



434/260-1292
fornelisso.ftadcd@gmail.com

Civil / Structural



1705 Chester Mill Road
Silver Spring, MD 20906

MEP



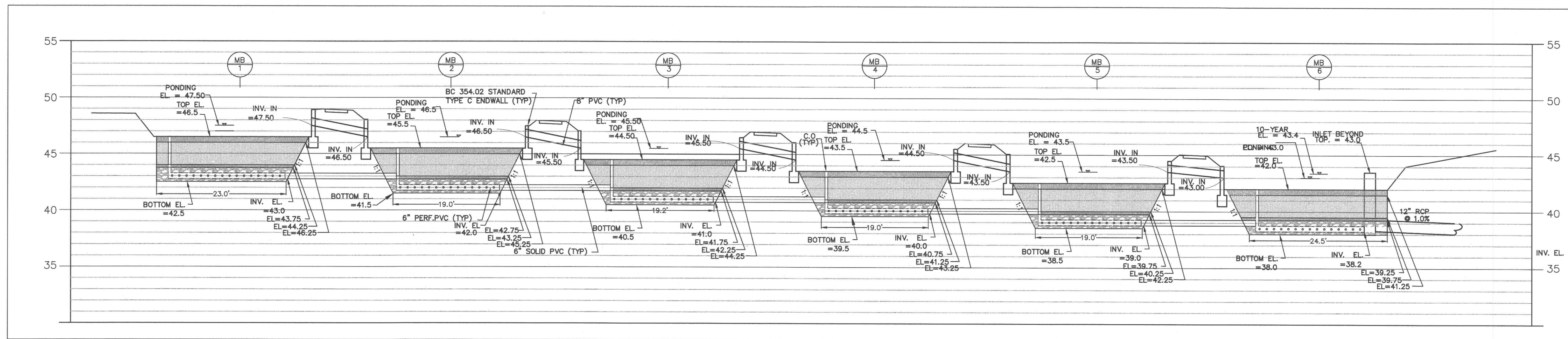
1334 9th Street,
NW Suite 206
Washington DC, 20001

Owner / Client

Herena USA,
LLC

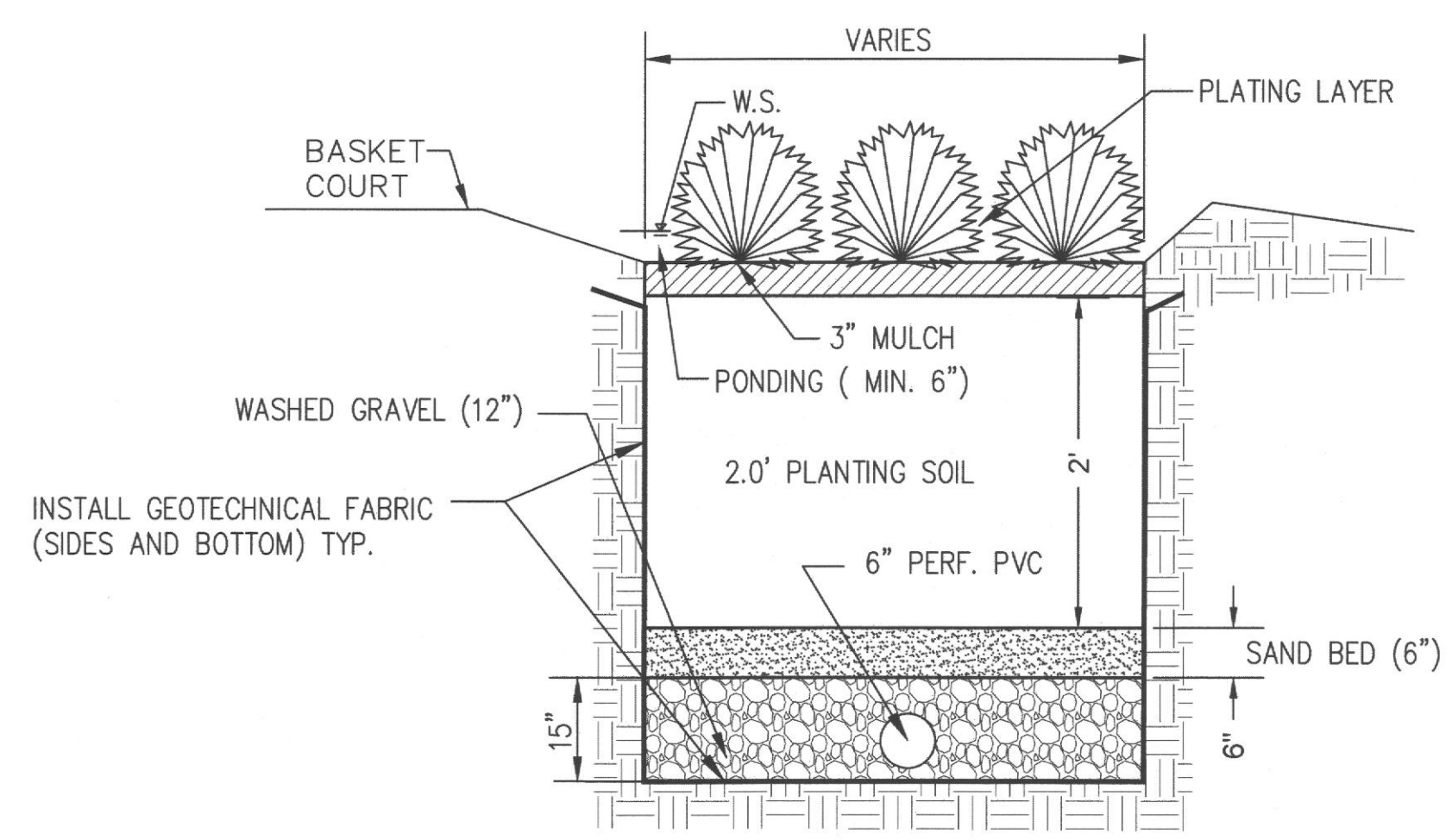
210 E. Lexington Street
Baltimore, Maryland 21202

Herena USA
E. Lombard Street
1622-1634 Lombard Street
922 S.Bethel Street
Baltimore, MD 21212



MB-1 THRU MB-6 SECTION AND PROFILE

SCALE H: 1" = 10'
V: 1" = 5'



TYPICAL MICRO-BIORETENTION SECTION

NOT TO SCALE

MAINTENANCE SCHEDULE FOR BIORETENTION AREAS

DESCRIPTION	METHOD	FREQUENCY	TIME OF THE YEAR
SOIL			
INSPECT AND REPAIR EROSION	VISUAL	MONTHLY	MONTHLY
ORGANIC LAYER			
REMULCH ANY VOID AREAS	BY HAND	WHENEVER NEEDED	WHENEVER NEEDED
REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER (OPTIONAL)	BY HAND	ONCE EVERY TWO TO THREE YEARS	SPRING
ANY ADDITIONAL MULCH ADDED (OPTIONAL)	BY HAND	ONCE A YEAR	SPRING
PLANTS			
REMOVAL AND REPLACEMENT OF ALL DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT	SEE PLANTING SPECIFICATIONS	TWICE A YEAR	3/15 TO 4/30 AND 10/1 TO 11/30
TREAT ALL DISEASED TREES AND SHRUBS	MECHANICAL OR BY HAND	N/A	VARIES, DEPENDS ON INSECT OR DISEASE INFESTATION
WATERING OF PLANT MATERIAL SHALL TAKE PLACE AT THE END OF EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER PLANTING HAS BEEN COMPLETED	BY HAND	IMMEDIATELY AFTER COMPLETION OF PROJECT	N/A
REPLACE STAKES AFTER ONE YEAR	BY HAND	ONCE A YEAR	ONLY REMOVE STAKES IN THE SPRING
REPLACE ANY DEFICIENT STAKES OR WIRES	BY HAND	N/A	WHENEVER NEEDED

BIORETENTION AREA SOIL SPECIFICATIONS

A. PLANTING SOIL

THE BIORETENTION AREAS SHALL CONSIST OF A PLANTING SOIL HAVING A COMPOSITION OF 12 PERCENT SOIL FINES MAXIMUM AND SHALL BE OF A SANDY LOAM OR LOAMY SAND TEXTURE. LOAMY SANDS MAY BE UTILIZED FOR THE PLANTING SOIL BUT MUST CONSIST OF 85% MINIMUM. IN ADDITION, THE FURNISHED PLANTING SOIL SHALL BE UNIFORM COMPOSITION, FREE OF STONES, STUMPS, ROOTS OR SIMILAR OBJECTS LARGER THAN ONE INCH, BRUSH OR ANY OTHER MATERIAL OR SUBSTANCE WHICH MAY BE HARMFUL TO PLANT GROWTH, OR HINDRANCE TO PLANTING OR MAINTENANCE OPERATIONS.

THE PLANTING SOIL SHALL BE FREE OF PLANT PARTS OF BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, MUGWORT, NUTSEDGE, POISON IVY CANADIAN THISTLE OR OTHER AS SPECIFIED.

IT SHALL NOT CONTAIN TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH.

THE PLANTING SOIL SHALL BE TESTED AND MEET THE FOLLOWING CRITERIA:

- pH RANGE: 5.5 TO 6.5
- ORGANIC MATTER: 1.5 TO 3.0%
- MAGNESIUM: 35lb/ACRE
- PHOSPHORUS: 100lb/ACRE
- POTASSIUM: 85lb/ACRE
- SOLUBLE SALTS: NOT TO EXCEED 500 PPM

THE FOLLOWING TESTING FREQUENCIES SHALL APPLY TO THE ABOVE SOIL CONSTITUENTS:

pH ORGANIC MATTER: 1 TEST PER 90 CUBIC YARDS, BUT NO MORE THAN 1 TEST PER BIORETENTION AREA.

MAGNESIUM, PHOSPHORUS, POTASSIUM, SOLUBLE SALTS: 1 TEST PER 500 CUBIC YARDS, BUT NO LESS THAN 1 TEST PER BORROW SOURCE.

ONE GRAIN SIZE ANALYSIS SHALL BE PERFORMED PER 90 CUBIC YARDS OF PLANTING SOIL, BUT NO LESS THAN ONE PER BIORETENTION AREA.

B. MULCH LAYER SPECIFICATIONS

A MULCH LAYER SHALL BE PROVIDED ON TOP OF THE PLANTING SOIL. AN ACCEPTABLE MULCH LAYER SHALL INCLUDE SHREDDED HARDWOOD OR SHREDDED WOOD CHIPS OR OTHER SIMILAR PRODUCT APPROVED BY THE DISTRICT OF COLUMBIA DEPARTMENT OF HEALTH SOIL RESOURCES DIVISION.

OF THE APPROVED MULCH PRODUCTS, ALL MUST BE WELL AGED, UNIFORM IN COLOR, AND FREE OF FOREIGN MATERIAL INCLUDING PLANT MATERIAL. WELL AGED MULCH IS DEFINED AS MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST TWELVE (12) MONTHS.

C. SAND SPECIFICATIONS

THE SAND SHALL BE FREE OF DELETERIOUS MATERIALS AND ROCK GREATER THAN 1 INCH IN DIAMETER.

D. COMPACTION

SOIL SHALL BE PLACED IN LIFTS OF LESS THAN 18 INCHES AND LIGHTLY COMPACTED (MINIMAL COMPACTIVE EFFORT) BY TAMPING WITH A BUCKET FROM A DOZER OR BACKHOE.

TABLE B.3.2. MATERIALS SPECIFICATIONS FOR BIORETENTION

MATERIAL	SPECIFICATION	SIZE	NOTES
PLANT SOIL: 24" MIN [18" MIN FOR SMALL SCALE PROJECT]	85-88% SAND 8-12% SOIL FINES 1-5% ORGANIC MATTERS	N/A	24" MIN (18" MIN FOR SMALL SCALE PRACTICES); USE ORGANIC MATTERS IN THE FORM OF AGED COMPOST OR WOOD CHIPS.
MULCH	SHREDDED HARDWOOD	N/A	LAY A 2" TO 3" LAYER ON THE SURFACE OF FILTER BED.
STONE DIAPHRAGM/PEA GRAVEL	PEA GRAVEL: ASTM-D-448	PEA GRAVEL: NO. 6	DOUBLE WASH PEA GRAVEL; AT LEAST 9" DEEP.
GEOTEXTILE	WOVEN MONOFILAMENT POLYPROPYLENE	FLOW RATE ≥ 100 GPM/SQ.FT. (ASTM D4491)	SUBMIT PRODUCT SPECIFICATIONS
UNDERDRAIN GRAVEL	1" DIAMETER STONE (ASTM-D-448)	AASHTO #57 OR 67 STONE	DOUBLE WASHED
UNDERDRAIN PIPING	N/A	4" 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
SAND	AASHTO-M-6 OR ASTM-C33	N/A	SAND SUBSTITUTIONS 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

NOTE
FOR STORMWATER MANAGEMENT
CALCULATION, SEQUENCE OF
CONSTRUCTION AND NOTES SEE
SHEETS SWM-3, SWM-4 AND
SWM-5

ESD # 7121

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21718, Expiration Date: 2017-09-16

REV	DESCRIPTION	DATE
4	SWM-ES	05/20/2017
3	SWM-ES	09/29/2016
2	SWM-ES	08/15/2016
1	BID-SET	02/5/2016



Date: 02/5/2016
Project # 1501.01
STORMWATER
MANAGEMENT NOTES
AND DETAILS

C-2.30