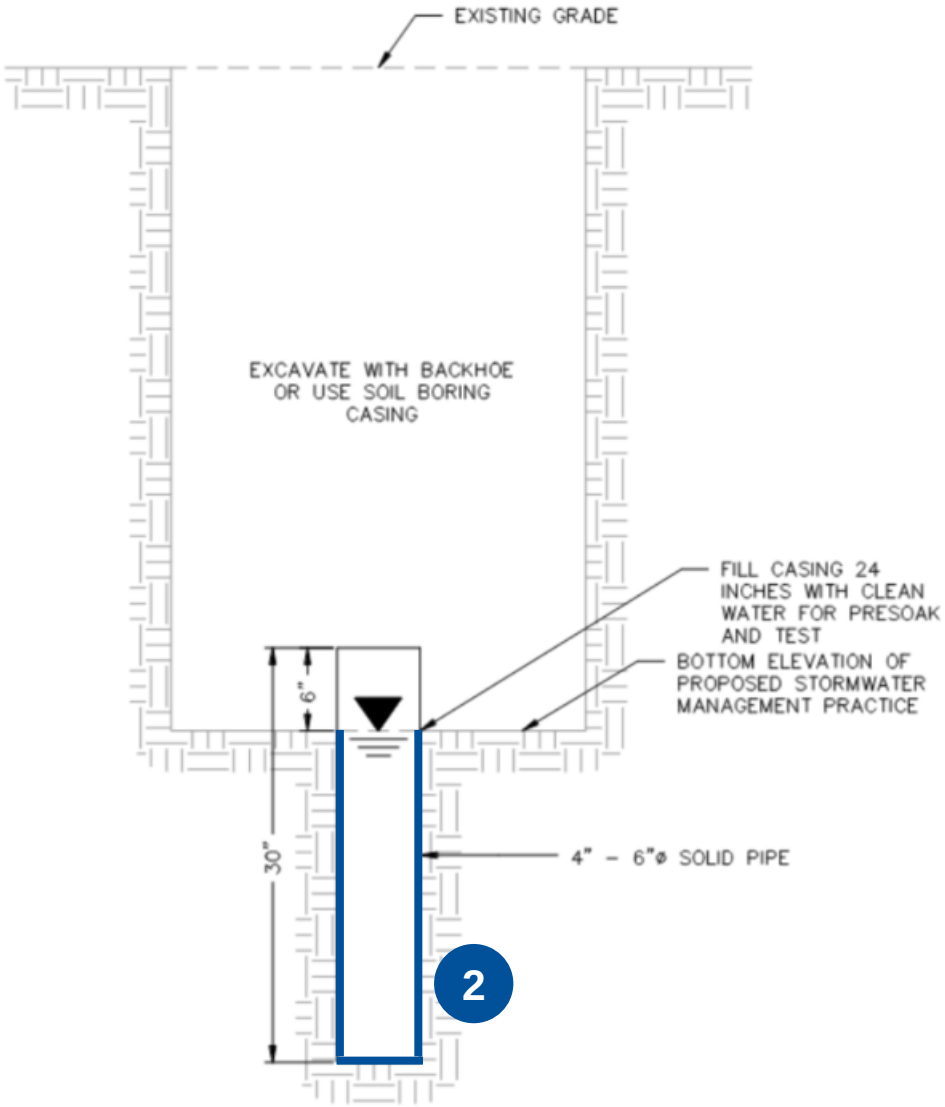

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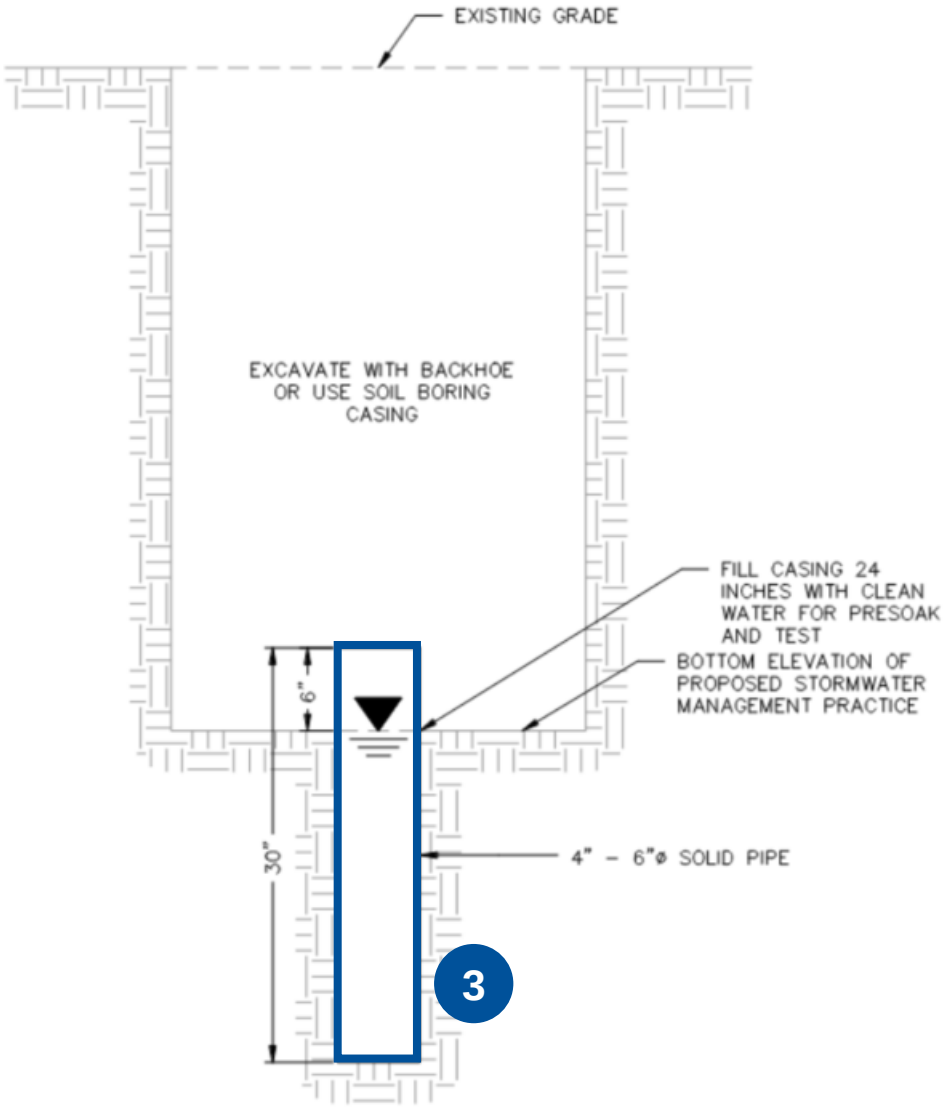

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4. **Fill casing with clean water to depth of 24”**
5. Allow a pre-soak for 24 hours[A]

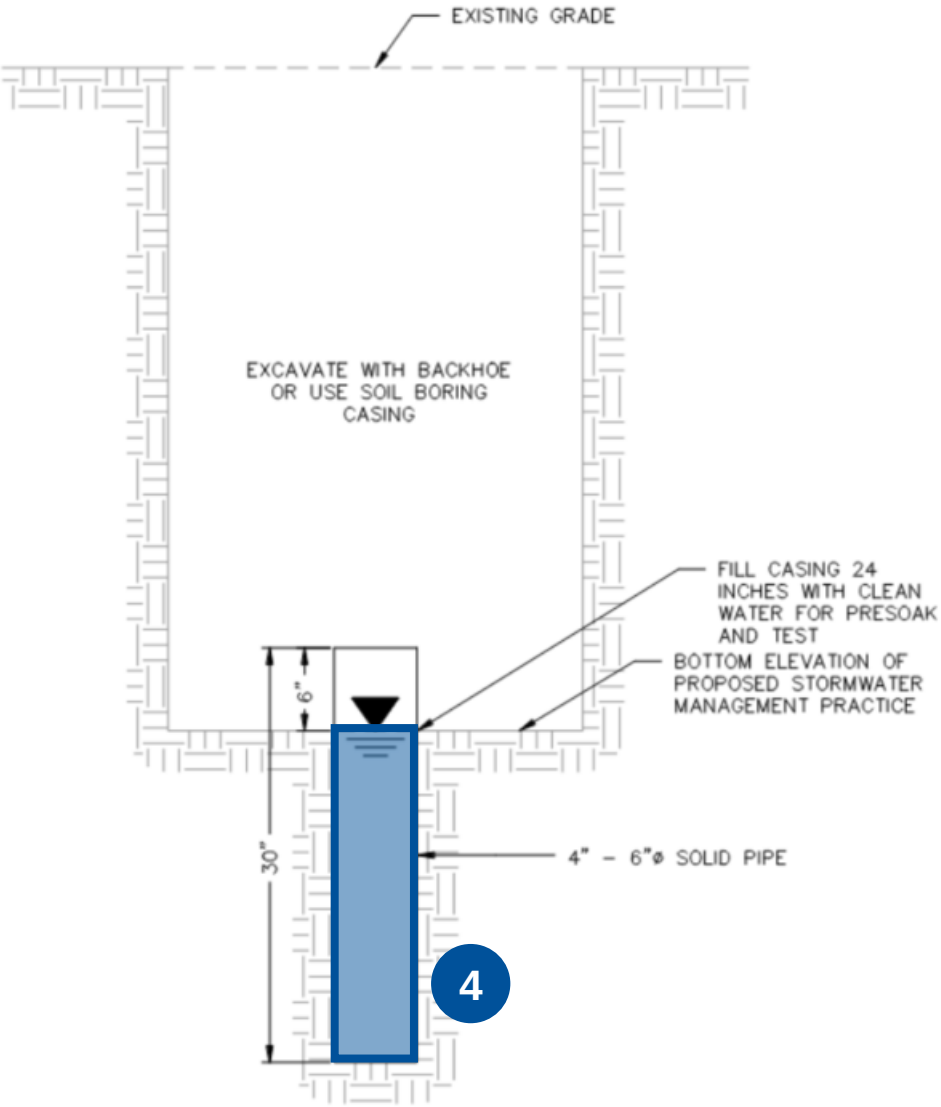


Figure D.1 Permeability Testing Requirements

Notes:

A. 24 hours, or until all water in the casing has infiltrated, whichever is earlier.

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

Field Permeability Set-Up

1. Excavate to proposed bottom of SMP
2. Dig 12” diameter x 24” deep excavation at bottom
3. Insert casing (4” - 6” diameter x 30” length)
4. Fill casing with clean water to depth of 24”
5. **Allow a pre-soak for 24 hours[A]**

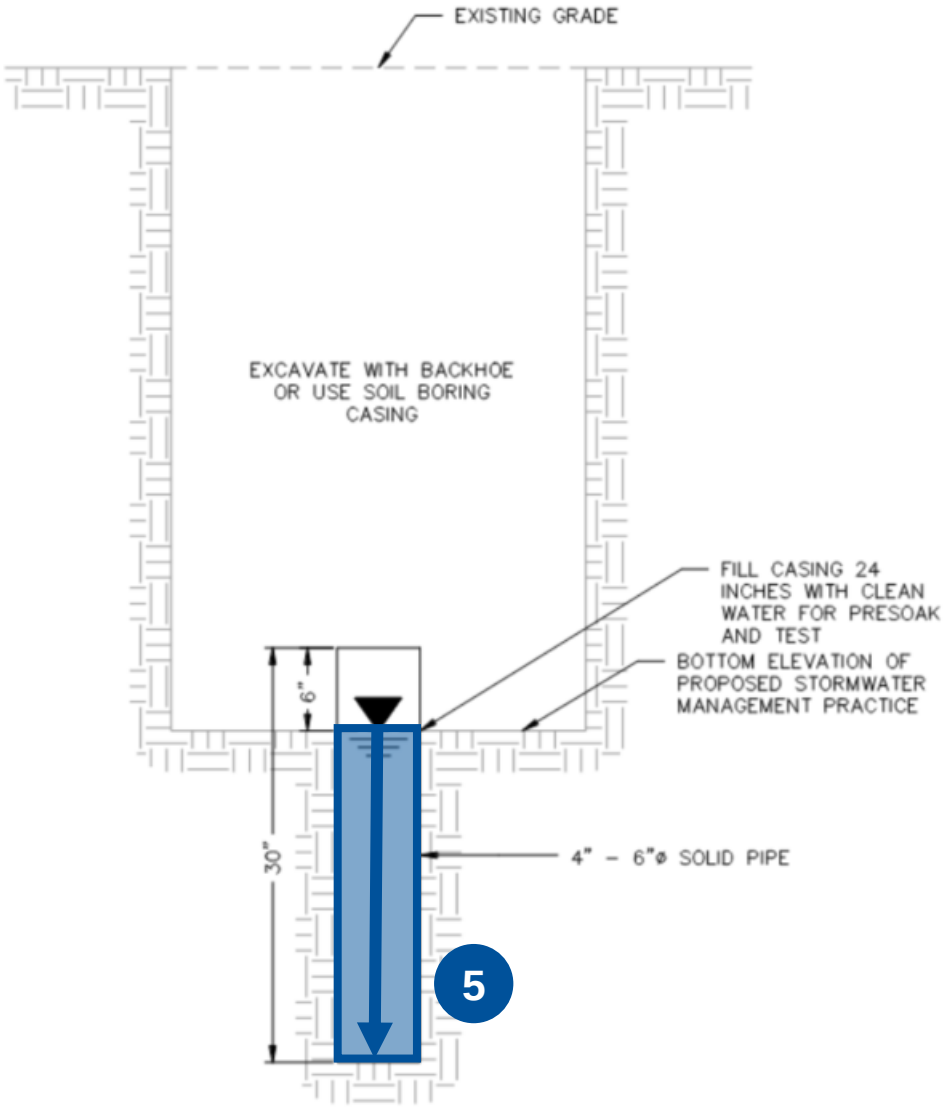


Figure D.1 Permeability Testing Requirements

Notes:

A. 24 hours, or until all water in the casing has infiltrated, whichever is earlier.

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

Field Permeability Procedure

6. Re-fill casing with clean water to depth of 24”
7. Monitor water level for 1 hour or until empty
8. Repeat Steps 6 & 7 a <u>minimum</u> of 3 additional times to achieve stabilized permeability rates (total of <u>4 runs</u>)
9. Report <u>lowest</u> stabilized rate per test in inches/hour
10. Remove casing & backfill excavation

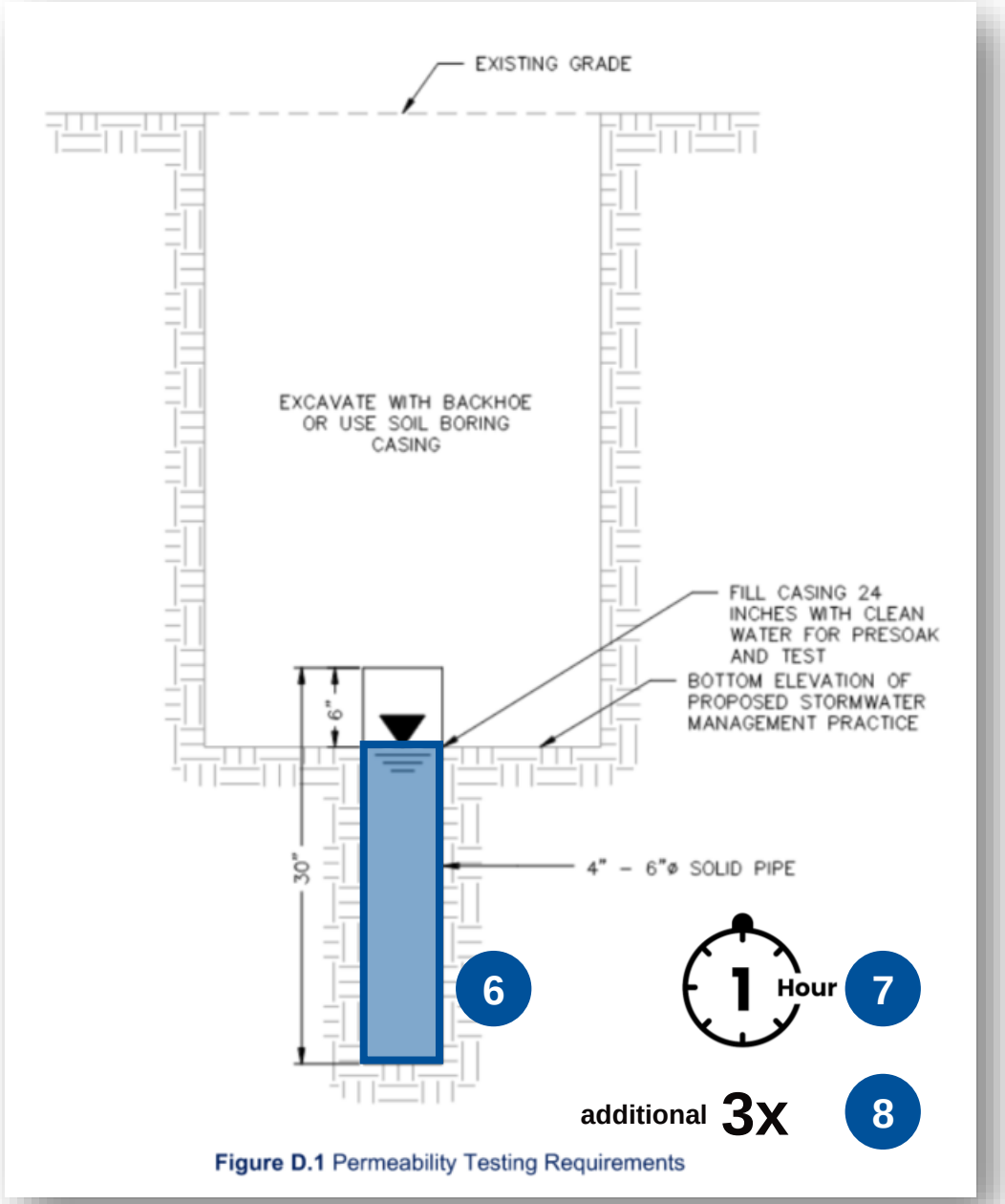


Figure D.1 Permeability Testing Requirements

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Testing Requirements

Field Permeability Procedure

When recording infiltration data:

1. Measurements should be taken from the top down
   i.e. top of the casing is 0" and the bottom is 30", therefore the water level is 6" at the start
2. Change in depth is calculated by the subtracting the initial depth from the final depth
3. Rate is calculated by dividing the change in depth by the change in time and converting to hours

* *Record the time if the water empties in less than 1 hour. If the hole empties and the time was not recorded, the test must be re-done.*

INFILTRATION TEST

Location:		**Test Hole No.:**	I-2
Project:		**Date:**	9/7/23 - 9/8/23
Application ID:		**Weather:**	Cloudy, 55 degrees
Qualified Professional:		**Surface Elevation:**	15.0
Casing Length:	30 inches	**Test Depth (Feet):**	6.0
Casing Inner Diameter:	4 inches	**Test Depth (Elevation):**	9.0

Run No.	Time (1)		Water Level Reading (inches) (2)		Water Level Fall (Inches) (3)	Time Interval	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	11:45 AM	8:00 AM	6.0	30.0	24.0	20.25 hr	---
1	8:13 AM	9:13 AM	6.0	18.0	12.0	60 min	12.0
2	9:14 AM	10:14 AM	6.0	15.0	9.0	60 min	9.0
3	10:14 AM	11:14 AM	6.0	8.5	2.5	60 min	2.5
4	11:20 AM	12:20 PM	6.0	8.25	2.25	60 min	2.25
5	12:25 PM	1:25 PM	6.0	8.0	2.0	60 min	2.0
6	1:30 PM	2:30 PM	6.0	8.0	2.0	60 min	2.0
Remarks:							Field *i* = 2.0 in/hr

Testing Requirements

Field Permeability Procedure

Stabilized rate is considered achieved when 2 successive tests are approximately equal

INFILTRATION TEST

Location: _____ Test Hole No.: I-2

Project: _____ Date: 9/7/23 - 9/8/23

Application ID: _____ Weather: Cloudy, 55 degrees

Qualified Professional: _____ Surface Elevation: 15.0

Casing Length: 30 inches Test Depth (Feet): 6.0

Casing Inner Diameter: 4 inches Test Depth (Elevation): 9.0

Run No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	11:45 AM	8:00 AM	6.0	30.0	24.0	20.25 hr	---
1	8:13 AM	9:13 AM	6.0	18.0	12.0	60 min	12.0
2	9:14 AM	10:14 AM	6.0	15.0	9.0	60 min	9.0
3	10:14 AM	11:14 AM	6.0	8.5	2.5	60 min	2.5
4	11:20 AM	12:20 PM	6.0	8.25	2.25	60 min	2.25
5	12:25 PM	1:25 PM	6.0	8.0	2.0	60 min	2.0
6	1:30 PM	2:30 PM	6.0	8.0	2.0	60 min	2.0
Remarks:							Field i = 2.0 in/hr

Testing Requirements

Field Permeability Procedure

When determining a stabilized rate, consider:

- If the rate has not stabilized in the initial tests, additional tests should be performed until stable.
- If the rate is continuing to slow down, additional tests must be performed until stable.
- If water is emptying the hole quickly, it may take longer to reach a stabilized rate.

INFILTRATION TEST

Location: _____ Test Hole No.: I-2

Project: _____ Date: 9/7/23 - 9/8/23

Application ID: _____ Weather: Cloudy, 55 degrees

Qualified Professional: _____ Surface Elevation: 15.0

Casing Length: 30 inches Test Depth (Feet): 6.0

Casing Inner Diameter: 4 inches Test Depth (Elevation): 9.0

Run No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	11:45 AM	8:00 AM	6.0	30.0	24.0	20.25 hr	---
1	8:13 AM	9:13 AM	6.0	18.0	12.0	60 min	12.0
2	9:14 AM	10:14 AM	6.0	15.0	9.0	60 min	9.0
3	10:14 AM	11:14 AM	6.0	8.5	2.5	60 min	2.5
4	11:20 AM	12:20 PM	6.0	8.25	2.25	60 min	2.25
5	12:25 PM	1:25 PM	6.0	8.0	2.0	60 min	2.0
6	1:30 PM	2:30 PM	6.0	8.0	2.0	60 min	2.0
Remarks:							Field *i* = 2.0 in/hr

Unstable

Stable

Testing Requirements

Acceptable Field Permeability Method

1. Drill casing directly to the relevant depth
2. Fill casing with clean water to depth of 24”
3. Allow a pre-soak for 24 hours[A]
4. Re-fill casing with clean water to depth of 24”
5. Monitor water level for 1 hour[B]
6. Repeat Steps 4 & 5 a minimum of 3 times to achieve stabilized permeability rates
7. Report lowest stabilized rate per test in inches/hr
8. Remove casing & backfill excavation

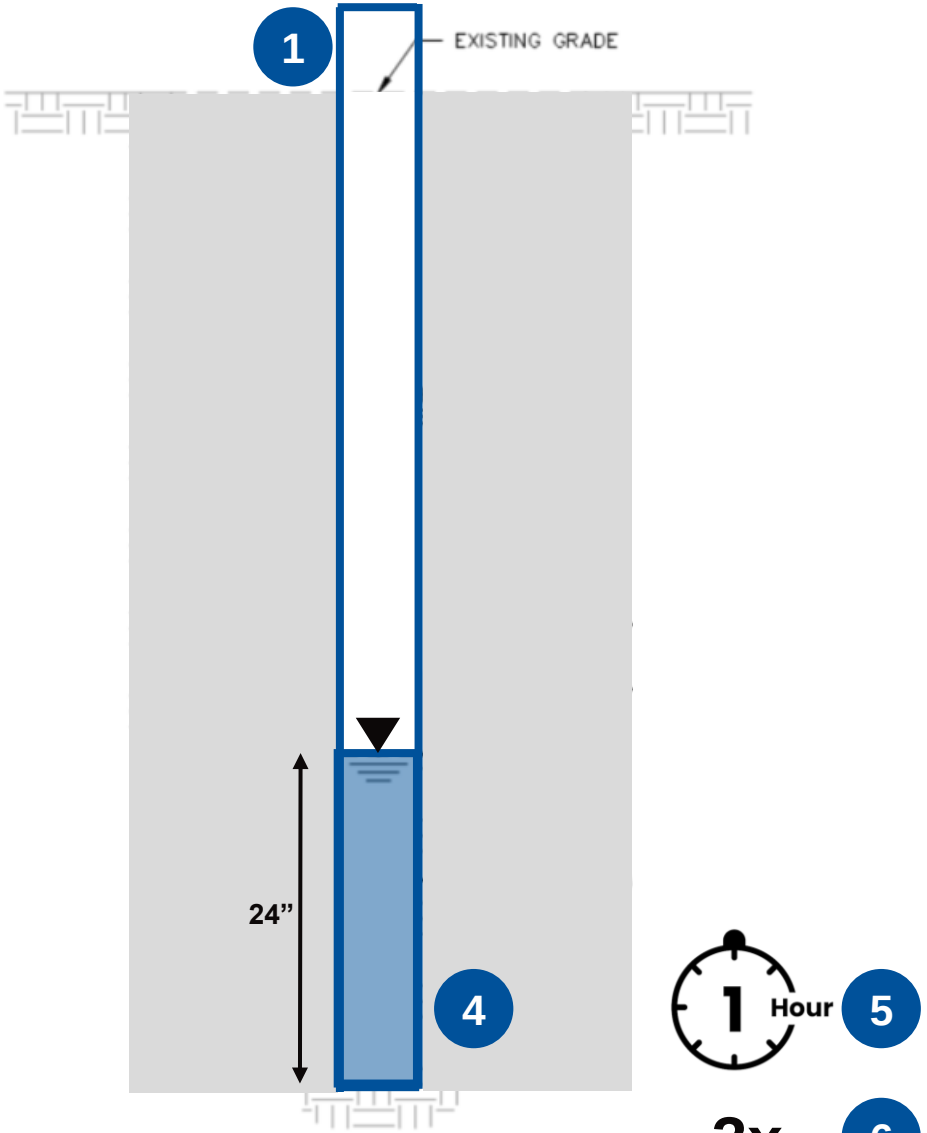


Figure D.1 Permeability Testing Requirements

Notes:

A. 24 hours, or until all water in the casing has infiltrated, whichever is earlier.
B. Monitor water level utilizing a measuring device that reads depth accurately.

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

Minimum Design Requirements

NYC Environmental Protection

Testing Requirements

Minimum Design Test Quantity

Minimum Design Testing Requirements[1]		
Area of Practice	**# of Test Pits/Boring**	**# of Permeability Testing**
< 2,500 ft	2	2
2,500 sf to <5,000 sf	2	3
5,000 sf to < 7,500 sf	3	4
7,500 sf to 10,000 sf	3	5
> 10,000 sf	Add 1 test pit/boring for each additional 5,000 sf of practice Add 1 permeability test for each additional 2,500 sf of practice	
Linear Practice	1 test pit/boring for each 250 linear feet of practice 1 permeability test for each 250 linear feet of practice	

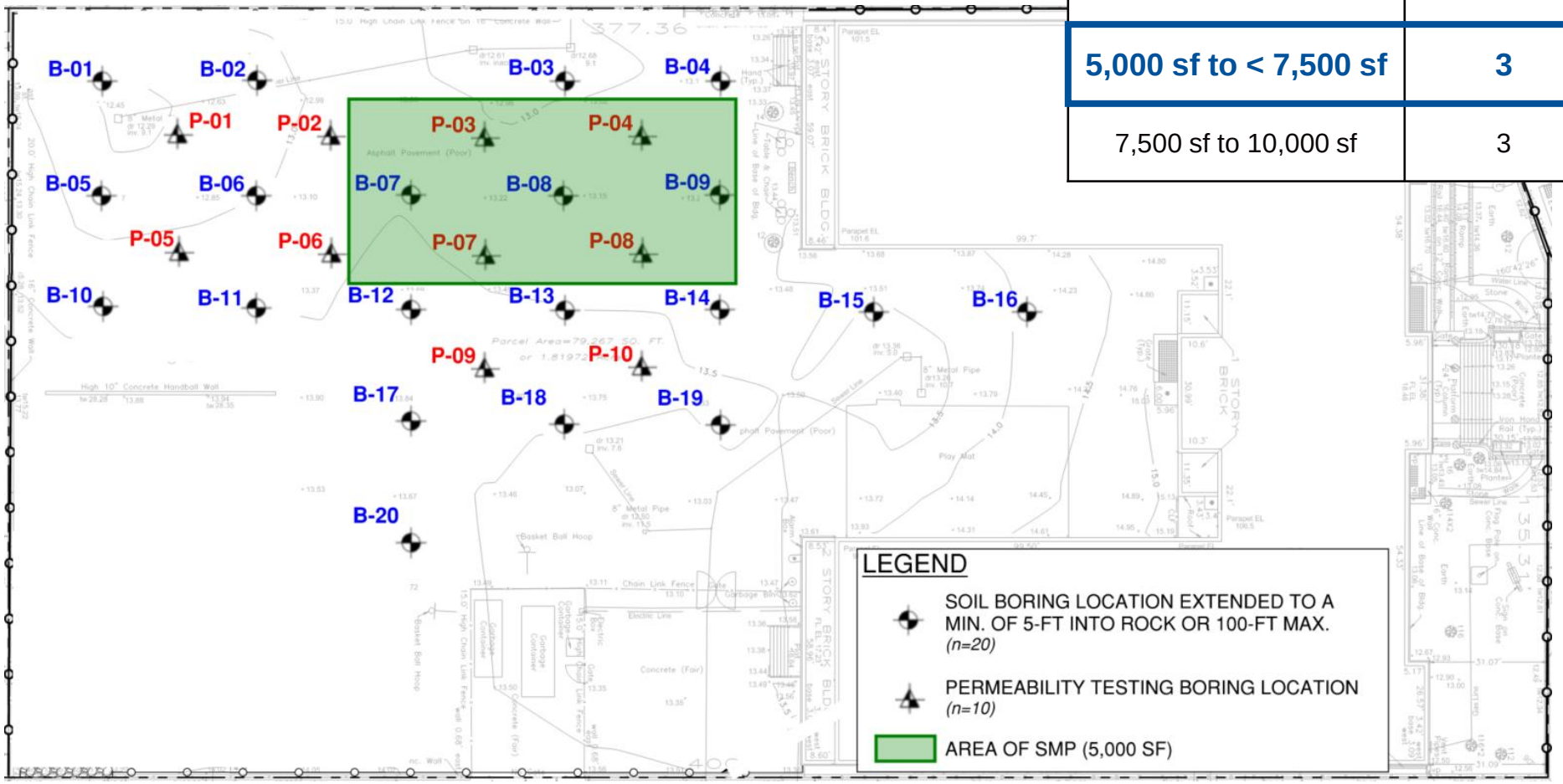
- SWPPP Preparer should locate tests throughout the site, not only at SMP locations, to provide alternate locations if results prove insufficient infiltration rates
- Enough test locations should be proposed to meet the minimum quantity of design tests needed for an SMP
- When 4(+) permeability tests are performed within the footprint of a single practice, the stabilized rates of the lowest & highest PT must be discarded

References:

1. NYS DEC Stormwater Management Design Manual (July 2024)

Testing Requirements

Location Plan



Minimum Design Testing Requirements		
Area of Practice	**# of Test Pits/Boring**	**# of Permeability Testing**
< 2,500 ft	2	2
2,500 sf to <5,000 sf	2	3
5,000 sf to < 7,500 sf	**3**	**4**
7,500 sf to 10,000 sf	3	5

Testing Requirements

Alternate Laboratory Testing

Purpose of these testing steps is to determine the preliminary suitability for engineered fill material **ONLY** & infiltration rates must be field verified once fill is in place:

Step 1: Measure the saturated hydraulic conductivity (K_{sat}) via test methods described in ASTM D2434 or ASTM D5856

Step 2: Calculate the Design Infiltration Rate by applying a minimum factor of safety (FS = 2)

Step 3: Perform confirmatory field testing via the Field Permeability Testing Requirements once fill is in place on site. If requirements are not met, material must be removed.

References:

1. *NYS DEC Stormwater Management Design Manual (July 2024)*

SWPPP Reporting

NYC Environmental Protection

SWPPP Reporting

Key Components

- SWPPP Appendix D
  - What supporting documents must be included in the SWPPP Appendix D?

Responsibility of Geotechnical QP

- Summary of General Soil Condition
  - What SWPPP sections must include a summary of soil conditions and types?
  - What geotechnical investigation findings must be reported in the SWPPP?
- Demonstrating Site Constraints
  - What SWPPP sections must include a description of site constraints?
  - What types of site constraints are determined through a geotechnical investigation?
- SMP Specific Data
  - What geotechnical investigation findings must be reported in the SWPPP post-construction SMP table?

Responsibility of SWPPP Preparer

SWPPP Appendix D

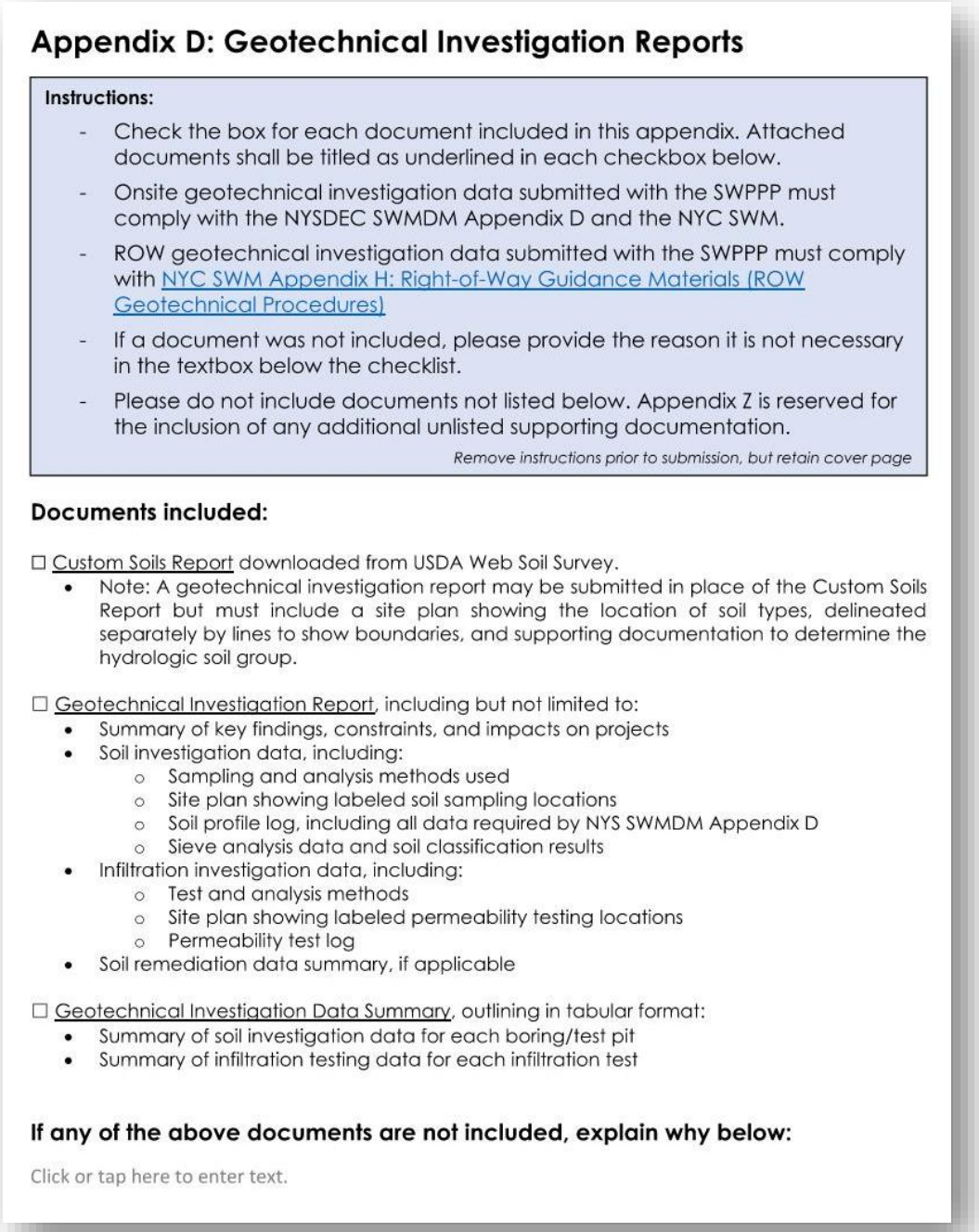
NYC Environmental Protection

SWPPP Reporting

SWPPP Appendix D

- Appendix D of the SWPPP must include all onsite geotechnical investigation data and supporting documentation that will be cited in SWPPP sections.

- Documents to include in Appendix D:
  1. Custom Soils Report
  2. Geotechnical Investigation Report
  3. Geotechnical Investigation Data Summary



Appendix D: Geotechnical Investigation Reports

Instructions:

- Check the box for each document included in this appendix. Attached documents shall be titled as underlined in each checkbox below.
- Onsite geotechnical investigation data submitted with the SWPPP must comply with the NYSDEC SWMDM Appendix D and the NYC SWM.
- ROW geotechnical investigation data submitted with the SWPPP must comply with NYC SWM Appendix H: Right-of-Way Guidance Materials (ROW Geotechnical Procedures)
- If a document was not included, please provide the reason it is not necessary in the textbox below the checklist.
- Please do not include documents not listed below. Appendix Z is reserved for the inclusion of any additional unlisted supporting documentation.

Remove instructions prior to submission, but retain cover page

Documents included:

☐ Custom Soils Report downloaded from USDA Web Soil Survey.
- Note: A geotechnical investigation report may be submitted in place of the Custom Soils Report but must include a site plan showing the location of soil types, delineated separately by lines to show boundaries, and supporting documentation to determine the hydrologic soil group.

☐ Geotechnical Investigation Report, including but not limited to:
- Summary of key findings, constraints, and impacts on projects
- Soil investigation data, including:
  - Sampling and analysis methods used
  - Site plan showing labeled soil sampling locations
  - Soil profile log, including all data required by NYS SWMDM Appendix D
  - Sieve analysis data and soil classification results
- Infiltration investigation data, including:
  - Test and analysis methods
  - Site plan showing labeled permeability testing locations
  - Permeability test log
- Soil remediation data summary, if applicable

☐ Geotechnical Investigation Data Summary, outlining in tabular format:
- Summary of soil investigation data for each boring/test pit
- Summary of infiltration testing data for each infiltration test

If any of the above documents are not included, explain why below:

Click or tap here to enter text.

SWPPP Reporting

SWPPP Appendix D

1. Custom Soil Report

- ✓ All project must submit a USDA Web Soil Survey
  - If a geotechnical investigation was performed, an Applicant may submit a site plan in its place if it shows the delineation of soil types and supporting documentation to determine the hydrologic soil group.

USDA Web Soil Survey

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
UGB	Urban land-Greenbelt complex, 3 to 8 percent slopes	2.4	99.4%
UrA	Urban land, reclaimed substratum, 0 to 3 percent slopes	0.0	0.6%
Totals for Area of Interest		**2.4**	**100.0%**

SWPPP Reporting

SWPPP Appendix D

2. Geotechnical Investigation Report

- ✓ **Includes a summary of key findings, constraints, and impacts on project**

3.0 SUBSURFACE INVESTIGATION

3.1 Findings from Investigation

The recent subsurface investigation consisted of drilling twenty (20) geotechnical soil borings and performing in-situ permeability test at six (6) locations across the site. A laboratory testing program was also performed to determine the physical, mechanical, and compressibility

General Subsurface Stratigraphy

Based on the recent investigation, the subsurface stratigraphy encountered generally consisted of between 18 ft to 25 ft of loosely placed fill material over approximately 10 ft to 25 ft of soft to medium stiff compressible clay. Below the clay, a combination of alluvial sand and interlayered glacially deposited silts and clays were encountered. Completely weathered bedrock was encountered between approximately 35 ft and 55 ft below ground surface.

Results of Permeability Testing

A total of six (6) in-situ permeability test were performed during the investigation, three (3) across the proposed new synthetic athletic field, and three (3) in the vicinity of the DEP stormwater retention system. Due to the shallow groundwater conditions at the site, all tests were performed within the miscellaneous fill layer.

Findings from Laboratory Testing Program

Representative samples of organic clay deposits were subjected to laboratory consolidation testing. The results of these tests indicate that this compressible layer is generally normally to slightly over-consolidated and has completed primary consolidation under the current loading conditions.

SWPPP Reporting

SWPPP Appendix D

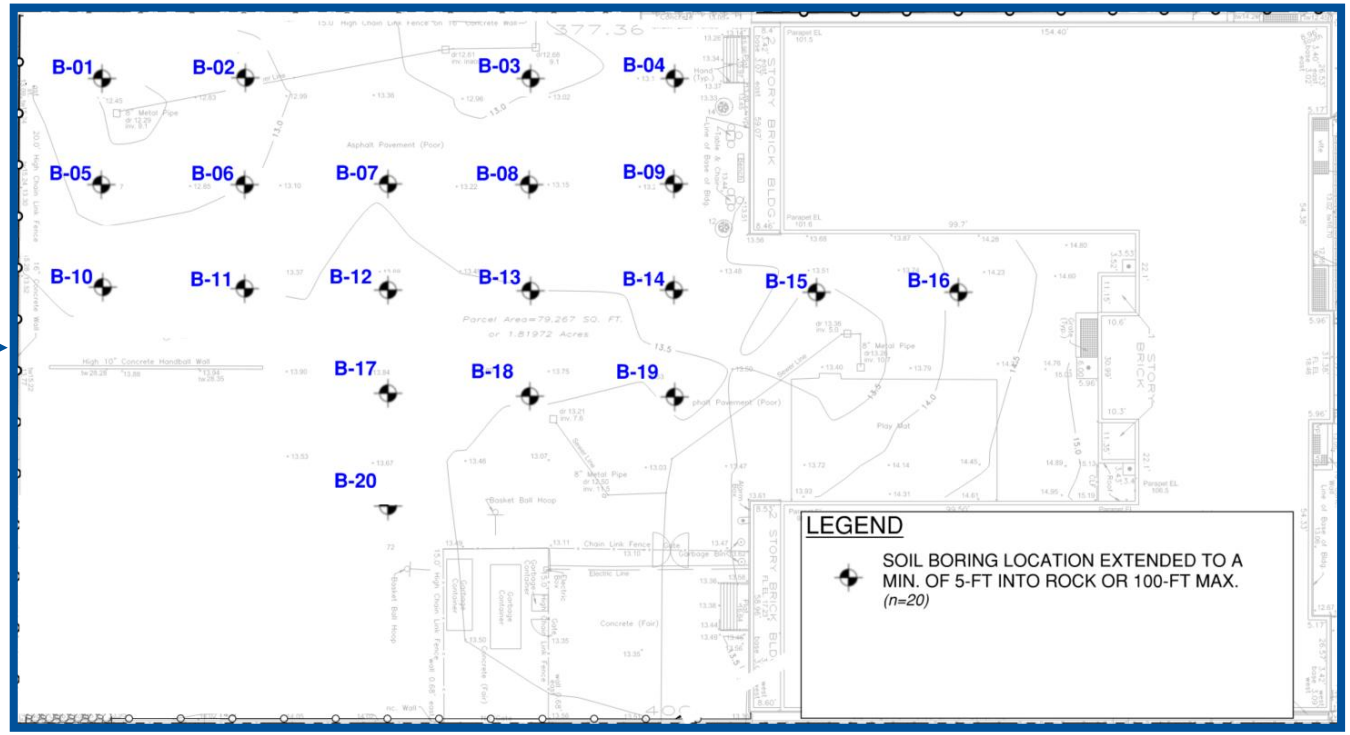
2. Geotechnical Investigation Report

- ✓ Includes a summary of key findings, constraints, and impacts on project
- ✓ **Soil investigation data, including:**
  - **Sampling and analysis methods used**
  - **Site plan showing labeled soil sampling locations**

4.0 SUBSURFACE INVESTIGATION

subsurface investigation for the proposed redevelopment and improvements consisted of the following:

- Five borings drilled in the vicinity of the proposed new structures.
- Nine probe borings drilled through the miscellaneous fill and soft organic material.
- A groundwater observation well installed in one of the completed borings.

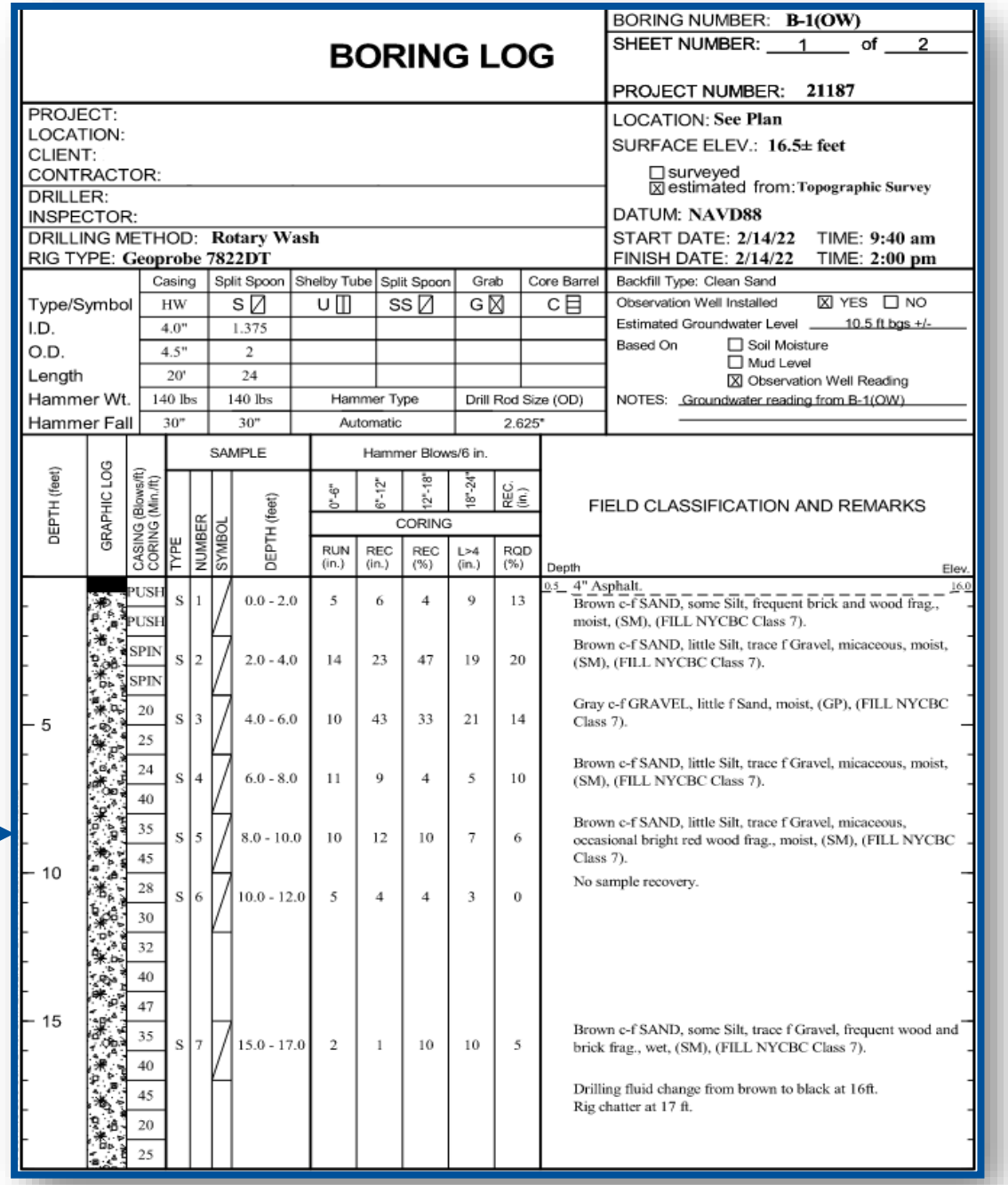


SWPPP Reporting

SWPPP Appendix D

2. Geotechnical Investigation Report

- ✓ Includes a summary of key findings, constraints, and impacts on project
- ✓ Soil investigation data, including:
  - Sampling and analysis methods used
  - Site plan showing labeled soil sampling locations
  - **Soil profile log, including all data required by NYS SWMDM Appendix D**



BORING LOG

BORING NUMBER: **B-1(OW)**
SHEET NUMBER: 1 of 2
PROJECT NUMBER: **21187**

PROJECT:
LOCATION:
CLIENT:
CONTRACTOR:
DRILLER:
INSPECTOR:
DRILLING METHOD: **Rotary Wash**
RIG TYPE: **Geoprobe 7822DT**

LOCATION: **See Plan**
SURFACE ELEV.: **16.5± feet**
☐ surveyed ☒ estimated from: **Topographic Survey**
DATUM: **NAVD88**
START DATE: **2/14/22** TIME: **9:40 am**
FINISH DATE: **2/14/22** TIME: **2:00 pm**

	Casing	Split Spoon	Shelby Tube	Split Spoon	Grab	Core Barrel
Type/Symbol	HW	S ☒	U ☐	SS ☒	G ☒	C ☐
I.D.	4.0"	1.375				
O.D.	4.5"	2				
Length	20'	24				
Hammer Wt.	140 lbs	140 lbs	Hammer Type		Drill Rod Size (OD)	
Hammer Fall	30"	30"	Automatic		2.625"	

Backfill Type: Clean Sand
Observation Well Installed ☒ YES ☐ NO
Estimated Groundwater Level 10.5 ft bgs +/-
Based On ☐ Soil Moisture ☐ Mud Level ☒ Observation Well Reading
NOTES: Groundwater reading from B-1(OW)

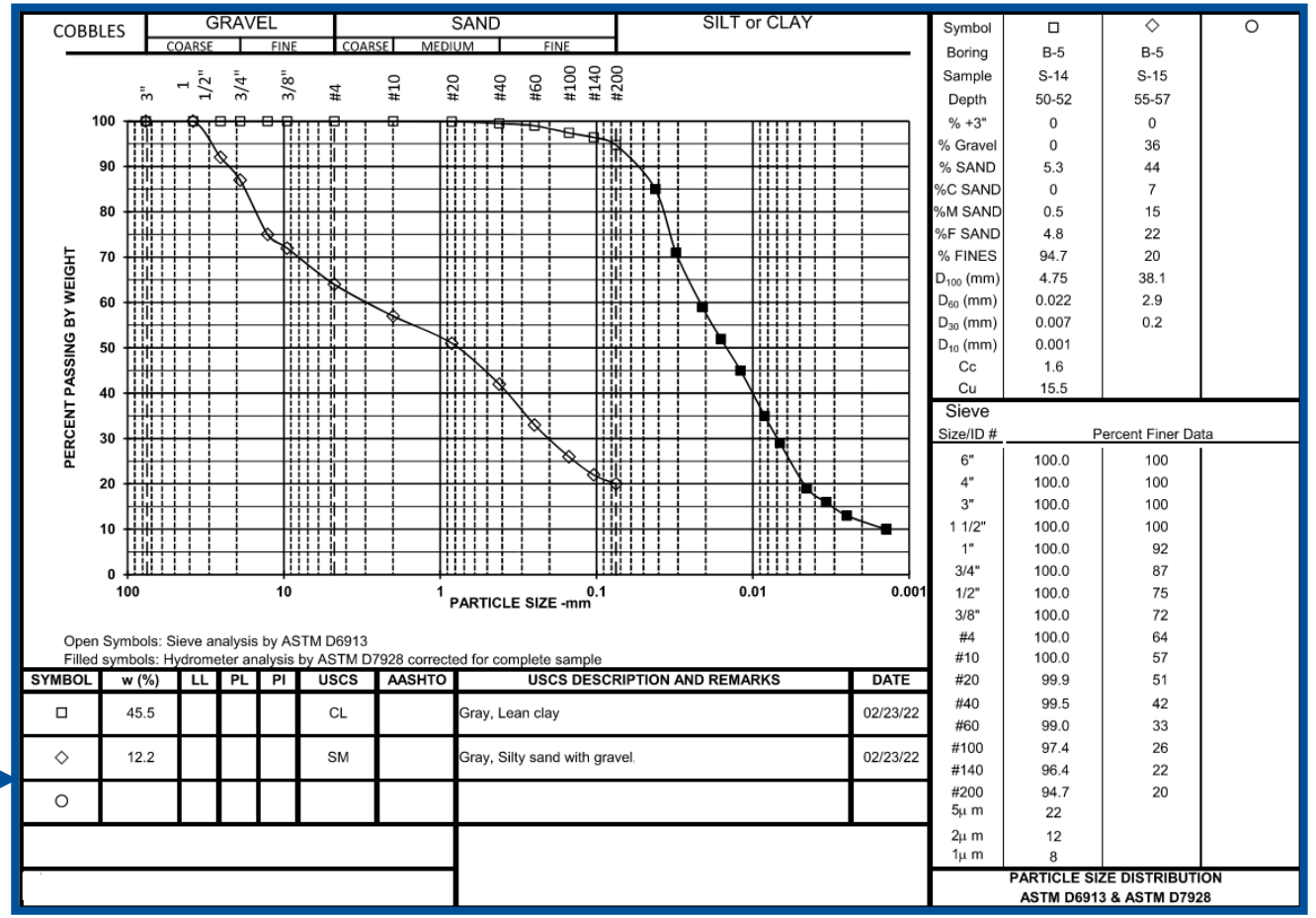
DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft) CORING (Min./ft)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE SYMBOL	SAMPLE DEPTH (feet)	Hammer Blows/6 in. 0"-6"	6"-12"	12"-18"	18"-24"	REC. (in.)	CORING RUN (in.)	CORING REC (in.)	CORING REC (%)	CORING L>4 (in.)	CORING RQD (%)	FIELD CLASSIFICATION AND REMARKS
		PUSH	S	1		0.0 - 2.0	5	6	4	9	13						Depth 0.5 — 4" Asphalt. — Elev. 16.0 Brown c-f SAND, some Silt, frequent brick and wood frag., moist, (SM), (FILL NYCBC Class 7).
		PUSH															
		SPIN	S	2		2.0 - 4.0	14	23	47	19	20						Brown c-f SAND, little Silt, trace f Gravel, micaceous, moist, (SM), (FILL NYCBC Class 7).
		SPIN															
		20	S	3		4.0 - 6.0	10	43	33	21	14						Gray c-f GRAVEL, little f Sand, moist, (GP), (FILL NYCBC Class 7).
5		25															
		24	S	4		6.0 - 8.0	11	9	4	5	10						Brown c-f SAND, little Silt, trace f Gravel, micaceous, moist, (SM), (FILL NYCBC Class 7).
		40															
		35	S	5		8.0 - 10.0	10	12	10	7	6						Brown c-f SAND, little Silt, trace f Gravel, micaceous, occasional bright red wood frag., moist, (SM), (FILL NYCBC Class 7).
		45															
10		28	S	6		10.0 - 12.0	5	4	4	3	0						No sample recovery.
		30															
		32															
		40															
		47															
15		35	S	7		15.0 - 17.0	2	1	10	10	5						Brown c-f SAND, some Silt, trace f Gravel, frequent wood and brick frag., wet, (SM), (FILL NYCBC Class 7).
		40															
		45															Drilling fluid change from brown to black at 16ft.
		20															Rig chatter at 17 ft.
		25															

SWPPP Reporting

SWPPP Appendix D

2. Geotechnical Investigation Report

- ✓ Includes a summary of key findings, constraints, and impacts on project
- ✓ Soil investigation data, including:
  - Sampling and analysis methods used
  - Site plan showing labeled soil sampling locations
  - Soil profile log, including all data required by NYS SWMDM Appendix D
  - **Sieve analysis data and soil classification result**



SWPPP Reporting

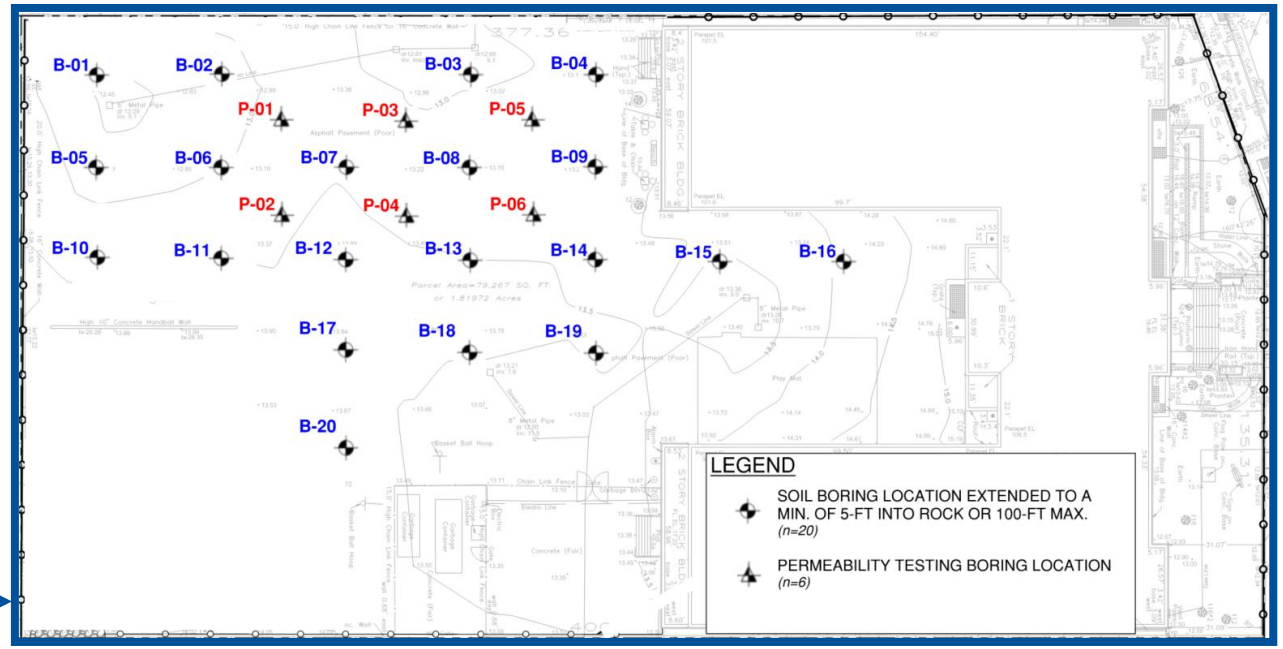
SWPPP Appendix D

2. Geotechnical Investigation Report

- ✓ Includes a summary of key findings, constraints, and impacts on project
- ✓ Soil investigation data, including:
  - Sampling and analysis methods used
  - Site plan showing labeled soil sampling locations
  - Soil profile log, including all data required by NYS SWMDM Appendix D
  - Sieve analysis data and soil classification result
- ✓ **Infiltration investigation data, including:**
  - **Test and analysis methods**
  - **Site plan showing labeled permeability testing locations**

4.4 Permeability Tests

Twelve in-situ permeability tests were performed at six testing locations denoted PT-1 through PT-6 in the vicinity of the proposed improvements. Three testing locations (PT-1, PT-2, PT-3) were performed in the area of the proposed DEP stormwater retention system. Three testing locations (PT-4, PT-5, PT-6) were performed in the area of the proposed synthetic turf field. At each testing location,

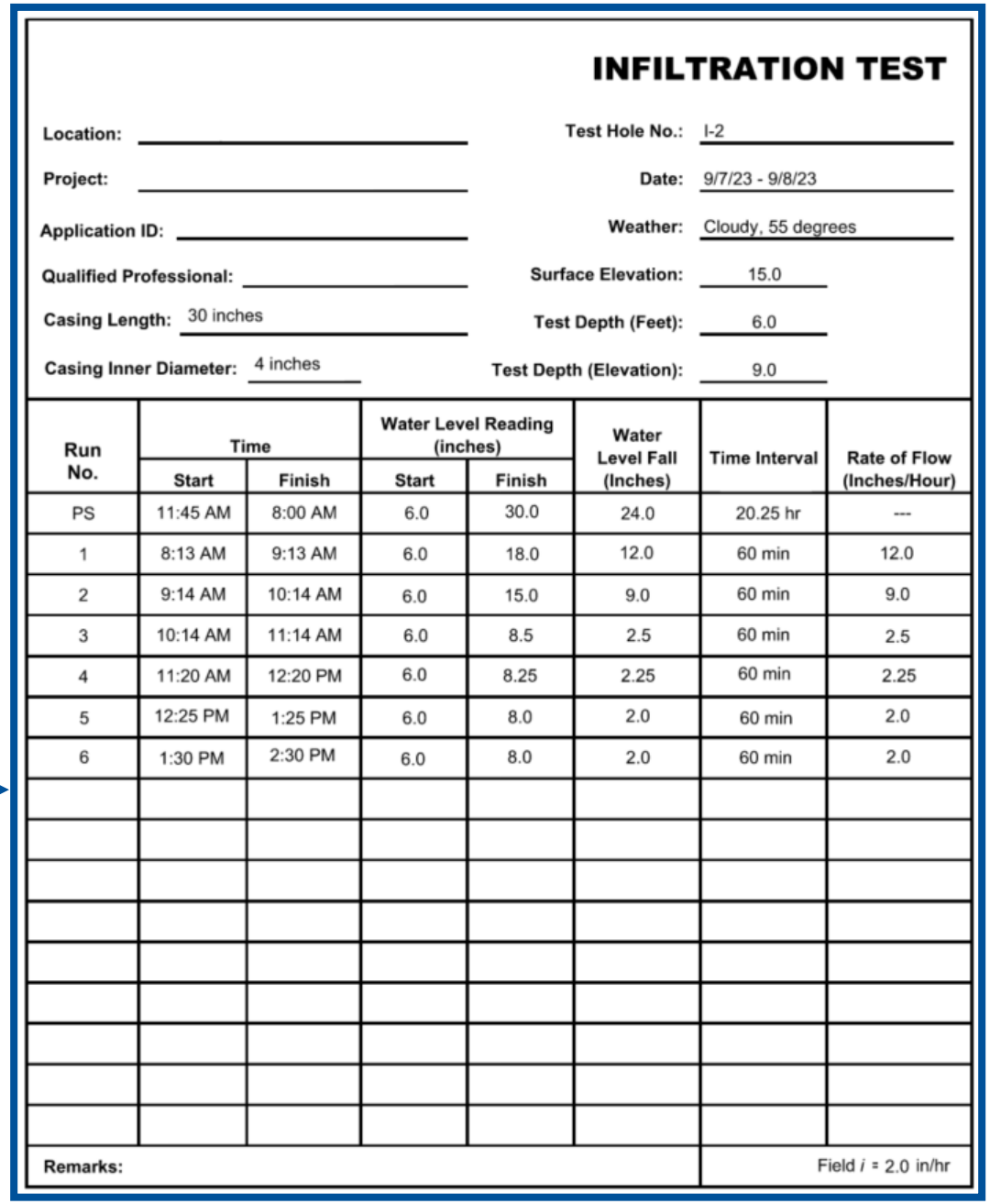


SWPPP Reporting

SWPPP Appendix D

2. Geotechnical Investigation Report

- ✓ Includes a summary of key findings, constraints, and impacts on project
- ✓ Soil investigation data, including:
  - Sampling and analysis methods used
  - Site plan showing labeled soil sampling locations
  - Soil profile log, including all data required by NYS SWMDM Appendix D
  - Sieve analysis data and soil classification result
- ✓ Infiltration investigation data, including:
  - Test and analysis methods
  - Site plan showing labeled permeability testing locations
  - **Permeability test log**



INFILTRATION TEST

Location: _____ Test Hole No.: I-2

Project: _____ Date: 9/7/23 - 9/8/23

Application ID: _____ Weather: Cloudy, 55 degrees

Qualified Professional: _____ Surface Elevation: 15.0

Casing Length: 30 inches Test Depth (Feet): 6.0

Casing Inner Diameter: 4 inches Test Depth (Elevation): 9.0

Run No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	11:45 AM	8:00 AM	6.0	30.0	24.0	20.25 hr	---
1	8:13 AM	9:13 AM	6.0	18.0	12.0	60 min	12.0
2	9:14 AM	10:14 AM	6.0	15.0	9.0	60 min	9.0
3	10:14 AM	11:14 AM	6.0	8.5	2.5	60 min	2.5
4	11:20 AM	12:20 PM	6.0	8.25	2.25	60 min	2.25
5	12:25 PM	1:25 PM	6.0	8.0	2.0	60 min	2.0
6	1:30 PM	2:30 PM	6.0	8.0	2.0	60 min	2.0

Remarks: Field *i* = 2.0 in/hr

SWPPP Reporting

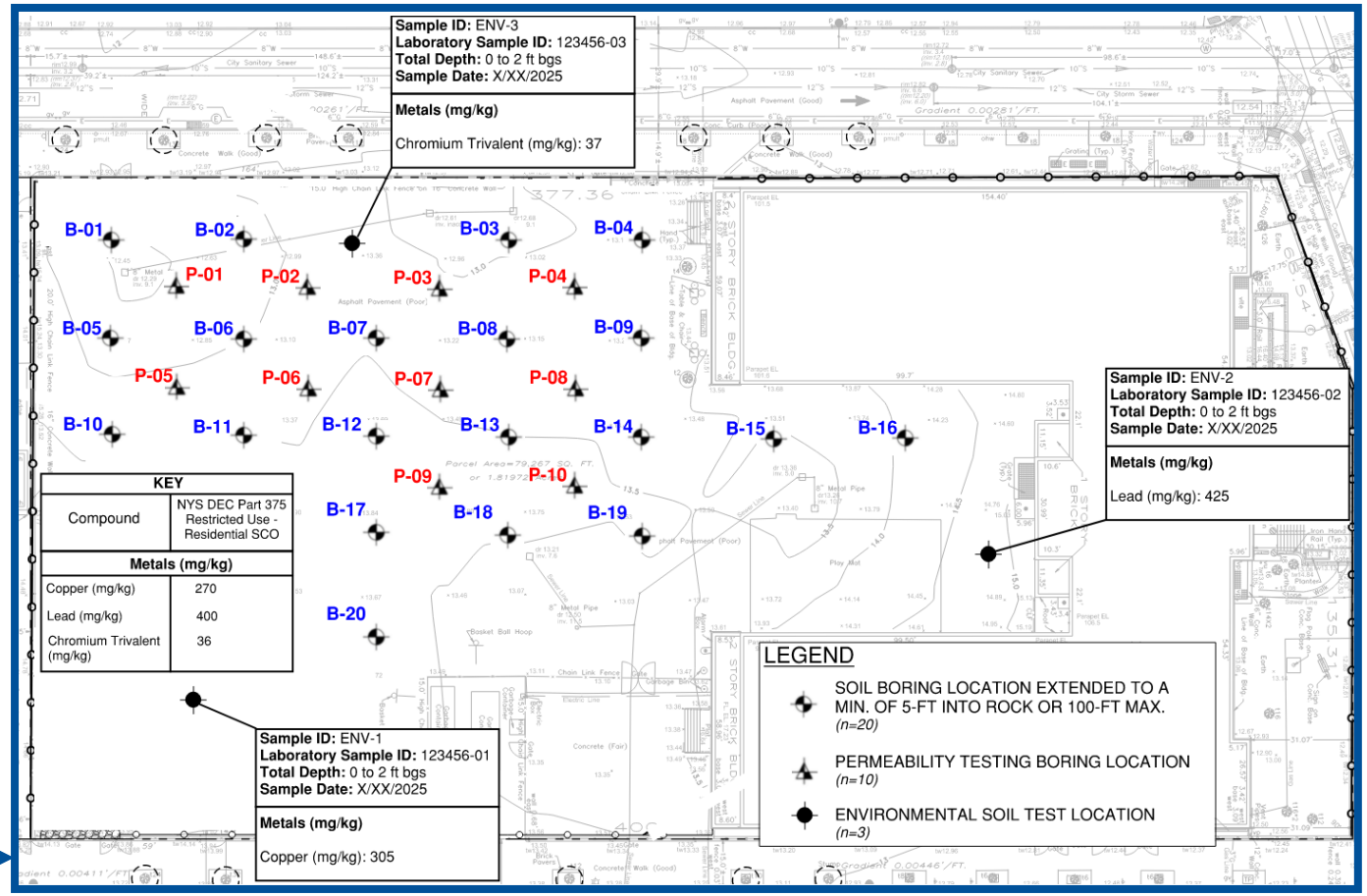
SWPPP Appendix D

Note:

If soils are observed to be contaminated, then contamination levels must be evaluated by a qualified professional and the state remediation program to determine if infiltration is permitted.

2. Geotechnical Investigation Report

- ✓ Includes a summary of key findings, constraints, and impacts on project
- ✓ Soil investigation data, including:
  - Sampling and analysis methods used
  - Site plan showing labeled soil sampling locations
  - Soil profile log, including all data required by NYS SWMDM Appendix D
  - Sieve analysis data and soil classification result
- ✓ Infiltration investigation data, including:
  - Test and analysis methods
  - Site plan showing labeled permeability testing locations
  - Permeability test log
- ✓ **Soil remediation data summary, if applicable**



SWPPP Reporting

SWPPP Appendix D

3. Geotechnical Investigation Data Summary *(in tabular format)**

- ✓ Summary of soil investigation data for each boring/test pit
- ✓ Summary of infiltration testing data for each test location

** Guidance material in progress*

Summary of General Soil Conditions

NYC Environmental Protection

SWPPP Reporting

Summary of General Soil Conditions

- Geotechnical Investigation results found in the SWPPP Appendix D supporting documentation, must also be incorporated into the body of the SWPPP report.

- Sections to be completed in the SWPPP report related to soil conditions per findings in geotechnical investigation:
    A. Section 3.1.4 Soil Information
    B. Table 3.2 Hydrologic Soil Groups

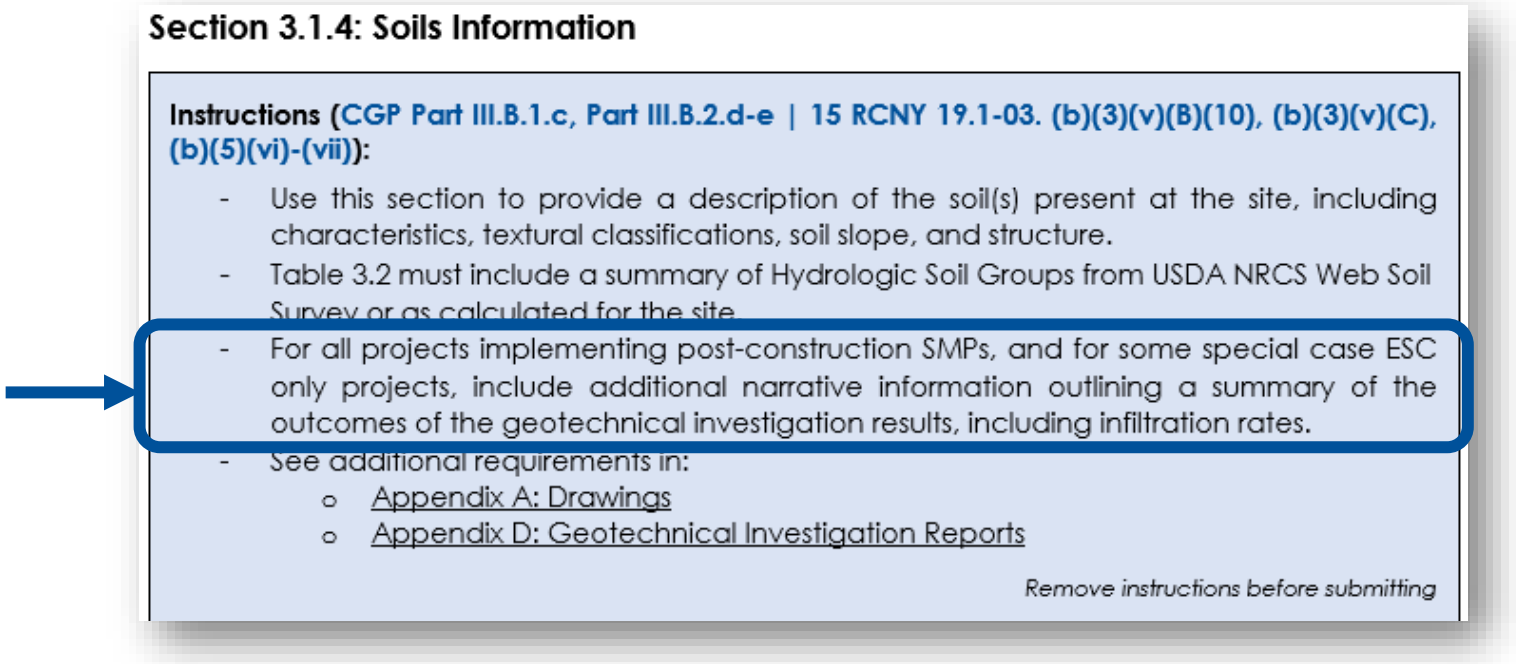
SWPPP Reporting

Summary of General Soil Conditions

Site-Specific information from the **Geotechnical Investigation**

A. Section 3.1.4 Soils Information

- ✓ Provide a description of the soil types present on site, including characteristics and textural classifications.
- ✓ Include a narrative outlining the summary of the geotechnical investigation outcomes, including infiltration rates.



Section 3.1.4: Soils Information

Instructions (CGP Part III.B.1.c, Part III.B.2.d-e | 15 RCNY 19.1-03. (b)(3)(v)(B)(10), (b)(3)(v)(C), (b)(5)(vi)-(vii)):

- Use this section to provide a description of the soil(s) present at the site, including characteristics, textural classifications, soil slope, and structure.
- Table 3.2 must include a summary of Hydrologic Soil Groups from USDA NRCS Web Soil Survey or as calculated for the site.
- For all projects implementing post-construction SMPs, and for some special case ESC only projects, include additional narrative information outlining a summary of the outcomes of the geotechnical investigation results, including infiltration rates.
- See additional requirements in:
  - Appendix A: Drawings
  - Appendix D: Geotechnical Investigation Reports

Remove instructions before submitting

SWPPP Reporting

Summary of General Soil Conditions

Site-Specific information from the **Geotechnical Investigation**

B. Table 3.2 Hydrologic Soil Group

- ✓ Summary of the Hydrologic Soil Groups can be obtained from the USDA NRCS Web Soil Survey.
- ✓ Values can also be calculated for the site based on geotechnical investigation results.

TABLE 3.2 – HYDROLOGIC SOIL GROUP

HSG A	HSG B	HSG C	HSG D
___ %	___ %	___ %	___ %

Note:

Unranked soils should be classified per the USDA NRCS Part 630 National Engineering Handbook Ch. 7. Otherwise, the soil should assume the properties of HSG-A for stormwater runoff reduction volume calculations and HSG-D for hydrologic modeling.

Demonstrating Site Constraints

NYC Environmental Protection

SWPPP Reporting

Demonstrating Site Constraints

- Geotechnical Investigation results found in the SWPPP Appendix D supporting documentation, must also be incorporated into the body of the SWPPP report to justify SMP selection based on subsurface constraints.

- Sections to be completed in the SWPPP report related to site constraints per findings in geotechnical investigation:

  C. Table 6.3 Site Constraints Summary

  D. Appendix A Subsurface Constraints Map

SWPPP Reporting

Demonstrating Site Constraints

Site-Specific information from the **Geotechnical Investigation**

C. Table 6.3 Site Constraints Summary

- ✓ Identifies each constraint present on site and describes the impact the constraint poses on the SMP design.

TABLE 6.3 – SITE CONSTRAINTS SUMMARY

TYPE	PRESENT?	LOCATION AND IMPACT[1]	REFERENCE[2]
Soil Constraints	☐ Yes ☐ No	Click or tap here to enter text.	Dwg No.
Subsurface Constraints	☐ Yes ☐ No	Click or tap here to enter text.	Document name
Hotspot Constraints	☐ Yes ☐ No	Click or tap here to enter text.	Click or tap here to enter text.
Surface Constraints	☐ Yes ☐ No	Click or tap here to enter text.	Click or tap here to enter text.
Space Constraints	☐ Yes ☐ No	Click or tap here to enter text.	Click or tap here to enter text.

[Add rows as needed to identify all site constraints].

[1]Provide a brief description of the areas affected by the constraints, and the resulting impacts on the selection and design of stormwater management practices.

[2]Refer to specific drawings and reports included in the appendices which delineate and describe the relevant constraints in detail.

SWPPP Reporting

Demonstrating Site Constraints

D. Appendix A Subsurface Constraints Map

- ✓ Site constraints represented in a graphical form to visually understand the site limitations.

SMP Specific Data

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SWPPP Reporting

SMP Specific Data

- Geotechnical Investigation results found in the SWPPP Appendix D supporting documentation, must also be incorporated into the body of the SWPPP report to confirm the proposed SMP meets DEP requirements.

- Section to be completed in the SWPPP report related to SMPs per findings in geotechnical investigation:

  E. Table 6.4(a) Post-Construction SMP Description

SWPPP Reporting

SMP Specific Data

E. Table 6. 4(a) Post-Construction SMP Description

- ✓ Provides high level overview of geotechnical investigation results, specifically related to findings that impact SMP design.

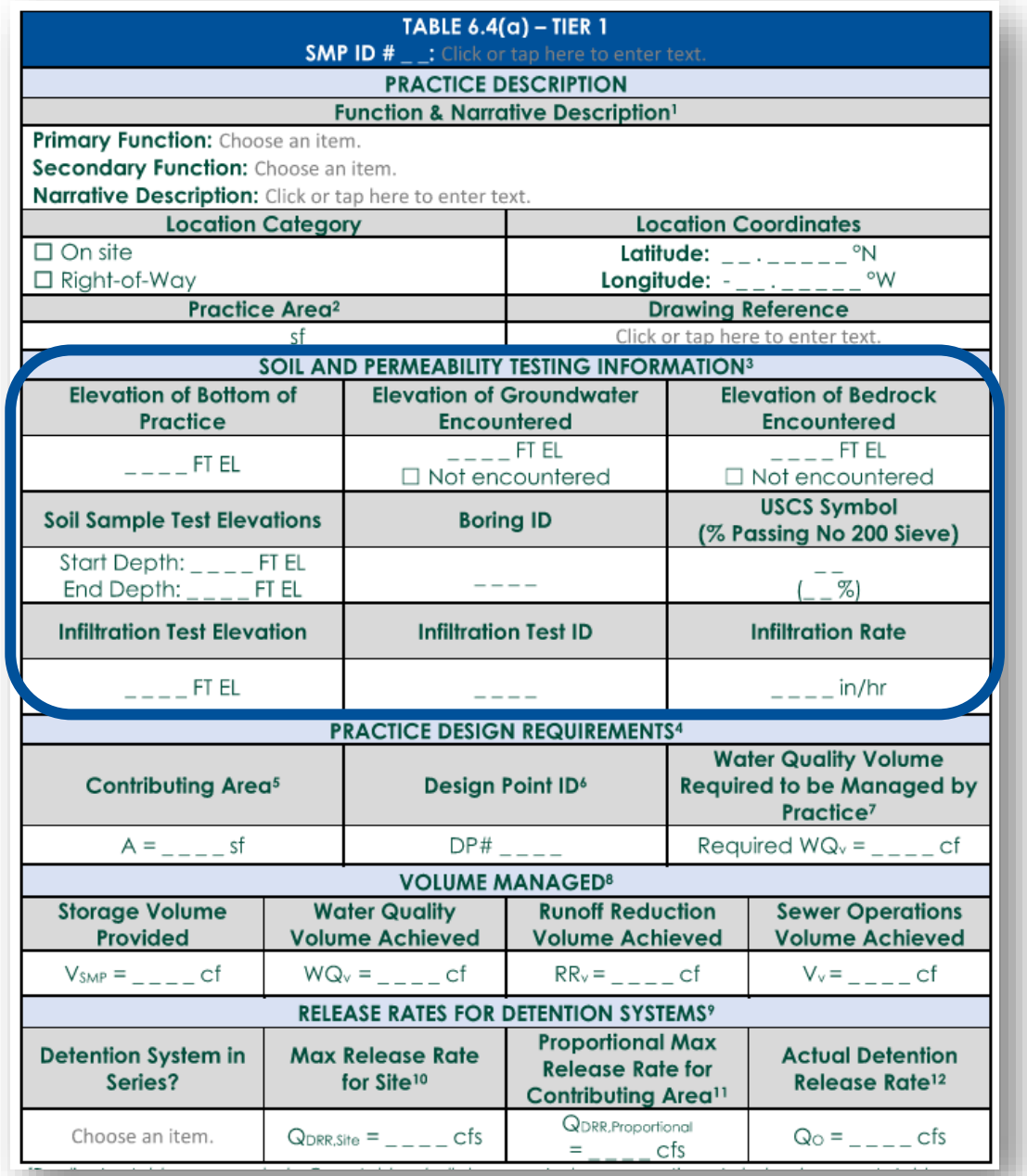


TABLE 6.4(a) – TIER 1
SMP ID # _ _: Click or tap here to enter text.

PRACTICE DESCRIPTION

Function & Narrative Description[1]

Primary Function: Choose an item.
Secondary Function: Choose an item.
Narrative Description: Click or tap here to enter text.

Location Category	Location Coordinates
☐ On site ☐ Right-of-Way	**Latitude:** _ _ . _ _ _ _ _ °N **Longitude:** - _ _ . _ _ _ _ _ °W
Practice Area[2]	**Drawing Reference**
sf	Click or tap here to enter text.

SOIL AND PERMEABILITY TESTING INFORMATION[3]

Elevation of Bottom of Practice	Elevation of Groundwater Encountered	Elevation of Bedrock Encountered
_ _ _ _ FT EL	_ _ _ _ FT EL ☐ Not encountered	_ _ _ _ FT EL ☐ Not encountered
Soil Sample Test Elevations	**Boring ID**	**USCS Symbol (% Passing No 200 Sieve)**
Start Depth: _ _ _ _ FT EL End Depth: _ _ _ _ FT EL	_ _ _ _	_ _ (_ _ %)
Infiltration Test Elevation	**Infiltration Test ID**	**Infiltration Rate**
_ _ _ _ FT EL	_ _ _ _	_ _ _ _ in/hr

PRACTICE DESIGN REQUIREMENTS[4]

Contributing Area[5]	Design Point ID[6]	Water Quality Volume Required to be Managed by Practice[7]
A = _ _ _ _ sf	DP# _ _ _ _	Required WQ_v = _ _ _ _ cf

VOLUME MANAGED[8]

Storage Volume Provided	Water Quality Volume Achieved	Runoff Reduction Volume Achieved	Sewer Operations Volume Achieved
V_{SMP} = _ _ _ _ cf	WQ_v = _ _ _ _ cf	RR_v = _ _ _ _ cf	V_v = _ _ _ _ cf

RELEASE RATES FOR DETENTION SYSTEMS[9]

Detention System in Series?	Max Release Rate for Site[10]	Proportional Max Release Rate for Contributing Area[11]	Actual Detention Release Rate[12]
Choose an item.	$Q_{DRR,Site}$ = _ _ _ _ cfs	$Q_{DRR,Proportional}$ = _ _ _ _ cfs	Q_O = _ _ _ _ cfs

Site-Specific information from the **Geotechnical Investigation**

Frequently Asked Questions

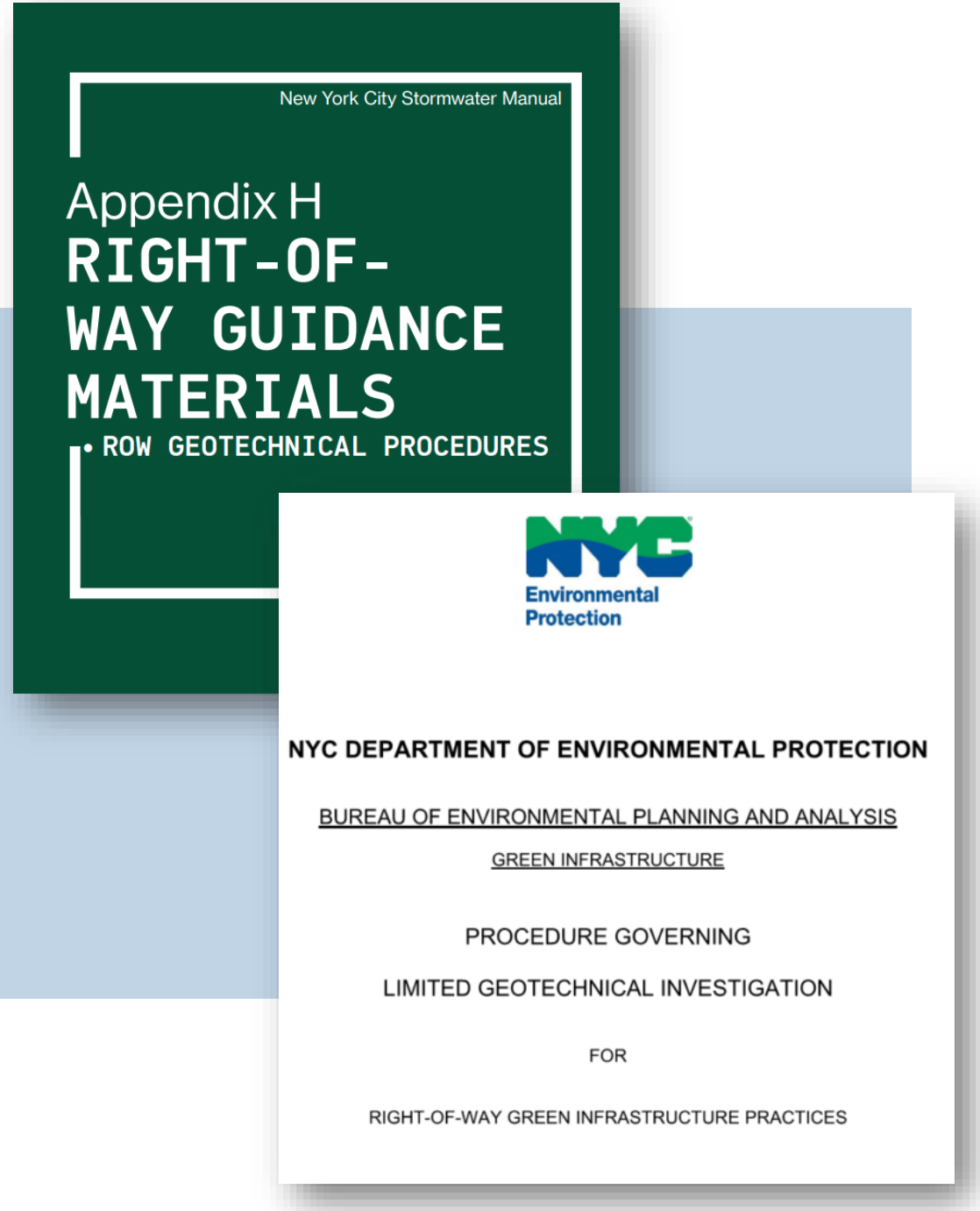
NYC Environmental Protection

FAQs

Q1

Geotechnical guidance is provided in NYC DEP Stormwater Manual Appendix H and the Green Infrastructure Standards, are these procedures applicable to on-site design?

No, all on-site projects must utilize the procedure outlined in Appendix D of the NYS DEC Stormwater Management Design Manual.



References:

1. *NYC DEP Stormwater Manual (February 2024)*
2. *https://www.nyc.gov/site/dep/water/green-infrastructure.page*

FAQs

Q2

NYS DEC Stormwater Management Design Manual (SWMDM) defines urban fill as soil that includes unsuitable materials such as brick, cement, asphalt, demolition debris, etc.

How does NYC DEP define urban fill?

NYC DEP utilizes NYS DEC's definition of urban fill.

Reference: *https://askesa.com/2017/07/lies-beneath-impact-historic-fill/*

FAQs

Q3

Will NYC DEP allow infiltration practices in urban fill?

While urban fill itself is not acceptable for infiltration, removal of the urban fill and replacement with engineered fill material can be used under the following conditions:

- Engineered fill material meets in-situ infiltration rate requirements
- Existing soils below the engineered fill are not classified as urban fill
- Existing soils below the engineered fill material meet infiltration rate requirements & provide adequate separation from rock/groundwater

Reference: Site Photo

FAQs

Q4

Are excavated pits required for permeability tests in NYC?

In lieu of excavated pits, casings can be drilled to the relevant test depth. However, the casing cannot be filled more than 24” from the bottom to align with NYS DEC testing procedures.

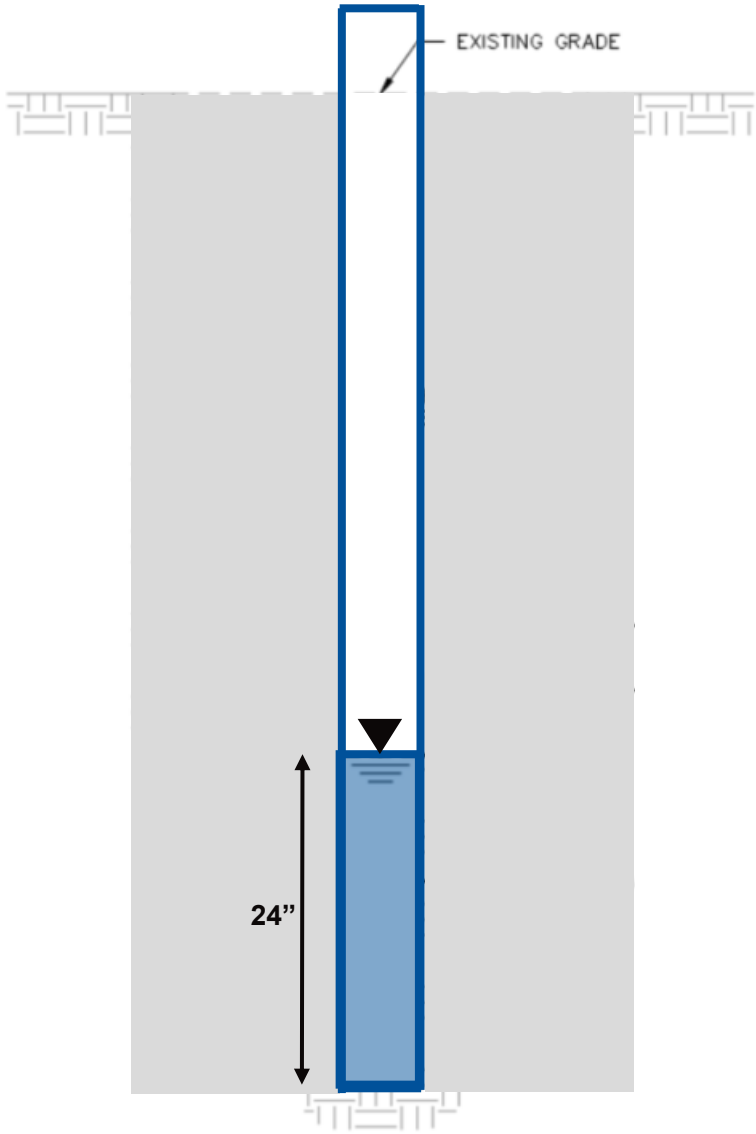


Figure D.1 Permeability Testing Requirements

Reference: *NYS DEC Stormwater Design Manual*

FAQs

Q5

NYS DEC SWMDM Appendix D details percolation test methods (for Feasibility) and infiltration test methods (for Design).

Can the percolation test methods be used to demonstrate soil constraints?

No.

NYC DEP will only accept infiltration test results to demonstrate soil constraints for infiltrating SMPs.

Reference: *https://www.atlantictesting.com/infiltration-testing-for-stormwater-management-design/*

Question & Answer

NYC Environmental Protection