

STORMWATER MANAGEMENT SYSTEM OPERATION & MAINTENANCE PLAN

This Stormwater Management System Operations & Maintenance Plan (the Plan) outlines measures that are essential for maintaining an effective stormwater management system at the Stearns Meadow Water Treatment Plant (WTP) and associated site improvements (the Site). Periodic and scheduled inspections and maintenance measures are recommended to prevent deficiencies and for proper performance of the stormwater management system. Failure to implement these measures can reduce the hydraulic capacity and the pollutant removal efficiency of stormwater measures potentially resulting in a reduced quality of stormwater runoff discharging from the Site.

RESPONSIBLE PARTY & ESTIMATED ANNUAL BUDGET

The party responsible for implementing this Plan and identifying the source of necessary funds is as follows:

*Town of Scituate
600 Chief Justice Cushing Hwy
Scituate, MA 02066
Telephone: (781) 545-8732*

GOOD HOUSEKEEPING

The Site will be maintained as clean and orderly. Routine inspections of the Site for debris and sediment accumulations shall be performed. Debris and sediment shall be disposed of in accordance with local and State requirements.

INSPECTIONS & MAINTENANCE MEASURES

Stormwater management is provided by sediment forebays, bioretention ponds, and Continuous Deflective Separation (CDS) units. These measures are illustrated on the Site Plans. Routine inspections and maintenance of the stormwater management system shall be performed in accordance with the *Stormwater Management System Operation & Maintenance Plan* for the Site. These measures are recommended to prevent deficiencies with the system that may result in poor quality stormwater runoff.

A sample Inspection Form is attached that is recommended for use during inspections of the stormwater management system. The form includes a table that outlines specific inspection and maintenance measures, in addition to the following information that can be recorded by the inspector during the inspection. Completed Inspections Forms should be kept at the Site to enable both facility managers and regulatory agencies to ensure that operation of the system is in compliance with permit requirements.

LANDSCAPE MANAGEMENT

Lawn and landscaped areas shall be inspected for patches of dead vegetation and erosion. If these conditions occur, effected areas shall be stabilized and replanted with vegetation to prevent sediment from entering the stormwater management system.

The following additional measures are provided in an effort to minimize the potential for runoff pollution due to overwatering, dead vegetation and erosion, direct disposal of lawn clippings, and over-application of materials such as fertilizers and pesticides.

Lawn Mowing

The following mowing practices are recommended:

- Maintain sharp mower blades.
- Grass shall not be cut shorter than 2 to 3 inches to minimize weed growth. Grass can be cut lower in the spring and fall to stimulate root growth, but no shorter than 1½ inches.
- Do not dispose of grass clippings within the stormwater management system.
- Employ practices to minimize the potential for grass clippings to enter the stormwater management system.

Fertilizers & Pesticides

Use of pesticides and fertilizers should be minimized to the extent practicable. Application of these materials may degrade the quality of stormwater runoff and should therefore be applied judiciously. In addition, fertilizers and pesticides shall not be applied when rain is expected. These materials should be stored under cover to prevent their exposure to stormwater.

Table 1 –Operations & Maintenance Measures

Bioretention Pond	
Objective: <i>Maintain the infiltration and storage capacity of the bioretention pond section.</i>	
Frequency	Measure
Monthly	<ul style="list-style-type: none"> • Remove accumulated trash from the area and at the outlet structure. • Inspect vegetation on a regular basis while vegetation is being established. • Assess bank stability and erosion after major storm events. • Remove obstructions that may impede flow through the basin, including trash, debris, and accumulated grass clippings and leaves. Dispose of material in accordance with all applicable regulations. • Inspect species distribution/survival, damage to embankments and spillways from burrowing animals, water elevations, and outlet condition.
Bi-annually	<ul style="list-style-type: none"> • Embankment should be mowed twice each year. Other area surrounding wetlands should not require mowing. Mowing and fertilizing help promote vigorous growth of plant roots and resist erosion
Annually	<ul style="list-style-type: none"> • Replace or add organic material to improve performance • Replace damaged or unhealthy plantings • Maintain vegetative cover on embankments and spillways. Confirm embankment are dense and healthy
After Heavy Rainfall Events ¹	<ul style="list-style-type: none"> • Do not stockpile snow on bioretention pond surface. This will require additional maintenance and vacuuming.

¹ At a minimum, perform inspections twice a year for the first year and annually thereafter.

Closed Conduit Drainage Systems/Deep Sump Catch Basins/Outlet Control Structure/Hoods	
Objective: <i>Preserve the hydraulic capacity of the closed conduit drainage systems.</i>	
Frequency	Measure
Quarterly	<ul style="list-style-type: none"> • Remove sediment from bottom of catch basin whenever the depth of sediment is greater than or equal to half the sump depth. Dispose of sediment in accordance with all applicable regulations. • Remove obstructions that may impede flow through catch basin grates, including trash, debris, and accumulated grass clippings and leaves. Dispose of material in accordance with all applicable regulations. • Avoid placement of snow on top of catch basin grates. • Inspect catch basin grates and manhole covers for damage. Repair as necessary. Covers and grates shall not be welded to the frame so that the structure can be inspected and maintained. • Inspect drainage piping for structural deficiency and debris accumulation. Repair piping as required. Dispose of material in accordance with all applicable regulations.
After Heavy Rainfall Events ¹	<ul style="list-style-type: none"> • Remove sediment from bottom of catch basin when using ½ sump depth with sediment. Dispose of sediment in accordance with all applicable regulations.

¹ At a minimum, perform inspections twice a year for the first year and annually thereafter.

Sediment Forebay

Objective: Maintain the storage capacity and removal efficiency of the sediment forebay

Frequency	Measure
Monthly	<ul style="list-style-type: none"> • Inspect area for signs of erosion. Stabilize accordingly with similar size riprap. • Remove obstruction that may limit runoff from entering the sediment forebay, including sediment, trash, debris, and leaves. • Maintain access to the basin.
Quarterly	<ul style="list-style-type: none"> • Sediment shall be cleaned out of the sediment forebay when it accumulates to a depth of more than ½ the design depth
After Heavy Rainfall Events ¹	<ul style="list-style-type: none"> • Inspect for ponded water 24-hours or several days after event. If water is ponded inside the sediment forebay, it may indicate that the bottom of the forebay has failed or that the bottom is clogged. To rehabilitate a failed sediment forebay, remove all riprap from the bottom and strip all accumulated sediment from the bottom. The bottom of the forebay must be scarified and tilled to induce infiltration and replace riprap.

¹ At a minimum, an event accumulating 2.7 inches of rainfall in a 24-hour period.

Infiltration Basin

Objective: Maintain the storage capacity of the detention basin.

Frequency	Measure
Monthly	<ul style="list-style-type: none"> • Inspect contributing drainage areas for any sediment or debris. • Inspect detention basin, flared end section, outlet control structure, v-notch weir, and trash rack for any sediment, debris and other obstructions that may impede flow. • Inspect detention basin and outlet control for structural damage. • Inspect the detention basin for erosion. • Observe the water level in the detention basin. Verify that the basin is dry or that the water level is decreasing, and the water is discharging into the swale. • Remove sediment and debris from contributing drainage areas. • Remove debris and other obstructions from detention basin. • Remove sediment, debris and other obstructions that may impede flow through the outlet control structure (i.e. trash, debris and leaves).
Bi-annually	<ul style="list-style-type: none"> • Mow basin vegetation annually along maintenance rights-of-way and the embankment. The remaining setback can be mowed every other year. • Remove grass clippings and leaves from the area. • Remove silt/sediment from the pond bottom when the sediment volume exceeds 10% of the total basin volume. • Repair minor erosion observed along the embankments. •
Annually	<ul style="list-style-type: none"> • Repair damage (if any) to detention basin, flared end section, outlet control structure, and trash rack. • All repaired areas/infrastructure shall be restored according to original design specifications.
After Heavy Rainfall Events ¹	<ul style="list-style-type: none"> • Inspect for ponded water 24-hours or several days after event. If water is ponded it may indicate that the bottom of the basin has failed. To rehabilitate a failed basin, remove top 6 inches and roto-till the surface to a depth of 12 inches. Restore basin to original cross-section and seed to restore ground cover.

¹ At a minimum, an event accumulating 2.7 inches of rainfall in a 24-hour period.

Continuous Deflective Separation (CDS) Unit

Refer to CDS Inspection and Maintenance Guide

CDS[®] Inspection and Maintenance Guide



Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allow both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine whether the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS system should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y ³	m ³
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities



Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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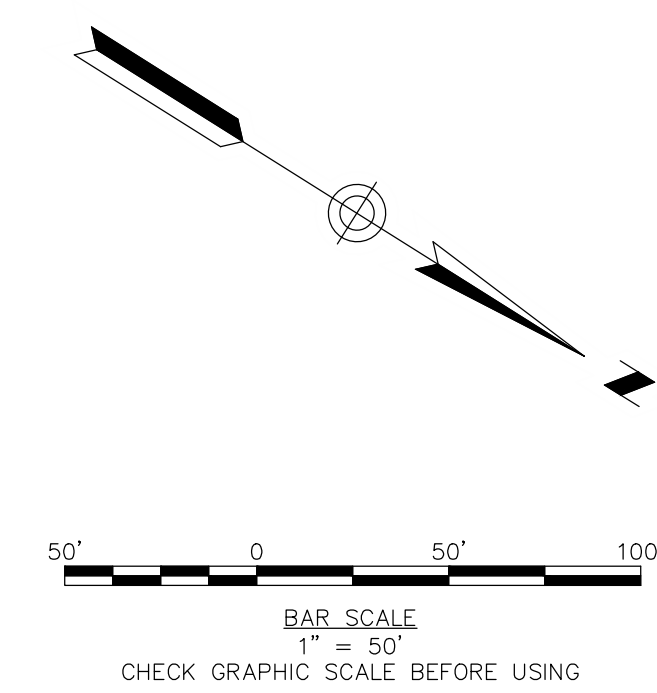
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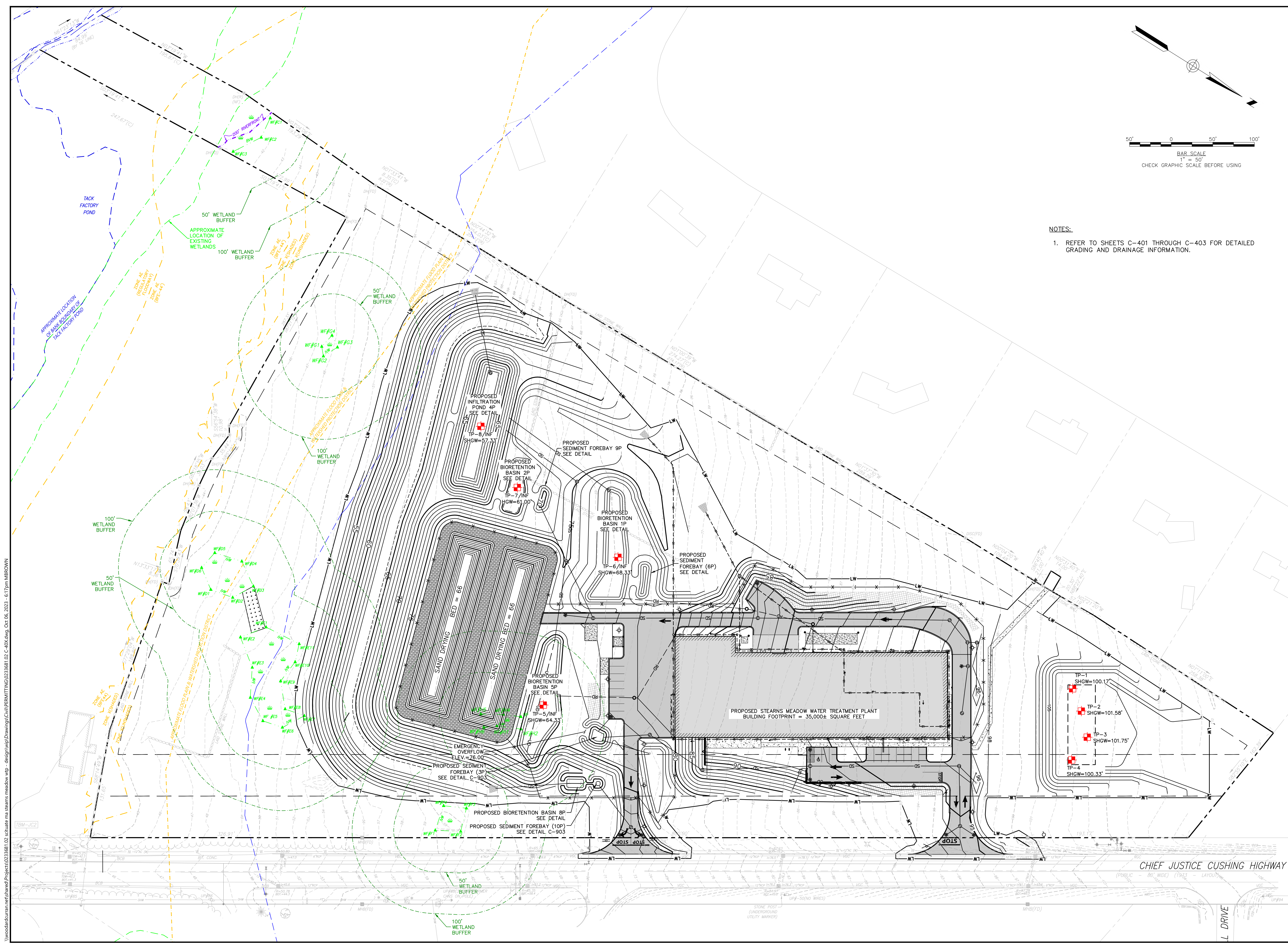


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NOTES:
1. REFER TO SHEETS C-401 THROUGH C-403 FOR DETAILED
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ISSUE FOR PERMIT

CLIENT INFO:
**TOWN OF SCITUATE,
MASSACHUSETTS
453 CHIEF JUSTICE
CUSHING HIGHWAY**

**STEARNS MEADOW
DRINKING WATER
TREATMENT PLANT**

REV	MM/DD/YY	DESCRIPTION
1	10/06/2023	PEER REVIEW RESPONSE

JOB NO: 0233681.02
DATE: AUGUST 2023
SCALE: AS SHOWN
DESIGNED BY: JC
DRAWN BY: MB
CHECKED BY: SK
FILENAME: 0233681.02_C-40X.dwg

DRAWING TITLE:

**OVERALL GRADING & DRAINAGE
PLAN**

DRAWING NO:
C-400