CTDOT MS4 Project Design
Maximum Extent Practicable (MEP) Worksheet

Section 1: Project Information	**Project #:**	240229
	Title:	Residential Development
	Location:	Montville, CT

Section 2: Existing Conditions

EC1	Total Project Area		3.40 acres		
EC2	Pre-construction Directly Connected Impervious Area (DCIA):		0.00 acres	0.00 %	
EC3	Soil Infiltration Potential	Data Source: ☑Existing Report / Soils Map ☐Field Verified	☑Good/Fair	☐Poor	☐Mixed
EC4	Depth to Maximum Groundwater	☑TBD	to	ft below grade	
EC5	Depth to Bedrock	☑TBD	to	ft below grade	
EC6	Aquifer Protection Area? (from PNDF)		☐Yes	☑No	
EC7	MS4 Priority Area? (from PNDF)		☑Yes (See Below)	☐No	
	Check All That Apply ☐Urbanized Area ☐DCIA >11% ☐Impaired Waterbody (See Below)				
	Select All Impairments That Apply Cause Unknown Choose an Item Choose an Item				
EC8	Contamination known or suspected to be present? (From Environmental Compliance)		☐Yes	☑No	
EC9	Adjoining DOT ROW beyond project limits available for stormwater quality management		0 acres		

Section 3: Designed Conditions

	Water Quality Calculations	**30% Design**	**60% Design**	**90% Design**	**FDP**
DC1	WQV retention design goal ☑ Full ☐ 1/2"-WQV	ac-ft ☐ TBD	ac-ft	ac-ft	ac-ft
DC2	WQV goal ***retained*** (refer to page 2)	ac-ft	ac-ft	ac-ft	ac-ft
DC3	WQV goal ***treated*** (refer to page 2)	ac-ft	ac-ft	ac-ft	ac-ft
DC4	Total WQV *retained and treated*	0 **ac-ft**	0 **ac-ft**	0 **ac-ft**	0 **ac-ft**
DC5	Post-construction DCIA(acres)	ac. ☐ TBD	ac.	ac.	ac.
DC6	Pre-construction DCIA (refer to EC2 above)	ac.	ac.	ac.	ac.
DC7	Change in DCIA from pre- to post-construction *Can be positive (DCIA gained) or negative (DCIA lost)*	0 **ac.** ☐ **TBD**	0 **ac.**	0 **ac.**	0 **ac.**
	Date completed				
	Completed by (initials)				
	Reviewed by (initials)				

Notes:

Worksheet users should refer to the *CT DOT MS4 Project Design MEP Worksheet Instructions*

Section 4: Stormwater BMP Selection Summary						
Design Phase ☐30% ☐60% ☐90% ☐FDP	**WQV Retained (ac-ft)**	**WQV Treated (ac-ft)**	**DCIA Captured (Acres)**	**DCIA Disconnection Credit (%)**	**DCIA Disconnection Credit (acres)**	**Site Constraints**
Disconnection (Dispersion)						
						Choose an Item.
						Choose an Item.
						Choose an Item.
Conveyance (Swales / Channels)						
						Choose an Item.
						Choose an Item.
						Choose an Item.
Infiltration / Retention						
						Choose an Item.
						Choose an Item.
						Choose an Item.
						Choose an Item.
						Choose an Item.
						Choose an Item.
						Choose an Item.
Treatment						
						Choose an Item.
						Choose an Item.
						Choose an Item.
TOTAL	0	0	0	0	0	

Notes:

Worksheet users should refer to the *CT DOT MS4 Project Design MEP Worksheet Instructions.* Refer to the 2004 CT Stormwater Quality Manual for more information on BMP criteria and limitations.

APPENDIX E

Construction Site Environmental Inspection Report (CSEIR)

State of Connecticut
Department of Transportation
Construction Site Environmental Inspection Report

This Form Must Be Completed At Least Once A Week And Within Twenty Four (24) Hours Of The End Of A Storm Event That Is 0.1 inches Or Greater

General Information			
Project Number		**Date**	
Permit Number(s)		**Location**	
		Phone No.	
Project Engineer		**Chief Inspector**	
Contractor			
Describe present phase of construction/activities that are occurring			

Type of Inspection:
☐ Weekly ☐ Pre-storm event ☐During storm event ☐ Post-storm event

Weather Information

Has there been a storm event since the last inspection? ☐Yes ☐No **If yes, provide:**

Storm Start Date & Time: Storm Duration (hrs): Type and Approximate Amount of Precipitation (in):

Weather at time of this inspection?
☐ Clear ☐Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snowing ☐High Winds Temperature:

Site-specific BMPs

- *Number the structural and non-structural BMPs on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map for reference with you during your inspections.*

BMP Maintenance

	BMP or Observation Site and Location	BMPs Installed ?	BMP Maintenance Required?	Remedial Action Required and Date Contractor was Notified *ALL REMEDIAL ACTIONS MUST BE COMPLETED WITHIN 24 HOURS*	Date Fixed	Photo Taken ?	Repeat Failure?
1		☐Yes ☐No	☐Yes ☐No			☐Yes ☐No	☐Yes ☐No
2		☐Yes ☐No	☐Yes ☐No			☐Yes ☐No	☐Yes ☐No
3		☐Yes ☐No	☐Yes ☐No			☐Yes ☐No	☐Yes ☐No

Are there any sediment discharges to a regulated area occurring or have any occurred since the last inspection? ☐Yes ☐No

If yes, contact the District Environmental Coordinator immediately.

Describe the discharge including location, time identified, and the approximate amount of sediment. (on back)

Environmental Inspector: _____

Signature: _____ **Date:** _____

Reviewed by: _____

Signature: _____ **Date:** _____

APPENDIX F

Notice of Termination Form

Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form: Non-Solar Projects

This Notice serves as a request to terminate the below listed permit as well as any applicable Letter(s) of Credit.

Part I: Permittee Information

The below information is required in accordance with Section 6(b) of the General Permit.

1. Permit Number: GSN _____
2. Registrant: _____
3. Site Address: _____

   City/Town: _____ State: _____ Zip Code: _____
4. Date of completion of construction: _____

   Date all storm drainage structures were cleared of construction sediment and debris: _____

   Beginning and Ending Dates of post-construction inspections: _____

   Date of final stabilization inspection(s)*: _____

   Qualified Inspector who conducted the Final Stabilization Inspection: (This person must sign Part III) _____
5. Check the post-construction activity(ies)** at the site (check all that apply):

   ☐ Industrial ☐ Residential ☐ Capped Landfill

   ☐ Commercial ☐ Solar Array ☐ Other: _____

* The Final Stabilization Inspection must occur at least one full growing season after final stabilization has been achieved. A full growing season is defined as the timeframe encompassed by two consecutive full seeding seasons: April 1 through June 15, and August 15 through October 1. If final stabilization is achieved during a seeding season, the following seeding season will be considered the first full seeding season after final stabilization has been achieved.

** If the post-construction activity involves solar arrays, the Department may require that the "Solar Projects: Notice of Termination Form" be used. Any questions regarding the necessity of such a form for the project can be sent via email to DEEP.StormwaterStaff@ct.gov.

Locally Approvable Projects Must Complete the following Part II - *(Attach additional sheets as needed)*

Part II: Locally Approvable Post-Construction Inspection Certification

The below information is required in accordance with Section 5(b)(4)(C)(i) of the General Permit.

Certification by a Qualified Professional Engineer / Qualified Soil Erosion and Sediment Control Professional / District Representative

"I hereby certify that I am a qualified professional engineer / a qualified soil erosion and sediment control professional / a representative of the District in which the site is located as defined in Section 2 of the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (general permit). I am familiar with the site described in this Notice of Termination and the requirements of the general permit. I certify, based on my personal inspection of the site pursuant to Section 6(a) of the general permit that all post-construction measures have been installed as specified in the permittee's Stormwater Pollution Control Plan and in accordance with Section 5(b)(2)(C) of the general permit and that all such measures have been cleaned of construction sediment and debris. I understand that this certification is part of a registration submitted in accordance with section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Signature of Qualified Professional Engineer / Qualified Soil Erosion and Sediment Control Professional / Representative of the District	Date
Printed Name of Qualified Professional Engineer / Qualified Soil Erosion and Sediment Control Professional / Representative of the District	Title

Check off the qualifications of the signatory of the above part:

☐ Qualified Professional Engineer ☐ Qualified Soil Erosion and Sediment Control Professional ☐ Representative of the District

Locally Exempt Projects Must Complete the following Part II - *(Attach additional sheets as needed)*

Part II: Locally Exempt Post-Construction Inspection Certification

The below information is required in accordance with Section 5(b)(4)(C)(ii) of the General Permit.

Certification by a Qualified Professional Engineer / Qualified Soil Erosion and Sediment Control Professional

"I hereby certify that I am a qualified professional engineer / a qualified soil erosion and sediment control professional as defined in Section 2 of the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (general permit). I am familiar with the site described in this Notice of Termination and the requirements of the general permit. I certify, based on my personal inspection of the site pursuant to Section 6(a) of the general permit that all post-construction measures have been installed as specified in the permittee's Stormwater Pollution Control Plan and in accordance with Section 5(b)(2)(C) of the general permit and that all such measures have been cleaned of construction sediment and debris. I understand that this certification is part of a registration submitted in accordance with section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Signature of Qualified Professional Engineer / Qualified Soil Erosion and Sediment Control Professional	Date
Printed Name of Qualified Professional Engineer / Qualified Soil Erosion and Sediment Control Professional	Title

Check off the qualifications of the signatory of the above part:

☐ Qualified Professional Engineer ☐ Qualified Soil Erosion and Sediment Control Professional

State Agency Projects Must Complete the following Part II - (Attach additional sheets as needed)

Part II: State Agency Post-Construction Inspection Certification

The below information is required in accordance with Section 5(b)(4)(C)(iii) of the General Permit.

Certification by a DOT District Engineer or his/her designee / a DOT District Environmental Coordinator / a designated employee of another state agency

"I hereby certify that I am a DOT District Engineer or his/her designee / a DOT District Environmental Coordinator / a designated employee of another state agency as defined in Section 2 of the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (general permit). I am familiar with the site described in this Notice of Termination and the requirements of the general permit. I certify, based on my personal inspection of the site pursuant to Section 6(a) of the general permit that all post-construction measures have been installed as specified in the permittee's Stormwater Pollution Control Plan and in accordance with Section 5(b)(2)(C) of the general permit and that all such measures have been cleaned of construction sediment and debris. I understand that this certification is part of a registration submitted in accordance with section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Signature	Date
Printed Name	Title

Check off the qualifications of the signatory of the above part:

☐ Qualified Professional Engineer ☐ Qualified Soil Erosion and Sediment Control Professional ☐ Representative of the District

All Projects Must Complete the following Part III - *(Attach additional sheets as needed)*

Part III: Final Stabilization Inspection Certification

The below information is required in accordance with Section 5(b)(4)(D) of the General Permit.

Certification by a Qualified Inspector

"I hereby certify that I am a qualified inspector as defined in Section 2 of the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (general permit). I am familiar with the site described in this Notice of Termination and the requirements of the general permit. I certify, based on my personal inspection of the site pursuant to Section 6(a) of the general permit that the site has been stabilized, as defined in Section 2 of the general permit, for a period of no less than one full growing season following the cessation of construction activities. I further certify that there is no active erosion or sedimentation present on site and no disturbed areas remain exposed. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Signature of Qualified Inspector	Date
Printed Name of Qualified Inspector	Title

All Projects Must Complete the following Part IV - *(Attach additional sheets as needed)*

Part IV: Permittee Certification

The below information is required in accordance with Section 5(b)(4)(D) of the General Permit.

Certification by the Permittee

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with section 22a-6 of the Connecticut General Statutes, pursuant to section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Signature of Permittee	Date
Printed Name of Permittee	Title

All Projects Must Complete the following Part V - *(Attach additional documentation as needed)*

Part V: Additional Submittals

The following attachments are required to be submitted along with the Notice of Termination Form:

☐ Post-Construction Inspection Report (must contain photos with time stamps)

☐ Final Stabilization Inspection Report (must contain photos with time stamps)

Complete and submit this form in accordance with the general permit (DEEP-WPED-GP-015) to ensure the proper handling of the termination. Print or type unless otherwise noted.

Submit this Notice of Termination Form to the address below, as well as via email to DEEP.StormwaterStaff@ct.gov:

WATER PERMITTING AND ENFORCEMENT DIVISION/STORMWATER GROUP
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

APPENDIX D
Operation and Maintenance Plan (O & M Plan)

Operation & Maintenance Plan

Horizon View

2268-2284 Route 32
Montville CT 06353

Prepared for:
Honeycomb Real Estate Partners
20 Avon Meadow Lane
Avon, CT 06001

Prepared by:
R.J. O'Connell & Associates, Inc.
80 Montvale Ave, Suite 201
Stoneham, MA 02180

Date:
September 25, 2024

TABLE OF CONTENTS

Operations and Maintenance Plan

INTRODUCTION

This Operations and Maintenance Plan has been prepared to ensure that the stormwater management system implemented at 2268-2284 Route 32 located in Montville, Connecticut functions as designed. It will develop and carry out suitable practices for source control and pollution prevention. It describes the various components of the stormwater management system, identifies the inspection and maintenance tasks to be undertaken after construction is complete, and establishes a schedule for implementing these tasks to ensure the proper, long-term operation of the system.

SECTION 1 - STORMWATER MANAGEMENT SYSTEM- OPERATION AND MAINTENANCE

The objectives of the stormwater management system are to effectively control and treat stormwater runoff from the site in accordance with the Connecticut stormwater management standards. To accomplish this objective, the following Best Management Practices (BMP's) are included in the stormwater management system:

<u>BMPs</u>

- Installation and maintenance of the catch basins with deep sumps and hoods to reduce the discharge of sediment and pollutants.
- Installation of a subsurface infiltration system to provide the required recharge of groundwater.

In consideration of the foregoing, it is the ongoing responsibility of the landowner, their successors and assignees, to adequately maintain the on-site stormwater management BMPs. Adequate maintenance is herein defined as good working condition so that these BMPs are performing their design functions.

Based on this, the landowner, successors and assignees are required to create a Pollution Prevention Team (PPT) that will be responsible for implementing this Operations and Maintenance Plan.

Upon transfer of ownership of the property, the landowner is required to notify the new owner of the presence of the stormwater management system and the requirements of this Operations and Maintenance Plan.

Property Information

Address: 2268-2284 Route 32
Montville, Connecticut

Landowner and Pollution Prevention Team Leader

Owners Name: TBD
Owner Contact: TBD
Title: Owner and Operator: TBD
Phone: TBD
Email: TBD

Responsibilities: Coordinate all aspects of the Operations and Maintenance Plan, coordinate and hire the other Pollution Prevention team members in order to conduct inspections, keep all records, and coordinate with contractors for maintenance and repair of the stormwater management system.

Spill Prevention & Control Contractor
The following contacts shall be notified only in those instances identified within Connecticut General Statutes (CGS) Chapter 446K Section 22a-450 (see Section 2 - Long-Term Pollution Prevention Plan).:

Primary Contact:
Office Phone:

Emergency Contact:
Company Name:
Contact Name:
Emergency Phone:

Consultant Contact:
Company Name:
Contact Name:
Phone:

CT Department of Energy and Environmental Protection (DEEP)
Emergency Response Triage
Contact Name:
Phone:

Municipal Contacts
Montville Fire Department
Contact Name: Paul Barnes, Fire Marshal
Phone: (860) 848-6781

Montville Public Works
Contact Name: John Carlson, Public Works Director
Phone: (860) 848-7473

Other Pollution Prevention Team Members

Member:

Responsibilities: Conduct scheduled inspections, maintain records, advise the Team Leader of maintenance needs, ensure inspection maintenance and repairs are completed and keep and maintain all records and inspection reports.

Company Name(s):
Address:
Office Phone:

Team Member Training

The Pollution Prevention Team Leader will coordinate an annual in-house training session with the qualified Engineering and/or Environmental Consulting Firm to discuss the Operations and Maintenance Plan, ongoing inspection and maintenance and preventative maintenance procedures.

Annual training session will generally include the following:

- Discuss the Operations and Maintenance Plan
    - What it is- identify potential sources of stormwater pollution and methods of reducing or eliminating that pollution
    - What it contains- emphasize good housekeeping measures and location of potential pollution sources.
    - Pollution Prevention Team- introduce the team and explain their responsibilities, explain the operations and continuous monitoring of the stormwater management system and encourage input and assistance from all.
- Review and explain the storm drainage system, how it works and its components, note the receiving resource area in which the storm drainage system discharges into and the role each component plays.
- Emphasize the importance of maintaining current and up-to-date inspection reports and maintenance records of BMPs. Documentation shall include any changes to the O&M Plan's procedures to accommodate changes and revisions to BMPs.

The components of the stormwater management system must be inspected, monitored, and maintained in accordance with the following to ensure that the on-site stormwater management BMPs are functioning as designed. Routine inspection and proper maintenance of these individual components is essential to providing the long-term enhancement of both the quality and quantity of the runoff from the properties.

Deep Sump Catch Basins:

Stormwater runoff from pavement areas is directed to catch basins via site grading and curbing. Catch basins are equipped with a deep (4 ft) sump and a hood. The sumps are designed to capture sediment and coarse particles, and the hoods prevent hydrocarbons and other floatable debris from entering the drainage system. To ensure proper functioning of catch basins, each will be inspected and maintained as follows:

Inspection: Beginning of March, June, September, December and after major storm events. Structural damage and other malfunctions are to be noted and reported. Basins shall also be inspected during every major rain event (3.1 inches or greater in 24 hours) to ensure the grates are not clogged and are functioning properly.

Maintenance: Catch basins are to be pumped and cleaned at a minimum once a year in the springtime, or when the sumps are half full. The cleaning shall be performed by a licensed contractor. Sediment and hydrocarbons will be properly handled and legally disposed of off-site in accordance with local, state, and federal guidelines and regulations. Any structural damage to catch basins and/or castings will be repaired upon discovery.

Subsurface Infiltration System

A subsurface infiltration system consists of perforated corrugated metal pipes (CMPs) placed underground that temporarily retain a portion of stormwater runoff and allow it to infiltrate into the ground thereby recharging the groundwater.

Inspection: Inspect inlets twice annually for sediment accumulation, trash and clogging. Remove any sediment and/or debris buildup at the inlet and outlet of the system during each inspection.

Maintenance: The subsurface retention system shall be maintained once a year. Remove any debris and sediment that might clog the system.

Outlet Control Structures:

The outlet control structures are pre-cast concrete manholes located downstream of the subsurface infiltration system and contains various configurations of orifices that regulate the rate of stormwater discharge from the subsurface infiltration system. The outlet control structure shall be inspected and maintained as follows:

Inspection: Structures must be inspected annually. Check the outlet control structures for sediment and debris accumulation and any structural damage.

Maintenance: Structures must be jet vacuumed and power washed by a licensed contractor at least once per year. Accumulated sediment will be disposed on in accordance with applicable local, state and federal guidelines and regulations.

Wetland Maintenance Activities:

Maintenance activities such as sediment removal, mowing, and repairs should be performed with rakes and light-weight equipment rather than heavy construction equipment to avoid soil compaction and damage to vegetation. Heavy equipment may be used for sediment removal and other maintenance activities if the equipment is positioned outside the limits of the system. Heavy construction equipment should not be allowed within the limits of the system for maintenance purposes.

Recommended wetland maintenance activities should include the following:

- Inspect after major storms (1 inch or more of precipitation) in the first few months following construction.
- Inspect sediment forebay twice per year and the rest of the system annually, including inlet and outlet control structures.
- Refer to Appendix B for maintenance inspection checklists, including items to focus on during the inspection.
- Remove trach and organic debris (leaves) in the spring and fall.
- Remove sediment from the forebay or other pretreatment areas when it accumulates to a depth of more than 24 inches or 50% of the design depth.
- Remove sediment from the permanent pool when volume has become reduced significantly, or when significant algal growth is observed.
- The vegetative cover should be maintained at 85%. If vegetation has damage, the area should be reestablished in accordance with the original specifications.
- Prune wetland vegetation on a regular schedule. Inspect wetland plants and manage/harvest dead or dying plants as necessary. Plant reinforcement plantings as necessary.
- Periodically mow perimeter grass during the growing season. Maintain perimeter grass at 6 inches or higher. High grass along the wetland edge will discourage waterfowl from taking up residence and serve to filter pollutants.
- Inspect and remove invasive vegetation as necessary.
- Remove trees and woody vegetation within 25 feet of all risers, pipe outlet structures, spillways, and downstream embankments that hold back water.
- Prune other woody vegetation where dead or dying branches are observed.

Please refer to Appendix A for the Inspection Forms, which are to be used by the Pollution Prevention Team member responsible for conducting the scheduled inspections.

SECTION 2 - LONG TERM POLLUTION PREVENTION PLAN (LTPPP)

A. MATERIALS COVERED

The following materials or substances are expected to be present onsite after construction:

Cleaning solvents	Petroleum based products
Detergents	Pesticides/Insecticides
Paints/Solvents	Fertilizers/Herbicides
Acids	Contaminated Soil
Solid Waste	

B. MATERIALS MANAGEMENT PRACTICES

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. The Pollution Prevention Team Leader will be responsible for ensuring that these procedures are followed:

1. Good Housekeeping

   The following good housekeeping practices will be followed onsite after construction:

   a) An effort will be made to store only enough products required to do the job.
   b) All materials stored onsite will be stored in a neat, orderly manner and, if possible, under a roof or in a containment area. At a minimum, all containers will be stored with their lids on when not in use. Drip pans shall be provided under all dispensers.
   c) Products will be kept in their original containers with the original manufacturer's label in legible condition.
   d) Substances will not be mixed with one another unless recommended by the manufacturer.
   e) Whenever possible, the product will be used up entirely before disposing of the container.
   f) Manufacturer's recommendations for proper use and disposal will be followed.
   g) A Pollution Prevention Team Member will be responsible for daily inspections to ensure proper use and disposal of materials.
   h) The storage of all deicing materials on the site shall be covered and not be exposed to precipitation.

2. Hazardous Substances

   These practices will be used to reduce the risks associated with hazardous substances. Material Safety Data Sheets (MSDS's) for each product with hazardous characteristics that are used on the property will be obtained and used for the proper management of potential wastes that may result from these products. An MSDS will be posted in the immediate area where such product is stored and/or used and another copy of each

MSDS will be maintained on-site, in the management office. Each employee who must handle a hazardous substance will be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product they are using, particularly regarding spill control techniques.

a) Products will be kept in original containers with the original labels in legible condition.
b) Original labels and MSDS's will be procured and used for each product.
c) If surplus product must be disposed of, the manufacturer's and local/state/federal required methods for proper disposal must be followed.

3. Hazardous Waste

It is imperative that all hazardous waste be properly identified and handled in accordance with all applicable hazardous waste standards, including the storage, transport and disposal of the hazardous wastes. There are significant penalties for the improper handling of hazardous waste. It is important that the Pollution Prevention Team Leader seeks appropriate assistance in making the determination of whether a substance or material is a hazardous waste. For example, hazardous waste may include certain hazardous substances, as well as pesticides, paints, paint solvents, cleaning solvents, contaminated soils, and other materials, substances or chemicals that have been discarded (or are to be discarded) as being out-of-date, contaminated, or otherwise unusable. The Pollution Prevention Team Leader is responsible for ensuring that all Pollution Prevention Team Members are instructed as to these hazardous waste requirements as well as that the requirements for handling and disposal are being followed.

4. Product Specific Practices

The following product specific practices will be followed on the job site:

a) Petroleum Products

Petroleum products will be stored in tightly sealed containers which are clearly labeled. Petroleum storage tanks shall be located a minimum of 100 linear feet from wetland resource areas, drainage ways, inlets and surface waters unless stored within a building. Any petroleum storage tanks stored onsite will be located within a containment area that is designed with an impervious surface between the tank and the ground. The secondary containment must be designed to provide a containment volume that is equal to 110% of the volume of the largest tank. Drip pans shall be provided for all dispensers. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations. The location of any fuel tanks and/or equipment storage areas must be identified on the Erosion Control Plan by the Contractor once the locations have been determined.

b) Fertilizers, Herbicides, Pesticides, and Insecticides

Fertilizers, herbicides, pesticides, and insecticides shall be applied only in the minimum amounts recommended by the manufacturer. Once applied, they shall be utilized so as to limit exposure to stormwater. Storage will be in a covered shed. The contents of any partially used bags or containers will be transferred to a sealable plastic bin to avoid spills.

Fertilizers shall not be applied within resource areas. Refer to Drawing C-2, Grading and Drainage Plan, for location of resource areas and buffer zones.

c) Paints, Paint Solvents, and Cleaning Solvents

All containers will be tightly sealed and stored when not in use. Excess paint and solvents will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions or state and federal regulations.

5. Solid Waste

All waste materials will be collected and stored in an appropriately covered container and/or securely contained metal dumpster rented from a local waste management company which must be a licensed solid waste management company. The dumpster will comply with all local and state solid waste management regulations.

All trash and debris from the site will be deposited in dumpsters. The dumpsters will be emptied a minimum of once per week or more often if necessary. All personnel will be instructed regarding the correct procedures for waste disposal.

All waste dumpsters and roll-off containers shall be located in an area where the likelihood of the containers contributing to stormwater discharges is negligible.

6. Contaminated Soils

Any contaminated soils resulting from spills of hazardous substances or oil shall be contained and cleaned up immediately in accordance with the procedures given in the Materials Management Plan and in accordance with applicable state and federal regulations. If there is a release, it should be reported as a spill, if it otherwise meets the requirements for a reportable spill.

C. SPILL PREVENTION AND RESPONSE PROCEDURES

The Pollution Prevention Team Leader will train all personnel in the proper handling and cleanup of spilled hazardous substances or oil. No spilled hazardous substances or oil will be allowed to come in contact with stormwater discharges. If such contact occurs, the storm water discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated storm water. It shall be the

responsibility of the Pollution Prevention Team Leader to be properly trained, and to train all personnel in spill prevention and clean up procedures.

1. In order to prevent or minimize the potential for a spill of hazardous substances or oil to come into contact with stormwater, the following steps shall be implemented:

    a) All hazardous substances or oil (such as pesticides, petroleum products, fertilizers, detergents, acids, paints, paint solvents, cleaning solvents, etc.) shall be stored in a secure location, with their lids on, preferably under cover, when not in use.
    b) The minimum practical quantity of all such materials shall be kept on site.
    c) A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) shall be provided on site.
    d) Manufacturer's recommended methods for spill cleanup shall be clearly posted and site personnel shall be trained regarding these procedures and the location of the information and cleanup supplies.
    e) It is the Pollution Prevention Team Leader's responsibility to ensure that all hazardous waste on site is disposed of properly by a licensed hazardous material disposal company. The Pollution Prevention Team Leader is responsible for not exceeding hazardous waste storage requirements mandated by the EPA or state and local authority.

2. In the event of a spill of hazardous substances or oil, the following procedures must be followed:

    a) All measures must be taken to contain and abate the spill and to prevent the discharge of the hazardous substance or oil to stormwater or off-site. (The spill area must be kept well ventilated and personnel must wear appropriate protective clothing to prevent injury from contact with the hazardous substances.)
    b) For spills of less than five (5) gallons of material, proceed with source control and containment, clean-up with absorbent materials or other applicable means unless an imminent hazard or other circumstances dictate that the spill should be treated by a professional emergency response contractor.
    c) For spills greater than five (5) gallons of material immediately contact the CT DEEP Emergency Response and Spill Prevention at (860) 424-3338, and an approved emergency response contractor. Provide information on the type of material spilled, the location of the spill, the quantity spilled, and the time of the spill to the emergency response contractor or coordinator, and proceed with prevention, containment and/or clean-up as safely deemed necessary.
    d) If there is a Reportable Quantity (RQ) release, then the National Response Center shall be notified immediately at (800) 424-8802; within 14 days a report will be submitted to the EPA regional office describing the release, the date and circumstances of the release and the steps taken to prevent another release. This Pollution Prevention Plan must be updated to reflect any such steps or actions taken and measures to prevent the same from reoccurring.

3. The Pollution Prevention Team Leader shall be the spill prevention and response coordinator. The Leader will designate the individuals who will receive spill prevention and response training. These individuals will each become responsible for a particular phase of prevention and response. The names of these personnel will be posted in the material storage area and in the management office.

SECTION 3 - ILLICIT DISCHARGE STATEMENT

Certain types of discharges are allowable under the U.S. Environmental Protection Agency Construction General Permit, and it is the intent of this Long Term Pollution Prevention Plan (LTPPP) to allow such discharges. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to, or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Illicit discharges, if they exist currently, shall be contained and eliminated in the manner specified by local, state and federal regulations, and will be prohibited in the proposed development.

SECTION 4 – SNOW MANAGEMENT

Snow management will be overseen by the Property Manager who will implement this plan and be authorized to utilize additional resources should unusual events occur. The Snow Management Contractor (SMC) shall be responsible for maintaining all roads, driveways, parking lots, sidewalks and pedestrian access areas for clear and safe travel. The SMC shall report directly to the Property Manager and maintain communication via cell phone 24 hours per day, 7 days per week. During extreme events, the first priority will be to clear and maintain proper access for residents and public safety vehicles. The next priority is parking areas, sidewalks, and fire hydrants. Snow shall not be piled around light bases or fire hydrants and handicap parking areas shall be cleared frequently.

The anti-icing operations typically precede snow plowing and will be provided when conditions warrant. Within 12 months of concrete walks, pads, or other features being poured, no salt shall be placed on those surfaces. After the materials have cured for 12 months, a combination of calcium chloride deicers and sand ("washed", fine to medium grade) shall be utilized. Parking areas shall receive spot treatment only when and where needed in a similar manner.

Snow plowing shall commence upon accumulation of two (2") inches or more. Snow shall be deposited in appropriate snow storage areas outside of the 100-foot wetland buffer and in locations that will minimize the impact to pedestrian access, vehicle circulation, and parking spaces. During extreme events, excess snow will be removed offsite as necessary. The SMC shall keep existing catch basins open for drainage or water resulting from melting.

Once the storm is over, the SMC shall monitor all areas on-site for icy spots and snowdrifts. If necessary, an application of salt/sand mixture will be applied to all pavement areas so that the riding surface remains drivable. When the ambient temperature drops below 25 degrees Fahrenheit, all major areas shall receive an application of pre-wetted salt with calcium chloride to maintain melting action and ice-free surfaces for as long as possible. Salt loses its effectiveness as temperatures drop below 25 degrees Fahrenheit.

De-icing chemicals shall be kept in original containers with the original product label in legible condition. When not in use, de-icing materials shall be stored in a neat, orderly manner under cover with the container lids on.

Appendix A

Maintenance and Inspection Forms

Horizon View
2268-2284 Route 32
Montville CT 06353
Operation and Maintenance Plan
Task Guide

The table below is a list of the minimum inspection and maintenance activities the Pollution Prevention Team needs to conduct for the Stormwater Operations and Management Plan and who is responsible for the activity. The task Guide is provided to assist the Pollution Prevention Team Leader and ensure that the activities are being conducted as scheduled.

Timing	**Task**	**Responsible Party**
Weekly	Inspect Lot/Land	PPT
Quarterly (March, June, September, December)	Inspect Catch Basins	PPT/Contractor
Semi-Annually (March and September)	Inspect Subsurface Systems Inlets, Outlets and overflow. Inspect sedimentation levels, remove as necessary	PPT/Contractor
Annually	Pollution Prevention Team training Comprehensive Annual Stormwater Evaluation and Inspection Report Clean Catch Basins Inspect outlet control structure and power wash and jet vacuum	PPT Leader PPT Leader PPT/Contractor PPT/Contractor
April	Spring clean-up	PPT/Contractor
Between November 14 and December 15	Fall clean-up	PPT/Contractor

Horizon View
2268-2284 Route 32
Montville CT 06353
Operations and Maintenance Plan
Comprehensive Annual Evaluation and Inspection Report

Once a year, the Pollution Prevention Team Leader must inspect and evaluate all aspects and provisions of the Operations and Maintenance Plan, complete the following report and keep a copy on file at the site.

Inspector/Reviewers:_____

Date of Inspection/Review: _____

Note any changes to the Plan in the space below and in the appropriate section of the Plan.

1. Review the Pollution Prevention Team list and update if necessary. Does the Pollution Prevention Team list need updating:

   (circle one) Yes No

2. Review the Operations and Maintenance Plan (O&M Plan). Are there sections of the O&M Plan that need updating?

   (circle one) Yes No

3. Review Monthly and Weekly Checklists. Update these as necessary

   - Are there any updates needed to Spill and Leak History and/or the checklists?

   (circle one) Yes No

4. Review site drawings and update if necessary
   - Are there updates needed to any of the drawings?

   (circle one) Yes No

Requested Changes (attach revisions)

Horizon View
2268-2284 Route 32
Montville CT 06353
Operations and Maintenance Plan
Annual Training Sign-off Sheet

For each Operations and Maintenance Plan training session, the Team Leader should keep records of all attending Team Members using the signoff sheet below, as well as the training agenda, notes, etc.

Training Date: _____	**Topic**:
Trainer: _____	
Team Member Name	**Team Member Signature**

Horizon View
2268-2284 Route 32
Montville CT 06353
Operations & Maintenance Plan
Weekly Task Checklist

The site will be checked each week for trash and debris by a member of the Pollution Prevention Team. If any trash or debris is observed in the specified area, write "yes" in the 2nd column and note the problem and corrective measures taken in the appropriate space. Make a new copy of this checklist each week.

Date: _____ **Checklist completed by**: _____

GROUNDS AREA TO CHECK	TASK	DESCRIPTION OF PROBLEM	CORRECTIVE MEASURES TAKEN
Parking Lot & Roadways	Pickup and Dispose of Litter		
Landscaped Areas	Pickup and Dispose of Litter		
Compactor/Dumpster Areas	Check for Leaking Liquid Pickup and Dispose of Litter		
Perimeter of Property	Pickup and Dispose of Litter		

Horizon View
2268-2284 Route 32
Montville CT 06353
Operations & Maintenance Plan
Quarterly Task Checklist (March, June, September, December)

The following will be checked each month for sources of pollutants by a member of the Pollution Prevention Team. If the condition in the "check for" column is observed, note the problem and corrective measures taken in the appropriate space. Make a new copy of the checklist each month.

Date: _____ **Checklist completed by**: _____

BMP	TASK	DESCRIPTION OF PROBLEM (IF PRESENT)	CORRECTIVE MEASURES TAKEN
Catch Basins	Inspect for Sediment, Trash, and Oil.		

Horizon View
2268-2284 Route 32
Montville CT 06353
Operations & Maintenance Plan
Semi-Annual Task Checklist (March, September)

The site will be checked semi-annually four sources of pollutants by a member of the Pollution Prevention Team. If the condition in the "check for" column is observed, note the problem and corrective measures taken in the appropriate space. Make a new copy of the checklist each month.

Date: _____ **Checklist completed by**: _____

BMP	TASK	DESCRIPTION OF PROBLEM (IF PRESENT)	CORRECTIVE MEASURES TAKEN
Subsurface Systems	Inspect inlets, outlets, and overflow. Inspect sedimentation levels and remove as necessary.		

Horizon View
2268-2284 Route 32
Montville CT 06353
Operations & Maintenance Plan
Annual Task Checklist

The following will be check each year for sources of pollutant by a member of the Pollution Prevention Team. If a problem is observed, note the problem and corrective measures take in the appropriate space. Make a new copy of the checklist each year.

Date: _____ **Checklist completed by**: _____

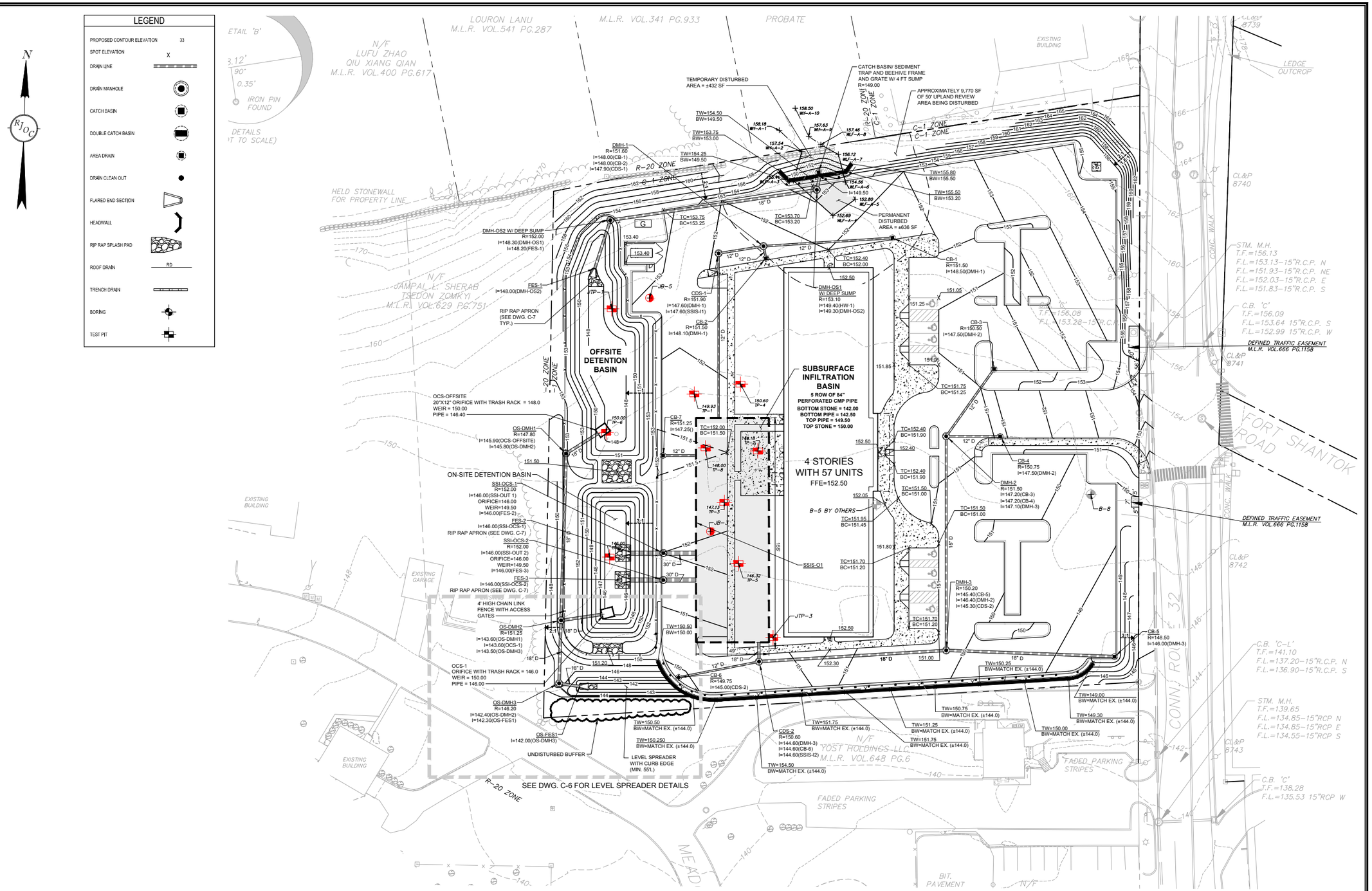
BMP	TASK	DESCRIPTION OF PROBLEM (IF PRESENT)	CORRECTIVE MEASURES TAKEN
Pollution Prevention Team Training	Pollution Prevention Team Training.		
Catch Basins	Remove sediment and debris from sump and power wash.		
Outlet Control Structure	Inspect, power wash and jet vacuum.		
Comprehensive Annual Stormwater Evaluation and Inspection Report	Compile the comprehensive annual stormwater evaluation and inspection report and file for future reference.		

Horizon View
2268-2284 Route 32
Montville CT 06353
Long Term Pollution Prevention Plan
Spill and Leak History
(____ to _____)

Date	Spill	Leak	Location	Description				Response Procedures	Measures to Prevent Reoccurrence	Reporting Pollution Prevention Team Member
(MM/DD/YY)	*(check one)*		*(as indicated on Site Map)*	*Type of Material*	*Quantity*	*Source, if known*	*Reason*			

Appendix B

C-2 – Grading and Drainage Plan



NOTES:

1. SLOPES STEEPER THAN 3:1 REQUIRE EROSION CONTROL MATTING FOR STABILIZATION.
2. SEE DRAWING N-1 FOR GENERAL NOTES, EROSION CONTROL NOTES, DEMOLITION NOTES, GRADING & DRAINAGE NOTES, UTILITY NOTES, AND PARKING AND TRAFFIC CONTROL SIGN SCHEDULE.
3. SEE DRAWING C-5 THROUGH C-10 FOR DETAILS.

30 0 15 30 60
GRAPHIC SCALE IN FEET

RJOC

NO.	REVISION	DATE
1.	SUBMITTED TO INLAND WETLANDS COMMISSION	09/27/2024

PREPARED BY:
RJO'CONNELL & ASSOCIATES, INC.
CIVIL ENGINEERS, SURVEYORS & LAND PLANNERS
80 MONTVALE AVENUE, SUITE 201 STONEHAM, MA 02180
PHONE: 781.279.0180 RJOCONNELL.COM

PREPARED FOR:
HONEYCOMB REAL ESTATE PARTNERS
20 AVON MEADOW LANE
AVON, CT 06001

PROJECT NAME:
HORIZON VIEW
MONTVILLE, CT

SEAL:

DESIGNED BY:	MAP/RWS
DRAWN BY:	WJH
REVIEWED BY:	BPD/RWS
SCALE:	1" = 30'
DATE:	09/25/2024

DRAWING NAME:
GRADING AND DRAINAGE PLAN

DRAWING NUMBER:
C-2

PROJECT NUMBER:
24029

Appendix C

CDS Stormwater Treatment Unit Operation and Maintenance Guidelines

CONTECH®
ENGINEERED SOLUTIONS

CDS Guide
Operation, Design, Performance and Maintenance

CDS®

Using patented continuous deflective separation technology, the CDS system screens, separates and traps debris, sediment, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, and minimize the re-suspension and release of previously trapped pollutants. Inline units can treat up to 6 cfs, and internally bypass flows in excess of 50 cfs (1416 L/s). Available precast or cast-in-place, offline units can treat flows from 1 to 300 cfs (28.3 to 8495 L/s). The pollutant removal capacity of the CDS system has been proven in lab and field testing.

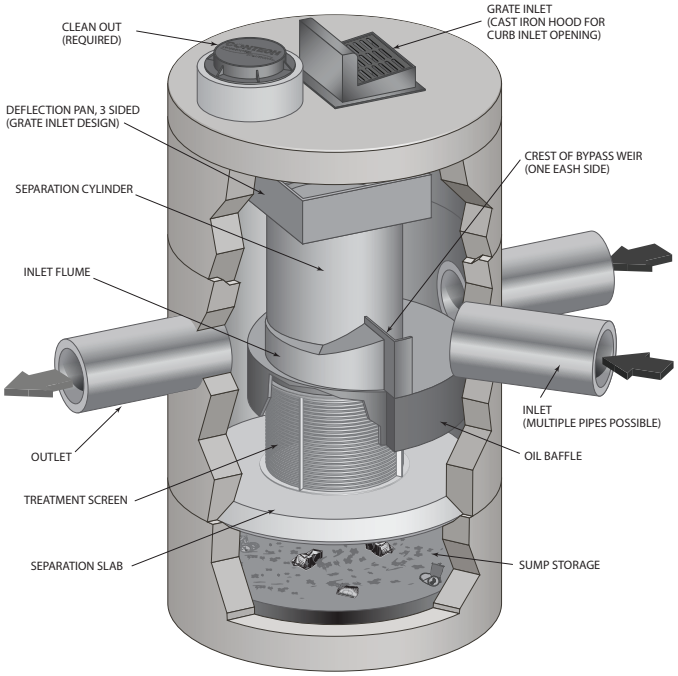
Operation Overview

Stormwater enters the diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed from the flow. All flows up to the system's treatment design capacity enter the separation chamber and are treated.

Swirl concentration and screen deflection force floatables and solids to the center of the separation chamber where 100% of floatables and neutrally buoyant debris larger than the screen apertures are trapped.

Stormwater then moves through the separation screen, under the oil baffle and exits the system. The separation screen remains clog free due to continuous deflection.

During the flow events exceeding the treatment design capacity, the diversion weir bypasses excessive flows around the separation chamber, so captured pollutants are retained in the separation cylinder.



Design Basics

There are three primary methods of sizing a CDS system. The Water Quality Flow Rate Method determines which model size provides the desired removal efficiency at a given flow rate for a defined particle size. The Rational Rainfall Method™ or the and Probabilistic Method is used when a specific removal efficiency of the net annual sediment load is required.

Typically in the Unites States, CDS systems are designed to achieve an 80% annual solids load reduction based on lab generated performance curves for a gradation with an average particle size (d50) of 125 microns (μm). For some regulatory environments, CDS systems can also be designed to achieve an 80% annual solids load reduction based on an average particle size (d50) of 75 microns (μm) or 50 microns (μm).

Water Quality Flow Rate Method

In some cases, regulations require that a specific treatment rate, often referred to as the water quality design flow (WQQ), be treated. This WQQ represents the peak flow rate from either an event with a specific recurrence interval, e.g. the six-month storm, or a water quality depth, e.g. 1/2-inch (13 mm) of rainfall.

The CDS is designed to treat all flows up to the WQQ. At influent rates higher than the WQQ, the diversion weir will direct most flow exceeding the WQQ around the separation chamber. This allows removal efficiency to remain relatively constant in the separation chamber and eliminates the risk of washout during bypass flows regardless of influent flow rates.

Treatment flow rates are defined as the rate at which the CDS will remove a specific gradation of sediment at a specific removal efficiency. Therefore the treatment flow rate is variable, based on the gradation and removal efficiency specified by the design engineer.

Rational Rainfall Method™

Differences in local climate, topography and scale make every site hydraulically unique. It is important to take these factors into consideration when estimating the long-term performance of any stormwater treatment system. The Rational Rainfall Method combines site-specific information with laboratory generated performance data, and local historical precipitation records to estimate removal efficiencies as accurately as possible.

Short duration rain gauge records from across the United States and Canada were analyzed to determine the percent of the total annual rainfall that fell at a range of intensities. US stations' depths were totaled every 15 minutes, or hourly, and recorded in 0.01-inch increments. Depths were recorded hourly with 1-mm resolution at Canadian stations. One trend was consistent at all sites; the vast majority of precipitation fell at low intensities and high intensity storms contributed relatively little to the total annual depth.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Rainfall Method. Since most sites are relatively small and highly impervious, the Rational Rainfall Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS system are

determined. Performance efficiency curve determined from full scale laboratory tests on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Probabilistic Rational Method

The Probabilistic Rational Method is a sizing program Contech developed to estimate a net annual sediment load reduction for a particular CDS model based on site size, site runoff coefficient, regional rainfall intensity distribution, and anticipated pollutant characteristics.

The Probabilistic Method is an extension of the Rational Method used to estimate peak discharge rates generated by storm events of varying statistical return frequencies (e.g. 2-year storm event). Under the Rational Method, an adjustment factor is used to adjust the runoff coefficient estimated for the 10-year event, correlating a known hydrologic parameter with the target storm event. The rainfall intensities vary depending on the return frequency of the storm event under consideration. In general, these two frequency dependent parameters (rainfall intensity and runoff coefficient) increase as the return frequency increases while the drainage area remains constant.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Method. Since most sites are relatively small and highly impervious, the Rational Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS are determined. Performance efficiency curve on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Treatment Flow Rate

The inlet throat area is sized to ensure that the WQQ passes through the separation chamber at a water surface elevation equal to the crest of the diversion weir. The diversion weir bypasses excessive flows around the separation chamber, thus preventing re-suspension or re-entrainment of previously captured particles.

Hydraulic Capacity

The hydraulic capacity of a CDS system is determined by the length and height of the diversion weir and by the maximum allowable head in the system. Typical configurations allow hydraulic capacities of up to ten times the treatment flow rate. The crest of the diversion weir may be lowered and the inlet throat may be widened to increase the capacity of the system at a given water surface elevation. The unit is designed to meet project specific hydraulic requirements.

Performance

Full-Scale Laboratory Test Results

A full-scale CDS system (Model CDS2020-5B) was tested at the facility of University of Florida, Gainesville, FL. This CDS unit was evaluated under controlled laboratory conditions of influent flow rate and addition of sediment.

Two different gradations of silica sand material (UF Sediment & OK-110) were used in the CDS performance evaluation. The particle size distributions (PSDs) of the test materials were analyzed using standard method "Gradation ASTM D-422 "Standard Test Method for Particle-Size Analysis of Soils" by a certified laboratory.

UF Sediment is a mixture of three different products produced by the U.S. Silica Company: "Sil-Co-Sil 106", "#1 DRY" and "20/40 Oil Frac". Particle size distribution analysis shows that the UF Sediment has a very fine gradation (d50 = 20 to 30 μm) covering a wide size range (Coefficient of Uniformity, C averaged at 10.6). In comparison with the hypothetical TSS gradation specified in the NJDEP (New Jersey Department of Environmental Protection) and NJCAT (New Jersey Corporation for Advanced Technology) protocol for lab testing, the UF Sediment covers a similar range of particle size but with a finer d50 (d50 for NJDEP is approximately 50 μm) (NJDEP, 2003).

The OK-110 silica sand is a commercial product of U.S. Silica Sand. The particle size distribution analysis of this material, also included in Figure 1, shows that 99.9% of the OK-110 sand is finer than 250 microns, with a mean particle size (d50) of 106 microns. The PSDs for the test material are shown in Figure 1.

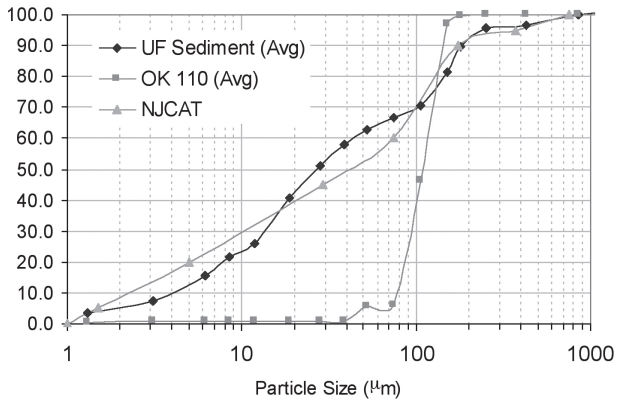


Figure 1. Particle size distributions

Tests were conducted to quantify the performance of a specific CDS unit (1.1 cfs (31.3-L/s) design capacity) at various flow rates, ranging from 1% up to 125% of the treatment design capacity of the unit, using the 2400 micron screen. All tests were conducted with controlled influent concentrations of approximately 200 mg/L. Effluent samples were taken at equal time intervals across the entire duration of each test run. These samples were then processed with a Dekaport Cone sample splitter to obtain representative sub-samples for Suspended Sediment Concentration (SSC) testing using ASTM D3977-97 "Standard Test Methods for Determining Sediment Concentration in Water Samples", and particle size distribution analysis.

Results and Modeling

Based on the data from the University of Florida, a performance model was developed for the CDS system. A regression analysis was used to develop a fitting curve representative of the scattered data points at various design flow rates. This model, which demonstrated good agreement with the laboratory data, can then be used to predict CDS system performance with respect

to SSC removal for any particle size gradation, assuming the particles are inorganic sandy-silt. Figure 2 shows CDS predictive performance for two typical particle size gradations (NJCAT gradation and OK-110 sand) as a function of operating rate.

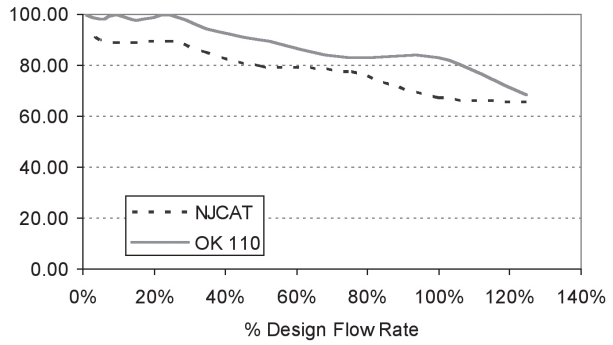


Figure 2. CDS stormwater treatment predictive performance for various particle gradations as a function of operating rate.

Many regulatory jurisdictions set a performance standard for hydrodynamic devices by stating that the devices shall be capable of achieving an 80% removal efficiency for particles having a mean particle size (d50) of 125 microns (e.g. Washington State Department of Ecology — WASDOE - 2008). The model can be used to calculate the expected performance of such a PSD (shown in Figure 3). The model indicates (Figure 4) that the CDS system with 2400 micron screen achieves approximately 80% removal at the design (100%) flow rate, for this particle size distribution (d50 = 125 μm).

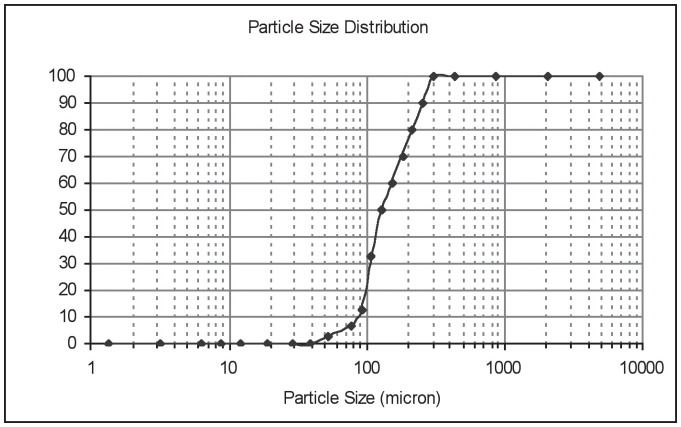


Figure 3. WASDOE PSD

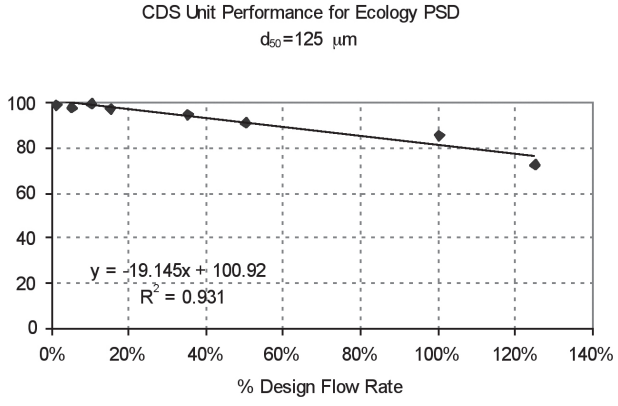


Figure 4. Modeled performance for WASDOE PSD.

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 allows 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 weather 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 systems 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.

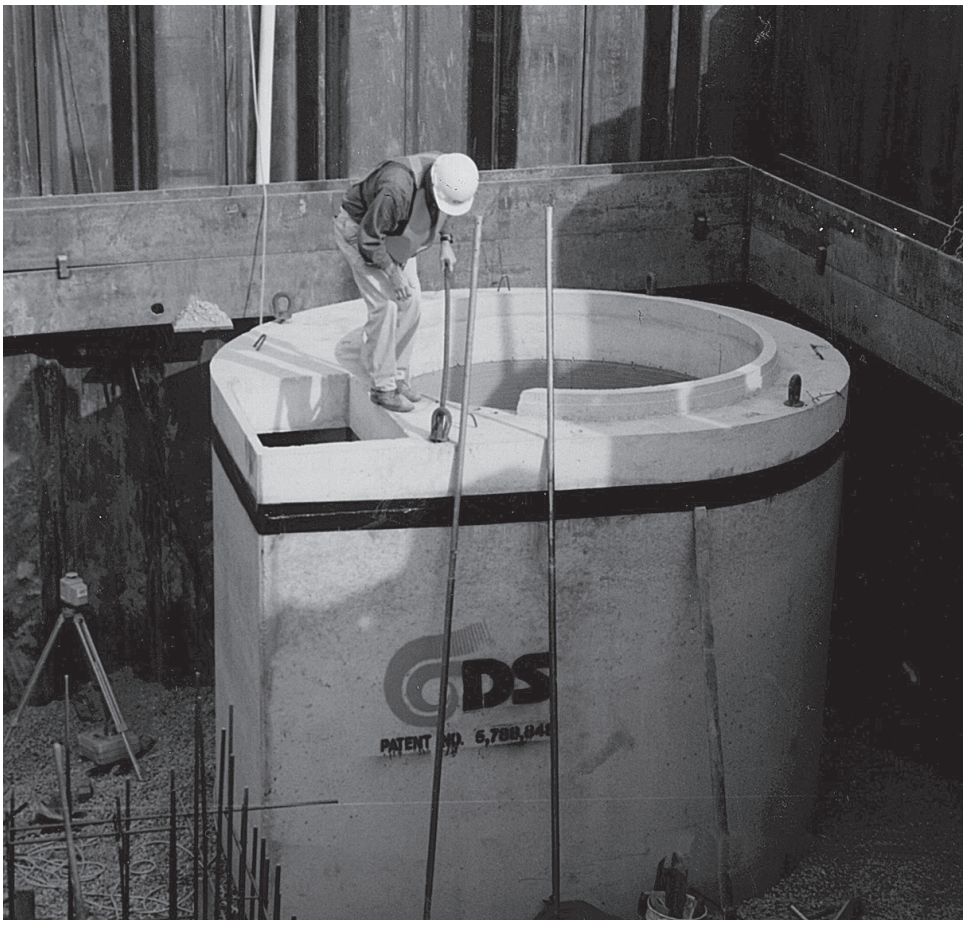
In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should 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 cleaned 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. Check your local regulations for specific requirements on disposal.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.5	0.4
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	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

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Note: To avoid underestimating the volume of sediment in the chamber, carefully lower the measuring device to the top of the sediment pile. Finer silty particles at the top of the pile may be more difficult to feel with a measuring stick. These finer particles typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.



CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile**.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.