

STORMWATER POLLUTION PREVENTION PLAN

Prepared For:

Stonehedge Farm Subdivision

Project Location:

**Spook Rock Road
Village of Montebello
Rockland County, New York**

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NOTE: ALL APPENDIX INFO WILL BE ADDED TO THE FULL SWPPP PRIOR TO THE START OF CONSTRUCTION

1.0 INTRODUCTION

1.1 Background

In 1972 Congress passed the Federal Water Pollution Control Act (FWPCA), also known as the Clean Water Act (CWA), to restore and maintain the quality of the nation's waterways. The ultimate goal was to make sure that rivers and streams were fishable, swimmable and drinkable. In 1987, the Water Quality Act (WQA) added provisions to the CWA that allowed the EPA to govern storm water discharges from construction sites. In 1998, the EPA published the final notice for General Permits for Storm Water Discharges from Construction Activities Disturbing 5 Acres or Greater (63 Federal Register 7898, February 14, 1998). The general permit includes provisions for development of a Storm Water Pollution Prevention Plan (SWPPP) to maximize the potential benefits of pollution prevention and sediment and erosion control measures at construction sites.

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater discharges from certain construction activities are unlawful unless they are authorized by a NPDES (National Pollutant Discharge Elimination System) permit or by a state permit program. New York State's SPDES (State Pollutant Discharge Elimination System) is a NPDES-approved program with permits issued in accordance with the Environmental Conservation Law ("ECL").

The New York State Department of Environmental Conservation (NYSDEC) issued SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002) in January, 2015. This general permit replaced the SPDES General Permit for Stormwater Discharges from Construction Activity (GP-10-001). An owner or operator of a construction activity that is eligible for coverage under the SPDES General Permit (GP-0-15-002) must obtain coverage under the permit prior to the commencement of construction activity.

Development, implementation, and maintenance of a Stormwater Pollution Prevention Plan (SWPPP) will provide the framework for reducing soil erosion and minimizing pollutants in storm water during construction of the project. The SWPPP will:

- Define the characteristics of the site and the type of construction which will be occurring.
- Describe the site plan for the facility to be constructed.
- Describe the practices that will be implemented to control erosion and the release of pollutants in storm water.
- Create an implementation schedule to ensure that the practices described in this SWPPP are in fact implemented and to evaluate the plan's effectiveness in reducing erosion, sediment, and pollutant levels in storm water discharged from the site.
- Describe the final stabilization/termination design to minimize erosion and prevent storm water impacts after construction is complete.

1.2 SWPPP Content

This SWPPP includes the following:

- Identification of the SWPPP coordinator with a description of this person's duties
- Identification of the storm water pollution prevention team that will assist in the implementation of the SWPPP during construction.
- Description of the existing site conditions including existing land use for the site (i.e., wooded areas, open grassed areas, pavement, buildings, etc.), soil types at the site,

as well as the location of surface waters which are located on or next to the site (wetlands, streams, rivers, lakes, ponds, etc.)

- Identification of the body of water(s) which will receive runoff from the construction site, including the ultimate body of water that receives the storm water
- Identification of drainage areas and potential storm water contaminants
- Description of storm water management controls and various Best Management Practices (BMPs) necessary to reduce erosion, sediment and pollutants in storm water discharge
- Description of the facility monitoring plan and how controls will be coordinated with construction activities
- Description of the implementation schedule and provisions for amendment of the plan.

1.3 SWPPP Coordinator and Duties

The construction site SWPPP coordinator for the facility is:

Name: _____
 Phone: _____
 Company: _____

Mr./Mrs. _____ duties include the following:

- Implement the SWPPP plan with the aid of the SWPPP team
- Oversee maintenance practices identified as BMPs in the SWPPP
- Implement and oversee employees training
- Conduct or provide for inspection and monitoring activities
- Identify other potential pollutant sources and make sure they are added to the plan
- Identify any deficiencies in the SWPPP and make sure they are corrected
- Ensure that any changes in the construction plans are addressed in the SWPPP

To aid in the implementation of the SWPPP plan, the members of the SWPPP team:

(Provide Name(s) and Description of Duties)

2.0 SITE DESCRIPTION

Project Name & Location:

STONEHEDGE FARM
 Spook Rock Road
 Village of Montebello
 Rockland County, New York

Applicant Name and Address:

Stonehedge Heights Corporation
 130 East Route 59
 Spring Valley, New York 10977

General Contractor:

T.B.D.

Description:

The Stonehedge Farm property is a 16.96 acre parcel located on the easterly side of Spook Rock Road, approximately 500 feet south of the intersection of Topaz Court. The parcel was previously used as a horse farm, and includes a single family dwelling, a guest cottage, a very large horse riding arena, horse stables, and several smaller outbuildings. The parcel also includes an extensive paved driveway system and numerous fenced-in horse pen areas. The remainder of the property is moderately vegetated with a combination of trees and brush.

The majority of the property drains with a gentle slope toward the wetlands along the southerly property line. A portion of the property adjacent to Spook Rock Road drains toward the road. The wetlands drain to a small drainage ditch that discharges to a pipe under Spook Rock Road and eventually into the ponds on the Spook Rock Golf Course. According to the Natural Resources Conservation Service (NRCS) Web Soil Survey of Rockland County, the soils on the project site are a combination of Wethersfield gravelly silt loam (WeB – Hydrologic Soil Group C) and Chesire gravelly fine sandy silt loam (CrB and CrC – Hydrologic Soil Group B). All of the soils are classified as well-drained according to the NRCS soil descriptions.

The proposed project is a twelve-lot clustered subdivision that generally conforms to the bulk requirements for single family dwellings in an R-25 zoning district. The cluster plan includes 11 new building lots to the east of a 200-foot preservation area on the easterly side of Spook Rock Road. The existing single-family dwelling, cottage and swimming pool will remain on an additional single parcel. All of the other structures on the project site, including the arena and the horse stables, will be removed. The existing paved driveway system will also be removed as part of the proposed project.

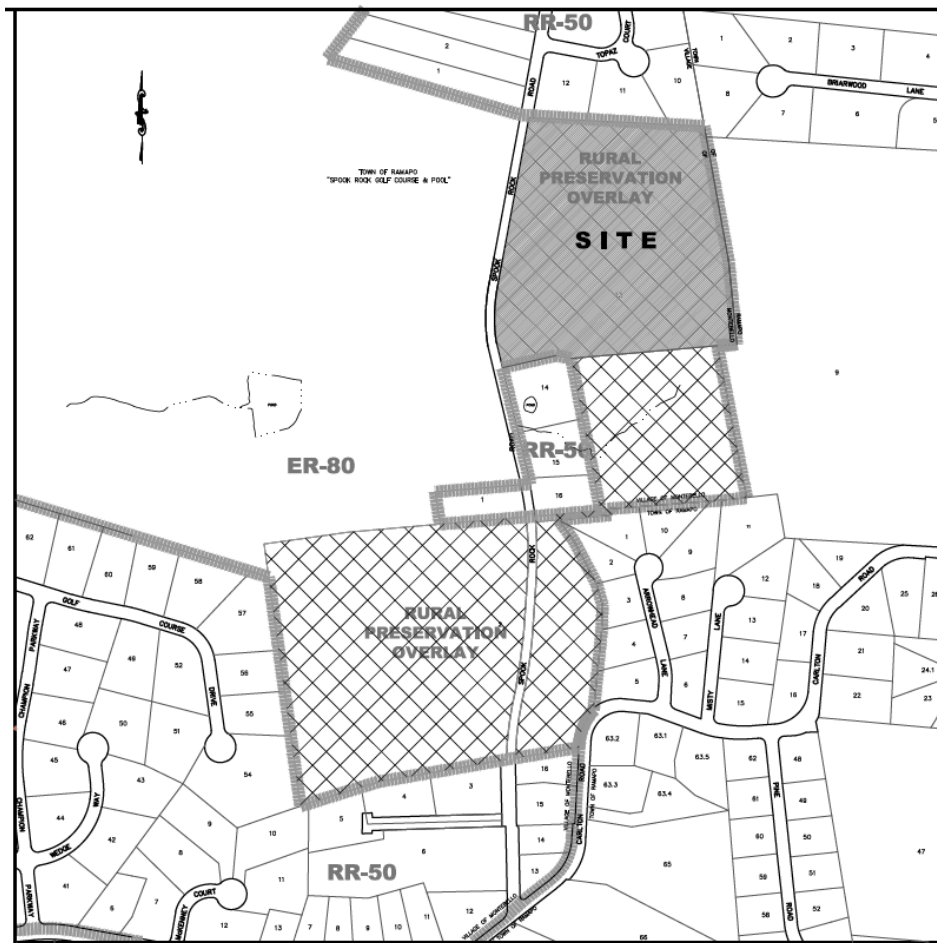
The proposed project will not alter the overall drainage pattern on the site. The majority of the site will continue to drain toward the wetlands on the southerly side of the property. The removal of the large buildings and the majority of the existing driveways will result in a net *reduction* of approximately 16% in impervious surfaces on the property.

Because the proposed project includes a net reduction of existing impervious cover, the volume of stormwater runoff generated from the site will be reduced, resulting in reduced peak discharges from the site. Therefore, no stormwater detention systems are needed or proposed. The stormwater collection system to be installed in the proposed road will discharge to the wetlands along the southerly property line.

The project is considered a redevelopment project in accordance with Chapter 9 of the New York State Stormwater Management Design Manual. In accordance with the provisions of Section 9.2 of the Stormwater Management Design Manual, water quality treatment will be provided through a combination of impervious cover reduction and treatment by standard practices.

The total area to be disturbed by construction activities is 9.4 acres. Soil disturbing activities will include: clearing and grubbing; installing stabilized construction entrances, perimeter and other erosion and sediment control measures; grading (cuts and fills); excavation for the installation of water mains, sewer mains, drainage, electric and other utilities; construction of the new road; excavation for building foundations; construction of driveways; preparation for final seeding and planting.

2.1 Site Maps



2.2 Sequence of Major Activities

The order of major construction activities is as follows:

1. Protect any areas designated on the plans by installing temporary snow fencing.
2. Install stabilized construction entrances.
3. Perform clearing and grubbing activities.
4. Install erosion and sediment controls, including silt fence, hay bales, temporary berms, swales, and temporary sediment traps.
5. Perform grading, excavation, and related operations for the road construction and installation of required improvements including drainage pipe system, sanitary sewers, water, gas and electric service lines. Stockpile topsoil in approved locations.
6. As construction proceeds, all disturbed areas shall be seeded, mulched, or planted as specified on the plans in a timely manner to prevent unnecessary erosion.
7. Utilize erosion controls to stabilize any disturbed areas where construction will cease for more than 14 days.
8. Once disturbed areas have been properly stabilized, temporary control measures shall be removed.

2.3 Construction Sequence:

1. Notify all involved agencies of proposed construction schedule.
2. Construct snow fencing around trees, structures, or other features identified by the owner to be protected during construction.
3. Construct stabilized construction entrances.
4. Install silt fence barriers at the base of all proposed slopes as designated on this plan.
5. Construct temporary sediment traps at the locations of concentrated storm water runoff, including swales and berms as needed to direct storm water runoff to the traps.
6. Prior to the start of grading operations, the contractor shall demonstrate, to the satisfaction of the owner's representative, that the areas designated to remain protected or undisturbed are protected by the uninterrupted system of silt fence barriers, basins, berms, and/or swales.
7. Clear and grub vegetation in areas to be graded.
8. Strip topsoil and stockpile in approved locations, as designated on the plan.
9. Stabilize topsoil stockpile areas and install silt fence.
10. Install temporary diversion measures. During construction, hay bale inlet protection shall be provided at all inlets, but shall be removed from roadways and driveways once the road sub-base course has been installed.
11. Perform earthwork to grade out storm water management systems.
12. Perform earthwork to rough grade roadway.
13. Install sanitary sewer, storm drainage and utilities.
14. Install curbs and base course for the roads.
15. When road is fully stabilized, conduct individual lot grading and installation of utility services for individual lots.
16. Install stabilized construction entrances for individual lots.
17. Begin construction of house foundations and structures.
18. Restore any existing site features disturbed during construction that were not part of the original scope.
19. The construction shall maintain all sediment and erosion control measures in proper condition throughout the construction period:
 - All Control measures shall be inspected at least once a week. If a repair is necessary, it shall be implemented within 24 hours of report.

- Built-up sediment shall be removed from silt fence when it has reached one-third the height of the fence.
 - Silt fence shall be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
 - Temporary and permanent seeding plantings shall be inspected for bare spots, washout, and healthy growth.
 - Sediment shall be removed from sediment traps once it has accumulated to one-half the design depth of the basin. Removed sediment shall be deposited in a suitable area in a manner such that it will not erode.
20. As construction proceeds, all disturbed areas shall be planted or seeded in a timely manner to prevent unnecessary erosion. Once disturbed uphill areas have been properly stabilized, temporary berms, temporary swales, temporary sediment traps, silt fence barriers, hay bales, crushed stone filter outlets, etc. shall be removed.
21. Perform final grading, soil restoration, and soil de-compaction. Soil restoration and de-compaction shall be performed for all areas that were cut, filled or subject to heavy vehicle traffic. Soil restoration and de-compaction shall be completed in conformance with the NYSDEC publication "Deep Ripping and De-compaction, 2008."
22. Install final seeding and landscaping.
23. Upon completion of the construction activities, remove soil erosion and sediment control measures.
24. Prepare As-Builts and post construction measures and procedures in accordance with all applicable federal, state and local requirements.

3.0 CONTROLS

3.1 Erosion and Sediment Controls

3.1.1 Description of Work

Provide all means necessary to install, inspect, maintain, and remove temporary erosion and sediment control measures as shown on the drawings and as required to minimize the erosion and unspecified transport of soil from the site.

3.1.2 Quality Assurance

- A. General
 - i. Install in accordance with the project drawings or the New York Standards and Specifications for Erosion and Sediment Control (November 2016 edition), whichever is stricter.
 - ii. Grade and maintain site at all times such that all storm water runoff from disturbed areas is diverted to soil erosion and sedimentation control facilities.
 - iii. No changes to the soil erosion and Sedimentation Control Plan shall be made without approval of the Owner's Representative.
 - iv. The Contractor shall comply with applicable Federal, State, and local regulations relating to the prevention and abatement of pollution.
 - v. The municipal Engineer may require additional erosion and sediment control measures to mitigate unforeseen siltation.
- B. Product Stockpiling: Stockpiles of stabilization measures such as hay bales and mulch shall be maintained at site for use in stabilizing disturbed areas in advance of severe weather conditions.

3.1.3 Work Schedule

- A. General: Install and remove measures as noted in the "Construction Sequence" narrative and plans. The measures shall be maintained until permanent protection of the contributing watershed is approved by the Municipal Representative. All storm drainage outlets will be stabilized, as required, before the discharge points become operational.
- B. Inspections: Inspect measures at least once every seven (7) calendar days. Stabilized areas shall be inspected monthly until the entire site is stabilized.
- C. Maintenance: Complete maintenance within seven calendar days determining its need, as determined by the Municipal Engineer.
- D. Stabilization/Planting: Temporarily or permanently stabilize within 24 hours after the end of construction activities in an area unless there is snow cover or construction activities will resume within 21 days.

3.1.4 Products and Execution

- A. Sediment Traps: Sediment traps shall be constructed to the line and grades of the proposed water quality basins.
- B. Earth Dikes: Compact dikes with earth moving equipment. Erosion control blankets shall be North American Green S150 or equal.

C. Stabilized Construction Entrance:

- A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.
- These entrances/exits will be used where dirt or mud can be tracked onto public roads; adjacent to water bodies; where poor soils are encountered; where dust is a problem during dry weather.
- The filter fabric shall be Mirafi 600X or equal. The contractor shall keep the roadways within the project clear of soil and debris and is responsible for any street cleaning necessary during the duration of construction.

D. Sediment Basins:

- Sediment basins are temporary basins formed by excavating and/or constructing an embankment so that sediment laden runoff is temporarily detained under slow-moving or inactive conditions, allowing sediment to settle out before the runoff is discharged.
- Sediment basins shall be designed to provide a minimum capacity of 3,600 cubic feet of storage per acre of drainage area contributing to the basin.
- Locate the basin so that it is accessible for maintenance.
- When possible, temporary sediment basins shall be located where permanent, post-construction detention basins will be constructed, except when the post-construction basin is an infiltration basin.
- Outflow structures and emergency spillways must be provided.
- When possible, the outflow structure can consist of the permanent outflow structure, provided that the low flow orifice is sufficiently blocked so as to be watertight and non-functional.
- The outflow shall be provided with outlet protection to prevent scouring and erosion of the embankment and channel.

E. Silt Fence:

- A silt fence is a temporary linear sediment barrier of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff. Silt fences allow sediment to settle from runoff before water leaves the construction site.
- Silt fences will be placed below the toe of exposed and erodible slopes; down-slope of exposed soil areas; around temporary stockpiles; along streams and channels; along the perimeter of a project.
- Silt fence fabric shall be Mirafi 100X or equal.
- Wood posts shall be of sound quality hardwood, a minimum 36 inches long and two inches square.
- Metal posts shall be standard T and U section weighing not less than one pound per linear foot.
- Wire fence backing shall be a minimum 14-1/2 gage with a maximum six-inch mesh opening and securely attached to fence posts.
- Posts shall extend a minimum of 16 inches into the ground.

F. Hay Bale Barriers:

- A hay bale barrier is a temporary linear sediment barrier consisting of straw bales, designed to intercept and slow sediment-laden sheet flow runoff.

- Straw bale barriers allow sediment to settle from runoff before water leaves the construction site.
- This BMP will be implemented on a project-by-project basis determined by the Engineer.
 - The hay bales will be placed along the perimeter of the site; along streams and channels; below the toe of exposed and erodible slopes; down slope of exposed soil areas; around stockpiles; across minor swales or ditches with small catchments; around above grade type temporary concrete washouts; parallel to a roadway to keep sediment off paved areas.
- G. Modified Control Structure: All pipe connections and the barrel connection to the control structure shall be watertight.
- H. Check Dams: The filter fabric shall be Mirafi 600X or equal.
- I. Temporary Stabilization:
- Establishment of Temporary Grass Cover: Prepare seed bed, scarify if compacted, remove debris and obstacles such as rocks and stumps, and seed within 24 hours. Amend soil, lime soil to pH of 6.0 and fertilize at a rate of 1/2 lbs. per 1,000 square feet with a 5-10-10 or equivalent fertilizer. Work amendments a minimum of four inches into soil. If seeding in October/November seed shall be Certified Aroostook winter rye at 100 lbs. per acre, otherwise seed shall be ryegrass (annual).
 - Mulch: Small grain straw mulch as specified on the drawings. Straw much shall be applied at a rate of two tons (100 to 120 bales) per acre.
- J. Permanent Stabilization:
Riprap: See erosion control plan for details (if required).
- K. Dust Control: Treat all disturbed areas within 500 feet of an inhabited dwelling as necessary to provide dust control. Conform to all local and state regulations governing these activities.
- L. Rock Removal: Rock ripping shall be used wherever possible in place of blasting. Observations made during test blasting shall be used in the development of a controlled rock removal program.
- M. Temporary Soil and Rock Stockpiling:
- Stockpile management procedures and practices are designed to reduce or eliminate air and storm water pollution from stockpiles of soil, and paving materials such as Portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub-base or pre-mixed aggregate, asphalt binder (so called "cold mix" asphalt) and pressure treated wood.
 - Materials shall not be stockpiled on steep slopes, drainage swales, wetland areas, or wetland setback arrears. Stockpiles shall be surrounded with silt fence and re-vegetated following completion of construction activities.

- N. Inlet Protection:
- Devices used at storm drain inlets that are subject to runoff from construction activities to detain and/or to filter sediment-laden runoff to allow sediment to settle and/or to filter sediment prior to discharge into storm drainage systems or watercourses.
 - Where ponding will not encroach into highway traffic; where sediment laden surface runoff may enter an inlet; where disturbed drainage areas have not yet been permanently stabilized; where drainage area is 0.4 ha (1 ac) or less; appropriate during wet and snow-melt seasons.
- O. Soil Restoration and De-compaction:
- Soil restoration is applied in the cleanup, restoration, and landscaping phase of construction, and is followed by the permanent establishment of an appropriate, deep-rooted groundcover.
 - All soil restoration and de-compaction activities shall be conducted in accordance with the NYSDEC publication "Deep Ripping and De-compaction, 2008."
 - Grade disturbed subsoil to rough final grade and apply the following soil restoration steps:
 1. Apply 3 inches of compost over subsoil
 2. Till compost into subsoil to a depth of at least 12 inches using a cat-mounted ripper, tractor-mounted disc, or tiller.
 3. Mix and circulate air and compost into subsoil.
 4. Rock-pick until uplifted stone/rock materials of four inches and larger size are cleaned off the site
 5. Apply topsoil to a depth of 6 inches.
 6. Vegetate as required by approved plan
- P. Concrete Truck Washout:
- A temporary excavated or above ground lined constructed pit where concrete truck mixers and equipment can be washed after their loads have been discharged, to prevent highly alkaline runoff from entering storm drainage systems or leaching into soil.
 - Washout facilities shall be provided for every project where concrete will be poured or otherwise formed on the site. This facility will receive highly alkaline wash water from the cleaning of chutes, mixers, hoppers, vibrators, placing equipment, trowels, and screeds. Under no circumstances will wash water from these operations be allowed to enter surface waters.
 - The washout facility should be sized to contain solids, wash water, and rainfall. Wash water shall be estimated at 7 gallons per chute and 50 gallons per hopper of the concrete pump truck and/or discharging drum. The minimum size shall be 8 feet by 8 feet at the bottom and 2 feet deep. If excavated, the side slopes shall be 2 horizontal to 1 vertical.
 - Locate the facility a minimum of 100 feet from drainage swales, storm drain inlets, wetlands, streams and other surface waters. Prevent surface water from entering the structure except for the access road. Provide appropriate access with a gravel access road sloped down to the structure. Signs shall be placed to direct drivers to the facility after their load is discharged.
 - All washout facilities will be lined to prevent leaching of liquids into the ground. The liner shall be plastic sheeting with a minimum thickness of 10 mils with no

holes or tears, and anchored beyond the top of the pit with an earthen berm, sand bags, stone, or other structural appurtenance except at the access point.

3.1.5 Maintenance

- A. Repair or replace all damaged erosion and sediment control measures.
- B. Sediment Traps: Clean out traps when sediment levels reach specified clean out levels. See Sediment Trap Schedule (if required).
- C. Inlet Protection:
 - Inspect fabric barriers after every rain event and repair as needed.
 - Straw bales shall be kept tight, with bottom edge adhering to the ground.
 - Only clean stone or gravel shall be used.
 - Remove accumulated sediment as necessary and dispose on site.
- D. Stabilized Construction Entrance:
 - Inspect routinely for damage and assess effectiveness of the BMP. Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
 - Keep all temporary roadway ditches clear
 - Inspect for damage and repair as needed.
- E. Sediment Basins:
 - Inspect before and after rainfall events and weekly during rainy season.
 - Examine banks for seepage and structural soundness.
 - Check inlets and outlet structure for damage or obstructions; repair damage and remove obstructions as needed.
 - Remove accumulated sediment when its volume reaches one-third of the volume of the sediment storage.
- F. Silt Fence:
 - Repair undercut silt fences
 - Repair or replace split, torn, slumping, or weathered fabric
 - Inspect silt fence when rain is forecast. Perform necessary maintenance, or maintenance as required by the Resident Engineer (RE)
 - Inspect silt fence following rainfall events. Perform maintenance as necessary, or as required by the RE.
 - Maintain silt fences to provide adequate sediment holding capacity. Sediment shall be removed when the sediment accumulation reaches 1/3 of the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the right-of-way in conformance with the Standard Specifications.
 - Silt fences that are damaged and become unsuitable for the intended purpose, as determined by the RE, shall be removed from the site of work, disposed of outside the highway right-of-way in conformance with the Standard Specifications, and replaced with new silt fence barriers.
 - Holes, depressions or other ground disturbance caused by the removal of the temporary silt fences shall be backfilled and repaired in conformance with the Standard Specifications.

- Remove silt fence when no longer needed or as required by the RE. Fill and compact holes and anchorage trench, remove sediment accumulation, and grade fence alignment to blend with adjacent ground.
- G. Hay Bale Barriers:
- Inspect straw bale barriers before and after each rainfall event, and weekly throughout the rainy season.
 - Inspect straw bale barriers for sediment accumulations and remove sediment when depth reaches 1/3 the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.
 - Replace or repair damaged bales as needed or as directed by the RE
 - Repair washouts or other damages as needed or as directed by the RE
 - Remove hay bales when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area.
- H. Construction Vehicles:
- Procedures and practices to minimize or eliminate the discharge of pollutants to the storm drain systems or to watercourses from vehicle and equipment maintenance procedures.
 - These maintenance procedures will be applied to all construction projects where the storage and maintenance of heavy equipment and vehicles is necessary.
 - Maintain waste fluid containers in leak proof condition.
 - Vehicle and equipment maintenance areas shall be inspected regularly
 - Vehicles and equipment shall be inspected on each day of use. Leaks shall be repaired immediately or the problem vehicles(s) or equipments shall be removed from the project site.
 - Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.
- I. Temporary Soil and Rock Stockpiling:
- Repair and/or replace perimeter controls and covers as needed, or as directed by the RE, to keep them functioning properly. Sediment shall be removed when sediment accumulation reached 1/3 of the barrier height.
- J. Concrete Truck Washout:
- Concrete washout facilities shall be inspected daily. Damaged or leaking facilities shall be deactivated and repaired or replaced immediately.
 - Inspect the project site frequently to ensure that no concrete discharges are taking place in non-designated areas.
 - Excess rainwater that has accumulated over hardened concrete should be pumped to a stabilized area.
 - Accumulated hardened material shall be removed when 75% of the storage capacity of the facility is filled. Dispose of the hardened material off-site in a construction/demolition landfill.
 - The plastic liner shall be replaced with each cleaning of the washout facility.

3.2 STORM WATER MANAGEMENT CONTROL

3.2.1 Peak Flow Attenuation

The proposed project will not alter the overall drainage pattern on the site. A portion of the property adjacent to Spook Rock Road drains toward the road. The drainage area from the site that drains toward Spook Rock Road will not change, so the peak discharge will remain the same.

The majority of the site will continue to drain toward the wetlands on the southerly side of the property. The removal of the large buildings and the existing driveways will result in a net *reduction* of approximately 16% in impervious surfaces on the property.

The project is considered a redevelopment project in accordance with Chapter 9 of the New York State Stormwater Management Design Manual. In accordance with the provisions of Section 9 of the Stormwater Management Design Manual, if the redevelopment activities result in no change to hydrology that increases the discharge rate from the project site, the ten-year and hundred-year criteria do not apply. Because the proposed project includes a net reduction of existing impervious cover, the volume of stormwater runoff generated from the site will be reduced, resulting in reduced peak discharges from the site. Therefore, no stormwater detention systems are needed or proposed.

3.2.2 Water Quality

Water quality treatment will be provided through a combination of impervious cover reduction and treatment by approved proprietary practices. The proposed project includes a reduction impervious cover of approximately 16% compared to the existing conditions on the project site. The reduction in site imperviousness will reduce the volume of stormwater runoff, thereby partially achieving the water quality objective.

The plan also proposes the use of alternative stormwater management practices (SMPs) to treat the water quality volume from the proposed impervious surfaces of the new road, new driveways and new dwellings. The use of alternative SMP including accepted and verified manufactured technologies is allowable for redevelopment projects. A water quality treatment manhole fitted with a First Defense High Capacity (FDHC) Stormwater Treatment Device as manufactured by Hydro International will be installed. The FDHC has received certification from the New Jersey Department of Environmental Protection, and in accordance with the NYSDEC policy, proprietary devices certified by NJDEP can be used for water quality treatment on redevelopment projects. The FDHC water quality treatment manhole has been positioned at the end of the stormwater collection system, and receives runoff from the new road, driveways and roof of the new dwellings.

This system is designed as a flow-through device, and the proposed 8-foot diameter unit has a maximum treatment flow rate of 6.00 cfs.

3.2.3 Runoff Reduction Volume

Runoff reduction is not required for redevelopment projects. Redevelopment projects which do not use runoff reduction techniques are still required to provide water quality treatment. The project utilizes a combination of impervious surface reduction and the alternative treatment device to achieve the required water quality treatment.

3.2.4 Maintenance

The long-term maintenance of the stormwater management systems will be the responsibility of the Village of Montebello. The piping, catch basins and manholes that comprise the stormwater collection and treatment system will be constructed by the developer and dedicated to the Village of Montebello. All of the components of the stormwater collection and treatment system are within the right-of-way of the new road or easements. Upon dedication, they will be maintained in the same manner as the Village maintains the stormwater piping system within the bed of existing roads or easements throughout the municipality.

The stormwater system will be maintained in accordance with standard procedures and guidelines contained in the latest edition of the New York State Stormwater Management Design Manual. An Operation and Maintenance (O&M) plan for the post-construction stormwater management practices is included in Section 12 of this SWPPP.

3.3 Other Controls

Waste Materials:

All waste materials will be collected and stored in securely lidded metal dumpsters rented from _____ which is a solid waste management company located in _____ County. The dumpsters will meet all Town, County, and New York state solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpsters. The dumpsters will be emptied as necessary, and the trash will be hauled off-site. No construction waste materials will be buried on site.

Hazardous Waste:

All hazardous waste materials will be disposed of in the manner specified by local or State regulation or by the manufacturer. Site personnel will be instructed in these practices and the individual, who manages day-to-day site operations, will be responsible for seeing that these practices are followed.

Sanitary Waste:

All sanitary waste will be collected from the portable units by a licensed sanitary waste management contractor.

Offsite Vehicle Tracking:

A Stabilized construction entrance will be provided to help reduce vehicle tracking of sediments. Existing paved roadways located adjacent to the construction site entrances will be swept daily to remove any excess mud, dirt or rock tracked from the site. Dump trucks hauling material from the construction site will be covered with a tarpaulin.

3.4 Timing of Controls/Measures

As indicated in the Sequence of Major Activities, the stabilized construction entrances and other sediment and erosion controls will be constructed prior to earthwork activities on any part of the site. Areas where construction activity temporarily ceases for at least 21 days will be stabilized with a temporary seed and mulch within 14 days of the last disturbance. Once construction activity ceases permanently in an area, that area will be stabilized with permanent seed and mulch. After the entire site is stabilized, accumulated sediments will be removed from the sediment and erosion control structures and the controls will be removed.

3.5 Certification of Compliance with Federal, State & Local Regulations

The storm water pollution plan reflects New York State Department of Environmental Conservation requirements for storm water management and erosion and sediment control, as established in Article 17, Titles 7, 8 and Article 70 of the Environmental Conservation Law. To ensure compliance, this plan was prepared in accordance with guidelines issued with the SPDES General Permit for Storm Water Discharges from Construction Activities that are classified as “Associated with Construction Activity,” published by the New York State Department of Environmental Conservation.

3.5.1 Historic Places or Archeological Resources

According to a search that was conducted using the New York State Office of Parks, Recreation and Historic Places (OPRHP) geographic information system online resource, there are no historic places listed, or eligible for listing, on the State or National Registers of Historic Places in the vicinity of the proposed project. A similar search indicated that there are no known areas of archeological sensitivity that may indicate the need for a survey in the vicinity of the proposed project.

4.0 MAINTENANCE/INSPECTION PROCEDURES

4.1 Sediment & Erosion Control Inspection and Maintenance Practices

The following are inspection and maintenance practices that will be used to maintain sediment and erosion controls.

- All Control measures will be inspected at least once each week and immediately following any storm event of 0.5 inches or greater.
- All measures will be maintained in good working order. If a repair is necessary. It will be initiated within 24 hours of report.
- Built-up sediment will be removed from silt fence when it has reached 1/3 the height of the fence.
- Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
- Temporary and permanent seeding and panting will be inspected for bare spots, washouts, and healthy growth.
- A Maintenance inspection report will be made after each inspection.

The Job Supervisor will select individuals who will be responsible for inspections, maintenance and repair activities, and filling out the inspection and maintenance report.

Inspection reports shall summarize:

1. Name of inspector
2. Qualifications of inspector
3. Areas inspected, including measurements
4. Observed conditions
5. Changes necessary to the SWPPP

5.0 NON-STORM WATER DISCHARGES

It is expected that the following non-storm water discharges will occur from the site during the construction period:

- Water from water line flushing.
- Waste water from power washing.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).

6.0 INVENTORY FOR POLLUTION PREVENTION PLAN

The materials or substances listed below are expected to be present on the site during construction:

Concrete and Mortar

Detergents

Paints (enamel and latex)

Metal Pipe

Concrete

Fertilizers

Petroleum Based Products

Cleaning Solvents

Wood (treated and untreated)

Masonry



7.0 SPILL CONTROL & PREVENTION

7.1 Material 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 storm water runoff.

Good Housekeeping:

The following good housekeeping practices will be followed on site during the construction project:

- An effort will be made to store only enough product required to do the job
- All materials stored on site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of the container.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The Job Supervisor will inspect daily to ensure proper use and disposal of materials on site.

Hazardous Products:

The following practices will be used to reduce the risks associated with hazardous materials:

- Products will be kept in original containers unless they are not re-sealable.
- Original labels and material safety data will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

7.2 Product Specific Practices

The following product specific practices will be followed on site.

Petroleum Products:

All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.

Fertilizers:

Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer or specified. Once applied fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

Paints:

All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm drainage system, but will be properly disposed of according to manufacturers' instructions or State and local regulations.

Concrete Trucks:

Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash on the site.

Detergents and Cleaning Solvents:

Detergents and cleaning solvents will only be utilized on site when needed for immediate maintenance of construction equipment. Detergents and cleaning solvents will be stored in sealed containers, and will not be disposed of on the site or discharged to the storm drainage system. Environmentally friendly solvents and cleaners will be utilized when available.

8.0 SPILL CONTROL AND PREVENTION LOG

Date of Spill	Material Spilled	Spill Location	Cause

Cleanup	Agency Reported (Toxic/Hazardous)	Reoccurrence Prevention Measure

8.1 Spill Control Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanups:

- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area on site. Equipment and materials will include, but not be limited to, brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size of the spill.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from re-occurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.

The Job Supervisor responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase or prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the office trailer on site.

9.0 SUPPORTING PLANS & ANALYSES

- Subdivision Plans, "Stonehedge Farms", last revised December 13, 2018, by Brooker Engineering, P.L.L.C.
- Drainage Analysis, by Brooker Engineering, P.L.L.C., dated December 13, 2018.

10.0 POLLUTION PREVENTION PLAN CERTIFICATIONS

SWPPP Preparer:

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. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____

Date: _____

Qualified Inspector:

I certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project, and that I have agreed to perform the inspections for the Stonehedge Farms project for compliance with the erosion and sediment controls described in the SWPPP.

Within one business day of the completion of an inspection, I agree to notify the qualified inspector shall notify the owner or operator and appropriate contractor or subcontractor identified in Part III.A.6. of the permit of any corrective actions that need to be taken. The contractor or subcontractor shall be instructed to begin implementing the corrective actions within one business day of this notification, and shall complete the corrective actions in a reasonable time frame.

(Signature)

Brooker Engineering PLLC
(Company)

Stuart Strow, P.E.
(Name)

74 Lafayette Avenue
(Street)

Professional Engineer
(Title)

Suffern, NY 10901
(City, State, Zip)

(Date)

845-357-4411
(Phone Number)

Owner

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. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(Signature)

(Printed Name)

(Owner Name)

(Title)

(Date)

(Phone Number)

Site Contractor:

I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to 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 most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations

(Signature)

(Company)

(Name)

(Street)

(Title)

(City, State, Zip)

(Date)

(Phone Number)

11.1 Erosion Control Inspection Notes

[Empty box for inspection notes]

12.0 POST CONSTRUCTION CONTROLS

The long-term maintenance of the stormwater management systems will be the responsibility of the Village of Montebello. The piping, catch basins and manholes that comprise the stormwater collection and treatment system will be constructed by the developer and dedicated to the Village of Montebello.

The Operation and Maintenance (O&M) plan for the post-construction stormwater management practices shall include the following:

1. The owner(s) of the stormwater management systems shall erect or post, in the immediate vicinity of the facility, a conspicuous and legible sign of not less than 18 inches by 24 inches bearing the following information:

**STORMWATER MANAGEMENT PRACTICE
(INFILTRATION SYSTEM or STORMWATER DETENTION SYSTEM)
Project Identification - (SPDES Construction Permit #)
This facility must be maintained in accordance with O&M Plan
DO NOT REMOVE OR ALTER**

2. The owner of the property shall be responsible for the operation and maintenance of the post-construction stormwater management practices until such time as they are dedicated to the municipi. As of the date of the preparation of this SWPPP, the owner is identified as:

**Stonehedge Heights Corporation
130 East Route 59
Spring Valley, New York 10977**

3. The long-term operation and maintenance of the stormwater management practices shall be ensured by a legally binding maintenance agreement that is to be filed in the Office of the Rockland County Clerk. The maintenance agreement shall include provisions for any necessary easements.
4. A Soil Erosion and Sediment Control Plan is part of the Subdivision Plans entitled "Stonehedge Farms" prepared by Brooker Engineering, P.L.L.C. The Subdivision Plans are considered a part of this SWPPP, and include schematics, measurements and specifications for the stormwater management practices on the site.
5. Catch basin maintenance measures shall include the following:
 - Catch basins shall be visually inspected annually at the start of spring (or prior to significant snow melt or rain conditions).
 - The inspection should include documentation of debris build up in each structure, as well as noting any structural defects that have surfaced, including defects to castings, frames, covers, grates and concrete cracking or spalling.
 - Catch basins shall be cleaned of all debris at a frequency of no less than one fiscal year or in the event that sediment buildup exceeds six inches.
 - Trash and debris shall be removed regardless of buildup depth.
 - Debris or sediment removal shall be done as soon as reasonably possible to avoid impacts to receiving system, and no later than one month after the inspection report.
 - Cosmetic deficiencies shall be corrected based on the severity of the deficiency. Any deficiency that notes structural imperfections that may cause potential failure shall be corrected immediately and without delay.

6. Water quality treatment manhole maintenance measures shall include the following:
- All maintenance shall be conducted in accordance with the *First Defense High Capacity Stormwater Treatment Device* (as manufactured by Hydro International) manufacturer's minimum requirements.
 - Maintenance requirements are included in the manufacturer's specifications in Appendix D of this SWPPP.
 - Manhole shall be visually inspected every six months.
 - Sump clean out and removal of sediment and floatable debris is typically conducted once a year.

12.1 Post Construction Controls Reporting

The maintenance and inspection records for each fiscal year shall be dutifully retained by the owner as well as submitted to the Village of Montebello, which is the acting enforcement agent for the MS4 program.

The report shall be entitled:

"STONEHEDGE FARMS SUBDIVISION, ROCKLAND COUNTY, New York"
"Annual Maintenance and Inspection Report"

The report cover shall also include the following information:

- Name of company who prepared or assisted in compiling information and inspections
- Date
- Name, address and phone number of current owner

The required inspections and reports are to be performed by a New York State licensed Professional Engineer. The reports shall include photographs of each structure and additional photos of any corrective work that is undergone for that fiscal year. If corrective work is conducted, work logs and inventory of materials shall be documented and included within the report.

Appendix D

First Defense High Capacity (FDHC) Stormwater Treatment Device Specifications

First Defense® High Capacity

A Simple Solution for your Trickiest Sites

Product Profile

The First Defense® High Capacity is an enhanced vortex separator that combines an effective stormwater treatment chamber with an integral peak flow bypass. It efficiently removes sediment total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® High Capacity is available in several model configurations to accommodate a wide range of pipe sizes, peak flows and depth constraints (**Table 1**, next page).

Applications

- Stormwater treatment at the point of entry into the drainage line
- Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- Pretreatment for filters, infiltration and storage

Advantages

- Inlet options include surface grate or multiple inlet pipes
- Integral high capacity bypass conveys large peak flows without the need for "offline" arrangements using separate junction manholes
- Proven to prevent pollutant washout at up to 450% of its treatment flow
- Long flow path through the device ensures a long residence time within the treatment chamber, enhancing pollutant settling
- Delivered to site pre-assembled and ready for installation

How it Works

The First Defense® High Capacity has internal components designed to remove and retain gross debris, total suspended solids (TSS) and hydrocarbons (**Fig.1**).

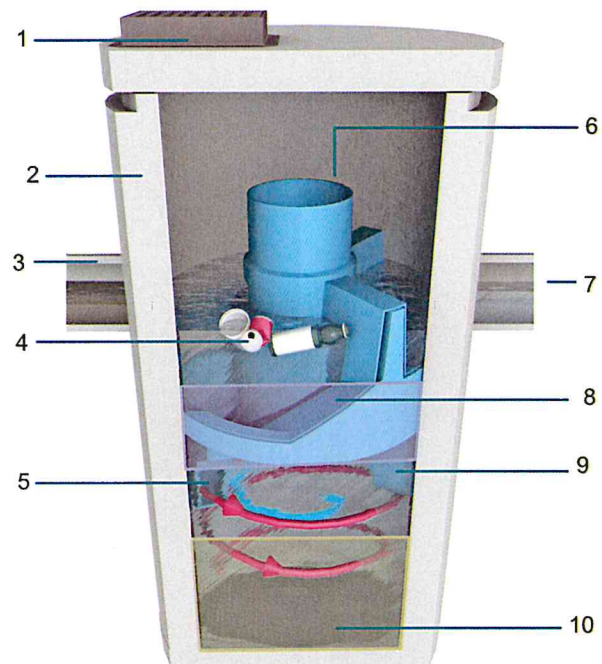
Contaminated stormwater runoff enters the inlet chute from a surface grate and/or inlet pipe. The inlet chute introduces flow into the chamber tangentially to create a low energy vortex flow regime (magenta arrow) that directs sediment into the sump while oils, floating trash and debris rise to the surface.

Treated stormwater exits through a submerged outlet chute located opposite to the direction of the rotating flow (blue arrow). Enhanced vortex separation is provided by forcing the rotating flow within the vessel to follow the longest path possible rather than directly from inlet to outlet.

Higher flows bypass the treatment chamber to prevent turbulence and washout of captured pollutants. An internal bypass conveys infrequent peak flows directly to the outlet eliminating the need for, and expense of, external bypass control structures. A floatables draw off slot functions to convey floatables into the treatment chamber prior to bypass.

Verified by NJCAT and NJDEP

Fig.1 The First Defense® High Capacity has internal components designed to efficiently capture pollutants and prevent washout at peak flows.



Components

- | | |
|--|-------------------------------|
| 1. Inlet Grate (optional) | 6. Internal Bypass |
| 2. Precast chamber | 7. Outlet pipe |
| 3. Inlet Pipe (optional) | 8. Oil and Floatables Storage |
| 4. Floatables Draw Off Slot (not pictured) | 9. Outlet chute |
| 5. Inlet Chute | 10. Sediment Storage Sump |

First Defense® High Capacity

Sizing & Design

This adaptable online treatment system works easily with large pipes, multiple inlet pipes, inlet grates and now, contains a high capacity bypass for the conveyance of large peak flows. Designed with site flexibility in mind, the First Defense® High Capacity allows engineers to maximize available site space without compromising treatment level.

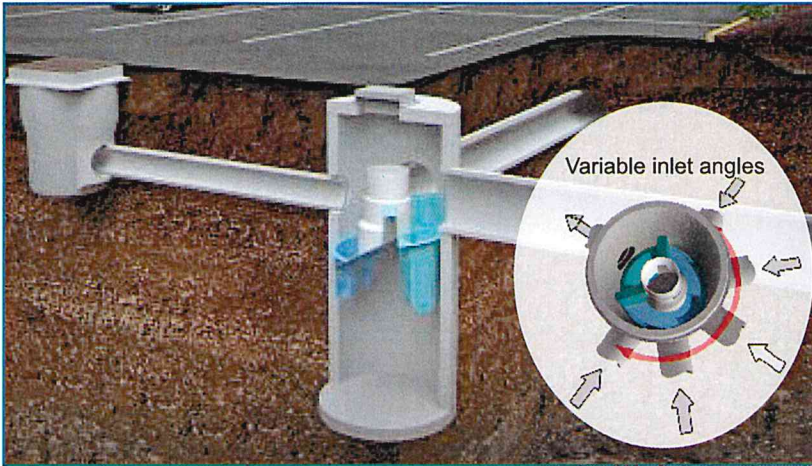


Fig 2. Works with multiple inlet pipes and grates

Inspection and Maintenance

Nobody maintains our systems better than we do. To ensure optimal, ongoing device performance, be sure to recommend Hydro International as a preferred service and maintenance provider to your clients.

Call 1 (800) 848-2706 to schedule an inspection and cleanout or learn more at hydro-int.com/service

SIZING CALCULATOR FOR ENGINEERS



This simple online tool will recommend the best separator, model size and online/offline arrangement based on site-specific data entered by the user.

Go to hydro-int.com/sizing to access the tool.



Fig 3. Maintenance is done with a vector truck

Table 1. First Defense® High Capacity Design Criteria.

First Defense® High Capacity Model Number	Diameter	Typical TSS Treatment Flow Rates		Peak Online Flow Rate	Maximum Pipe Diameter ¹	Oil Storage Capacity	Typical Sediment Storage Capacity ²	Minimum Distance from Outlet Invert to Top of Rim ³	Standard Distance from Outlet Invert to Sump Floor
		NJDEP Certified	110µm						
	(ft / m)	(cfs / L/s)	(cfs / L/s)	(cfs / L/s)	(in / mm)	(gal / L)	(yd ³ / m ³)	(ft / m)	(ft / m)
FD-3HC	3 / 0.9	0.84 / 23.7	1.06 / 30.0	15 / 424	18 / 457	125 / 473	0.4 / 0.3	2.0 - 3.5 / 0.6 - 1.0	3.71 / 1.13
FD-4HC	4 / 1.2	1.50 / 42.4	1.88 / 53.2	18 / 510	24 / 600	191 / 723	0.7 / 0.5	2.3 - 3.9 / 0.7 - 1.2	4.97 / 1.5
FD-5HC*	5 / 1.5	2.34 / 66.2	2.94 / 83.2	20 / 566	24 / 600	300 / 1135	1.1 / .84	2.5 - 4.5 / 0.7 - 1.3	5.19 / 1.5
FD-6HC	6 / 1.8	3.38 / 95.7	4.23 / 119.8	32 / 906	30 / 750	496 / 1,878	1.6 / 1.2	3.0 - 5.1 / 0.9 - 1.6	5.97 / 1.8
FD-8HC	8 / 2.4	6.00 / 169.9	7.52 / 212.9	50 / 1,415	48 / 1219	1120 / 4239	2.8 / 2.1	3.0 - 6.0 / 0.9 - 1.8	7.40 / 2.2

*Coming soon

¹Contact Hydro International when larger pipe sizes are required.

²Contact Hydro International when custom sediment storage capacity is required.

³Minimum distance for models depends on pipe diameter.

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

Stormwater Solutions
hydro-int.com/firstdefensehc

FDHCSS1703



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Nonpoint Pollution Control

Division of Water Quality

401-02B

Post Office Box 420

Trenton, New Jersey 08625-0420

609-633-7021 Fax: 609-777-0432

http://www.state.nj.us/dep/dwq/bnpc_home.htm

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

April 4, 2016

Lisa Lemont, CPSWQ
Business Development Manager
Hydro International
94 Hutchins Drive
Portland, ME 04102

Re: MTD Lab Certification
First Defense® HC (FDHC) Stormwater Treatment Device by Hydro International

TSS Removal Rate 50%

Dear Ms. Lemont:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7 (c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Hydro International has requested an MTD Laboratory Certification for the First Defense® HC Stormwater Treatment Device.

The projects falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated February 2016) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the First Defense® HC Stormwater Treatment Device by Hydro International at a TSS removal rate of 50% when designed, operated and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5.

2. The First Defense® HC Stormwater Treatment Device shall be installed using the same configuration reviewed by NJCAT and shall be sized in accordance with the criteria specified in item 6 below.
3. This First Defense® HC Stormwater Treatment Device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at www.njstormwater.org.
5. The maintenance plan for a site using the First Defense® HC Stormwater Treatment Device shall incorporate, at a minimum, the maintenance requirements noted in the attached document. However, it is recommended to review the maintenance website at http://www.hydro-int.com/UserFiles/downloads/FD_O%2BM_F1512.pdf for any changes to the maintenance requirements.
6. Sizing Requirements:

The example below demonstrates the sizing procedure for the First Defense® HC Stormwater Treatment Device:

Example: A 0.25 acre impervious site is to be treated to 50% TSS removal using a First Defense® HC Stormwater Treatment Device. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

time of concentration = 10 minutes

i=3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)

c=0.99 (curve number for impervious)

$Q=ciA=0.99 \times 3.2 \times 0.25 = 0.79$ cfs

Given the site runoff is 0.79 cfs and based on Table 1 below, the First Defense® HC Model 4-ft with a MTFR of 1.5 cfs would be the smallest model approved that could be used for this site that could remove 50% of the TSS from the impervious area without exceeding the MTFR.

The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the Verification Appendix under Table A-1 and Table A-2 of the NJCAT Verification Report.

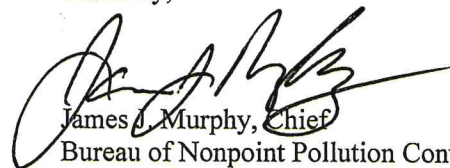
Table 1 First Defense® HC Models

First Defense® Model	Manhole Diameter (ft)	Maximum Treatment Flowrate, MTR (cfs)
4-ft	4-ft	1.50
6-ft	6-ft	3.38
8-ft	8-ft	6.00

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Practices Manual.

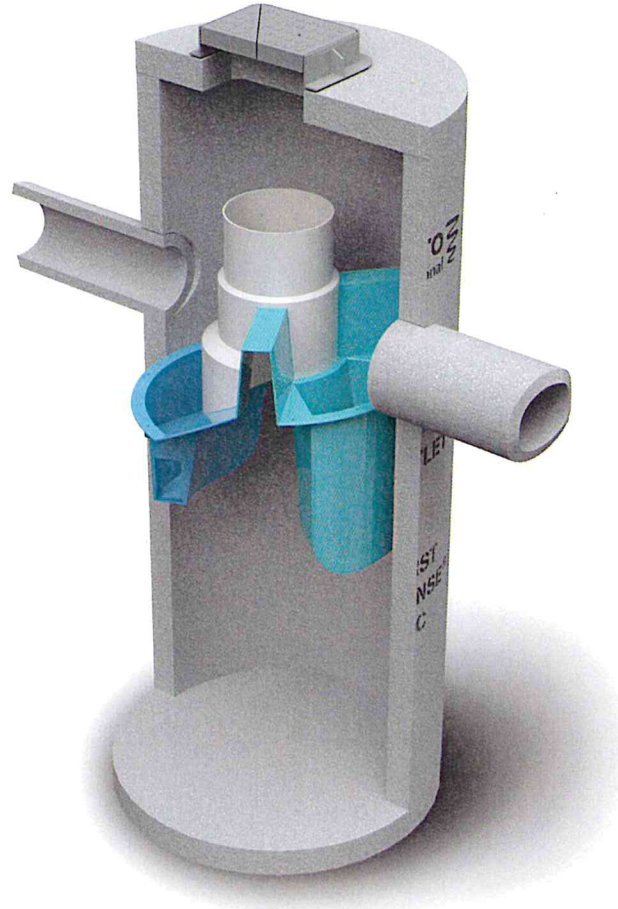
If you have any questions regarding the above information, please contact Mr. Titus Magnanao of my office at (609) 633-7021.

Sincerely,


James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

C: Chron File
Richard Magee, NJCAT
Vince Mazzei, DLUR
Ravi Patraju, NJDEP
Gabriel Mahon, BNPC
Titus Magnanao, BNPC



Operation and Maintenance Manual

First Defense[®] and First Defense[®] High Capacity

Vortex Separator for Stormwater Treatment

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5	MAINTENANCE <ul style="list-style-type: none">- OVERVIEW- MAINTENANCE EQUIPMENT CONSIDERATIONS- DETERMINING YOUR MAINTENANCE SCHEDULE
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9	FIRST DEFENSE® INSPECTION AND MAINTENANCE LOG

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I. First Defense® by Hydro International

Introduction

The First Defense® is an enhanced vortex separator that combines an effective and economical stormwater treatment chamber with an integral peak flow bypass. It efficiently removes total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® is available in several model configurations (refer to *Section II. Model Sizes & Configurations*, page 4) to accommodate a wide range of pipe sizes, peak flows and depth constraints.

Operation

The First Defense® operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is fabricated with 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 First Defense® has been designed to allow for easy and safe access for inspection, monitoring and clean-out procedures. Neither entry into the unit nor removal of the internal components is necessary for maintenance, thus safety concerns related to confined-space-entry are avoided.

Pollutant Capture and Retention

The internal components of the First Defense® have been designed to optimize pollutant capture. Sediment is captured and retained in the base of the unit, while oil and floatables are stored on the water surface in the inner volume (Fig.1).

The pollutant storage volumes are isolated from the built-in bypass chamber to prevent washout during high-flow storm events. The sump of the First Defense® retains a standing water level between storm events. This ensures a quiescent flow regime at the onset of a storm, preventing resuspension and washout of pollutants captured during previous events.

Accessories such as oil absorbent pads are available for enhanced oil removal and storage. Due to the separation of the oil and floatable storage volume from the outlet, the potential for washout of stored pollutants between clean-outs is minimized.

Applications

- Stormwater treatment at the point of entry into the drainage line
- Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- Pretreatment for filters, infiltration and storage

Advantages

- Inlet options include surface grate or multiple inlet pipes
- Integral high capacity bypass conveys large peak flows without the need for "offline" arrangements using separate junction manholes
- Proven to prevent pollutant washout at up to 500% of its treatment flow
- Long flow path through the device ensures a long residence time within the treatment chamber, enhancing pollutant settling
- Delivered to site pre-assembled and ready for installation

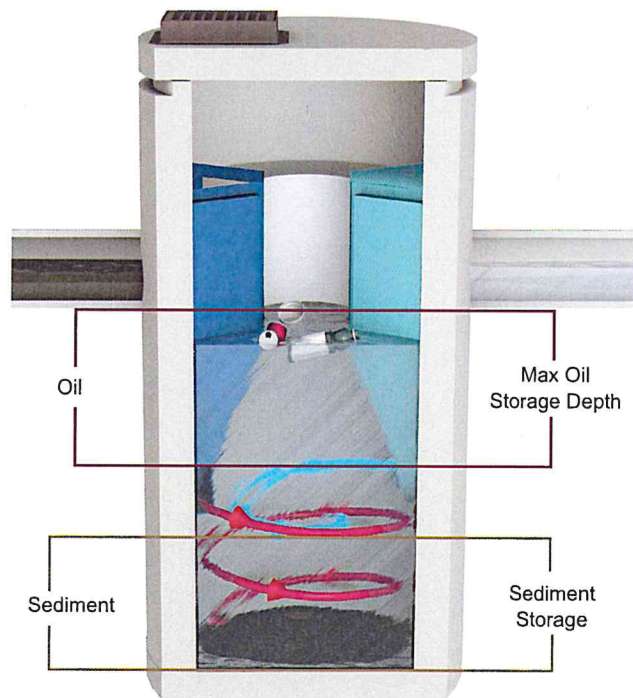


Fig.1 Pollutant storage volumes in the First Defense®.

II. Model Sizes & Configurations

The First Defense® inlet and internal bypass arrangements are available in several model sizes and configurations. The components of the First Defense®-4HC and First Defense®-6HC have modified geometries as to allow greater design flexibility needed to accommodate various site constraints.

All First Defense® models include the internal components that are designed to remove and retain total suspended solids (TSS), gross solids, floatable trash and hydrocarbons (Fig.2a - 2b). First Defense® model parameters and design criteria are shown in Table 1.

First Defense® Components

- | | | |
|--------------------|-----------------------------|-------------------------|
| 1. Built-In Bypass | 4. Floatables Draw-off Port | 7. Sediment Storage |
| 2. Inlet Pipe | 5. Outlet Pipe | 8. Inlet Grate or Cover |
| 3. Inlet Chute | 6. Floatables Storage | |

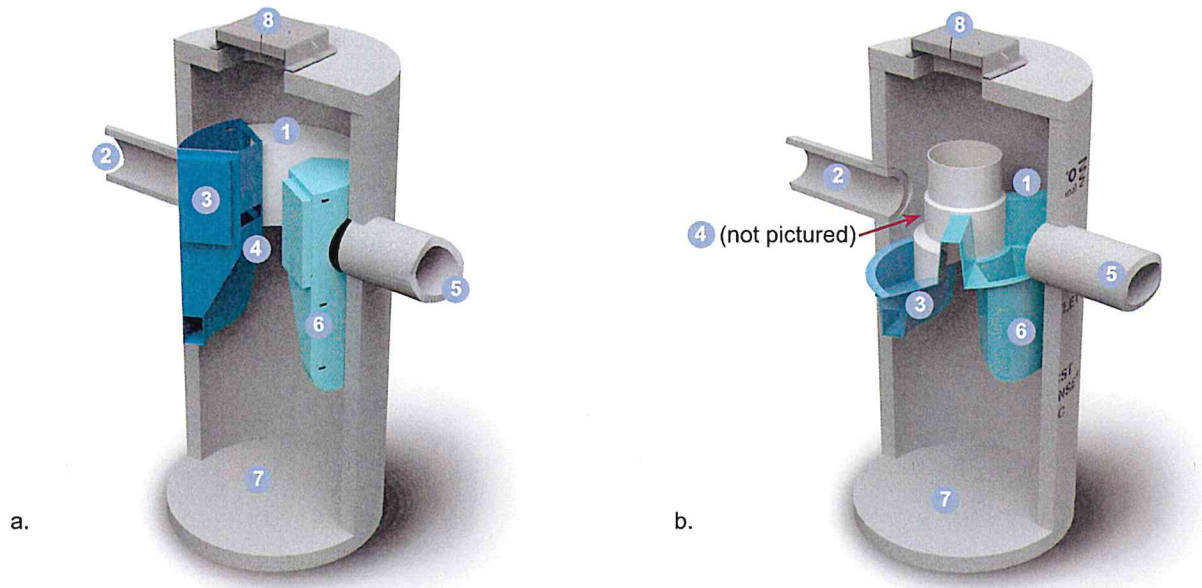


Fig. 2a) First Defense®-4 and First Defense®-6; b) First Defense®-4HC and First Defense®-6HC, with higher capacity dual internal bypass and larger maximum pipe diameter.

First Defense® High Capacity Model Number	Diameter	Typical TSS Treatment Flow Rates	Peak Online Flow Rate	Maximum Pipe Diameter ¹	Oil Storage Capacity	Typical Sediment Storage Capacity ²	Minimum Distance from Outlet Invert to Top of Rim ³	Chamber Depth
		NJDEP Certified						
	(ft / m)	(cfs / L/s)	(cfs / L/s)	(in / mm)	(gal / L)	(yd ³ / m ³)	(ft / m)	(ft / m)
FD-3HC	3 / 0.9	0.85 / 24.0	15 / 424	18 / 457	125 / 473	0.4 / 0.3	2.0 - 3.5 / 0.6 - 1.0	3.75 / 1.14
FD-4HC	4 / 1.2	1.50 / 42.4	18 / 510	24 / 600	191 / 723	0.7 / 0.5	2.3 - 3.9 / 0.7 - 1.2	5.00 / 1.52
FD-5HC	5 / 1.5	2.35 / 66.2	20 / 566	24 / 609	300 / 1135	1.1 / .84	2.5 - 4.5 / 0.7 - 1.3	5.25 / 1.60
FD-6HC	6 / 1.8	3.38 / 95.7	32 / 906	30 / 750	496 / 1878	1.6 / 1.2	3.0 - 5.1 / 0.9 - 1.6	6.25 / 1.90
FD-7HC	7 / 2.1	4.60 / 130.2	40 / 1133	42 / 1067	750 / 2839	2.1 / 1.9	3.0 - 5.5 / 0.9 - 1.7	7.25 / 2.20
FD-8HC	8 / 2.4	6.00 / 169.9	50 / 1,415	48 / 1219	1120 / 4239	2.8 / 2.1	3.0 - 6.0 / 0.9 - 1.8	8.00 / 2.43

¹Contact Hydro International when larger pipe sizes are required.

²Contact Hydro International when custom sediment storage capacity is required.

³Minimum distance for models depends on pipe diameter.

III. Maintenance

Overview

The First Defense® protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the First Defense®. The First Defense® 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 First Defense® will no longer be able to store removed sediment and oil. Maximum pollutant storage capacities are provided in Table 1.

The First Defense® allows for easy and safe inspection, monitoring and clean-out procedures. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables. Access ports are located in the top of the manhole.

Maintenance events may include Inspection, Oil & Floatables Removal, and Sediment Removal. Maintenance events do not require entry into the First Defense®, nor do they require the internal components of the First Defense® 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.

Maintenance Equipment Considerations

The internal components of the First Defense®-HC have a centrally located circular shaft through which the sediment storage sump can be accessed with a sump vac hose. The open diameter of this access shaft is 15 inches in diameter (Fig.3). Therefore, the nozzle fitting of any vactor hose used for maintenance should be less than 15 inches in diameter.

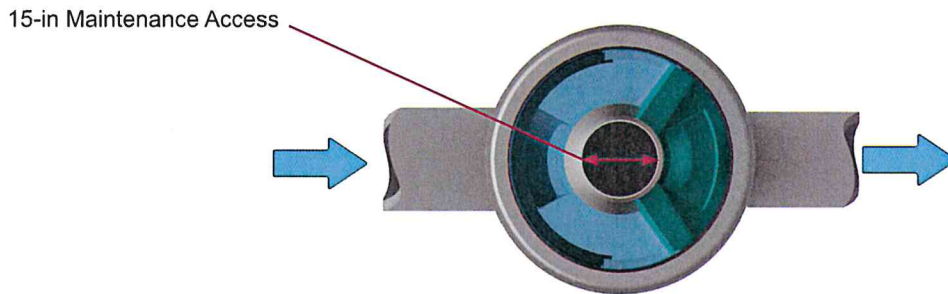


Fig.3 The central opening to the sump of the First Defense®-HC is 15 inches in diameter.

Determining Your Maintenance Schedule

The frequency of clean out 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 log (see page 9) to establish a routine maintenance schedule.

The vactor procedure, including both sediment and oil / floatables removal, for a 6-ft First Defense® typically takes less than 30 minutes and removes a combined water/oil volume of about 765 gallons.

Inspection Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities. Fig.4 shows the standing water level that should be observed.
4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the components and water surface.
5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel.
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.
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 Clean Out

Floatables clean out is typically done in conjunction with sediment removal. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables (Fig.5).

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 clean out are typically conducted once a year during any season.
- Floatables and sump clean out should occur as soon as possible following a spill in the contributing drainage area.

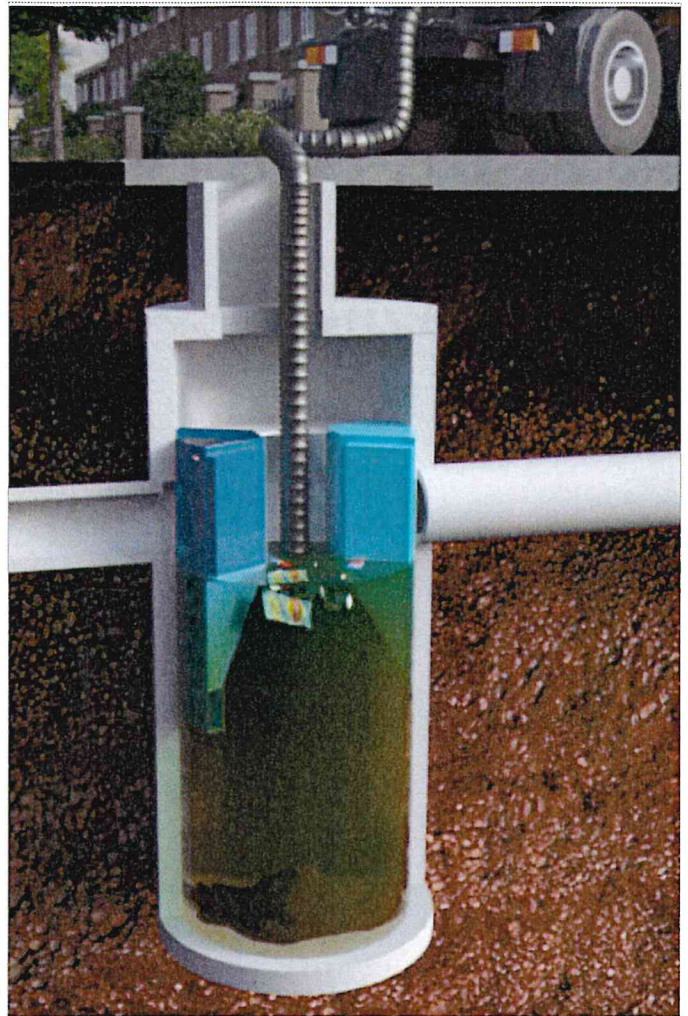


Fig.4 Floatables are removed with a vactor hose (First Defense model FD-4, shown).

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®)
- Vactor truck (flexible hose recommended)
- First Defense® Maintenance Log

Floatables and sediment Clean Out Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
4. Remove oil and floatables stored on the surface of the water with the vector hose (Fig.5) or with the skimmer or net (not pictured).
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 (page 9).
6. Once all floatables have been removed, drop the vector hose to the base of the sump. Vector out the sediment and gross debris off the sump floor (Fig.5).
7. Retract the vector 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, blockages, or irregularly high or low water levels.
9. Securely replace the grate or lid.

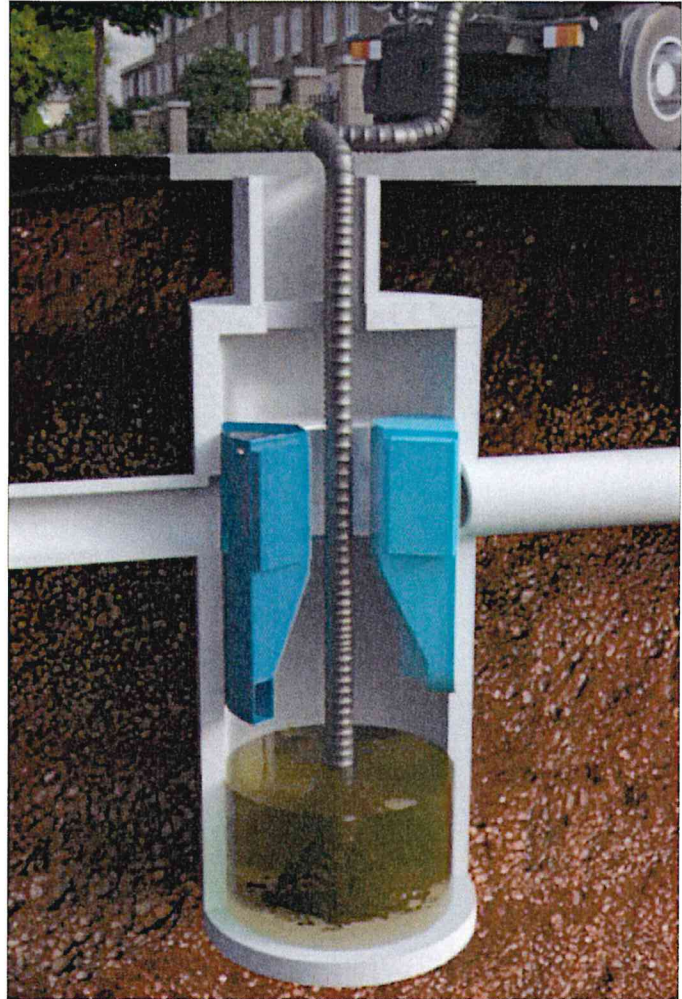


Fig.5 Sediment is removed with a vector hose (First Defense model FD-4, shown).

Maintenance at a Glance

Inspection	<ul style="list-style-type: none"> - Regularly during first year of installation - Every 6 months after the first year of installation
Oil and Floatables Removal	<ul style="list-style-type: none"> - Once per year, with sediment removal - Following a spill in the drainage area
Sediment Removal	<ul style="list-style-type: none"> - Once per year or as needed - Following a spill in the drainage area
<p>NOTE: For most clean outs the entire volume of liquid does not need to be removed from the manhole. Only remove the first few inches of oils and floatables from the water surface to reduce the total volume of liquid removed during a clean out.</p>	



First Defense® Inspection and Maintenance Log

Date	Initials	Depth of Floatables and Oils	Sediment Depth Measured	Volume of Sediment Removed	Site Activity and Comments