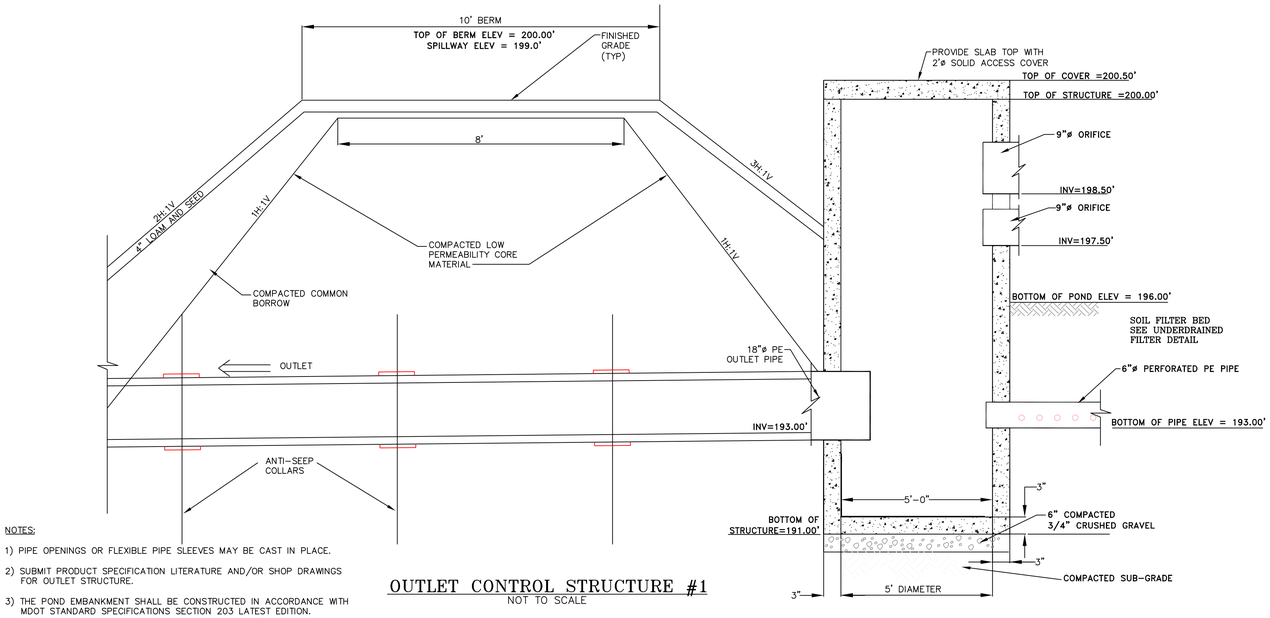


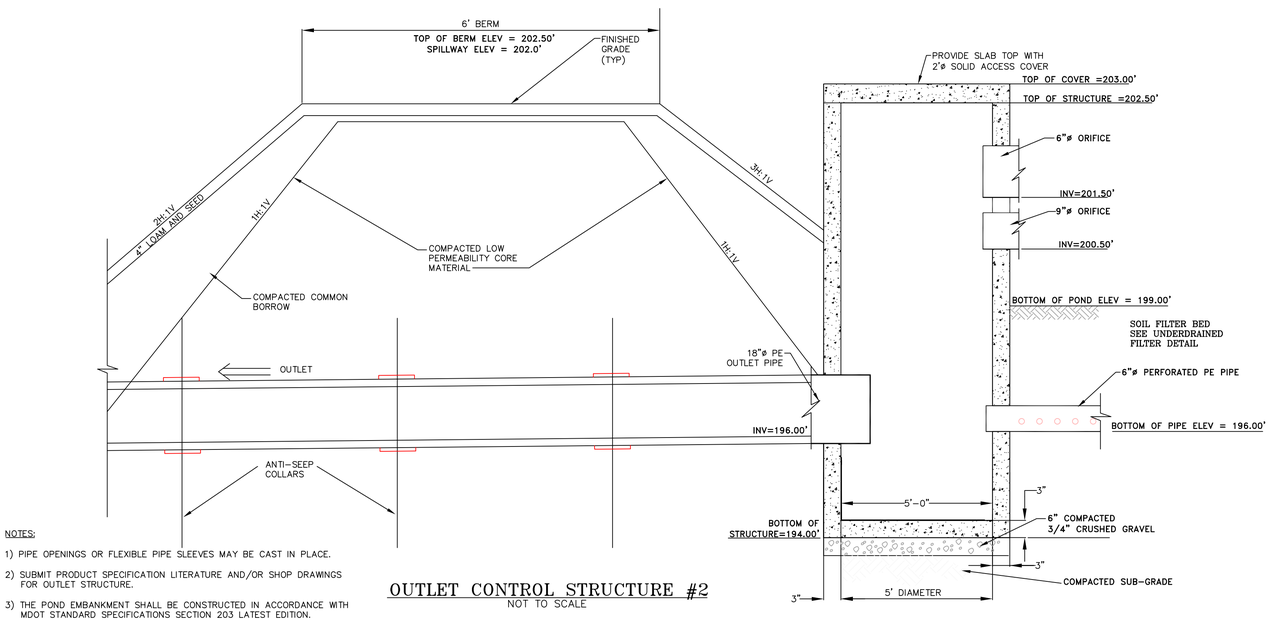
NOTES:

1) PIPE OPENINGS OR FLEXIBLE PIPE SLEEVES MAY BE CAST IN PLACE.

2) SUBMIT PRODUCT SPECIFICATION LITERATURE AND/OR SHOP DRAWINGS FOR OUTLET STRUCTURE.

3) THE POND EMBANKMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH MDOT STANDARD SPECIFICATIONS SECTION 203 LATEST EDITION.

OUTLET CONTROL STRUCTURE #1
NOT TO SCALE



NOTES:

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OUTLET CONTROL STRUCTURE #2
NOT TO SCALE

CONSTRUCTION OVERSIGHT NOTES:

The applicant will retain the services of a professional engineer to inspect the construction and stabilization of all stormwater management structures to be built as part of the project. If necessary, the inspecting engineer will interpret the construction plans for the contractor. Once all stormwater management structures are constructed and stabilized, the inspecting engineer will notify the department in writing within 30 days to state that the structures have been completed. Accompanying the engineer's notification must be a copy of the test results for any soil fill, aggregate, or mulch materials used in the construction of the stormwater management structures and a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

UNDERDRAINED FILTER BASINS

Construction Oversight: At a minimum, the professional engineer's inspection will occur after foundation soil preparation but prior to placement of the embankment fill, after the underdrain pipes are installed but not backfilled, after the pipe bedding fill is placed but prior to the placement of the filter media, after the filter media has been placed and the filter surface seeded.

Testing and Submittals: All the soil, mulch, and aggregate used for the construction of the vegetated underdrained soil filter basin must be confirmed as suitable by testing. The contractor shall identify the source of each material and obtain samples for each material for testing. All testing must be done by a certified laboratory. All results of field and laboratory testing shall be submitted to the project engineer for confirmation. It shall be the contractor's responsibility to ensure completion of the following sampling and testing before the fill or aggregate is placed as part of the vegetated underdrained soil filter basin's construction.

- Obtain samples of the sandy soil, topsoil, and wood fiber mulch (or other approved organic source) to be blended to make the filter media. Samples must be a composite of three different locations (grabs) from the stockpile or pit face. The sample size required will be determined by the testing laboratory.
- Perform analyses of the blended filter media showing it has 8% to 12% by weight passing the #200 sieve (as determined by a sieve analysis), a clay content of less than 2% (as determined hydrometer grain size analysis), and has an organic matter content of no less than 10% by dry weight.
- Obtain a sample of the gravel fill to be used for the coarse gravel transition zone above the crushed stone pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile or pit face. The sample size required will be determined by the testing laboratory.
- Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Course Aggregates 1996A) of the gravel to be used for the underdrain pipe bedding. The gravel fill must conform to MEDOT specification 703.22 Underdrain Type B.

CONSTRUCTION DEWATERING NOTES:

SPECIFICATIONS:

Dewatering excavated areas must be in two distinct phases. The removal of the collected water within the excavation and the treatment of the collected water.

Physical Dewatering:
The removal of water from the excavated area can be accomplished by numerous methods. The most common of these are: gravity drain through daylight channels, mechanical pumping, siphoning, and using the bucket of construction equipment to scoop and dump water from the excavation.

1) Channels dug for discharging water from the excavated area need to be stable. If flow velocities cause erosion within the channel then a ditch lining should be used.
2) Bucketed water should be discharged in a stable manner to the sediment removal area. A splash pad of riprap underlain with geotextile may be necessary to prevent scouring of the soil in the basin.
3) Dewatering in periods of intense, heavy rain, when the infiltrative capacity of the soil is exceeded, should be avoided.

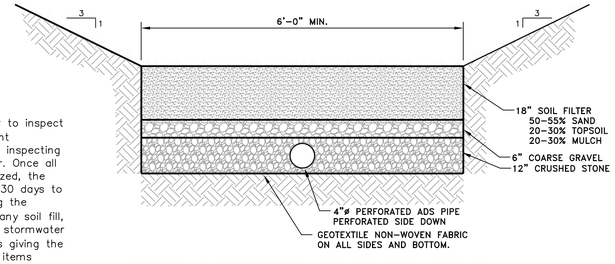
Sediment Removal:
Methods of settling or filtering sediment are listed below.

1) Flow to the sediment removal structure may not exceed the sediment removal structure's capacity to settle and filter flow or the structure's volume capacity.
2) Sediment Removal Basins should discharge wherever possible to a well-vegetated buffer through sheet flow and should maximize the distance to the nearest water resources and minimizing the slope of the buffer area.
3) Various basin designs have been proposed in past projects.
4) An enclosure of Jersey Barriers lined with a large piece of silt tape geotextile.
5) A temporary enclosure constructed with hay bales, silt fence, or both. Erosion control mix also may be incorporated with silt fence or hay bales.
6) Direct discharge of lightly sediment bearing water may be able to go directly into wellbuffered areas with 0-2% slope as long as a method of spreading flow into sheet flow is available.
7) Discharge to a manufactured / pre-made structure specifically designed for sediment removal, like a Silt Sak, Silt Bag, or other similar product.
8) Concrete or steel settling chambered systems for sediment removal.
9) Excavated or bermed sedimentation ponds or structures. Side slopes no greater than 2 to 1, or with a combined interior and exterior slope of no greater than 5 to 1. See the SEDIMENT TRAP BMP section.

Installation Requirements:
1) For trench excavation, limit the trench length to 500 feet and place the excavated material on the up gradient side of the trench.
2) Install diversion ditches or berms to minimize the amount of clean stormwater runoff allowed into the excavated area.
3) Never discharge to areas that are bare or newly vegetated.

MAINTENANCE

During the active dewatering process, inspection of the dewatering facility should be reviewed frequently. Special attention should be paid to the buffer area for any sign of erosion and concentration of flow that may compromise the buffer area. Observe where possible the visual quality of the effluent and determine if additional treatment can be provided.



TYPICAL UNDERDRAIN FILTER DETAIL
NOT TO SCALE

THE CONTRACTOR WILL INSTALL THE TRANSITION ZONE FILL AND SOIL FILTER MEDIA IN EACH UNDERDRAIN SOIL FILTER BASIN ONLY AFTER THE DRAINAGE AREA TO THE BASIN IS FULLY STABILIZED.

IF LEDGE IS ENCOUNTERED AND BLASTING IS NECESSARY, THEN UTILIZE THE MIRAFI 160N ON TOP OF LEDGE TO ACT AS A CUSHION BENEATH THE RUFCO 3000B MEMBRANE. FOLLOW MANUFACTURER'S SPECIFICATIONS AND TAKE CARE NOT PUNCTURE EITHER GEOTEXTILE WHEN INSTALLING. THE RUFCO 3000B MEMBRANE HAS THE FOLLOWING SPECIFICATIONS:

THICKNESS = 30 mm (ASTM D5199)
DENSITY = 0.939 g/cm (ASTM D792 OR D1505)
TENSILE STRENGTH = 114 lbf/in width (ASTM D638/D6693)

UNDERDRAIN FILTER SPECIFICATIONS

SOIL FILTER MEDIA:

THE SOIL FILTER SHALL CONSIST OF A LOAMY COARSE SAND, WITH A HIGH LEVEL OF ORGANIC MATTER. THE SOIL FILTER MEDIA SHALL MEET THE FOLLOWING SPECIFICATIONS:

FILTER MEDIA	MIXTURE BY VOLUME	SPECIFICATIONS
SAND	50%-55%	MDOT SPECIFICATION #703.01 FINE AGGREGATE FOR CONCRETE (TABLE 7-3)
TOPSOIL	20%-30%	LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE
MULCH	20%-30%	MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE 200 SIEVE.

THE AGGREGATE SHALL MEET THE FOLLOWING SPECIFICATIONS:

SIEVE SIZE	% PASSING
3/8	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#60	10-30
#100	2-10
#200	0-5

THE SOIL FILTER SHALL BE AT LEAST 18" DEEP WITH 12" OF CRUSHED STONE AND AN 6" PERFORATED ADS PIPE UNDERNEATH. THE GRAVEL/SOIL INTERFACE SHALL BE ROTOTILLED OR MIXED BY HAND TO CREATE A 4" TO 6" MIXING ZONE BETWEEN THE TWO LAYERS. WHEN PLACING AND SHAPING THE SOIL FILTER, MATERIAL COMPACTION SHOULD BE AVOIDED. IF COMPACTION DOES OCCUR, THE SURFACE SHALL BE ROTOTILLED BEFORE SEEDING OR SODDING. THE SURFACE OF THE SOIL FILTER MATERIAL SHALL BE COVERED WITH A LOAMY SAND, HIGH ORGANIC CONTENT TOPSOIL ON WHICH A DENSE COVER OF SOD SHALL BE ESTABLISHED AND MAINTAINED TO PREVENT CLOGGING.

THE CRUSHED STONE BEDDING SHALL MEET THE FOLLOWING SPECIFICATIONS:

SIEVE SIZE	% PASSING
1"	100
3/4	90-100
3/8	0-75
#4	0-25
#10	0-5

CONSTRUCTION SEQUENCE:
EROSION AND SEDIMENTATION FROM UNSTABLE SUBCATCHMENTS IS THE MOST COMMON REASON FOR FILTER FAILURE. NOT HEEDING THE CONSTRUCTION SEQUENCING CRITERIA IS LIKELY TO RESULT IN THE NEED TO REPLACE THE SOIL FILTER. THE SOIL FILTER MEDIA AND VEGETATION MUST NOT BE INSTALLED UNTIL THE AREA THAT DRAINS TO THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURE , 90% VEGETATIVE COVER, OR OTHER PERMANENT STABILIZATION. OT OTHERWISE, THE RUNOFF FROM THE CONTRIBUTING DRAINAGE AREA MUST BE DIVERTED AROUND THE FILTER UNTIL STABILIZATION IS COMPLETED UNLESS THE DEPARTMENT HAS DETERMINED, ON A CASE-BY-CASE BASIS THAT SUFFICIENT MEASURES ARE BEING TAKEN TO PREVENT EROSION OF MATERIAL FROM THE UNSTABLE CATCHMENT AREA AND DEPOSITION ON THE FILTER.

FILTER MEDIA/PIPE BEDDING TRANSITION ZONE:
THE CRUSHED STONE BEDDING MATERIAL MUST BE COVERED WITH A SIX INCH LAYER OF WELL GRADED, CLEAN, COARSE GRAVEL MEETING MEDOT SPECIFICATION 703.22 UNDERDRAIN TYPE B FOR UNDERDRAIN BACKFILL MATERIAL. FINES PASSING THE #200 SIEVE IN THE GRAVEL SHOULD BE NO MORE THAN 5% (PREFERABLY 2%). UNDERDRAIN PIPES SHALL BE SPACED NO MORE THAN 8' APART. THE CONTRACTOR WILL INSTALL THE TRANSITION ZONE FILL AND SOIL FILTER MEDIA IN EACH UNDERDRAINED SOIL FILTER BASIN ONLY AFTER THE DRAINAGE AREA TO THE BASIN IS FULLY STABILIZED.

MAINTENANCE:
DURING THE FIRST YEAR THE DRY SWALE WILL BE INSPECTED SEMIANNUALLY AND FOLLOWING MAJOR STORM EVENTS. AFTER THE FIRST YEAR, AN ANNUAL INSPECTION WILL BE SUFFICIENT.

PRETREATMENT: THE FOREBAY, PEA GRAVEL DIAPHRAGM AND SIDE SLOPE VEGETATION SHALL BE INSPECTED AT LEAST ONCE A YEAR, PREFERABLY IN THE SPRING. DEBRIS AND SEDIMENT BUILDUP SHALL BE REMOVED FROM THE FOREBAY AND DIAPHRAGM AS NEEDED. ANY EROSION RILLS OR GULLIES ON THE SIDE SLOPES SHALL BE CORRECTED AND BARE AREAS SEEDED, OR SODDED, AS NECESSARY.

SOIL BED: IF EROSION OCCURS AT THE INFLOW POINT TO THE SOIL FILTER BED IT SHOULD BE CORRECTED AS NECESSARY. MAINTAINING GOOD GRASS COVER WILL MINIMIZE THE SOIL FILTER CLOGGING WITH FINE SEDIMENTS. IF PONDING OCCURS FOR MORE THEN 48 HOURS ROTOTILLING THE TOP OF THE SOIL BED MAY BE NECESSARY TO REESTABLISH THE SOIL'S FILTRATION CAPACITY.

VEGETATION: GRASS SHALL BE MOWED ON A REGULAR BASIS TO A HEIGHT NOT EXCEEDING 6". ANY BARE AREAS SHOULD BE SEEDED, OR SODDED AS NECESSARY. THE GRASS IN THE SWALE SHOULD GENERALLY CONTAIN BOTH UPLAND AND WETLAND SPECIES TOLERANT OF FREQUENT INUNDATION. REED CANARY GRASS SHOULD BE AVOIDED IN THE MIXTURE IF THERE ARE MEADOW WETLANDS NEARBY, AS REED CANARY GRASS IS CONSIDERED A WETLAND INVASIVE SPECIES. REFERENCE IS MADE TO THE WETLAND SEED MIX TABLE ON PAGE 7-6 IN MDEP'S MANUAL STORMWATER MANAGEMENT FOR MAINE (JANUARY 2006). IF GRASS COVER DOES NOT DO WELL IN SOME PLACES, ALTERNATE SPECIES SHALL BE CONSIDERED.

SEDIMENT: SEDIMENT BUILDUP FROM WITHIN THE SWALE SHALL BE REMOVED WHEN IT HAS ACCUMULATED TO APPROXIMATELY 25% OF DESIGN VOLUME OR CHANNEL CAPACITY.

SNOW REMOVAL: IN THE EARLY SEASON SNOW SHALL BE PLOWED FROM THE PARKING AREAS DOWN INTO THE SWALE TO INSULATE THE SOIL FILTER AND PREVENT FROST PENETRATION.

STATE OF MAINE
JAMES E. COFFIN
8500
LICENSED PROFESSIONAL ENGINEER

ES COFFIN ENGINEERING & SURVEYING
E.S. COFFIN ENGINEERING & SURVEYING, INC. © 2014
432 Cony Road P.O. Box 4687 Augusta, Maine 04330
Ph. (207) 623-9475 Fax (207) 623-0016 Toll Free 1-800-244-9475

NO.	REVISIONS	DATE

SHEET TITLE: **SITE DETAILS V**
SCALE: AS SHOWN
DATE: JULY 20, 2016
DRAWN BY: TGH
CHECKED BY: JEC

CLIENT/PROJECT: **GARY VIOLETTE PROPERTIES**
LOCATION: ROUTE 202
TOWN: MANCHESTER
COUNTY: KENNEBEC
STATE: MAINE

PROJ. NO. 2015-062

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