

# CONSTRUCTION SEQUENCE

#### Recommended Sequence of Construction

Use of erosion and sediment control structures and practices are important for maintaining site stability under runoff and during daily construction activities. The Construction Sequence should be staged with erosion and sediment controls, as follows, with all controls in place and implemented prior to respective infrastructure construction. As construction proceeds, the controls should be monitored, maintained and replaced as needed. Additional controls may be required as needed to address unforeseen situations.

Refer to The Construction Drawings for all plans and details which relate to the Construction Sequence. This Sequence should be followed in conjunction with all Plans, Notes, and the Stormwater Pollution Prevention Plan.

for Construction. The Sequence shall be discussed at the time of the Pre-construction Meeting.

During construction of the project, the Contractor is responsible to coordinate all required inspections with various agencies and the Project Engineer.

Prior to the commencement of work, the Owner and General Contractor shall read and understand the Sequence

#### Construction Sequence

General Sequence: The general sequence applies to the start of all Phases of the project. The requirements in such shall be applied as appropriate in that phase and shall be assumed in place prior to the start of the work outlined in the sequence for each Phase.

- 1. Prior to the beginning of any site work the major features of the construction must be field staked by a licensed surveyor. These include the building, limits of disturbance, utility lines, and Stormwater practices. . Prior to the start of the project, an on—site pre—construction meeting will be held. This will be attended by the Project Owner, the Operator responsible for complying with the approved construction drawings including the Erosion and Sediment Control (E&SC) Plan and Details, the Design Engineer, the Engineer responsible for E&SC monitoring during construction, Town representatives from the Engineering Department and Code Enforcement.
- . Cut and clear trees within the phase limits as necessary for the areas to be disturbed. Install tree protective measure at marked locations on E&SC Plan.
- 4. Install all temporary erosion control measures as shown on the Erosion and Sediment Control Plan for the project's immediate disturbance areas. This shall include, but not limited to silt fence, stabilized construction entrances, diversion swales, sediment traps, construction fence, etc. This sequence must be followed to insure proper implementation of the Erosion and Sediment Control Plan (E&SC) and Stormwater Pollution Prevention Plan (SWPPP).
- Timbered trees and woodchips shall be temporarily stored in the stockpile and/or staging area if necessary before being removed off-site. Woodchips may be used for mulch to stabilize disturbed areas. Woodchip mulch shall be applied at a minimum rate of 500 lbs. per 1000 SF (2" thick minimum).
- Remove existing vegetative cover, cut and clear trees, grub, remove stumps and other surface features in the limit of construction only. Any disturbance that results from tree clearing and grubbing shall be immediately stabilized with woodchips mulch, hydro-mulch, or straw and seed. Timbered trees, wood chips, and stumps shall be removed off—site unless otherwise directed. As stated woodchips may be stockpiled for use as stabilizing ground cover. Demolish and/or remove existing features, i.e.: fence, concrete slab, asphalt etc., and dispose of or stockpile as required by the Owner. All construction debris shall be properly disposed of in accordance with all Federal, State, and Local requirements.
- Once the tree removal operation is complete strip the topsoil within the limits of disturbance and place excavated topsoil within the identified stockpile locations. Any soils so deemed by the Design or Monitoring Engineer shall be stockpiled for future use as landscaped area topsoil. Contractor shall take every precaution feasible to reduce the amount of disturbed/exposed soils during construction.
- 3. Begin rough grading of driveways and adjacent areas. Slops in excess of 3H:1V shall not be left exposed and must be stabilized.
- ). Cut material shall first be moved to the fill locations required to complete the access drive and parking and bring the area up to final grades. Excess material to be used toward infilling in Phase II shall be stockpiled. Blasted rock that is not suitable to remain on site shall be hauled away and properly disposed of. 10. Begin installation of subsurface detention chambers within limits of disturbance.
- 11. When the subsurface units are installed, the upstream drainage structure shall be blocked so as to not allow sediment laden water from reaching the subsurface chambers.
- 12. Backfill as installation is complete and stabilize the area. If trenches are to be left open, place excavated material on the up-slope sides of the trench and protect and stabilize if it is to remain open for an extended period of seven (7) days or more.
- 13. Upon completion of the subsurface chambers, begin installation of proposed Downstream Defender unit. Install storm sewer piping, catch basins and manholes, working downstream to upstream. During the installation of catch basins, install inlet protection as per E&SC Plan to assure that sediment laden water will not enter the storm system. Once the final grade above the system is achieved, put into place the final topsoil cover, seed mix, and erosion control blanket, or hydro-mulch. 14. Once the infiltrator system has been installed, grade and install the base course for the driveways and
- parking areas.

### Final Site Stabilization and Completion of New Construction:

- 15. Upon completion of all Phases, the site shall be inspected by the Supervising Engineer and Town Inspector to determine completion of all work and permanent stabilization of the site. 16. Any areas deemed incomplete or not properly stabilized shall be done so to the satisfaction to the Supervising Engineer and Town Inspector.
- 17. Once the site is deemed adequately stable the temporary erosion and sediment control measures can be removed including the sediment traps. The area where the sediment trap was located shall be filled, top soiled, seeded and mulched in accordance with the specifications within this plan. At that time if deemed appropriate drainage structures upstream from the subsurface stormwater management systems shall be BENERIAN ERENDONO NOTED TO BE UNDER COMPERCION OF THE ST. be unblocked to allow for flow of collected surface runoff.
- Contractor shall be responsible for compliance with all sediment and erosion control practices. The sediment and erosion control practices are ontact information during and after construction:
  to be installed prior to any major soil disturbances and maintained until permanent protection is established. Road surface flows from the site 593 ֆիթյվել ից բկիցելի աբեթել with լեզուտը pad or appropriate measures during adjacent road shoulder regrading. The contractor is responsible for the 593 installation and sedimentation control devices throughout the course of construction. OssirOatch blasin Other Orotection must be installed and operating at all times until tributary areas have been stabilized. When possible, flows should
- be stabilized before reaching inlet protection structure. Timely maintenance of sediment control structures is the responsibility of the contractor. All structures shall be maintained in good working order at all times. The sediment level in all sediment traps shall be closely monitored and sediment removed promptly when maximum levels are reached or as ordered by the engineer. All sediment control structures shall be inspected on a regular basis, and after each heavy rain to insure proper operation as designed. An inspection schedule shall be set forth prior to the start of construction.
- The locations and the installation times of the sediment capturing standards shall be as specified in these plans, as ordered by the engineer, and in accordance with the latest edition of the "New York standards and specifications for erosion and sediment control" (NYSSESC). All topsoil shall be placed in a stabilized stockpile for reuse on the site. All stockpile material required for final grading and stored on site shall be temporarily seeded and mulched within 7 days. Refer to soil stockpile details.
- Any disturbed areas that will be left exposed more than 7 days and not subject to construction traffic, shall immediately receive temporary seeding. Mulch shall be used if the season prevents the establishment of a temporary cover. Disturbed areas shall not be limed and fertilized
- prior to temporary seeding. All disturbed areas within 500 feet of an inhabited dwelling shall be wetted as necessary to provide dust control.
- The contractor shall keep the roadways within the project clear of soil and debris and is responsible for any street cleaning necessary during the 3. Fertilize with 10-10-10 at 400/acre.
- Sediment and erosion control structures shall be removed, and the area stabilized when the drainage area has been properly stabilized by permanent measures.
- All sediment and erosion control measures shall be installed in accordance with current edition of nyssesc. . All regraded areas must be stabilized appropriately prior to any rock blasting, cutting, and/or filling of soils. Special care should be taken during
- construction to insure stability during maintenance and integrity of control structures. Any slopes graded at 3:1 or greater shall be stabilized with erosion blankets to be staked into place in accordance with the manufactures requirements. Erosion blankets may also be required at the discretion of town officials or project engineer. When stabilized blanket is utilized for
- 13. To prevent heavy construction equipment and trucks from tracking soil off-site, construct a pervious crushed stone pad. Locate and construct pads as detailed in these plans. 4. Contractor is responsible for controlling dust by sprinkling exposed soil areas periodically with water as required. Contractor to supply all
- equipment and water. 5. Contractor shall be responsible for construction inspections as per NYSDEC GP-0-15-002 and Town of Ossining code.

channel stabilization, place all of the volume of seed mix prior to laying net, or as recommended by the manufacturer.

# OWNER / OPERATOR CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law."

Name (please print):	
Title:	
Date:	
Address:	
Phone:	
E-mail:	
Signature:	

# MAINTENANCE OF TEMPORARY EROSION AND SEDIMENT CONTROL STRUCTURES:

- NYS DEC GP-0-15-002 exposure restrictions states that any exposed earthwork shall be stabilized in accordance with the
- guidelines of this plan. Trees and vegetation shall be protected at all times as shown on the detail drawing and as directed by the engineer.
- 2. Care should be taken so as not to channel concentrated runoff through the areas of construction activity on the site. 3. Fill and site disturbances should not be created which causes water to pond off site or on adjacent properties.
- 4. Runoff from land disturbances shall not be discharged or have the potential to discharge off site without first being intercepted by a control structure, such as a sediment trap or silt fence. Sediment shall be removed before exceeding 50%
- of the retention structure's capacity. 5. For finished grading, adequate grade shall be provided so that water will not pond on lawns for more than 24 hours after
- rainfall, except in swale flow areas which may drain for as long as 48 hours after rainfall.
- 6. All swales and other areas of concentrated flow shall be properly stabilized with temporary control measures to prevent
- erosion and sediment travel. Surface flows over cut and fill areas shall be stabilized at all times. 7. All sites shall be stabilized with erosion control materials within 7 days of final grading.

CLEAN

8. Temporary sediment trapping devices shall be removed from the site within 30 days of final stabilization.

INSP.

MAINTENANCE SCHEDULE

	DAILY	WEEKLY	MONTHLY	AFTER RAINFALL	NECESSARY TO MAINTAIN FUNCTION	AFTER APPROVAL OF INSPECTOR
SILT FENCE	-		INSP.	INSP.	CLEAN/ REPLACE	REMOVE

## MAINTENANCE OF PERMANENT CONTROL STRUCTURES DURING CONSTRUCTION:

REPLACE

REPLACE

The stormwater management system and outlet structure shall be inspected on a regular basis and after every rainfall event. Sediment build up shall be remo from the inlet protection regularly to insure detention capacity and proper drainage. Outlet structure shall be free of obstructions. All piping and drain inlets shall be free of obstruction. Any sediment build up shall be removed.

### MAINTENANCE OF CONTROLS AFTER CONSTRUCTION

INSP.

Controls (including respective outlet structures) should be inspected periodically for the first few months after construction and on an annual basis thereafter. They should also be inspected after major storm events. DEBRIS AND LITTER REMOVAL

#### Twice a year, inspect outlet structure and drain inlets for accumulated debris. Also, remove any accumulations during each mowing operation. STRUCTURAL REPAIR/REPLACEMENT:

Outlet structure must be inspected twice a year for evidence of structural damage and repaired immediately.

### **EROSION CONTROL**

Unstable areas tributary to the basin shall immediately be stabilized with vegetation or other appropriate erosion control measures. SEDIMENT REMOVAL:

### Sediment should be removed after it has reached a maximum depth of five inches above the stormwater management system floor.

CLEANER

PROTECTION

Existing topsoil will be removed and stored in piles sufficiently as to avoid mixing with other excavation. Stockpiles shall be surrounded by erosion control as outlined on these plans. The furnishing of new topsoil shall be of a better or equal to the following criteria (SS713.01 NYSDOT): 1. The pH of the material shall be 5.5 to 7.6.

- 2. The organic content shall not be less than 2% or more than 70%.
- 3. Gradation: SIEVE SIZE % PASSING BY WGT. 2 INCH

1 INCH	85 TO 100
1/4 INCH	65 TO 100
NO. 200 MESH	20 TO 80

### PERMANENT VEGETATIVE COVERS

- Site preparation Install erosion control measures
- Scarify compacted soil areas. Lime as required to ph 6.5.
- Fertilize with 10-6-4 4 lbs/1,000 S.F.
- Incorporate amendments into soil with disc harrow.

Seed mixtures for use of	on swales and cut and fill areas.		
MIXTURE		LBS./ACRE	
ALT. A	KENTUCKY BLUE GRASS		20
	CREEPING RED FESCUE		28
	RYE GRASS OR REDTOP	5	
ALT. B	CREEPING RED FESCUE		20

Prepare seed bed by raking to remove stones, twigs, roots and other foreign material.

TALL FESCUE/SMOOTH BLOOMGRASS

- Apply soil amendments and integrate into soil. Apply seed uniformly by cyclone seeder culti-packer or hydro-seeder at rate indicated.
- Stabilize seeded areas in drainage swales.
- Irrigate to fully saturate soil layer, but not to dislodge planting soil. Seed between April 1st and May 15th or August 15th and October 15th.
- Seeding may occur May 15th and August 15th if adequate irrigation is provided.

#### TEMPORARY VEGETATIVE COVER: SITE PREPARATION:

- Install erosion control measures
- Scarify areas of compacted soil.
- 4. Lime as required to ph 6.5.

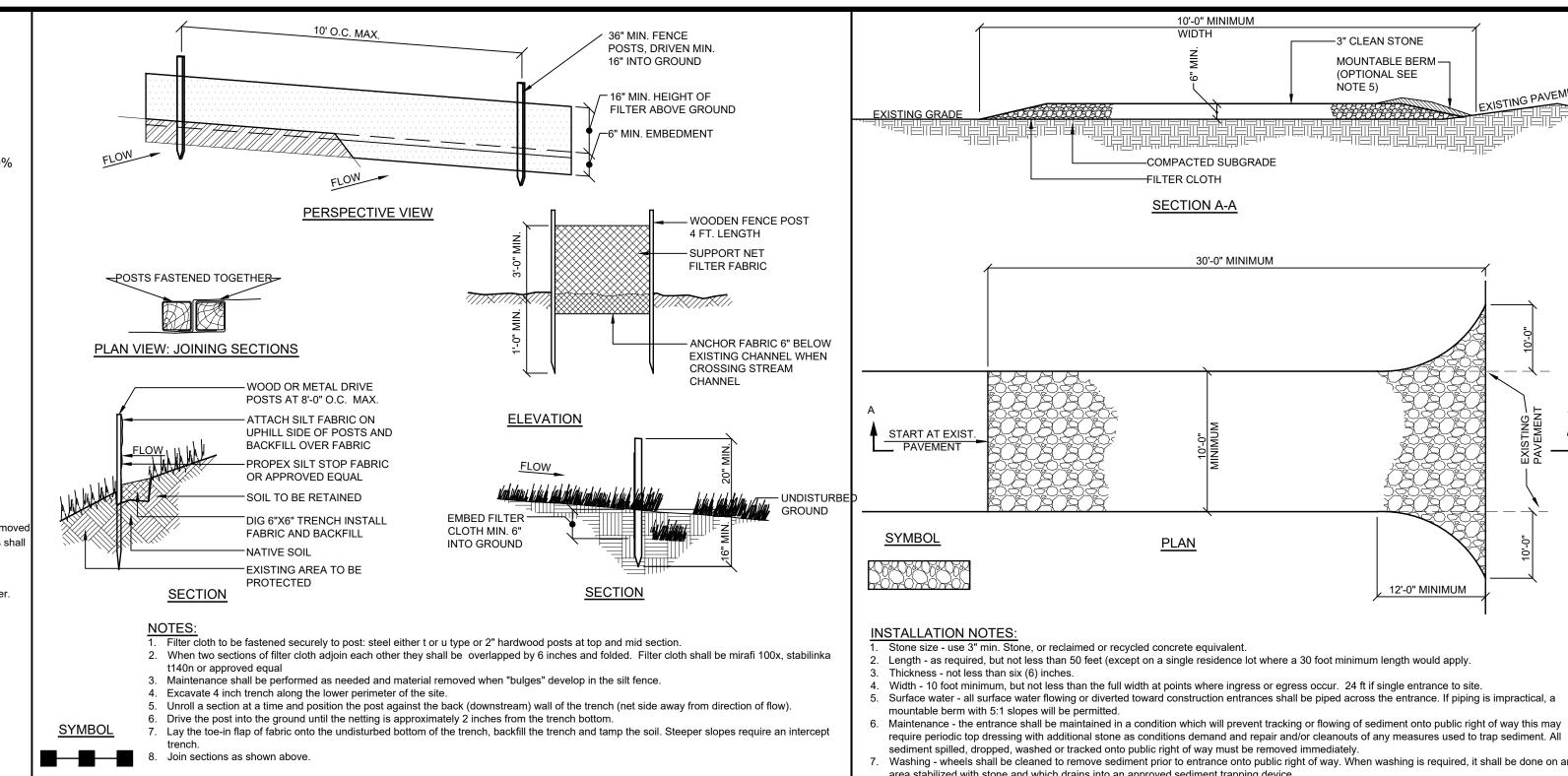
Today's Date:

	OLLD OF LOILO.		
	MIXTURE	LBS./ACRE	
ı	Rapidly germinating annual ryegrass		20
	(or approved equal)		
	Perennial ryegrass		20
r	Cereal oats	36	

accordance with Part III.A.5 of the SPDES General Permit for Stormwater Runoff from Construction Activity, GP-0-15-002, dated January 12, 2015, Page 10 of 40, shall sign a copy of the following Certification Statement before undertaking any construction activity at the Site identified in the SWPPP:

implement any corrective actions identified by the Qualified Inspector during a site inspection. I also understand that the Owner or Operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") General Permit for Stormwater Discharge from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal civil and/or administrative proceedings "

subject the to chillinal, civil and/or adm	illistrative proceedings.
Individual Contractor:	
Name and Title (please print):	
Signature of Contractor:	
Company / Contracting Firm:	
Name of Company:	
Address of Company:	
Telephone Number / Cell Number:	
Site Information:	
Address of Site:	



FINISHED GRADE -

RETAINING WALL -

E-1

# SILT FENCE DETAIL

### Washing - wheels shall be cleaned to remove sediment prior to entrance onto public right of way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device. 8. Periodic inspection and needed maintenance shall be provided after each rain STABILIZED CONSTRUCTION ENTRANCE DETAIL

-3" CLEAN STONE

NOTE 5)

-COMPACTED SUBGRADE

30'-0" MINIMUM

FILTER CLOTH

<u>PLAN</u>

**SECTION A-A** 

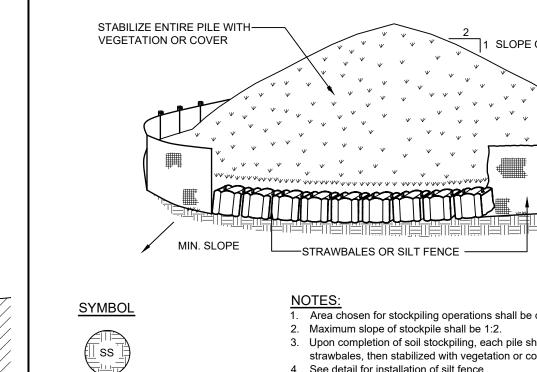
MOUNTABLE BERM -(OPTIONAL SEE

12'-0" MINIMUM

5

H

UMBIN

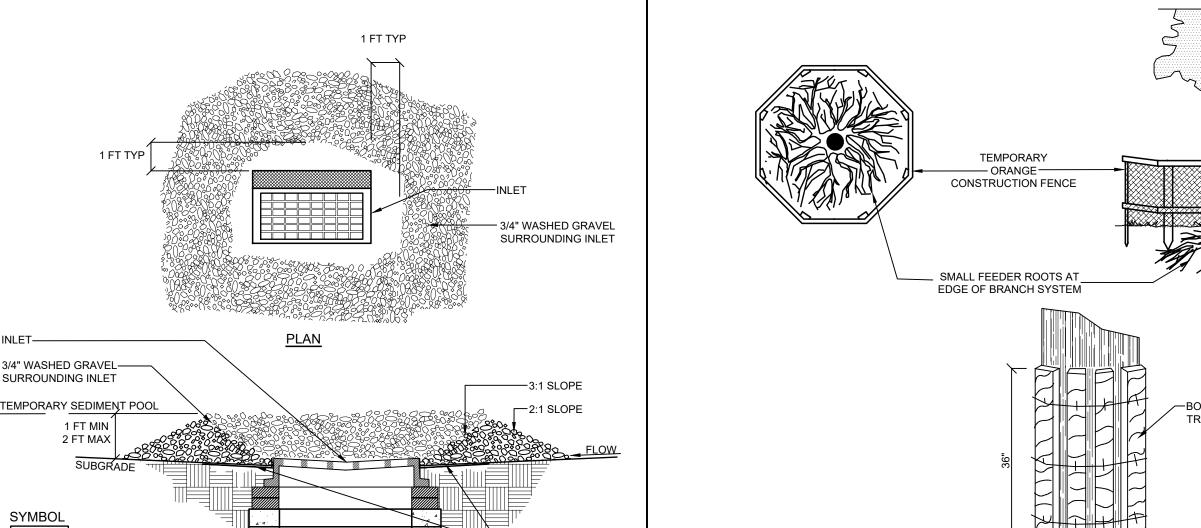


- Area chosen for stockpiling operations shall be dry and stable 3. Upon completion of soil stockpiling, each pile shall be surrounded with either silt fencing or strawbales, then stabilized with vegetation or covered.
- 4. See detail for installation of silt fence.

# TREE PROTECTION PLAN E-3 FOR GRADE CHANGE DETAIL

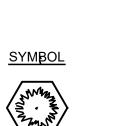
E-4

SOIL STOCKPILE DETAIL



FINISHED —

GRADE



Contractor shall use the tree trunk armor detail for isolated trees that require protection 2. As an alternate, the contractor may protect trees in the vicinity of regular heavy traffic / construction areas or clusters of trees to be protected as per the construction fence detail.

BOARD FENCE WRAPPED AROUND TRUNK 1" GAP BETWEEN BOARDS

TREE TRUNK ARMOR / TREE PROTECTION DETAIL

1' OF GRAVEL FILTER

E-6

E-5

**INLET PROTECTION DETAIL** 

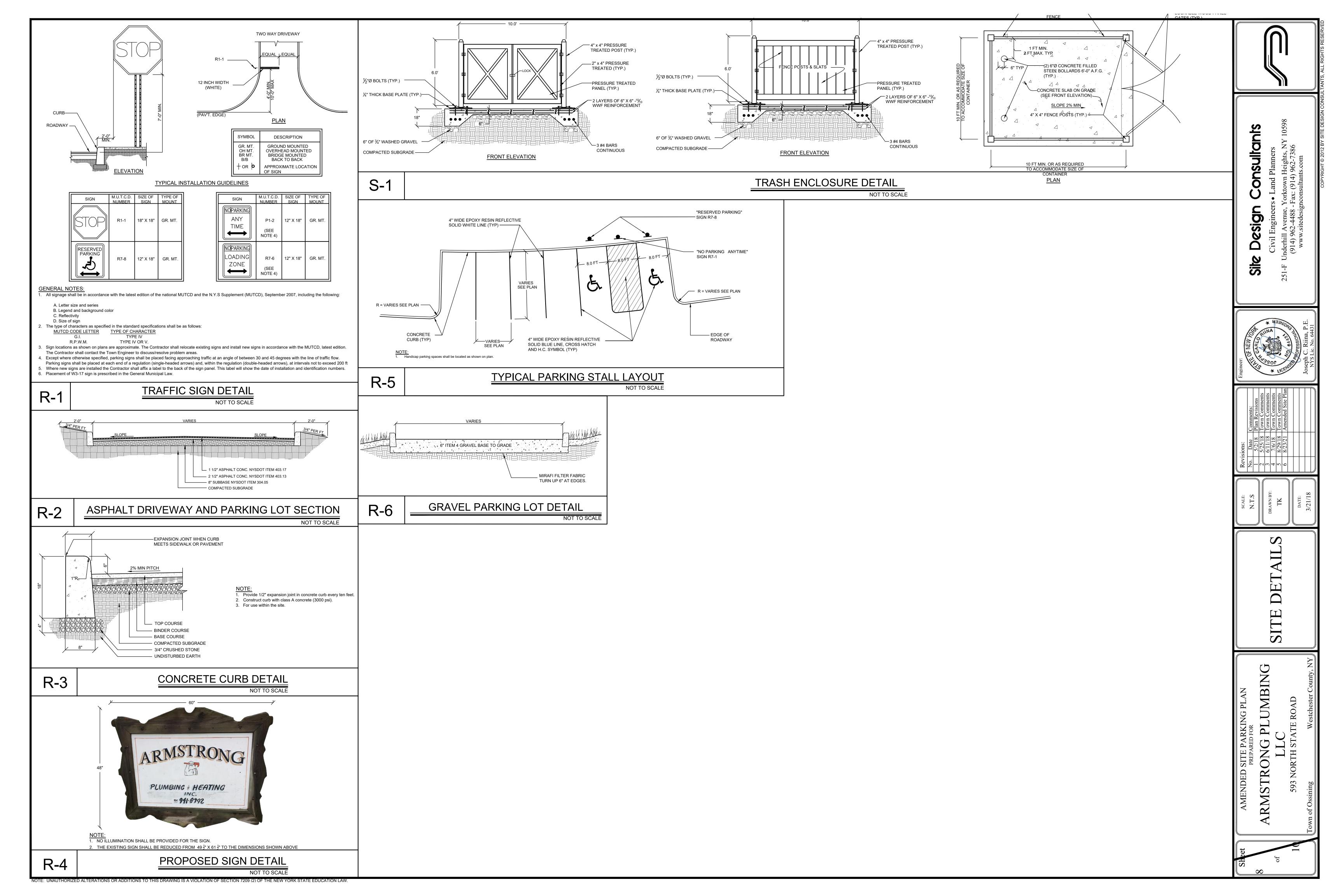
NOT TO SCALE

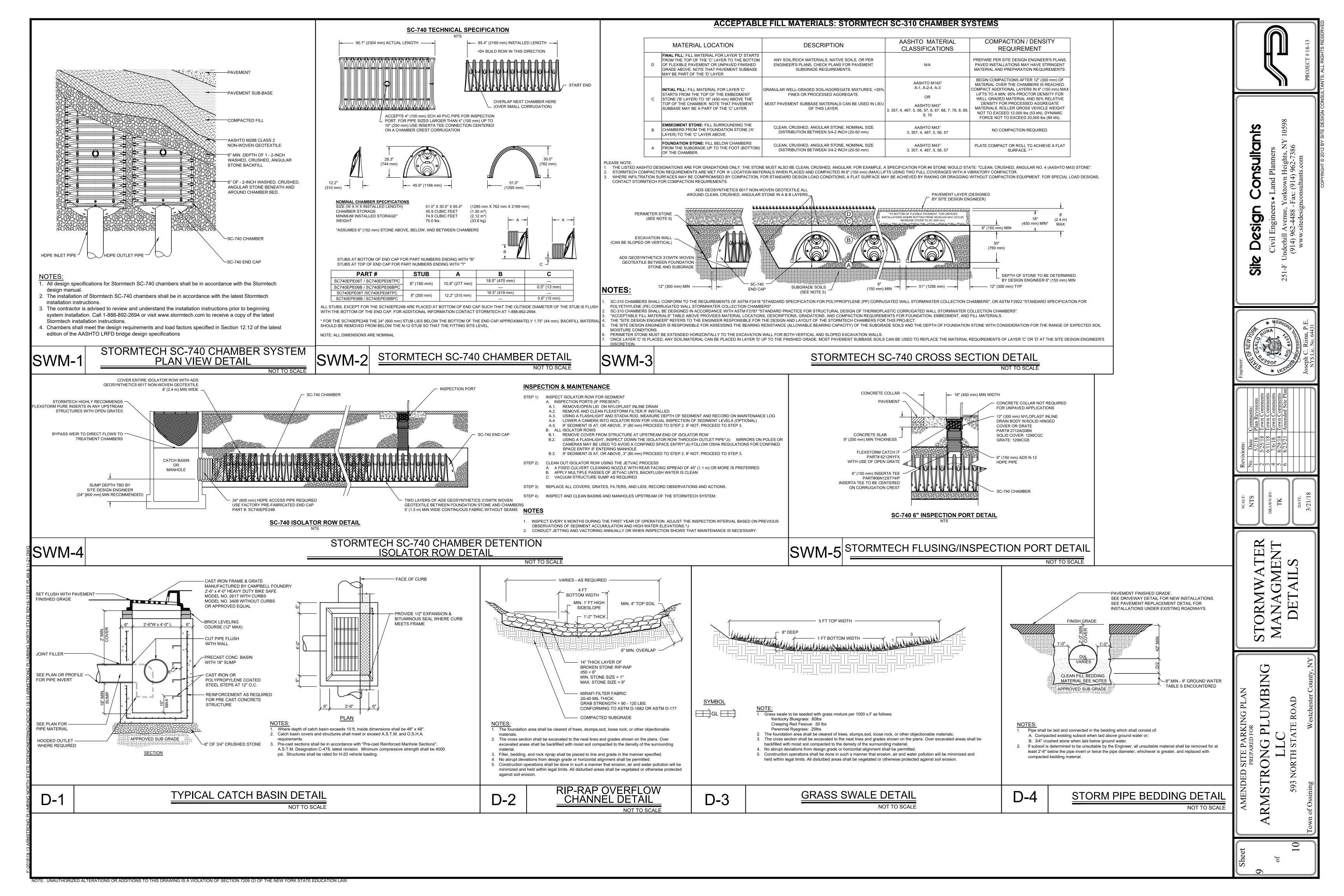
Same as permanent vegetative cover

CONTRACTOR CERTIFICATION STATEMENT

Certification Statement - All contractors and subcontractors as identified in a SWPPP, by the Owner or Operator, in

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to





PRECAST MANHOLE (BY HYDRO) MANHOLE LID, FRAME AND COVER 30 INLET PIPE (BY ADS/OTHERS) OUTLET PIPE (BY ADS/OTHERS) REDUCER/ EXPANDER (NOT SHOWN FOR DETAIL) 5 PIPE COUPLING (BY ADS/OTHERS) 6 LEDGER ANGLE SUPPORT FRAME DIP PLATE CENTER SHAFT & CONE

MATERIALS & LABOR TO ACHIEVE

0 BENCHING SKIRT

Hydro <

PEAK TREATMENT FLOW: 3.0 CFS (85 L/S) . SEDIMENT STORAGE CAPACITY: 0.70 YD3 (0.54 m3) OIL STORAGE CAPACITY: 70 GALLONS (265 LITERS)

ADDITIONAL DESIGN INFORMATION

1. THE OUTLET PIPE STUB IS A ROTO-MOLDED PRODUCT WITH AN I.D. OF 12" THAT CANNOT BE MODIFIED. TO AVOID THE USE OF

- A REDUCER OR EXPANDER ON THE OUTLET A 12" OUTLET PIPE SHOULD BE USED IF POSSIBLE. . ONLY SMALLER INLET PIPES MAY BE USED. THE INLET PIPE INVERT SHOULD BE PLACED ONE INLET PIPE DIAMETER BELOW THE OUTLET PIPE INVERT. THE I.D. OF THE INLET PIPE SHOULD BE PLACED TANGENT TO THE I.D. OF THE MANHOLE.
- HEADLOSS AT 3.0 CFS WITH A 12" INLET: 8" (203 mm). HEADLOSS WILL INCREASE WITH SMALLER INLET PIPES. 3. SEDIMENT SHALL BE STORED IN A ZONE THAT IS ISOLATED FROM THE MAIN FLOW PATH AND PROTECTED FROM
- RE-ENTRAINMENT BY THE BENCHING SKIRT.

FINAL GRADE (BY OTHERS) stormwater <<

70 INWOOD ROAD, SUITE 3 ROCKY HILL, CT 06067 V: 888-892-2694 F: 866-328-8401

		RMSTRON 4' ONLINE [	_	
	DATE:	05/25/2018	PROJECT:	91772
1	DRAWN:	DWC	SCALE:	1/4" = 1'
	CHECKED:	MRJ	PAGE:	2 OF 3

ARMSTRONG PLUMBING - NY

SCALE:

PAGE:

PROJECT: 91772

1/4" = 1'

3 OF 3

4' ONLINE DD - PLAN VIEW

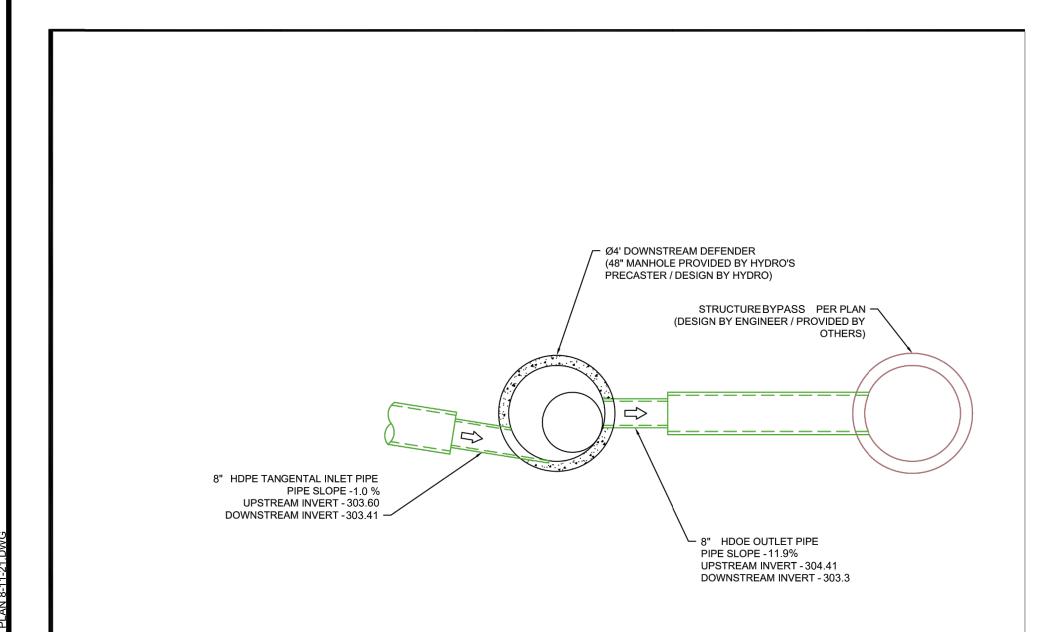
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DWC

DATE:

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70 INWOOD ROAD, SUITE 3

V: 888-892-2694 F: 866-328-8401

NOTE: UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS A VIOLATION OF SECTION 7209 (2) OF THE NEW YORK STATE EDUCATION LAV

### Introduction

Operation

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The Downstream Defender® operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is manufactured from durable non-corrosive components. No manual procedures are required to operate the unit and maintenance is limited to monitoring accumulations of stored pollutants and periodic clean-outs. The Downstream Defender® has been designed to allow for easy and safe access for inspection/monitoring and clean-out procedures. Entry into the unit or removal of the internal components is not necessary for maintenance, thus safety concerns related to confined-spaceentry are avoided.

### Pollutant Capture and Retention

The internal components of the Downstream Defender® have Overview volumes so that separator performance is not reduced as pollutants Defender® vessel remains wet between storm events. Oil and floatables are stored on the water surface in the outer annulus separate from the sediment storage volume in the sump of the unit providing the option for separate oil disposal, and accessories such as adsorbant pads. Since the oil/floatables and sediment storage volumes are isolated from the active separation region, the potential for re-suspension and washout of stored pollutants between clean-outs is minimized.

#### Wet Sump The sump of the Downstream Defender® retains a standing water

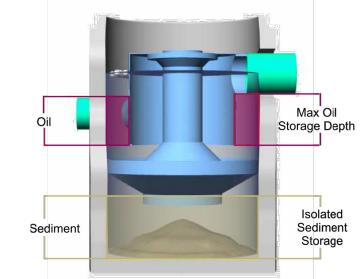


Fig.2 Pollutant storage volumes of the Downstream Defender®

#### Downstream Defender® Operation and Maintenance Manual Page | 5

level between storm events. The water in the sump prevents stored sediment from solidifying in the base of the unit. (The clean-out procedure becomes more difficult and labor intensive if the system allows fine sediment to dry-out and consolidate. Dried sediment must be manually removed by maintenance crews. This is a labor intensive operation in a hazardous environment.)

### Blockage Protection

The Downstream Defender® has large clear openings and no internal restrictions or weirs, minimizing the risk of blockage and hydraulic losses. In addition to increasing the system headloss, orifices and internal weirs can increase the risk of blockage within

### Maintenance

removing a wide range of pollutants from stormwater runoff. accumulate between clean-outs (Fig.2). The Downstream Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the Downstream Defender®. The Downstream Defender® will capture and retain sediment and oil until the sediment and oil storage volumes are full to capacity. When sediment and oil storage capacities are reached, the Downstream Defender® will no longer be able to store removed sediment and oil. Maximum pollutant storage capacities are provided in Table 1.

> Hydro International recommends that maintenance crews watch the Downstream Defender® maintenance training video at www.hydro-int.com/us/products/downstream-defender. Maintenance providers are also encouraged to participate in Hydro International's Maintenance Contractor Certification Program (see page 12).



Fig.3 Watch the Downstream Defender® instructional maintenance video at www.hydro-int.com/us/products/downstream-defender.

**Hydro International** (Stormwater), 94 Hutchins Drive, Portland ME 04102 Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

# Downstream Defender® Operation and Maintenance Manual



- 1. Set up any necessary safety equipment around the access port or grate of the Downstream Defender® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.
- 2. Remove the lids to the manhole (Fig. 4). NOTE: The 4-ft (1.2m) Downstream Defender® will only have one lid.

Inspection Procedures

- 3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities. See Fig.7 and 8 for typical inspection views.
- 4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the outer annulus of the chamber.
- 5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel (Fig.5).
- 6. On the Maintenance Log (see page 9), record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.



Fig.7 View over center shaft into sediment storage zone.

7. Securely replace the grate or lid.

- 8. Take down safety equipment.
- 9. Notify Hydro International of any irregularities noted during inspection.

Floatables and Sediment Cleanout Floatables cleanout is typically done in conjunction with sediment removal. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables (Fig.6).

Floatables and loose debris can also be netted with a skimmer and pole. The access port located at the top of the manhole provides unobstructed access for a vactor hose and skimmer pole to be lowered to the base of the sump.

# Scheduling

- Floatables and sump cleanout are typically conducted once a year during any season.
- If sediment depths are greater than 75% of maximum cleanout depths stated in Table 1, sediment removal is required.
- Floatables and sump cleanout should occur as soon as possible following a spill in the contributing drainage area.



Fig. 8 View of outer annulus of floatables and oil collection zone.

**Hydro International** (Stormwater), 94 Hutchins Drive, Portland ME 04102 Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

### Downstream Defender® Operation and Maintenance Manual

six months during the first year of operation to determine your

Typically, inspection may be conducted during any season

Sediment removal is not required unless sediment depths

Safety Equipment and Personal Protective Equipment

Crow bar or other tool to remove grate or lid

exceed 75% of maximum clean-out depths stated in Table 1

site-specific rate of pollutant accumulation

Recommended Equipment

Pole with skimmer or net

(traffic cones, work gloves, etc.)

Trash bag for removed floatables

Downstream Defender® Maintenance Log

The Downstream Defender® allows for easy and safe inspection, Inspection Procedures monitoring and clean-out procedures. A commercially or Inspection is a simple process that does not involve entry into the municipally owned sump-vac is used to remove captured sediment Downstream Defender®. Maintenance crews should be familiar and floatables. Access ports are located in the top of the manhole. with the Downstream Defender® and its components prior to On the 6-ft (1.8m), 8-ft (2.4m), 10-ft (3.0m) and 12-ft (3.7m) units, inspection the floatables access port is above the outlet pipe between the concrete manhole wall and the dip plate. The sediment removal access ports for all Downstream Defender® models are located It is important to inspect your Downstream Defender® every directly over the hollow center shaft.

Maintenance events may include Inspection, Oil & Floatables Removal, and Sediment Removal. Maintenance events do not require entry into the Downstream Defender®, nor do they require the internal components of the Downstream Defender® to be removed. In the case of inspection and floatables removal, a vactor truck is not required. However, a vactor truck is required if the maintenance event is to include oil removal and/or sediment removal

### Determining Your Maintenance Schedule

The frequency of cleanout is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. A simple probe such as a Sludge Judge® can be used to determine the level of accumulated solids stored in the sump. This information can be recorded in the maintenance • Sediment probe (such as a Sludge Judge®) log (see page 9) to establish a routine maintenance schedule.

The vactor procedure, including both sediment and oil/floatables removal, for a 6-ft (1.8m) Downstream Defender® typically takes less than 30 minutes and removes a combined water/oil volume of about 500 gallons (1900 liters).

Table 1. Downstream Defender® Pollutant Storage Capacities and Max. Cleanout Depths.

Unit D	iameter	Total Oil	Storage		ean-out epth	Total Se Stor		Sedir Clean-ou			uid Volume moved
(ft)	(m)	(gal)	(L)	(in)	(cm)	(yd³)	(m³)	(in)	(cm)	(gal)	(L)
4	1.2	70	265	<16	<41	0.70	0.53	<18	<45	384	1,454
6	1.8	216	818	<23	<58	2.10	1.61	<24	<61	1,239	4,690
8	2.4	540	2,044	<33	<84	4.65	3.56	<30	<76	2,884	10,917
10	3.0	1,050	3,975	<42	<107	8.70	6.65	<36	<91	5,546	20,994
12	3.7	1,770	6,700	<49	<125	14.70	11.24	<42	<107	9,460	35,810

- 1. Refer to Downstream Defender® Clean-out Detail (Fig.2) for measurement of depths.
- 2. Oil accumulation is typically less than sediment, however, removal of oil and sediment during the same service is recommended. 3. Remove floatables first, then remove sediment storage volume.
- 4. Sediment removal is not required unless sediment depths exceed 75% of maximum clean-out depths stated in Table 1



#### Recommended Equipment Safety Equipment (traffic cones, etc)

- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge Judge<sup>®</sup>)
- Vactor truck (6-inch/150mm diameter flexible hose recommended)
- Downstream Defender® Maintenance Log

# Floatables and Sediment Clean Out Procedures

- 1. Set up any necessary safety equipment around the access port or grate of the Downstream Defender® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.
- 2. Remove the lids to the manhole NOTE: The 4-ft (1.2m) Downstream Defender® will only have one lid.
- 3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
- 4. Using the Floatables Port for access, remove oil and floatables stored on the surface of the water with the vactor hose or the skimmer net (Fig.9, top).
- 5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel and record it in the Maintenance Log (Pg.9).
- 6. Once all floatables have been removed, drop the vactor hose to the base of the sump via the Central Access Port. Vactor out the sediment and gross debris off the sump floor (Fig.6 and 9).

# Downstream Defender® Operation and Maintenance Manual

# 7. Retract the vactor hose from the vessel.

- - 8. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.

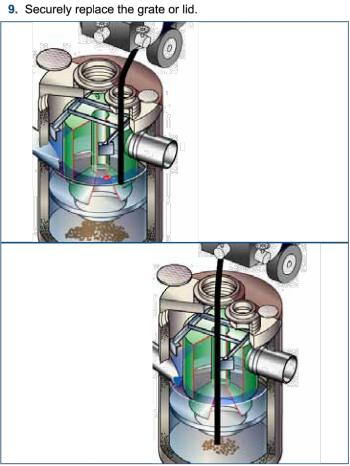


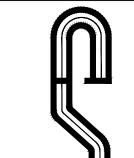
Fig.9 Floatables and sediment are removed with a vactor hose

# Maintenance at a Glance

Activity	Frequency
Inspection	<ul> <li>Regularly during first year of installation</li> <li>Every 6 months after the first year of installation</li> </ul>
Oil and Floatables Removal	<ul><li>Once per year, with sediment removal</li><li>Following a spill in the drainage area</li></ul>
Sediment Removal	- Once per year or as needed - Following a spill in the drainage area

Only removing the first few inches of oils/floatables and the sediment storage volume is required.





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NOTE: THESE PAGES HAVE BEEN TAKE FROM THE DOWNSTREAM DEFENDER MAINTENANCE AND OPERATIONS MANUAL. THEY ILLUSTRATE THE INPSECTION AND MAINTENANCE PROCEDURE FOR THE SYSTEM

