

BMP MATERIAL SPECIFICATIONS:

SAND/PEAT MIXTURE

SAND/PEAT MIXTURE SHALL BE 85% ASTM C-33 SAND AND 15% PEAT.

UDFCD RAIN GARDEN MIXTURE

GROWING MEDIA MIXTURE SHALL BE 85% COARSE SAND (CDOT CLASS C FILTER MATERIAL OR ASTM C-33 SAND) AND 15% COMPOST MIXTURE BY VOLUME. COMPOST MIXTURE SHALL CONSIST OF 50% CLASS 1 STA REGISTERED COMPOST (APPROXIMATE BULK DENSITY 1000 LBS/CY) AND 50% LOOSELY PACKED SHREDDED PAPER (APPROXIMATE BULK DENSITY 50 TO 100 LBS/CY).

ASTM C-33 SAND

SIEVE SIZE	MASS PERCENT PASSING
9.5mm (3/8")	100
4.75mm (NO. 4)	95-100
2.36mm (NO. 8)	80-100
1.18mm (NO. 16)	50-85
600µm (NO. 30)	25-60
300µm (NO. 50)	5-30
150µm	0-10

CDOT CLASS C FILTER MATERIAL

CLASS C FILTER MATERIAL DOES NOT REQUIRE GEOTEXTILE FABRIC. IF UNDERDRAIN IS REQUIRED SLOTTED PIPE SHALL BE USED. (SEE UNDERDRAIN SPECIFICATIONS.)

SIEVE SIZE	MASS PERCENT PASSING
19.0mm (3/4")	100
4.75mm (NO. 4)	60-100
300µm (NO. 50)	10-30
150µm (NO. 100)	0-10
75µm (NO. 200)	0-3

SANDY LOAM

SANDY LOAM SHALL CONSIST OF NATIVE TOPSOIL (SURFACE O- AND A-HORIZONS HAVING MAXIMUM ROOT MASS, ORGANIC MATTER, AND BIOLOGICAL ACTIVITY) STRIPPED FROM GRASSY AREAS OF THE SITE OR A NEARBY SITE AND SHALL MEET THE FOLLOWING PROPERTIES:

ORGANIC MATTER: 2.0% OR GREATER

SOIL TEXTURE: SANDY LOAM OR SANDY CLAY LOAM MEETING THE FOLLOWING COMPONENT RANGES:

SAND OR COARSER	50 - 80 %
SILT	5 - 40 %
CLAY	5 - 25 %
COARSE PARTICLES > 2MM	0 - 20 %

SALTS, SALINITY (ELECTRICAL CONDUCTIVITY, EC): 0 TO 2 MILLI-MHOS PER CENTIMETER (MMHOS/CM) OR DECI-SIEMENS PER METER (DS/M) (MMHOS/CM ARE EQUIVALENT TO DS/M)

SODIUM (SODIUM ADSORPTION RATIO, SAR): 0 TO 4

ACIDITY, ALKALINITY (PH): 6.5 TO 7.5

TO DETERMINE ADEQUACY OF SANDY LOAM, AT LEAST THREE REPRESENTATIVE SAMPLES OF THE NATIVE TOPSOIL SHALL RECEIVE A TEXTURAL ANALYSIS AND STANDARD AGRONOMIC TEST BY A QUALIFIED SOIL LAB. IF ORGANIC MATTER OR PH IS OUTSIDE OF THE SPECIFIED RANGE, AMENDMENTS MAY BE RECOMMENDED FOR REVIEW AND APPROVAL OF SEMSWA. ANY RECOMMENDATION FOR AMENDMENTS SHALL INCLUDE DOCUMENTATION OF AMENDMENT PROPERTIES, RATE OF APPLICATION, AND METHOD OF INCORPORATION. THE USE OF CHEMICAL FERTILIZERS OTHER THAN AN ORGANIC SLOW-RELEASE TYPE SUCH AS BIOSOL BY ROCKY MOUNTAIN BIO PRODUCTS IS NOT PERMITTED. THE USE OF ORGANIC MATTER THAT WOULD SIGNIFICANTLY INCREASE SOIL SALINITY IS NOT PERMITTED.

AASHTO #67 AGGREGATE

AASHTO #67 SHALL BE USED WITH NONWOVEN GEOTEXTILE AND PERFORATED PIPE. (SEE UNDERDRAIN SPECIFICATIONS.)

SIEVE SIZE	MASS PERCENT PASSING
25.0mm (1")	100
19.0mm (3/4")	90-100
9.5mm (3/8")	20-55
4.72mm (NO. 4)	0-10
2.38 (NO. 8)	0-5

CLASS 1 COMPOST

PROPERTY	CRITERION
RESPIROMETRY	STABLE TO VERY STABLE
AMMONIA N/ NITRATE N	<4
CARBON TO NITROGEN RATIO	<12
PERCENTAGE OF GERMINATION/ VIGOR	80+/80+
pH - ACCEPTABLE RANGE	6.0-8.4
CHEMICAL CONTAMINANTS AND PATHOGENS	MEETS OR EXCEEDS US EPA CLASS A STANDARD

NONWOVEN GEOTEXTILE

PROPERTY	CRITERION		TEST METHOD
	ELONGATION <50%	ELONGATION >50%	
GRAB STRENGTH	800N (180 LBS)	510N (115 LBS)	ASTM D4632
PUNCTURE RESISTANCE	310N (70 LBS)	180N (40 LBS)	ASTM D6241
TRAPEZOIDAL TEAR STRENGTH	310N (70 LBS)	180N (40 LBS)	ASTM D6241
APPARENT OPENING SIZE	0.3mm (NO. 50)		ASTM D4751
PERMITTIVITY	0.02 sec-1 DEFAULT VALUE		ASTM D4491
PERMEABILITY	k FABRIC > k SOIL cm/sec		ASTM D4491
UV DEGRADATION AT 500 HOURS	50% STRENGTH		ASTM D4355

GEOMEMBRANE

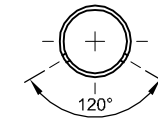
PROPERTY	CRITERION	TEST METHOD
THICKNESS	±5, % TOLERANCE	ASTM 1593
TENSILE STRENGTH	12.25 kN/m, (70 lbs/ft)	ASTM D882, METHOD B
MODULUS AT 100% ELONGATION	5.25 kN/m, (30 lbs/ft)	ASTM D882, METHOD B
ULTIMATE ELONGATION	350%	ASTM D882 METHOD A
TEAR RESISTANCE	38 N, (8.5 lbs)	ASTM D1004
VOLATILE LOSS	0.7, 5 MAX	ASTM D1203, METHOD A
PINHOLES	1 / 8m ² MAX	NA
BONDED SEAM STRENGTH	80% OF TENSILE STRENGTH	NA

PVC PIPE

ALL PVC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND SHALL MEET ASTM D2729 OR ASTM F758.

PERFORATED PIPE UNDERDRAIN

ALL PERFORATED PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND SHALL MEET ASTM D2729 OR ASTM F758. PERFORATED PIPE UNDERDRAIN SHALL BE USED ONLY WITH AASHTO #67 AGGREGATE. (SEE AASHTO #67 AGGREGATE SPECIFICATIONS.)



HOLE SIZE = 1/2"
HOLE SPACING = 5" O.C.

PERFORATED PIPE DETAIL

SCALE: 1" = 1'

SLOTTED PIPE UNDERDRAIN

ALL SLOTTED PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND SHALL MEET ASTM D2729 OR ASTM F758 SLOTTED PIPE UNDERDRAIN SHALL BE USED ONLY WITH CDOT CLASS C FILTER MATERIAL. (SEE CDOT CLASS C FILTER MATERIAL SPECIFICATIONS.)

DIMENSIONS FOR SLOTTED PIPE

PIPE DIAMETER	SLOT LENGTH*	MAXIMUM SLOT WIDTH	SLOT CENTERS*	OPEN AREA* (PER FOOT)
4"	1-1/16"	0.032"	.413"	1.90 in ²
6"	1-3/8"	0.032"	.516"	1.98 in ²

* SOME VARIATION IN THESE VALUES IS ACCEPTABLE AND IS EXPECTED FROM VARIOUS PIPE MANUFACTURERS. BE AWARE THAT BOTH INCREASED SLOT LENGTH AND DECREASED SLOT CENTERS WILL BE BENEFICIAL TO HYDRAULICS BUT DETRIMENTAL TO THE STRUCTURE OF THE PIPE.

BMP MATERIAL SELECTION TABLE

		PORUS LANDSCAPE DETENTION	SAND FILTER BASIN	GRASS SWALE	GRASS BUFFER	MODIFIED EXTENDED DETENTION BASIN
GROWING MEDIA	SAND/PEAT (85%/15%)	✓		✓	✓	✓
	UDFCD RAIN GARDEN MIXTURE	✓		✓	✓	✓
	SANDY LOAM			✓	✓	✓
FILTER MEDIA	ASTM C-33 SAND		✓	✓	✓	
	CDOT CLASS C FILTER MATERIAL		✓	✓	✓	
DRAINAGE MEDIA	AASHTO #67 WITH NONWOVEN GEOTEXTILE & PERFORATED PIPE UNDERDRAIN	✓	✓	✓	✓	
	CDOT CLASS C FILTER MATERIAL WITH SLOTTED PIPE UNDERDRAIN	✓	✓	✓	✓	

NOTE:
BMP MATERIAL SELECTION TABLE REPRESENTS ALLOWED MATERIAL ALTERNATIVES FOR EACH BMP. ONLY ONE MATERIAL ALTERNATIVE SHALL BE CHOSEN FOR EACH LAYER.

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REFERENCE:	SCALE:	Standard Plan Revision	
		No.	Date



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