



ALL WATER LINES AT THE SITE ARE BURIED WITH A MINIMUM OF 4 FOOT CLEARANCE. THE CLOSEST PIPE WILL BE THE FIRE HYDRANT LINE CROSSING NEAR THE DOWNSTREAM END OF THE DRY SWALE. TOP OF PIPE ELEVATION IS EXPECTED TO BE LOWER THAN 940.0. BOTTOM OF THE DRY SWALE STONE LAYER IS 941.27 AT THE CROSSING. VERTICAL CLEARANCE IS EXPECTED TO BE GREATER THAN 1 FOOT.

A. ENGINEERED SOIL MEDIA: "BIOFILTER" BY LUCK STONE. "BIORETENTION MIX" BY ROCKDALE QUARRIES CORPORATION, OR APPROVED EQUAL WHICH MEETS THE 2011 VIRGINIA BIORETENTION SPECIFICATION:

- i. 85-88% SAND
- ii. 8-12% SOIL FINES
- iii. 3-5% ORGANIC MATTER FROM LEAF COMPOST
- iv. P-I-INDEX RANGE 10-30
- v. CATION EXCHANGE CAPACITY (CEC) >10

B. UNDERDRAIN: 6" SCHEDULE 40 PVC. BENEATH THE SOIL MEDIA PROVIDE PERFORATED PIPE WITH 3 ROWS OF 3/8" INCH SLOTS. INSTALL WITH 1 ROW OF SLOTS FACING DOWN. PROVIDE SOLID PIPE FOR CLEANOUT RISERS AND UNDERDRAIN EXTENSION TO EXISTING STORM INLET.

C. CLEANOUTS: PROVIDE A VERTICAL RISER AT THE BEGINNING AND END OF THE DRY SWALE. SEE DETAIL THIS SHEET.

D. STONE LAYER SHALL BE WASHED #8 STONE WITH NO FINES. MINIMUM 3 INCHES DEEP.

- A. PROVIDE SURVEY CONTROL FOR ACCURATE HORIZONTAL AND VERTICAL CONSTRUCTION.
- B. PHASE CONSTRUCTION OF THE DRY SWALE AFTER THE INSTALLATION OF UNDERGROUND PIPING, AND COMPLETION OF THE TANK. UPHILL AREA SHOULD BE FULLY REVEGETATED PRIOR TO BEGINNING WORK ON THE DRY SWALE.
- C. EXCAVATION AND BACKFILL OF THE DRY SWALE SHALL OCCUR BY EQUIPMENT WORKING FROM THE SIDE. DO NOT COMPACT THE SWALE BY EQUIPMENT WHEELS / TREADS OR ANY OTHER MEANS.
- D. RIP OR ROTO-TILL THE BOTTOM OF THE DRY SWALE EXCAVATION TO PROMOTE GREATER INFILTRATION. PERFORM AS-BUILT SURVEY OF BOTTOM OF EXCAVATION.
- E. PLACE STONE AND UNDERDRAIN LAYER. INSTALL CLEANOUT RISERS, CAP UNDERDRAIN ON UPSTREAM END. CONNECT TO EXISTING STORM INLET ON DOWNSTREAM END. PROVIDE 45 DEGREE ELBOWS TO ADJUST OUTFALL PIPE AROUND THE EXISTING VALVE VAULT. PERFORM AS-BUILT SURVEY OF UNDERDRAIN AND STONE.
- F. PLACE SOIL MEDIA IN TWO UNCOMPACTED 10" LIFTS. THE 20" OF SOIL IS ASSUMED TO SELF-CONSOLIDATE OVER TIME INTO THE REQUIRED 18" MINIMUM DEPTH. PERFORM AS-BUILT SURVEY OF SURFACE ELEVATIONS.
- G. PROVIDE GRASS SEEDING AND TEMPORARY EROSION CONTROL BLANKET.
- H. PROVIDE MAINTENANCE DURING WARRANTY PERIOD, INCLUDING REPAIR AND REVEGETATION OF ANY BARE SOIL WITHIN THE DRY SWALE OR IPSI OPE AREAS.

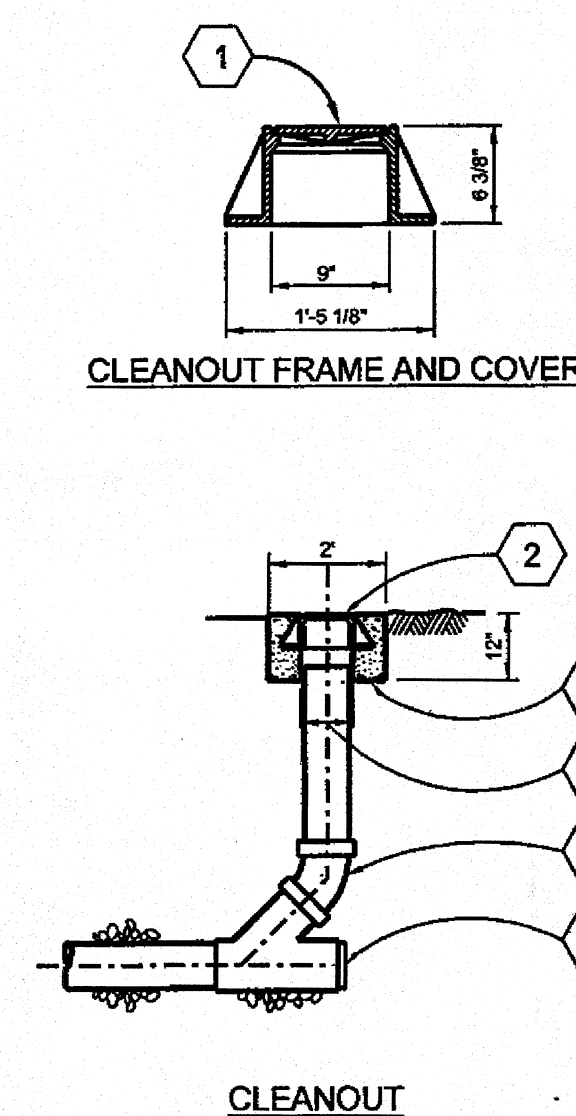
DRY SWALE LEVEL 1:
 PER SPECIFICATION No. 10, VER.1.9 MARCH 1, 2011

1. SIZING CALCULATION: SEE SECTION 4 OF SWPPP

TREATMENT VOLUME: $TV = [1 \text{ INCH (RV) (A)}] / 12$
 SITE RV FROM RRM CALCULATION SUMMARY SHEET = 0.24
 $A = 9583 \text{ SF DRAINAGE AREA}$
 $TV = 191.66 \text{ CUBIC FEET}$
 $\text{SURFACE AREA} = TV / 0.5 = 383.3 \text{ SQUARE FEET}$
 $\text{BOTTOM WIDTH} = 5 \text{ FEET}$
 $\text{REQUIRED LENGTH} = 383.3 / 5 = 76.7 \text{ FEET}$
 $\text{PROVIDED LENGTH} = 80 \text{ FEET}$
2. RUNOFF FLOW CALCULATION:
 REQUIRED DEPTH = D10 + 3 INCHES.
 $Q = CIA$
 $Q10 = [(0.34AC) (0.25) + (0.02) (0.9)] * 6.8 \text{ IN/HR}$
 $Q10 = 0.70 \text{ CFS}$
 (FOR QUALITY CONTROL CALCULATIONS, 0.14 ACRES OF UPHILL PRESERVED FOREST DOES NOT HAVE A PLACE IN THE RRM CALCULATION INPUT FOR THE DRY SWALE. FOR 10-YEAR QUANTITY, THE FOREST AREA IS INCLUDED. SEE SEPARATE DRAINAGE AREA EXHIBIT IN SWPPP)
 $N = 0.19$ FOR FLOW AT 4.5 INCH DEPTH THROUGH GRASS.
 $D10 = 0.37 \text{ FEET} = 4.5 \text{ INCHES}$, $V10 = 0.31 \text{ FPS}$
 DOWNHILL BERM HEIGHT = 7.5 INCHES OR 0.62 FEET MINIMUM.
 PLAN SHOWS BERM SPOT ELEVATIONS 0.7' HIGHER THAN THE DRY SWALE INVERT
3. PRE-TREATMENT: THE RUNOFF FROM THE TANK RECEIVES PRE-TREATMENT VIA SHEET FLOW THROUGH A GRASS FILTER STRIP OF 5 FEET AT 5% SLOPE (ELEVATION 947.25 TO 947.0) PLUS MORE THAN 10 FEET FLOW LENGTH AT 3:1 SLOPE. (SEE SPEC #10, 6.4, BULLET 4)
4. CLEANOUTS: SEE PLAN VIEW AND DETAIL THIS SHEET.
5. UNDERDRAIN: THE SITE IS HSG B SOILS, BUT NO IN-SITU SOIL PERCOLATION RATE DATA IS AVAILABLE. THEREFORE AN UNDERDRAIN IS PROVIDED, AS A FACTOR OF SAFETY.
6. GROUND COVER: TURF GRASS. SAME SEED MIX AS THE REMAINDER OF THE DISTURBED AREA.



1. EXISTING INLET
RIM 943.42
xINV. IN 939.57 24" RCP
xINV. OUT 939.39 24" RCP
INV. IN 942.0 10" TANK OVERFLOW
INV. IN 941.5 6" BMP UNDERDRAIN
CORE DRILL EXISTING INLET WALL
2. 6" PVC UNDERDRAIN. SEE MATERIAL SPECIFICATION THIS SHEET
3. 5'x80" SHAPE SHOWN IS THE SURFACE AREA OF THE ENGINEERED SOIL MIX.
4. UPSTREAM CLEANOUT. SEE DETAIL THIS SHEET.
5. DOWNSTREAM CLEANOUT. SEE DETAIL THIS SHEET.
6. CAREFULLY TEST DIG TO VERIFY TOP ELEVATION OF FIRE HYDRANT WATERLINE PRIOR TO FULL EXCAVATION



1. CAP
2. CLEANOUT FRAME AND COVER
3. CONCRETE COLLAR
4. PIPE OD + 1"
5. 45° BEND
6. PLUG OR ADAPTER TO SERVICE
CONN PIPE AS REQUIRED

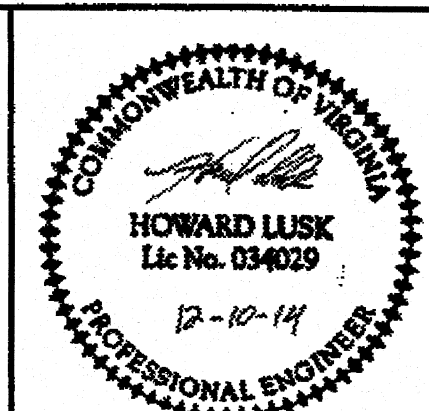
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CIVIL

SWM/BMP PLAN & DETAILS

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
0	1"
DATE	JUNE 2014
PROJ	47548
DWG	C-5000
SHEET	of

	00	31	14	
CONSTRUCTION DOCUMENTS				



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