

Table 1: Roof Expansion Runoff & Greenspace Surface Sand Filter

Step 1: Water Quality Volume:

Drainage/Disturbed Area:	0.63	Acres
Percent Impervious Cover(I):	55.5	%
Required WQv Area:	1,433	Cu. FT [WQv=(1.14*(I+.009I)*A/12)*43560]

Step 2: Sediment Basin Surface Area(Asf)

Required WQv:	1433
Asf:	95

*Note: This equation is for % Impervious < 75%

Step 3: WQv Pretreatment Forebay

Required WQv:	1,074	Cu. FT [Vp=0.75xWQv]
Pretreatment Volume(Vp):	358	Cu. FT [Vp=0.25xWQv]

Provided:

Elevation	Area	Volume
546.50	194	0
547.00	357	138
547.50	520	357
548.00	683	658

Step 4: WQv Basin Area

Provided:

Area(Af) =	858	Ft.²
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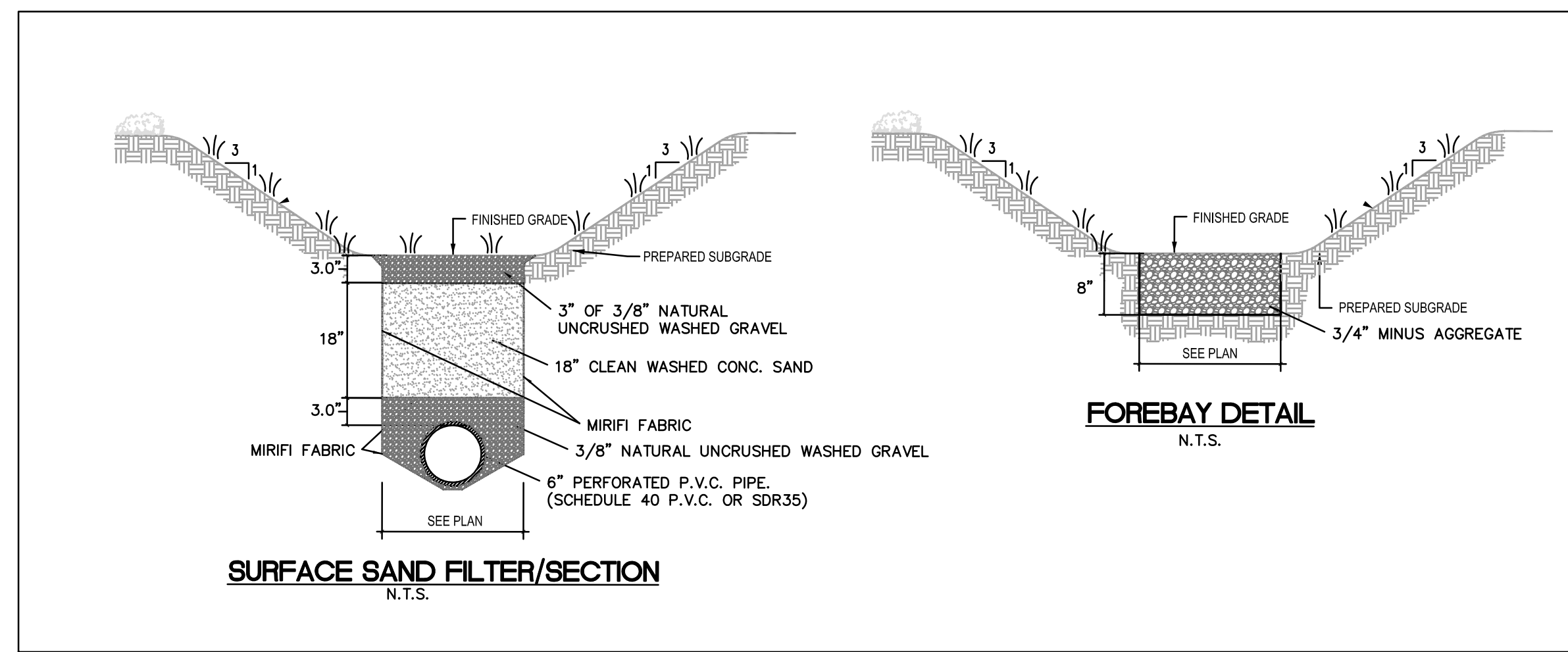
Required WQv:	1,433	Cu. FT
Filter Bed Depth(df):	1.50	Ft.**
Coefficient of Permeability(k):	3.5	Ft./day***
Avg. height of water above Bed(hf):	0.75	Ft.
Design Filter Bed Drain Time(tf):	1.67	days****
Surface Area of Filter Bed(Af):	163	Ft.² [(WQv x df) / (k x (hf + df) x tf)]

**Filter Bed Depth Typically is 1.5' (18") for sand filter, and has to be 1.0' minimum.
***k=3.5 ft/day for sand
****Note: 1.67 days for Sand Filters

Step 5: Storage Provided(100% WQv)

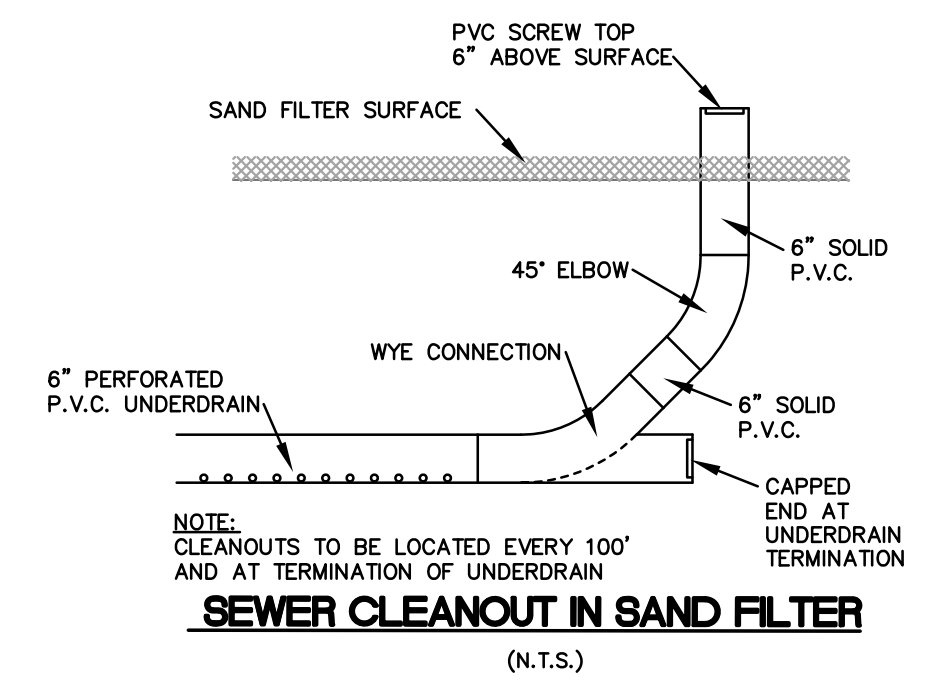
Required WQv:	1,433
Pretreatment Volume(Vp):	357
Treatment Volume(Vt):	1,854
Provided WQv:	2,241

v(Voids) = 0.40



MATERIAL SPECIFICATIONS FOR SAND FILTERS

MATERIAL	SPECIFICATION / TEST METHOD	SIZE	NOTES
SAND	CLEAN AASHTO-M6 OR ASTM-C-33 CONCRETE SAND	0.02" TO 0.04"	SAND SUBSTITUTES SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.
PEAT	ASH CONTENT: <15% pH RANGE: 5.2 TO 4.9 LOOSE BULK DENSITY 0.12 TO 0.15 g/cc	N/A	THE MATERIAL MUST BE REED-SEDEGE HEMIC PEAT, SHREDDED, UNCOMPACTED, UNIFORM AND CLEAN
LEAF COMPOST		N/A	
UNDERDRAIN GRAVEL	AASHTO-M-43	No. 57 TO 0.75"	NATURAL UNCRUSHED, WASHED
GEOTEXTILE FABRIC (IF REQUIRED)	ASTM-D-4833 (PUNCTURE STRENGTH-125 lb.) ASTM-D-4632 (TENSILE STRENGTH-300 lb.)	0.08" THICK EQUIVALENT OPENING SIZE OF #80 SIEVE	MUST MAINTAIN 125 gpm PER SQ. FT. FLOW RATE. NOTE: A 4" PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS.
IMPERMEABLE LINER (IF REQUIRED)	ASTM-D-4833 (THICKNESS) ASTM-D-412 (TENSILE STRENGTH-1,100 lb., ELONGATION 200%) ASTM-D-424 (TEAR RESISTANCE-150 lb./in) ASTM-D-471 (WATER ABSORPTION: +1 TO 2% MASS)	30 mil. THICKNESS	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR AASHTO-M-278	4"-6" RIGID SCHEDULE 40 PVC OR SDR35	3/8" PERF. @ 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES.
STONE WINDOW	ASTM-D-448	PEA GRAVEL: 0.75"	USE CLEAN BANK-RUN GRAVEL



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IMPROVEMENT PLANS FOR:
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6430 WELDON SPRING ROAD
OFALLON, MISSOURI

STATE OF MISSOURI
GEORGE MICHAEL STOCK
CIVIL ENGINEER
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3. 2015-12-30 REVISED PER CITY & CLIENT COMMENTS

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DUCKETT CREEK # BASE MAP #
S.C.C. H&T # H&T S.U.P. #
M.D.N.R. # MO-RA07437
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SHEET NO.: C8.0