SITE DEVELOPMENT PLAN
L&R BUILDINGS
L. 13356 F. 0464
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

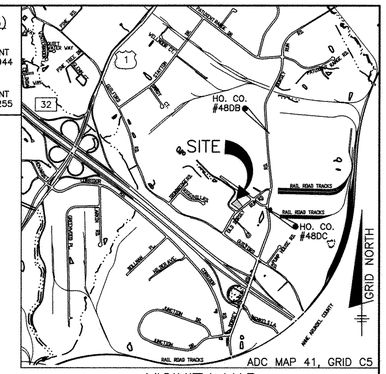
GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. EXISTING TOPOGRAPHY SHOWN ONSITE AND BOUNDARY ARE BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED BY BENCHMARK ENGINEERING, INC. IN DECEMBER 2011. CONTOUR INTERVAL IS 2'.
4. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 48DB AND 48DC WERE USED FOR THIS PROJECT.
5. WATER AND SEWER ARE PUBLIC AND WILL CONNECT TO IMPROVEMENTS PROVIDED UNDER SEWER CONTRACT NUMBER 20-3236 AND WATER CONTRACT 670-W. THE DRAINAGE AREA IS LITTLE PATUXENT.
6. EXISTING UTILITIES SHOWN ARE BASED ON CONTRACT DRAWINGS, HOWARD COUNTY GIS AND FIELD SURVEYED LOCATIONS.
7. CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO ANY CONSTRUCTION ACTIVITY AND SHALL ADJUST ALL UTILITIES AND RIM ELEVATIONS AS NEEDED TO MATCH THIS PLAN.
8. THERE ARE NO WETLANDS, WETLAND BUFFERS, STREAMS, STREAM BUFFERS, STEEP SLOPES (25% OR GREATER) OR 100-YEAR FLOODPLAINS ON THE SITE.
9. A NOISE STUDY IS NOT REQUIRED FOR COMMERCIAL PROJECTS.
10. THE SUBJECT PROPERTY IS ZONED M-2 PER THE 2-2-2004 COMPREHENSIVE ZONING PLAN AND THE "COMP LITE" ZONING AMENDMENTS EFFECTIVE 7-28-2006.
11. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES OR HISTORIC STRUCTURES LOCATED ON THIS SITE.
12. THIS PROJECT IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
13. LANDSCAPING FOR THIS PARCEL IS PROVIDED IN ACCORDANCE WITH A CERTIFIED LANDSCAPE PLAN INCLUDED WITH THIS SITE DEVELOPMENT PLAN SET IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT FOR IN THE AMOUNT OF $5,250.00 ($4,800.00 FOR THE 16 REQUIRED SHADE TREES, $450.00 FOR THE REQUIRED 3 EVERGREENS).
14. PREVIOUS HOWARD COUNTY FILE NUMBERS: ECP-12-041
15. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
16. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
17. ALL EXTERIOR LIGHTING SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL VOLUME III (1993), ZONING SECTION 134 AND AS SHOWN ON THESE PLANS. ALL EXTERIOR LIGHT FIXTURES SHALL BE ORIENTED TO DIRECT LIGHT INWARDS AND DOWNWARDS ON-SITE AWAY FROM ALL ADJOINING RESIDENTIAL PROPERTIES AND PUBLIC ROADS IN ACCORDANCE WITH SECTION 134 OF THE HOWARD COUNTY ZONING REGULATIONS.
18. TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO PLACEMENT OF ANY ASPHALT.
19. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2.5" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE)-3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
20. THE FOREST CONSERVATION ACT OBLIGATION FOR THIS PROJECT WILL BE MET BY PAYMENT OF FEE-IN-LIEU IN THE AMOUNT OF $4,901 FOR AN OBLIGATION OF 0.15 ACRES. (6,534 S.F. X $0.75 = $4,901)
21. SHC ELEVATION SHOWN IS LOCATED AT THE PROPERTY LINE.
22. A TRAFFIC STUDY DATED SEPTEMBER, 2012, WAS PREPARED FOR THIS PROJECT BY MARS GROUP, INC. AND WAS APPROVED FEBRUARY 7, 2013 PER DPZ LETTER.
23. ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
24. "BRL" INDICATES BUILDING RESTRICTION LINE.
25. ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE BUILDER'S AND/OR DEVELOPER'S EXPENSE.
26. THIS PLAN CONFORMS WITH THE AMENDED 5th EDITION OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE DEVELOPER SHALL APPLY FOR BUILDING PERMITS FOR THIS SITE DEVELOPMENT PLAN WITHIN ONE YEAR OF SIGNATURE APPROVAL OF THIS PLAN.
27. STORMWATER MANAGEMENT SHALL BE PROVIDED FOR THIS PROJECT BASED ON GUIDELINES ESTABLISHED BY THE STORMWATER MANAGEMENT ACT OF 2009. TREATMENT FOR THIS PROJECT SHALL BE PROVIDED BY ONE BIORETENTION FACILITY, PERMEABLE PAVEMENT AND THREE DRY WELLS. STORMWATER MANAGEMENT FACILITIES SHALL BE PRIVATELY OWNED AND MAINTAINED.
28. DRIVEWAY CONSTRUCTION SHALL BE IN CONFORMANCE WITH HOWARD COUNTY STANDARD R-6.10.
29. WATER METER SHALL BE PRIVATE, AND OUTSIDE SETTING.
30. HANDICAP PARKING ACCESS AISLE SHALL BE SLOPED TO MEET SIDEWALK ELEVATION BUT NOT EXCEED 2% IN ANY DIRECTION.
31. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAMS OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN.
32. THE EXISTING WELL IS TO BE PROPERLY ABANDONED BY A LICENSED WELL DRILLER AND A CERTIFICATION SHALL BE PROVIDED TO THE HOWARD COUNTY HEALTH DEPARTMENT BEFORE SIGNATURE APPROVAL OF THIS PLAN.
33. A KNOX BOX SHALL BE INSTALLED WITHIN 6' OF THE FRONT DOOR AT A RANGE OF 4' TO 5' IN HEIGHT. THE BOX SHALL BE ELECTRONICALLY SUPERVISED TO NOTIFY THE OWNER THAT IT IS BEING ACCESSED.
34. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH UTILITY COMPANIES TO SCHEDULE BRACING OF POLES FOR WORK WITHIN 5.0' OF ANY POLE.
35. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)." A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREETLIGHT AND ANY TREE.

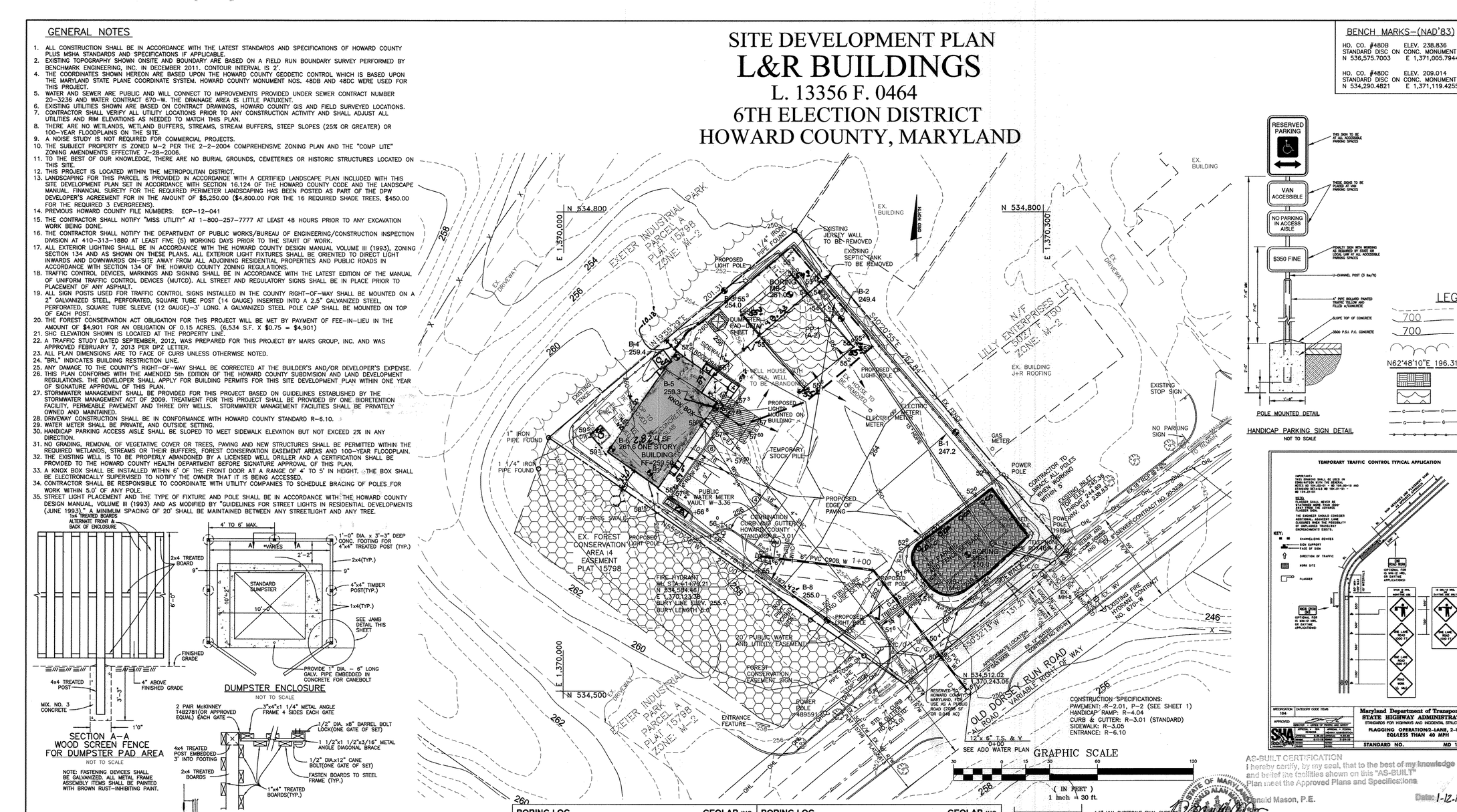
BENCH MARKS-(NAD'83)

HO. CO. #48DB ELEV. 238.836
STANDARD DISC ON CONC. MONUMENT
N 536,575.7003 E 1,371,005.7944

HO. CO. #48DC ELEV. 209.014
STANDARD DISC ON CONC. MONUMENT
N 534,290.4821 E 1,371,119.4255



VICINITY MAP
SCALE: 1" = 2000'



LEGEND

- 700 — EXISTING CONTOURS
- 700 — PROPOSED CONTOURS
- EXISTING TREELINE
- N62°48'10"E, 196.31' — PROPERTY BOUNDARY
- MICRO-BIORETENTION
- PERMEABLE PAVING
- C C C — COMMUNICATIONS LINES
- G G G — GAS LINES
- PROPOSED FENCE

POLE MOUNTED DETAIL

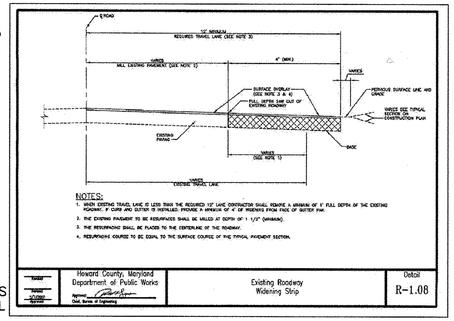
HANDICAP PARKING SIGN DETAIL
NOT TO SCALE

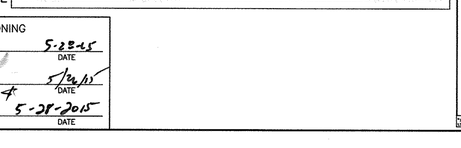
SECTION A-A
WOOD SCREEN FENCE
FOR DUMPSTER PAD AREA
NOT TO SCALE

NOTE: FASTENING DEVICES SHALL BE GALVANIZED. ALL METAL FRAME ASSEMBLY ITEMS SHALL BE PAINTED WITH BROWN RUST-INHIBITING PAINT.

DUMPSTER ENCLOSURE
NOT TO SCALE

JAMB DETAIL
NOT TO SCALE





BORING LOG — GEOLAB, INC.

Report No.: Date:
Client: Benchmark Engineering
Project: 8594 Old Dorsey Run Road - Jessup, Maryland — Project No. 112-057
Boring No.: MB-1 (1 of 1) Elev.: 260.0 +/- Location: See Boring Location Plan
Type of Boring: Test Pit — Started: 5/17/12 — Completed: 5/17/12 — Driller: Rivers Construction

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	Sample Blows	Sample No. (Test)	Moisture Content	REMARKS
260	0.0	No. 2 crushed stone				Test pit dry during excavation and at completion.
259.5	0.5	Brown silty fine to medium SAND with gravel, moist, very loose (SM) USDA: SANDY LOAM	1.0	1		
			5,6,8	2	11.3	
257	3.0	Orangish-brown fine to coarse sandy GRAVEL with some clayey silt, damp, loose (GM) USDA: SANDY LOAM	3.0	3		
			8,10,12	4	8.0	
255	5.0	Dark orangish-brown to off-white fine SAND with some silt, moist to damp, medium dense (SM) USDA: SANDY LOAM	6.0	5		
			7,9,9	7	14.0	
250	10.0	End of Boring	10.0	9		
			6,8,11	11	9.5	

Weather of blows required for a 140 lb hammer dropping 30" to drive 1" O.D., 1.375" I.D. sampler a total of 18 inches is: Blows 1: Increments: The sum of the last two increments of penetration is termed the standard penetration resistance, N.

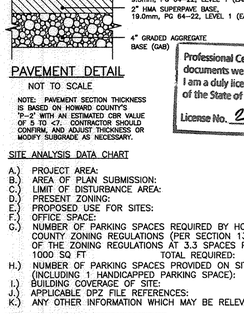
BORING LOG — GEOLAB, INC.

Report No.: Date:
Client: Benchmark Engineering
Project: 8594 Old Dorsey Run Road - Jessup, Maryland — Project No. 112-057
Boring No.: MB-2 (1 of 1) Elev.: 251.0 +/- Location: See Boring Location Plan
Type of Boring: Test Pit — Started: 5/17/12 — Completed: 5/17/12 — Driller: Rivers Construction

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	Sample Blows	Sample No. (Test)	Moisture Content	REMARKS
251	0.0	Brown silty fine to medium SAND with gravel, moist, very loose (SM) USDA: SANDY LOAM	1.0	1		Test pit dry during excavation and at completion.
			3,3,4	2	15.5	
249	2.0	Tan to off-white fine to medium SAND with trace silt, damp, very loose (SP) USDA: SAND	3.0	3		
			3,4,6	4	6.0	
245	6.0		6.0	5		
			3,4,4	7	6.3	
239	12.0	End of Boring	10.0	9		
			3,4,5	11	6.7	

Weather of blows required for a 140 lb hammer dropping 30" to drive 1" O.D., 1.375" I.D. sampler a total of 18 inches is: Blows 1: Increments: The sum of the last two increments of penetration is termed the standard penetration resistance, N.

PAVEMENT DETAIL
NOT TO SCALE



NOTE: PAVEMENT SECTION THICKNESS IS BASED ON HOWARD COUNTY'S "F-2" WITH AN ESTIMATED CBR VALUE OF 5 TO <7. CONTRACTOR SHOULD CONFIRM, AND ADJUST THICKNESS OR MODIFY SUBGRADE AS NECESSARY.

SITE ANALYSIS DATA CHART

A.)	PROJECT AREA:	1.00 AC.±
B.)	AREA OF PLAN SUBMISSION:	1.00 AC.±
C.)	LIMIT OF DISTURBANCE AREA:	1.00 AC.±
D.)	PRESENT ZONING:	M-2
E.)	PROPOSED USE FOR SITES:	CONTRACTOR OFFICE
F.)	OFFICE SPACE:	2823 SF
G.)	NUMBER OF PARKING SPACES REQUIRED BY HOWARD COUNTY ZONING REGULATIONS (PER SECTION 133.D.3.a. OF THE ZONING REGULATIONS AT 3.3 SPACES PER 1000 SQ FT TOTAL REQUIRED:	9 SPACES
H.)	NUMBER OF PARKING SPACES PROVIDED ON SITE (INCLUDING 1 HANDICAPPED PARKING SPACE):	10 SPACES
I.)	BUILDING COVERAGE OF SITE:	6%
J.)	APPLICABLE DPZ FILE REFERENCES:	ECP-12-041
K.)	ANY OTHER INFORMATION WHICH MAY BE RELEVANT:	N/A

PLEASE NOTE THAT THIS REVISION SUPERSEDES THE PREVIOUS SHEET DATED NOVEMBER, 2014

INFILTRATION RATES
TEST MB-1 6.0 INCHES/HR
TEST MB-2 24.0 INCHES/HR

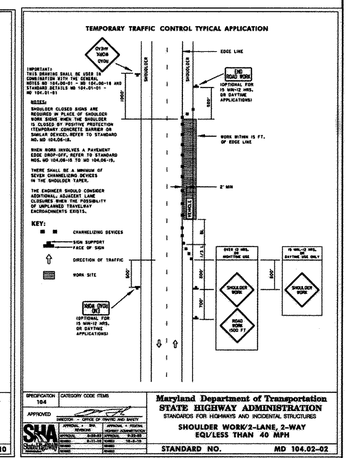
ADDRESS CHART

BUILDING	STREET ADDRESS
1	8594 OLD DORSEY RUN ROAD

PERMIT INFORMATION CHART

SUBDIVISION NAME:		SECTION/AREA:		LOT/PARCEL#:
L&R BUILDINGS		-		P. 22
PLAT No.	GRID No.	ZONE	TAX MAP	ELECTION DISTRICT	CENSUS TRACT
-	14	M-2	48	SIXTH	6069.01

CONSTRUCTION SPECIFICATIONS:
PAVEMENT: R-2.01, P-2 (SEE SHEET 1)
HANDICAP RAMP: R-4.04
CURB & GUTTER: R-3.01 (STANDARD)
SIDEWALK: R-3.05
ENTRANCE: R-6.10



SHEET INDEX

NO.	DESCRIPTION
1	SITE DEVELOPMENT AND GRADING PLAN
2	LANDSCAPE PLAN, STORMWATER MANAGEMENT NOTES AND DETAILS, WATER AND SEWER HOUSE CONNECTION PROFILES
3	SEDIMENT AND EROSION CONTROL PLAN, NOTES AND DETAILS, DRAINAGE AREA MAPS AND STORM DRAIN PROFILES
4-6	RETAINING WALL DESIGN

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications.
Donald Mason, P.E. Date: 1-12-18

STATE OF MARYLAND — DONALD ALAN MASON — No. 19149 — PROFESSIONAL ENGINEER

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. 21213 Expiration Date: 12-21-18

NO.	DATE	REVISION
2	10-29-15	CHANGE BUILDING FOOTPRINT/LOCATION, ADJUST SITE ANALYSIS & ADJUST HANDICAP ACCESS ROUTES
1	3-19-15	CHANGE BUILDING, WALLS AND SWM PRACTICES

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEC-CIVILENGINEERING.COM

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER
3/24/15

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. 45577, Expiration Date: 06-08-2016.

OWNER/DEVELOPER:
L&R BUILDINGS, LLC
11404 GALT AVENUE
SILVER SPRING, MD 20902
717-600-6171
ATT: LUIS RIVERA
240-372-2283

L&R BUILDINGS
L. 13356 F. 0464

TAX MAP: 48, GRID: 14, PARCEL: 22
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

REVISED SITE DEVELOPMENT AND GRADING PLAN

DATE: NOVEMBER, 2014 / MARCH, 2015
PROJECT NO. 2437
DESIGN: AAM DRAFT: AAM CHECK: JC
SCALE: 1" = 30'
SHEET 1 OF 6
SDP-13-003

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 5-28-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 5/28/15
ACTING DIRECTOR	DATE 5-28-2015

J:\2437\dwg\1000 redline for perm pvmt.dwg, SDP SHT 1, 3/23/2015 9:22:16 AM, bdodson

AS-BUILT

LANDSCAPE NOTES:

1. STREET TREES TO BE CENTERED BETWEEN THE CURB AND SIDEWALK WHERE THE DISTANCE BETWEEN THE CURB AND SIDEWALK IS 6 FEET OR GREATER. WHEN TREES ARE PLANTED BETWEEN THE SIDEWALK AND CURB, THEY SHALL BE PLACED A MINIMUM OF 30 FEET FROM ALL SIGNS AND INTERSECTIONS. TREES MAY NOT BE PLANTED WITHIN 5 FEET OF A DRAIN INLET, 5 FEET OF AN OPEN SPACE ACCESS STRIP, OR 10 FEET OF A DRIVEWAY.
2. SEE TREE PLANTING DETAIL – THIS SHEET.
3. HIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.
4. AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.
5. THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
6. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT FOR IN THE AMOUNT OF $4,950.00 ($4,500.00 FOR THE 15 REQUIRED SHADE TREES, $450.00 FOR THE REQUIRED 3 EVERGREENS).

SCHEDULE A
PERIMETER LANDSCAPE EDGE

CATEGORY		NO	YES	TOTALS
	ADJACENT TO ROADWAY	NO	YES	
	ADJACENT TO PERIMETER PROPERTIES	YES	NO	
PERIMETER NO. / LANDSCAPE TYPE		1 A	2 B	
LINEAR FEET OF ROADWAY (FRONTAGE/PERIMETER)		703	131	
CREDIT FOR EXISTING VEGETATION: NO OR YES (DESCRIBE BELOW IF NEEDED)		NO	NO	
CREDIT FOR WALL, FENCE OR BERM: NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		NO	NO	
NUMBER OF PLANTS REQUIRED:				
SHADE TREES		12	3	15
EVERGREEN TREES		–	3	3
OTHER TREES (2:1 SUBSTITUTE)		–	–	–
		–	–	–
NUMBER OF PLANTS PROVIDED:				
SHADE TREES		12	3	15
EVERGREEN TREES		–	3	3
OTHER TREES (2:1 SUBSTITUTE)		–	–	–
SHRUBS (10:1 SUBSTITUTE)		–	–	–
(DESCRIBE PLANT SUBSTITUTION		–	–	–
CREDITS BELOW IF NEEDED)		–	–	–

* ONE EVERGREEN TREE IS PROPORTIONAL TO 10 SHRUBS TREES.

STREET TREE CALCULATIONS

STREET TREES REQUIRED FOR 131 LF OF RIGHT-OF-WAY
131 / 40 = 3 TREES REQUIRED
3 TREES PROVIDED

SCHEDULE B
PARKING LOT INTERNAL LANDSCAPING

NUMBER OF PARKING SPACES	10
NUMBER OF LANDSCAPE ISLANDS REQUIRED	1
NUMBER OF LANDSCAPE ISLANDS PROVIDED	1
NUMBER OF SHADE TREES REQUIRED	1
NUMBER OF SHADE TREES PROVIDED	1

STREET TREE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS
(symbol)	3	ACER GRISEUM "PAPERBACK MAPLE"	1 1/2"–2" MIN. CAL. B & B FULL HEAD

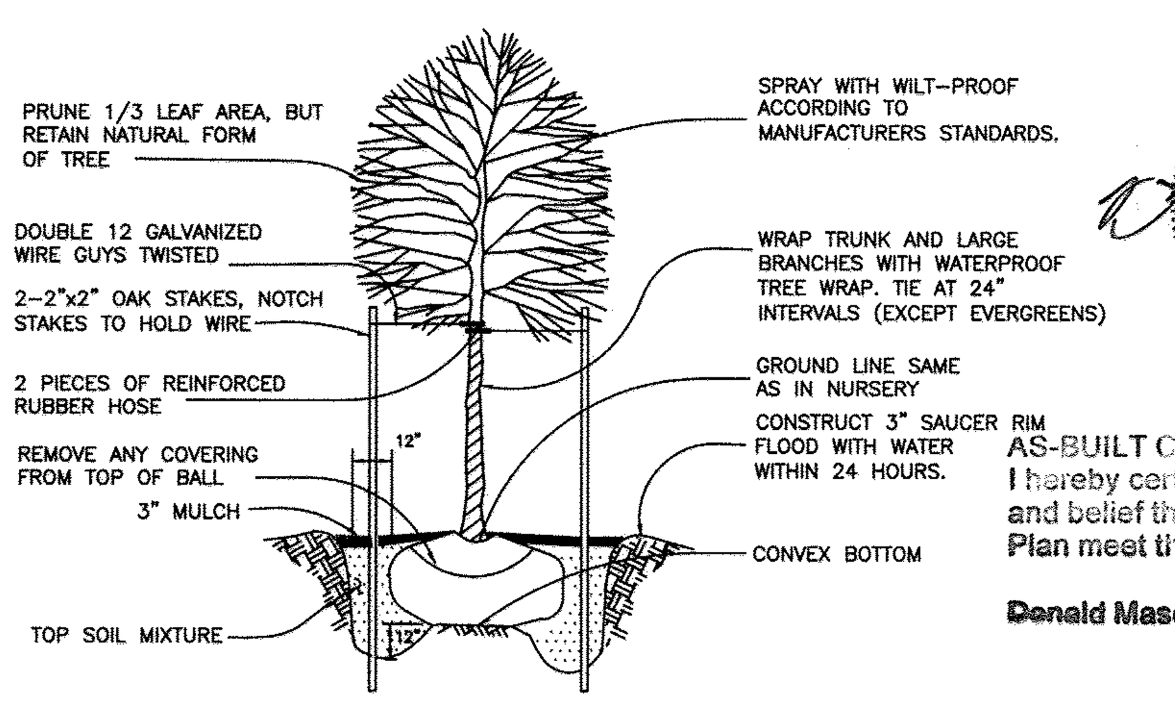
BGE ZONE LEGEND

GREEN ZONE

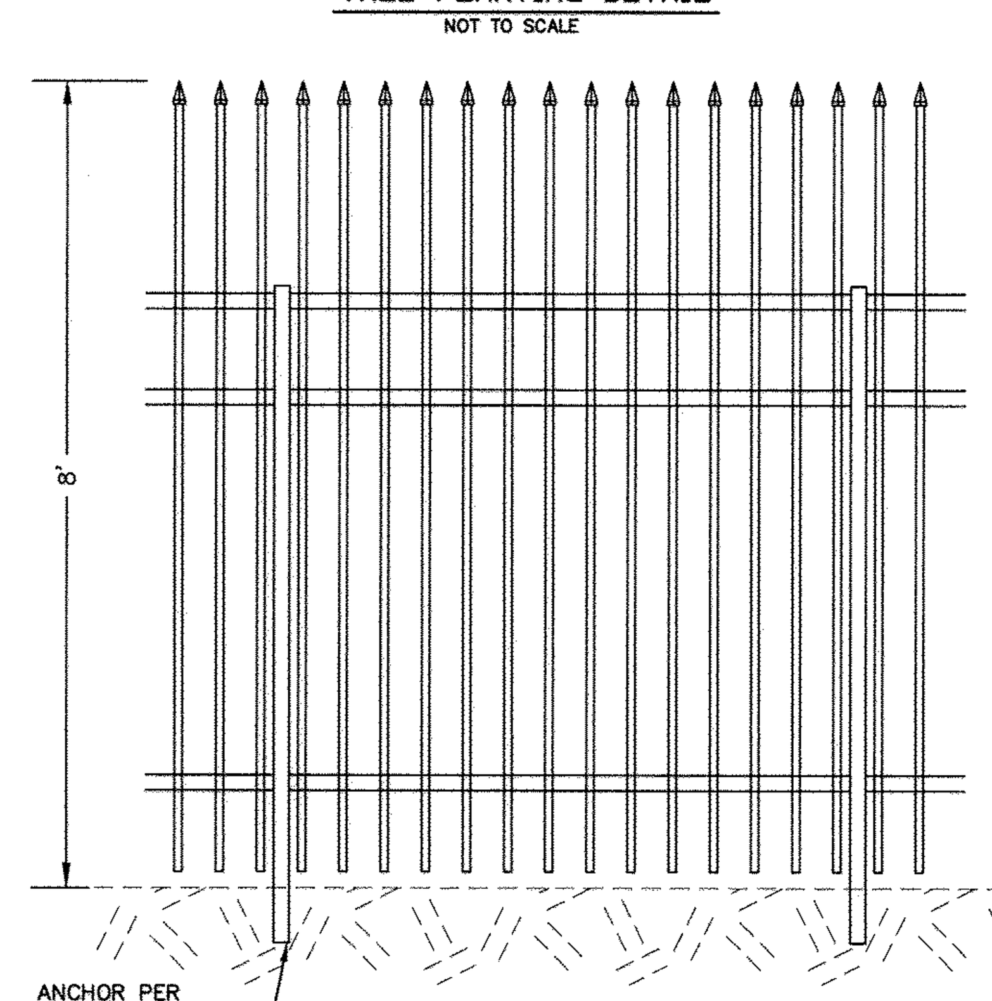
YELLOW ZONE

LANDSCAPE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS
(symbol)	6	BETULA NIGRA 'HERITAGE' HERITAGE CLUMP RIVER BIRCH	10' – 12' HT.
(symbol)	7	ACER RUBRUM 'AUTUMN FLAME' AUTUMN FLAME RED MAPLE	2 1/2"–3" MIN. CAL.
(symbol)	3	ILEX 'NELLIE R. STEVENS' NELLIE R. STEVENS HOLLY	5' – 6' HT.
(symbol)	3	ACER GRISEUM PAPERBACK MAPLE	1 1/2"–2" MIN. CAL.



TREE PLANTING DETAIL
NOT TO SCALE

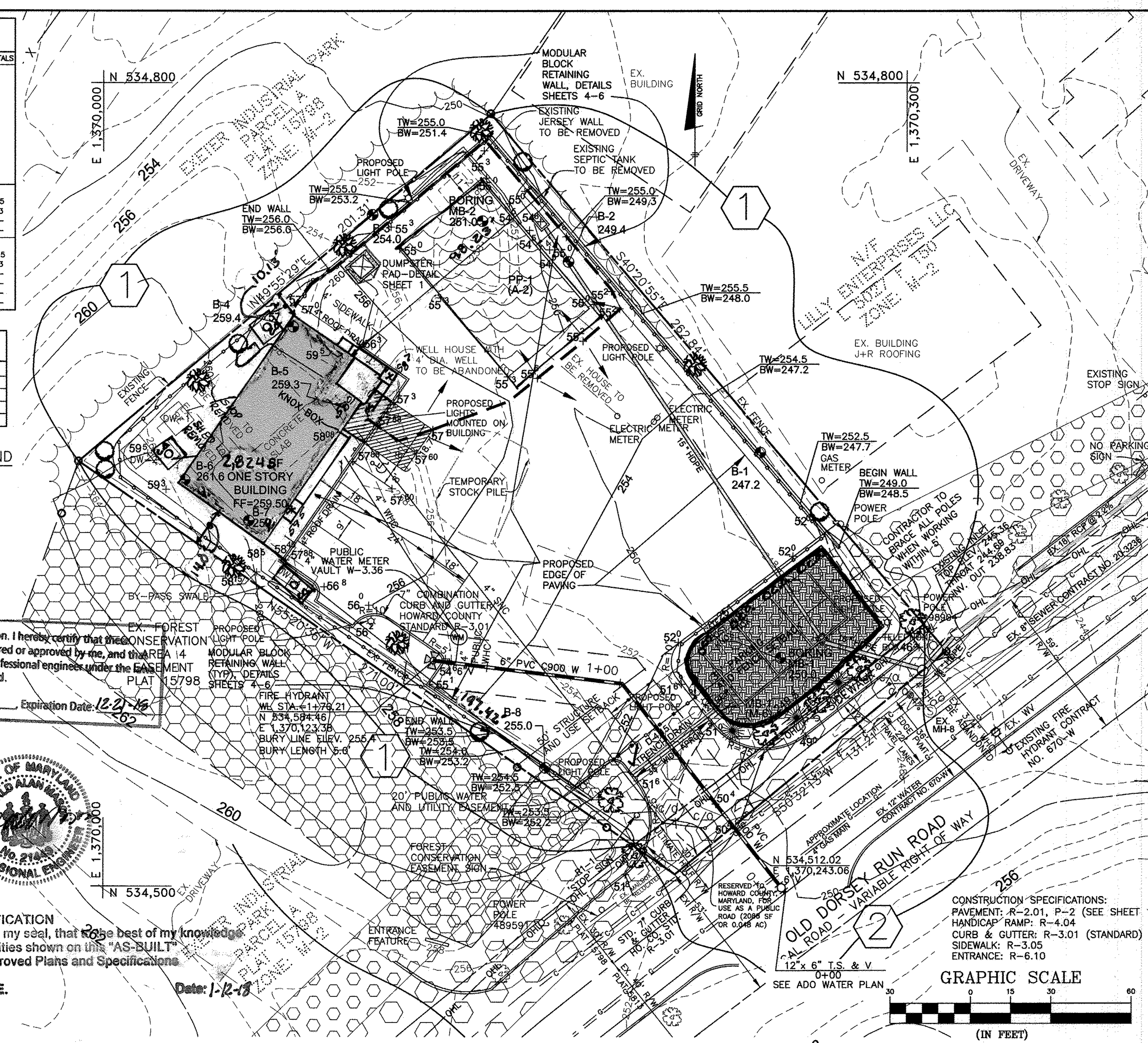


FENCE DETAIL
NOT TO SCALE

AN 8' TALL OPEN SECURITY FENCE SHALL BE PROVIDED. FENCE SHALL BE INSTALLED ON TOP OF RETAINING WALL WHERE APPLICABLE. TOP OF FENCE WILL CURVE OUTWARD TO DISCOURAGE CLIMBING. FENCE TO BE ANCHORED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.

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. 21443 Expiration Date: 12-21-16

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E. Date: 1-12-18



CONSTRUCTION SPECIFICATIONS:
PAVEMENT: R–2.01, P–2 (SEE SHEET 1
HANDICAP RAMP: R–4.04
CURB & GUTTER: R–3.01 (STANDARD)
SIDEWALK: R–3.05
ENTRANCE: R–6.10

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 inch = 30 ft.

B.4.C Specifications for Micro-Bioretention, Rain Gardens, Landscape Infiltration & Infiltration Berms

1. **Material Specifications:** The allowable materials to be used in these practices are detailed in Table B.4.1.
2. **Filtering Media or Planting Soil:** The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the micro-bioretention practice that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05. The planting soil shall be tested and shall meet the following criteria:
   Soil Component - Loamy Sand or Sandy Loam (USDA Soil Textural Classification)
   Organic Content - Minimum 10% by dry weight (ASTM D 2974). In general, this can be met with a mixture of loamy and (60%-65%) and compost (35% to 40%) or sandy loam (30%), coarse sand (30%), and compost (40%).
   Clay Content - Media shall have a clay content of less than 5%.
   pH Range - Should be between 5.5 - 7.0. Amendments (e.g., lime, iron sulfate plus sulfur) may be mixed into the soil to increase or decrease pH.
   There shall be at least one soil test per project. Each test shall consist of both the standard soil test for pH, and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the topsoil was excavated.
3. **Compaction:** It is very important to minimize compaction of both the base of bioretention practices and the required backfill. When possible, use excavation hoes to remove original soil. If practices are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure. Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment. Rototill 2 to 3 inches of sand into the base of the bioretention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base. When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade. When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.
4. **Plant Material:** Recommended plant material for micro-bioretention practices can be found in Appendix A, Section A.2.3.
5. **Plant Installation:** Compost is a better organic material source, is less likely to float, and should be placed in the invert and other low areas. Mulch should be placed in surrounding to a uniform thickness of 2" to 3". Shredded or chipped hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance. Rootstock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8th of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation. Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball. Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications. The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.
6. **Underdrains:** Underdrains should meet the following criteria:
   - Pipe- Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTMF 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or HDPE).
   - Perforations - If perforated pipe is used, perforations should be ⅜" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a ¼" (No. 4 or 4x4) galvanized hardware cloth.
   - Gravel - The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain
   - The main collector pipe shall be at a minimum 0.5% slope.
   - A rigid, non-perforated observation well must be provided (one per every 1,0000 square feet) to provide a clean-out port and monitor performance of the filter.
   - A 4" layer of pea gravel (⅛" to ¾" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

   The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).
7. **Miscellaneous:** These practices may not be constructed until all contributing drainage area has been stabilized

LEGEND

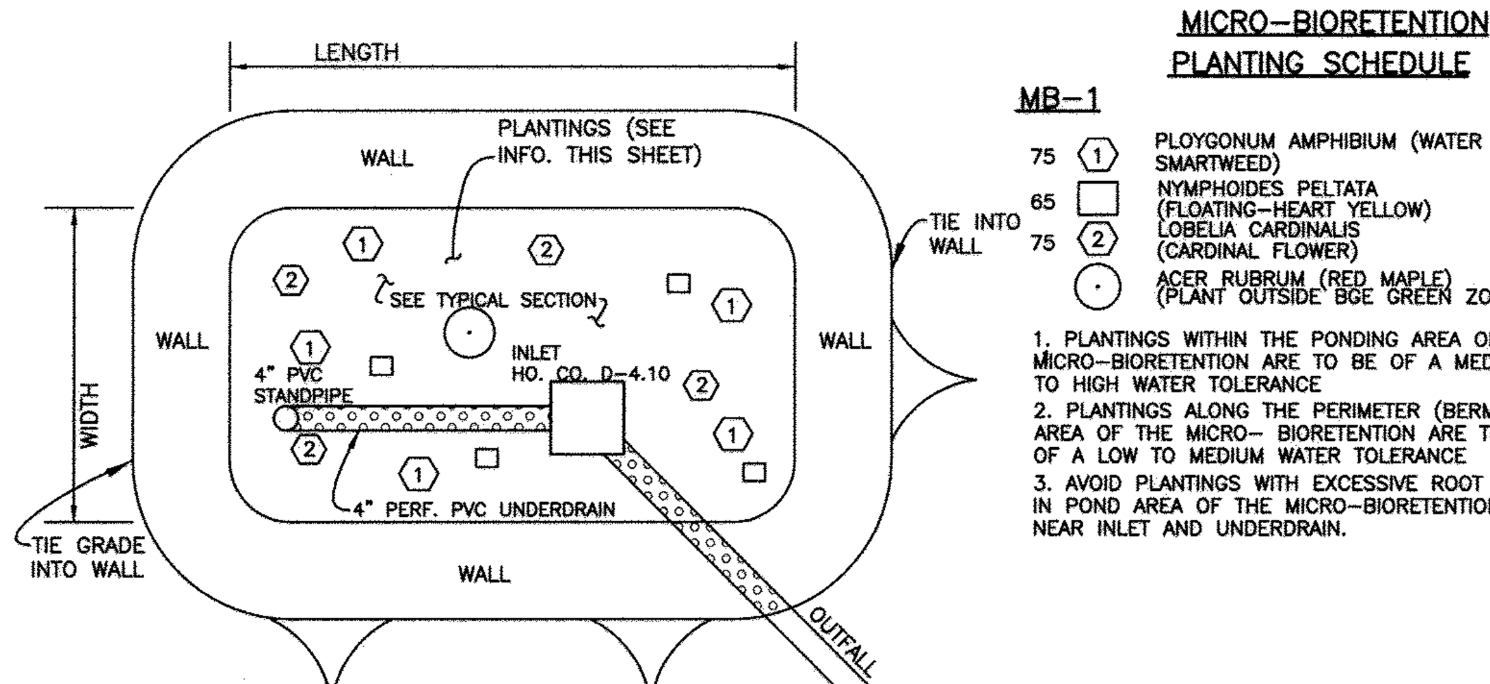
- 700 — EXISTING CONTOURS
- 700 — PROPOSED CONTOURS
- EXISTING TREELINE
- N62°48'10"E 196.31' — PROPERTY BOUNDARY
- MICRO–BIORETENTION
- PERMEABLE PAVING
- —C— COMMUNICATIONS LINES
- —G— GAS LINES
- PROPOSED FENCE
- EXISTING ADJOINING FOREST CONSERVATION EASEMENT

MICRO–BIORETENTION PLANTING SCHEDULE

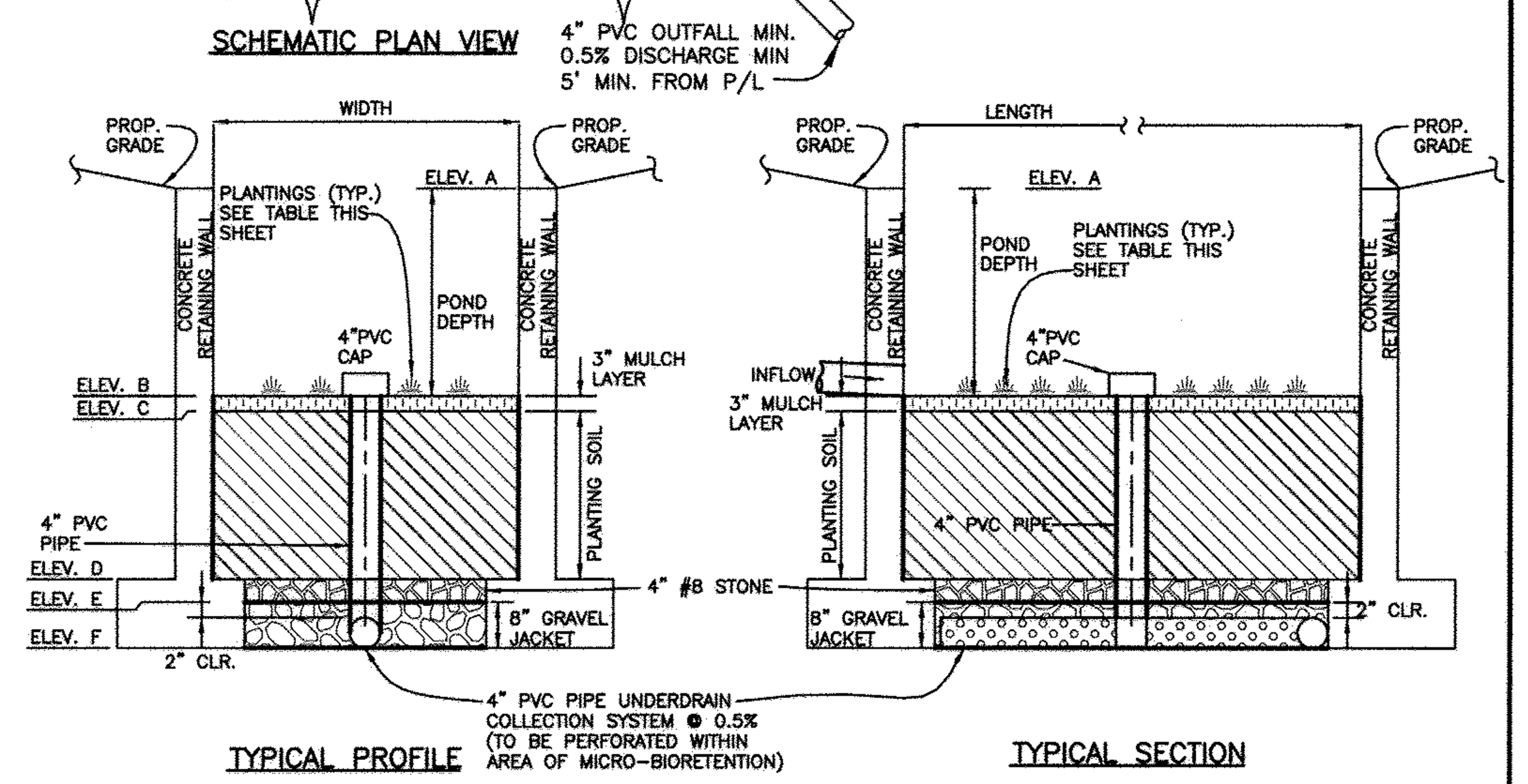
MB–1

75	(1)	PLOYGONUM AMPHIBIUM (WATER SMARTWEED)
65	(square)	NYMPHOIDES PELTATA (FLOATING–HEART YELLOW)
75	(2)	LOBELIA CARDINALIS (CARDINAL FLOWER)
	(circle)	ACER RUBRUM (RED MAPLE) (PLANT OUTSIDE BGE GREEN ZONE)

1. PLANTINGS WITHIN THE PONDING AREA OF THE MICRO–BIORETENTION ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE
2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE MICRO– BIORETENTION ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE
3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE MICRO–BIORETENTION NEAR INLET AND UNDERDRAIN.



SCHEMATIC PLAN VIEW

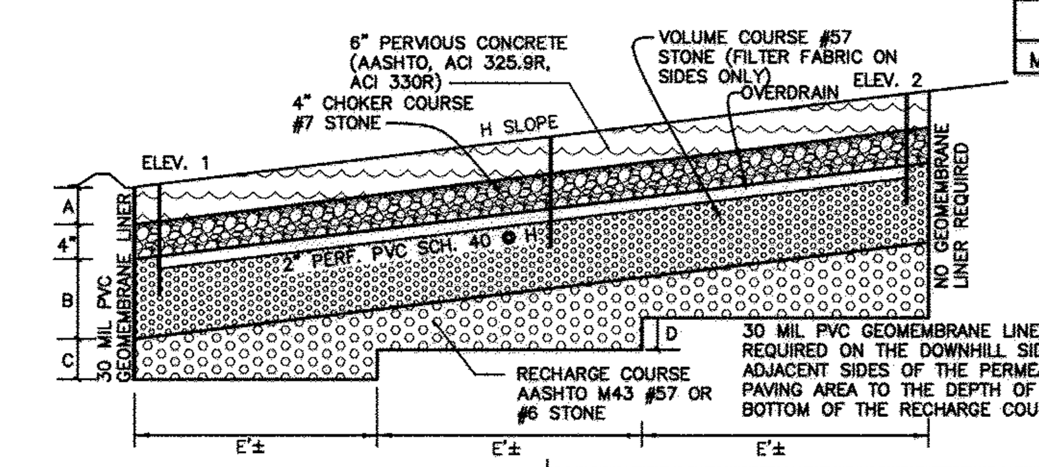


TYPICAL PROFILE — TYPICAL SECTION

MICRO–BIORETENTION (M–6) DETAILS
NOT TO SCALE

MICRO–BIORETENTION (M–6) GEOMETRY									
DA	LENGTH	WIDTH	DEPTH	A	B	C	D	E	F
MB–1	✓ 67'	✓ 39'	1.0'*	251.00	249.50	249.25	246.75	246.42	245.75

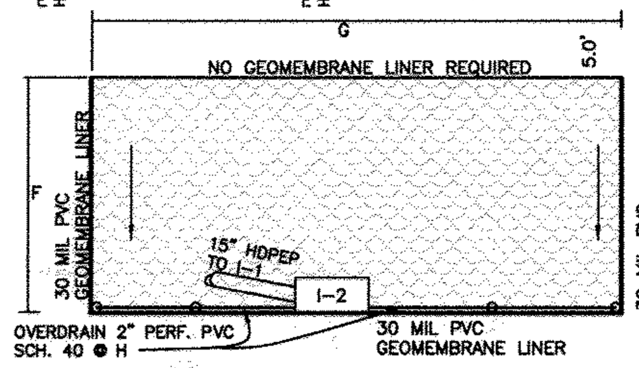
*DEPTH CONTROLLED BY INLET WEIR



TYPICAL PROFILE

PERMEABLE SURFACE DESIGN TABLES

PP–1	
ELEV. 1	255.3 ✓
ELEV. 2	254.7 ✓
DIMENSIONS	
'A'	0.5'
'B'	2.1'
'C'	0.25'
'D'	0.27'
'E'	13.23'
'F'	~~39.68'~~ 41.2
'G'	~~63.04'~~ 68.6
SLOPE	
'H'	2.0%
CLEAN–OUT	
NUMBER	SPACING
4	14'

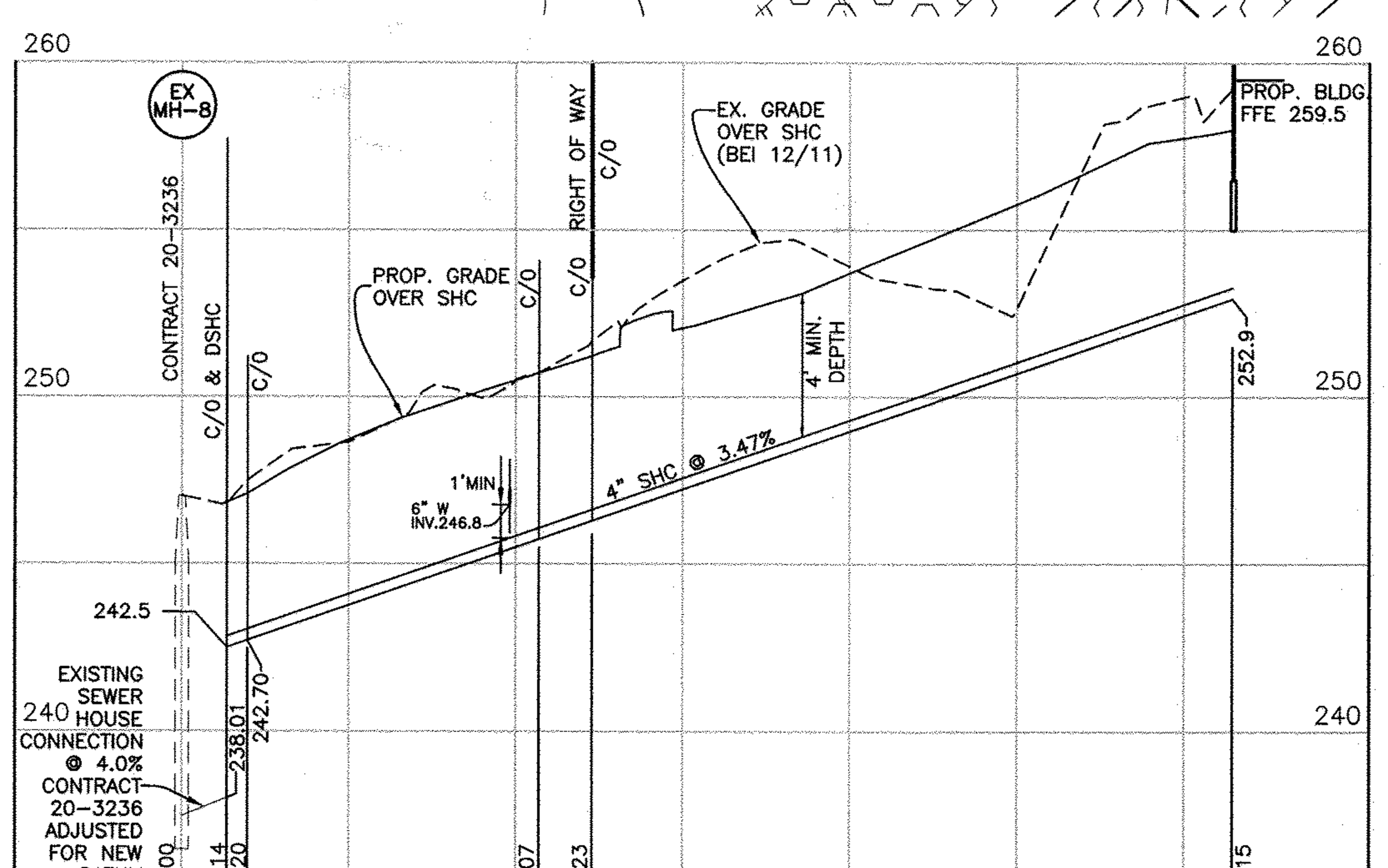


NOTE:
TIE OVERDRAINS INTO OVERFLOW INLETS OR OUTFALLS. DO NOT OUTFALL OVERDRAINS INTO MICRO–BIORETENTION FACILITY.

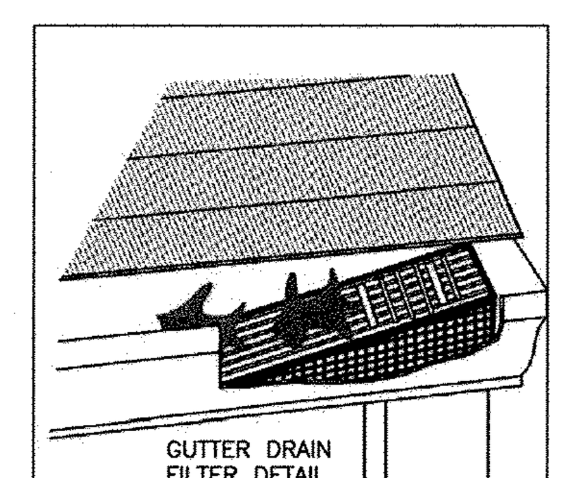
TYPICAL PERMEABLE SURFACE (A–2) BMP DETAILS
NOT TO SCALE

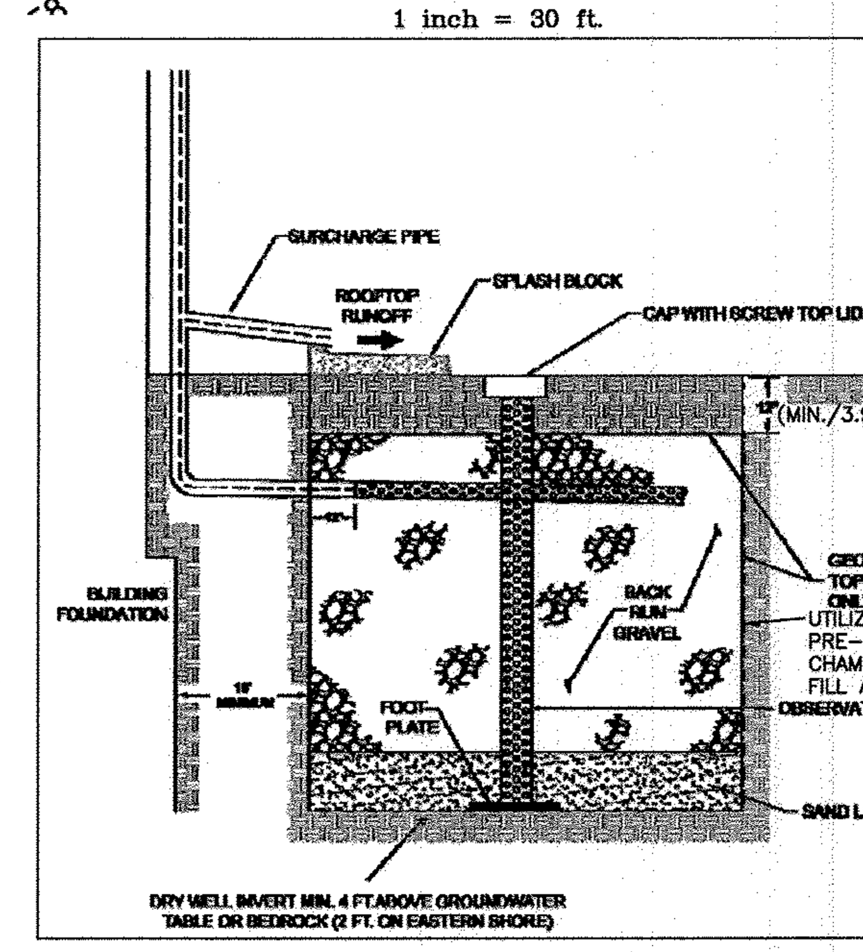
CONSTRUCTION AND INSPECTION SPECIFICATIONS FOR ALTERNATIVE SURFACES (A–2 PERMEABLE PAVING)

1. Erosion and Sediment Control: Final grading for installation shall not take place until the surrounding site is stabilized. If this cannot be accomplished, runoff from disturbed areas shall be diverted around proposed pavement locations.
2. Soil Compaction: Sub soils shall not be compacted. Construction should be performed with lightweight, wide tracked equipment to minimize compaction. Excavated materials should be placed in a contained area.
3. Distribution Systems: Overdrain, underdrain, and distribution pipes shall be checked to ensure that both the material and perforations meet specifications (see Appendix B.4). The upstream ends of pipes should be capped prior to installation. All underdrain or distribution pipes used should be installed flat along the bed bottom.
4. Subbase Installation: Subbase aggregate shall be clean, washed, and free of fines. The subbase shall be placed in lifts and lightly rolled according to the specifications (see Appendix B.4).
5. Inspection: Regular inspections shall be made during the following stages of construction:
   - o During excavation to subgrade.
   - o During placement and backfill of any drainage or distribution system(s).
   - o During placement of the subbase material.
   - o During placement of the surface material.
   - o Upon completion of final grading and establishment of permanent stabilization.



SEWER HOUSE CONNECTION PROFILE
1"=50' HORIZONTAL
1"=5' VERTICAL





OPERATION AND MAINTENANCE SCHEDULE FOR MICRO–BIORETENTION (M–6)

A. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.
B. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
C. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
D. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

FOREST CONSERVATION WORKSHEET
8594 Old Dorsey Road

Computations by: JC — BEI JOB No. 2437 — Date: 1.24.13

NET TRACT AREA:			
A.	Total tract area		1.00 ac.
B.	Land Dedication acres (parks, county facility, etc.)		0.00 ac.
C.	Land Dedication for roads and utilities (not being constructed by this plan)		0.00 ac.
D.	Area to remain in Commercial Agricultural Production/use		0.00 ac.
E.	Other deductions:		0.00 ac.
F.	Net Tract Area		1.00 ac.
LAND USE CATEGORY:			
	Select category (RLD, RMD, Sub., CIO, Inst.)		CIO
G.	Afforestation Threshhold	15% x "F" =	0.15 ac.
H.	Conservation threshhold	15% x "F" =	0.15 ac.
EXISTING FOREST COVER:			
I.	Existing forest cover		0.00 ac.
J.	Area of forest above afforestation threshold		0.00 ac.
K.	Area of forest above conservation threshold		0.00 ac.
BREAK EVEN POINT:			
L.	Forest retention above threshold with no mitigation		0.00 ac.
M.	Clearing permitted without mitigation		0.00 ac.
	Break Even Point		0.12 ac.
PROPOSED FOREST CLEARING:			
N.	Total area of forest to be cleared		0.00 ac.
O.	Total area of forest to be retained		0.00 ac.
PLANTING REQUIREMENTS:			
P.	Reforestation for clearing above conservation threshold		0.00 ac.
Q.	Reforestation for clearing below conservation threshold		0.00 ac.
R.	Credit for retention above conservation threshold		0.00 ac.
S.	Total reforestation required		0.00 ac.
T.	Total afforestation required		0.15 ac.
U.	Credit for landscaping - may not exceed 20% of "S."		0.00 ac.
V.	Total reforestation and afforestation required		0.15 ac.

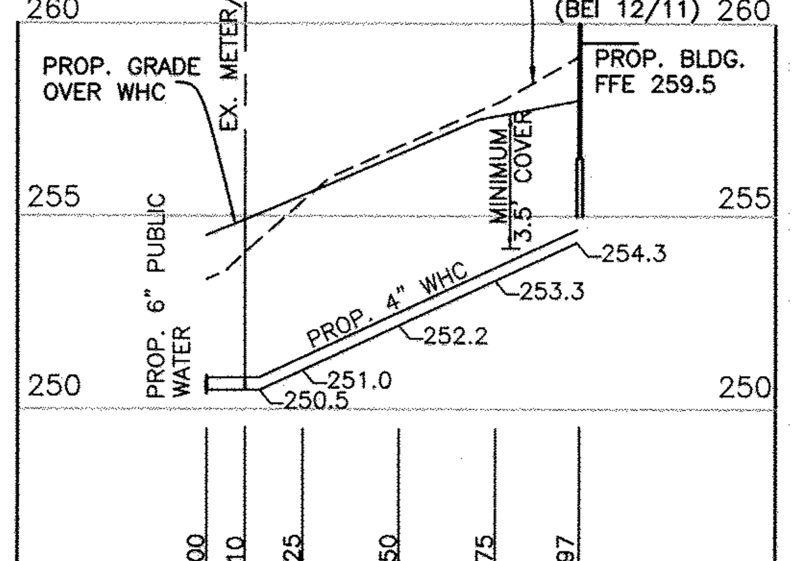
The Forest Conservation Oligations for this project will be met by:
0.00 ac. of ex. forest retained within an on-site Forest Conservation Easement, and a payment of a fee-in-lieu of planting for the 6,534 square foot obligation at $0.75 per square foot for a total payment of $4,901.00.

OPERATION & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED & MAINTAINED DRY WELLS (M–5)

a. The Owner shall inspect the monitoring wells and structures on a quarterly basis and after every heavy storm event.
b. The Owner shall record the water levels and sediment build up in the monitoring wells over a period of several days to insure trench drainage.
c. The Owner shall maintain a log book to determine the rate at which the facility drains.
d. When the facility becomes clogged so that it does not drain down within a seventytwo (72) hour time period, corrective action shall be taken.
e. The maintenance log book shall be available to Howard County for inspection to insure compliance with operation and maintenance criteria.
f. Once the performance characteristics of the infiltration facility have been verified, the monitoring schedule can be reduced to an annual basis unless the performance data indicates that a more frequent schedule is required.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED & MAINTAINED PERMEABLE PAVEMENT (A–2)

1. Pavement surfaces should be swept and vacuumed (if porous concrete) to reduce sediment accumulation and ensure continued surface porosity. Sweeping should be performed at least twice annually with a commercial cleaning unit. Washing or compressed air units should not be used to perform surface cleaning.
2. Drainage pipes, inlets, stone edge drains and other structures within or draining to the subbase should be cleaned out at regular intervals.
3. Deicers should be used in moderation. Deicers should be non-toxic and be applied either as calcium magnesium acetate or as pretreated salt. Snow plowing should be done carefully with blades set one-inch above the surface. Plowed snow piles and snowmelt should not be directed to permeable pavement.



WATER HOUSE CONNECTION PROFILE
1"=50' HORIZONTAL
1"=5' VERTICAL

PLEASE NOTE THAT THIS REVISION SUPERSEDES THE PREVIOUS SHEET DATED NOVEMBER, 2014

DEVELOPER'S/BUILDER'S CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION OF A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE-YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

[signature] for
LUIS RIVERA, MEMBER

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 5-29-15
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 5/26/15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

ACTING W. A. Mackey Jr. 5-28-2015
DIRECTOR — DATE

PROJECT:	8594 OLD DORSEY RUN ROAD	DATE:	12/4/2014
	PRACTICES AND SIZING		
	Pe: 2.1 inches		

BIORETENTION FACILITIES (M-6)

FACILITY	Drainage Area	Impervious	I (%)	Rv	ESDv (cf)	75% ESDv (cf)	Volume Stored	Volume treated (V/0.75)	Pe Treated
MB-1	23586	20014	85%	0.814	3358.6	2518.9	2535 cf	3380 cf	2.11
						TOTAL:	2535 cf	3380 cf	

DRYWELL FACILITIES (M-5)

FACILITY	Drainage Area	Impervious	I (%)	Rv	ESDv (cf)	Depth	Porosity	Width	Length	Volume Stored	Pe Treated
1	1000	1000	100%	0.950	166.3	5.0	0.40	9.1	9.1	165.62	2.09
2	1000	1000	100%	0.950	166.3	5.0	0.40	9.1	9.1	165.62	2.09
3	1029	1029	100%	0.950	171.1	5.0	0.40	5	17	170	2.09
								TOTAL:	501.24 cf		

PERMEABLE PAVEMENT (A-2)

FACILITY	MDE Type	Total DA	Impervious Area	Rv	Area (SF) Provided	Area (SF) OK?	Stone Depth	ESDv (CF) Total	ESDv (CF) Required	ESDv (CF) Provided	Pe Treated	Additional Permeable Pavement Computations: Area 2 Rv	Area 2 ESDv
PP-1	A-8	7,355	7,355	0.95	2500	PASS	2.1	1223	1223	1557.1	2.3	0.950	807.1
TOTAL TREATED		7,355	7,355						Total	1,557.1			
			Pervious Pavement		2500								

MATERIALS & SPECIFICATIONS FOR MICRO–BIORETENTION

MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS	SEE APPENDIX A; TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.0' TO 4.0' DEEP)	LOAMY SAND 60–65% COMPOST 35–40% OR SANDY LOAM 30% COARSE SAND 30% & COMPOST 40%	N/A	USDA SOIL TYPES: LOAMY SAND OR SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN 10% BY DRY WEIGHT ASTM D 2974		
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM, NO PINE OR WOOD CHIPS
GEOTEXTILE (CLASS "C")		N/A	PE TYPE 1 NONWOVEN
GEOTEXTILE (1/4" WIRE MESH)		1/4" WIRE MESH	1/4" WIRE MESH
UNDERDRAIN GRAVEL	AASHTO M–43	NO. 57 OR NO. 6 0.375" TO 0.750"	
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M–278	4" TO 6" RIGID SCH.40 PVC OR SDR35	3/8" PERF. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES. PIPE SHALL BE WRAPPED WITH 1/4–INCH GALVANIZED HARDWARE CLOTH

NO.	DATE	REVISION
2	10-29-15	CHANGE BUILDING FOOTPRINT/LOCATION & ADJUST HANDICAP RAMP ACCESS ROUTE
1	3–19–15	CHANGE BUILDING, WALLS AND SWM PRACTICES

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410–465–6105 (F) 410–465–6644
WWW.BEI–CIVILENGINEERING.COM

3/25/15
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. 45577, Expiration Date: 06-08-2016.

OWNER/DEVELOPER:

L&R BUILDINGS, LLC
11404 GALT AVENUE
SILVER SPRING, MD 20902
717–600–6171
ATT: LUIS RIVERA
240–372–2283

L&R BUILDINGS

TAX MAP: 48, GRID: 14, PARCEL: 22
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

REVISED SITE DEVELOPMENT PLAN
LANDSCAPE PLAN, STORMWATER MANAGEMENT NOTES AND DETAILS, WATER AND SEWER HOUSE CONNECTION PROFILES

DATE: ~~NOVEMBER, 2014~~ MARCH, 2015 — PROJECT NO. 2437

DESIGN: AAM — DRAFT: EDD — CHECK:

SCALE: 1" = 30' — SHEET 2 OF 6

SDP-13-003

AS-BUILT

J:\2437\dwg\1000 redline for perm pvmt.dwg, SDP SHT 2, 3/23/2015 9:28:29 AM, bdodson

SEDIMENT CONTROL NOTES

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION. (313-1850).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL" REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SEC. 51) SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:

TOTAL AREA OF SITE	1.00	ACRES
AREA DISTURBED	1.08	ACRES
AREA TO BE ROOFED OR PAVED	0.80	ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.28	ACRES
TOTAL CUT	1103	CY
TOTAL FILL	2832	CY

* CUT/FILL QUANTITIES ARE FOR SEDIMENT CONTROL PURPOSES ONLY. CONTRACTOR SHALL PERFORM THEIR OWN EARTHWORK CALCULATIONS FOR SITE BALANCING.

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

Definition: A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose: To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria: 1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.

2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.

3. Runoff from the stockpile area must drain to a suitable sediment control practice.

4. Access the stockpile area from the upgrade side.

5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.

6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.

7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.

8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impervious sheeting.

Maintenance: The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

H-5 STANDARDS AND SPECIFICATIONS FOR DUST CONTROL

Definition: Controlling the suspension of dust particles from construction activities.

Purpose: To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and traffic hazards.

Conditions Where Practice Applies: Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications:

1. Mulches: See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
2. Vegetative Cover: See Section B-4-4 Temporary Stabilization.
3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment that may produce the desired effect.
4. Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
5. Barriers: Solid board fences, silt fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
6. Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority.

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION
48 HOURS PRIOR TO START OF CONSTRUCTION
1. OBTAIN GRADING PERMIT. (DAY 1)
2. INSTALL STABILIZED CONSTRUCTION ENTRANCE AND SUPER SILT FENCES. (DAY 2-4)
3. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, BRING SITE TO GRADE AND STABILIZE IN ACCORDANCE WITH TEMPORARY SEEDBED NOTES. UTILIZE DUST CONTROL METHODS. (DAY 5-20)
4. INSTALL STORM DRAINS, UTILITIES, FINAL GRADE AND PAVING. INSTALL PERMEABLE PAVING ONLY AFTER THE STORM DRAIN AND CURB AND GUTTER IS INSTALLED. (DAY 21-60)
5. WHEN CONTRIBUTING AREAS TO MICRO-BIORETENTION FACILITY ARE STABILIZED, INSTALL PLANTING SOIL, EROSION CONTROL MATTING AND PERMANENT SEEDING. (DAY 61-66)
6. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL DEVICES, AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES. (DAY 67-70)

SOILS LEGEND

MAP SYMBOL	SOIL SYMBOL	SOIL TYPE
SrC	B	SASSAFRAS AND CROOM SOIL, 5 TO 10 PERCENT SLOPES
EbC	A	EVESBORO LOAMY SAND, 2 TO 10 PERCENT SLOPES
UtD	D	URBAN LAND – UDORTHENTS COMPLEX, 0 TO 15 PERCENT SLOPES

TAKEN FROM HOWARD COUNTY SOILS SURVEY, ISSUED MAY 2008, MAP NO. 25

STORM DRAIN DRAINAGE AREA DATA

INLET NO.	ZONING	AREA (AC)	'C' FACTOR	% IMPERVIOUS
I-1 = MB-1	M-2	0.57	0.77	86
I-2 = MB-2	M-2	0.23	0.68	74
EX. INLET	M-2	0.44	0.31	23
T-1	M-2	0.15	0.80	92

ENGINEER'S CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

ENGINEER — DATE 3/25/15

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

DEVELOPER — for L&R Buildings — DATE 4/8/15

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 4/14/15

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5-28-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/26/15

ACTING DIRECTOR — DATE 5-28-2015

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

A. Soil Preparation

1. Temporary Stabilization
   a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
   b. Apply fertilizer and lime as prescribed on the plans.
   c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
   a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
   i. Soil pH between 6.0 and 7.0.
   ii. Soluble salts less than 500 parts per million (ppm).
   iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
   iv. Soil contains 1.5 percent minimum organic matter by weight.
   v. Soil contains sufficient pore space to permit adequate root penetration.
   b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
   c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
   d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
   e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment operating on the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unfavorable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
   a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
   b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
   c. The subsoil or soil to be vegetated contains material toxic to plant growth.
   d. The soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
   a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil shall not consist of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
   b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
   c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
6. Topsoiling Application
   a. Erosion and sediment control practices must be maintained when applying topsoil.
   b. Uniformly distribute topsoil in a 4 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
   c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)

1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200–400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

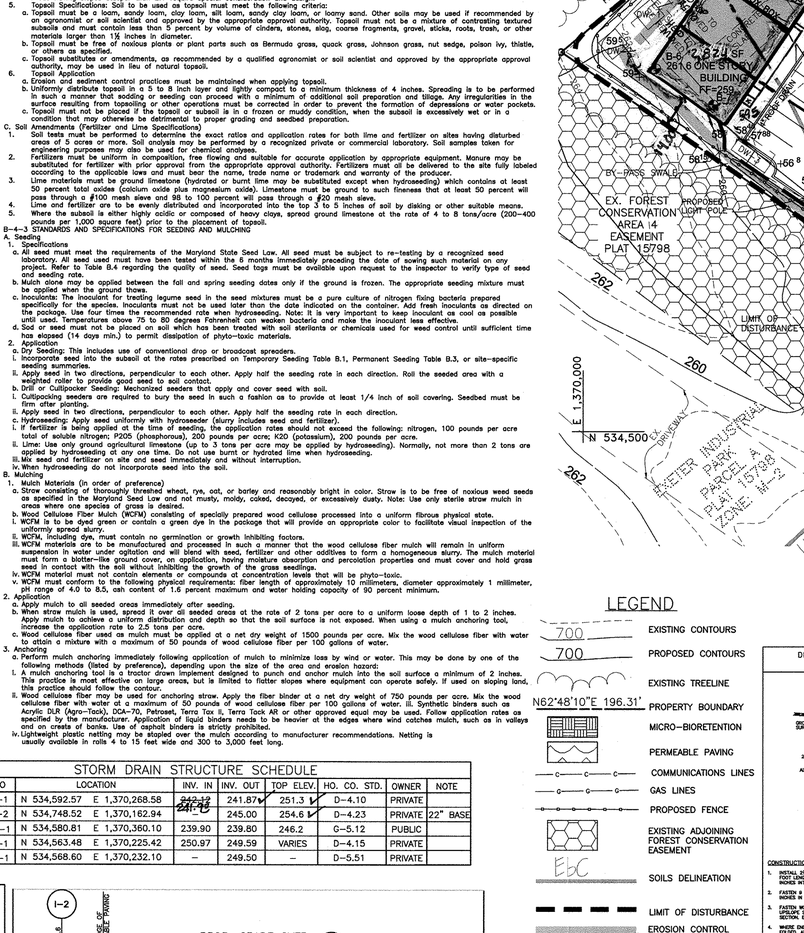
A. Seeding

1. Specifications
   a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
   b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
   c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
   d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
2. Application
   a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
   i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
   ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
   b. Drill or Cultipacker Seeding: Mechanical seeders that apply and cover seed with soil.
   i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
   ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
   c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
   i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P205 (phosphorous), 200 pounds per acre; K20 (potassium), 200 pounds per acre.
   ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
   iii. Mix seed and fertilizer on site and seed immediately and without interruption.
   iv. When hydroseeding do not incorporate seed into the soil.

B. Mulching

1. Mulch Materials (in order of preference)
   a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland State Seed Law and is to be mostly stalk, decayed, or excessively chaffy. Note: Use only sterile straw mulch in areas where one species of grass is desired.
   b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
   i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
   ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
   iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
   iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
   v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
   a. Apply mulch to all seeded areas immediately after seeding.
   b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution of cover, such that the soil surface is not exposed. When using a mulch blowing tool, increase the application rate to 2.5 tons per acre.
   c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring
   a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
   i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
   ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water. iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
   iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

NO	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.	OWNER	NOTE
I-1	N 534,592.57 E 1,370,268.58	~~242.19~~ 241.49	241.87	251.3	D-4.10	PRIVATE	
I-2	N 534,748.52 E 1,370,162.94		245.00	254.6	D-4.23	PRIVATE	22" BASE
M-1	N 534,580.81 E 1,370,360.10	239.90	239.80	246.2	G-5.12	PUBLIC	
T-1	N 534,563.48 E 1,370,225.42	250.97	249.59	VARIES	D-4.15	PRIVATE	
E-1	N 534,568.60 E 1,370,232.10	–	249.50	–	D-5.51	PRIVATE	


I-2
I-1
M-1
EX. INLET
PROP. GRADE OVER STORM DRAIN
EDGE OF PERMEABLE PAVING
PERMEABLE PAVING
EDGE OF PAVING
T/P=253.3 INVERT 250.0
T/P=246.2
HGL
TP
1.12' CLR.
EX. GRADE OVER STORM DRAIN
EX. OUTFALL
EX. WHC
HGL@ TOP OF PIPE (TYP)
BASE OF I-2 IS TO BE 22" THICK TO PREVENT FLOATATION
PRIVATE 15" HDPE @ 3.84% Q10=1.35 cfs Vf=1.10 fps Va=8.09 fps Sf=0.04%
PRIVATE 18" HDPE @ 5.0% Q10=4.34 cfs Vf=2.46 fps Va=10.15 fps Sf=0.17%
PUBLIC 18" HDPE @ 5.0% Q=4.34 cfs Vf=2.46 fps Va=10.15 fps Sf=0.17%
EX. 18" RCP @ 2.2% Q=5.22 cfs Vf=2.95 fps Va=7.94 fps Sf=0.25%
I-2 TO EX. OUTFALL STORM DRAIN PROFILES
1"=50' HORIZONTAL
1"=5' VERTICAL
249.33
247.50
242.12
241.87
239.90
238.93
250
240
230
260
245
255.0
T/P=254.6
T/P=251.3
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SPECIFICATIONS
MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 DESCRIPTION

A. WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTION OF A MODULAR RETAINING WALL SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN, AND DIMENSIONS SHOWN ON THE PLANS.

B. WORK INCLUDES PREPARING FOUNDATION SOIL, FURNISHING AND INSTALLING LEVELING PAD, UNIT DRAINAGE FILL AND BACKFILL TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS.

C. WORK INCLUDES FURNISHING AND INSTALLING GEOGRID SOIL REINFORCEMENT OF THE TYPE, SIZE, LOCATION, AND LENGTHS DESIGNATED ON THE CONSTRUCTION DRAWINGS.

1.02 DELIVERY, STORAGE AND HANDLING

A. CONTRACTOR SHALL CHECK ALL MATERIALS UPON DELIVERY TO ASSURE THAT THE PROPER TYPE, GRADE, COLOR, AND CERTIFICATION HAS BEEN RECEIVED.

B. CONTRACTOR SHALL PROTECT ALL MATERIALS FROM DAMAGE DUE TO JOB SITE CONDITIONS AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. DAMAGED MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK.

PART 2: PRODUCTS

2.01 MODULAR CONCRETE RETAINING WALL UNITS

A. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING ARCHITECTURAL REQUIREMENTS:

FACE COLOR - COLOR MAY BE SPECIFIED BY THE OWNER.

FACE FINISH - SCULPTURED ROCK FACE IN ANGULAR TRI-PLANER OR FLAT CONFIGURATION. OTHER FACE FINISHES WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF OWNER.

BOND CONFIGURATION - RUNNING WITH BONDS NOMINALLY LOCATED AT MIDPOINT VERTICALLY ADJACENT UNITS, IN BOTH STRAIGHT AND CURVED ALIGNMENTS.

EXPOSED SURFACES OF UNITS SHALL BE FREE OF CHIPS, CRACKS OR OTHER IMPERFECTIONS WHEN VIEWED FROM A DISTANCE OF 10 FEET UNDER DIFFUSED LIGHTING.

B. MODULAR CONCRETE MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C1372 - STANDARD SPECIFICATIONS FOR SEGMENTAL RETAINING WALL UNITS.

C. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING STRUCTURAL AND GEOMETRIC REQUIREMENTS MEASURED IN ACCORDANCE WITH APPROPRIATE REFERENCES:

COMPRESSIVE STRENGTH = 3000 PSI MINIMUM; ABSORPTION = 8% MAXIMUM (6% IN NORTHERN STATES) FOR STANDARD WEIGHT AGGREGATES;

DIMENSIONAL TOLERANCES = ±1/8" FROM NOMINAL UNIT DIMENSIONS NOT INCLUDING ROUGH SPLIT FACE, ±1/16"

UNIT HEIGHT - TOP AND BOTTOM PLANES; UNIT SIZE - 8" (H) X 18" (W) X 12 (D) MINIMUM;

UNIT WEIGHT - 75 LBS/UNIT MINIMUM FOR STANDARD WEIGHT AGGREGATES;

INTER-UNIT SHEAR STRENGTH - 1000 PLF MINIMUM AT 2 PSI NORMAL PRESSURE; AT 2 PSI NORMAL FORCE.

GEOGRID/UNIT PEAK CONNECTION STRENGTH - 1000 PLF MINIMUM

D. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING CONSTRUCTABILITY REQUIREMENTS: (IF APPLICABLE)

VERTICAL SETBACK = 1/8"± PER COURSE (NEAR VERTICAL) OR 1"± PER COURSE PER THE DESIGN; ALIGNMENT AND GRID POSITIONING MECHANISM - FIBERGLASS PINS, TWO PER UNIT MINIMUM;

MAXIMUM HORIZONTAL GAP BETWEEN ERECTED UNITS SHALL BE - 1/2 INCH.

2.02 SHEAR CONNECTORS (IF APPLICABLE)

A. SHEAR CONNECTORS SHALL BE 1/2 INCH DIAMETER THERMOSET ISOPTHALIC POLYESTER RESIN-PROTRUDED FIBERGLASS REINFORCEMENT RODS OR EQUIVALENT TO PROVIDE CONNECTION BETWEEN VERTICALLY AND HORIZONTALLY ADJACENT UNITS. STRENGTH OF SHEAR CONNECTORS BETWEEN VERTICAL ADJACENT UNITS SHALL BE APPLICABLE OVER A DESIGN TEMPERATURE OF 10 DEGREES F TO + 100 DEGREES F. B. SHEAR CONNECTORS SHALL BE CAPABLE OF HOLDING THE GEOGRID IN THE PROPER DESIGN POSITION DURING GRID PRE-TENSIONING AND BACKFILLING.

2.03 BASE LEVELING PAD MATERIAL

A. MATERIAL SHALL CONSIST OF A COMPACTED #57 CRUSHED STONE BASE AS SHOWN ON THE CONSTRUCTION DRAWINGS.

2.04 UNIT DRAINAGE FILL

A. UNIT DRAINAGE FILL SHALL CONSIST OF #57CRUSHED STONE

2.05 REINFORCED BACKFILL

A. REINFORCED BACKFILL SHALL TYPE SM, BE FREE OF DEBRIS AND MEET THE FOLLOWING GRADATION TESTED IN ACCORDANCE WITH ASTM D-422 AND MEET OTHER PROPERTIES SHOWN ON THE PLAN:

SIEVE SIZE	PERCENT PASSING
2 INCH	100-75
3/4 INCH	100-75
NO. 40	0-60
NO. 200	0-35

PLASTICITY INDEX (PI) <10 AND LIQUID LIMIT <35 PER ASTM D-4318.

B. MATERIAL CAN BE SITE EXCAVATED SOILS WHERE THE ABOVE REQUIREMENTS CAN BE MET. UNSUITABLE SOILS FOR BACKFILL (HIGH PLASTIC CLAYS OR ORGANIC SOILS) SHALL NOT BE USED IN THE REINFORCED SOIL MASS.

2.06 GEOGRID SOIL REINFORCEMENT

A. GEOSYNTHETIC REINFORCEMENT SHALL CONSIST OF GEOGRIDS MANUFACTURED SPECIFICALLY FOR SOIL REINFORCEMENT APPLICATIONS AND SHALL BE MANUFACTURED FROM HIGH TENACITY POLYESTER YARN.

2.07 DRAINAGE PIPE

A. THE DRAINAGE PIPE SHALL BE PERFORATED CORRUGATED HDPE PIPE MANUFACTURED IN ACCORDANCE WITH ASTM D-1248.

PART 3 EXECUTION

3.01 EXCAVATION

A. CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. OWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR INSPECTING AND APPROVING THE EXCAVATION PRIOR TO PLACEMENT OF LEVELING MATERIAL OR FILL SOILS.

3.02 BASE LEVELING PAD

A. LEVELING PAD MATERIAL SHALL BE PLACED TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS, TO A MINIMUM THICKNESS OF 6 INCHES AND EXTEND LATERALLY A MINIMUM OF 6" IN FRONT AND BEHIND THE MODULAR WALL UNIT.

B. LEVELING PAD SHALL BE PREPARED TO INSURE FULL CONTACT TO THE BASE SURFACE OF THE CONCRETE UNITS.

3.03 MODULAR UNIT INSTALLATION

A. FIRST COURSE OF UNITS SHALL BE PLACED ON THE LEVELING PAD AT THE APPROPRIATE LINE AND GRADE. ALIGNMENT AND LEVEL SHALL BE CHECKED IN ALL DIRECTIONS AND INSURE THAT ALL UNITS ARE IN FULL CONTACT WITH THE BASE AND PROPERLY SEATED.

B. PLACE THE FRONT OF UNITS SIDE-BY-SIDE. DO NOT LEAVE GAPS BETWEEN ADJACENT UNITS. LAYOUT OF CORNERS AND CURVES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

C. INSTALL SHEAR/CONNECTING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.

D. PLACE AND COMPACT DRAINAGE FILL WITHIN AND BEHIND WALL UNITS. PLACE AND COMPACT BACKFILL SOIL BEHIND DRAINAGE FILL. FOLLOW WALL ERECTION AND DRAINAGE FILL CLOSELY WITH STRUCTURE BACKFILL.

E. MAXIMUM STACKED VERTICAL HEIGHT OF WALL UNITS. PRIOR TO UNIT DRAINAGE FILL AND BACKFILL PLACEMENT AND COMPACTION, SHALL NOT EXCEED THREE COURSES.

3.04 STRUCTURAL GEOGRID INSTALLATION

A. GEOGRID SHALL BE ORIENTED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL ALIGNMENT.

B. GEOGRID REINFORCEMENT SHALL BE PLACED AT THE STRENGTHS, LENGTHS, AND ELEVATIONS SHOWN ON THE CONSTRUCTION DESIGN DRAWINGS OR AS DIRECTED BY THE ENGINEER.

C. THE GEOGRID SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL AND ATTACHED TO THE MODULAR WALL UNITS. PLACE THE NEXT COURSE OF MODULAR CONCRETE UNITS OVER THE GEOGRID. THE GEOGRID SHALL BE PULLED TAUT, AND ANCHORED PRIOR TO BACKFILL PLACEMENT ON THE GEOGRID.

D. GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTHS AND PLACED SIDE-BY-SIDE TO PROVIDE 100% COVERAGE AT EACH LEVEL. SPLICED CONNECTIONS BETWEEN SHORTER PIECES OF GEOGRID OR GAPS BETWEEN ADJACENT PIECES OF GEOGRID ARE NOT PERMITTED.

3.05 REINFORCED BACKFILL PLACEMENT

A. REINFORCED BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK IN THE GEOGRID AND INSTALLATION DAMAGE.

B. REINFORCED BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES WHERE HAND COMPACTION IS USED, OR 8 - 10 INCHES WHERE HEAVY COMPACTION EQUIPMENT IS USED. LIFT THICKNESS SHALL BE DECREASED TO ACHIEVE THE REQUIRED DENSITY AS REQUIRED.

C. REINFORCED BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM D698. THE MOISTURE CONTENT OF THE BACKFILL MATERIAL PRIOR TO AND DURING COMPACTION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT EACH LAYER AND SHALL BE + 3% TO - 3% OF OPTIMUM.

D. ONLY LIGHTWEIGHT HAND-OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET FROM THE TAIL OF THE MODULAR CONCRETE UNIT.

E. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY UPON THE GEOGRID REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TRACKED VEHICLE TURNING SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING THE GEOGRID.

F. RUBBER TIRED EQUIPMENT MAY PASS OVER GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

G. AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LIFT OF REINFORCED BACKFILL AWAY FROM THE WALL UNITS TO DIRECT RUNOFF AWAY FROM WALL FACE. THE CONTRACTOR SHALL NOT ALLOW SURFACE RUNOFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION SITE.

3.06 CAP INSTALLATION

A. CAP UNITS SHALL BE GLUED TO UNDERLYING UNITS WITH AN ALL-WEATHER ADHESIVE RECOMMENDED BY THE MANUFACTURER.

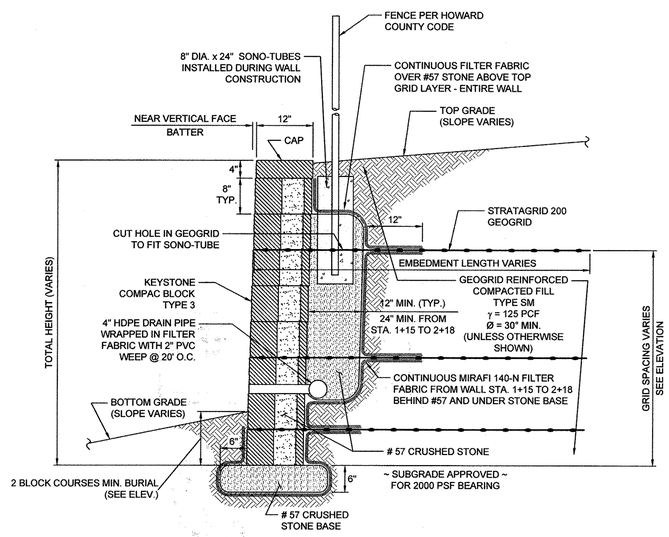
3.07 FIELD QUALITY CONTROL

A. THE OWNER SHALL ENGAGE INSPECTION AND TESTING SERVICES, INCLUDING INDEPENDENT LABORATORIES, TO PROVIDE QUALITY ASSURANCE AND TESTING SERVICES DURING CONSTRUCTION.

B. AS A MINIMUM, QUALITY ASSURANCE TESTING SHOULD INCLUDE FOUNDATION SOIL INSPECTION, SOIL AND BACKFILL TESTING, VERIFICATION OF DESIGN PARAMETERS, AND OBSERVATION OF CONSTRUCTION FOR GENERAL COMPLIANCE WITH DESIGN DRAWINGS AND SPECIFICATIONS.

HOWARD COUNTY GENERAL NOTES:

1. No trees shall be planted within 10 feet of the top of the retaining wall.
2. Retaining walls shall only be constructed under the observation of a registered professional engineer and a (NICET, WACEL, or equiv.) certified soils technician.
3. The required bearing pressure beneath the wall system shall be verified in the field by a certified soils technician. Testing documentation must be provided to the Howard County Inspector prior to start of construction. The required bearing test shall be the Dynamic Cone Penetrometer test ASTM STP-399.
4. The suitability of fill material shall be confirmed by the on-site soils technician. Each 8" lift must be compacted to a minimum 95% standard proctor density and the testing report shall be made available to the Howard County Inspector upon completion of construction.
5. Walls shall not be constructed on uncertified fill materials.
6. Walls shall not be constructed within a Howard Co. right-of-way or easement.



TYPICAL MODULAR BLOCK WALL SECTION
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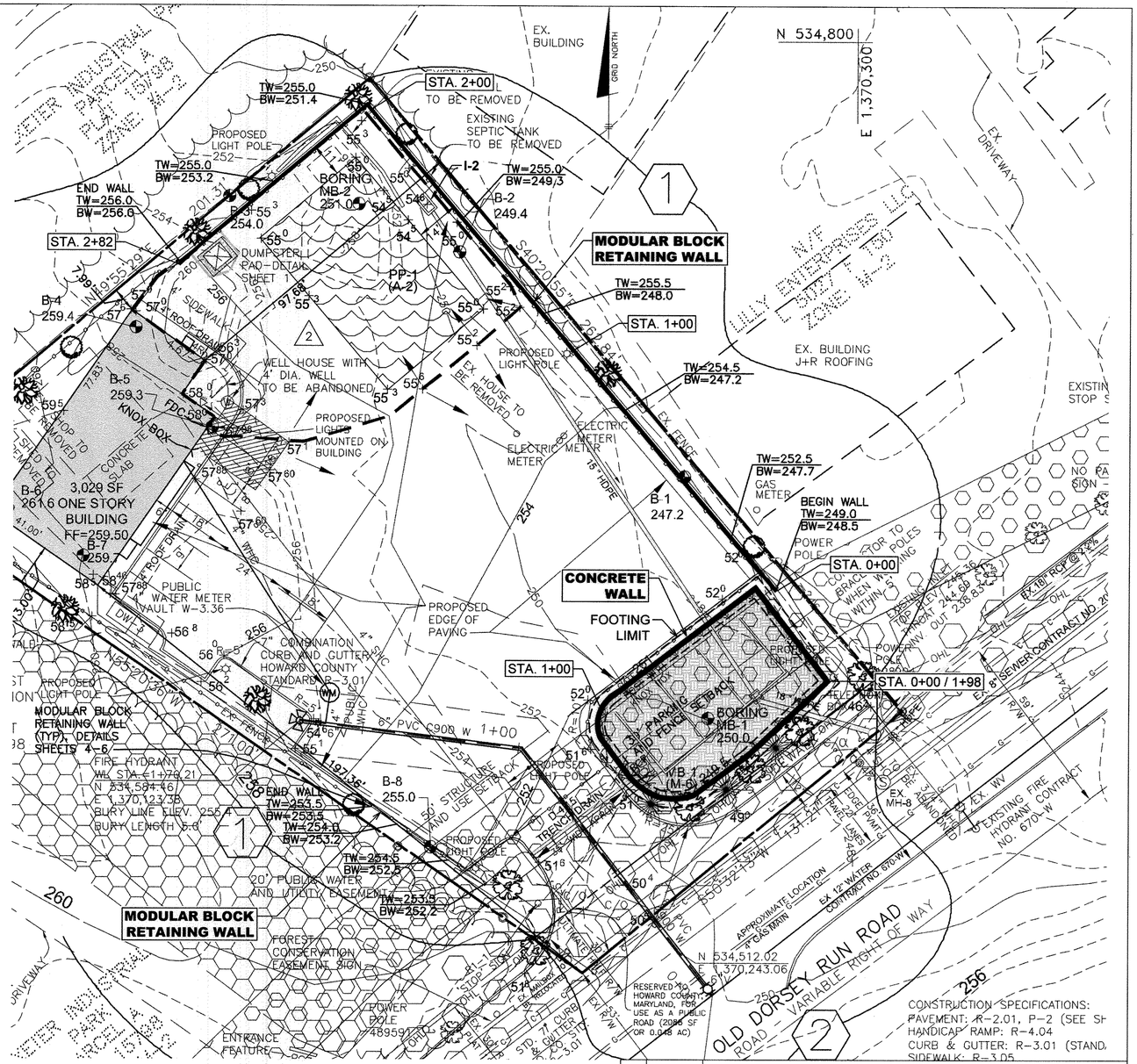


RETAINING WALL LOCATION PLAN
1" = 20'

"NO AS-BUILT INFORMATION" SHOWN ON THIS PLAN

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. 21443 Expiration Date: 12-21-15

NO.	DATE	REVISION
2	05/08/15	RELOCATE POROUS PAVEMENT AREA
1	12/12/14	REPLACEMENT SHEET – REVISE PERIMETER WALL & ADD SWM CONCRETE WALL

HILLIS-CARNES ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A Annapolis Junction, Maryland
(410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098

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. 14434, Expiration Date: 05/13/2017.

OWNER/DEVELOPER:

L&R BUILDINGS, LLC
11404 GALT AVENUE
SILVER SPRING, MD 20902
717-600-6171
ATT: LUIS RIVERA
240-372-2283

L&R BUILDINGS
L. 13356 F. 0464

TAX MAP: 48, GRID: 14, PARCEL: 22
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

REVISED SITE DEVELOPMENT PLAN
RETAINING WALL LOCATION PLAN
AND MODULAR BLOCK WALL
CONSTRUCTION DETAILS

DESIGN: JJC/RWS | DRAFT: HM | CHECK: JJC | DATE: DECEMBER 2014 | SCALE: AS SHOWN | PROJECT NO. 12341A | SHEET 4 OF 6

APPROVED: DEPARTMENT OF PLANNING AND ZONING

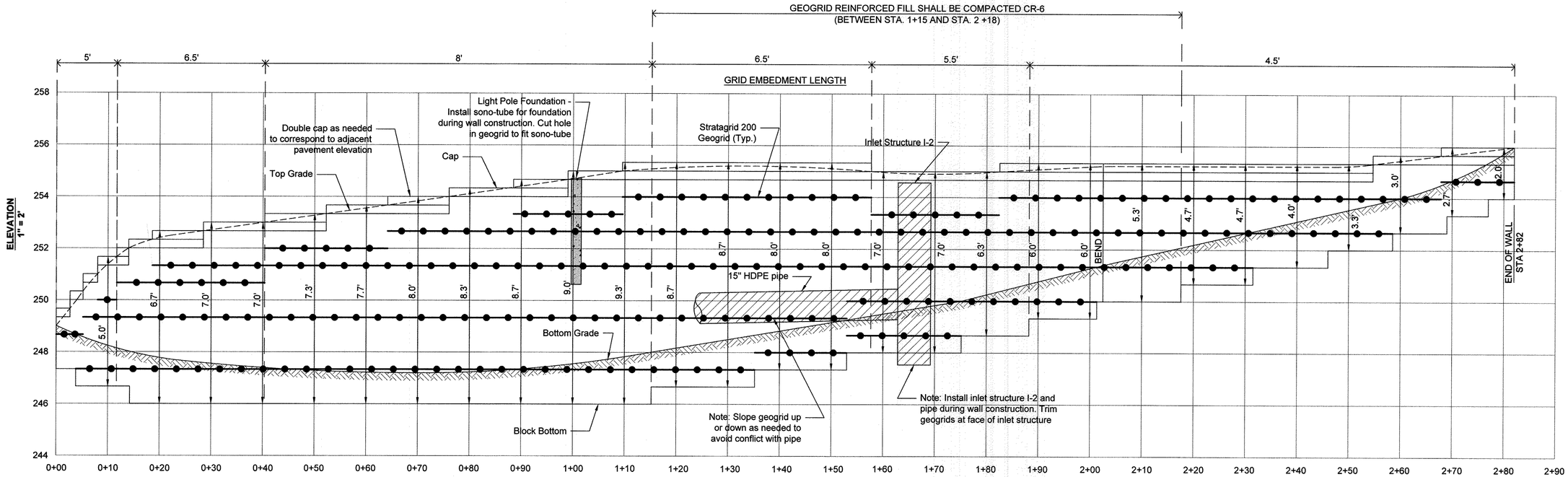
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5-28-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/28/15

ACTING DIRECTOR W. A. Mackey Jr. — DATE 5-28-2015

AS-BUILT

SDP-13-003



MODULAR BLOCK RETAINING WALL ELEVATION

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5-28-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/29/15

ACTING DIRECTOR — DATE 5-28-2015

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. 21443 Expiration Date: 12-21-13

12-12-13

AS-BUILT INFORMATION SHOWN ON THIS PLAN

NO.	DATE	REVISION
1	12/12/14	REPLACEMENT SHEET – REVISE PERIMETER WALL & ADD SWM CONCRETE WALL

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A Annapolis Junction, Maryland
(410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098

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L. 13356 F. 0464

TAX MAP: 48, GRID: 14, PARCEL: 22
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

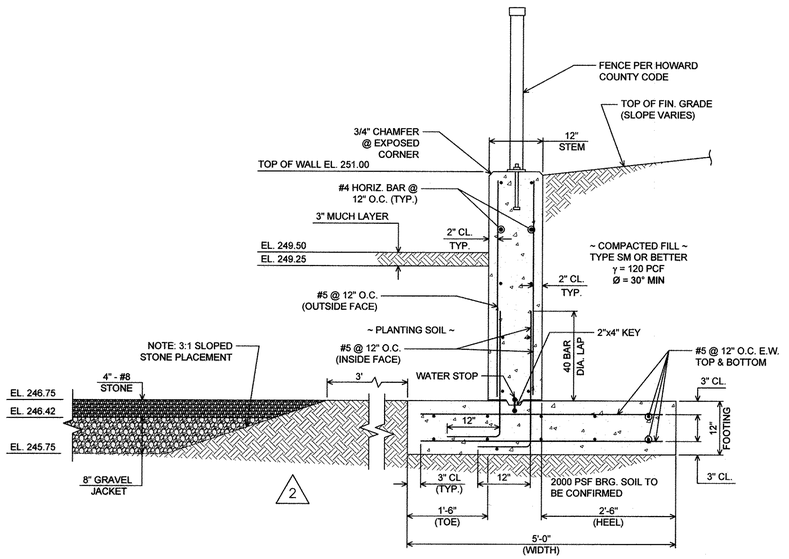
REVISED SITE DEVELOPMENT PLAN
MODULAR BLOCK RETAINING WALL ELEVATION

DATE: DECEMBER 2014 PROJECT NO. 12341A

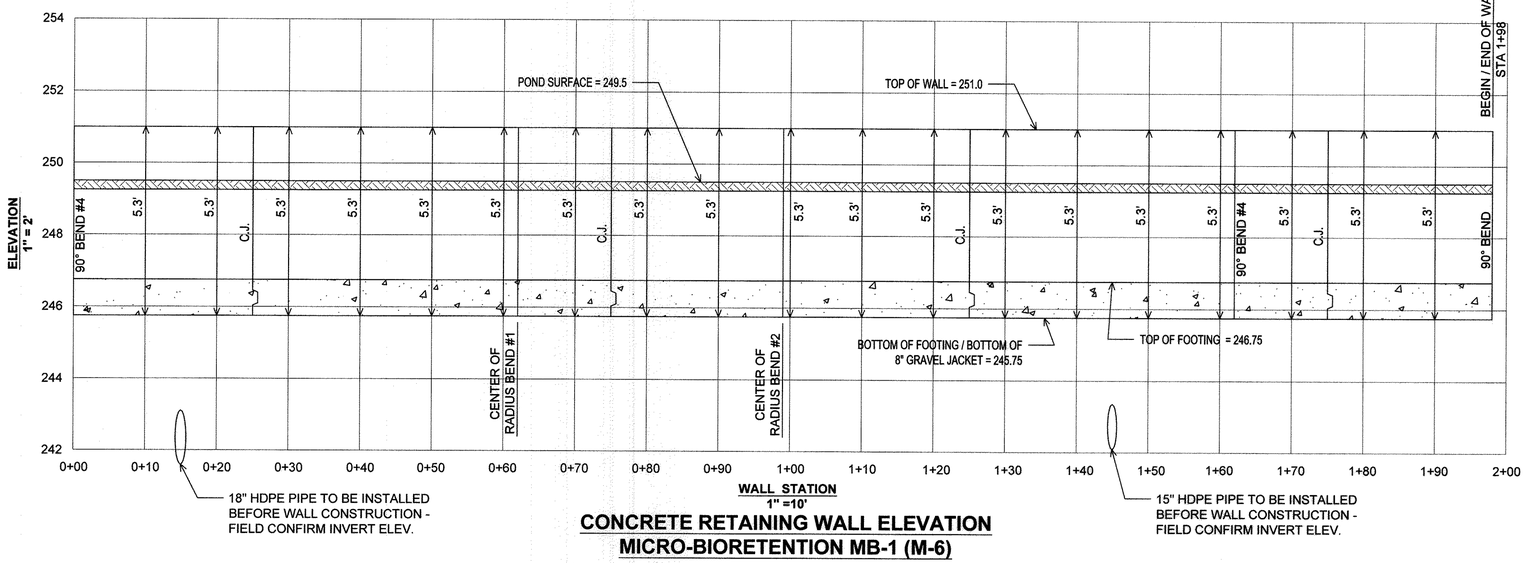
DESIGN:JJC/RWS DRAFT: HM CHECK: JJC SCALE: AS SHOWN SHEET 5 OF 6

AS-BUILT

SDP-13-003



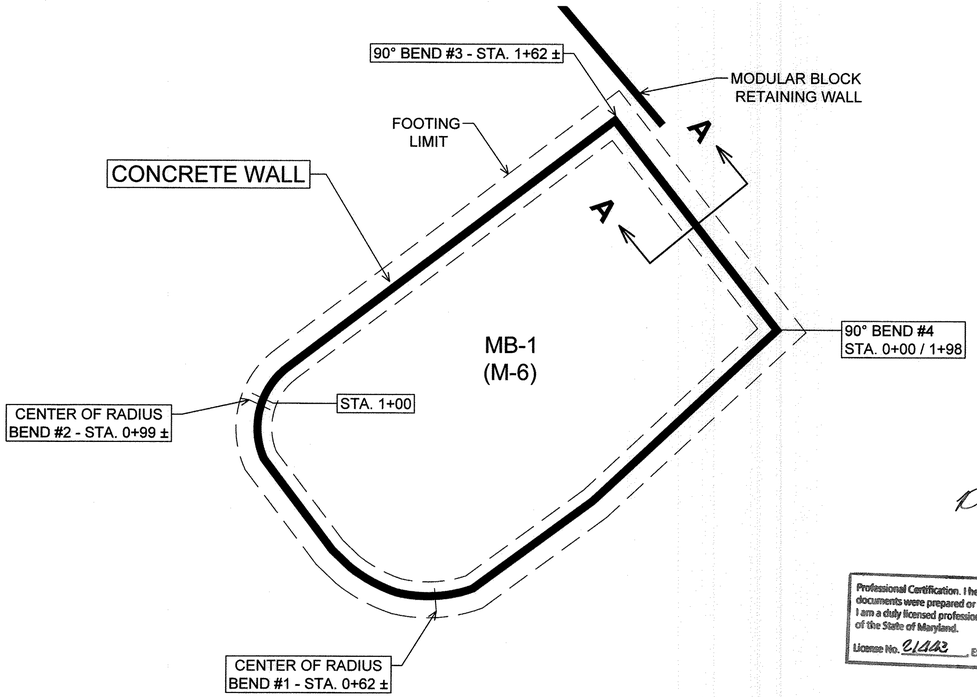
CONCRETE WALL - SECTION A-A (TYP.)
MICRO-BIORETENTION MB-1 (M-6)
3/4" = 1'-0"



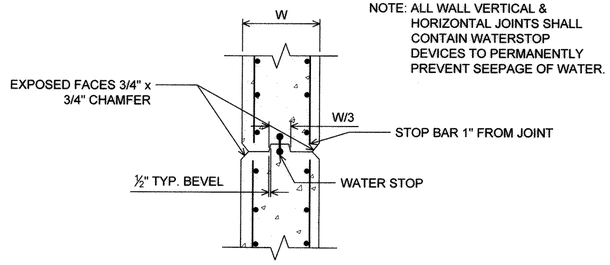
CONCRETE RETAINING WALL ELEVATION
MICRO-BIORETENTION MB-1 (M-6)

GENERAL NOTES:

1. ALL RETAINING WALL CONCRETE SHALL BE 4000 PSI WITH AIR ENTRAINMENT.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 60.
3. CONCRETE WORK SHALL COMPLY WITH THE LATEST ACI 318 BUILDING CODE FOR CONCRETE STRUCTURES.
4. ALL REBAR SPLICES NOT SHOWN SHALL BE A MINIMUM OF 40 BAR DIAM.
5. ALL WALL EXPOSED SURFACES SHALL BE MORTAR PATCHED AND SACK-RUBBED FINISHED WITH GROUT AND BURLAP, (RUB FINISH PER OWNER'S SPECIFICATIONS).
6. ALL DIMENSIONS, ROUNDED BEND CORNERS WITH RADIUS, ANGLES AT BENDS AND LOCATIONS SHALL BE ESTABLISHED FROM BENCHMARK ENGINEERING'S SITE DEVELOPMENT AND GRADING PLAN AND SHALL BE FIELD VERIFIED.
7. REFER TO GEOTECHNICAL EVALUATION FOR SITE PREPARATION AND EARTHWORK RECOMMENDATIONS.
8. RETAINING WALL SHALL ONLY BE CONSTRUCTION UNDER THE OBSERVATION OF A REGISTERED PROFESSIONAL ENGINEER AND A (NICET, WACEL OR EQUIVALENT) CERTIFIED SOILS TECHNICIAN.
9. THE DESIGN BEARING PRESSURE OF 2000 PSF BENEATH THE FOOTING OF THE WALL SHALL BE VERIFIED IN THE FIELD BY A CERTIFIED SOILS TECHNICIAN. TESTING DOCUMENTATION SHALL BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO THE START OF CONSTRUCTION. THE REQUIRED TEST PROCEDURE SHALL BE THE DYNAMIC CONE PENETROMETER TEST ASTM STP-399.
10. THE SUITABILITY OF FILL MATERIAL SHALL BE CONFIRMED BY THE ONSITE SOILS TECHNICIAN. EACH (8) INCH LIFT SHALL BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY (T-99) AND THE TESTING REPORT SHALL BE MADE AVAILABLE TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.



CONCRETE WALL PLAN
MICRO-BIORETENTION MB-1 (M-6)
1" = 10'



CONCRETE WALL STEM VERTICAL CONTRACTION JOINT C.J. DETAIL (PLAN VIEW)
NOT TO SCALE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5-28-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/28/15

ACTING DIRECTOR — DATE 5-28-2015

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. 21443, Expiration Date: 12-21-15

12-2-14

"NO AS-BUILT INFORMATION" SHOWN ON THIS PLAN

NO.	DATE	REVISION
2	05/08/15	PROVIDED OFFSET FOR STORAGE STONE PLACEMENT
1	12/12/14	REPLACEMENT SHEET – REVISE PERIMETER WALL & ADD SWM CONCRETE WALL

HILLIS-CARNES ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A Annapolis Junction, Maryland
(410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098

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. 14434, Expiration Date: 05/13/2017.

OWNER/DEVELOPER:

L&R BUILDINGS, LLC
11404 GALT AVENUE
SILVER SPRING, MD 20902
717-600-6171
ATT: LUIS RIVERA
240-372-2283

L&R BUILDINGS
L. 13356 F. 0464

TAX MAP: 48, GRID: 14, PARCEL: 22
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

REVISED SITE DEVELOPMENT PLAN
CONCRETE RETAINING WALL DETAILS

DATE: DECEMBER 2014 — PROJECT NO. 12341A
DESIGN: JJC/RWS — DRAFT: HM — CHECK: JJC — SCALE: AS SHOWN — SHEET 6 OF 6

AS-BUILT

SDP-13-003