



ST. MARTIN BIORETENTION

DESCRIPTION

The St. Martin bioretention basins are stormwater filtration systems that treat runoff from the parking lot located in front of St. Martin Hall and reduce stormwater runoff to the city storm sewers. Stormwater is directed to two paved waterways located at the southern corners of the parking lot. Runoff is conveyed to sediment forebays, which serve as pretreatment and provide approximately 6" of water quality volume storage. Sediment forebays are separate cells containing rip rap in order to dissipate energy flows and trap sediment particles. Flows are directed over the sediment forebay embankment to the bioretention basin cells, where stormwater is treated through filtration. Stormwater is filtered through hardwood mulch and engineered soil media, nutrients are removed through plant uptake. The bioretention system is designed to infiltrate stormwater volumes, increasing groundwater recharge and reducing the campus's output of runoff into the Narragansett Bay Commission sewer system.

OBJECTIVES

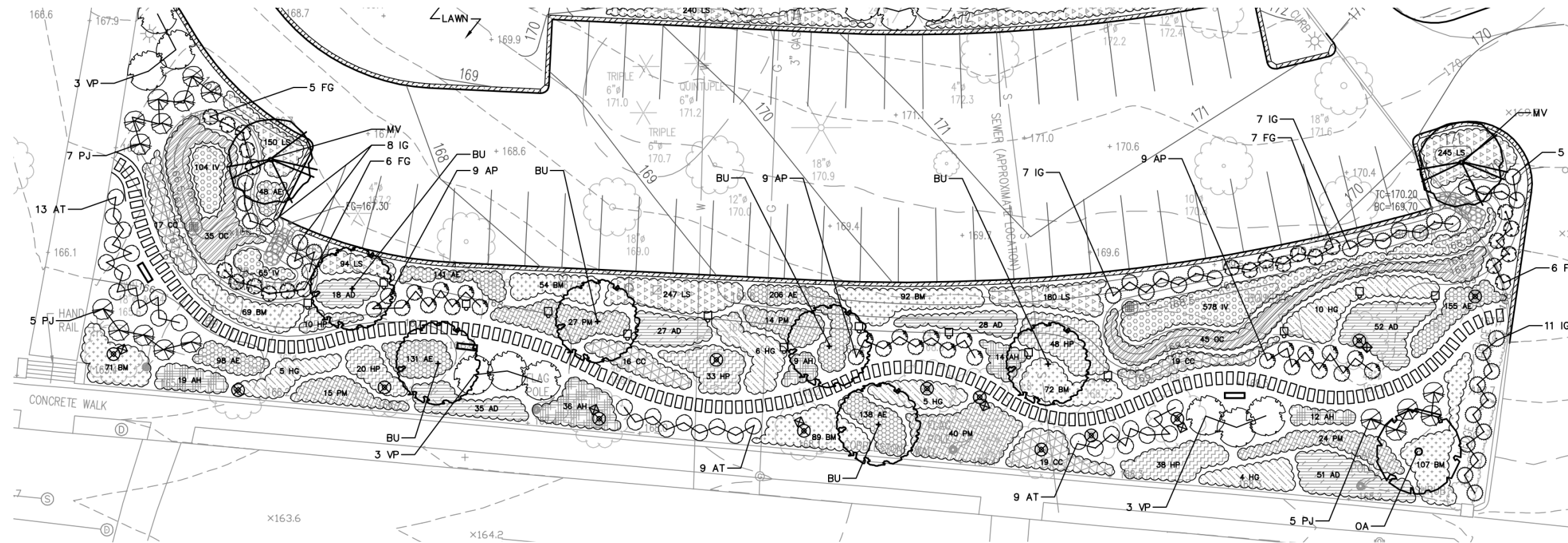
The project's two primary objectives are to treat stormwater runoff and reduce stormwater runoff and volume from the campus.



KEY DESIGN FEATURES

Treatment Type	Filter
Drainage Area	18,694 ft ² (0.43 ac.)
Drainage Area Imperviousness	81%
Design Storm	Water Quality
Water Quality Volume (WQv)	725 ft ³ (5,423 gal.)
Infiltration Volume (WQ storm)	1,845 ft ³ (13,802 gal.)

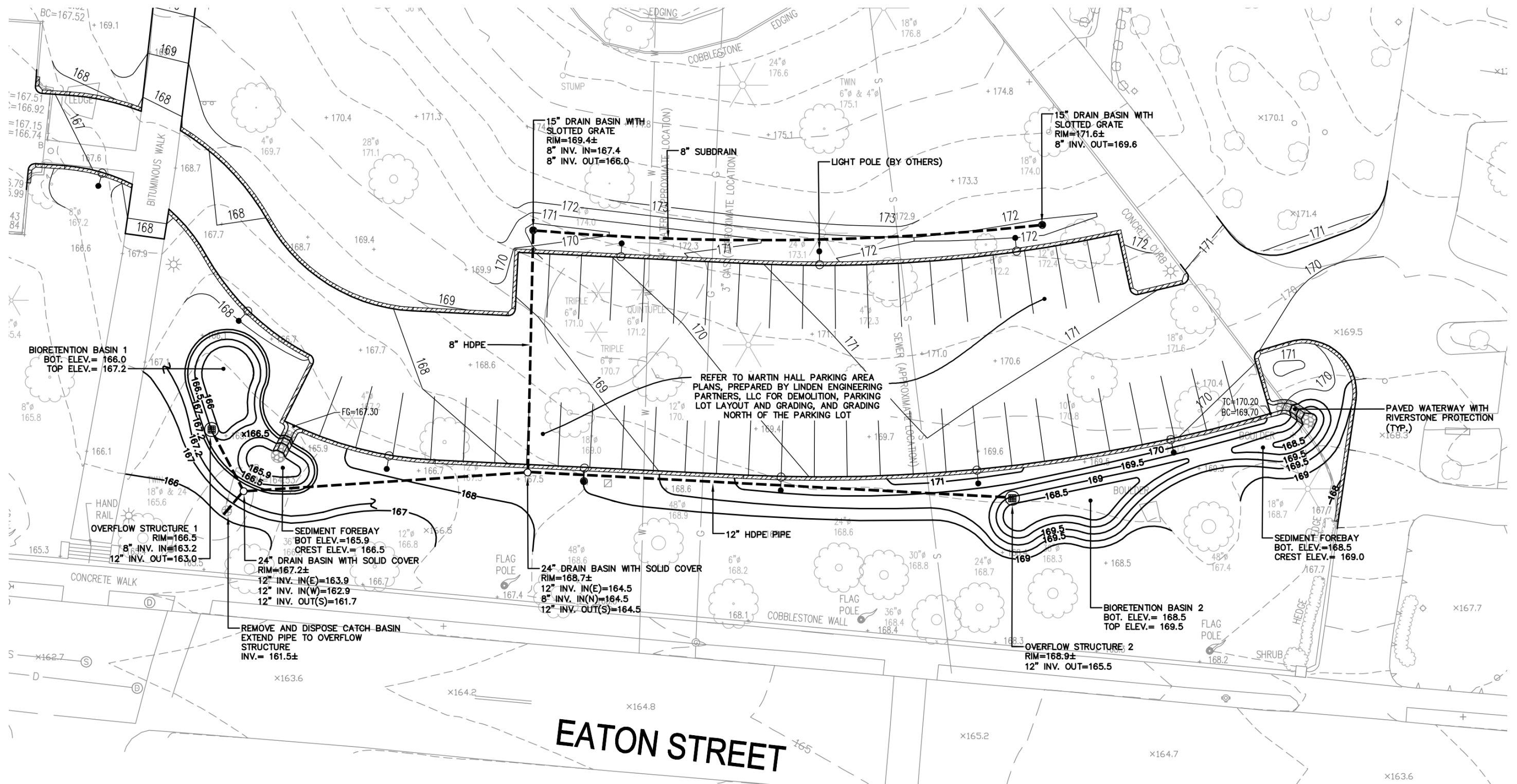
Notes: The filter bed is composed of a mixture of about 70% concrete sand (ASTM C-33), 20% well-aged leaf compost, and 10% topsoil.



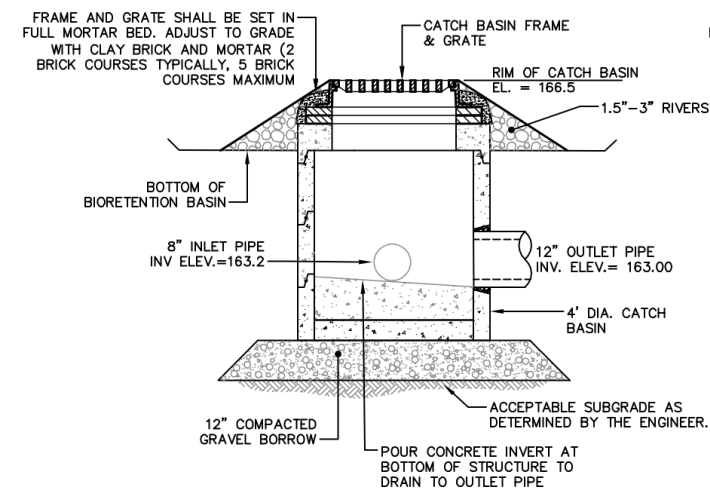
PLANT LIST

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
TREES					
BU	6	BETULA UTILIS VAR. JACQUEMONTI	HIMALAYAN BIRCH	10'-12' HT.	B&B, CLUMP
MV	2	MAGNOLIA VIRGINIANA	SWEETBAY MAGNOLIA	10'-12' HT.	B&B
OA	1	OXYDENDRUM ARBOREUM	SOURWOOD	3" CAL.	B&B
SHRUBS					
AP	27	AZALEA X 'PURPLE SPLENDOR'	AZALEA	3 GAL.	CONT.
AT	41	AZALEA X 'TRADITION'	AZALEA	3 GAL.	CONT.
FG	36	FOTHERGILLA GARDENII	DWARF FOTHERGILLA	3 GAL.	CONT.
IG	38	ILEX GLABRA 'SHAMROCK'	INKBERRY	5 GAL.	CONT.
PJ	29	PIERIS JAPONICA 'MOUNTAIN FIRE'	ANDROMEDA	5 GAL.	CONT.
VP	18	VIBURNUM PLICATUM VAR. TOMENTOSM 'SHASTA'	SHASTA VIBURNUM	7 GAL.	CONT.
PERENNIALS, FERNS & GROUNDCOVERS					
AH	90	AQUILEGIA X HYBRIDA 'BLUE STAR'	COLUMBINE	1 GAL.	24" O.C.
AE	917	ASARIUM EUROPAEUM	EUROPEAN GINGER	FLATS	12" O.C.
AD	211	ASTILBE 'DRUM & BASS'	PLUME FLOWER	1 GAL.	24" O.C.
BM	554	BRUNNERA MACROPHYLLA 'JACK FROST'	SIBERIAN BUGLOSS	1 GAL.	18" O.C.
CC	71	CORNUS CANADENSIS	BUNCHBERRY	1 GAL.	30" O.C.
HP	149	HEUCHERA 'PLUM PUDDING'	CORAL BELLS	1 GAL.	24" O.C.
HG	30	HOSTA 'GUACAMOLE'	PLANTAIN LILY	1 GAL.	48" O.C.
IV	747	IRIS VERSICOLOR	NORTHERN BLUE FLAG IRIS	FLATS	12" O.C.
LS	1422	LIROPE SPICATA	LILY TURF	FLATS	12" O.C.
OC	80	OSMUNDA CINNAMOMEA	CINNAMON FERN	1 GAL.	36" O.C.
PM	120	POLYSTICHUM MUNITUM	WESTERN SWORD FERN	1 GAL.	30" O.C.

Planting Plan

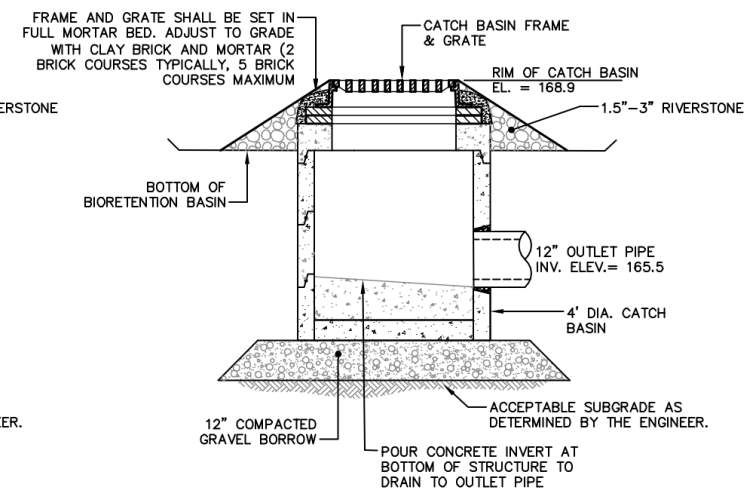


Grading and Drainage Plan



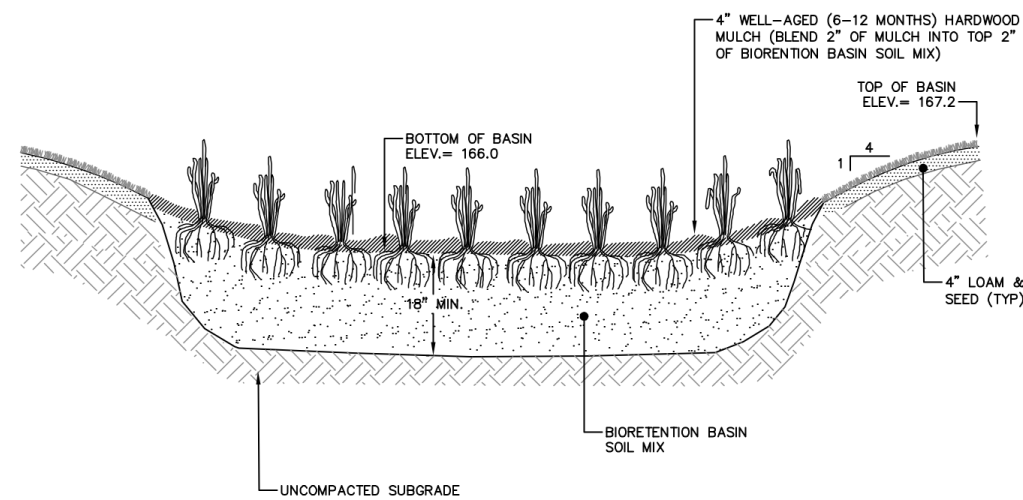
OVERFLOW STRUCTURE 1

NOT TO SCALE



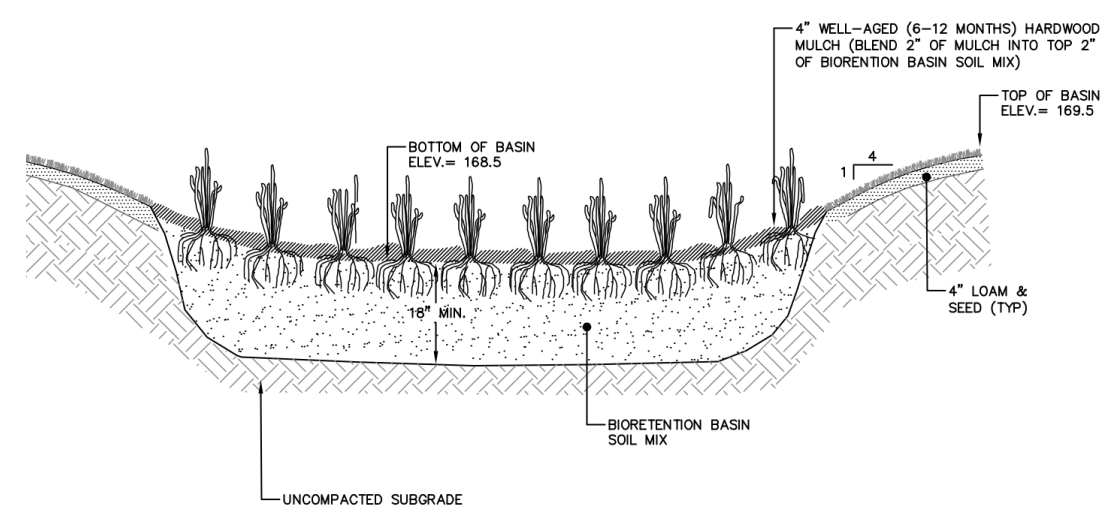
OVERFLOW STRUCTURE 2

NOT TO SCALE



BIORETENTION BASIN 1

NOT TO SCALE



BIORETENTION BASIN 2

NOT TO SCALE

NOTES:

- BIORETENTION SOIL MIX SHALL HAVE A LOAMY SAND TEXTURE PER USDA TEXTURAL TRIANGLE WITH A MAXIMUM CLAY CONTENT OF LESS THAN 2%. SOIL MIXTURE SHALL BE 85-88% SAND, 8-12% SOIL FINES, AND 3-5% ORGANIC MATTER.
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS, OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE, TEARTHUB, OR OTHER NOXIOUS WEEDS.
- PRIOR TO INSTALLATION, SOIL SHALL BE TESTED AND CONFORM TO THE FOLLOWING CRITERIA:
PH RANGE: 5.7 - 7.0
MAGNESIUM: NOT TO EXCEED 32 PPM
PHOSPHORUS P2O5: NOT TO EXCEED 69 PPM
POTASSIUM K2O: NOT TO EXCEED 78 PPM
SOLUBLE SALTS: NOT TO EXCEED 500 PPM
- LANDSCAPING IS CONCEPTUAL ONLY AND SHALL BE DESIGNED BY A LANDSCAPE ARCHITECT.
- BIORETENTION BASIN SUBGRADE SHALL NOT BE COMPACTED AND SHALL BE SCARIFIED PRIOR TO THE PLACEMENT OF BIORETENTION BASIN SOIL MIX.
- BIORETENTION BASIN SOIL MIX SHALL BE PLACED IN TWO - NINE INCH LIFTS AND BE LIGHTLY COMPACTED BY TAMPING WITH THE BUCKET OF BULLDOZER OR BACKHOE.

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Bioretention Basin Details