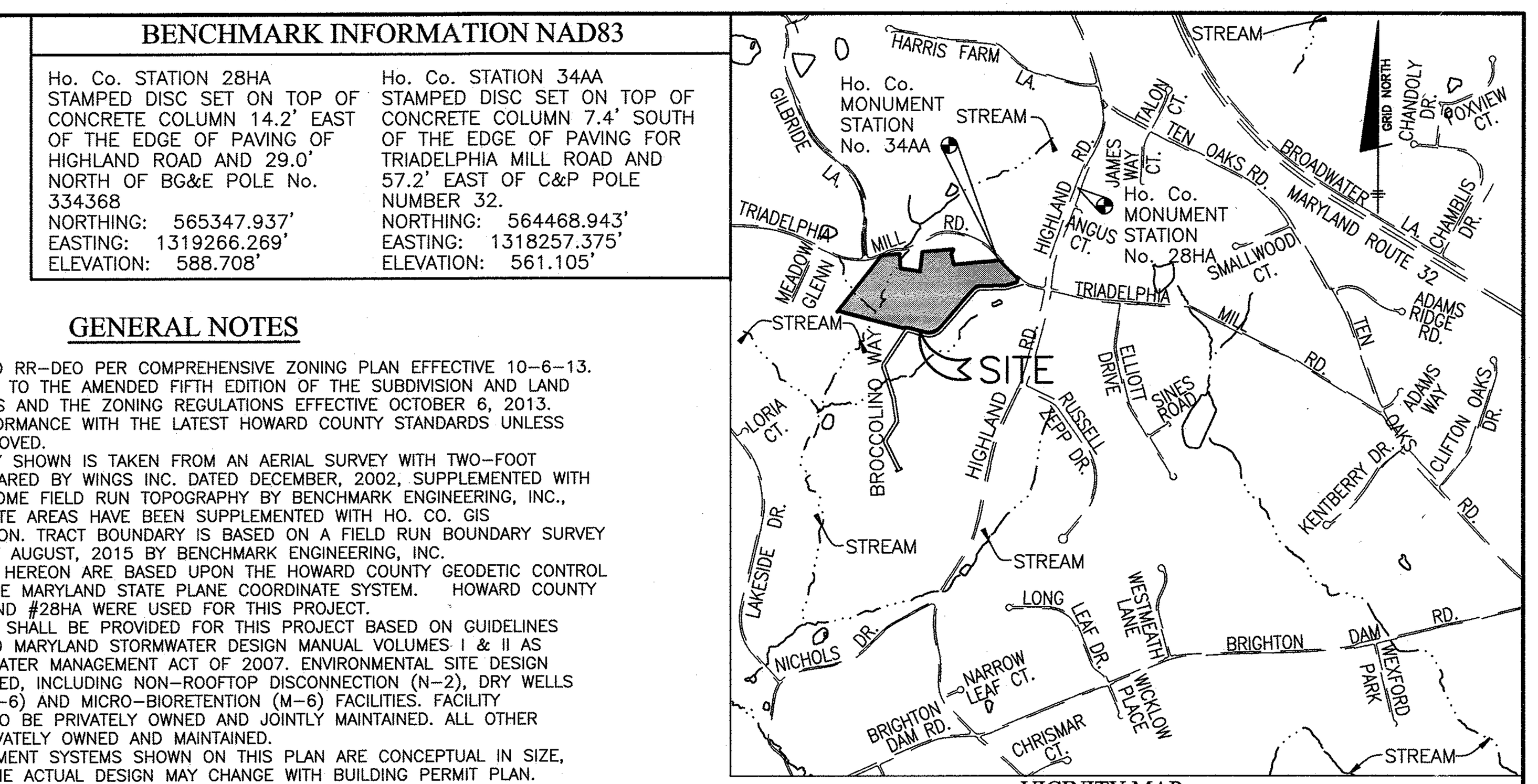
FINAL ROAD CONSTRUCTION PLANS
BRIGHTON MILL II
LOTS 1 THRU 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'E'
5TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

DENSITY EXCHANGE CHART	
RECEIVING PARCEL INFORMATION	TAX MAP 34, GRID 2, PARCEL 16
TOTAL AREA OF SUBDIVISION	29.03 AC
DENSITY UNITS ALLOWED BY RIGHT	29.03 / 4.25 = 6 D.U.
MAXIMUM DEO UNITS ALLOWED	26.22 / 2 = 13 D.U.*
NUMBER OF UNITS PROPOSED	13 (12 LOTS AND 1 BUILDABLE PRESERVATION PARCEL)
CEO DENSITY UNITS TO BE RECEIVED FROM SENDING PARCEL #1	1
SENDING PARCEL #1 INFORMATION	MATTINGLY PROPERTY TAX MAP 14, GRID 1, PARCEL 112
CEO DENSITY UNITS TO BE RECEIVED FROM SENDING PARCEL #2	6
SENDING PARCEL #2 INFORMATION	ROSHAN PROPERTY TAX MAP 15, GRID 17, PARCEL 18

*MAXIMUM DENSITY UNITS ALLOWED AS FOLLOWS:
TOTAL TRACT AREA (29.03 ac.)
FLOODPLAIN AREA (−1.58 ac.)
STEEP SLOPES AREA (−1.68 ac.)
STEEP SLOPES IN FLOODPLAIN (+0.45 ac.)
NET TRACT AREA = 26.22 ac.

BENCHMARK INFORMATION NAD83	
Ho. Co. STATION 28HA STAMPED DISC SET ON TOP OF CONCRETE COLUMN 14.2' EAST OF THE EDGE OF PAVING OF HIGHLAND ROAD AND 29.0' NORTH OF BG&E POLE No. 334368 NORTHING: 565347.937' EASTING: 1319266.269' ELEVATION: 588.708'	Ho. Co. STATION 34AA STAMPED DISC SET ON TOP OF CONCRETE COLUMN 7.4' SOUTH OF THE EDGE OF PAVING FOR TRIADELPHIA MILL ROAD AND 57.2' EAST OF C&P POLE NUMBER 32. NORTHING: 564468.943' EASTING: 1318257.375' ELEVATION: 561.105'

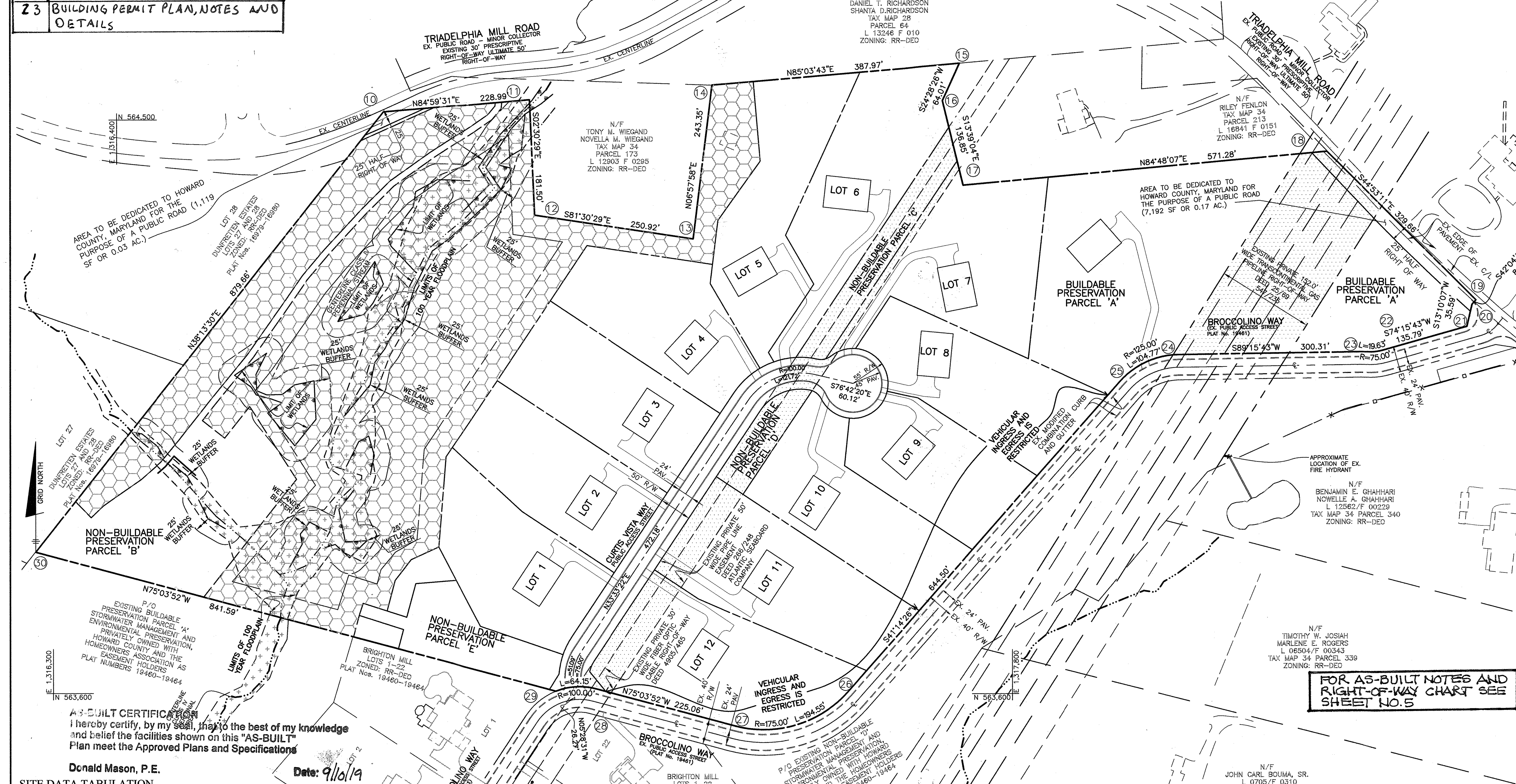


ADC MAP 24 GRID D8

VICINITY MAP
SCALE: 1" = 2000'

GENERAL NOTES

1. SUBJECT PROPERTY ZONED RR-DEO PER COMPREHENSIVE ZONING PLAN EFFECTIVE 10-6-13.
2. THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE OCTOBER 6, 2013.
3. THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
4. THE EXISTING TOPOGRAPHY SHOWN IS TAKEN FROM AN AERIAL SURVEY WITH TWO-FOOT CONTOUR INTERVALS PREPARED BY WINGS INC. DATED DECEMBER, 2002, SUPPLEMENTED WITH RECORD DRAWINGS AND SOME FIELD RUN TOPOGRAPHY BY BENCHMARK ENGINEERING, INC., DATED MAY, 2015. OFF-SITE AREAS HAVE BEEN SUPPLEMENTED WITH HO. CO. GIS TOPOGRAPHICAL INFORMATION. TRACT BOUNDARY IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED ON OR ABOUT AUGUST, 2015 BY BENCHMARK ENGINEERING, INC.
5. 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. #34AA AND #28HA WERE USED FOR THIS PROJECT.
6. STORMWATER MANAGEMENT SHALL BE PROVIDED FOR THIS PROJECT BASED ON GUIDELINES ESTABLISHED BY THE 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUMES I & II AS AMENDED BY THE STORMWATER MANAGEMENT ACT OF 2007. ENVIRONMENTAL SITE DESIGN METHODS SHALL BE UTILIZED, INCLUDING NON-ROOFTOP DISCONNECTION (N-2), DRY WELLS (M-5), BIO-RETENTION (F-6) AND MICRO-BIORETENTION (M-6) FACILITIES. FACILITY BIO-RETENTION BR#1 IS TO BE PRIVATELY OWNED AND JOINTLY MAINTAINED. ALL OTHER FACILITIES ARE TO BE PRIVATELY OWNED AND MAINTAINED.
7. THE STORMWATER MANAGEMENT SYSTEMS SHOWN ON THIS PLAN ARE CONCEPTUAL IN SIZE, SHAPE AND LOCATION. THE ACTUAL DESIGN MAY CHANGE WITH BUILDING PERMIT PLAN.
8. THE WETLANDS DELINEATION FOR THIS PROJECT WAS PREPARED BY ECO-TONE, INC., DATED JULY 16, 2015, AND WAS APPROVED UNDER ECP-16-011 ON 03/28/2016.
9. THE TRAFFIC STUDY FOR THIS PROJECT WAS PREPARED BY THE MARS GROUP, DATED SEPTEMBER, 2015, AND WAS APPROVED WITH THE PRELIMINARY EQUIVALENT SKETCH PLAN ON NOVEMBER 28, 2016.
10. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAM, OR THEIR REQUIRED BUFFERS, 100-YR. FLOODPLAIN, STEEP SLOPES AND FOREST CONSERVATION EASEMENTS.
11. A FOREST STAND DELINEATION WAS PREPARED BY ECO-TONE, INC., DATED AUGUST 10, 2015 AND APPROVED UNDER ECP-16-011 ON 03/28/2016.
12. THE FLOOD STUDY FOR THIS PROJECT WAS PREPARED BY BENCHMARK ENGINEERING, INC., DATED OCTOBER, 2015, AND WAS APPROVED WITH THE PRELIMINARY EQUIVALENT SKETCH PLAN ON 1/20/16.
13. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO CEMETERIES LOCATED ON THIS SITE AND THIS SITE IS NOT LOCATED WITHIN AN HISTORIC DISTRICT.
14. A NOISE STUDY IS NOT REQUIRED FOR THIS DEVELOPMENT.
15. THIS SITE IS NOT LOCATED WITHIN THE METROPOLITAN DISTRICT. WATER AND SEWER WILL BE PRIVATE ON-SITE FACILITIES.
16. PREVIOUS DPZ FILES FOR THIS SITE ARE: F-06-067, ECP-16-011, SP-16-004, WP-16-064, PB-419.
17. THE GEOTECHNICAL ANALYSIS FOR THIS PROJECT WAS COMPLETED BY PERCOLATION TESTING AND WAS APPROVED WITH THE PRELIMINARY EQUIVALENT SKETCH PLAN ON NOVEMBER 28, 2016.
18. COMMUNITY MEETING WAS HELD ON JULY 14, 2015 AT THE 5TH DISTRICT VOLUNTEER FIRE DEPARTMENT.
19. LOTS 11 AND 12 EXCEED 50,000 SF. IN ACCORDANCE WITH SECTION 104.0(E)(1)(C) OF THE ZONING REGULATIONS, LOTS CAN EXCEED 50,000 SF BUT MUST STAY UNDER 60,000 SF IF IT IS NECESSARY TO PROVIDE SWM, SEPTIC RESERVE AREA AND WELLS ON THE LOTS. A DETAILED JUSTIFICATION HAS BEEN PROVIDED TO THE DEPARTMENT OF PLANNING AND ZONING FOR WHY EACH OF THESE LOTS EXCEEDS 50,000 SQUARE FEET.
20. [hatched symbol] THIS AREA DESIGNATES A PRIVATE SEWAGE AREA OF AT LEAST 10,000 SQUARE FEET AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWERAGE IS AVAILABLE. THESE AREAS SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWERAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWAGE AREA. RECORDATION OF A MODIFIED SEWAGE AREA SHALL NOT BE NECESSARY.
21. PER SECTION 105.0.G.1.d, NON-BUILDABLE PRESERVATION PARCELS 'C', 'D' AND 'E' ARE TO BE OWNED BY THE HOMEOWNERS ASSOCIATION WITH HOWARD COUNTY, MARYLAND AS AN EASEMENT HOLDER. THE INTENDED USE OF PARCELS 'C' AND 'D' IS GREEN SPACE. THE INTENDED USE OF PARCEL 'E' IS SOLELY FOR STORMWATER MANAGEMENT.
22. PER SECTION 105.0.G.1.d, NON-BUILDABLE PRESERVATION PARCEL 'B' IS TO BE PRIVATELY OWNED WITH THE HOMEOWNERS ASSOCIATION AND HOWARD COUNTY, MARYLAND, AS THE EASEMENT HOLDERS. THE INTENDED USE OF THIS PARCEL IS ENVIRONMENTAL PRESERVATION. THE DEVELOPER HAS MET WITH THE DEPARTMENT OF RECREATION AND PARKS AND HAS REACHED AN UNDERSTANDING WITH THEM REGARDING THE OWNERSHIP OF THIS PARCEL. THE DIRECTOR OF PLANNING IS ZONING IS ACCEPTABLE TO PRIVATE OWNERSHIP PROVIDED THAT REAL ESTATE SERVICES INDICATES IN THE LEGAL DOCUMENTS/DEED OF PRESERVATION EASEMENT THAT OWNERSHIP OF NON-BUILDABLE PRESERVATION PARCEL "B" AND ADJACENT BUILDABLE PRESERVATION PARCEL "A" OF BRIGHTON MILL REMAIN IN THE SAME OWNERSHIP.
23. PER SECTION 105.0.G.4.b, BUILDABLE PRESERVATION PARCEL 'A' IS TO BE PRIVATELY OWNED, WITH HOWARD COUNTY, MARYLAND AND THE HOMEOWNER'S ASSOCIATION AS EASEMENT HOLDERS. PARCEL 'A' IS TO BE IMPROVED WITH RESIDENTIAL STRUCTURE(S).
24. THE MODERATE INCOME HOUSING UNIT REQUIREMENT (COUNCIL BILL 35-2013) SHALL BE FULFILLED BY PAYMENT OF A FEE-IN-LIEU IN AN AMOUNT THAT IS TO BE CALCULATED BY THE DEPARTMENT OF INSPECTIONS LICENSES AND PERMITS AT THE TIME OF BUILDING PERMIT. THE FEE-IN-LIEU SHALL BE PAID FOR LOTS/RESIDENTIAL UNITS 1 THROUGH 12 AND PARCEL "A" WITHIN THIS SUBDIVISION AT TIME OF BUILDING PERMIT ISSUANCE.
25. TRAFFIC CONTROL DEVICES:
 A.) THE R1-1("STOP") SIGN AND THE STREET NAME SIGN (SNS) ASSEMBLY FOR THIS DEVELOPMENT MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETED.
 B.) THE TRAFFIC CONTROL DEVICES LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION 410-313-2430) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES.
 C.) ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES." (MDMUTCD). D.) ALL SIGN POST USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED ("QUICK PUNCH"), SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE(12 GAUGE)-3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
26. MARYLAND DEPARTMENT OF THE ENVIRONMENT HAS GRANTED A VARIANCE FOR THE INSTALLATION OF WELLS ON LOTS 5 AND 6 THAT ARE DOWN GRADIENT OF THE SEPTIC SYSTEM ON LOT 7. THIS VARIANCE IS GRANTED WITH THE FOLLOWING CONDITIONS: THE INITIAL AND REPLACEMENT WELLS ON LOTS 6 AND 5 (FORMERLY LOTS 9 AND 10, RESPECTIVELY) WILL BE INSTALLED AS STEEL CASINGS TO A DEPTH OF 50 FEET, OR 10 FEET INTO COMPETENT BEDROCK, WHICHEVER IS DEEPER, AND THE SEPTIC SYSTEM ON LOT 7 (FORMERLY LOT 6) IS TO INCLUDE A BEST AVAILABLE TECHNOLOGY UNIT FOR NITROGEN REMOVAL AND ALL DRAINFIELDS INSTALLED AS LOW-PRESSURE DISTRIBUTION OR EQUIVALENT.
27. A GROUNDWATER APPROPRIATIONS PERMIT MUST BE ISSUED BY MARYLAND DEPARTMENT OF THE ENVIRONMENT PRIOR TO HEALTH DEPARTMENT ISSUANCE OF WELL PERMITS.
28. ALL WELLS SHALL BE DRILLED PRIOR TO FINAL PLAT RECORDATION. IT IS THE DEVELOPER'S RESPONSIBILITY TO SCHEDULE THE WELL DRILLING PRIOR TO FINAL PLAT SUBMISSION. IT WILL NOT BE CONSIDERED "GOVERNMENT DELAY" IF THE WELL DRILLING HOLDS UP HEALTH DEPARTMENT SIGNATURE OF THE RECORD PLAT.
29. DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
 a) WIDTH – 12' (16' SERVING MORE THAN ONE RESIDENCE).
 b) SURFACE – 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-1/2" MIN.)
 c) GEOMETRY – MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM 45' TURNING RADIUS.
 d) STRUCTURES (CULVERTS/BRIDGES) – CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).
 e) DRAINAGE ELEMENTS – CAPABLE OF SAFELY PASSING 100 YEAR FLOODPLAIN WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY.
 g) MAINTENANCE – SUFFICIENT TO INSURE ALL WEATHER USE.
30. THE PRIVATE MAINTENANCE ACCESS AGREEMENT FOR LOTS 5 AND 6 SHALL BE RECORDED SIMULTANEOUSLY WITH THE RECORDATION OF THE PLAT.
31. FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT-OF-WAY LINE AND NOT ONTO THE PIPESTEM LOT DRIVEWAY.
32. THE PROTECTIVE TREE FENCE FOR SPECIMEN TREE #2812, TREE IS DESIGNATED FOR *FUTURE* REMOVAL BY WP-16-064, SHALL BE REMOVED PRIOR TO BUILDING PERMIT APPROVAL.
33. THE DEPARTMENT OF PLANNING AND ZONING HAS APPROVED THE RETENTION OF THE EXISTING FOUNDATION WITHIN THE LIMITS OF THE FOREST CONSERVATION EASEMENT EAST OF THE BOUNDARY LINE WITH THE BEARING OF NORTH 06 DEGREES 57 MINUTES 58 SECONDS EAST AND DISTANCE OF 243.35'. THE FOUNDATION IS TO REMAIN IN PLACE.
34. WAIVER PETITION WP-16-064, A REQUEST TO WAIVE SECTIONS 16.120(B)(8), 16.1205(A)(7) & 16.1205(A)(10) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, WAS APPROVED BY THE PLANNING DIRECTOR ON JANUARY 29, 2016. THE APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:
 1. WAIVER PETITION APPROVAL IS LIMITED TO THE REMOVAL OF SPECIMEN TREES #2806, #2814, #2815, #2820, #2821, #2842 SO DEPICTED ON THE WAIVER EXHIBIT. ANY PROPOSAL TO REMOVE ADDITIONAL SPECIMEN TREES WILL REQUIRE A NEW WAIVER REQUEST OR AN AMENDMENT TO THIS WAIVER REQUEST.
 2. PERMISSION IS ALSO GRANTED FOR THE FUTURE REMOVAL OF SPECIMEN TREES #2813 AND #2812 (IF NECESSARY TO ACCOMMODATE THE REPLACEMENT SEWAGE DISPOSAL AREA).
 3. INDIVIDUAL TREE PROTECTION DEVICES (TREE FENCING) SHALL BE PLACED COMPLETELY AROUND SPECIMEN TREE #2812 AND SPECIMEN TREE #2813 PRIOR TO THE COMMENCEMENT OF ANY GRADING. THIS SHALL BE OUTLINED IN THE PRE-CONSTRUCTION MANAGEMENT PLAN OF THE FINAL FOREST CONSERVATION PLAN (FCP) AND WITHIN THE SEQUENCE OF CONSTRUCTION PROVIDED ON THE FINAL PLAN FOR "BRIGHTON MILL II".
 4. A <u>MINIMUM</u> OF 16 ADDITIONAL, NATIVE, 2-3" CALIPER TREES SHALL BE PROVIDED ON SITE AS PART OF THE MITIGATION FOR SPECIMEN TREE REMOVAL. THIS MITIGATION SHALL BE ADDRESSED WITHIN THE PROJECT KNOWN AS "BRIGHTON MILL II" AND WILL BE <u>IN ADDITION TO</u> ANY REQUIRED LANDSCAPE OR FOREST CONSERVATION PLANTINGS. THE MITIGATION WILL BE SHOWN ON THE ASSOCIATED LANDSCAPE PLAN AND SURETY FOR THESE ADDITIONAL TREES WILL BE REQUIRED AS PART OF THE FINAL PLAN.
 5. SOME OR ALL OF THE MITIGATION PLANTINGS SHOULD BE PLACED WITHIN THE REAR YARDS OF PROPOSED LOTS 8-12 (OUTSIDE THE SEWAGE DISPOSAL AREA) AFTER GRADING AND FILL OCCURS BUT PRIOR TO SALES OF INDIVIDUAL LOTS. THESE REPLACEMENT TREES <u>SHALL BE IN ADDITION</u> TO THE REQUIRED TYPE 'B' LANDSCAPE BUFFER ALONG THE REAR YARDS OF PROPOSED LOTS 8-12.
 6. NO ADDITIONAL ACCESS POINTS ONTO BROCCOLINO WAY FOR LOTS 8-12 SHALL BE GRANTED, NOW OR IN THE FUTURE.
 7. PROVIDE ACCESS RESTRICTION ARROWS AND LABELS BETWEEN LOTS 8-12 AND BROCCOLINO WAY ON ALL CURRENT AND FUTURE PLANS.
 8. WRITTEN PERMISSION MUST BE PROVIDED BY BOTH THE FIBER OPTIC CABLE RIGHT-OF-WAY OPERATOR AND ATLANTIC SEABOARD COMPANY FOR THE CROSSING OF THESE AREAS WITH PROPOSED DRIVEWAYS FOR LOTS 8-12 AND THE CREATION OF CURTIS VISTA WAY.
 9. A REVISED WAIVER PETITION EXHIBIT SHALL BE SUBMITTED WITHIN 2 WEEKS OF WAIVER APPROVAL (ON OR BEFORE FEBRUARY 12, 2016) WHICH ADDRESS THE FOLLOWING:
  - LABEL THE 50' WIDE PIPELINE EASEMENT OWNED BY ATLANTIC SEABOARD COMPANY.
  - MODIFIES THE SPECIMEN TREE TABLE TO INDICATE POSSIBLE FUTURE REMOVAL OF SPECIMEN TREES #2812 AND #2813.
  - DEPICTS AND LABELS ACCESS RESTRICTION ARROWS AND LABELS BETWEEN LOTS 8-12 AND BROCCOLINO WAY ON ALL CURRENT AND FUTURE PLANS.
35. THIS PROPERTY IS DESIGNATED A TIER III PROPERTY PER THE SUSTAINABLE GROWTH AND AGRICULTURAL PRESERVATION ACT OF 2012, MAP 6-3, AS APPROVED BY THE HOWARD COUNTY COUNCIL AS PART OF PLAN HOWARD 2030.
36. EXISTING UTILITIES ARE BASED ON ARIEL TOPOGRAPHY AND PLANS OF RECORD.
37. AN ADVANCED PRE-TREATMENT SYSTEM, WHICH UTILIZES CURRENTLY ACCEPTABLE TECHNOLOGY TO PERFORM NITROGEN REDUCTION, MUST BE INSTALLED AS A COMPONENT OF THE SEPTIC SYSTEM TO BE INSTALLED ON LOT 7 IN THIS SUBDIVISION. THIS ADVANCED PRE-TREATMENT SYSTEM SHALL BE LIMITED TO THE SYSTEMS LISTED IN THE WEB-SITE OR BAY RESTORATION FUND (BRF) BEST AVAILABLE TECHNOLOGY FOR REMOVING NITROGEN FROM ONSITE SYSTEMS. A SUPPLEMENTAL SITE PLAN WITH ALL OF THE NECESSARY DETAILS FOR INSTALLATION OF THE SEPTIC SYSTEM WILL BE REQUIRED PRIOR TO RELEASE OF THE BUILDING PERMIT AND SEPTIC SYSTEM INSTALLATION PERMIT FOR THIS LOT.
38. THE LOTS SHOWN HEREON COMPLY WITH THE MINIMUM OWNERSHIP, WIDTH, AND LOT AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT.
39. EXISTING WELLS, SEPTIC SYSTEMS AND SEWAGE DISPOSAL AREAS WITHIN A 100' OF THE PROPERTY AND THOSE WELLS WITHIN 200' DOWN GRADIENT OF THE EXISTING OR PROPOSED SEPTIC SYSTEMS OR SEWAGE DISPOSAL AREAS HAVE BEEN SHOWN.
40. ANY CHANGES TO A PRIVATE SEWAGE AREA SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
41. A PLANNING BOARD HEARING WAS HELD ON SEPTEMBER 1, 2016 FOR THIS SUBDIVISION. A DECISION AND ORDER, STATING THE PRELIMINARY EQUIVALENT SKETCH PLAN WAS APPROVED BY THE PLANNING BOARD OF HOWARD COUNTY, MARYLAND, WAS SIGNED ON OCTOBER 6, 2016.
42. THIS SUBDIVISION IS NOT LOCATED ON A SCENIC ROAD.
43. ALL EXISTING STRUCTURES ON THIS SITE ARE TO BE REMOVED PRIOR TO RECORDATION OF THE ASSOCIATED PLAT.
44. ON FEBRUARY 3, 2016 THE CHIEF OF DEVELOPMENT ENGINEERING DIVISION APPROVED AND A DESIGN MANUAL WAIVER (SECTION 2.3.A.a, 2.3.A.c, APPENDIX A, 2.5.B AND TABLE 2.8) FOR THE ROADWAY CENTERLINE RADIUS REQUIREMENT REDUCTION TO A 75' AND A 100' RADIUS ON HORIZONTAL CURVES ALONG CURTIS VISTA WAY UNDER THE FOLLOWING CONDITIONS:
 A. THE CURB RADIUS AT THE INTERSECTION OF BROCCOLINO WAY AND CURTIS VISTA WAY INCREASE TO 30ft.
 B. INCREASE PAVEMENT WIDTH OF CURTIS VISTA WAY BETWEEN STATION 0+00 AND 1+00 TO 26ft TO ACCOMMODATE SCHOOL BUSES, TRASH TRUCK AND EMERGENCY VEHICLES TURNING WITHOUT ENCROACHING ONTO THE OPPOSING LANE.
45. THE 40 PUBLIC STREET TREES FOR VISTA RIDGE WAY AND THE 2 TREES TO BE RELOCATED ALONG BROCCOLINO WAY SHALL BE ADDRESSED WITH DEVELOPMENT ENGINEERING DIVISION'S COST ESTIMATE IN THE AMOUNT OF $12,600.
46. THIS SUBDIVISION COMPLIES WITH THE REQUIREMENTS OF SECTION 16.200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION VIA THE ON-SITE RETENTION OF 2.53 ACRES OF FOREST WITHIN A FOREST CONSERVATION EASEMENT AND BY THE ON-SITE REFORESTATION OF 4.81 ACRES. SURETY, IN THE AMOUNT OF $104,761.80 MUST BE POSTED WITH THE DPW DEVELOPER'S AGREEMENT.
47. LANDSCAPING IS PROVIDED WITH A CERTIFIED LANDSCAPE PLAN IN ACCORDANCE ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL. FINANCIAL POSTING OF SURETY FOR REQUIRED LANDSCAPING IN ACCORDANCE WITH SECTION 16.124 OF THE LANDSCAPE MANUAL IN THE AMOUNT OF $23,100 FOR 64 SHADE TREES, 26 EVERGREENS. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING MUST BE POSTED AS PART OF THE DEVELOPER'S AGREEMENT.
48. HOWARD COUNTY STANDARD DETAIL R-6.03 SHALL BE UTILIZED FOR THE DRIVEWAY APRONS.
49. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
50. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
51. 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.
52. 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 PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
53. SEE SHEETS 22 AND 23 FOR FINAL STORMWATER MANAGEMENT DESIGN FOR THE LOTS.



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: 9/10/19

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: 12/2/20

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

PLAN VIEW
SCALE: 1" = 100'
(IN FEET)
1 inch = 100 ft.

LEGEND
- LIMIT OF SUBMISSION
- EXISTING STRUCTURE
- EXISTING EASEMENTS
- FOREST CONSERVATION EASEMENT
- EX. 100 YEAR FLOODPLAIN
- COORDINATE
- WETLANDS

SITE DATA TABULATION
1) GENERAL SITE DATA
 a. PRESENT ZONING: RR-DEO
 b. LOCATION: TAX MAP 34 – GRID 2 – PARCEL 16
 c. APPLICABLE DPZ FILE REFERENCES: F-06-067, ECP-16-011, SP-16-004, PB#419, WP-16-064
 d. DEED REFERENCE: L. 16173 F. 0440
 e. PROPOSED USE OF SITE: 12 SFD LOTS; 1 BUILDABLE PRESERVATION PARCEL; 4 NON-BUILDABLE PRESERVATION PARCELS
 f. PROPOSED WATER AND SEWER: PRIVATE WATER AND PRIVATE SEWER

2) AREA TABULATION
- a. TOTAL AREA OF SITE .... 29.03 Ac.±
- b. AREA OF 100 YEAR FLOODPLAIN (APPROX.) .... 1.58 Ac.±
- c. AREA OF STEEP SLOPES (25% OR GREATER) .... 1.68 Ac.±
  AREA OF STEEP SLOPES LESS THAN 10 VERT. FEET PLUS AREAS OF STEEP SLOPES WITHIN FLOODPLAIN.... 0.45 Ac.±
- d. NET AREA OF SITE .... 26.22 Ac.±
- e. AREA OF THIS PLAN SUBMISSION .... 29.03 Ac.±
- f. LIMIT OF DISTURBANCE (APPROX.) .... 13.2 Ac.±
- g. AREA OF PROPOSED BUILDABLE LOTS .... 13.72 Ac.±
- h. AREA OF BUILDABLE PRESERVATION PARCELS .... 4.03 Ac.±
- i. AREA OF NON-BUILDABLE PRESERVATION PARCELS .... 10.14 Ac.±
- j. AREA OF PROPOSED PUBLIC ROAD .... 0.94 Ac.±
- k. AREA OF PROPOSED PUBLIC R/W DEDICATION .... 0.20 Ac.±

3) DENSITY TABULATION
- a. NET AREA OF SITE .... 26.22 Ac.±
- b. TOTAL NUMBER OF LOTS ALLOWED PER ZONING
  1 UNIT PER 4.25 GROSS ACRES ALLOWED BY RIGHT........ 6
  1 UNIT PER 2 NET ACRES (MAX) PER DEO PROVISION........ 13

4) UNIT/LOT TABULATION
- a. TOTAL NUMBER OF BUILDABLE LOTS PROPOSED ON THIS SUBMISSION 12
- b. TOTAL NUMBER OF NON-BUILDABLE PRESERVATION PARCELS PROPOSED ON THIS SUBMISSION 4
- c. TOTAL NUMBER OF BUILDABLE PRESERVATION PARCELS PROPOSED ON THIS SUBMISSION 1

APPROVED: DEPARTMENT OF PUBLIC WORKS
[signature] 6/14/2017
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[signature] 6.29.17
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 6.28.17
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

PROJECT BACKGROUND INFORMATION
PRESENT ZONING: RR-DEO
LOCATION: TAX MAP 34 – GRID 02 – PARCEL 16
APPLICABLE DPZ FILE REFERENCES: F-06-067, ECP-16-011, SP-16-004, wp-16-064, PB#419
DEED REFERENCES: L.16173 F.440
PROPOSED USE OF SITE: RESIDENTIAL (SFD)
PROPOSED WATER AND SEWER SYSTEMS: PRIVATE WATER & PRIVATE SEWER

MINIMUM LOT SIZE CHART			
LOT NO.	GROSS AREA	PIPESTEM AREA	MIN. LOT SIZE
5	50,275 SF	370 SF	49,905 SF
6	54,573 SF	5,034 SF	49,539 SF
7	53,140 SF	3,636 SF	49,504 SF

BIORETENTION FACILITIES	
Facility	Notes
BR-1	ESDv provided by NR#6 and NR#7
MBR-2	LINED
MBR-3	LINED
MBR-4	LINED
MBR-5	
MBR-6	LINED
MBR-7	LINED
MBR-8	LINED
MBR-9	LINED
MBR-10	
MBR-11	
MBR-12	LINED
MBR-13	LINED
MBR-14	LINED
MBR-15	
MBR-16	
MBR-17	

COORDINATE CHART (NAD '83)		
No.	NORTH	EAST
10	564,512.5720	1,316,817.2476
11	564,532.5626	1,317,045.3680
12	564,351.2365	1,317,053.3107
13	564,314.1833	1,317,301.4809
14	564,555.7404	1,317,330.9958
15	564,589.0491	1,317,717.4237
16	564,530.8736	1,317,691.0079
17	564,397.8918	1,317,723.3051
18	564,449.6489	1,318,292.2351
19	564,216.0855	1,318,524.8752
20	564,209.5106	1,318,518.9395
21	564,174.8541	1,318,510.8309
22	564,138.0226	1,318,380.1330
23	564,135.2172	1,318,360.7561
24	564,131.3484	1,318,060.4668
25	564,088.7614	1,317,968.0835
26	563,604.1268	1,317,543.2123
27	563,550.4025	1,317,366.5184
28	563,608.4069	1,317,149.0630
29	563,604.6210	1,317,086.1212
30	563,821.5250	1,316,272.9597

STORMWATER MANAGEMENT PRACTICES						
LOT NUMBER		ADDRESS	DRY WELL M-5 (QUANTITY)	DISCONNECTION OF NON-ROOFTOP RUNOFF N-2 (QUANTITY)	MICRO-BIO RETENTION M-6 (QUANTITY)	BIO RETENTION F-6 (QUANTITY)
LOT 1	13603	CURTIS VISTA WAY	0	0	0	0
LOT 2	13607	CURTIS VISTA WAY	0	0	1	0
LOT 3	13611	CURTIS VISTA WAY	0	0	1	0
LOT 4	13615	CURTIS VISTA WAY	2	0	1	0
LOT 5	13619	CURTIS VISTA WAY	0	1	1	0
LOT 6	13623	CURTIS VISTA WAY	2	2	1	0
LOT 7	13627	CURTIS VISTA WAY	0	0	2	0
LOT 8	13618	CURTIS VISTA WAY	0	0	1	0
LOT 9	13614	CURTIS VISTA WAY	0	1	1	0
LOT 10	13610	CURTIS VISTA WAY	0	2	1	0
LOT 11	13606	CURTIS VISTA WAY	0	0	1	0
LOT 12	13602	CURTIS VISTA WAY	0	2	1	0
PRES 'A'	13504	BROCOLINO WAY	0	0	2	0
PRES 'E'		CURTIS VISTA WAY	0	0	0	1

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS $ ADD GENERAL NOTES

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

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: 06-08-2018.
5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II
LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

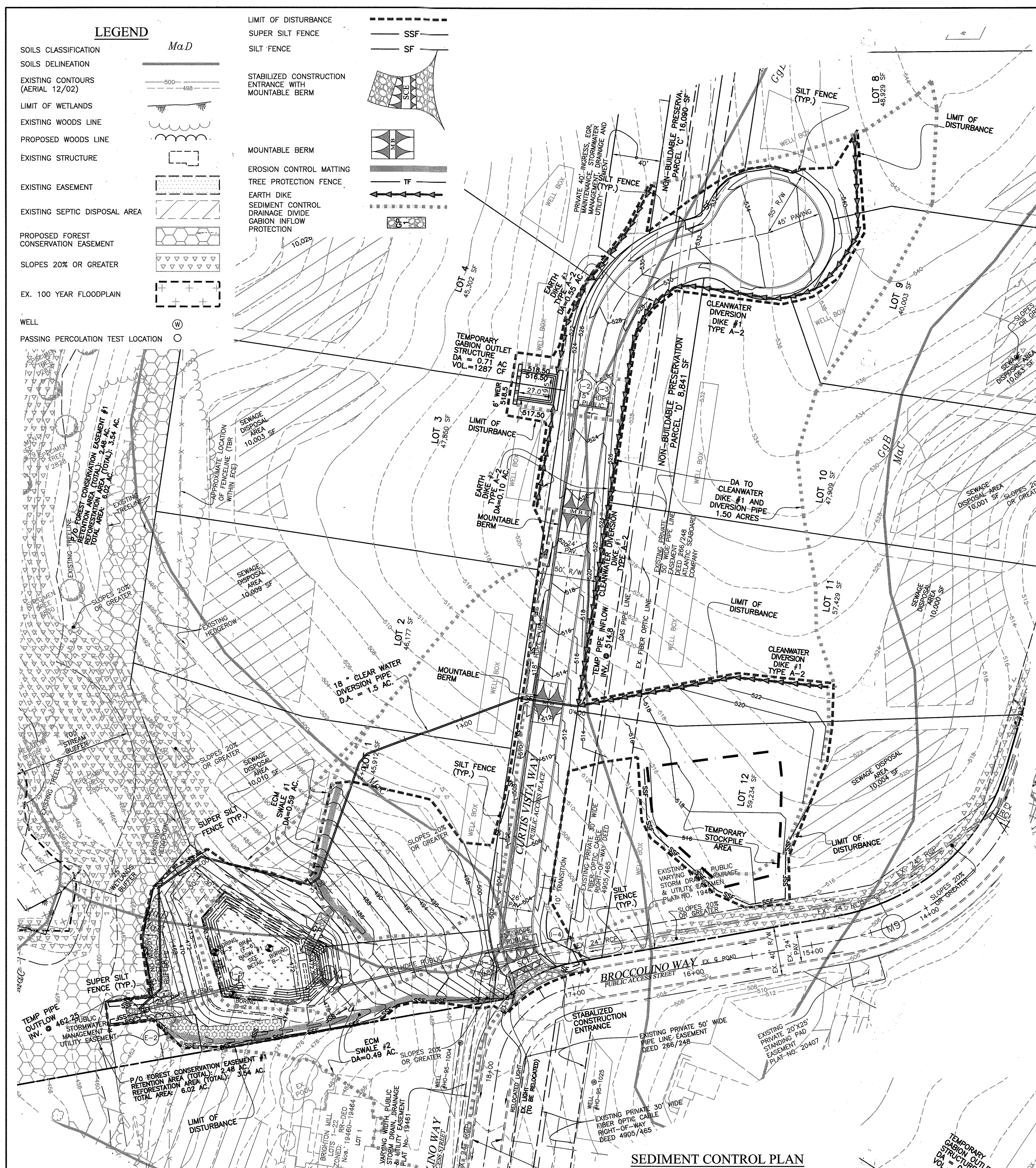
FINAL ROAD CONSTRUCTION PLANS
TITLE SHEET

DESIGN: JC/NAF	DRAFT: JC/NAF	DATE: MAY, 2017	BEI PROJECT NO. 2627
		SCALE: AS SHOWN	SHEET 1 OF 23

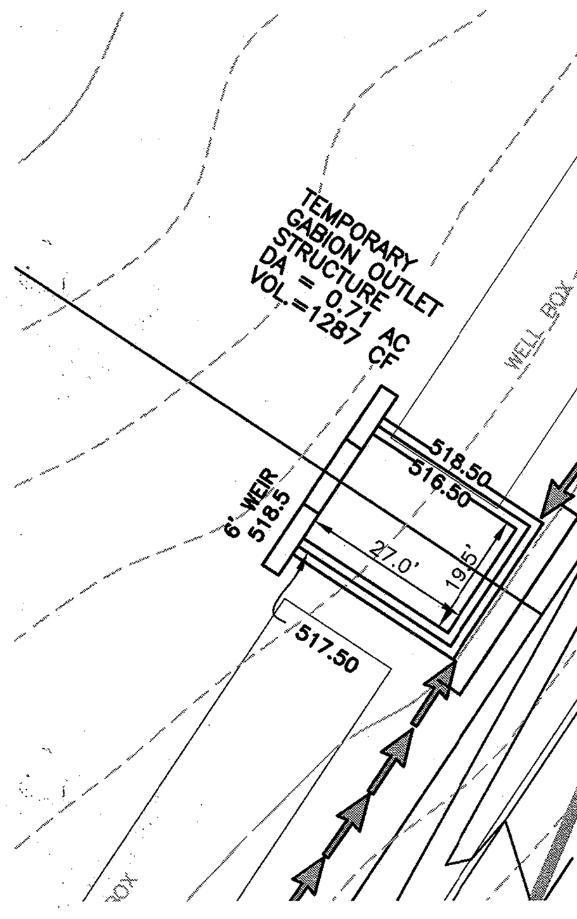
AS-BUILT F-17-054

LEGEND

SOILS CLASSIFICATION	MaD
SOILS DELINEATION	
EXISTING CONTOURS (AERIAL 12/02)	500 / 498
LIMIT OF WETLANDS	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
EXISTING STRUCTURE	
EXISTING EASEMENT	
EXISTING SEPTIC DISPOSAL AREA	
PROPOSED FOREST CONSERVATION EASEMENT	
SLOPES 20% OR GREATER	
EX. 100 YEAR FLOODPLAIN	
WELL	W
PASSING PERCOLATION TEST LOCATION	O
LIMIT OF DISTURBANCE	
SUPER SILT FENCE	SSF
SILT FENCE	SF
STABILIZED CONSTRUCTION ENTRANCE WITH MOUNTABLE BERM	SCE
MOUNTABLE BERM	MB
EROSION CONTROL MATTING	
TREE PROTECTION FENCE	TF
EARTH DIKE	
SEDIMENT CONTROL DRAINAGE DIVIDE	
GABION INFLOW PROTECTION	GP-1



SEDIMENT CONTROL PLAN
SCALE: 1" = 50'



PLAN VIEW - TGOS
SCALE: 1" = 30'

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALT. GROUP	NAME	k Value
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.20
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.20
GmB*	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37**
GoB		C	C	GLENVILLE-CODORUS SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37**
MaC		B		MANOR LOAM, 8 TO 15 PERCENT SLOPES	0.24
MaD		B		MANOR LOAM, 15 TO 25 PERCENT SLOPES	0.24

* INDICATES HYDRIC SOILS
** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16

GRADING PLAN
SCALE: 1" = 50'

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

HOUSES MAY NOT BE CONSTRUCTED USING THIS PLAN.

THIS PLAN IS FOR EROSION & SEDIMENT CONTROL PURPOSES ONLY.

THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.

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 ANY WORK.

50 0 25 50 100
(IN FEET)
1 inch = 50 ft.

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:** 12/21/20

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

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:** 9/10/19

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 5/30/17

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 6/14/2017

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-28-17

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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 — DATE 5-16-17

ENGINEER'S CERTIFICATE

"I 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 – JOHN M. CARNEY #45577 — DATE 5/16/17

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADD LOT GRADING + SWM NOTE

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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: 06-08-2018.

STATE OF MARYLAND JOHN M. CARNEY No. 45577 PROFESSIONAL ENGINEER — 5/16/17

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BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
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FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
GRADING, SEDIMENT AND EROSION CONTROL PLAN AND SOILS MAP

DATE: MAY, 2017		BEI PROJECT NO. 2627	
DESIGN: JC/NAF	DRAFT: JC/NAF	SCALE: AS SHOWN	SHEET 2 OF 23

AS-BUILT F-17-054

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION
Definition: Using vegetation as cover to protect exposed soil from erosion.
Purpose: To promote the establishment of vegetation on exposed soil.
Conditions Where Practice Applies: On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.
Effects on Water Quality and Quantity: Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas. Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth. Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone. Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment
Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.
1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION
Definition: Establishment of vegetative cover on cut and fill slopes.
Purpose: To provide timely vegetative cover on cut and fill slopes as work progresses.
Conditions Where Practice Applies: Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.
Criteria:
A. Incremental Stabilization - Cut Slopes
1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (Refer to Figure B.1):
a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.
Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.
B. Incremental stabilization - fill slopes
1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (refer to figure b.2):
a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. construct silt fence on low side of fill unless other methods shown on the plans address this area.
b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
c. Place phase 1 fill, prepare seedbed, and stabilize.
d. Place phase 2 fill, prepare seedbed, and stabilize.
e. Place final phase fill, prepare seedbed, and stabilize. overseed previously seeded areas as necessary.
Note: once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization. figure b.

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS
Definition: The process of preparing the soils to sustain adequate vegetative stabilization.
Purpose: To provide a suitable soil medium for vegetative growth.
Conditions Where Practice Applies: Where vegetative stabilization is to be established.
Criteria
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 love-grass 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 leaving 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 unacceptable 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 original 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 must not be a mixture 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. Topsoil Application
a. Erosion and sediment control practices must be maintained when applying topsoil.
b. Uniformly distribute topsoil in a 5 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
Definition: The application of seed and mulch to establish vegetative cover.
Purpose: To protect disturbed soils from erosion during and at the end of construction.
Conditions Where Practice Applies To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.
Criteria:
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
d. 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: Mechanized 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; P2O5 (phosphorous), 200 pounds per acre; K2O (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 Seed Law and not musty, moldy, caked, decayed, or excessively dusty. 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 celluloseprocessed 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 atconcentration 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 and depth so that the soil surface is not exposed. When using a mulch anchoring 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.

B-4-5 STANDARDS AND SPECIFICATION FOR PERMANENT STABILIZATION
Definition: To stabilize disturbed soils with permanent vegetation.
Purpose: To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.
Conditions Where Practice Applies: Exposed soils where ground cover is needed for 6 months or more.
Criteria:
A. Seed Mixtures
1. General Use
a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guild, Section 342 - Critical Area Planting.
c. For sites having disturbed areas over 5 acres, use and show the rates recommended by the soil testing agency.
d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
2. Turfgrass Mixtures
a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the PermanentSeeding Summary. The summary is to be placed on the plan.
i. Kentucky Bluegrass: Full sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars with each ranging from 10 to 30 percent of the total mixture by weight.
iii.Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 ½ to 3 pounds per 1000 squarefeet.
Notes:Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland" Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.
c. Ideal Times of Seeding for Turf Grass Mixtures
Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b,6a)
Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b).
d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 ½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is not especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.
B. Sod: to provide quick cover on disturbed areas (2:1 grade or flatter).
1. General Specifications
a. Class of turfgrass must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
b. Sod must be machine cut at a uniform soil thickness of ¾ inch, plus or minus ¼ inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.
2. Sod Installation
a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.
3. Sod Maintenance
a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
b. After the first week, sod watering is required as necessary to maintain adequate moisture content.
c. Do not mow until the sod is firmly rooted. No more than 1/3 of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABLIZATION
Definition: To stabilize disturbed soils with vegetation for up to 6 months.
Purpose: To use fast growing vegetation that provides cover on disturbed soils.
Conditions Where Practice Applies: Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are req'd.
Criteria:
1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

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 impermeable 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, snow 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.

Table B.1: Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate [1/] lb/ac	Seeding Rate [1/] lb/1000 ft²	Seeding Depth [2/] (inches)	Recommended Seeding Dates by Plant Hardiness Zone [3/]: 5b and 6a	6b	7a and 7b
Cool-Season Grasses						
Annual Ryegrass (*Lolium perenne ssp. multiflorum*)	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Barley (*Hordeum vulgare*)	96	2.2	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Oats (*Avena sativa*)	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Wheat (*Triticum aestivum*)	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Cereal Rye (*Secale cereale*)	112	2.8	1.0	Mar 15 to May 31; Aug 1 to Oct 31	Mar 1 to May 15; Aug 1 to Nov 15	Feb 15 to Apr 30; Aug 15 to Dec 15
Warm-Season Grasses						
Foxtail Millet (*Setaria italica*)	30	0.7	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14
Pearl Millet (*Pennisetum glaucum*)	20	0.5	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14

NOTES:
1/ Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.

Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.

Oats are the recommended nurse crop for warm-season grasses.

2/ For sandy soils, plant seeds at twice the depth listed above.
3/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

Table B.3: Recommended Planting Dates for Permanent Cover in Maryland [1/]

Type of Plant Material	Plant Hardiness Zones: 5b and 6a	6b	7a and 7b
Seeds - Cool-Season Grasses (includes mixes with forbs and/or legumes)	Mar 15 to May 31 Aug 1 to Sep 30	Mar 1 to May 15 Aug 1 to Oct 15	Feb 15 to Apr 30 Aug 15 to Oct 31 Nov 1 to Nov 30◆
Seeds - Warm-Season/Cool-Season Grass Mixes (includes mixes with forbs and/or legumes)	Mar 15 to May 31◆◆ Jun 1 to Jun 15*	Mar 1 to May 15◆◆ May 16 to Jun 15*	Feb 15 to Apr 30◆◆ May 1 to May 31*
Sod - Cool-Season	Mar 15 to May 31 Jun 1 to Aug 31* Sep 1 to Nov 1*+	Mar 1 to May 15 May 16 to Sep 14* Sep 15 to Nov 15*+	Feb 15 to Apr 30 May 1 to Sep 30* Oct 1 to Dec 1*+
Unrooted Woody Materials; Bare-Root Plants; Bulbs, Rhizomes, Corms, and Tubers [2/]	Mar 15 to May 31 Jun 1 to Jun 30*	Mar 1 to May 15 May 16 to Jun 30*	Feb 15 to Apr 30 May 1 to Jun 30*
Containerized Stock; Balled-and-Burlapped Stock	Mar 15 to May 31 Jun 1 to Jun 30* Sep 1 to Nov 15*+	Mar 1 to May 15 May 16 to Jun 30* Sep 15 to Nov 30*+	Feb 15 to Apr 30 May 1 to Jun 30* Oct 1 to Dec 15*+

Table B.3 Notes:
1. The planting dates listed are averages for each zone. These dates may require adjustment to reflect local conditions, especially near the boundaries of the zones. When seeding toward the end of the listed planting dates, or when conditions are expected to be less than optimal, select an appropriate nurse crop from Table 1 and plant with the permanent seeding mix. (See Table B.2, Note 1, for more information.)
2. When planted during the growing season, most of these materials must be purchased and kept in a dormant condition until planting. Bare-root grasses are the exception—they may be supplied as growing (non-dormant) plants.
◆ Additional planting dates for the lower Coastal Plain, dependent on annual rainfall and temperature trends. Recommend adding a nurse crop, as noted above, if planting during this period.
◆◆ Warm-season grasses need a soil temperature of at least 50 degrees F in order to germinate. If soil temperatures are colder than 50 degrees, or moisture is not adequate, the seeds will remain dormant until conditions are favorable. In general, planting during the latter portion of this period allows more time for weed emergence and weed control prior to planting. When selecting a planting date, consider the need for weed control vs. the likelihood of having sufficient moisture for later plantings, especially on droughty sites.
* Additional planting dates during which supplemental watering may be needed to ensure plant establishment.
+ Frequent freezing and thawing of wet soils may result in frost-heaving of materials planted in late fall, if plants have not sufficiently rooted in place. Sod usually needs 4 to 6 weeks to become sufficiently rooted. Large containerized and balled-and-burlapped stock may be planted into the winter months as long as the ground is not frozen and soil moisture is adequate.

HOWARD SOIL CONSERVATION DISTRICT (HSCD) STANDARD SEDIMENT CONTROL NOTES

1. A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-3133-1855 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hours notice to CID must be given at the following stages:
a. Prior to the start of earth disturbance,
b. Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading,
c. Prior to the start of another phase of construction or opening of another grading unit,
d. Prior to the removal or modification of sediment control practices.

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 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.

3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.

4. 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 topsoil (Sec. B-4-2), permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec. B-4-3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B-4-1) specifications shall be enforced in areas with >15' of cut and/or fill. Stockpiles (Sec. B-4-8) in excess of 20 feet must be benched with stable outlet. All concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).

5. 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 CID.

6. Site Analysis:
Total Area of Site: 29.0 Acres
Area Disturbed: 13.2 Acres
Area to be roofed or paved: 2.7 Acres
Area to be vegetatively stabilized: 10.5 Acres
Total cut: 13,353* Cu Yds
Total fill: 14,736* Cu Yds
Off-site waste/borrow area location: N/A

*CUT/FILL NUMBERS ARE FOR SEDIMENT CONTROL PURPOSES ONLY. CONTRACTOR TO VERIFY.

7. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.

8. Additional sediment control must be provided, if deemed necessary by the CID. The site and all controls shall be inspected by the contractor weekly; and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:

- Inspection date
- Inspection type (routine, pre-storm event, during rain event)
- Name and title of inspector
- Weather information (current conditions as well as time and an=mount of last recorded precipitation
- Brief description of project's status (e.g. percent complete) and/or current activities
- Evidence of sediment discharges
- Identification of plan deficiencies
- Identification of sediment controls that require maintenance
- Identification of missing or improperly installed sediment controls
- Compliance status regarding the sequence of construction and stabilization requirements
- Photographs
- Monitoring/sampling
- Maintenance and/or corrective action performed
- Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE).

9. Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back filled and stabilized by the end of each work day, whichever is shorter.

10. Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may be allowed by the CID per the list of HSCD-approved field changes.

11. Disturbance shall not occur outside the L.O.D. A project is to be sequenced so that grading activities begin on one grading unit (maximum acreage of 20 ac. per grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has been stabilized and approved by the CID. Unless otherwise specified and approved by the HSCD, no more than 30 acres cumulatively may be disturbed at a given time.

12. Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.

13. Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade.

14. All silt fence and super silt fence shall be placed on-the-contour, and be imbricated at 25' minimum intervals, with lower ends curled uphill by 2' in elevation.

15. Stream channels must not be disturbed during the following restricted time periods (inclusive):
- Use I and IP March 1 – June 15
- Use III and IIIP October 1 – April 30
- Use IV March 1 – May 31

16. A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

SWALE #1	
A	1.0'
B	2.0'
C	3:1
D	0.12'
SLOPE	16%
BOTTOM DIMS	
LENGTH	130'
WIDTH	2.0'

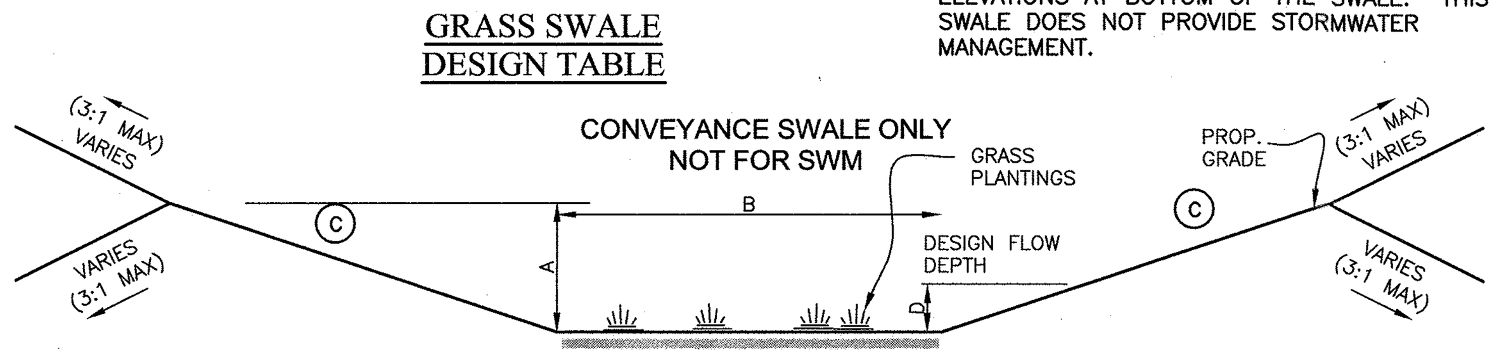
STORM	Q (RUNOFF)	VELOCITY
2YR	0.71 CFS	2.77 FPS
10YR	2.08 CFS	4.00 FPS

SWALE #2	
A	1.0'
B	2.0'
C	3:1
D	0.15'
SLOPE	11%
BOTTOM DIMS	
LENGTH	230'
WIDTH	2.0'

STORM	Q (RUNOFF)	VELOCITY
2YR	0.36 CFS	2.01 FPS
10YR	1.06 CFS	2.88 FPS

GRASS SWALE DESIGN TABLE

NOTE: ELEVATIONS LISTED IN CHART ARE ELEVATIONS AT BOTTOM OF THE SWALE. THIS SWALE DOES NOT PROVIDE STORMWATER MANAGEMENT.



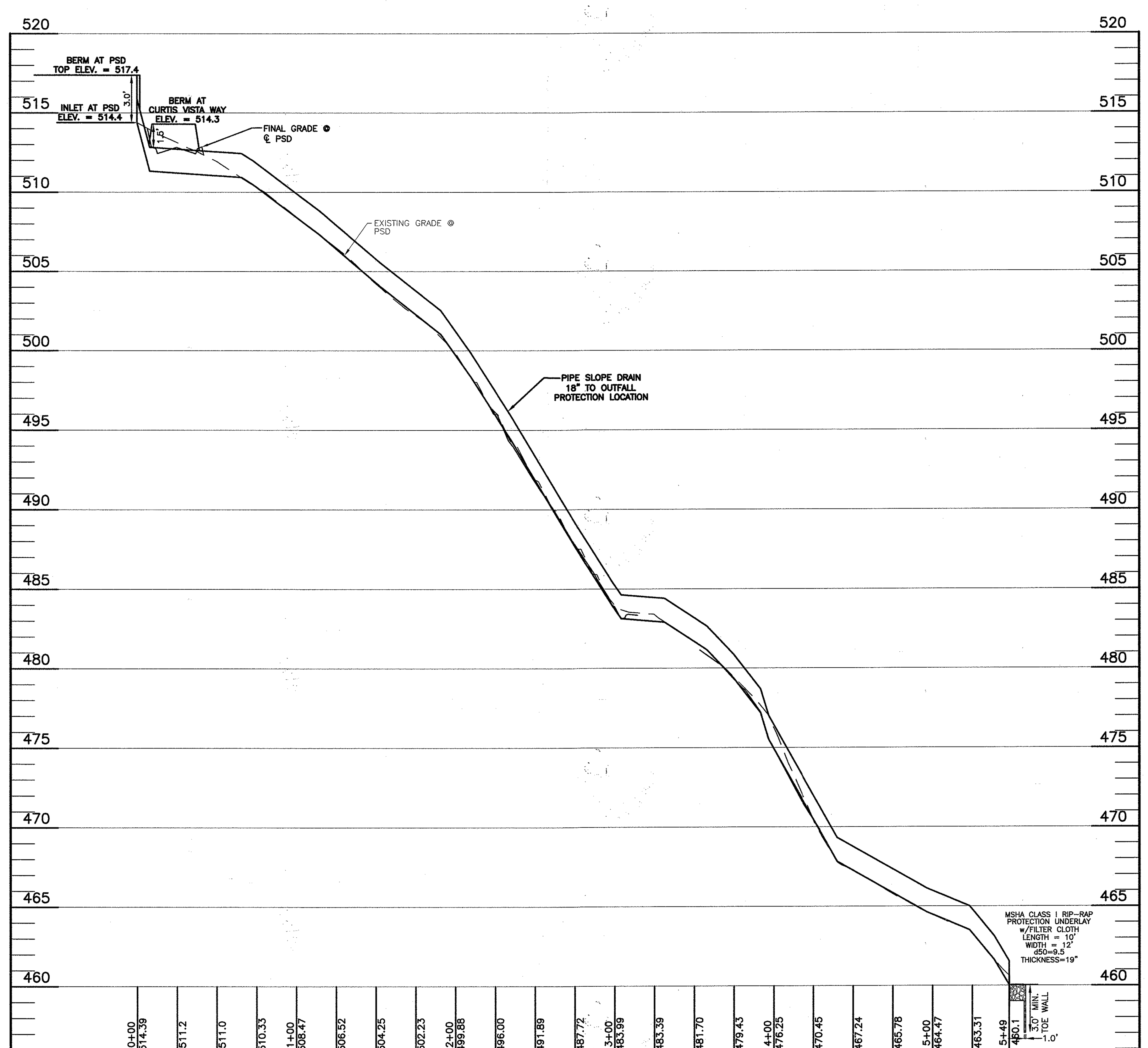
GRASS SWALE TYPICAL SECTION DETAIL
NOT TO SCALE

ENGINEER'S CERTIFICATE
"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."
ENGINEER – JOHN M. CARNEY #45577 — 5/16/17 DATE

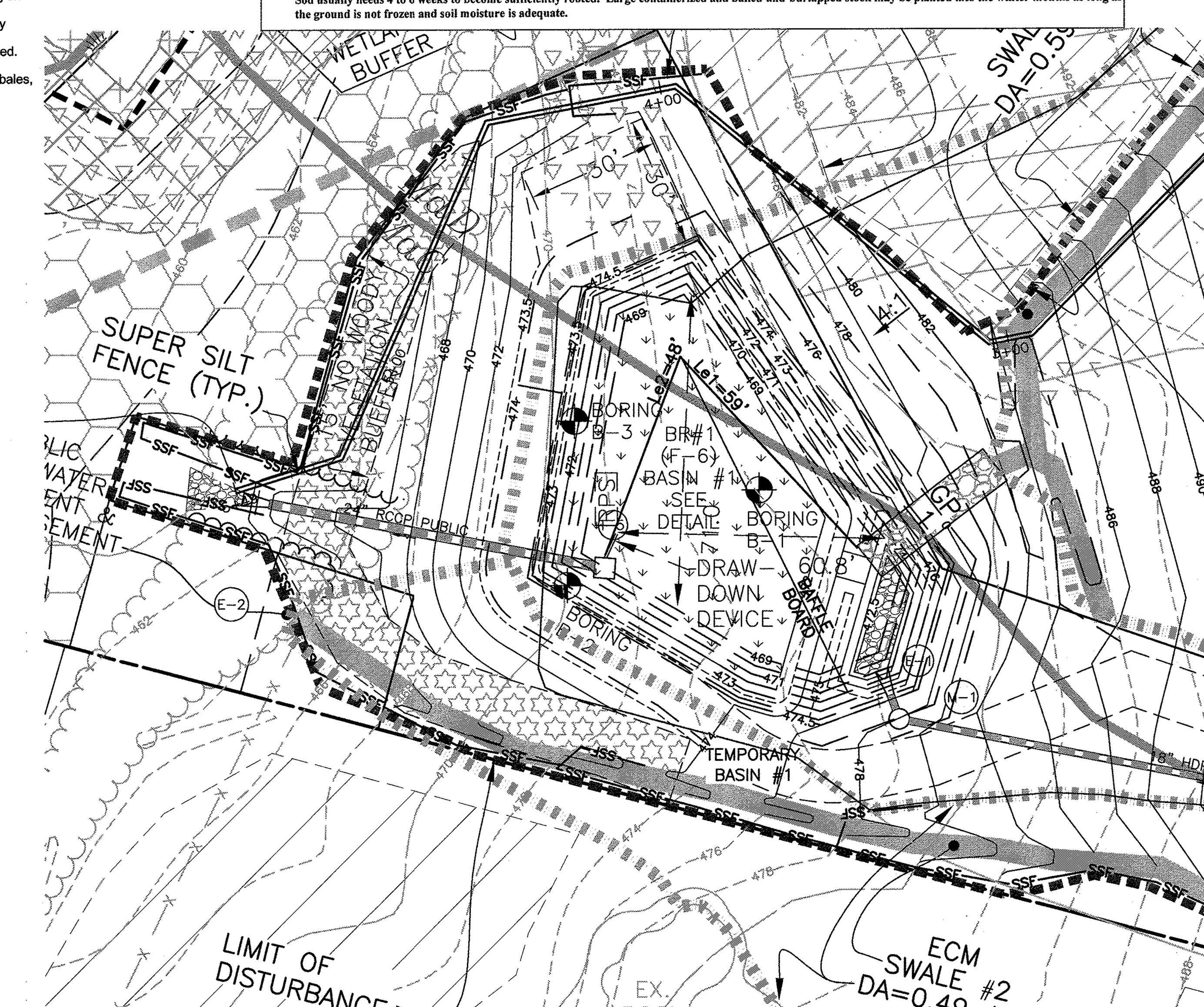
DEVELOPER'S CERTIFICATE
"I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL ON EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."
DEVELOPER — 5-16-17 DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD SOIL CONSERVATION DISTRICT — 5/30/17 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION — 6-28-17 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT — 6-29-17 DATE
APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — 6/23/2017 DATE



CLEANWATER DIVERSION PIPE
SCALE: HORIZONTAL 1" = 60'
VERTICAL 1" = 6'



PLAN VIEW - BASIN #1
SCALE: 1" = 30'
(IN FEET)
1 inch = 30 ft.

BAFFLE BOARD (G-2-4) COMPUTATIONS
BASIN #1
A = SURFACE AREA AT WET STORAGE ELEVATION = 4,746 ft²
EFFECTIVE WIDTH, $W_e = (A/2)^{1/2}$ = 48.7 ft
FLOW LENGTH FROM INFLOW POINT TO OUTLET = 60.8 ft
IF FLOW LENGTH IS LESS THAN WE X 2, PROVIDE BAFFLE BOARDS TO LENGTHEN FLOW PATH
EFFECTIVE FLOW LENGTH, L_e = 59+48 = 107 ft
(MUST BE ≥ W_e X 2 = 97.4 ft)

Basin #1	
Existing D.A.	2.5 Ac
Proposed D.A.	3.2 Ac
Storage Required	
Wet	9265.5 cf
Dry	9265.5 cf
Storage Provided	
Wet	9266 cf
Dry	15395 cf
Wet Storage Elev.	471.22
Dry Storage Elev.	473.00
Embankment Elev.	474.50
Embankment width	10 ft
Weir crest Elev.	NA
Weir Crest Length	NA
Cleanout Elev.	469.75
Bottom Elev.	469.00

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER — 9/10/19

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: 12-21-20

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

THIS PLAN IS FOR EROSION & SEDIMENT CONTROL PURPOSES ONLY

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADJUST HSCD TABLE

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

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: 06-08-2018.
STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER — 5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
SEDIMENT AND EROSION CONTROL NOTES & DETAILS

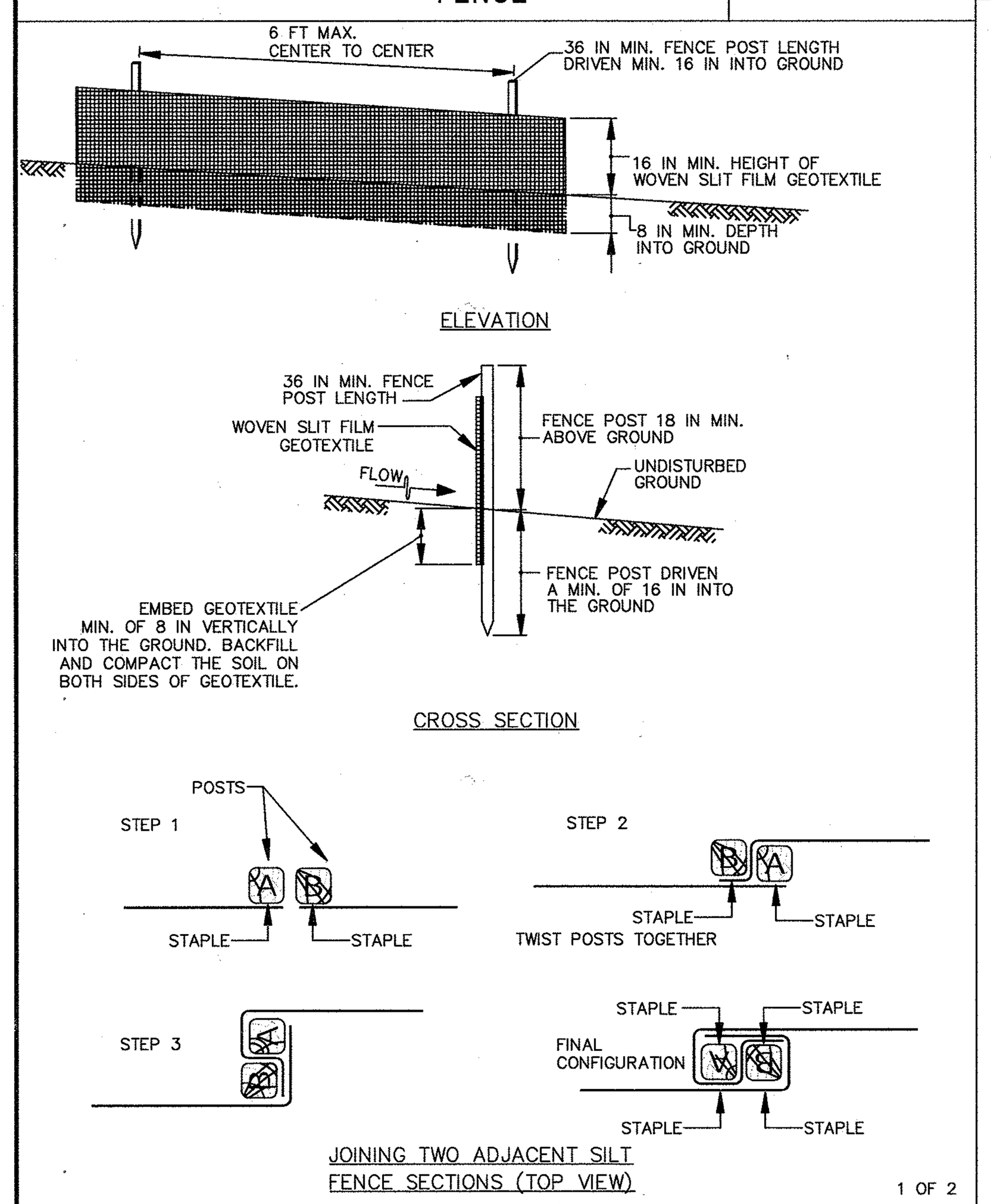
DATE: MAY, 2017	BEI PROJECT NO. 2627
SCALE: AS SHOWN	SHEET 3 OF 23

DESIGN: JC/NAF — DRAFT: JC/NAF

AS-BUILT F-17-054

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ├──SF──┤



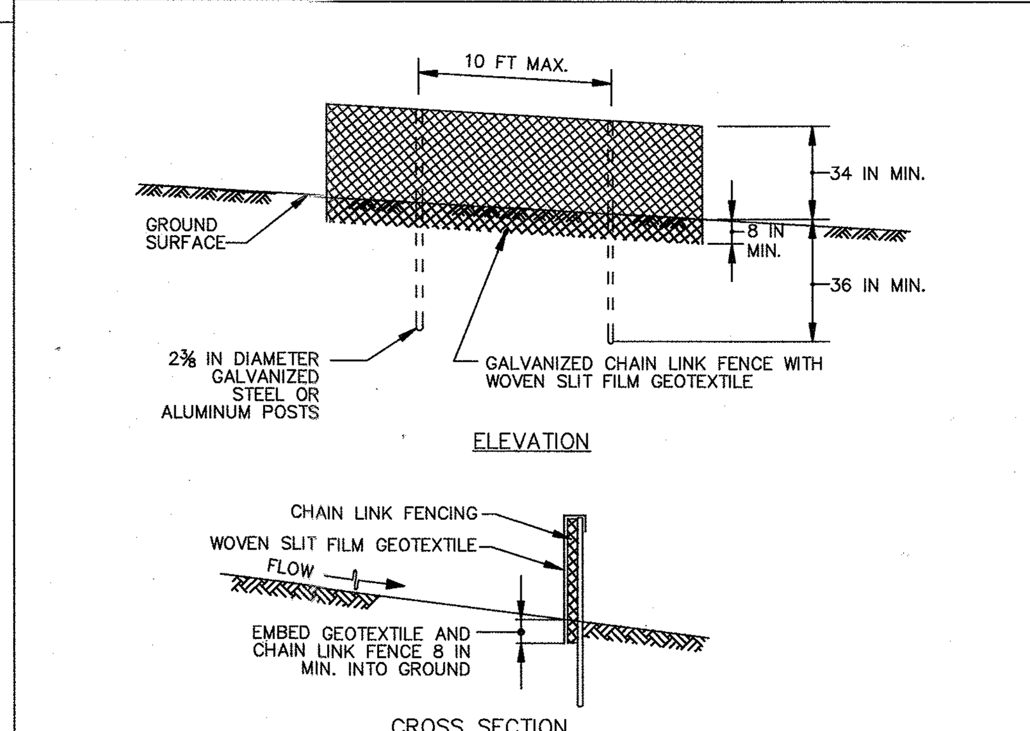
1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: ├──SSF──┤



CONSTRUCTION SPECIFICATIONS

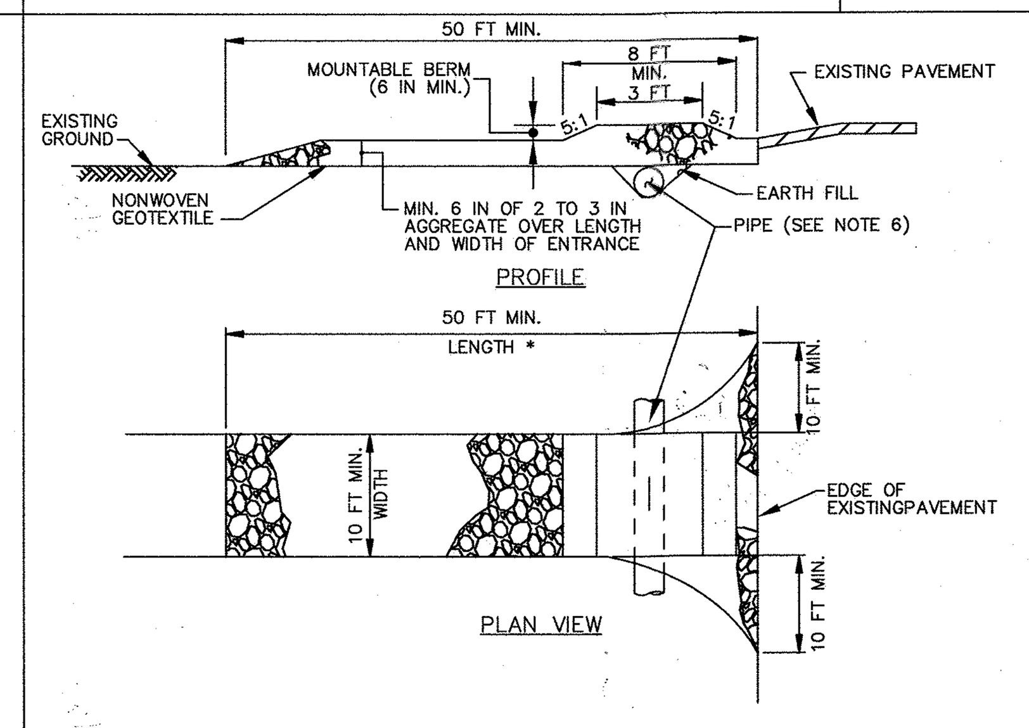
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL



CONSTRUCTION SPECIFICATIONS

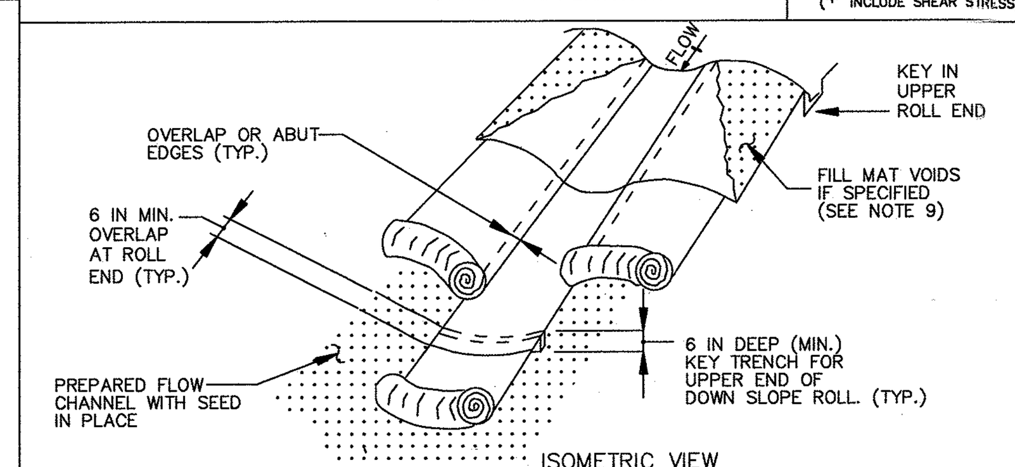
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-C PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: PSSMC – 2.0 lb/ft² Min. (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

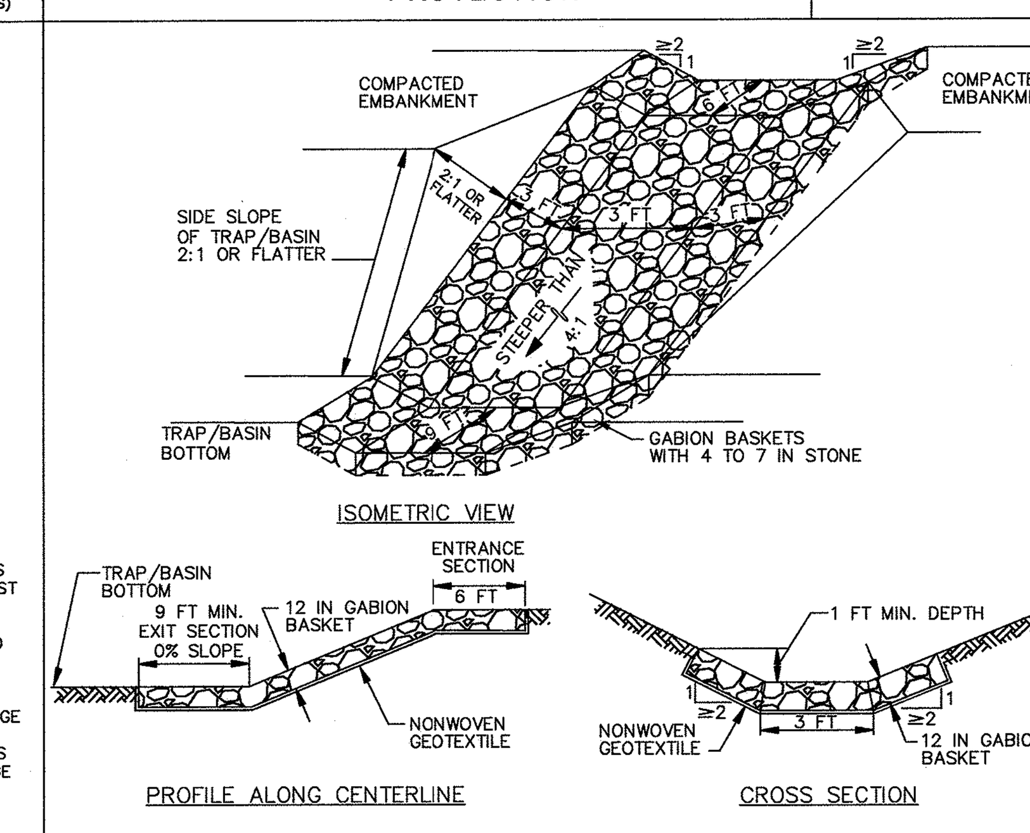
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 ½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTER LINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-3-2 GABION INFLOW PROTECTION

STANDARD SYMBOL: GP



CONSTRUCTION SPECIFICATIONS

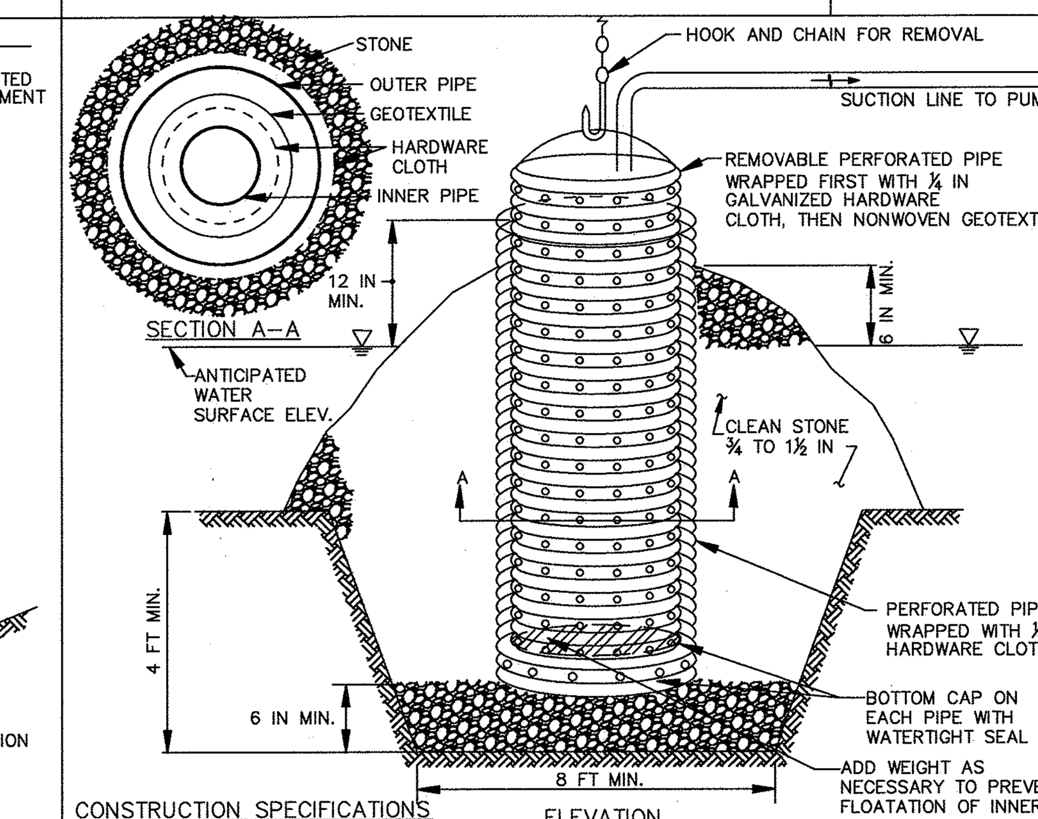
1. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL GABION BASKETS.
2. USE BASKETS MADE OF MINIMUM 11 GAUGE WIRE.
3. CONSTRUCT GABION INFLOW PROTECTION BY ARRANGING 9 X 3 X 1 FOOT GABION BASKETS TO FORM A TRAPEZOIDAL SECTION WITH A 3 FOOT BOTTOM WIDTH, 1 FOOT MINIMUM DEPTH, 3 FOOT SIDE WALLS, AND 2:1 OR FLATTER SIDE SLOPES. FILL GABION BASKETS WITH 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE WITHOUT REBAR OR WEIR MESH.
4. INSTALL ENTRANCE AND EXIT SECTIONS AS SHOWN ON THE PROFILE.
5. INSTALL GABIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
6. BLEND GABIONS INTO EXISTING GROUND.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-1 REMOVABLE PUMPING STATION

STANDARD SYMBOL: ☒RPS



CONSTRUCTION SPECIFICATIONS

1. USE CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS 6 INCHES ON CENTER.
2. USE A MINIMUM 12 INCH DIAMETER INNER PIPE WITH AN OUTER PIPE A MINIMUM 6 INCHES LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
3. WRAP EACH PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH. ON INNER PIPE WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
4. EXCAVATE 8 FEET X 8 FEET X 4 FEET DEEP PIT FOR PIPE PLACEMENT. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
5. SET TOP OF INNER AND OUTER PIPES MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION (OR RISER CREST ELEVATION WHEN DEWATERING A BASIN).
6. BACKFILL PIT AROUND THE OUTER PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
7. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ├──SF──┤

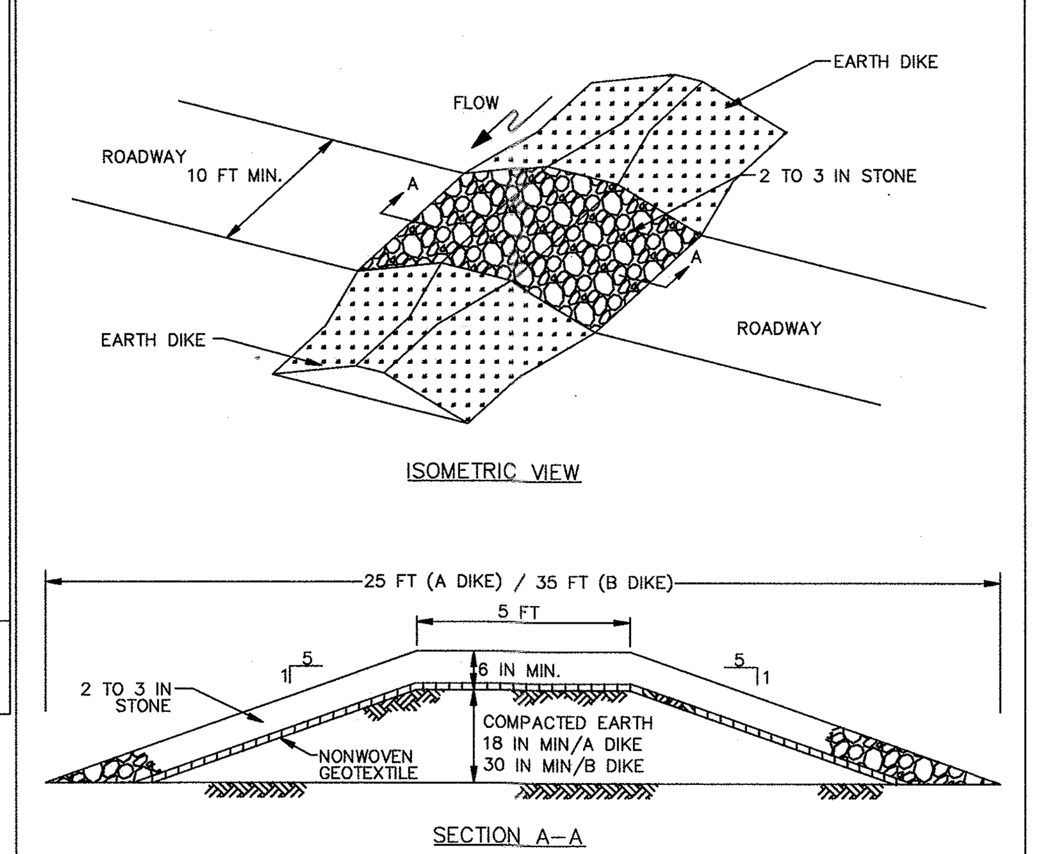
CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± 1/16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

DETAIL C-8 MOUNTABLE BERM

STANDARD SYMBOL: MB



CONSTRUCTION SPECIFICATIONS

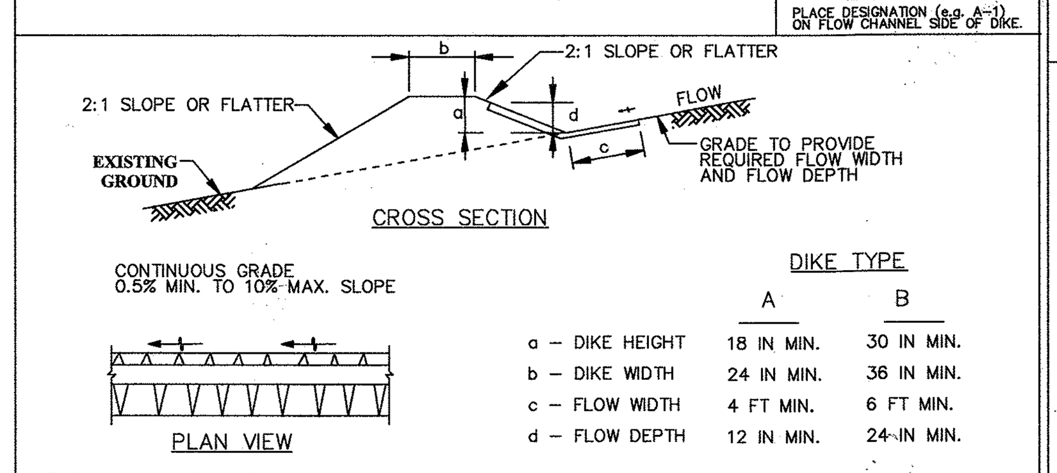
1. USE MINIMUM WIDTH OF 10 FEET TO ALLOW FOR VEHICULAR PASSAGE.
2. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE EARTH MOUND PRIOR TO PLACING STONE.
3. PLACE 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE MOUNTABLE BERM.
4. MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL: A-1 — PLACE DESIGNATION (e.g. A-1) ON FLOW CHANNEL SIDE OF DIKE.



	DIKE TYPE A	DIKE TYPE B
a – DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b – DIKE WIDTH	24 IN MIN.	36 IN MIN.
c – FLOW WIDTH	4 FT MIN.	6 FT MIN.
d – FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION

- A-1 SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
- A-2/B-2 SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
- A-3/B-3 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

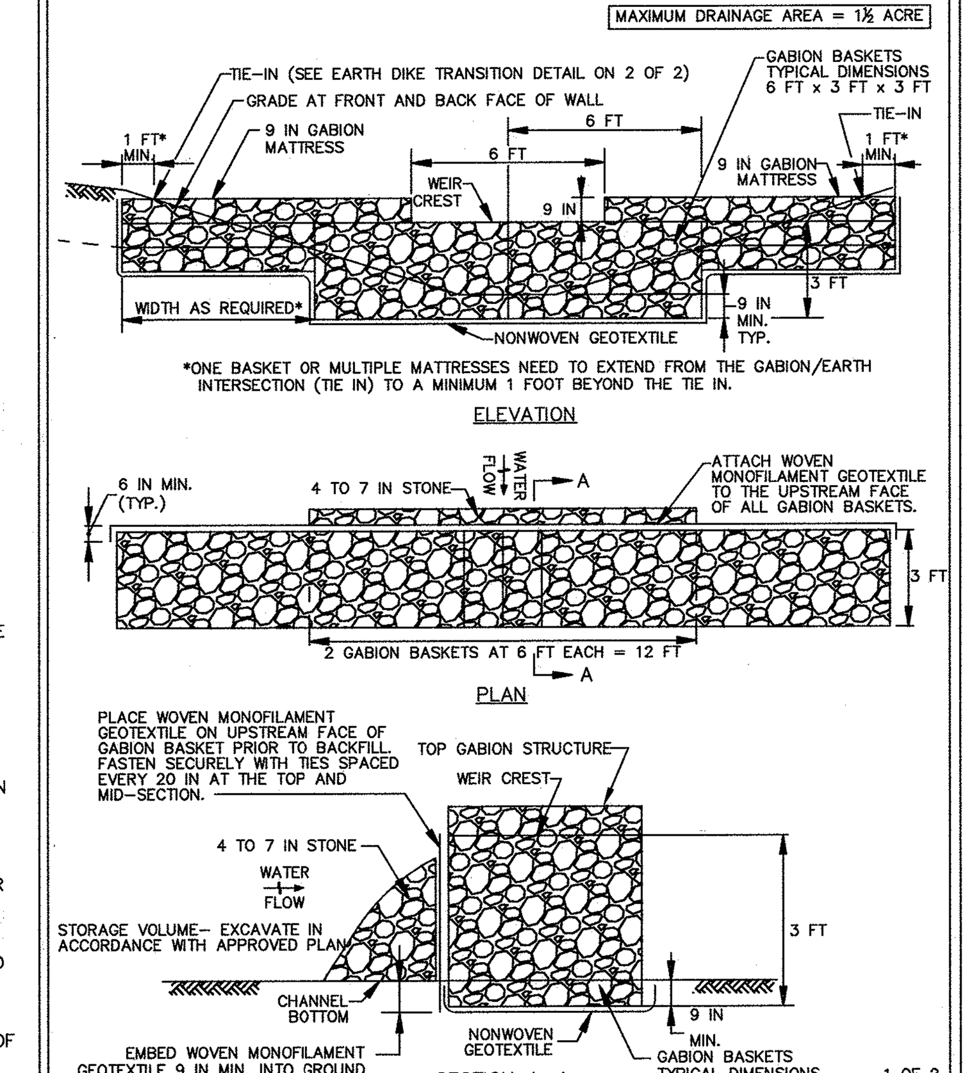
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-8 TEMPORARY GABION OUTLET STRUCTURE

STANDARD SYMBOL: TGOS

MAXIMUM DRAINAGE AREA = 1½ ACRE



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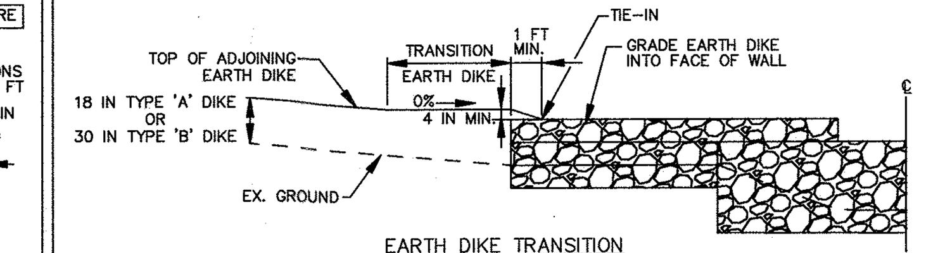
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-8 TEMPORARY GABION OUTLET STRUCTURE

STANDARD SYMBOL: TGOS



NOTES:

1. PROVIDE TRANSITION LENGTH AND HEIGHT AS SPECIFIED ON PLAN. HEIGHT OF TRANSITION EARTH DIKE MUST EXCEED 4 INCH MINIMUM FREEBOARD ABOVE TOP OF GABION AND EXTEND AT THIS ELEVATION UNTIL IT INTERCEPTS THE TOP OF ADJOINING EARTH DIKE.
2. PROVIDE POSITIVE DRAINAGE ALONG EARTH DIKE TO GABION OUTLET STRUCTURE.
3. COMPACT FILL.
4. SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED ON PLAN. BANK PROJECTIONS OR IRREGULARITIES ARE NOT ALLOWED.

CONSTRUCTION SPECIFICATIONS

1. PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
2. USE BASKETS MADE OF 11 GAUGE WIRE OR HEAVIER.
3. USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
4. INSTALL GABIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
5. EMBED THE GABION OUTLET STRUCTURE INTO THE SOIL A MINIMUM OF 9 INCHES. PROVIDE NONWOVEN GEOTEXTILE UNDER ALL GABIONS.
6. FILL GABION BASKETS WITH CLEAN 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE WITHOUT REBAR OR WIRE MESH.
7. MAKE THE WEIR CREST OF THE GABION OUTLET STRUCTURE 9 INCHES LOWER THAN THE TOP OF THE ADJACENT GABIONS.
8. PROVIDE A MINIMUM WEIR CREST OF 6 FEET.
9. ATTACH WOVEN MONOFILAMENT GEOTEXTILE TO THE UPSTREAM FACE OF GABION BASKETS AND COVER WITH 4 TO 7 INCH STONE.
10. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 12 INCHES OF THE WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO FUNCTION. MAINTAIN LINE, GRADE, AND CROSS SECTION.
11. UPON REMOVAL OF GABION OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

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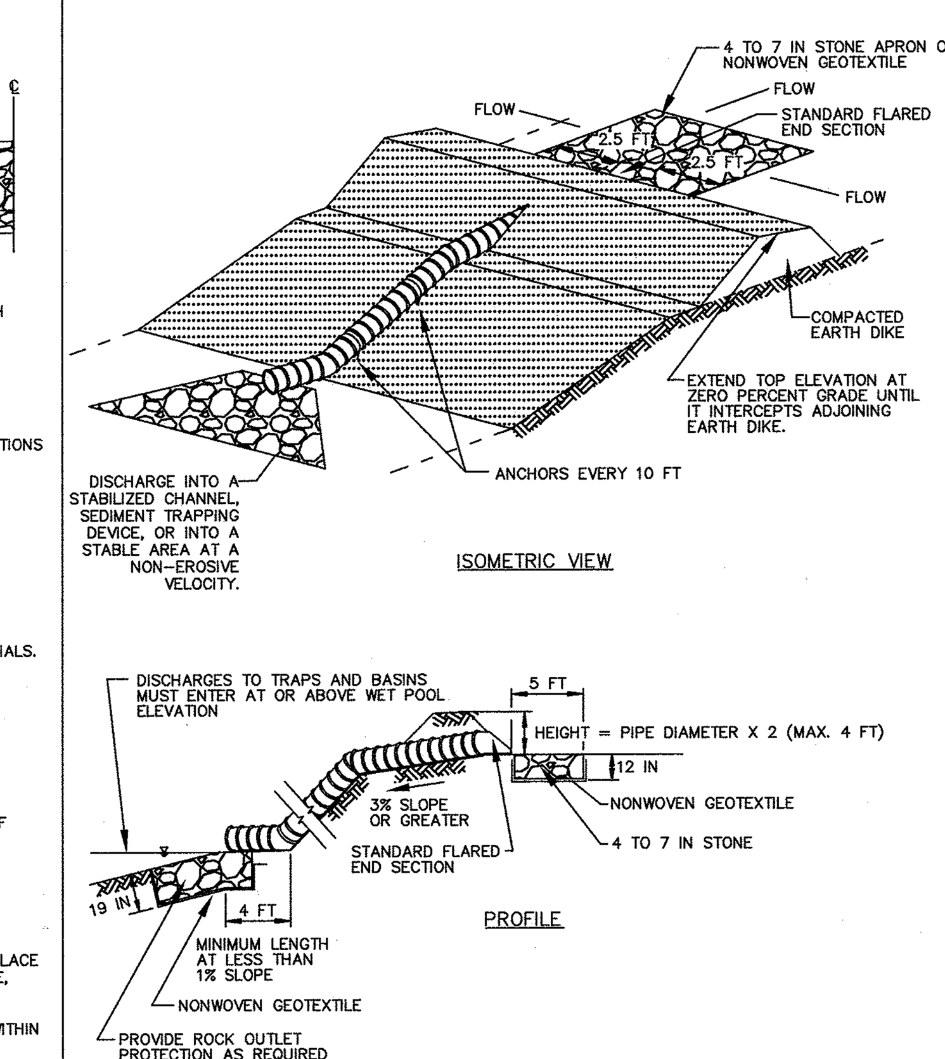
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-1 PIPE SLOPE DRAIN

STANDARD SYMBOL: PSD – 12 — DESIGNATION PSD-12 REFERS TO 12 IN PIPE SLOPE DRAIN.



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MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-1 PIPE SLOPE DRAIN

STANDARD SYMBOL: PSD – 12 — DESIGNATION PSD-12 REFERS TO 12 IN PIPE SLOPE DRAIN.

CONSTRUCTION SPECIFICATIONS

1. THE HEIGHT OF THE EARTH DIKE MUST BE AT LEAST 2 TIMES THE PIPE DIAMETER MEASURED FROM THE INVERT OF THE PIPE. EXTEND THE TOP ELEVATION OF DIKE AT ZERO PERCENT GRADE UNTIL IT INTERCEPTS THE TOP OF THE ADJOINING EARTH DIKE.
2. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. ALL CONNECTIONS MUST BE WATERTIGHT.
3. ATTACH A FLARED END SECTION TO THE INLET END OF PIPE WITH A WATERTIGHT CONNECTION. AT THE INLET OF THE PIPE SLOPE DRAIN, INSTALL 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PLACED 12 INCHES IN DEPTH ON NONWOVEN GEOTEXTILE AND EXTEND OUT 5 FEET FROM THE INLET IN ALL DIRECTIONS.
4. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
5. SECURELY ANCHOR THE PIPE SLOPE DRAIN (PSD) TO THE SLOPE. SPACE THE ANCHORS EVERY 10 FEET.
6. HAND TAMP THE SOIL AROUND AND UNDER THE PIPE AND END SECTION IN 4 INCH LIFTS TO THE TOP OF THE EARTH DIKE.
7. UPON COMPLETING INSTALLATION OF THE PSD, STABILIZE ASSOCIATED DISTURBANCES WITH SEED, MULCH, AND TACK.
8. INSTALL OUTLET PROTECTION AS SPECIFIED ON APPROVED PLAN.
9. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REMOVE ACCUMULATED SEDIMENT AND DEBRIS.

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MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

*NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET

SEE SHEET 22 FOR SEQUENCE OF CONSTRUCTION

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: 12-21-20

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER — 9/9/19

THIS PLAN IS FOR EROSION & SEDIMENT CONTROL PURPOSES ONLY

ENGINEER'S CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

ENGINEER – JOHN M. CARNEY #45577 — DATE 5/16/17

DEVELOPER'S CERTIFICATE

"I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL ON EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."

DEVELOPER — DATE 5-16-17

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 5/30/17

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-28-17

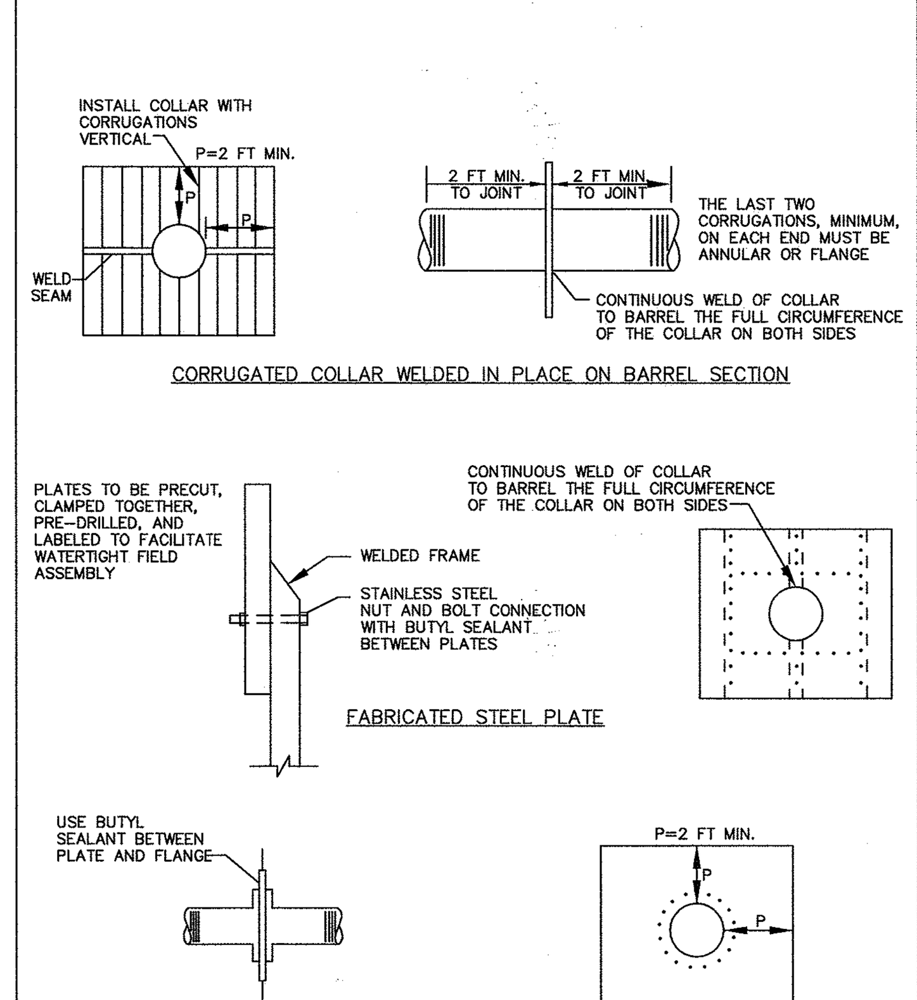
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 6/23/2017

DETAIL G-2-1 TYPICAL ANTI-SEEP COLLARS

STANDARD SYMBOL



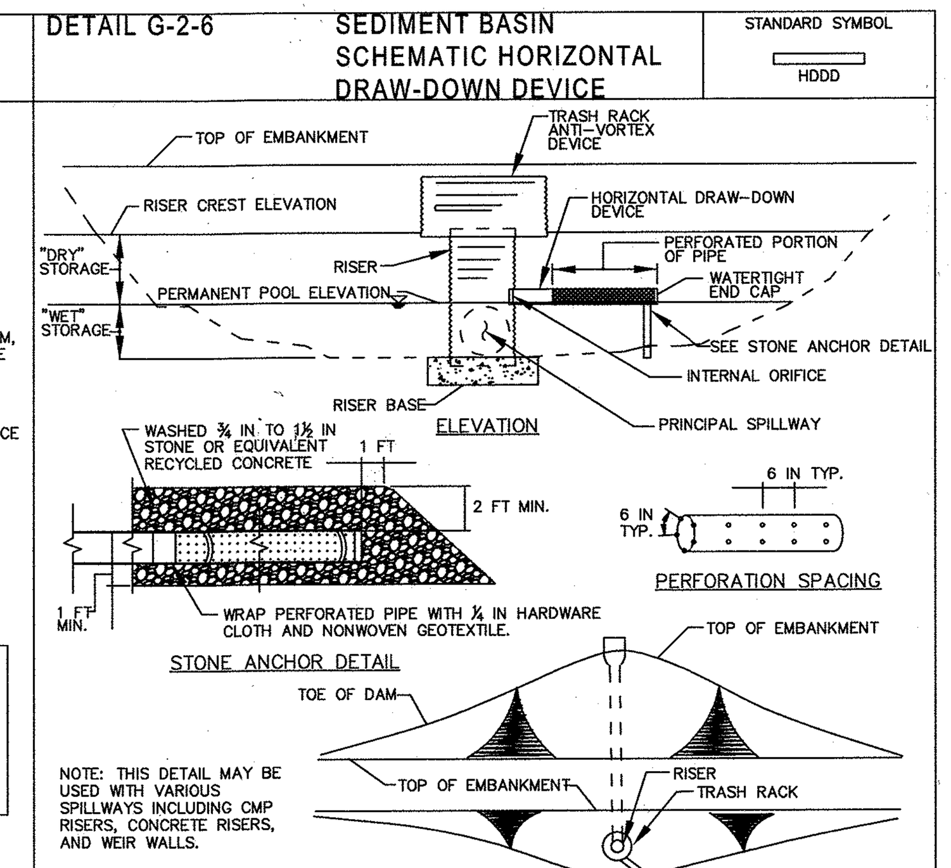
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DRAW-DOWN DEVICE TO BE: 4' OF 6" PVC WITH 3 ROW OF 1" DIA. HOLES EVERY 6"

DETAIL G-2-6 SEDIMENT BASIN SCHEMATIC HORIZONTAL DRAW-DOWN DEVICE

STANDARD SYMBOL: HDDD



CONSTRUCTION SPECIFICATIONS

1. PERFORATE PIPE WITH 1 INCH DIAMETER PERFORATIONS SPACED 6 INCHES APART LONGITUDINALLY AND RADIALLY OR IN ACCORDANCE WITH APPROVED PLAN.
2. WRAP THE PERFORATED PORTION OF THE DRAW-DOWN DEVICE FIRST WITH ¼ INCH GALVANIZED HARDWARE CLOTH, THEN WITH NONWOVEN GEOTEXTILE. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS. DO NOT WRAP WITH MORE THAN ONE LAYER OF GEOTEXTILE.
3. AS AN ALTERNATE TO STONE ANCHORING, SECURE DRAW-DOWN DEVICE WITH TWO 1 INCH STEEL ANGLES SET 3 FEET MINIMUM INTO THE GROUND ATTACHED TO DRAW-DOWN DEVICE BY A 1 INCH WIDE GALVANIZED STEEL STRAP OR 12 GAUGE OR HEAVIER WIRE.
4. REMOVE SEDIMENT WHEN IT ACCUMULATES TO CLEANOUT ELEVATION (50% OF THE WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA IN A SUCH A MANNER THAT IT WILL NOT ERODE. MAINTAIN WATER TIGHT CONNECTIONS. REPLACE GEOTEXTILE AROUND PERFORATED RISER IF DRY STORAGE VOLUME DOES NOT DRAW DOWN WITHIN 10 HOURS.

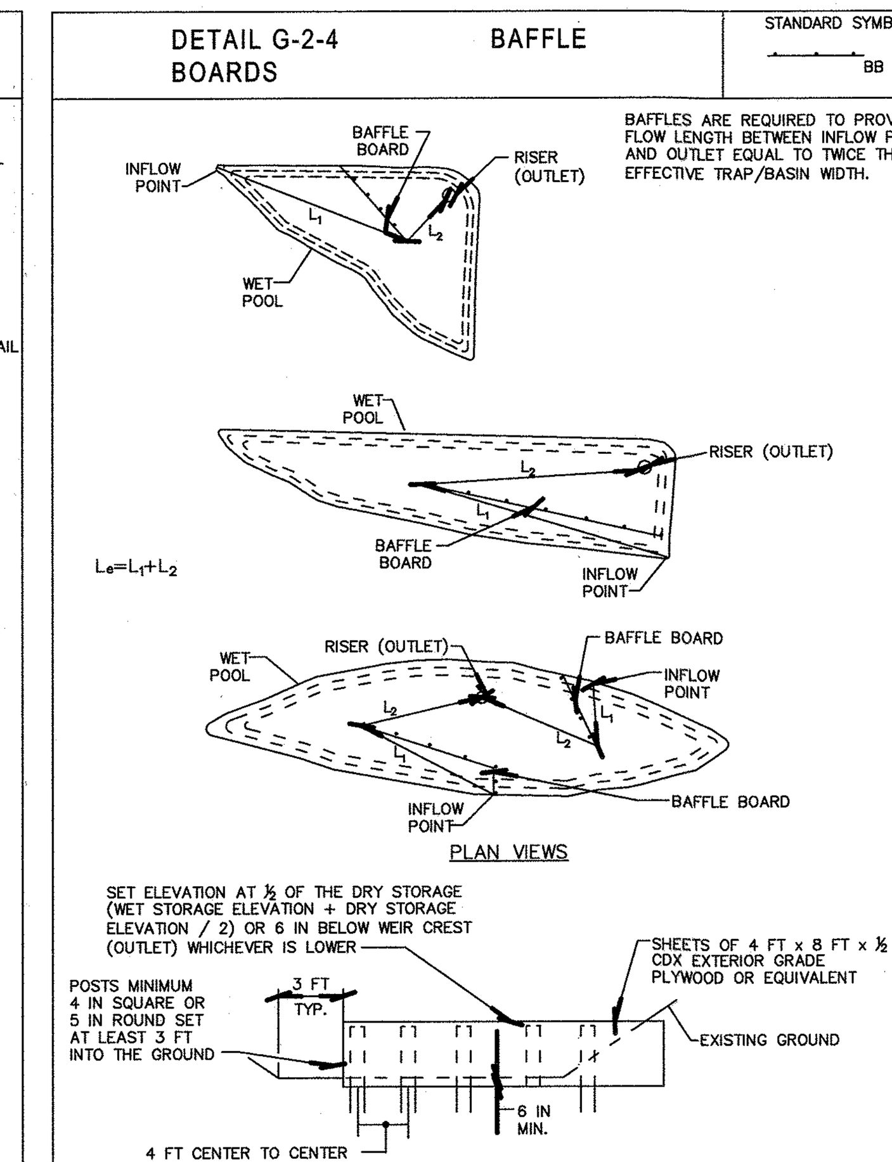
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-2-4 BAFFLE BOARDS

STANDARD SYMBOL: BB

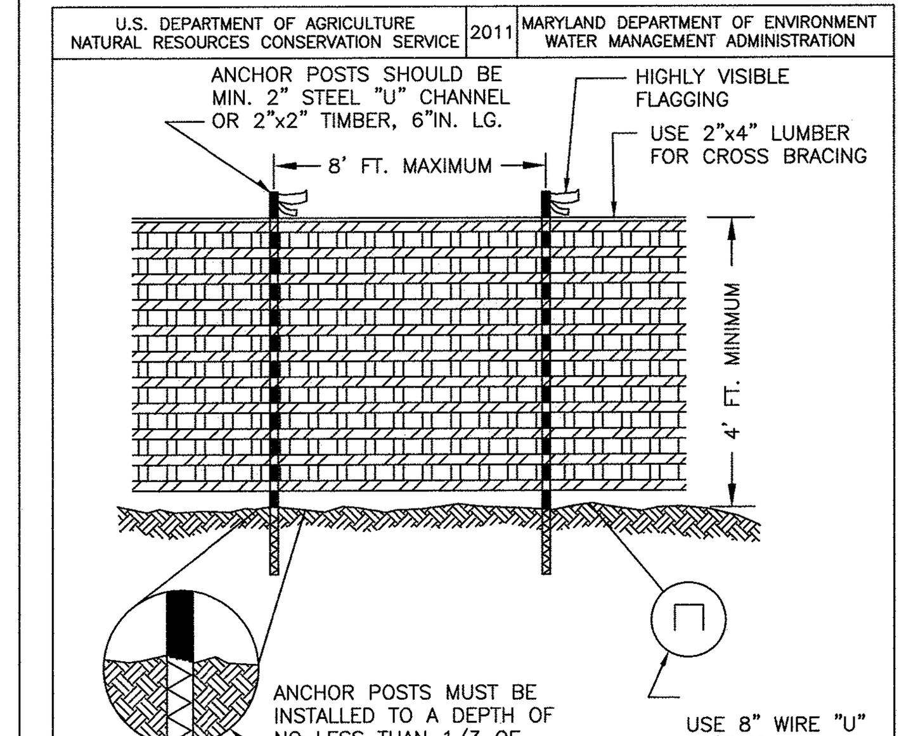
BAFFLES ARE REQUIRED TO PROVIDE A FLOW LENGTH BETWEEN INFLOW POINT AND OUTLET EQUAL TO TWICE THE EFFECTIVE TRAP/BASIN WIDTH.



MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



NOTES:

1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
4. AVOID ROOT DAMAGE WHEN PLACING ANCHOR POSTS.
5. DEVICE SHOULD BE PROPERLY MAINTAINED DURING CONSTRUCTION
6. PROTECTIVE SIGNAGE IS ALSO REQUIRED.

TEMPORARY TREE PROTECTION FENCE

SCALE: NTS

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADD NOTE

BENCHMARK ENGINEERING, INC.

ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS

8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

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: 06-08-2018.

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER — 5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

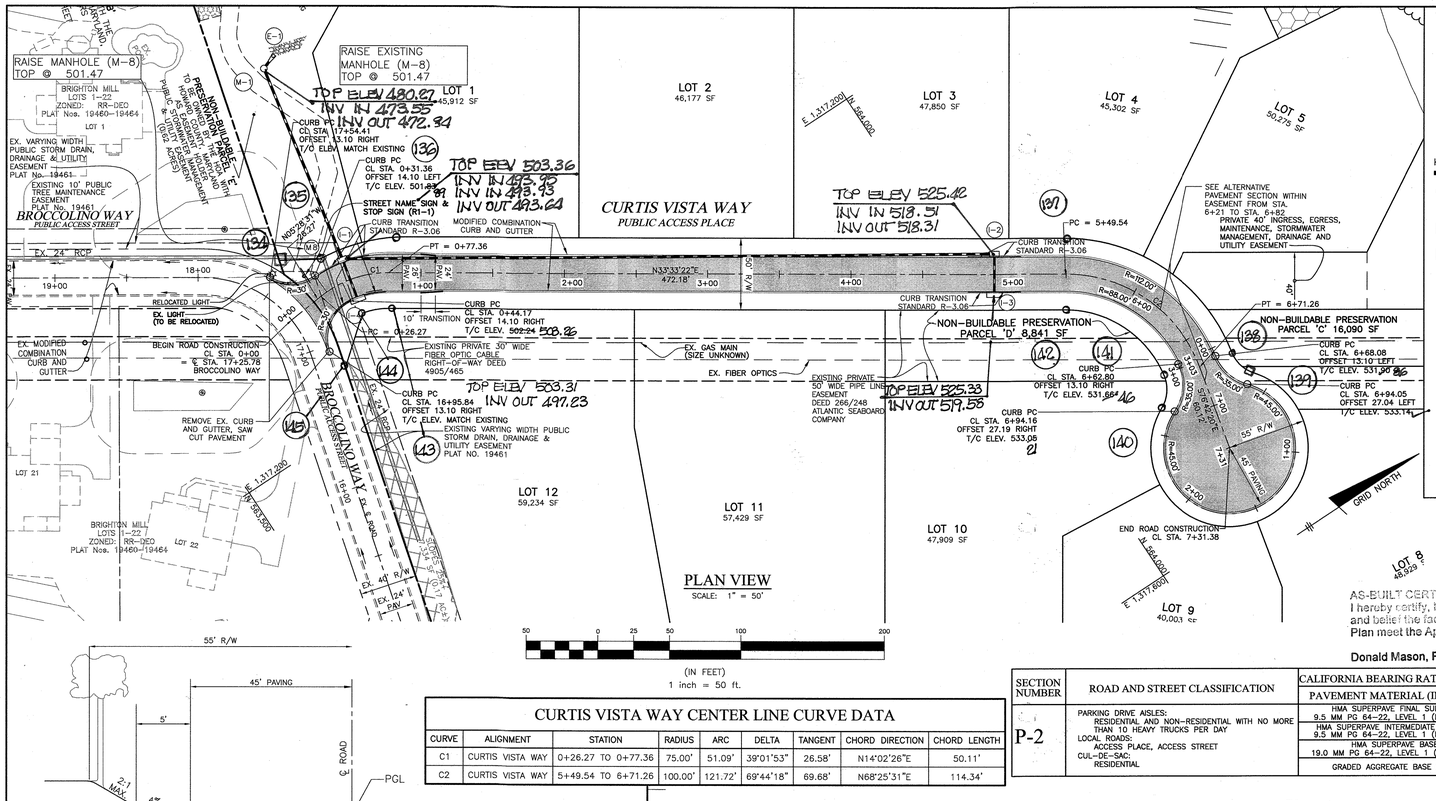
TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

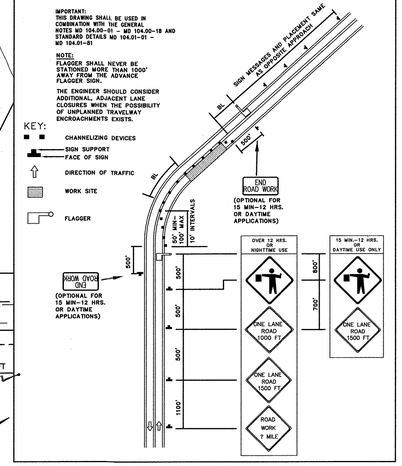
FINAL ROAD CONSTRUCTION PLANS
SEDIMENT AND EROSION CONTROL
NOTES & DETAILS

DATE: MAY, 2017	BEI PROJECT NO. 2627
DESIGN: JC/NAF · DRAFT: JC/NAF · SCALE: AS SHOWN	SHEET 4 OF 23

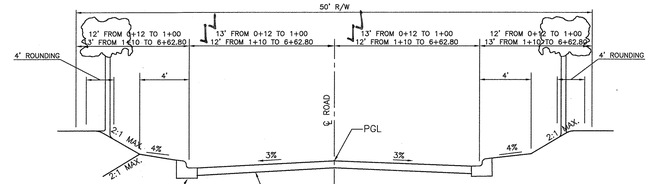
AS-BUILT F-17-054

2627 Brighton Mill Sec 2\dwg\2026.dwg, 04 ENL ... 5/15/2017 5:00:43 PM ... PlotWave 360 - WPD2



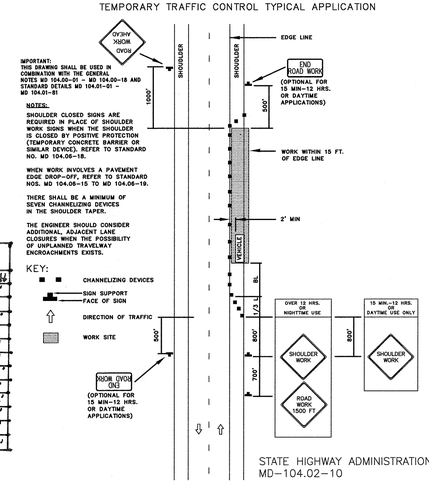


STATE HIGHWAY ADMINISTRATION DETAIL
MD-104.02-10



TYPICAL ROADWAY SECTION
CURTIS VISTA WAY
(PUBLIC ACCESS PLACE – 200 ADT OR LESS)
DESIGN SPEED: 25 MPH
STA. 0+12 TO STA. 7+31
NOT TO SCALE

NOTE: TEN FOOT LONG TRANSITION FROM 26' WIDE PAVING SECTION TO 24' WIDE PAVING SECTION TO BEGIN AT STATION 1+00 AND TO END AT STATION 1+10.



STATE HIGHWAY ADMINISTRATION DETAIL
MD-104.02-10

RIGHT OF WAY ELEVATION CHART NAD 83

R/W PT NO	DESCRIPTION	ELEVATION
134	CONC MON	498.50'
135	REBAR & CAP	501.91'
136	REBAR & CAP	502.09'
137	REBAR & CAP	522.13'
138	REBAR & CAP	538.61'
139	CONC MON	531.44'
140	REBAR & CAP	533.03'
141	REBAR & CAP	531.55'
142	REBAR & CAP	526.86'
143	REBAR & CAP	538.47'
144	REBAR & CAP	508.07'
145	REBAR & CAP	502.89'

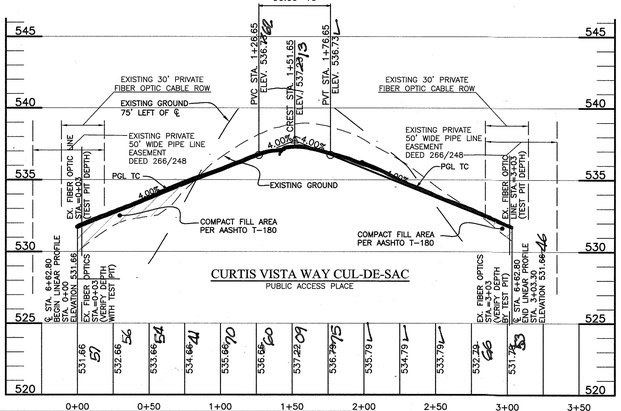
CURTIS VISTA WAY CENTER LINE CURVE DATA

CURVE	ALIGNMENT	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD DIRECTION	CHORD LENGTH
C1	CURTIS VISTA WAY	0+26.27 TO 0+77.36	75.00'	51.09'	39°01'53"	26.58'	N14°02'26"E	50.11'
C2	CURTIS VISTA WAY	5+49.54 TO 6+71.26	100.00'	121.72'	69°44'18"	69.68'	N68°25'31"E	114.34'

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 TO <5	5 TO <7	≥7	3 TO <5	5 TO <7	≥7
		PAVEMENT MATERIAL (INCHES)	MIN HMA WITH GAB			HMA WITH CONSTANT GAB		
P-2	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SAC: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		HMA SUPERPAVE BASE 19.0 MM PG 64-22, LEVEL 1 (LOW ESAL)	2.0	2.0	2.0	3.5	2.0	2.0
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	4.0

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: 9/16/19

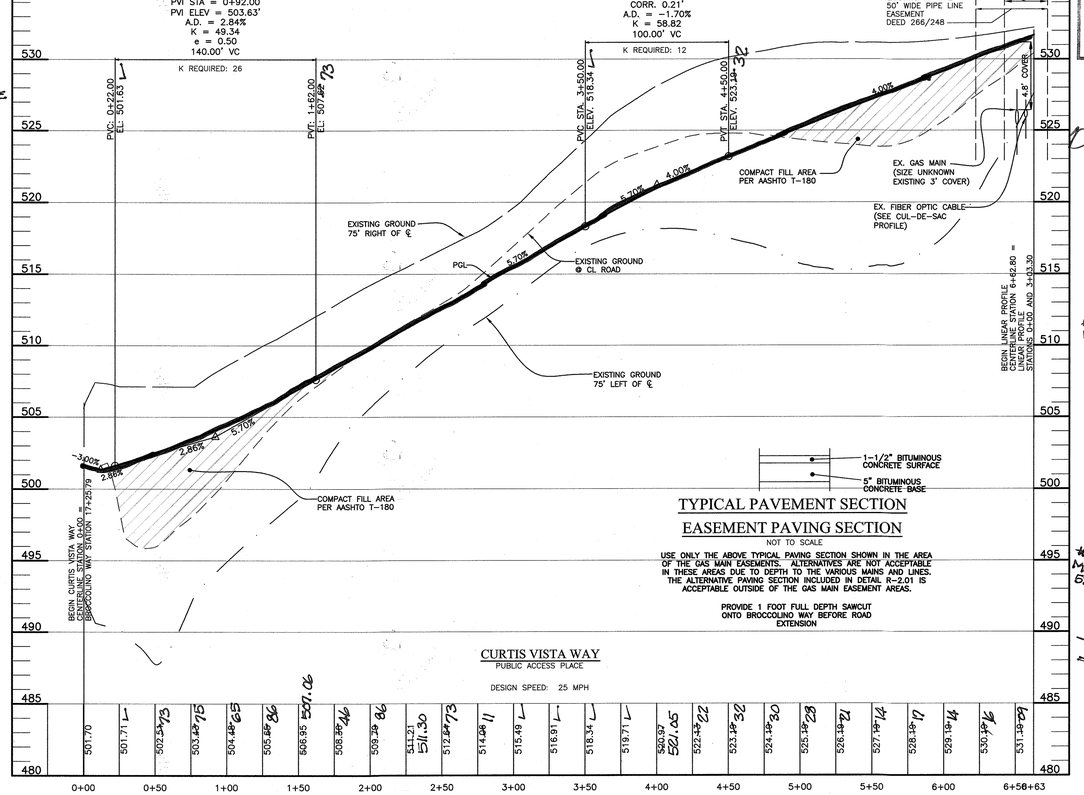


TYPICAL ROADWAY SECTION
CURTIS VISTA WAY
CUL-DE-SAC BULB
(PUBLIC ACCESS PLACE – 200 ADT OR LESS)
DESIGN SPEED: 25 MPH
STA. 0+00 TO STA. 3+03
NOT TO SCALE

AS-BUILT NOTES:
1.) HORIZONTAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD 83/ADJ 07 AS PROJECTED FROM HO. CO. GEODETIC CONTROL STATIONS 23HA AND 24AA. VERTICAL DATUM FOR THIS AS-BUILT IS NORTH AMERICAN VERTICAL DATUM NGVD 29 AS PROJECTED FROM THE ABOVE MENTIONED HOWARD COUNTY GEODETIC CONTROL STATIONS
2) THE INSTRUMENTS USED IN PERFORMING THIS AS-BUILT WERE A 5" TOTAL STATION AND PRISM AND RTK GPS.
3.) THIS AS-BUILT WAS PERFORMED BY BENCHMARK ENGINEERING, INC.

CURTIS VISTA WAY CUL-DE-SAC
PUBLIC ACCESS PLACE

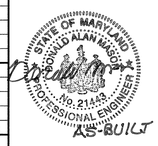
PROFILE VIEWS
SCALE:
HORIZONTAL 1" = 50'
VERTICAL 1" = 5'



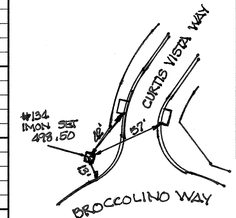
TYPICAL PAVEMENT SECTION
EASEMENT PAVING SECTION
NOT TO SCALE
1-1/2" BITUMINOUS CONCRETE SURFACE
5" BITUMINOUS CONCRETE BASE
USE ONLY THE ABOVE TYPICAL PAVING SECTION SHOWN IN THE AREA OF THE GAS MAIN EASEMENTS. ALTERNATIVES ARE NOT ACCEPTABLE IN THESE AREAS DUE TO DEPTH TO THE VARIOUS MAINS AND LINES. THE ALTERNATIVE PAVING SECTION INCLUDED IN DETAIL R-2.01 IS ACCEPTABLE OUTSIDE OF THE GAS MAIN EASEMENT AREAS.
PROVIDE 1 FOOT FULL DEPTH SAWCUT ONTO BROCCOLINO WAY BEFORE ROAD EXTENSION

CURTIS VISTA WAY
PUBLIC ACCESS PLACE
DESIGN SPEED: 25 MPH

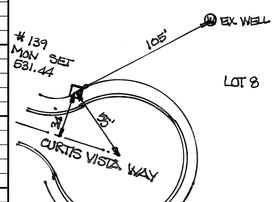
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12/2/20



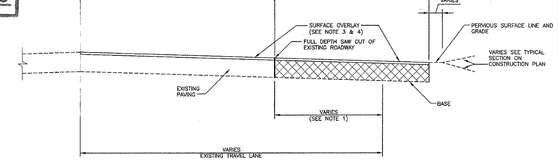
AS-BUILT



MONUMENT #134



MONUMENT #139



NOTES:
1. WHEN EXISTING TRAVEL LANE IS LESS THAN THE REQUIRED 12' LANE CONTRACTOR SHALL REMOVE A MINIMUM OF 1" FULL DEPTH OF THE EXISTING ROADWAY, IF CURB AND GUTTER IS INSTALLED, PROVIDE A MINIMUM OF 4" OF WIDENING FROM FACE OF GUTTER PAN.
2. THE EXISTING PAVEMENT TO BE RESURFACED SHALL BE MILLED AT DEPTH OF 1 1/2" (MINIMUM).
3. THE RESURFACING SHALL BE PLACED TO THE CENTERLINE OF THE ROADWAY.
4. RESURFACING COURSE TO BE EQUAL TO THE SURFACE COURSE OF THE TYPICAL PAVEMENT SECTION.

Revised	Howard County, Maryland Department of Public Works	Existing Roadway Widening Strip	Detail R-1.08
Revised 1/7/2000 Approved	Approved: Chief, Bureau of Engineering		

NO.	DATE	REVISION
1	7/18/19	CHANGE TOTAL SHEETS

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 6/14/2017

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/28/17

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
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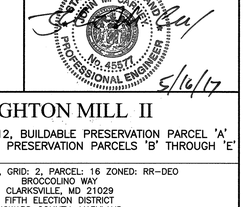
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 21443, Expiration Date: 06-08-2018.



5/16/17

OWNER:
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304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
ROAD PLAN & PROFILES

DATE: MAY, 2017	BEI PROJECT NO. 2627
DESIGN: JC/NAF DRAFT: JC/NAF	SCALE: AS SHOWN SHEET 5 OF 23

AS-BUILT F-17-054

STREET TREE REQUIREMENTS		
ROADWAY NAME:	CURTIS VISTA WAY	TOTAL
LINEAR FEET OF ROAD FRONTAGE	1616	1616
LINEAR FEET OF CREDIT	–	–
LINEAR FEET OF OBLIGATION	1616	1616
STREET TREES REQUIRED (1:40)	40	40
NUMBER OF SHADE TREES PROVIDED:	40	40

STREET TREE PLANTING LIST				
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	40	Tilia cordata 'GREENSPIRE' (Greenspire Littleleaf Linden)	2.5" – 3" cal.	TO BE PLANTED ALONG CURTIS VISTA WAY (PROVIDED BY THE DEVELOPER)
	2	Tilia cordata 'GREENSPIRE' (Greenspire Littleleaf Linden)	2.5" – 3" cal.	RELOCATED TREES TO BE PLANTED ALONG BROCCOLINO WAY (PROVIDED BY THE DEVELOPER)

SCHEDULE A PERIMETER LANDSCAPE EDGE				
CATEGORY	ADJACENT TO ROADWAY	NO	NO	TOTAL
	ADJACENT TO PERIMETER PROPERTIES	YES	YES	
PERIMETER NO. / LANDSCAPE TYPE		(1) A	(2) B	
LINEAR FEET OF PERIMETER (FRONTAGE/ROADWAY)		2409	1022	3438
CREDIT FOR EXISTING VEGETATION: NO OR YES (✔/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		YES 730	NO –	791
LINEAR FEET OF REQUIRED PERIMETER LANDSCAPING		1679	1022	2547
CREDIT FOR WALL, FENCE OR BERM: NO OR YES (✔/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		NO –	NO –	
NUMBER OF PLANTS REQUIRED:	SHADE TREES 1:60	28	20	64*
	EVERGREEN TREES –	–	26	26
	OTHER TREES (2:1 SUBSTITUTE)	–	–	–
	SHRUBS	–	–	–
NUMBER OF PLANTS PROVIDED:	SHADE TREES	28	20	64*
	EVERGREEN TREES	–	26	26
	OTHER TREES (2:1 SUBSTITUTE)	–	–	–
	SHRUBS (10:1 SUBSTITUTE)	–	–	–
	(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	–	–	–

* PER WP-16-064: (16) 2" TO 3" CALIPER TREES INCLUDED. TREES REQUIRED BY WP-16-064 APPROVAL ARE SHOWN WITH ⊙ THE ⊙ SYMBOL

LANDSCAPING NOTES

1. THE PROPOSED LANDSCAPING SHALL BE PROVIDED BY THE PLANTINGS AS SHOWN ON THESE PLANS.
2. THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL INTERNAL PLANTINGS; THE PRESERVATION OF THE EXISTING PERIMETER VEGETATION; AND FOR THE PERIMETER PLANTINGS.
3. A MINIMUM DISTANCE OF TWENTY (20) FEET MUST BE MAINTAINED BETWEEN ANY TREES LOCATED ALONG THE CURB LINE AND FROM STREET LIGHTS.
4. TREES MUST BE PLANTED A MINIMUM OF FIVE (5) FEET FROM AN OPEN SPACE ACCESS STRIP, TEN (10) FEET FROM A DRIVEWAY AND FIVE (5) FEET FROM A STORM DRAIN.
5. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
6. STREET TREES SHALL BE PLANTED SIX (6) FEET BEHIND FACE OF CURB WHEN THERE ARE NO SIDEWALKS.
7. ALL LANDSCAPING PLANT TYPES SHOWN ON THESE PLANS ARE RECOMMENDATIONS AND MAY BE SUBSTITUTED WITH APPROVED EQUIVALENTS FROM THE HOWARD COUNTY LANDSCAPE MANUAL.
8. NO TREES SHALL BE PLACED WITHIN 10' BEHIND A RETAINING WALL OR WITHIN A RELATED MAINTENANCE EASEMENT, WHICHEVER IS GREATER.
9. SHOULD ANY TREE DESIGNATED FOR PRESERVATION FOR WHICH LANDSCAPING CREDIT IS GIVEN, DIE PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE HOWARD COUNTY LANDSCAPE MANUAL.
10. POSTING OF SURETY FOR REQUIRED LANDSCAPING IN ACCORDANCE WITH SECTION 16.124 OF THE LANDSCAPE MANUAL IN THE AMOUNT OF $23,100 FOR 64 SHADE TREES, 26 EVERGREENS. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING MUST BE POSTED AS PART OF THE DEVELOPER'S AGREEMENT.
11. THE OWNER, TENANT 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.
12. 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 RELOCATIONS 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 THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.
13. PER WP-16-064: A MINIMUM OF 16 ADDITIONAL, NATIVE, 2-3" CALIPER TREES SHALL BE PROVIDED ON SITE AS PART OF THE MITIGATION FOR SPECIMEN TREE REMOVAL. THIS MITIGATION SHALL BE ADDRESSED WITHIN THE PROJECT KNOWN AS "BRIGHTON MILL II" AND WILL BE IN ADDITION TO ANY REQUIRED LANDSCAPE OR FOREST CONSERVATION PLANTINGS. THE MITIGATION WILL BE SHOWN ON THE ASSOCIATED LANDSCAPE PLAN AND SURETY FOR THESE ADDITIONAL TREES WILL BE REQUIRED AS PART OF THE FINAL PLAN.
14. THE 40 PUBLIC STREET TREES FOR VISTA RIDGE WAY AND THE 2 TREES TO BE RELOCATED ALONG BROCCOLINO WAY SHALL BE ADDRESSED WITH DEVELOPMENT ENGINEERING DIVISION'S COST ESTIMATE IN THE AMOUNT OF $12,600.
15. PERIMETER 1 IS BETWEEN LOTS 1 THROUGH 8 AND THE PRESERVATION PARCELS "A" AND "B", NEIGHBORING PARCEL 173, 164 AND 213. PERIMETER 1 HAS SUBSTANTIAL CREDITS APPLIED FOR RETENTION OF EXISTING VEGETATION. PERIMETER 2 IS BETWEEN THE REAR OF LOTS 8 THROUGH 12 WHERE THE LOTS ABUT EXISTING BROCCOLINO WAY. WAIVER PETITION, WP-16-064, REQUIRES 16 ADDITIONAL TREES BE PLANTED IN PERIMETER 2 DUE TO THE REMOVAL OF SPECIMEN TREES FROM OTHER LOCATIONS ON THIS SITE.

PERIMETER PLANTING LIST				
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	26	Pinus Strobus (Eastern White Pine)	6' – 8' HGT.	TO BE PLANTED ALONG CURTIS VISTA WAY (PROVIDED BY THE DEVELOPER)
	16	Quercus rubra (Red Oak)	2.5" –3" cal.	TO BE PLANTED ALONG CURTIS VISTA WAY (PROVIDED BY THE DEVELOPER)
+	48	Tilia cordata 'Greenspire' (Greenspire Littleleaf Linden)	2.5" –3" cal.	TO BE PLANTED ALONG CURTIS VISTA WAY (PROVIDED BY THE DEVELOPER)

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

LEGEND

- SOILS CLASSIFICATION / SOILS DELINEATION — GgB
- EXISTING CONTOURS — 480 / 478
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- TREE PROTECTION FENCE — TF
- EXISTING STRUCTURE
- EXISTING FIBER OPTICS & GAS EASEMENT
- PROPOSED STRUCTURE
- SEWAGE DISPOSAL AREA
- FOREST CONSERVATION AREA (RETENTION)
- FOREST CLEARING AREA
- BIO-RETENTION AREAS
- PROPOSED WELL — WELL
- 15% TO 25% SLOPES
- 25% & GREATER SLOPES
- 100-YEAR FLOODPLAIN
- STREAM
- LIMIT OF DISTURBANCE
- FCE PERMANENT SIGNAGE
- EXISTING SPECIMEN TREE
- EXISTING SPECIMEN TREE (TO BE REMOVED)
- EXISTING STREET TREE
- PROPOSED STREET TREE
- PROPOSED TREES
- TREE RELOCATION GUIDE

PLAN VIEW
SCALE: 1" = 50'

(IN FEET)
1 inch = 50 ft.

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADD GRADING SWM NOTE

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

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: 06-08-2018.

STATE OF MARYLAND — No. 45577 — PROFESSIONAL ENGINEER — 5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
LANDSCAPE PLAN, NOTES AND CHARTS

DESIGN: JC/NAF	DRAFT: JC/NAF	SCALE: AS SHOWN	DATE: MAY, 2017	BEI PROJECT NO. 2627	SHEET 6 OF 23

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 SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND 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.

DEVELOPER – RICHARD DEMMITT — DATE 5-16-17

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 6/14/2017

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-28-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-28-17

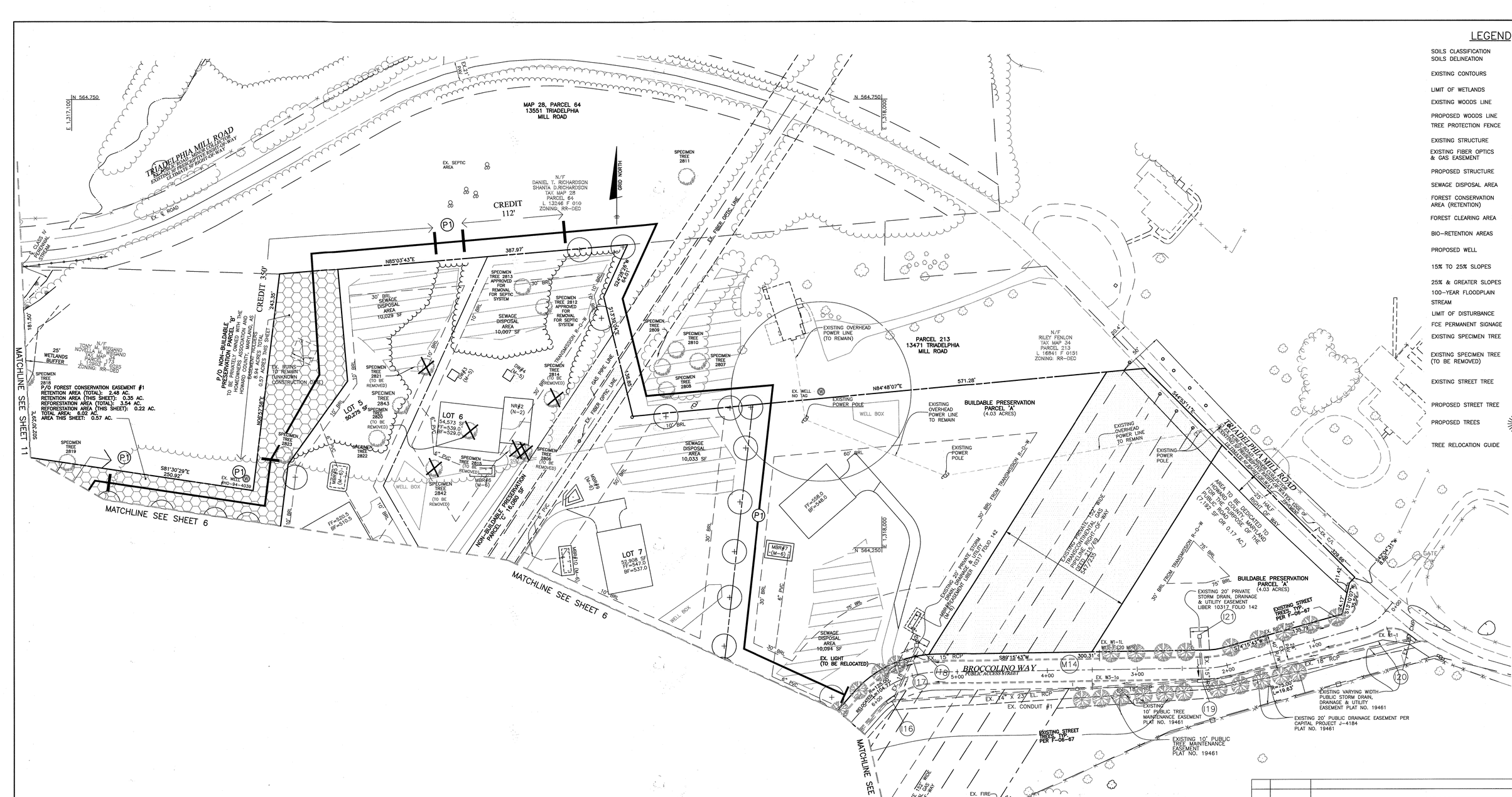
STATE OF MARYLAND — DONALD ALAN MASSEY — No. 21449 — PROFESSIONAL ENGINEER — 7/10/19

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. 21449 Expiration Date: 12/31/20

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

AS-BUILT

F-17-054



LEGEND

- SOILS CLASSIFICATION
- SOILS DELINEATION
- EXISTING CONTOURS
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- TREE PROTECTION FENCE — TF —
- EXISTING STRUCTURE
- EXISTING FIBER OPTICS & GAS EASEMENT
- PROPOSED STRUCTURE
- SEWAGE DISPOSAL AREA
- FOREST CONSERVATION AREA (RETENTION)
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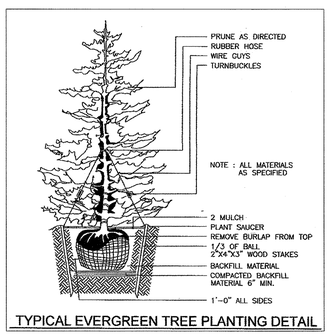
- PROPOSED TREES
- TREE RELOCATION GUIDE

PLAN VIEW
SCALE: 1" = 50'

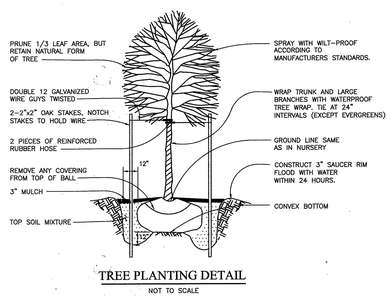
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET



TYPICAL EVERGREEN TREE PLANTING DETAIL



TREE PLANTING DETAIL
NOT TO SCALE

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADD GRADING SWM NOTE

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Richard F. Demmitt 5-16-17
DEVELOPER – RICHARD DEMMITT DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS DATE 6/14/2017

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT DATE 6-29-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 6.28.17

STATE OF MARYLAND DONALD ALAN MASON No. 21449 PROFESSIONAL ENGINEER
AS-BUILT 9/10/19

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. 21449 Expiration Date: 12-21-20

BENCHMARK
ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
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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: 06-08-2018.
STATE OF MARYLAND SUSAN C. LEE No. 45577 PROFESSIONAL ENGINEER
5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

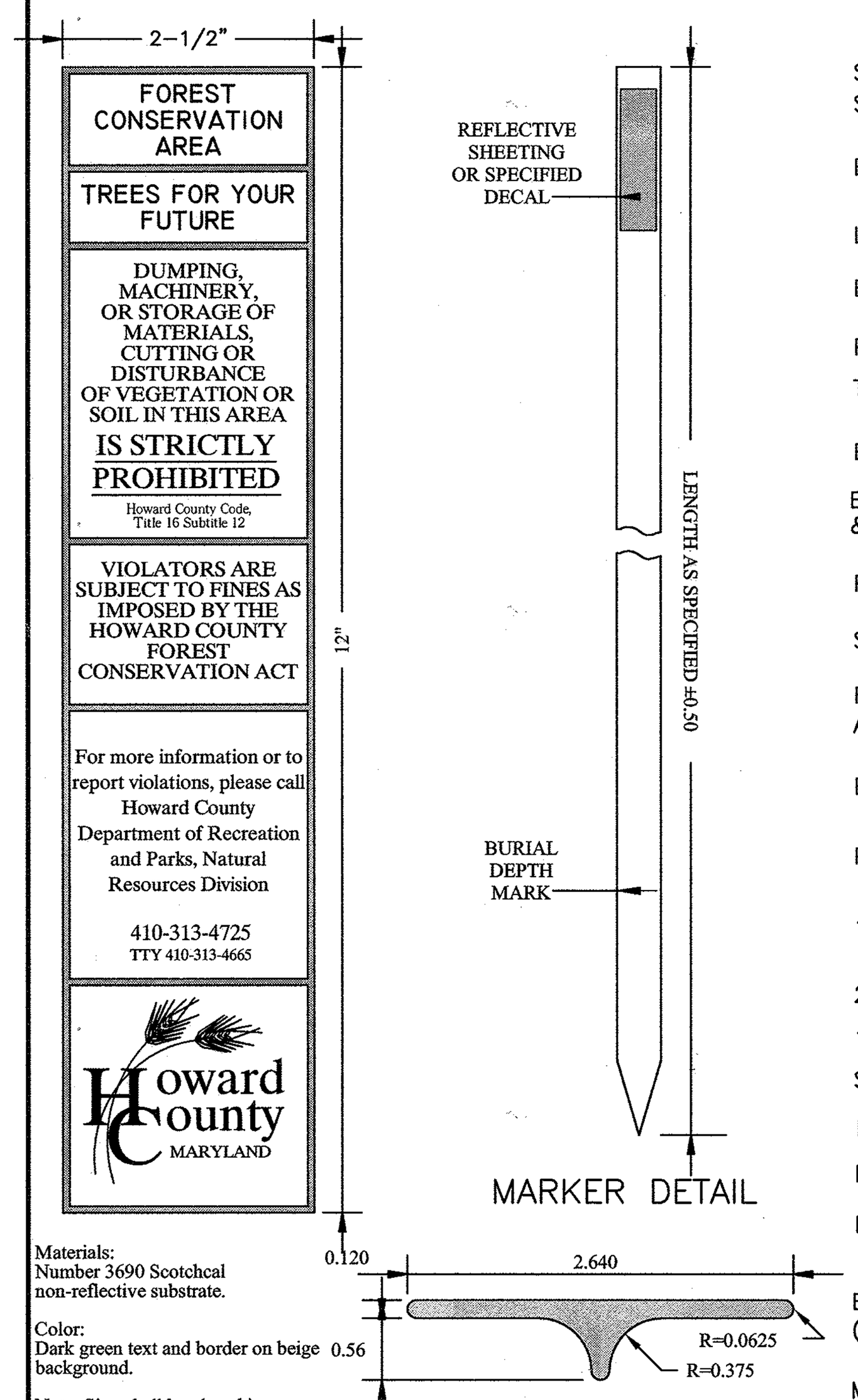
LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
LANDSCAPE PLAN AND DETAILS

DESIGN: JC/NAF	DRAFT: JC/NAF	DATE: MAY, 2017	BEI PROJECT NO. 2627
		SCALE: AS SHOWN	SHEET 7 OF 23

AS-BUILT F-17-054



Materials:
Number 3690 Scotchcal non-reflective substrate.

Color:
Dark green text and border on beige background.

Note: Sign shall be placed in perpetuity

FCE CARSONITE MARKER

NOT TO SCALE

LEGEND

- SOILS CLASSIFICATION / SOILS DELINEATION — GgB
- EXISTING CONTOURS — 480 / 478
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- TREE PROTECTION FENCE — TF
- EXISTING STRUCTURE
- EXISTING FIBER OPTICS & GAS EASEMENT
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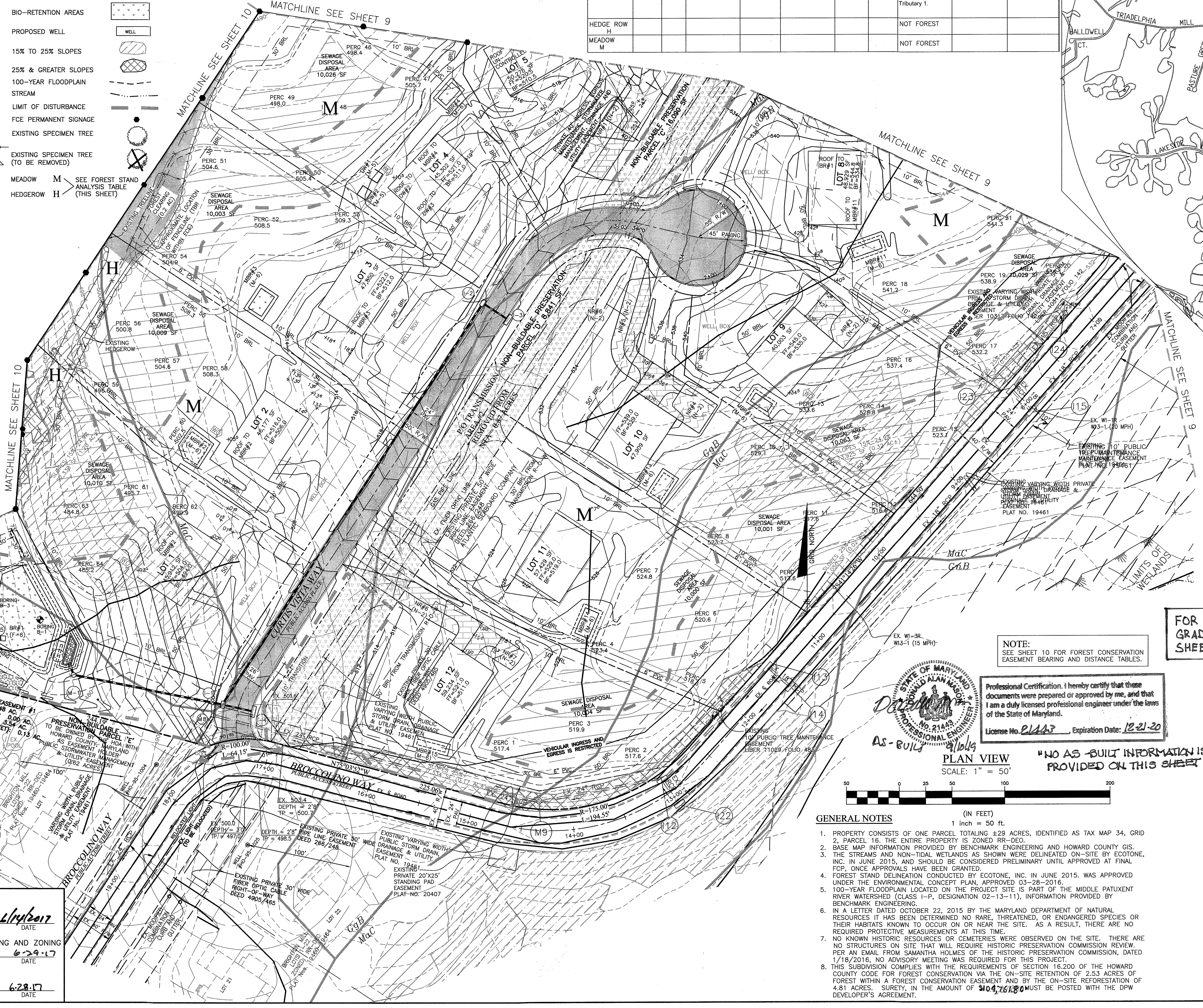
- 25% & GREATER SLOPES
- 100-YEAR FLOODPLAIN
- STREAM
- LIMIT OF DISTURBANCE
- FCE PERMANENT SIGNAGE
- EXISTING SPECIMEN TREE
- EXISTING SPECIMEN TREE (TO BE REMOVED)
- MEADOW M / HEDGEROW H — SEE FOREST STAND ANALYSIS TABLE (THIS SHEET)

FOREST STAND ANALYSIS TABLE

A. TYPE OF COMMUNITY	B. AREA	C. SOIL INFORMATION 1. Soil Types	2. Typical Forest Cover for Soil Type	3. Woodland Suitability Index	D. EXISTING VEGETATION	E. STAND CHARACTERISTICS 1. Size (diameter)	2. Age	3. General Conditions	F. FOREST AREA IN SENSITIVE ENVIRONMENTS (acres)	G. HABITAT VALUE
Deciduous Forest F1	1.92 acres	MaC - Manor Loam	Mixed Oaks	43	White Oak Northern Red Oak Tulip poplar	24-36 18-30 18-30	50-75	Late successional forest in good condition with little or no understory due to age class.	0.0 acres	
Deciduous Forest F2	1.89 acres	MaC - Manor Loam	Mixed Oaks	43	Northern Red Oak White Oak Tulip poplar Red Maple Mockernut Hickory	18-30 18-30 18-24 14-18 8-12	50-75	Late successional forest in good condition with little or no understory due to age class. This stand is a priority stand due to it's proximity to Tributary 1.	1.09 acres	
		MaD - Manor Loam	Mixed Oaks	44						
HEDGE ROW H								NOT FOREST		
MEADOW M								NOT FOREST		



VICINITY MAP

ADC MAP 24 GRID D8
SCALE: 1" = 1000'

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALT. GROUP	NAME	k Value
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.20
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.20
GmB**	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37**
GoB**		C	C	GLENVILLE-CODORUS SILT LOAM, 0 TO 8 PERCENT SLOPE	0.37**
MaC		B		MANOR LOAM, 8 TO 15 PERCENT SLOPES	0.24
MaD		B		MANOR LOAM, 15 TO 25 PERCENT SLOPES	0.24

** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

NOTE:
SEE SHEET 10 FOR FOREST CONSERVATION EASEMENT BEARING AND DISTANCE TABLES.

Ecotone Inc. FORESTS • WETLANDS • RIVERS • WILDLIFE
OFFICE: 410-420-2600 / FAX: 410-420-6983
2120 HIGH POINT ROAD FOREST HILL, MARYLAND 21050
HTTP://ECOTONEINC.COM

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — 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. 21443 Expiration Date: 12-21-20

AS-BUILT 9/10/19

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

PLAN VIEW

SCALE: 1" = 50'

50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

GENERAL NOTES

1. PROPERTY CONSISTS OF ONE PARCEL TOTALING ±29 ACRES, IDENTIFIED AS TAX MAP 34, GRID 2, PARCEL 16. THE ENTIRE PROPERTY IS ZONED RR-DEO.
2. BASE MAP INFORMATION PROVIDED BY BENCHMARK ENGINEERING AND HOWARD COUNTY GIS.
3. THE STREAMS AND NON-TIDAL WETLANDS AS SHOWN WERE DELINEATED ON-SITE BY ECOTONE, INC. IN JUNE 2015, AND SHOULD BE CONSIDERED PRELIMINARY UNTIL APPROVED AT FINAL FCP, ONCE APPROVALS HAVE BEEN GRANTED.
4. FOREST STAND DELINEATION CONDUCTED BY ECOTONE, INC. IN JUNE 2015. WAS APPROVED UNDER THE ENVIRONMENTAL CONCEPT PLAN, APPROVED 03-28-2016.
5. 100-YEAR FLOODPLAIN LOCATED ON THE PROJECT SITE IS PART OF THE MIDDLE PATUXENT RIVER WATERSHED (CLASS I-P, DESIGNATION 02-13-11), INFORMATION PROVIDED BY BENCHMARK ENGINEERING.
6. IN A LETTER DATED OCTOBER 22, 2015 BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES IT HAS BEEN DETERMINED NO RARE, THREATENED, OR ENDANGERED SPECIES OR THEIR HABITATS KNOWN TO OCCUR ON OR NEAR THE SITE. AS A RESULT, THERE ARE NO REQUIRED PROTECTIVE MEASUREMENTS AT THIS TIME.
7. NO KNOWN HISTORIC RESOURCES OR CEMETERIES WERE OBSERVED ON THE SITE. THERE ARE NO STRUCTURES ON SITE THAT WILL REQUIRE HISTORIC PRESERVATION COMMISSION REVIEW. PER AN EMAIL FROM SAMANTHA HOLMES OF THE HISTORIC PRESERVATION COMMISSION, DATED 1/18/2016, NO ADVISORY MEETING WAS REQUIRED FOR THIS PROJECT.
8. THIS SUBDIVISION COMPLIES WITH THE REQUIREMENTS OF SECTION 16.200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION VIA THE ON-SITE RETENTION OF 2.53 ACRES OF FOREST WITHIN A FOREST CONSERVATION EASEMENT AND BY THE ON-SITE REFORESTATION OF 4.81 ACRES. SURETY, IN THE AMOUNT OF $104,761.80 MUST BE POSTED WITH THE DPW DEVELOPER'S AGREEMENT.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 6/14/2017

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-28-17

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADD GRADING SWM NOTE & REMOVE MELVIN NOTE

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

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: 06-08-2018.
STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER — 5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
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BRIGHTON MILL II

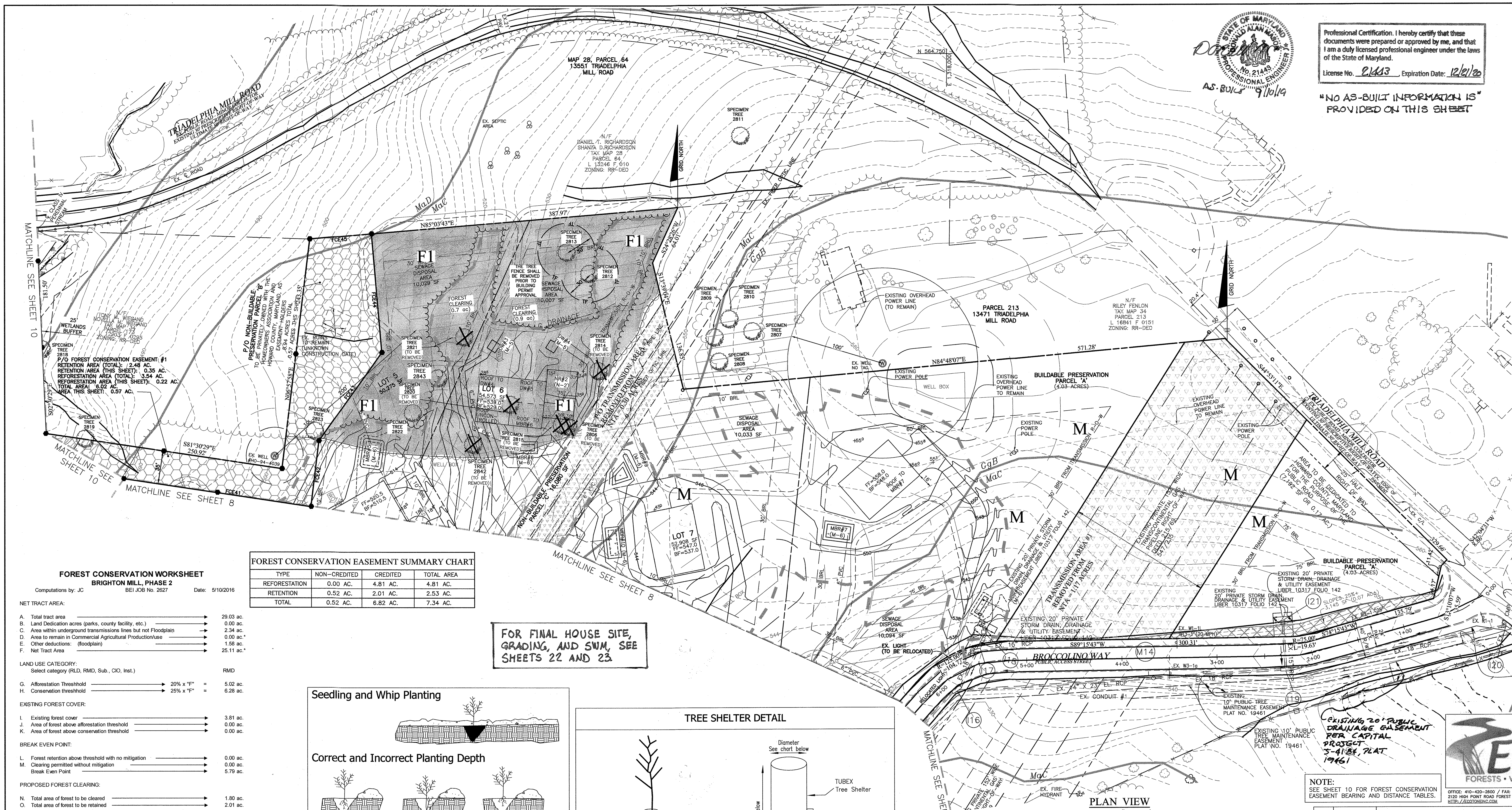
LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
FOREST CONSERVATION PLAN

DATE: MAY, 2017	BEI PROJECT NO. 2627
DESIGN: JC/NAF — DRAFT: JC/NAF — SCALE: AS SHOWN	SHEET 8 OF 23

AS-BUILT F-17-054



"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

AS-BUILT 9/10/19

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License No. 21443, Expiration Date: 12/21/20

LEGEND

SOILS CLASSIFICATION / SOILS DELINEATION	GgB
EXISTING CONTOURS	480 / 478
LIMIT OF WETLANDS	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
TREE PROTECTION FENCE	TF
EXISTING STRUCTURE	
EXISTING FIBER OPTICS & GAS EASEMENT	
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FOREST CONSERVATION AREA (RETENTION)	
BIO-RETENTION AREAS	
PROPOSED WELL	WELL
15% TO 25% SLOPES	
25% & GREATER SLOPES	
100-YEAR FLOODPLAIN	
STREAM	
LIMIT OF DISTURBANCE	
FCE PERMANENT SIGNAGE	
EXISTING SPECIMEN TREE	
EXISTING SPECIMEN TREE (TO BE REMOVED)	

FOREST CONSERVATION EASEMENT SUMMARY CHART

TYPE	NON-CREDITED	CREDITED	TOTAL AREA
REFORESTATION	0.00 AC.	4.81 AC.	4.81 AC.
RETENTION	0.52 AC.	2.01 AC.	2.53 AC.
TOTAL	0.52 AC.	6.82 AC.	7.34 AC.

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

FOREST CONSERVATION WORKSHEET

BRIGHTON MILL, PHASE 2

Computations by: JC BEI JOB No. 2627 Date: 5/10/2016

NET TRACT AREA:

A.	Total tract area	29.03 ac.
B.	Land Dedication acres (parks, county facility, etc.)	0.00 ac.
C.	Area within underground transmissions lines but not Floodplain	2.34 ac.
D.	Area to remain in Commercial Agricultural Production/use	0.00 ac.*
E.	Other deductions: (floodplain)	1.58 ac.
F.	Net Tract Area	25.11 ac.*

LAND USE CATEGORY:
Select category (RLD, RMD, Sub., CIO, Inst.) RMD

G.	Afforestation Threshhold	20% x "F" =	5.02 ac.
H.	Conservation threshhold	25% x "F" =	6.28 ac.

EXISTING FOREST COVER:

I.	Existing forest cover	3.81 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	5.79 ac.

PROPOSED FOREST CLEARING:

N.	Total area of forest to be cleared	1.80 ac.
O.	Total area of forest to be retained	2.01 ac.

PLANTING REQUIREMENTS:

P.	Reforestation for clearing above conservation threshold	0.00 ac.
Q.	Reforestation for clearing below conservation threshold	3.60 ac.
R.	Credit for retention above conservation threshold	0.00 ac.
S.	Total reforestation required	3.60 ac.
T.	Total afforestation required	1.21 ac.
U.	Credit for landscaping - may not exceed 20% of "S."	0.00 ac.
V.	Total reforestation and afforestation required	4.81 ac.

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALT. GROUP	NAME	k Value
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GmB**	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37**
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TAKEN FROM THE NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16

APPROVED: DEPARTMENT OF PUBLIC WORKS

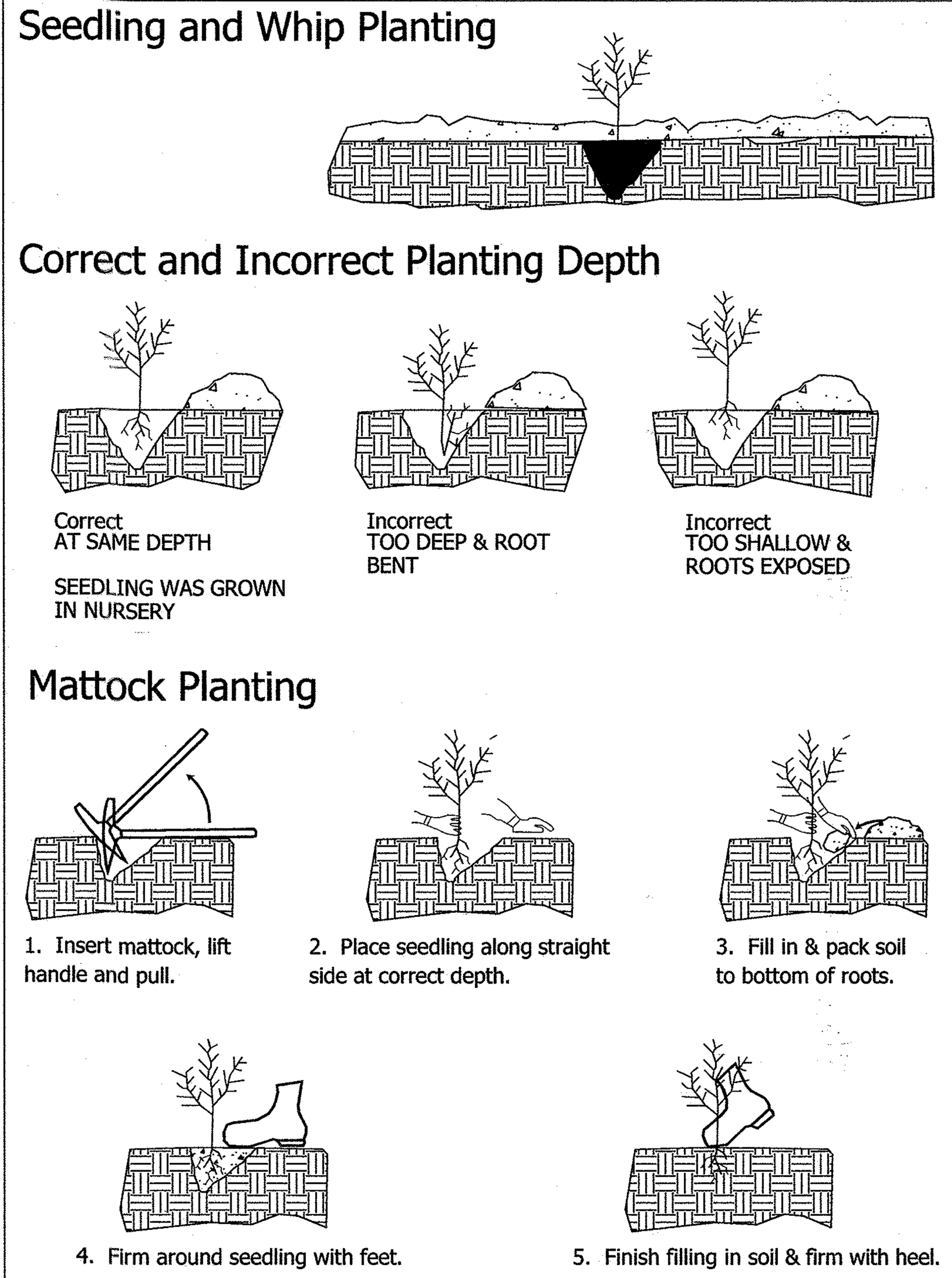
CHIEF, BUREAU OF HIGHWAYS — DATE 6/14/2017

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-28-17

Seedling and Whip Planting

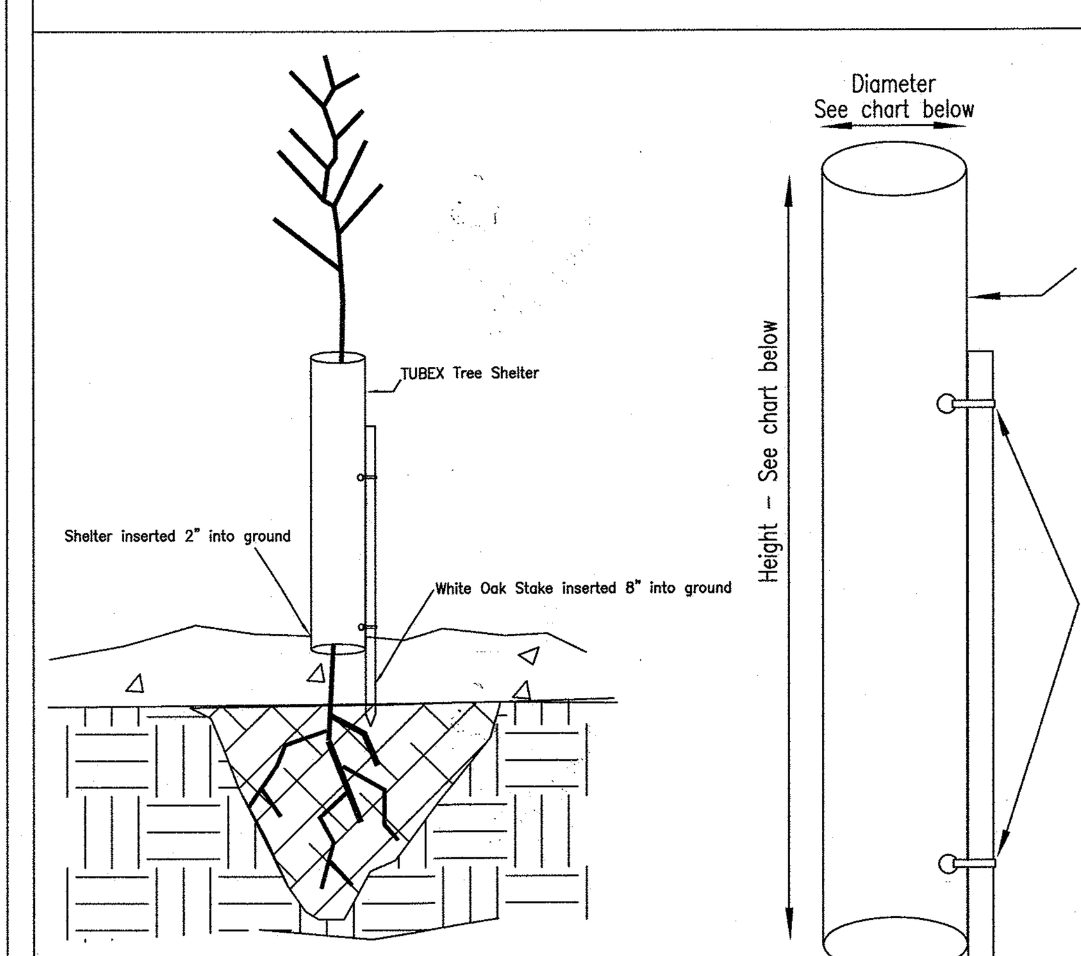


Note:
Mulching newly planted seedlings helps the soil retain water and protects the seedling from compaction and stem injuries.

Source: Adapted from Forest Conservation Manual, 1991

Seedling and Whip Planting Techniques

TREE SHELTER DETAIL



NOTES:
1. Always install stake before planting tree to prevent damaging the roots
2. Do not fasten ties too tightly, heaving of the tube caused by frost may damage tree if ties are not loose enough
3. Substitutions in materials only with approval from the Project Engineer.

Stock Type:	Shelter Height:	Shelter Width:	Stake Height
Tree	48 inches	4 inches (avg.)	48 inches
Shrub	24 inches	5 inches (min.)	30 inches

INSTALLATION SEQUENCE:
1. Drive wooden stake 8 inches into the ground on the windward side of proposed tree location.
2. Plant tree as shown in TREE PLANTING DETAIL.
3. Place the tree shelter tube over tree and insert it 2 inches into the ground.
4. Fasten the tree shelter tube to the stake with galvanized wire or plastic zip ties.

PLAN VIEW

SCALE: 1" = 50'

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

SPECIMENT TREE CHART						
AG #	COMMON NAME	SCIENTIFIC NAME	DBH	VIGOR	COMMENTS	Impact
2806	northern red oak	Quercus rubra	31	Good		Removed
2807	black oak	Quercus velutina	31	Fair		Retained off Parcel
2808	northern red oak	Quercus alba	39	Fair	broken skaffold branches	Retained off Parcel
2809	northern red oak	Quercus rubra	38	Fair		Retained off Parcel
2810	white oak	Quercus alba	38	Good		Retained off Parcel
2811	white oak	Quercus alba	30	Good		Retained in easement
2812	northern red oak	Quercus rubra	32	Good		Retained on lot*
2813	white oak	Quercus alba	31.5	Good		Retained on lot*
2814	white oak	Quercus alba	33	Fair		Removed
2815	northern red oak	Quercus alba	31	Good		Removed
2818	white oak	Quercus alba	34	Fair	barbed wire through trunk	Retained in easement
2819	black gum	Nyssa Sylvatica	33	Good		Retained off Parcel
2820	white oak	Quercus alba	34.5	Good		Removed
2821	black gum	Nyssa Sylvatica	34	Good		Removed
2822	northern red oak	Quercus alba	34	Good		Retained on lot
2823	red maple	Quercus rubra	37	Fair	vines triple @ 5'	Retained in easement
2842	northern red oak	Quercus alba	30	Fair	leaning	Removed
2843	black oak	Quercus velutina	30	Good		Retained on Lot
note: no 2816, 2817 & 2835						

* Permission is granted for future removal of specimen trees to accommodate the replacement septic area per WP-16-064

NOTE:
SEE SHEET 10 FOR FOREST CONSERVATION EASEMENT BEARING AND DISTANCE TABLES.

Ecotone Inc.
FORESTS • WETLANDS • RIVERS • WILDLIFE
OFFICE: 410-420-2600 / FAX: 410-420-6983
2120 HIGH POINT ROAD FOREST HILL, MARYLAND 21050
HTTP://ECOTONEINC.COM

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADD GRADING SWM NOTE

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

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: 06-08-2018.

5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
FOREST CONSERVATION PLAN

DATE: MAY, 2017		BEI PROJECT NO. 2627	
DESIGN: JC/NAF	DRAFT: JC/NAF	SCALE: AS SHOWN	SHEET 9 OF 23

AS-BUILT F-17-054

PLANTING SPECIFICATIONS

GENERAL
1. The Contractor shall notify Ecotone, Inc. and the land owner's representative at least two (2) weeks prior to start of planting within the project area so that planting zones may be marked in the field and the land owner can make any necessary preparations related to the agricultural activities on the areas surrounding the project site.
2. The Contractor is responsible for the location of all underground utilities prior to the start of construction. Any damages to utilities as a result of planting or other activities will be the sole responsibility of the Contractor and shall be repaired at the Contractors expense.

STANDARDS
1. Planting material will conform to the current issue of the "American Standards for Nursery Stock", published by the American Association of Nurseryman.
2. The root system of container-grown plant material shall be white, well-developed, and well-distributed throughout the growing media, with the roots extending to the inside face of the container, and the container size must conform to the size specified. Plants not meeting these criteria will be rejected.
3. Foliage of non-dormant plants shall appear healthy, with no leaf spots, damage, discoloration, or wilting, and no evidence of insects on the plant. Plants not meeting these criteria will be rejected.
4. Planting materials may be substituted upon written approval from Howard County Department of Planning and Zoning Division of Land Development.

STORAGE AND DELIVERY
1. Seed shall be delivered in containers having labels reporting the origin, purity, and germination percentage of the seed, and the date of germination testing of the seed.
2. All container-grown plants shall be clearly and correctly labeled to allow confirmation of species and quantities. At least 25% of each species in every shipment shall have legible labels securely attached prior to delivery to the site.
3. All plants delivered to the project site must have thoroughly moist soil/root masses. Dry or light-weight plants shall be rejected.
4. All rejected material shall be immediately removed from the project site.
5. All plants delivered to the project site shall be stored in a cool, shaded location, and watered regularly so that roots are kept moist until time of planting.

PRODUCTS
1. Straw shall be from small grain species such as wheat or barley, and shall be free of rot, mildew, and noxious weed seeds.

PLANTING PROCEDURES
1. Planting shall be performed in accordance with the current edition of the Landscape Contractors Association "Landscape Specification Guidelines" and as specified below.
2. Plants shall be randomly installed within the planting area, using the plant spacing specified in the plant schedule as a guide.
3. Container-grown stock shall be planted during the periods of September 1 - November 15 or April 1 - May 15. Planting outside of these specified dates is not permissible without approval from Ecotone, Inc.
4. Planting shall not occur during periods of sub-freezing temperatures, when the ground is frozen or excessively wet or dry, or when other conditions not generally accepted as suitable for planting persist.
5. For each plant to be installed, excavate a planting hole at least 12 inches wider than the width of the root ball and to a depth which leaves approximately 1/8 of the root ball above existing grade.
6. Remove the plant by cutting or inverting the container.
7. Using a knife or sharp blade, make 4 to 5 one-inch deep vertical cuts along the root ball.
8. Install plant in the center of the hole, with approximately 1/8 of the root ball above surrounding grade.
9. Backfill planting hole with native soil. Any surplus soil remaining after planting shall be evenly scattered around plants.
10. Water each plant thoroughly after backfilling until the backfilled soil is saturated.
11. All woody material must be planted erect. Plants leaning greater than 10 degrees from perpendicular must be straightened or replanted by the Contractor.
12. A minimum of five species shall be planted within each Forest Conservation Easement to provide diverse forest habitat.

MAINTENANCE AND GUARANTEE
1. Plant material shall be maintained by the Contractor for a period of two growing seasons from the date of final inspection and acceptance by Ecotone, Inc. Maintenance shall include the removal of all dead or diseased woody vegetation.
2. The Contractor shall guarantee a 75% survival of all plants for the two year period stated above, except in the case of damage by fire, animal damage, vandalism, or other events beyond the Contractors ability to control.
3. Plants which are 25% dead or more shall be considered dead.
4. Replacement plants shall be of the same type, size, and variety as the plants specified herein, or substitutions approved in writing by the Howard County Department of Planning and Zoning Division of Land Development. Replacement plants shall be provided and installed subject to the requirements of these plans and specifications.
5. At the end of the two year period all tree stakes and shelters may be removed from plantings.

FOREST CONSERAVTION EASEMENT #2 LINE TABLE

LINE	BEARING	DISTANCE
FCE1	N43°56'11"W	35.00'
FCE2	N46°03'49"E	26.52'
FCE3	N55°06'50"E	72.30'
FCE4	N48°19'04"E	41.09'
FCE5	N39°10'35"E	43.39'
FCE6	N38°09'17"E	78.82'
FCE7	N38°54'36"E	96.35'
FCE8	N34°57'27"E	95.43'
FCE9	N34°40'38"E	53.34'
FCE10	N40°14'32"E	53.43'
FCE11	N42°30'30"E	88.21'
FCE12	N44°52'03"E	60.20'
FCE13	N54°20'29"E	78.72'
FCE14	N56°53'22"E	74.03'
FCE15	N55°12'24"E	32.98'
FCE16	N39°44'44"E	17.92'
FCE17	N05°17'12"E	5.15'
FCE46	N65°38'25"E	126.18'
FCE47	N65°38'25"E	126.18'
FCE48	N65°38'25"E	126.18'
FCE49	N65°38'25"E	126.18'

Ecotone Inc.
FORESTS • WETLANDS • RIVERS • WILDLIFE
OFFICE: 410-420-2600 / FAX: 410-420-6983
2120 HIGH POINT ROAD FOREST HILL, MARYLAND 21050
HTTP://ECOTONEINC.COM

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 6/14/2017

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-28-17

FOREST PROTECTION PROCEDURES - Preconstruction Phase

1) The edge of the woods to be protected will be marked (staked or flagged) in the field per the limits of forest conservation easement shown in the approved site development plan prior to the start of construction activity. All areas within protective easement are to be considered "off limits" to any construction activities. The optional protective fencing shall be installed at the outside edge of forested areas and should be combined with sediment control devices when possible. The limit of the critical root zone and therefore the location of the protective devices is to be determined as follows: Edge of Forested Area – 1 foot of protective radius/inch of DBH or an eight foot protective radius, whichever is greater. Critical Root Zone for the forest on this site is an average of 12 feet from the trunk of the tree. Critical root zones for Specimen Trees are to be determined at final plan stage.
2) Construction activities expressly prohibited within the preservation areas are: Placing or stockpiling backfill or top soil in protected areas, Felling trees into protected areas, Driving construction equipment into or through protected areas, Burning in or in close proximity to protected areas, Stacking or storing supplies of any kind, Concrete wash-off areas. Conducting trenching operations, Grading beyond the limits of disturbance Parking vehicles or construction equipment, Removal of root mat or topsoil, Siting and construction of: Utility lines, Access roads, Impervious surfaces, Stormwater management devices, and Staging areas.
3) Protective fencing (see Figure "Protective Fencing") shall be the responsibility of the general contractor. The general contractor shall affix signs to the fencing at 25' minimum intervals indicating that these areas are "Forest Retention Area" (see Figure "Signage"). The general contractor shall take great care to assure the restricted areas are not violated and theat root systems are protected from smothering, flooding, excessive wetting from dewatering operations, off-site runoff, spillage, and drainage or solutions containing materials hazardous to tree roots.
4) The general contractor shall be responsible for any tree damaged or destroyed within the preservation areas whether caused by the contractor, his agents, employees, subcontractors, or licensees.
5) Foot traffic shall be kept to a minimum in the protective areas.
6) All trees which are not to be preserved within fifty feet of any tree preservation areas are to be removed in a manner that will not damage those trees that are designated for preservation. It is highly recommended that tree stumps within this fifty foot area be ground out with a stump grinding machine to minimize damage.
7) The general contractor shall designate a "wash out" area onsite for concrete trucks which will not drain toward a protected area.
8) A pre-construction meeting shall be held with local authorities before any disturbance has taken place on site.

FOREST PROTECTION PROCEDURES - Preconstruction Phase
Stress Reduction and Protection of Specimen Trees Isolated from Forest Retention Areas and General Forest Retention Areas
(as they may apply)

Isolated specimen trees that are to be preserved will be examined to determine if stress reduction techniques are needed. Protective measures and their evaluation criteria are provided on this plan only if they are employed herein.

Root Pruning Evaluation Criteria
Will the critical root zone be affected by construction activities such as grade changes, digging for foundations and roads or utility installation?
Design Considerations
a) Prune prior to construction as shown on the plan (see Figure "Root Pruning Detail.")
b) Prune root with a clean cut using proper pruning equipment such as a vibratory knife.
c) Exact location of pruning trench should be identified, and immediately backfilled to cover exposed roots after pruning with soil removed other topsoil, peat moss, or other suitable material or with other high organic soil.
d) For trees over 15" in diameter, root pruning may be done up to one year in advance of construction.
e) Tree(s) will be monitored for signs of stress.

Crown Reduction or Pruning Evaluation Criteria
Has the root system been significantly reduced (>30%) or are there dead, damaged, or diseased limbs?
Design Considerations
a) Reduce only at specified times of the year:
Flowering trees – only after flowering and before bud set
Non-Flowering trees – in late winter, early spring or mid summer
b) No more than 1/3 of the crown should be removed at one time using acceptable pruning methods (see Figure "Crown Reduction Detail")
c) Monitor for signs of stress Watering Evaluation Criteria Will construction activities alter the hydrology of the site? Has or will root pruning occur? Design Considerations
a) Water only as necessary
b) Monitor for signs of stress (see Figure "Tree Planting and Maintenance Calendar")

Fertilizing Evaluation Criteria
Is or will be tree(s) be under stressful conditions? Has or will root pruning occur?
Design Considerations
a) Use low nitrogen and slow release fertilizers.
b) Apply in late fall or early spring (see Figure "Tree Planting and Maintenance and Calendar")
c) For small trees (<3" in diameter), use punch hole method or pressurized injection method (see Figure "Application of Fertilizers by Injection.")
d) For larger trees (>3" diameter), use punch hole method or pressurized injuction method (see Figure "Application of Fertilizers by Injection.")
e) Do not apply fertilizer any closer than 3' from tree trunk for pressurized injection method.
f) Monitor for signs of stress.

PLACE TREE PROTECTION FENCE AROUND TREES 2812 AND 2813 PRIOR TO GRADING.

FOREST CONSERAVTION EASEMENT #1 LINE TABLE

LINE	BEARING	DISTANCE
FCE18	S05°17'12"W	10.07'
FCE19	S39°44'44"W	22.38'
FCE20	S55°12'24"W	34.49'
FCE21	S56°53'22"W	73.96'
FCE22	S54°20'29"W	77.67'
FCE23	S44°52'03"W	59.17'
FCE24	S42°30'30"W	87.80'
FCE25	S40°14'32"W	52.74'
FCE26	S34°40'38"W	52.88'
FCE27	S34°57'27"W	95.80'
FCE28	S38°54'36"W	96.63'
FCE29	N38°09'17"E	30.28'
FCE30	N51°50'43"W	44.42'

FOREST CONSERAVTION EASEMENT #1 LINE TABLE

LINE	BEARING	DISTANCE
FCE31	N38°09'54"E	63.21'
FCE32	S32°29'39"E	136.13'
FCE33	S14°56'08"W	34.97'
FCE37	S37°48'06"W	40.92'
FCE38	S65°22'03"W	47.62'
FCE39	S04°31'36"W	141.98'
FCE40	N33°33'22"E	150.00'
FCE41	N81°30'29"W	198.73'
FCE42	S06°57'58"W	69.75'
FCE43	N35°21'06"E	114.40'
FCE44	N04°56'17"W	125.00'
FCE45	N85°03'43"E	65.00'

RESOURCE TABULATION

A.	TOTAL AREA OF SITE	29.03 Ac.±
B.	AREA OF 100 YEAR FLOODPLAIN (APPROX.)	1.58 Ac.±
C.	AREA OF STEEP SLOPES (25% OR GREATER)	1.68 Ac.±
D.	SPECIMEN TREES	29
E.	CHAMPION TREES	0
F.	STREAM BUFFER	5.38 Ac.±
G.	STREAM	1400 LF±
H.	WETLANDS	0.72 Ac.±
I.	WETLANDS BUFFER	1.54 Ac.±

WETLANDS CHART

WETLAND #	WETLAND TYPE	AREA (ACRES)
WETLAND 1	FORESTED NATIONAL WETLAND	0.05 ac
WETLAND 2	FORESTED NATIONAL WETLAND	0.04 ac
WETLAND 3	EMERGENT NONTIDAL WETLAND	0.04 ac
WETLAND 4	EMERGENT NONTIDAL WETLAND	0.05 ac
WETLAND 5	EMERGENT NONTIDAL WETLAND	0.01 ac
WETLAND 6	EMERGENT NONTIDAL WETLAND	0.03 ac
WETLAND 7	EMERGENT NONTIDAL WETLAND	0.01 ac
WETLAND 8	EMERGENT NONTIDAL WETLAND	0.14 ac
WETLAND 9	EMERGENT NONTIDAL WETLAND	0.09 ac
WETLAND 10	EMERGENT NONTIDAL WETLAND	0.26 ac
	TOTAL =	0.72 ac

Post Construction Management

1. Developer shall coordinate a DNR Qualified Profession to conduct inspections on Forest Conservation Areas and/or Reforestation Areas at the beginning and end of each growing season.
2. Occupants of the development must be notified of Forest Conservation Easement (FCE) adjacent to lots and educated as to the restrictions on the FCE.
3. Existing forest shall be inspected to determine if forest health is compromised.
4. If health of existing forest is compromised, practices must be implemented to restore forest health.
5. Fencing and/or Forest Conservation signage must be maintained.
6. Reforestation areas shall be inspected to determine the health and survivability of planted trees and if maintenance is required to manage competing vegetation. If trees have a survivability of less than 75%, planting must occur to meet the requirement. Maintenance and inspection must be done for a period of two years.
7. At the completion of the post construction maintenance period, the developer must have the easement area inspected and certified by County staff.

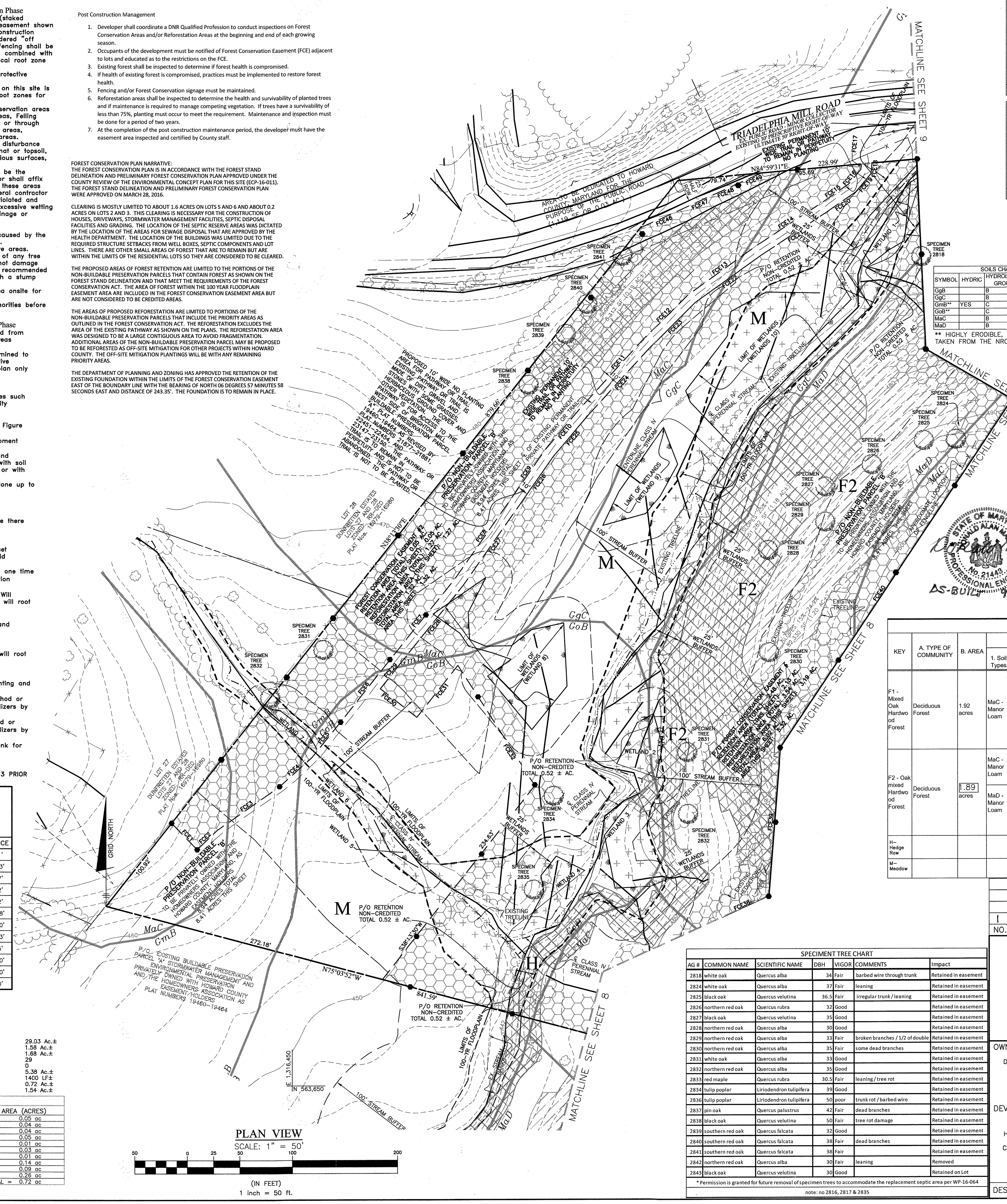
FOREST CONSERVATION PLAN NARRATIVE:
THE FOREST CONSERVATION PLAN IS IN ACCORDANCE WITH THE FOREST STAND DELINEATION AND PRELIMINARY FOREST CONSERVATION PLAN APPROVED UNDER THE COUNTY REVIEW OF THE ENVIRONMENTAL CONCEPT PLAN FOR THIS SITE (ECP-16-011). THE FOREST STAND DELINEATION AND PRELIMINARY FOREST CONSERVATION PLAN WERE APPROVED ON MARCH 28, 2016.

CLEARING IS MOSTLY LIMITED TO ABOUT 1.6 ACRES ON LOTS 5 AND 6 AND ABOUT 0.2 ACRES ON LOTS 2 AND 3. THIS CLEARING IS NECESSARY FOR THE CONSTRUCTION OF HOUSES, DRIVEWAYS, STORMWATER MANAGEMENT FACILITIES, SEPTIC DISPOSAL FACILITIES AND GRADING. THE LOCATION OF THE SEPTIC RESERVE AREAS WAS DICTATED BY THE LOCATION OF THE AREAS FOR SEWAGE DISPOSAL THAT ARE APPROVED BY THE HEALTH DEPARTMENT. THE LOCATION OF THE BUILDINGS WAS LIMITED DUE TO THE REQUIRED STRUCTURE SETBACKS FROM WELL BOXES, SEPTIC COMPONENTS AND LOT LINES. THERE ARE OTHER SMALL AREAS OF FOREST THAT ARE TO REMAIN BUT ARE WITHIN THE LIMITS OF THE RESIDENTIAL LOTS SO THEY ARE CONSIDERED TO BE CLEARED.

THE PROPOSED AREAS OF FOREST RETENTION ARE LIMITED TO THE PORTIONS OF THE NON-BUILDABLE PRESERVATION PARCELS THAT CONTAIN FOREST AS SHOWN ON THE FOREST STAND DELINEATION AND THAT MEET THE REQUIREMENTS OF THE FOREST CONSERVATION ACT. THE AREA OF FOREST WITHIN THE 100 YEAR FLOODPLAIN EASEMENT AREA ARE INCLUDED IN THE FOREST CONSERVATION EASEMENT AREA BUT ARE NOT CONSIDERED TO BE CREDITED AREAS.

THE AREAS OF PROPOSED REFORESTATION ARE LIMITED TO PORTIONS OF THE NON-BUILDABLE PRESERVATION PARCELS THAT INCLUDE THE PRIORITY AREAS AS OUTLINED IN THE FOREST CONSERVATION ACT. THE REFORESTATION EXCLUDES THE AREA OF THE EXISTING PATHWAY AS SHOWN ON THE PLANS. THE REFORESTATION AREA WAS DESIGNED TO BE A LARGE CONTIGUOUS AREA TO AVOID FRAGMENTATION. ADDITIONAL AREAS OF THE NON-BUILDABLE PRESERVATION PARCEL MAY BE PROPOSED TO BE REFORESTED AS OFF-SITE MITIGATION FOR OTHER PROJECTS WITHIN HOWARD COUNTY. THE OFF-SITE MITIGATION PLANTINGS WILL BE WITH ANY REMAINING PRIORITY AREAS.

THE DEPARTMENT OF PLANNING AND ZONING HAS APPROVED THE RETENTION OF THE EXISTING FOUNDATION WITHIN THE LIMITS OF THE FOREST CONSERVATION EASEMENT EAST OF THE BOUNDARY LINE WITH THE BEARING OF NORTH 06 DEGREES 57 MINUTES 58 SECONDS EAST AND DISTANCE OF 243.35'. THE FOUNDATION IS TO REMAIN IN PLACE.



Forest Conservation Easement #1 3.54 acres - Plant Schedule

Quantity	Scientific Name	Common Name	Size	Condition	Spacing
558	Platanus occidentalis	American Sycamore	2-4'	Bare-root	11'x11' Random Spacing
186	Robinia pseudoacacia	Black Locust	2-4'	Bare-root	11'x11' Random Spacing
124	Liquidambar styracflua	Sweet Gum	2-4'	Bare-root	11'x11' Random Spacing
124	Prunus serotina	Black Cherry	2-4'	Bare-root	11'x11' Random Spacing
124	Prununs americana	American Plum	2-4'	Bare-root	11'x11' Random Spacing
124	Liriodendron tulipifera	Tulip Polpar	2-4'	Bare-root	11'x11' Random Spacing
Total: 1,239					

Forest Conservation Easement #2 1.27 acres - Plant Schedule

Quantity	Scientific Name	Common Name	Size	Condition	Spacing
200	Platanus occidentalis	American Sycamore	2-4'	Bare-root	11'x11' Random Spacing
67	Robinia pseudoacacia	Black Locust	2-4'	Bare-root	11'x11' Random Spacing
45	Liquidambar styracflua	Sweet Gum	2-4'	Bare-root	11'x11' Random Spacing
45	Prunus serotina	Black Cherry	2-4'	Bare-root	11'x11' Random Spacing
45	Prununs americana	American Plum	2-4'	Bare-root	11'x11' Random Spacing
45	Liriodendron tulipifera	Tulip Polpar	2-4'	Bare-root	11'x11' Random Spacing
Total: 445					

TREE SHELTERS ARE REQUIRED FOR ALL TREE PLANTINGS WITHIN THE FOREST CONSERVATION EASEMENTS

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE

SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALT. GROUP	NAME	k Value
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.20
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.20
GmB**	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37**
GoB**		C	C	GLENVILLE-CODORUS SILT LOAM, 0 TO 8 PERCENT SLOPE	0.37**
MaC		B		MANOR LOAM, 8 TO 15 PERCENT SLOPES	0.24
MaD		B		MANOR LOAM, 15 TO 25 PERCENT SLOPES	0.24

** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16

LEGEND

- SOILS CLASSIFICATION (GgB)
- SOILS DELINEATION
- EXISTING CONTOURS (480, 478)
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- TREE PROTECTION FENCE (TF)
- EXISTING STRUCTURE
- EXISTING FIBER OPTICS & GAS EASEMENT
- PROPOSED STRUCTURE
- FOREST CONSERVATION AREA (RETENTION)
- BIO-RETENTION AREAS
- PROPOSED WELL (WELL)
- 15% TO 25% SLOPES
- 25% & GREATER SLOPES
- 100-YEAR FLOODPLAIN
- STREAM
- LIMIT OF DISTURBANCE
- FCE PERMANENT SIGNAGE
- EXISTING SPECIMEN TREE
- EXISTING SPECIMEN TREE (TO BE REMOVED)

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

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: 12-21-20

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

AS-BUILT 9/10/19

FOREST STAND ANALYSIS TABLE

KEY	A. TYPE OF COMMUNITY	B. AREA	C. SOIL INFORMATION: 1. Soil Types	C. 2. Typical Forest Cover for Soil Type	C. 3. Woodland Suitability Index	D. EXISTING VEGETATION	E. STAND CHARACTERISTICS: 1. Size (diameter)	E. 2. Age	E. 3. General Conditions	F. FOREST AREA IN SENSITIVE ENVIRONMENTS (acres)	G. HABITAT VALUE
F1 - Mixed Oak Hardwood Forest	Deciduous Forest	1.92 acres	MaC - Manor Loam	Mixed Oaks	43	White Oak Northern Red Oak Tulip poplar	24-36 18-30 18-30	50-75	Late successional forest in good condition with little or no understory due to age class.	0.0 acres	
F2 - Oak mixed Hardwood Forest	Deciduous Forest	1.89 acres	MaC - Manor Loam	Mixed Oaks	43	Northern Red Oak White Oak Tulip poplar Red Maple Mockernut Hickory	18-30 18-30 18-24 14-18 8-12	50-75	Late successional forest in good condition with little or no understory due to age class. This stand is a priority stand due to it's proximity to Tributary 1.	1.09 acres	
			MaD - Manor Loam	Mixed Oaks	44						
H–Hedge Row									NOT FOREST		
M–Meadow									NOT FOREST		

SPECIMENT TREE CHART

AG #	COMMON NAME	SCIENTIFIC NAME	DBH	VIGOR	COMMENTS	Impact
2818	white oak	Quercus alba	34	Fair	barbed wire through trunk	Retained in easement
2824	white oak	Quercus alba	37	Fair	leaning	Retained in easement
2825	black oak	Quercus velutina	36.5	Fair	irregular trunk / leaning	Retained in easement
2826	northern red oak	Quercus rubra	32	Good		Retained in easement
2827	black oak	Quercus velutina	35	Good		Retained in easement
2828	northern red oak	Quercus alba	30	Good		Retained in easement
2829	northern red oak	Quercus alba	33	Fair	broken branches / 1/2 of double	Retained in easement
2830	northern red oak	Quercus alba	35	Fair	some dead branches	Retained in easement
2831	white oak	Quercus alba	33	Good		Retained in easement
2832	northern red oak	Quercus alba	35	Good		Retained in easement
2833	red maple	Quercus rubra	30.5	Fair	leaning / tree rot	Retained in easement
2834	tulip poplar	Liriodendron tulipifera	39	Good		Retained in easement
2836	tulip poplar	Liriodendron tulipifera	50	poor	trunk rot / barbed wire	Retained in easement
2837	pin oak	Quercus palustrus	42	Fair	dead branches	Retained in easement
2838	black oak	Quercus velutina	50	Fair	tree rot damage	Retained in easement
2839	southern red oak	Quercus falcata	32	Good		Retained in easement
2840	southern red oak	Quercus falcata	38	Fair	dead branches	Retained in easement
2841	southern red oak	Quercus falcata	38	Fair		Retained in easement
2842	northern red oak	Quercus alba	30	Fair	leaning	Removed
2843	black oak	Quercus velutina	30	Good		Retained on Lot

* Permission is granted for future removal of specimen trees to accommodate the replacement septic area per WP-16-064

note: no 2816, 2817 & 2835

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS

BENCHMARK
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(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

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: 06-08-2018.

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER — 5/16/17

OWNER:
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BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

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FINAL ROAD CONSTRUCTION PLANS
FOREST CONSERVATION PLAN

DATE: MAY, 2017		BEI PROJECT NO.	2627
DESIGN: JC/NAF	DRAFT: JC/NAF	SCALE: AS SHOWN	SHEET 10 OF 23

AS-BUILT F-17-054

LEGEND

SOILS CLASSIFICATION — MaD

SOILS DELINEATION

EXISTING CONTOURS (AERIAL 12/02) — 498 / 500

LIMIT OF WETLANDS

EXISTING WOODS LINE

PROPOSED WOODS LINE

EXISTING STRUCTURE

EXISTING EASEMENT

SEWAGE DISPOSAL AREA

PROPOSED FOREST CONSERVATION EASEMENT

SLOPES 25% OR GREATER

SLOPES BETWEEN 15% AND 25%

EX. 100 YEAR FLOODPLAIN

WELL (W)

STORM DRAIN DRAINAGE AREA

GRID NORTH

PLAN VIEW
SCALE: 1" = 50'

50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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: 12-31-20

AS-BUILT 9/16/19

AREA AND "C" FACTOR TABULATION

PROJECT: **Brighton Mill, Phase 2** DATE: 12/4/2016 BY: NF BEI JOB # 2627

INLET #	ZONING (Z)	SUBAREA (B)	AREA (Ac) (A)	"C" FACTOR (C)<25	"C" FACTOR (C)>25	% IMPERVIOUS
I-1	RR-DEO		0.18	0.86	0.96	100
I-2	RR-DEO		0.24	0.65	0.74	72
I-3	RR-DEO		0.72	0.42	0.80	41
I-4	RR-DEO		1.46	0.37	0.85	34
EX. I-11	RR-DEO		1.24	0.44	0.53	44
EX. I-12	RR-DEO		0.58	0.33	0.41	29
EX. I-13	RR-DEO		2.40	0.30	0.38	25
EX. I-23	RR-DEO		0.28	0.47	0.55	52
EX. I-24	RR-DEO		1.61	0.26	0.34	20
EX. I-18	RR-DEO		2.06	0.14	0.19	1
EX. I-17	RR-DEO		0.50	0.62	0.72	68
EX. I-21	RR-DEO		1.30	0.31	0.37	21

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALT. GROUP	NAME	K-Value
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.20
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.20
GmB*	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37**
GoB		C	C	GLENVILLE-CODORUS SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37**
MaC		B		MANOR LOAM, 8 TO 15 PERCENT SLOPES	0.24
MaD		B		MANOR LOAM, 15 TO 25 PERCENT SLOPES	0.24

NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16
* INDICATES HYDRIC SOILS
** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES TAKEN FROM THE

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 6/14/2017

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-28-17

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADD GRADING SWM NOTE

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

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. 45570, Expiration Date: 06-08-2018.
5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONE: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS

STORM DRAIN DRAINAGE AREA MAP

DESIGN: JC/NAF	DRAFT: JC/NAF	SCALE: AS SHOWN	DATE: MAY, 2017	BEI PROJECT NO. 2627	SHEET 11 OF 23

AS-BUILT F-17-054

LEGEND

- SOILS CLASSIFICATION — MaD
- SOILS DELINEATION
- EXISTING CONTOURS (AERIAL 12/02) — 495 / 500
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- EXISTING STRUCTURE
- EXISTING EASEMENT
- SEWAGE DISPOSAL AREA
- PROPOSED FOREST CONSERVATION EASEMENT
- SLOPES 25% OR GREATER
- SLOPES BETWEEN 15% AND 25%
- EX. 100 YEAR FLOODPLAIN
- WELL
- STORM DRAIN DRAINAGE AREA

AREA AND "C" FACTOR TABULATION

PROJECT: **Brighton Mill, Phase 2** DATE: 12/4/2016 BY: NF BEI JOB # 2627

INLET #	ZONING (Z)	SUBAREA (B)	AREA (Ac) (A)	"C" FACTOR (C)<25	"C" FACTOR (C)>25	% IMPERVIOUS
I-1	RR-DEO		0.18	0.86	0.96	100
I-2	RR-DEO		0.24	0.65	0.74	72
I-3	RR-DEO		0.72	0.42	0.80	41
I-4	RR-DEO		1.46	0.37	0.85	34
EX. I-11	RR-DEO		1.24	0.44	0.53	44
EX. I-12	RR-DEO		0.58	0.33	0.41	29
EX. I-13	RR-DEO		2.40	0.30	0.38	25
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EX. I-24	RR-DEO		1.61	0.26	0.34	20
EX. I-18	RR-DEO		2.06	0.14	0.19	1
EX. I-17	RR-DEO		0.50	0.62	0.72	68
EX. I-21	RR-DEO		1.30	0.31	0.37	21

PLAN VIEW

SCALE: 1" = 50'

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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License No. 21443 Expiration Date: 12-21-20

AS-BUILT 9/10/19

"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

FOR FINAL HOUSE SITE, GRADING & SWM SEE SHEETS 22 AND 23.

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE					
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* INDICATES HYDRIC SOILS
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TAKEN FROM THE NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 6/14/2017

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-28-17

NO.	DATE	REVISION
1	7/18/18	CHANGE SHEET TOTAL + ADD GRADING + SWM NOTE

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LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
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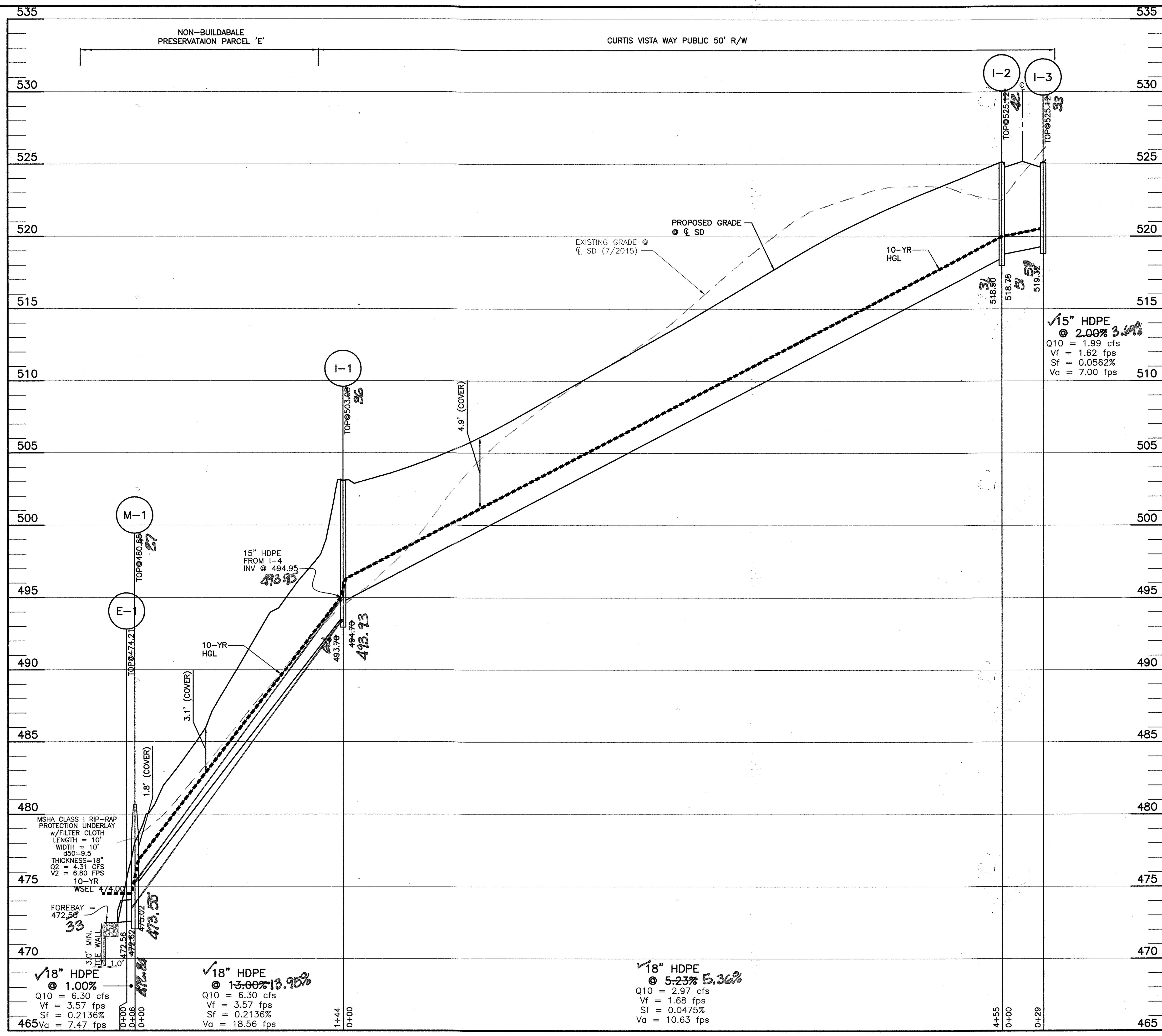
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS STORM DRAIN DRAINAGE AREA MAP

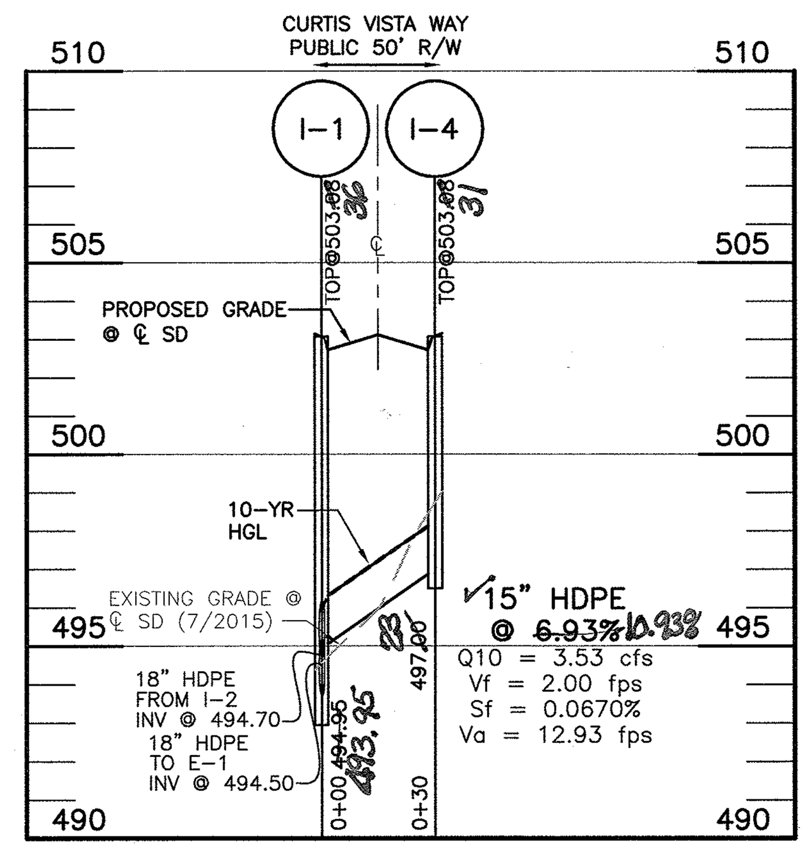
DATE: MAY, 2017	BEI PROJECT NO. 2627
DESIGN: JC/NAF — DRAFT: JC/NAF — SCALE: AS SHOWN	SHEET 12 OF 23

AS-BUILT F-17-054



E-1 thru I-3

SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'



I-1 thru I-4

SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'

CONSTRUCTION SPECIFICATIONS

1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.

2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.

3. GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.

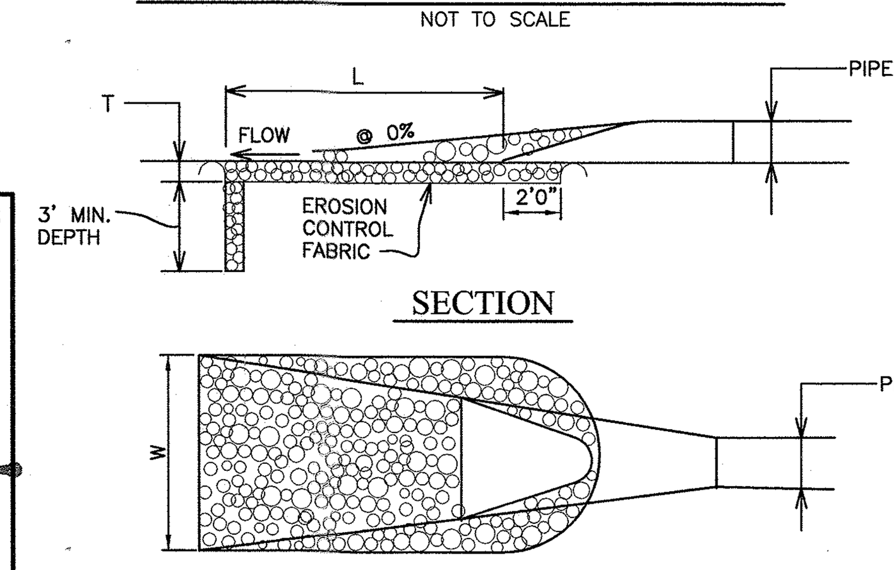
4. STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR HE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.

5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

STRUCTURE	D-50	LENGTH (L)	WIDTH (W)	THICKNESS (T)	SHA CLASS
E-1	9.5" ✓	10' ✓	10'	18"	I
E-2	9.5" ✓	10' ✓	10'	18"	I

OUTLET PROTECTION DETAIL

NOT TO SCALE



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
CHIEF, DEVELOPMENT ENGINEERING DIVISION	6.28.17 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT	6.29.17 DATE
APPROVED: DEPARTMENT OF PUBLIC WORKS	
CHIEF, BUREAU OF HIGHWAYS	6/23/2017 DATE

PIPE TABLE

OWNERSHIP	SIZE / MATERIAL	LENGTH
PUBLIC	15" HDPE	59'
PUBLIC	18" HDPE	604'
PUBLIC	24" RCP	78'

RUNOFF COMPUTATIONS

PROJECT : Brighton Mill, Phase 2 DATE : 12/4/2016 DESIGN BY: NF BEI JOB NO.: 2627

D.A. #	AREA (Ac.)	"C" (< 25 Yr)	"C" (> 25 Yr)	tc (min)*	I_2 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	I_{100} (in/hr)	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
I-1	0.18	0.86	0.96	10.0	4.50	6.60	7.50		0.69	1.02	1.29	
I-2	0.24	0.65	0.74	10.0	4.50	6.60	7.50		0.70	1.02	1.33	
I-3	0.72	0.42	0.80	10.0	4.50	6.60	7.50		1.36	1.99	4.31	
I-4	1.46	0.37	0.85	10.0	4.50	6.60	7.50		2.41	3.53	9.33	
EX I-11	1.24	0.44	0.53	10.0	4.50	6.60	7.50		2.44	3.58	4.87	
EX I-12	0.58	0.33	0.41	10.0	4.50	6.60	7.50		0.86	1.27	1.80	
EX I-13	2.40	0.30	0.38	10.0	4.50	6.60	7.50		3.26	4.78	6.89	
EX I-23	0.28	0.47	0.55	10.0	4.50	6.60	7.50		0.60	0.88	1.17	
EX I-24	1.61	0.26	0.34	10.0	4.50	6.60	7.50		1.88	2.76	4.10	
EX I-18	2.06	0.14	0.19	10.0	4.50	6.60	7.50		1.34	1.96	2.87	
EX I-17	0.50	0.62	0.72	10.0	4.50	6.60	7.50		1.40	2.05	2.67	
EX I-21	1.30	0.31	0.37	10.0	4.50	6.60	7.50		1.81	2.66	3.57	

STRUCTURE TABLE

NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	STD. DETAIL	OWNER	REMARKS
I-1	A-5	CL STA. 0+50.00 CURTIS VISTA WAY, OFFSET 13.42 LEFT	~~494.70~~ 493.93(18") ~~494.95~~ 493.95(15")	493.70 64 (18")	503.~~08~~ 36	HO. CO. D-4.01	PUBLIC	
I-2	A-5	CL STA. 5+00.00 CURTIS VISTA WAY, OFFSET 12.42 LEFT	518.~~75~~ 51(15")	518.~~50~~ 31(18")	525.~~12~~ 42	HO. CO. D-4.01	PUBLIC	
I-3	A-10	CL STA. 4+99.97 CURTIS VISTA WAY, OFFSET 12.42 RIGHT		519.~~32~~ 58(15")	525.~~12~~ 33	HO. CO. D-4.03	PUBLIC	
I-4	A-10	CL STA. 0+50.00 CURTIS VISTA WAY, OFFSET 13.42 RIGHT	~~497.00~~(15")	497.23 ~~475.68~~	503.~~08~~ 31	Ho. Co. D-4.03	PUBLIC	
I-5	D (MODIFIED)	N 563706.7944 E 1316891.6971 468.18	~~468.00~~(18")	467.15 ~~468.25~~(6")	473.~~83~~ 79	Ho. Co. D-4.10	PUBLIC	SEE SWM DETAILS
M-1	48" MANHOLE	N 563672.2093 E 1316958.6104 473.55	472.62(18")	472.84 ~~475.02~~(18")	480.~~68~~ 27	Ho. Co. G-5.11	PUBLIC	
E-1	18" END SECTION	N 563677.5837 E 1316956.6823	~~472.50~~	472.~~56~~ 33(18")	~~474.21~~	–	PUBLIC	SEE MANUFACTURER'S SPECIFICATIONS
E-2	24" END SECTION	N 563721.5653 E 1316815.5083	~~460.02~~	460.~~60~~ 31(18")	~~462.25~~	–	PUBLIC	SEE MANUFACTURER'S SPECIFICATIONS

STRUCTURE LOCATION FOR INLETS IS AT THE CENTER OF THE INLET FACE.
STRUCTURE LOCATION FOR THE END-SECTIONS IS AT THE MIDPOINT OF THE END OF THE STRUCTURE.
PRECAST STRUCTURES MEETING HOWARD COUNTY STANDARDS MUST BE USED.
ALL A TYPE INLET WIDTHS SHALL BE 3.67 FT

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER
AS-BUILT 9/10/19

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: 12/21/20

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: 9/10/19

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS

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5/16/17

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BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
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FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
FINAL STORM DRAIN PROFILES

DATE: MAY, 2017	BEI PROJECT NO. 2627
DESIGN: JC/NAF DRAFT: JC/NAF SCALE: AS SHOWN	SHEET 13 OF 23

AS-BUILT F-17-054

2627 Brighton Mill Sec 2\dwg\7044.dwg, 17 SD PRFILE, 5/18/2017 3:57:55 PM, Oce PlotWave 360 - WPD2

LEGEND

- SOILS CLASSIFICATION / SOILS DELINEATION
- EXISTING CONTOURS (AERIAL 12/02)
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
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- EXISTING SEWAGE DISPOSAL AREAS
- PROPOSED SEWAGE DISPOSAL AREAS
- PROPOSED FOREST CONSERVATION EASEMENT
- PROPOSED BIORETENTION
- PROPOSED DRY WELL
- PROPOSED DISCONNECTION IMPERVIOUS
- PROPOSED DISCONNECTION
- SLOPES 25% OR GREATER
- SLOPES BETWEEN 15% AND 25%
- EX. 100 YEAR FLOODPLAIN
- WELL
- EFFECTIVE SITE AREA
- LIMIT OF DISTURBANCE
- SWM DRAINAGE DIVIDE
- PERCOLATION TEST LOCATION

GRID NORTH

CONCEPTUAL SWM

PLAN
SCALE: 1" = 50'

50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

PROJECT: **Brighton Mill II** — DATE: 02/23/17
Facility Summary
Pe (LOTS): 1.0 inches — Pe (BR#1): 1.6 inches

BIORETENTION FACILITIES

Facility	Drainage Area	Impervious	I (%)	Rv	ESDv Req'd (cf)	Req'd Ponded Storage (75%)	Ponded Volume Provided (cf)	Req'd Stone Storage (cf)	Stone Storage Provided (cf)	Total ESDv	Pe Prov.	Rev (cf)	Notes
BR-1 (F-6)	162,419	35,489	22%	0.247	5341	4006	4070	1,335	1474	5544	1.66	1474	
MBR-2 (M-6)	19,502	5,405	28%	0.299	487	365	608	122	139	747	1.53	139	
MBR-3 (M-6)	11,116	5,418	49%	0.489	453	340	464	113	178	641	1.42	178	
MBR-4 (M-6)	8,605	3,843	45%	0.452	324	243	321	81	99	420	1.29		LINED
MBR-5 (M-6)	7,724	4,192	54%	0.538	347	260	530	87	106	636	1.83		LINED
MBR-6 (M-6)	2,682	1,401	52%	0.520	116	87	242	29	56	298	2.56		LINED
MBR-7 (M-6)	13,209	4,638	35%	0.366	403	302	473	101	113	586	1.46		LINED
MBR-8 (M-6)	5,005	1,957	39%	0.402	168	126	193	42	43	236	1.41	43	
MBR-9 (M-6)	4,268	1,275	30%	0.319	113	85	188	28	31	219	1.93	31	
MBR-10 (M-6)	5,454	3,500	64%	0.628	285	214	337	71	86	423	1.48		LINED
MBR-11 (M-6)	5,424	3,498	64%	0.630	285	214	381	71	76	457	1.60		LINED
MBR-12 (M-6)	5,536	3,500	63%	0.619	286	214	275	71	87	362	1.27		LINED
MBR-13 (M-6)	5,568	3,500	63%	0.616	286	214	399	71	74	473	1.66	74	
MBR-14 (M-6)	11,637	4,275	37%	0.381	369	277	496	92	96	592	1.60	96	
MBR-15 (M-6)	4,599	3,500	76%	0.735	282	211	269	70	75	343	1.22		LINED
TOTALS		85,391			9544		9244		2731	11975		2035	

Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Length (ft)	Width (ft)	Depth (ft)	Volume CF	Rev Provided (CF)	Full ESDv Provided?
DW-1 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-2 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-3 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-4 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
Totals	3500							392	392	

Non-Rooftop Disconnection (N-2)

Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Contrib. Per. Length (ft)	Contrib. Imp. Length (ft)	Disconnection Ratio	Pe Treated (inches)	Volume Provided (CF)
NR-1 (N-2)	1097	2297	0.48	91.85	2	16	16	1.0	1.0	91.85
NR-2 (N-2)	639	1632	0.40	54.73	0	25	26	1.0	1.0	54.73
NR-3 (N-2)	573	1504	0.39	49.24	0	23	23	1.0	1.0	49.24
NR-4 (N-2)	1005	2368	0.43	85.24	0	37	37	1.0	1.0	85.24
NR-5 (N-2)	1192	2689	0.45	100.60	6	12	12	1.0	1.0	100.60
NR-6 (N-2)	940	1840	0.51	78.17	0	28	29	1.0	1.0	78.17
NR-7 (N-2)	573	1607	0.37	49.67	0	23	24	1.0	1.0	49.67
Totals	6019									509
The total ESDv provided by this design is:				12876	CF					
The total Rev provided by this design is:				2936	CF					
Micro-Bioretention facilities within the 100' well radius must be provided with an impermeable liner.										

*The ESDv summary table portrays storage in excess of that required for Environmental Site Design requirements.

NO.	DATE	REVISION
1	7/16/18	CHANGE TOTAL SHEETS & SPECIFY CONCEPTUAL SWM

THIS PLAN IS FOR CONCEPTUAL STORMWATER MANAGEMENT ONLY. FINAL STORMWATER MANAGEMENT WILL BE DESIGNED UNDER THE BUILDING PERMIT PLAN AND SHOWN AS AN AS-BUILT

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE

SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k Value
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.20
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.20
GmB**	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37
GoB**		C	C	GLENVILLE-COCORUS SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37
MaC		B		MANOR LOAM, 8 TO 15 PERCENT SLOPES	0.24
MaD		B		MANOR LOAM, 15 TO 25 PERCENT SLOPES	0.24

** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 5/30/17

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 6/19/2017

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6.29.17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6.28.17

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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 — DATE 5-16-17

ENGINEER'S CERTIFICATE

"I 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 – JOHN M. CARNEY # 45577 — DATE 5/16/17

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
AS-BUILT 9/10/19

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: 12/2/20

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

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: 06-08-2018.

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER
5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

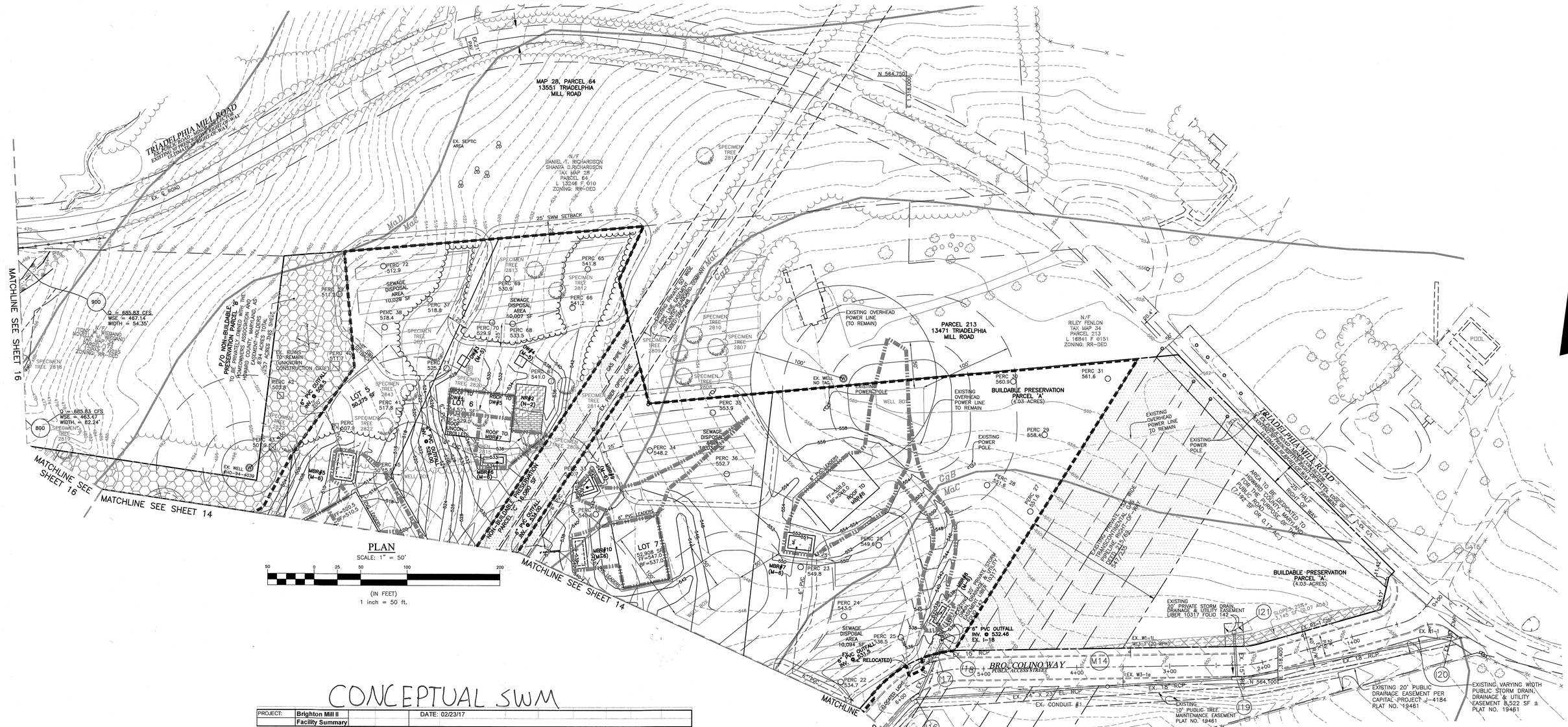
TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
STORMWATER MANAGEMENT
PLAN

DATE: MAY, 2017 — BEI PROJECT NO. 2627
DESIGN: JC/NAF — DRAFT: JC/NAF — SCALE: AS SHOWN — SHEET 14 OF 23

AS-BUILT

F-17-054



PLAN
SCALE: 1" = 50'

(IN FEET)
1 inch = 50 ft.

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

CONCEPTUAL SWM

PROJECT:	Brighton Mill II		DATE: 02/23/17
	Facility Summary		
Pe (LOTS):	1.0 inches	Pe (BR#1):	1.6 inches

BIORETENTION FACILITIES

Facility	Drainage Area	Impervious	I (%)	Rv	ESDv Req'd (cf)	Req'd Ponded Storage (75%)	Ponded Volume Provided (cf)	Req'd Stone Storage (cf)	Stone Storage Provided (cf)	Total ESDv	Pe Prov.	Rev (cf)	Notes
BR-1 (F-6)	162,419	35,489	22%	0.247	5341	4006	4070	1,335	1474	5544	1.66	1474	
MBR-2 (M-6)	19,502	5,405	28%	0.299	487	365	608	122	139	747	1.53	139	
MBR-3 (M-6)	11,116	5,418	49%	0.489	453	340	464	113	178	641	1.42	178	
MBR-4 (M-6)	8,605	3,843	45%	0.452	324	243	321	81	99	420	1.29		LINED
MBR-5 (M-6)	7,724	4,192	54%	0.538	347	260	530	87	106	636	1.83		LINED
MBR-6 (M-6)	2,682	1,401	52%	0.520	116	87	242	29	56	298	2.56		LINED
MBR-7 (M-6)	13,209	4,638	35%	0.366	403	302	473	101	113	586	1.46		LINED
MBR-8 (M-6)	5,005	1,957	39%	0.402	168	126	193	42	43	236	1.41	43	
MBR-9 (M-6)	4,268	1,275	30%	0.319	113	85	188	28	31	219	1.93	31	
MBR-10 (M-6)	5,454	3,500	64%	0.628	285	214	337	71	86	423	1.48		LINED
MBR-11 (M-6)	5,424	3,498	64%	0.630	285	214	381	71	76	457	1.60		LINED
MBR-12 (M-6)	5,536	3,500	63%	0.619	286	214	275	71	87	362	1.27		LINED
MBR-13 (M-6)	5,568	3,500	63%	0.616	286	214	399	71	74	473	1.66	74	
MBR-14 (M-6)	11,637	4,275	37%	0.381	369	277	496	92	96	592	1.60	96	
MBR-15 (M-6)	4,599	3,500	76%	0.735	282	211	268	70	75	343	1.22		LINED
TOTALS		85,391			9544		9244		2731	11975		2035	

Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Length (ft)	Width (ft)	Depth (ft)	Volume CF	Rev Provided (CF)	Full ESDv Provided?
DW-1 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-2 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-3 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-4 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
Totals	3500							392	392	

Non-Rooftop Disconnection (N-2)

Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Contrib. Per. Length (ft)	Contrib. Imp. Length (ft)	Disconnection Length (ft)	Ratio 0	Pe Treated (inches)	Volume Provided (CF)
NR-1 (N-2)	1097	2297	0.48	91.85	2	16	16	1.0	1.0	91.85
NR-2 (N-2)	639	1632	0.40	54.73	0	25	26	1.0	1.0	54.73
NR-3 (N-2)	573	1504	0.39	49.24	0	23	23	1.0	1.0	49.24
NR-4 (N-2)	1005	2368	0.43	85.24	0	37	37	1.0	1.0	85.24
NR-5 (N-2)	1192	2689	0.45	100.60	6	12	12	1.0	1.0	100.60
NR-6 (N-2)	940	1840	0.51	78.17	0	28	29	1.0	1.0	78.17
NR-7 (N-2)	573	1607	0.37	49.67	0	23	24	1.0	1.0	49.67
Totals	6019									509

The total ESDv provided by this design is: 12876 CF
The total Rev provided by this design is: 2936 CF
Micro-Bioretention facilities within the 100' well radius must be provided with an impermeable liner.

*The ESDv summary table portrays storage in excess of that required for Environmental Site Design requirements.

LEGEND

- SOILS CLASSIFICATION / SOILS DELINEATION
- EXISTING CONTOURS (AERIAL 12/02)
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- EXISTING STRUCTURE
- EXISTING SEWAGE DISPOSAL AREAS
- PROPOSED SEWAGE DISPOSAL AREAS
- PROPOSED FOREST CONSERVATION EASEMENT
- PROPOSED BIORETENTION
- PROPOSED DRY WELL
- PROPOSED DISCONNECTION IMPERVIOUS
- PROPOSED DISCONNECTION
- SLOPES 25% OR GREATER
- SLOPES BETWEEN 15% AND 25%
- EX. 100 YEAR FLOODPLAIN
- WELL
- EFFECTIVE SITE AREA
- LIMIT OF DISTURBANCE
- SWM DRAINAGE DIVIDE
- PERCOLATION TEST LOCATION

STATE OF MARYLAND — DAVID ALAN MAGEE — No. 21443 — PROFESSIONAL ENGINEER — AS-BUILT 5/16/17

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: 12-21-20

THIS PLAN IS FOR CONCEPTUAL STORMWATER MANAGEMENT ONLY. FINAL STORMWATER MANAGEMENT WILL BE DESIGNED UNDER THE BUILDING PERMIT PLAN AND SHOWN AS AN AS-BUILT

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k Value
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.20
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.20
GmB**	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37**
GoB**		C	C	GLENVILLE-CODORUS SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37**
MaC		B		MANOR LOAM, 8 TO 15 PERCENT SLOPES	0.24
MaD		B		MANOR LOAM, 15 TO 25 PERCENT SLOPES	0.24

** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES TAKEN FROM THE NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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 — DATE 5-16-17

ENGINEER'S CERTIFICATE

"I 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 – JOHN M. CARNEY # 45577 — DATE 5/16/17

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 5/22/17

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 6/19/2017

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-29-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6.29.17

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & ADD GRADING SWM

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

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: 06-08-2018.

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER — 5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

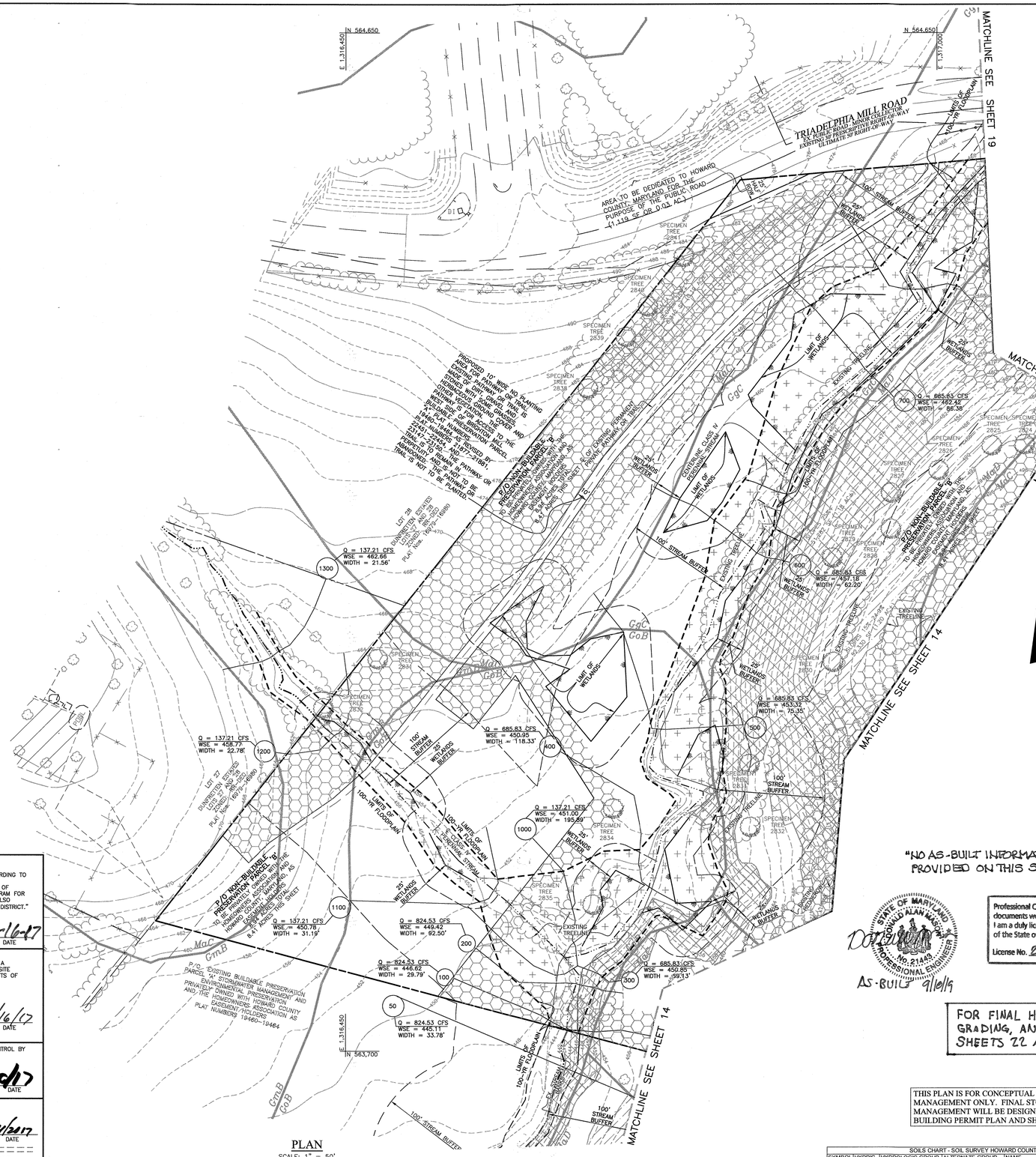
TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
STORMWATER MANAGEMENT PLAN

DESIGN: JC/NAF	DRAFT: JC/NAF	DATE: MAY, 2017	BEI PROJECT NO. 2627
		SCALE: AS SHOWN	SHEET 15 OF 23

AS-BUILT

F-17-054



PLAN
SCALE: 1" = 50'

50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

LEGEND

- SOILS CLASSIFICATION / SOILS DELINEATION — GqC
- EXISTING CONTOURS (AERIAL 12/02) — 500 / 498
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- EXISTING STRUCTURE
- EXISTING SEWAGE DISPOSAL AREAS
- PROPOSED FOREST CONSERVATION EASEMENT
- PROPOSED BIORETENTION
- PROPOSED DRY WELL
- PROPOSED DISCONNECTION IMPERVIOUS
- PROPOSED DISCONNECTION
- SLOPES 25% OR GREATER
- SLOPES BETWEEN 15% AND 25%
- EX. 100 YEAR FLOODPLAIN
- WELL
- EFFECTIVE SITE AREA
- LIMIT OF DISTURBANCE
- SWM DRAINAGE DIVIDE
- PERCOLATION TEST LOCATION

CONCEPTUAL SWM

PROJECT:	Brighton Mill II			DATE: 02/23/17								
	Facility Summary											
Pe (LOTS):	1.0	inches		Pe (BR#1):	1.6	inches						

BIORETENTION FACILITIES

Facility	Drainage Area	Impervious	I (%)	Rv	ESDv Req'd (cf)	Req'd Ponded Storage (75%)	Ponded Volume Provided (cf)	Req'd Stone Storage (cf)	Stone Storage Provided (cf)	Total ESDv	Pe Prov.	Rev (cf)	Notes
BR-1 (F-6)	162,419	35,489	22%	0.247	5341	4006	4070	1,335	1474	5544	1.66	1474	
MBR-2 (M-6)	19,502	5,405	28%	0.299	487	365	608	122	139	747	1.53	139	
MBR-3 (M-6)	11,116	5,418	49%	0.489	453	340	464	113	178	641	1.42	178	
MBR-4 (M-6)	8,605	3,843	45%	0.452	324	243	321	81	99	420	1.29		LINED
MBR-5 (M-6)	7,724	4,192	54%	0.538	347	260	530	87	106	636	1.83		LINED
MBR-6 (M-6)	2,682	1,401	52%	0.520	116	87	242	29	56	298	2.56		LINED
MBR-7 (M-6)	13,209	4,638	35%	0.366	403	302	473	101	113	586	1.46		LINED
MBR-8 (M-6)	5,005	1,957	39%	0.402	168	126	193	42	43	236	1.41	43	
MBR-9 (M-6)	4,268	1,275	30%	0.319	113	85	188	28	31	219	1.93	31	
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MBR-11 (M-6)	5,424	3,498	64%	0.630	285	214	381	71	76	457	1.60		LINED
MBR-12 (M-6)	5,536	3,500	63%	0.619	286	214	275	71	87	362	1.27		LINED
MBR-13 (M-6)	5,568	3,500	63%	0.616	286	214	399	71	74	473	1.66	74	
MBR-14 (M-6)	11,637	4,275	37%	0.381	369	277	496	92	96	592	1.60	96	
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TOTALS		85,391			9544		9244		2731	11975		2035	

Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Length (ft)	Width (ft)	Depth (ft)	Volume CF	Rev Provided (CF)	Full ESDv Provided?
DW-1 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-2 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-3 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
DW-4 (M-5)	875	875	0.95	69.27	7	7	5	98	98	yes
Totals	3500							392	392	

Non-Rooftop Disconnection (N-2)

Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Contrib. Per. Length (ft)	Contrib. Imp. Length (ft)	Disconnection Length (ft)	Ratio 0	Pe Treated (inches)	Volume Provided (CF)
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NR-5 (N-2)	1192	2689	0.45	100.60	6	12	12	1.0	1.0	100.60
NR-6 (N-2)	940	1840	0.51	78.17	0	28	29	1.0	1.0	78.17
NR-7 (N-2)	573	1607	0.37	49.67	0	23	24	1.0	1.0	49.67
Totals	6019									509
The total ESDv provided by this design is:				12876	CF					
The total Rev provided by this design is:				2936	CF					
Micro-Bioretention facilities within the 100' well radius must be provided with an impermeable liner.										

*The ESDv summary table portrays storage in excess of that required for Environmental Site Design requirements.

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

AS-BUILT 9/6/19

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

THIS PLAN IS FOR CONCEPTUAL STORMWATER MANAGEMENT ONLY. FINAL STORMWATER MANAGEMENT WILL BE DESIGNED UNDER THE BUILDING PERMIT PLAN AND SHOWN AS AN AS-BUILT

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND PAGE

SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k Value
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.20
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.20
GmB**	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37**
GoB**		C	C	GLENVILLE-CODORUS SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37**
MaC		B		MANOR LOAM, 8 TO 15 PERCENT SLOPES	0.24
MaD		B		MANOR LOAM, 15 TO 25 PERCENT SLOPES	0.24

** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY, AUGUST 2014. SHEET 16

DEVELOPER'S CERTIFICATE

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Richard J. Weinstock 5-16-17
DEVELOPER DATE

ENGINEER'S CERTIFICATE

"I 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.

John M. Carney 5/16/17
ENGINEER – JOHN M. CARNEY / 45577 DATE

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

5/30/17
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

6/14/2017
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

6.29.17
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

6.28.17
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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. 21649, Expiration Date: 12-21-20

NO.	DATE	REVISION
1	7/18/19	CHANGE TOTAL SHEETS & ADD GRADING SWM NOTE

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

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: 06-08-2018.

5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

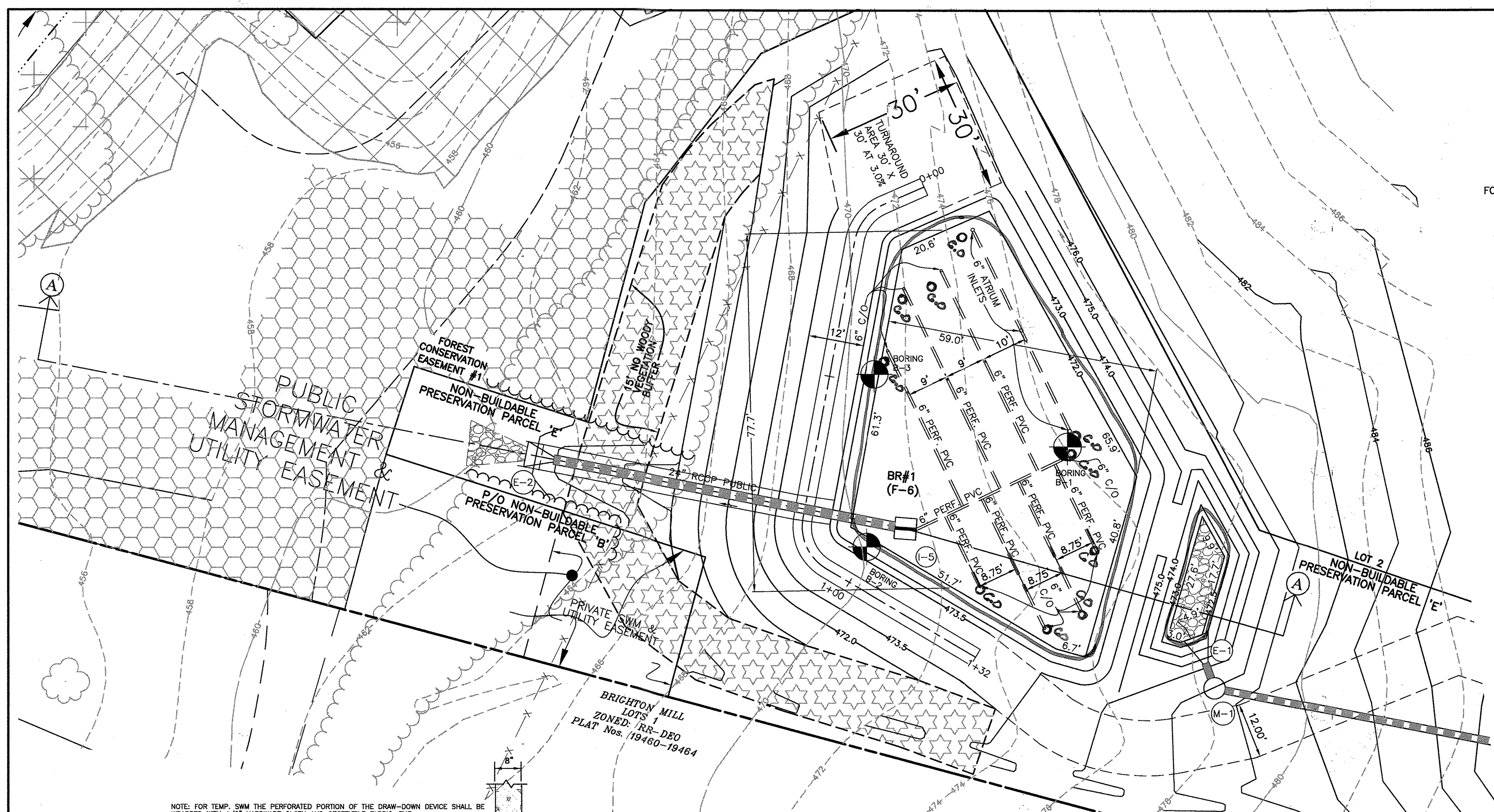
LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
STORMWATER MANAGEMENT
PLAN

DESIGN: JC/NAF	DRAFT: JC/NAF	DATE: MAY, 2017	BEI PROJECT NO. 2627
		SCALE: AS SHOWN	SHEET 16 OF 23

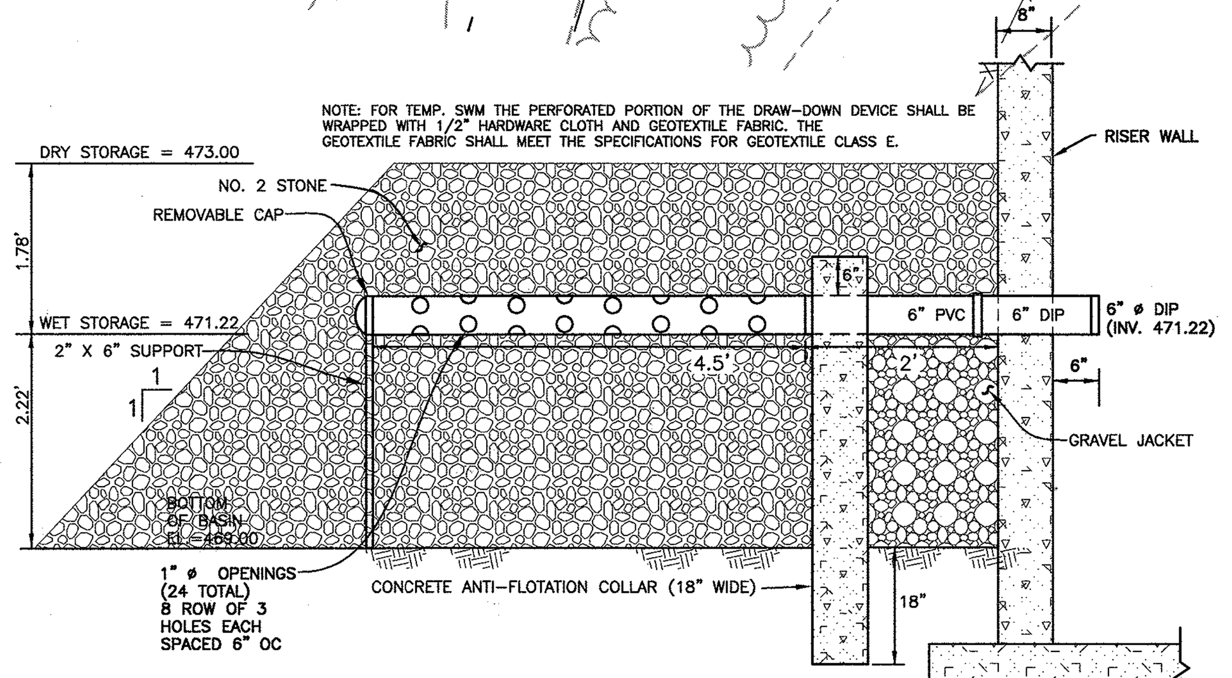
AS-BUILT F-17-054



PLAN

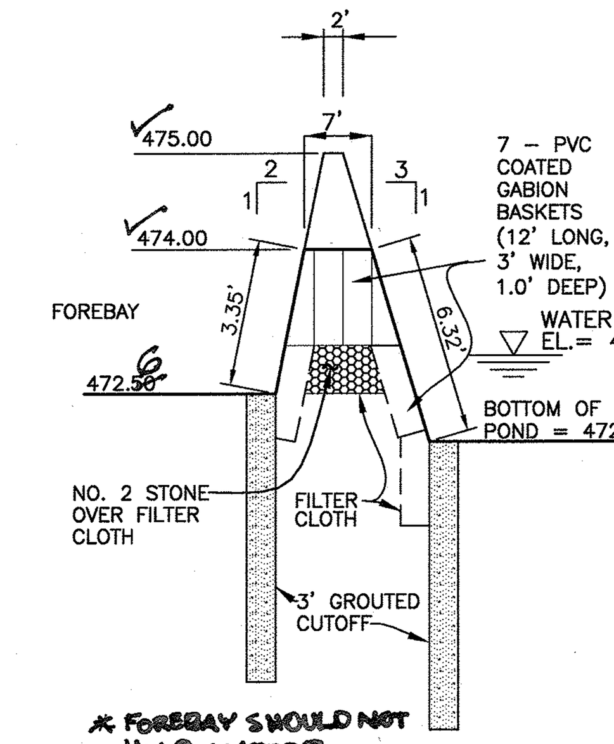
SCALE: 1" = 20'

(IN FEET)
1 inch = 20 ft.



6" TEMPORARY SWM HORIZONTAL DRAW-DOWN DEVICE

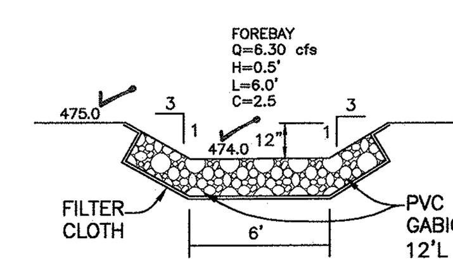
NOT TO SCALE



* FOREBAY SHOULD NOT HOLD WATER

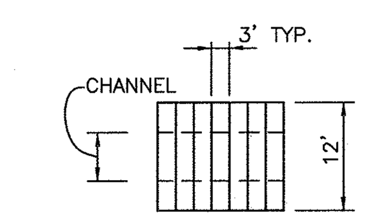
TYPICAL SECTION OF GABION WEIR AT FOREBAY

NOT TO SCALE



PROFILE THROUGH FOREBAY WEIR

NOT TO SCALE



GABION BASKET LAYOUT

NOT TO SCALE

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

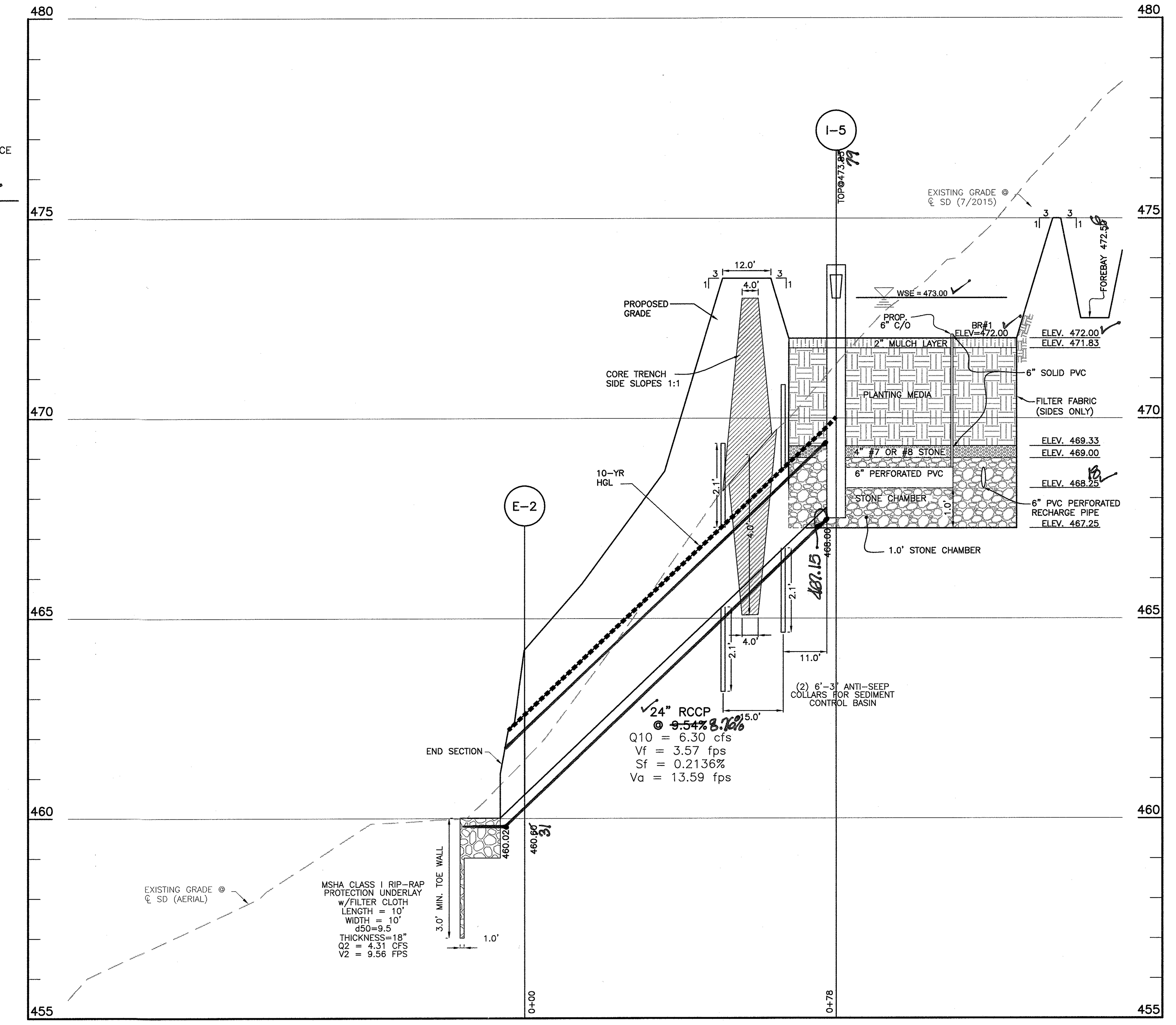
Donald Mason, P.E. Date: 9/10/19

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

AS-BUILT 9/10/19

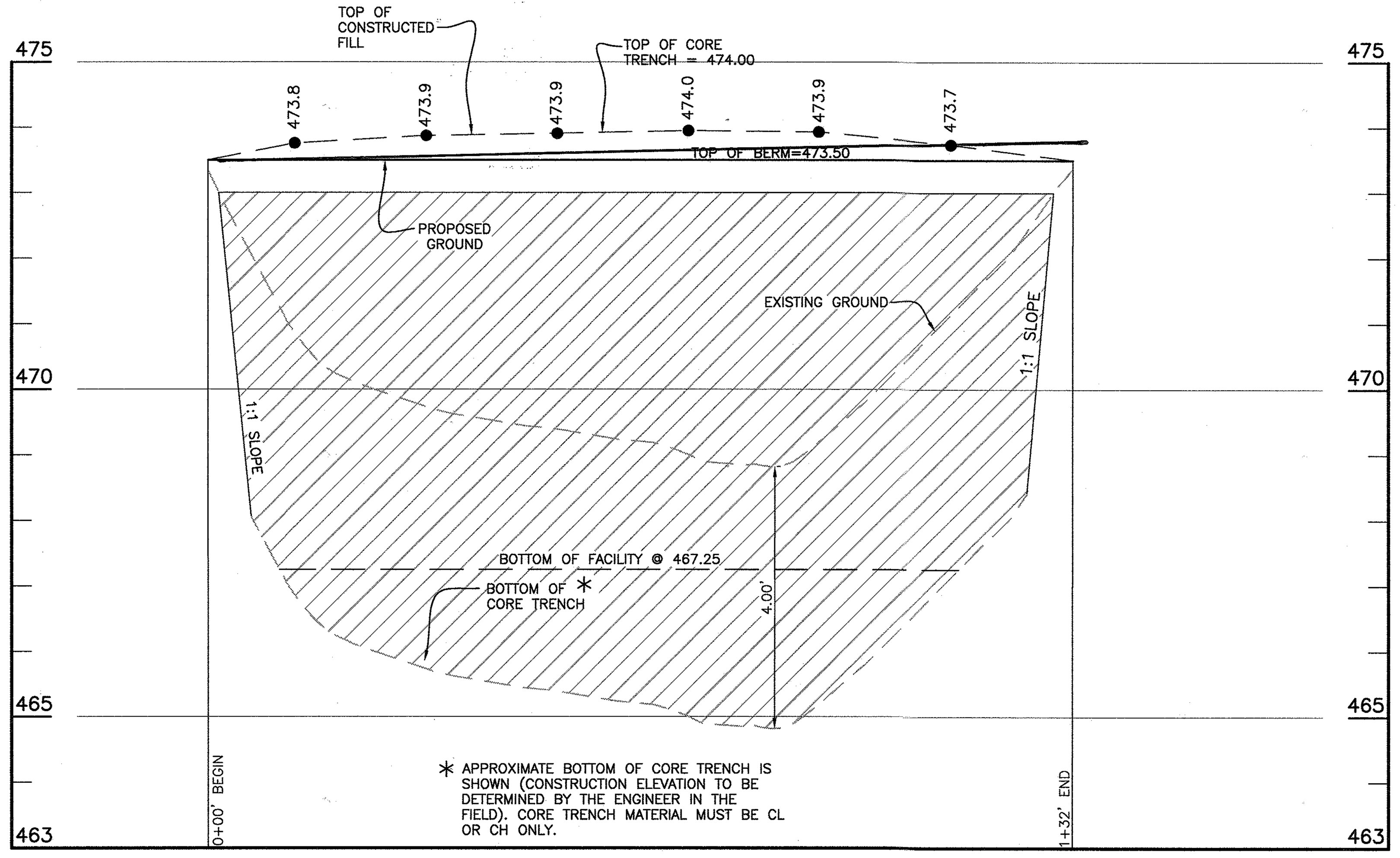
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12/21/20



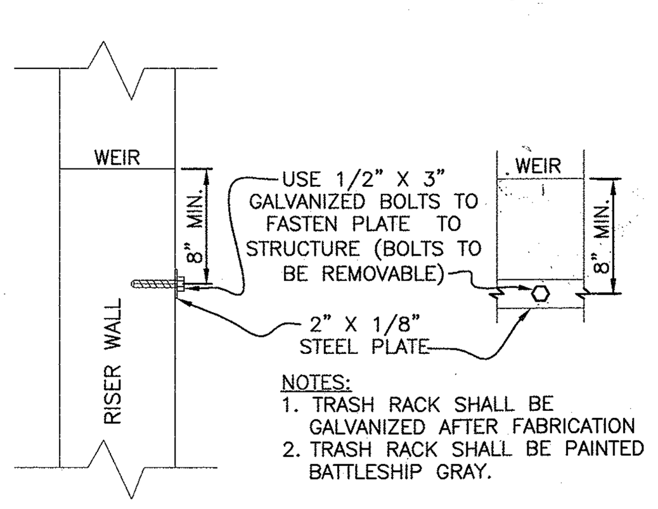
BIORETENTION CROSS SECTION A-A

SCALE: 1"=20' HORIZ., 1"=2' VERT.



BIORETENTION EMBANKMENT

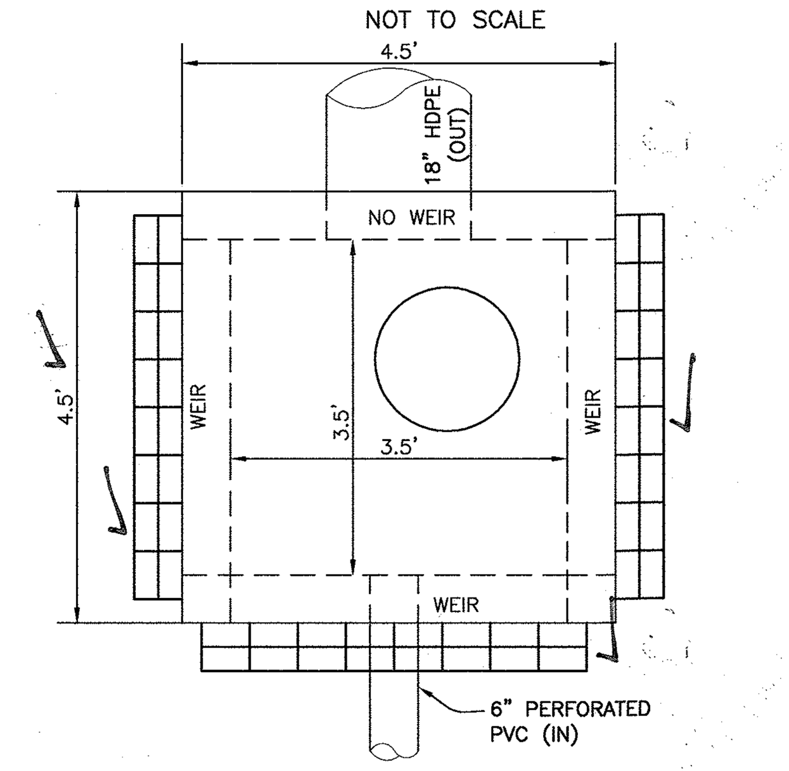
SCALE: 1"=20' HORIZ., 1"=2' VERT.



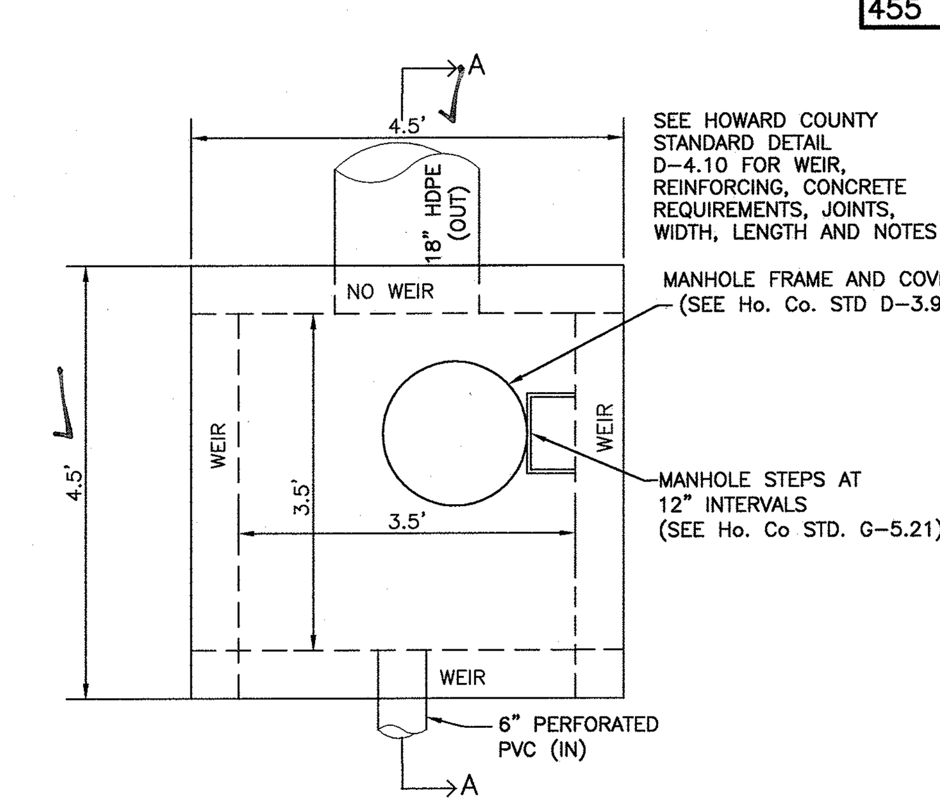
NOTES:
1. TRASH RACK SHALL BE GALVANIZED AFTER FABRICATION
2. TRASH RACK SHALL BE PAINTED BATTLESHIP GRAY.

TRASH RACK ANCHOR DETAIL

NOT TO SCALE

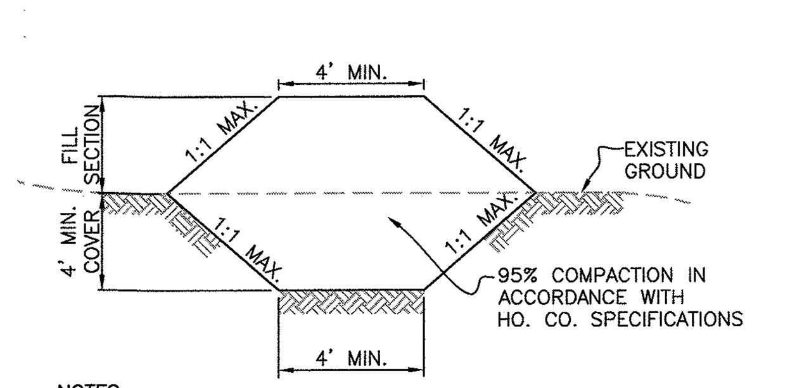


TOP



PLAN - BELOW SLAB

SCALE: 1" = 2'



NOTES:
1. IF WATER IS ENCOUNTERED DURING THE CONSTRUCTION OF THE CORE TRENCH, IT IS TO BE REMOVED BY PUMPING.
2. CORE TRENCH SHALL CONSIST OF IMPERVIOUS MATERIAL (GC, SC, CL, CH) AS DIRECTED BY A GEOTECHNICAL ENGINEER ONSITE AND MAY REQUIRE TO BE HAULED FROM AN OFFSITE LOCATION.

CORE TRENCH SECTION

NOT TO SCALE

EXCAVATED PONDS

GENERAL – EXCAVATED PONDS THAT CREATE A FAILURE POTENTIAL THROUGH A CONSTRUCTED OR CREATED EMBANKMENT WILL BE DESIGNED AS EMBANKMENT PONDS EXCAVATED PONDS THAT INCLUDE A PIPE OR WEIR OUTLET CONTROL SYSTEM FOR URBAN STORMWATER MANAGEMENT SHALL BE DESIGNED USING THE PRINCIPAL AND EMERGENCY SPILLWAY HYDROLOGIC CRITERIA FOR EMBANKMENT PONDS, TABLE 1.
SIDE SLOPES – SIDE SLOPES OF EXCAVATED PONDS SHALL BE SUCH THAT THEY WILL BE STABLE AND SHALL NOT BE STEEPER THAN 1 HORIZONTAL TO 1 VERTICAL. FLATTER SLOPES ARE TO BE UTILIZED WHERE SAFETY FOR CHILDREN, LIVESTOCK WATERING, ETC. IS A DESIGN FACTOR.
PERIMETER FORM – WHERE THE STRUCTURES ARE USED FOR RECREATION OR ARE LOCATED IN HIGH PUBLIC VIEW, THE PERIMETER OR EDGE SHOULD BE SHAPED TO A CURVILINEAR FORM.
INLET PROTECTION – WHEN THE EXCAVATED POND IS A BYPASS TYPE AND WATER IS BEING DIVERTED FROM A STREAM, THE MINIMUM SIZE INLET LINE SHALL BE A 4-INCH DIAMETER PIPE. ALL STATE LAWS CONCERNING WATER USE AND DOWNSTREAM RIGHTS SHALL BE STRICTLY ADHERED TO. WHERE SURFACE WATER ENTERS THE POND IN A NATURAL OR EXCAVATED CHANNEL, THE SIDE SLOPE OF THE POND
SHALL BE PROTECTED AGAINST EROSION.
OUTLET PROTECTION – AN EXCAVATED POND WITH A LOW EMBANKMENT (COMBINATION EXCAVATION / EMBANKMENT POND SHALL BE DESIGNED TO ENSURE A STABLE OUTFALL FOR THE 10-YEAR, 24-HOUR FREQUENCY STORM.
PLACEMENT OF EXCAVATED MATERIAL – THE MATERIAL EXCAVATED FROM THE POND SHALL BE PLACED IN ONE OF THE FOLLOWING WAYS SO THAT ITS WEIGHT WILL NOT ENDANGER THE STABILITY OF THE POND SIDE SLOPES AND WHERE IT WILL NOT BE WASHED BACK INTO THE POND BY RAINFALL:
1. UNIFORMLY SPREAD TO A HEIGHT NOT EXCEEDING 3 FEET WITH THE TOP GRADED TO A CONTINUOUS SLOPE AWAY FROM THE POND;
2. UNIFORMLY PLACED OR SHAPED REASONABLY WELL WITH SIDE SLOPES NO STEEPER THAN 2 TO 1. THE EXCAVATED MATERIAL WILL BE PLACED AT A DISTANCE EQUAL TO THE DEPTH OF THE POND, BUT NOT LESS THAN 12 FEET FROM THE EDGE OF THE POND;
3. SHAPED TO A DESIGNED FORM THAT BLENDS VISUALLY WITH THE LANDSCAPE;
4. USED FOR LOW EMBANKMENT AND LEVELING; OR
5. HAULED AWAY.

FACILITY NUMBER	AS BUILT FACILITY DIMENSIONS		
	LENGTH	WIDTH	AREA (Af)
	80	60	3936

BIORETENTION FACILITIES															
	ELEVATIONS (SEE TYPICAL BIORETENTION DETAIL)								FILTER			PLANTINGS			LINER REQ'D
FACILTY	A	B	C	D	E	F	G	H	LENGTH (ft)	WIDTH (ft)	AREA (sf)	1	2	3	
BR-1	473.50	473.00	472.00	471.83	469.33	469.00	468.25	467.25	70.0	42.6	3685	354	310	166	NO

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
[signature] 5/30/17
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
[signature] 6/14/2017
CHIEF, BUREAU OF HIGHWAYS — DATE

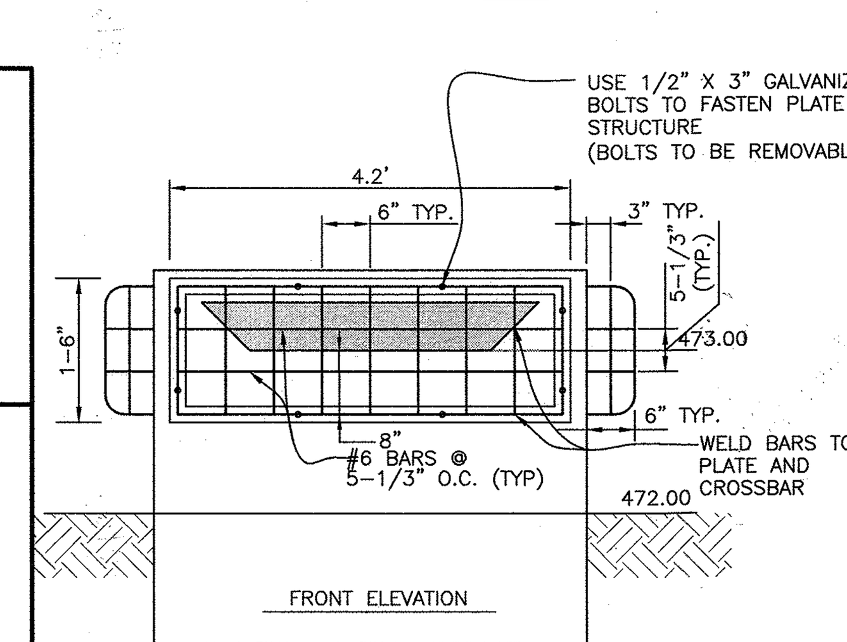
APPROVED: DEPARTMENT OF PLANNING AND ZONING
[signature] 6.29.17
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE
[signature] 6.28.17
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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."
[signature] 5-16-17
DEVELOPER — DATE

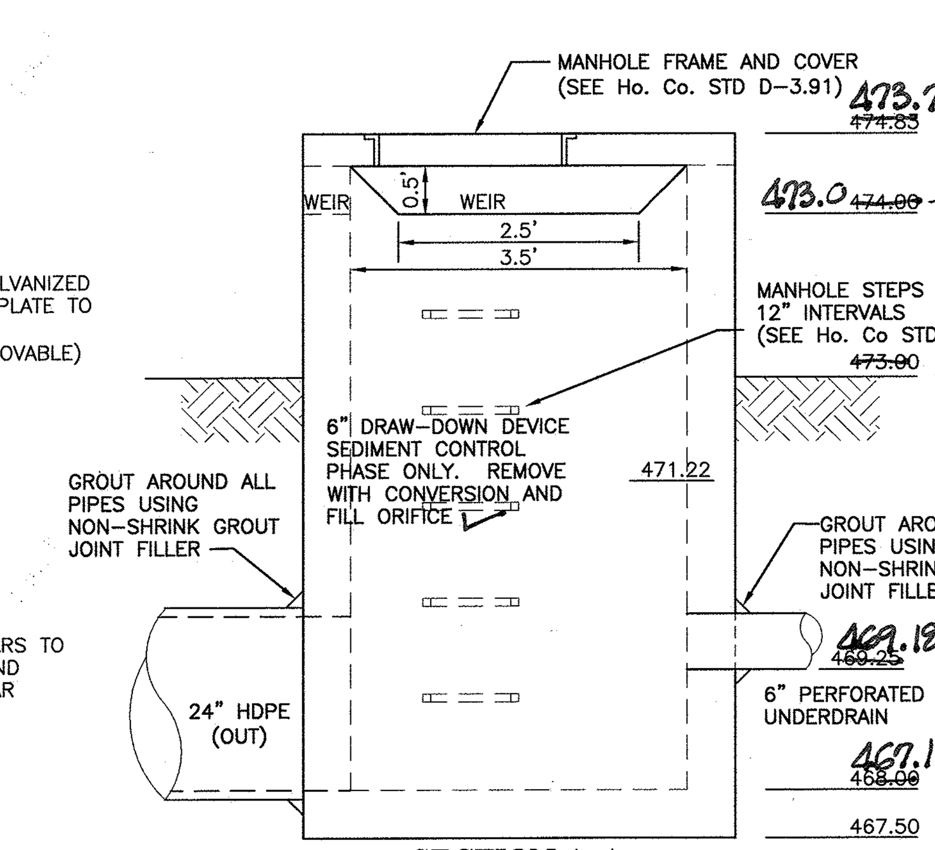
ENGINEER'S CERTIFICATE

"I 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.
[signature] 5/16/17
ENGINEER – JOHN M. CARNEY # 45577 — DATE



TRASH RACK DETAIL

SCALE: 1" = 2'



SECTION A-A

SCALE: 1" = 2'

Table B.3.2 Materials Specifications for Bioretention

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
planting soil [2.5' to 4' deep]	sand 35 - 60% silt 30 - 55% clay 10 - 25%	n/a	USDA soil types loamy sand, sandy loam or loam
mulch	shredded hardwood		aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448 ornamental stone: washed cobbles	pea gravel: No. 6 stone: 2" to 5"	
geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43	0.375" to 0.75"	
underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) *not using previously approved State or local standards* requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
sand [1' deep]	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	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.

Appendix B.3. Construction Specifications for Sand Filters, Bioretention and Open Channels

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

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: 06-08-2018.
STATE OF MARYLAND JOHN M. CARNEY No. 45577 PROFESSIONAL ENGINEER
[signature] 5/16/17

OWNER:
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304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

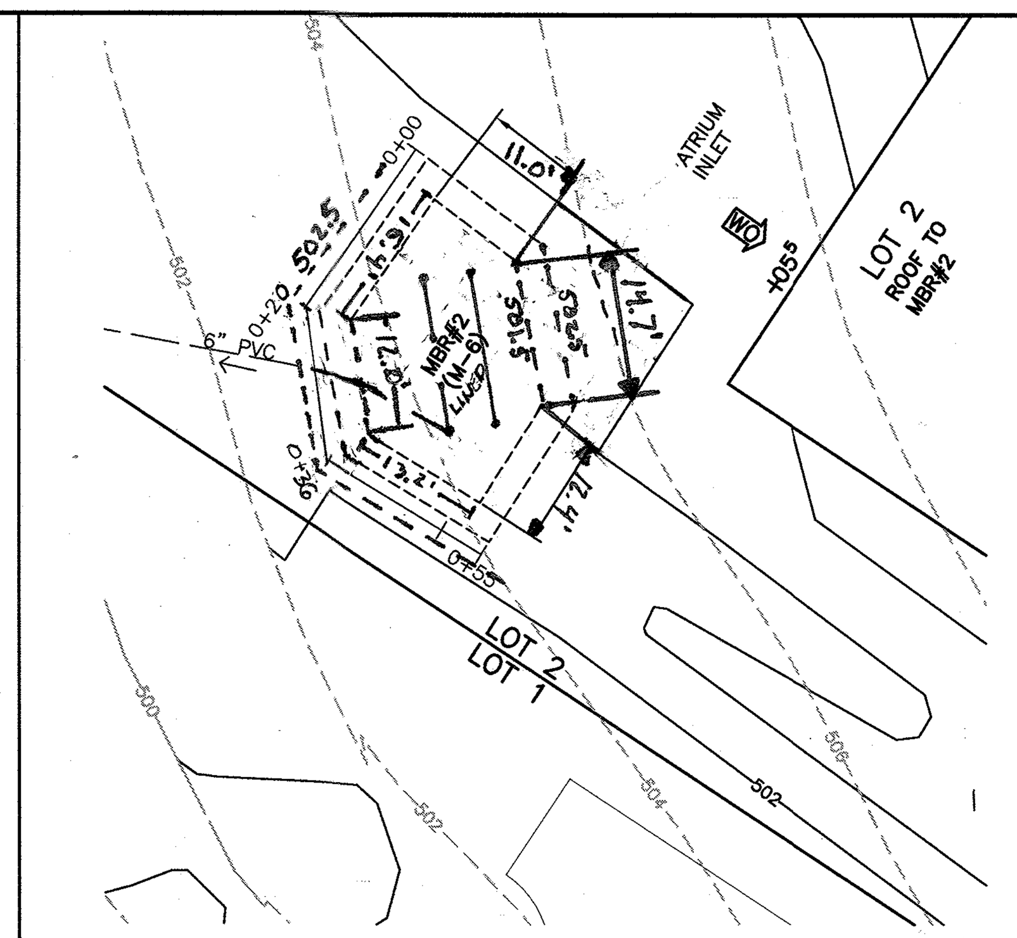
TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
STORMWATER MANAGEMENT
NOTES & DETAILS

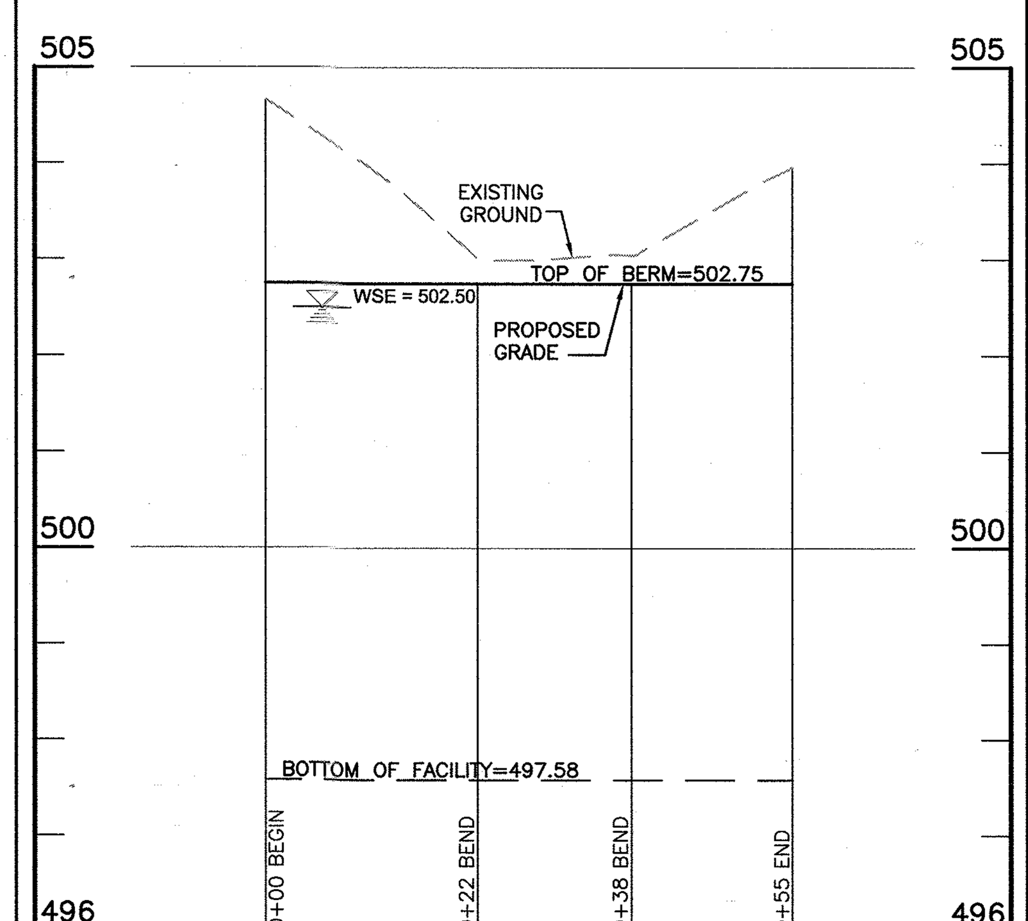
DATE: MAY, 2017	BEI PROJECT NO. 2627
SCALE: AS SHOWN	SHEET 17 OF 23

DESIGN: JC/NAF DRAFT: JC/NAF

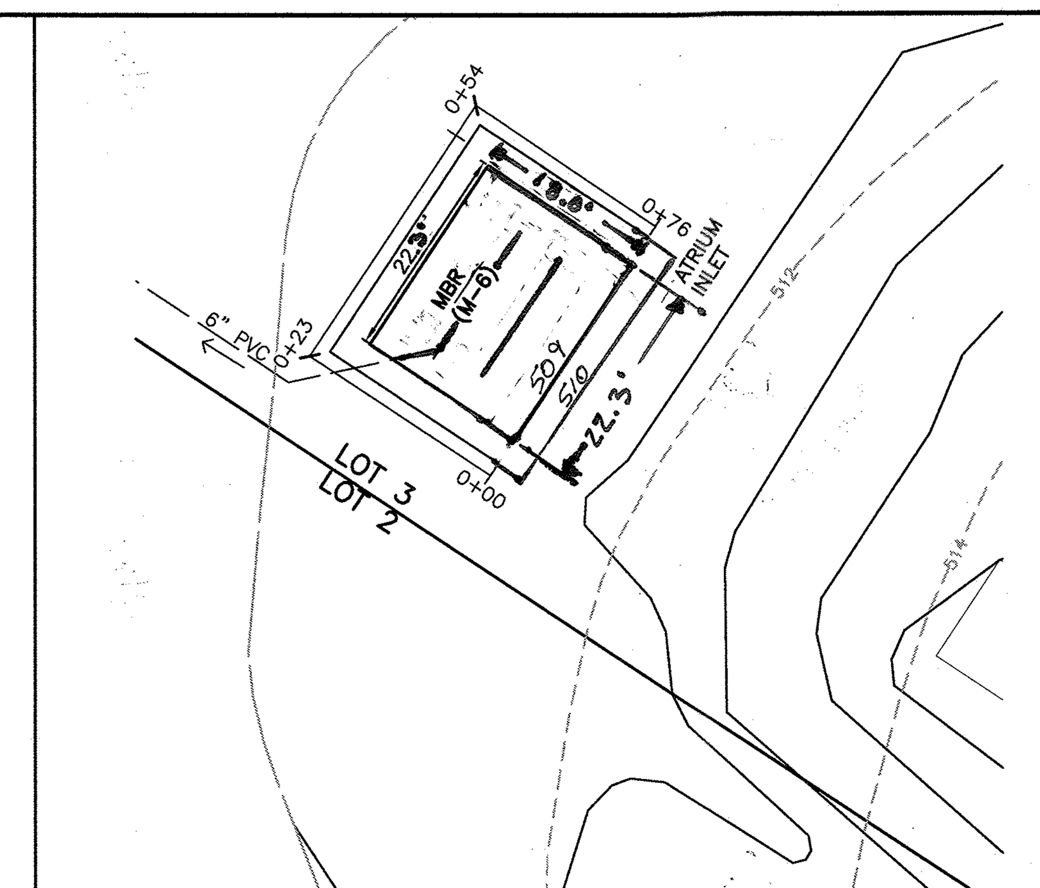
AS-BUILT F-17-054



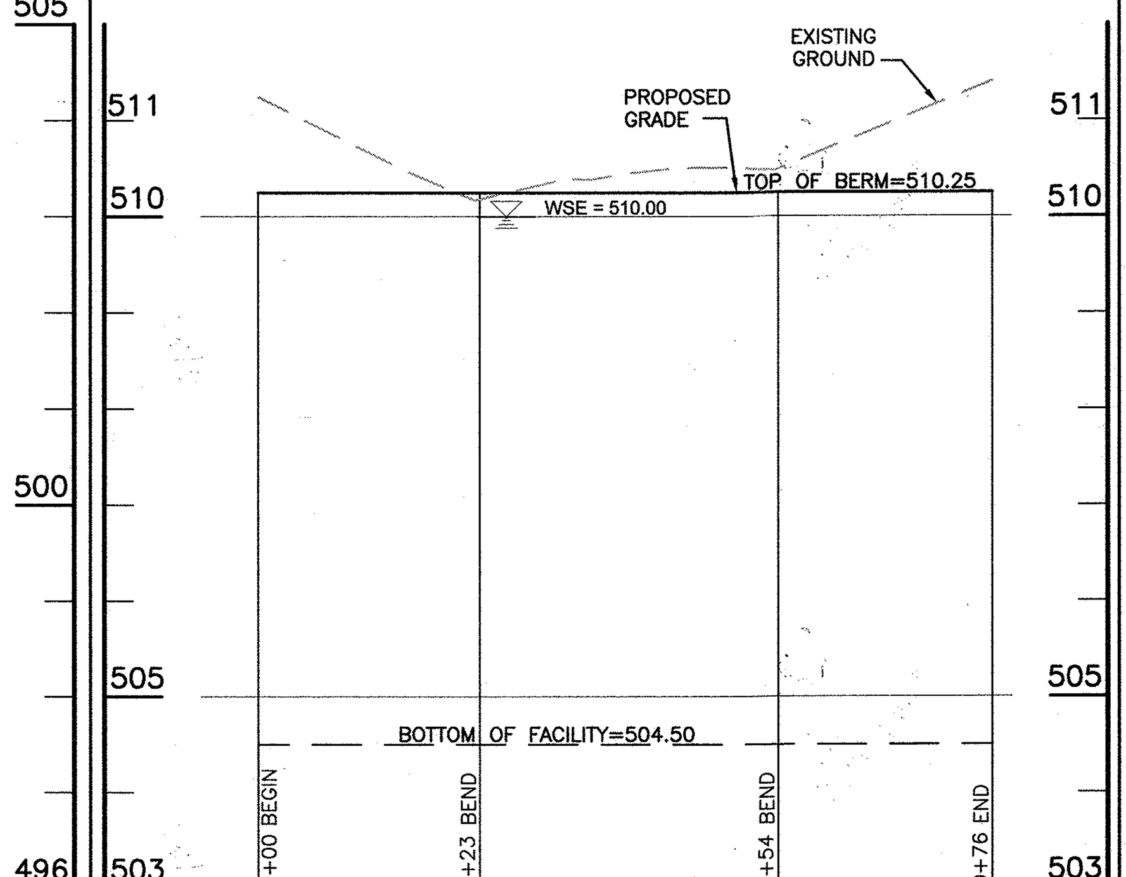
LOT 2
MBR #2 DETAIL
SCALE: 1" = 20'



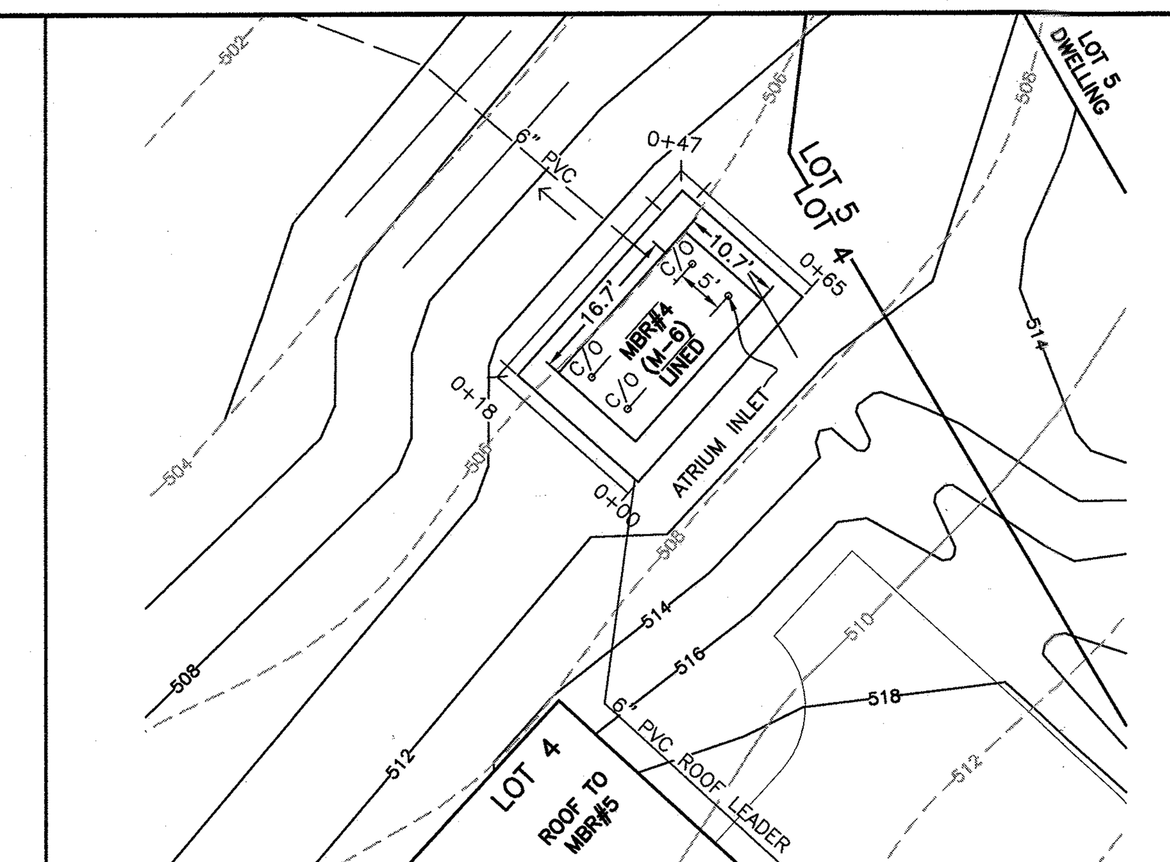
MBR #2 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.



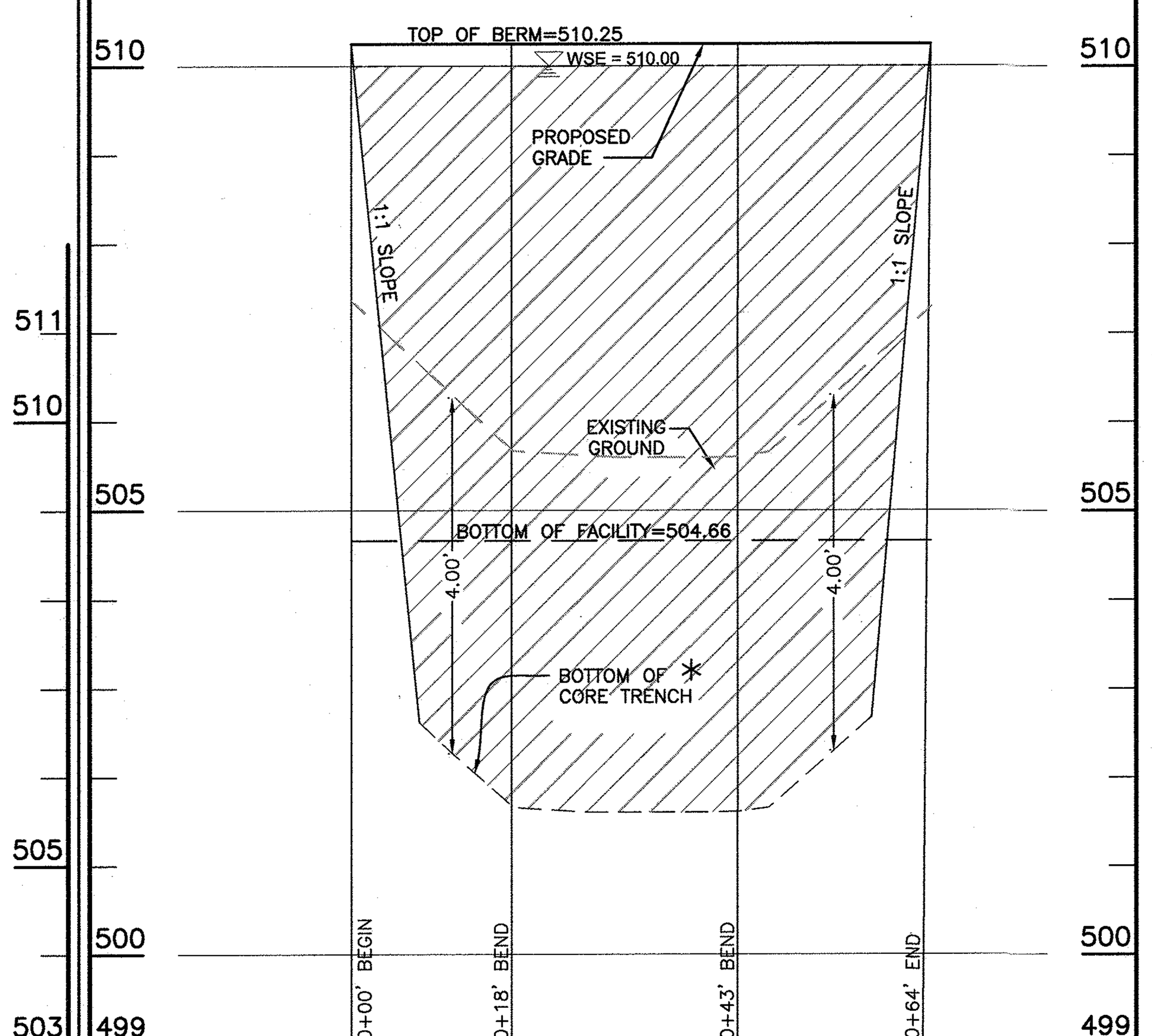
LOT 3
MBR #3 DETAIL
SCALE: 1" = 20'



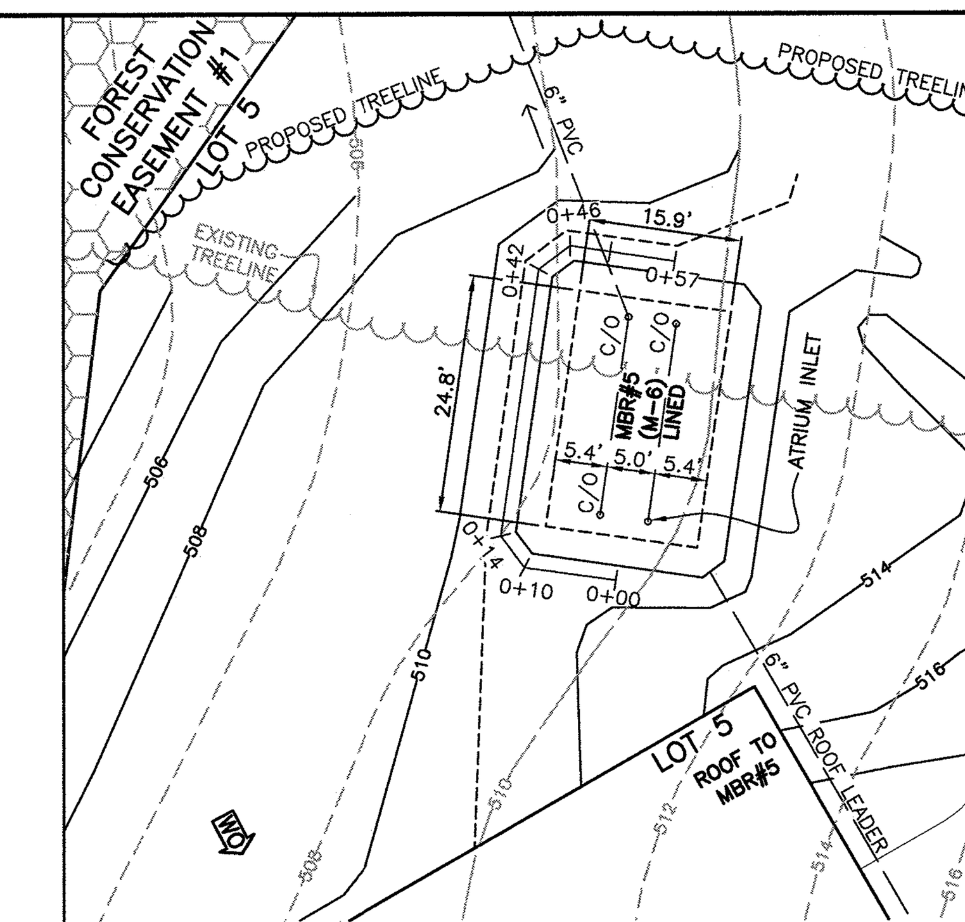
MBR #3 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.



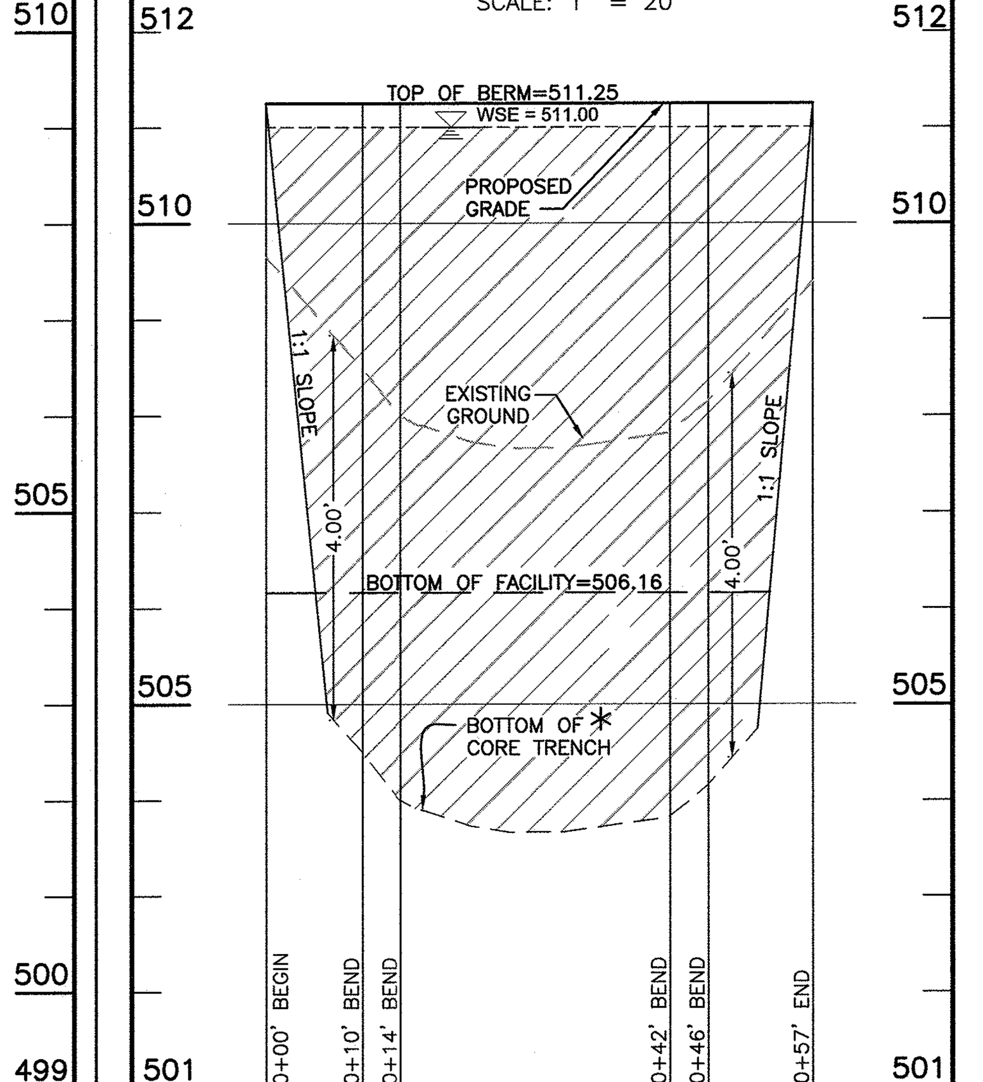
LOT 4
MBR #4 DETAIL
SCALE: 1" = 20'



MBR #4 EMABNKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.



LOT 5
MBR #5 DETAIL
SCALE: 1" = 20'



MBR #5 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.

LEGEND

SOILS CLASSIFICATION	GdC
SOILS DELINEATION	
EXISTING CONTOURS (AERIAL 12/02)	
LIMIT OF WETLANDS	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
EXISTING STRUCTURE	

CONSTRUCTION SPECIFICATIONS
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 SAND (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 ⅜" 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".

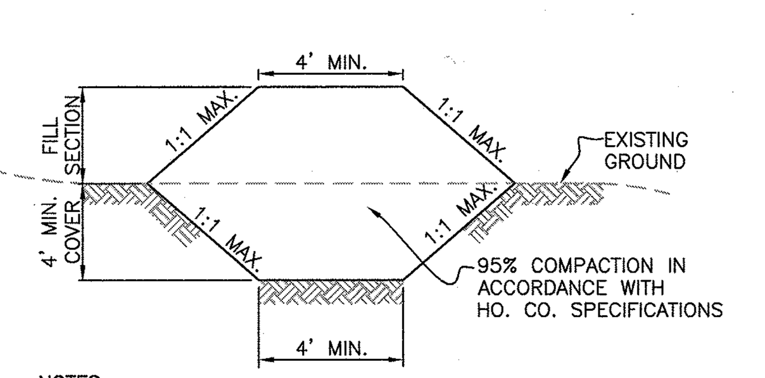
   THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).
7. MISCELLANEOUS:
THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED

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: 9/10/19

STATE OF MARYLAND DONALD ALAN MASON No. 21443 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. 21443 , Expiration Date: 12/21/20



NOTES:
1. IF WATER IS ENCOUNTERED DURING THE CONSTRUCTION OF THE CORE TRENCH, IT IS TO BE REMOVED BY PUMPING.
2. CORE TRENCH SHALL CONSIST OF IMPERVIOUS MATERIAL (GC, SC, CL, CH) AS DIRECTED BY A GEOTECHNICAL ENGINEER ONSITE AND MAY REQUIRE TO BE HAULED FROM AN OFFSITE LOCATION.

CORE TRENCH SECTION
NOT TO SCALE

DEVELOPER'S CERTIFICATE
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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 5-16-17 DATE

ENGINEER'S CERTIFICATE
"I 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 – JOHN M. CARNEY # 45577 5/16/17 DATE

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

HOWARD SOIL CONSERVATION DISTRICT 5/30/17 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS 6/14/2017 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT 6-29-17 DATE

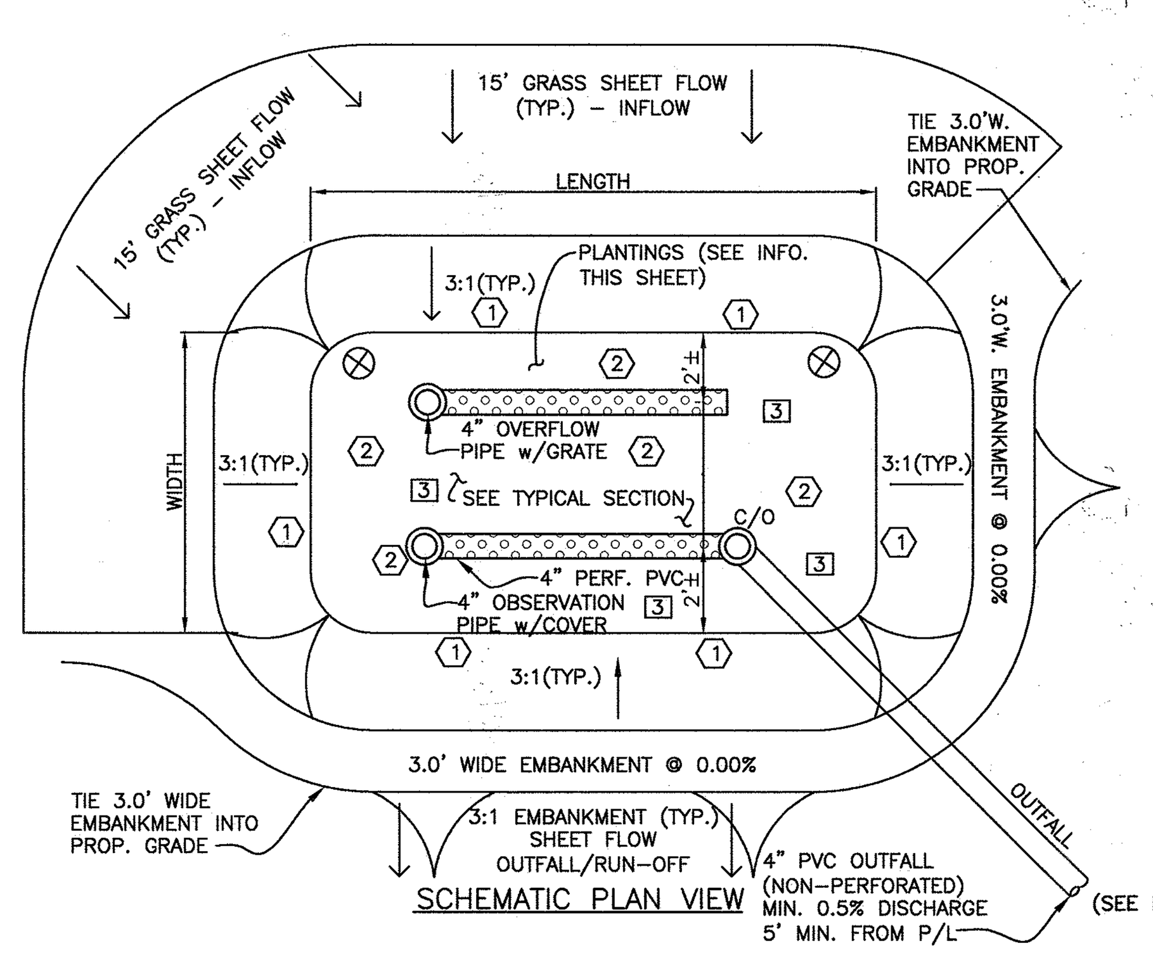
CHIEF, DEVELOPMENT ENGINEERING DIVISION 6-28-17 DATE

LOT 2 - ASBUILT
SCALE: 1" = 20'

LOT 3 - ASBUILT
SCALE: 1" = 20'

LOT 4 - ASBUILT
SCALE: 1" = 20'

LOT 5 - ASBUILT
SCALE: 1" = 20'



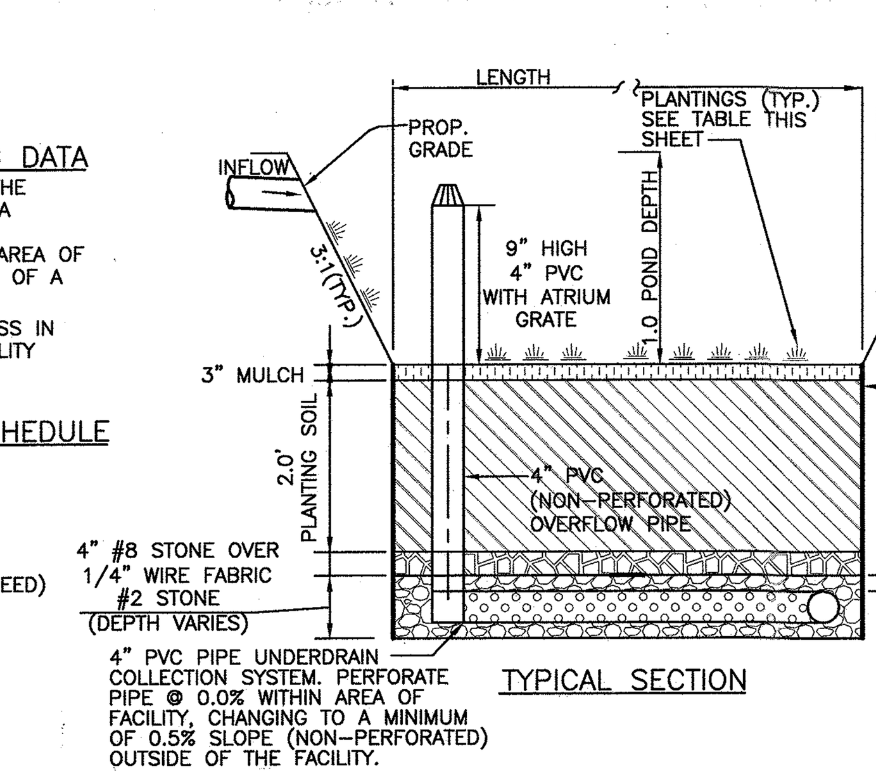
SCHEMATIC PLAN VIEW

NOTE: FACILITIES MUST BE CONSTRUCTED WITH IMPERMEABLE LINER WHEN INSTALLED WITHIN THE 100' WELL RADIUS. THIS LINING SHOULD INCLUDE ENTIRE SIDES AND BOTTOM OF THE EXCAVATION AND EXTEND TO TOP OF EMBANKMENT. LINING ON SIDE SLOPES SHALL BE BELOW TOP SOIL.

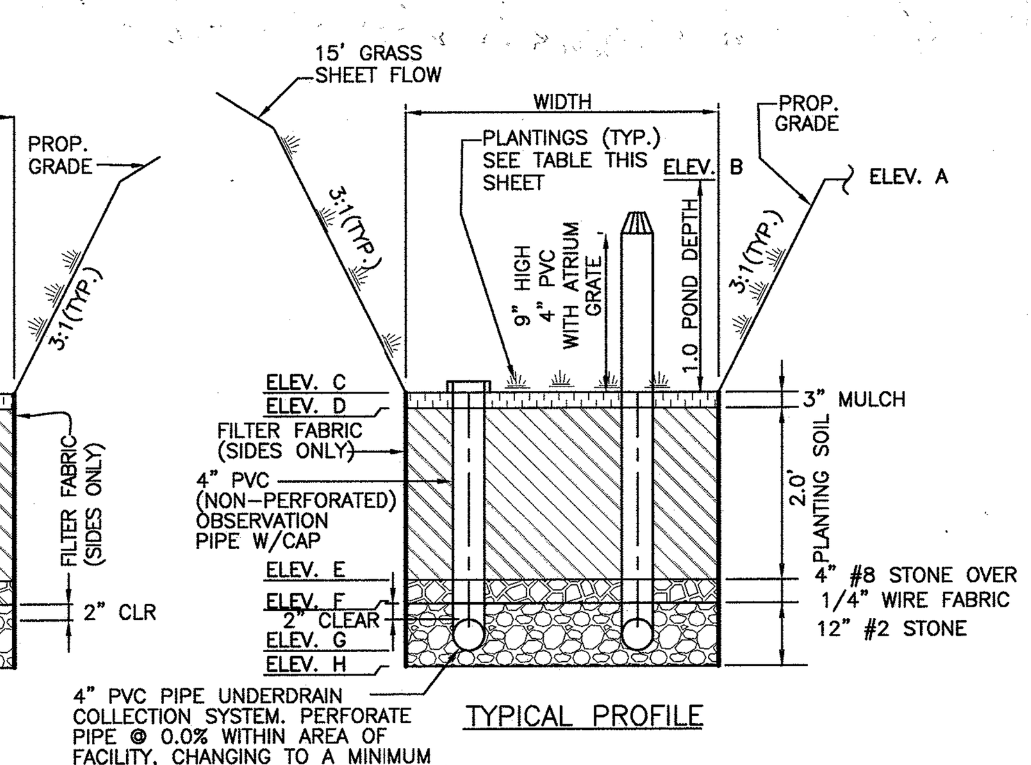
MICROBIORETENTION PLANTING DATA
1. PLANTINGS WITHIN THE PONDING AREA OF THE MICRO-BIORETENTION FACILITY ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE
2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE MICRO-BIORETENTION FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE
3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE MICRO-BIORETENTION FACILITY NEAR O.B. PIPE AND UNDERDRAIN.

MICROBIORETENTION PLANTING SCHEDULE
(SPECIFIC NUMBER OF PLANTINGS SHALL BE DETERMINED WITH FINAL DESIGN AT PLOT PLAN PHASE)

- 1 VINCA MINOR (COMMON PERIWINKLE)
- 2 AJUSTA REPTAS (CREEPING BUNGLEWEED)
- 3 IRIS VERSICOLOR (IRIS)
- ⊗ CALLUNA VULGARIS (HEATHER) (2 PER FACILITY)



TYPICAL SECTION



TYPICAL PROFILE

MICRO-BIORETENTION DETAILS (TYPICAL)
NOT TO SCALE

* APPROXIMATE BOTTOM OF CORE TRENCH IS SHOWN (CONSTRUCTION ELEVATION TO BE DETERMINED BY THE ENGINEER IN THE FIELD). CORE TRENCH MATERIAL MUST BE CL OR CH ONLY.

FACILITY NUMBER	AS BUILT FACILITY DIMENSIONS		
	LENGTH	WIDTH	AREA (Af)
MBR-2	23.5'	28.5'	464
MBR-3	23.0'	18.5'	425
MBR4 DW-1	9.5'	4.5'	
MBR4 DW2	7.0'	9.0'	
MBR4	21.2'	11.6'	215
MBR-5	21.5'	19.0'	383'

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS, REMOVE CONCEPTUAL DESIGN UPDATE MBR #2 & #3.

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

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: 06-08-2018.

STATE OF MARYLAND JOHN M. CARNEY No. 45577 PROFESSIONAL ENGINEER 5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

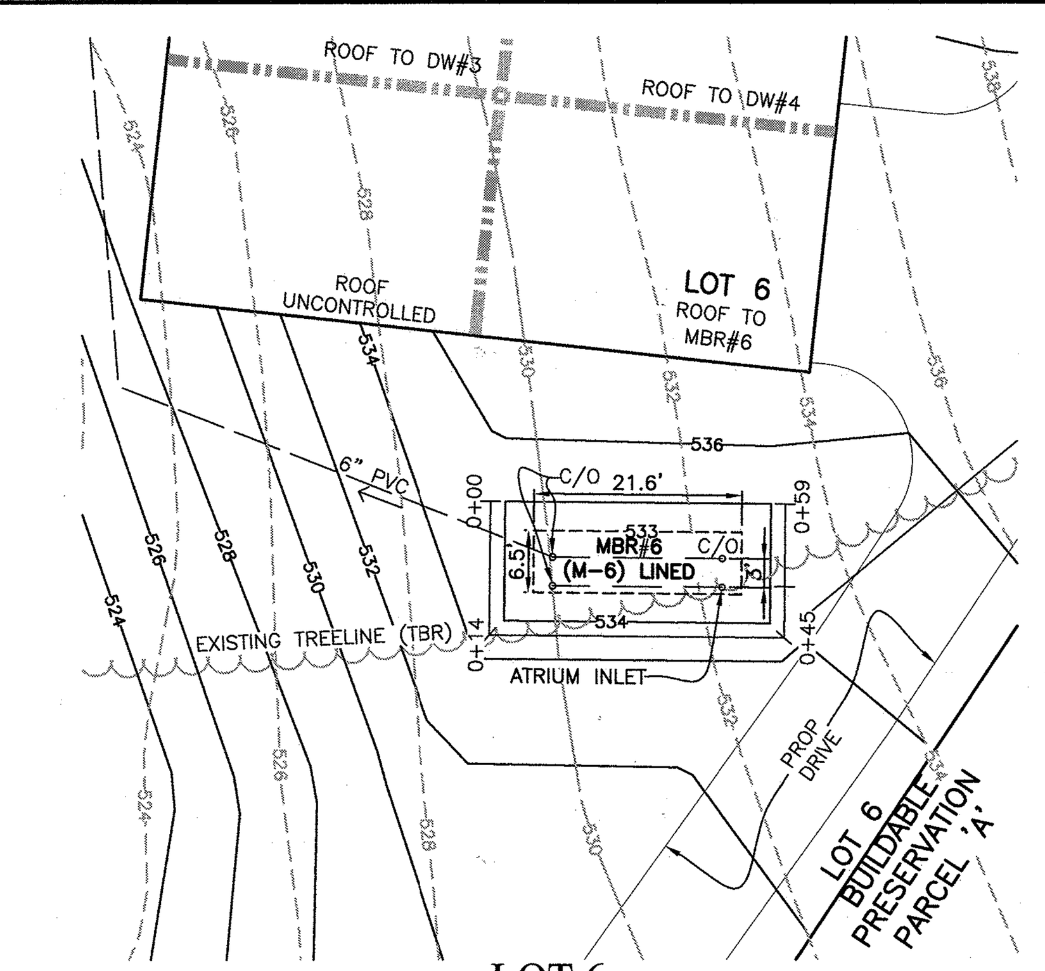
BRIGHTON MILL II
LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

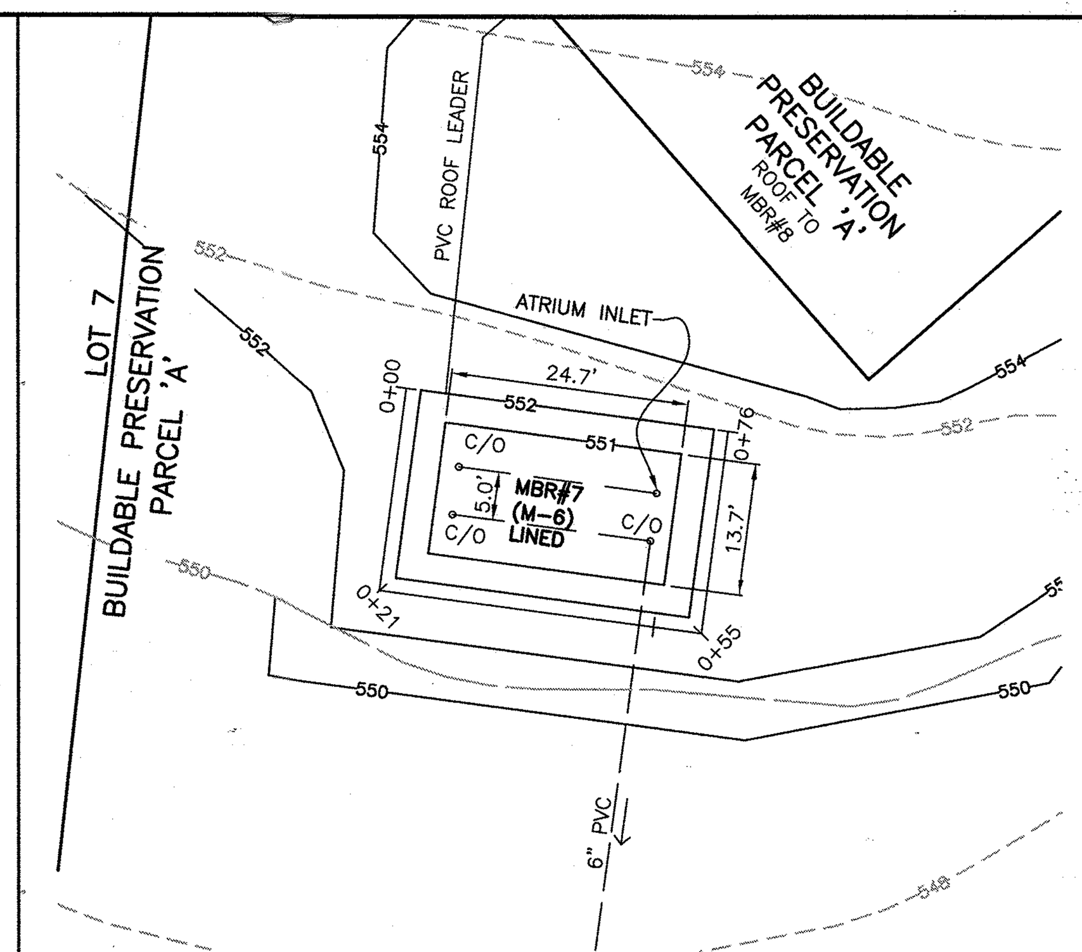
FINAL ROAD CONSTRUCTION PLANS
STORMWATER MANAGEMENT
NOTES & DETAILS

DATE: MAY, 2017		BEI PROJECT NO. 2627	
DESIGN: JC/NAF	DRAFT: JC/NAF	SCALE: AS SHOWN	SHEET 18 OF 23

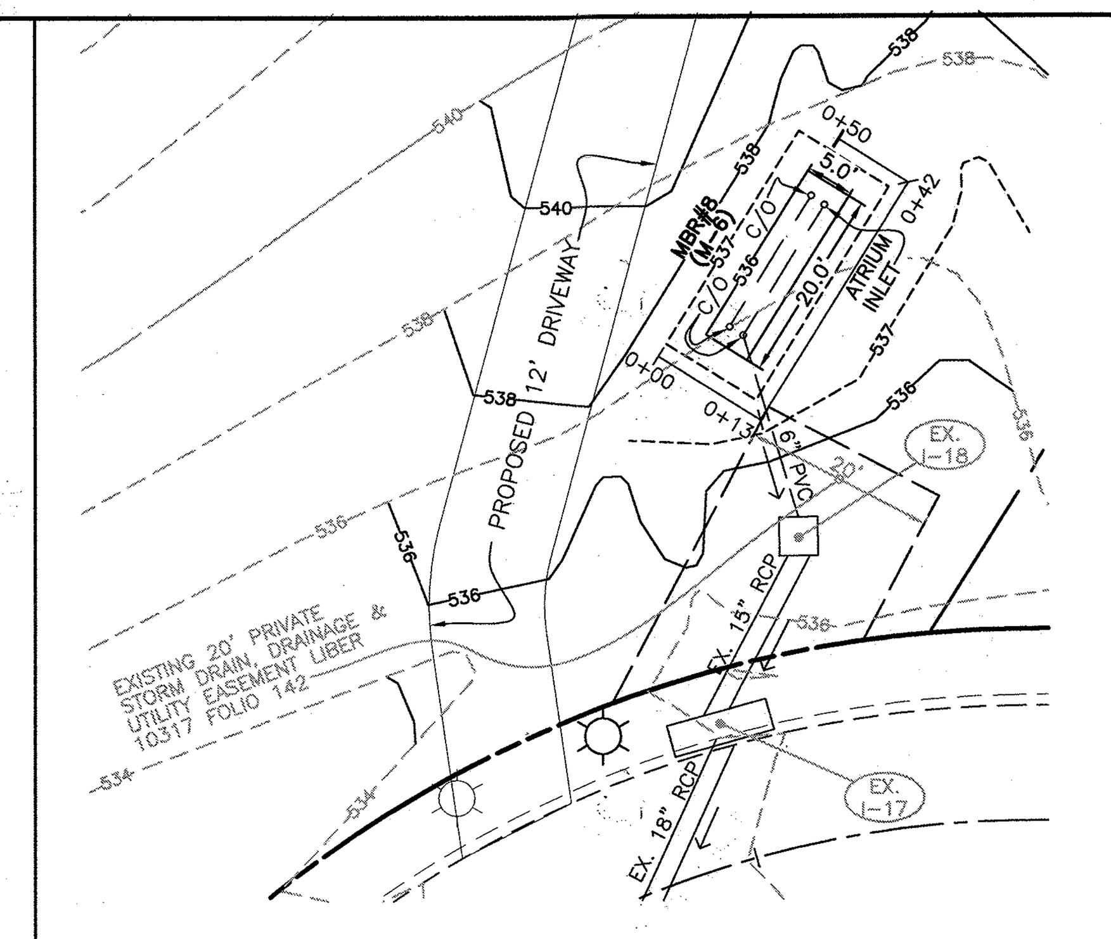
AS-BUILT F-17-054



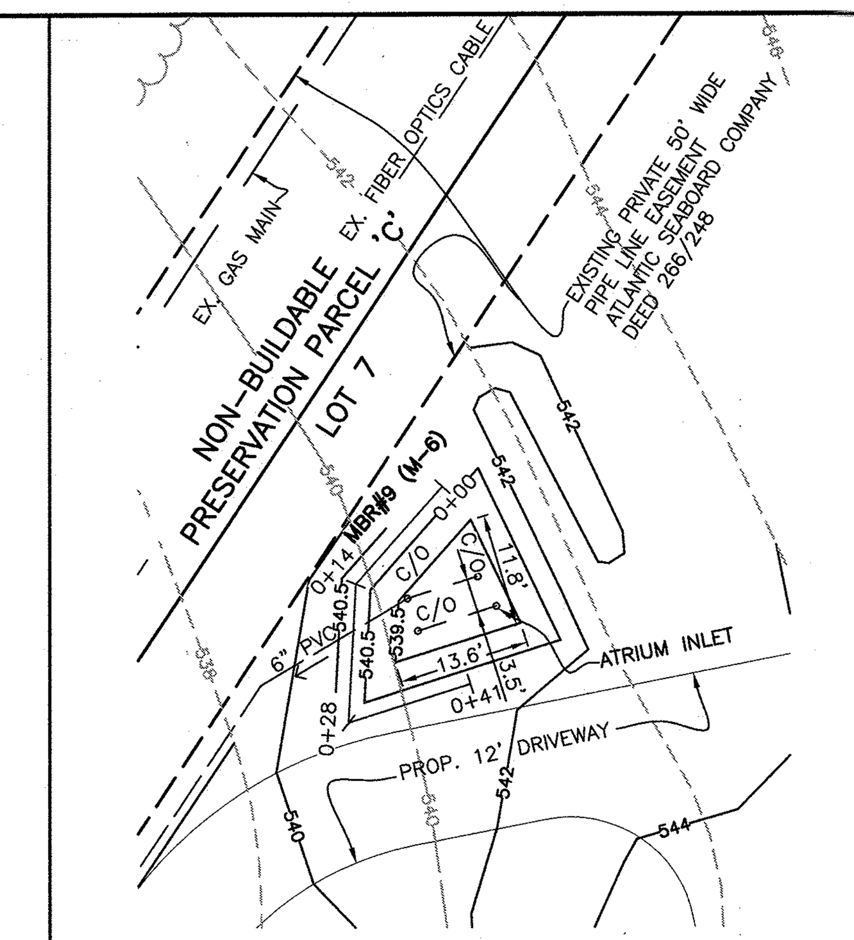
LOT 6
MBR#6 DETAIL
SCALE: 1" = 20'



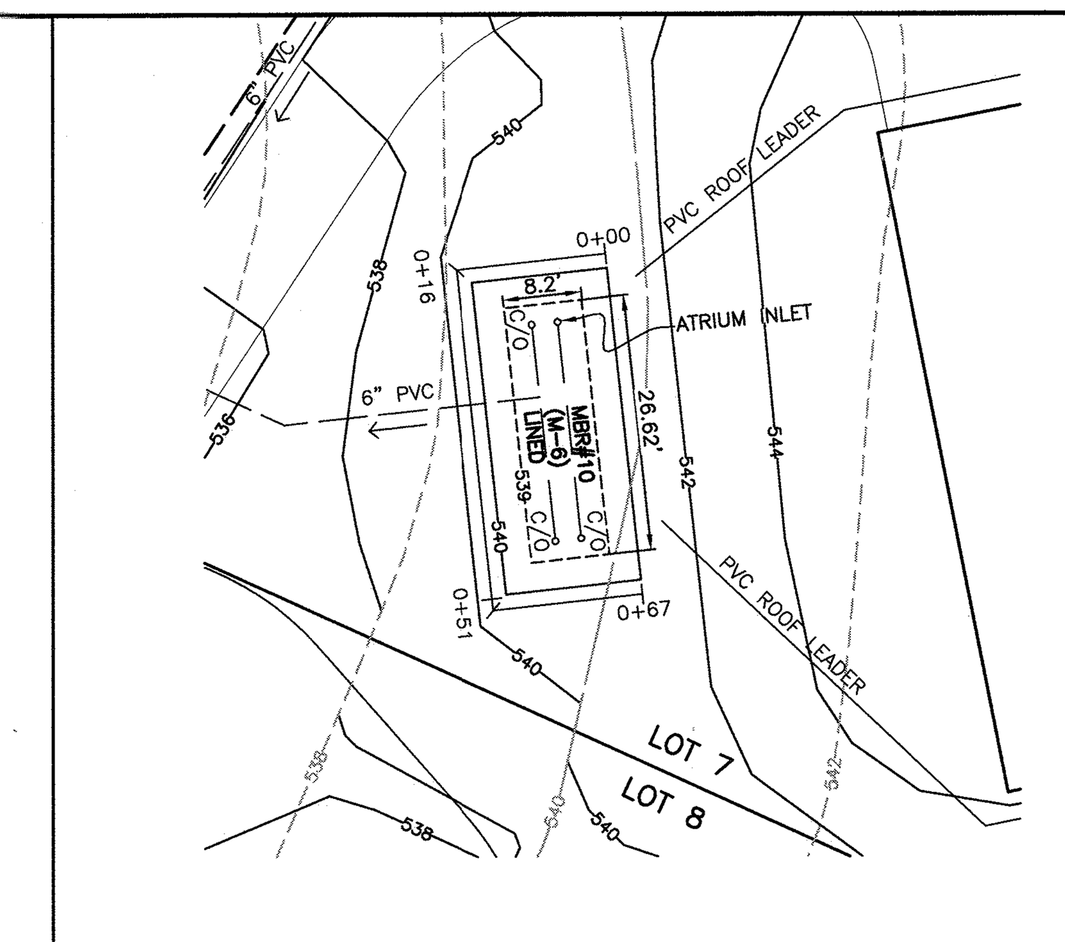
PRESERVATION PARCEL 'A'
MBR#7 DETAIL
SCALE: 1" = 20'



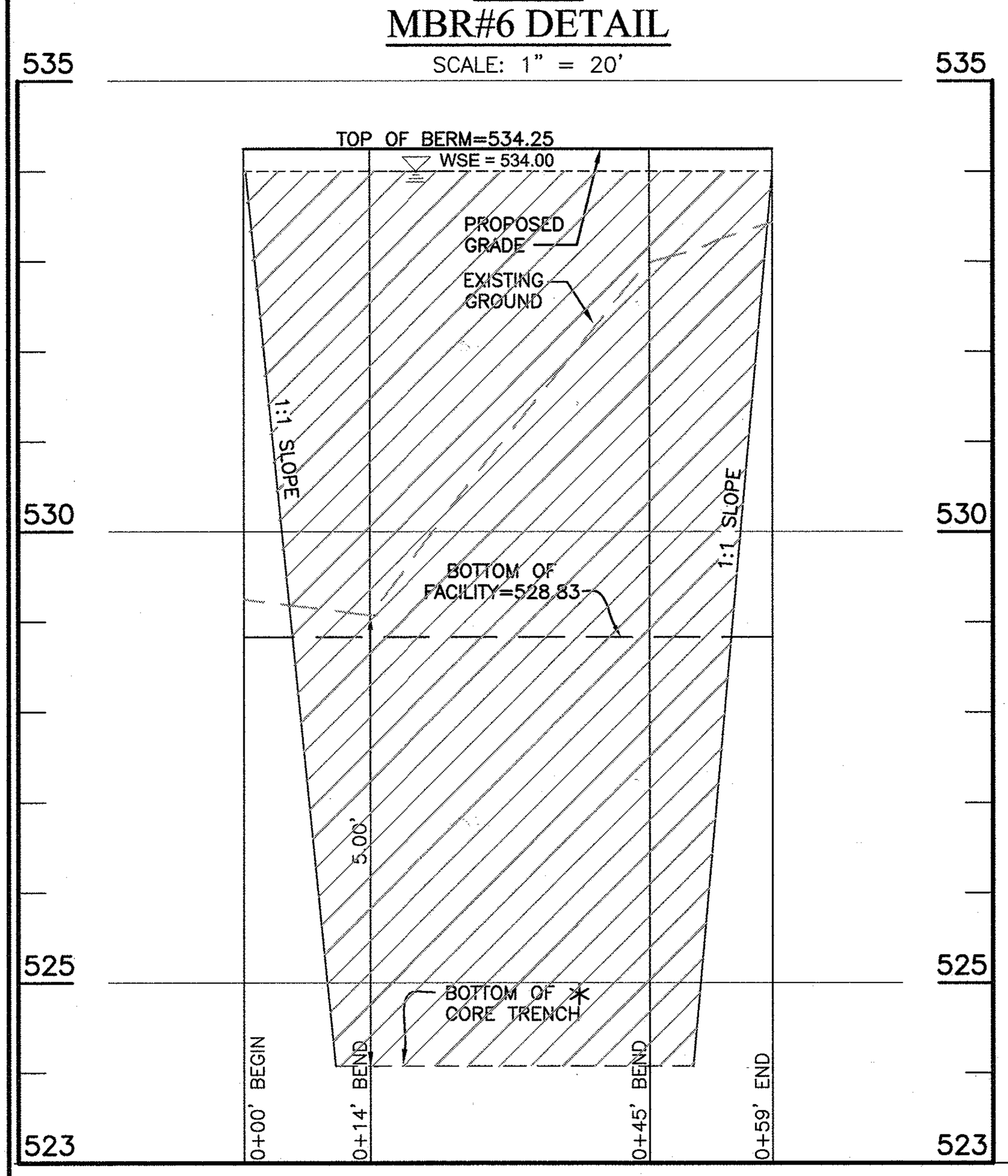
PRESERVATION PARCEL 'A'
MBR#8 DETAIL
SCALE: 1" = 20'



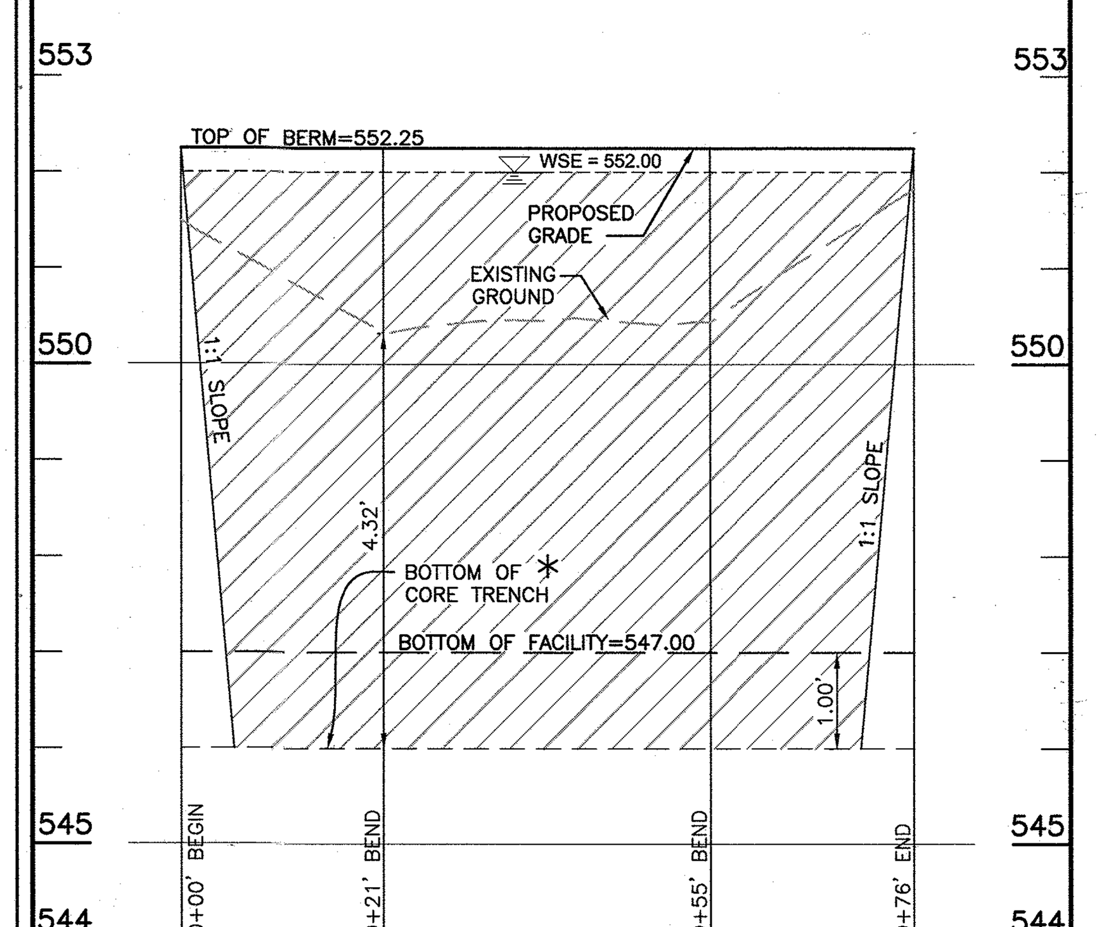
LOT 7
MBR#9 DETAIL
SCALE: 1" = 20'



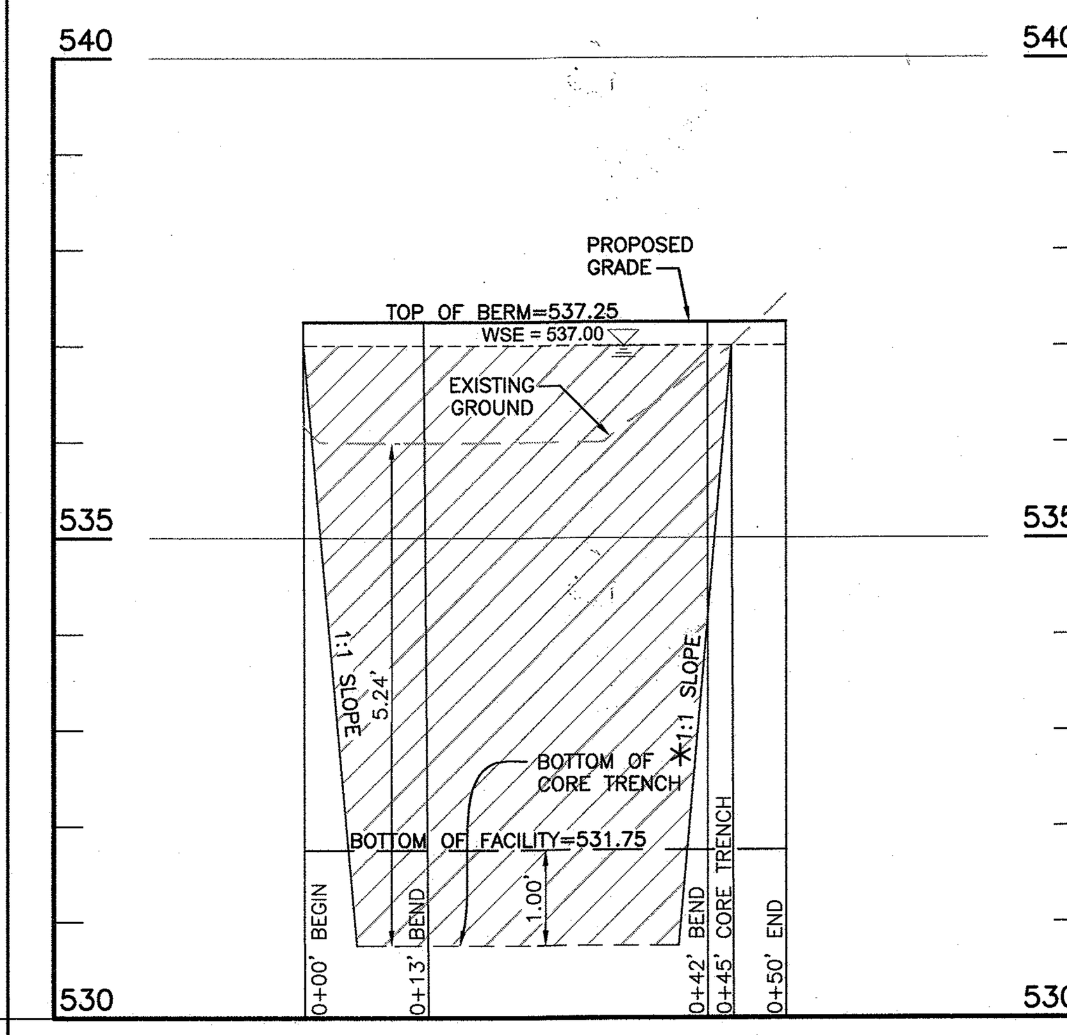
LOT 7
MBR#10 DETAIL
SCALE: 1" = 20'



MBR #6 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.



MBR #7 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.



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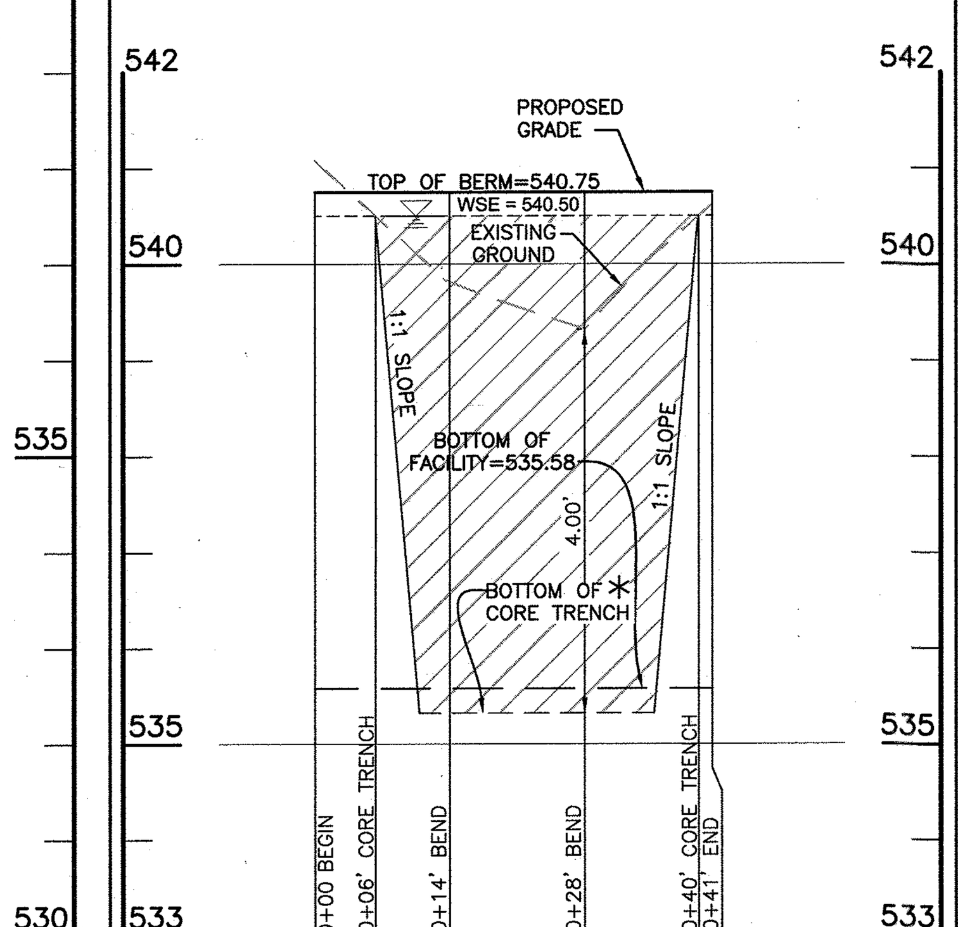
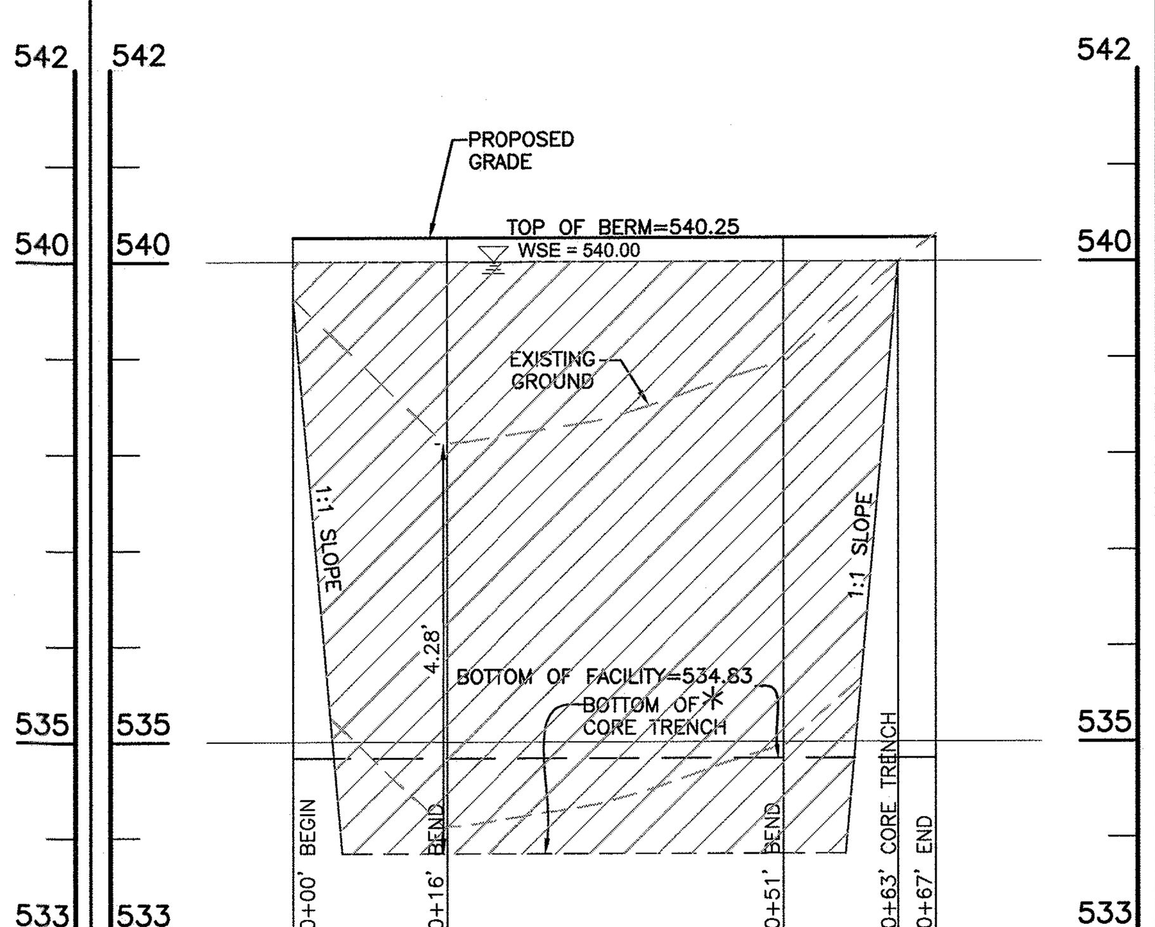
SCALE: 1"=20' HORIZ., 1"=2' VERT.



MBR #9 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.



MBR #10 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.

LEGEND

- SOILS CLASSIFICATION
- SOILS DELINEATION
- EXISTING CONTOURS (AERIAL 12/02)
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE

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: 9/10/19

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER
AS-BUILT

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: 12/21/20

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23.

* APPROXIMATE BOTTOM OF CORE TRENCH IS SHOWN (CONSTRUCTION ELEVATION TO BE DETERMINED BY THE ENGINEER IN THE FIELD). CORE TRENCH MATERIAL MUST BE CL OR CH ONLY.

LOT 6- ASBUILT
SCALE: 1" = 20'

PRESERVATION PARCEL 'A'- ASBUILT
SCALE: 1" = 20'

PRESERVATION PARCEL 'A' - ASBUILT
SCALE: 1" = 20'

LOT 7 - ASBUILT
SCALE: 1" = 20'

LOT 7 - ASBUILT
SCALE: 1" = 20'

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

5/30/17
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

6/14/2017
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

6.29.17
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

6.28.17
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

DEVELOPER'S CERTIFICATE

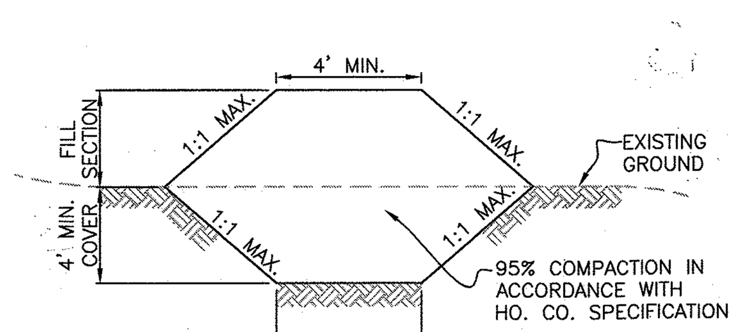
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE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

5-16-17
DEVELOPER — DATE

ENGINEER'S CERTIFICATE

"I 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.

5/16/17
ENGINEER – JOHN M. CARNEY # 45577 — DATE



NOTES:
1. IF WATER IS ENCOUNTERED DURING THE CONSTRUCTION OF THE CORE TRENCH, IT IS TO BE REMOVED BY PUMPING.
2. CORE TRENCH SHALL CONSIST OF IMPERVIOUS MATERIAL (GC, SC, CL, CH) AS DIRECTED BY A GEOTECHNICAL ENGINEER ONSITE AND MAY REQUIRE TO BE HAULED FROM AN OFFSITE LOCATION.

CORE TRENCH SECTION
NOT TO SCALE

[redacted]

FACILTY	ELEVATIONS (SEE TYPICAL BIORETENTION DETAIL) A	B	C	D	E	F	G	H	FILTER LENGTH (ft)	WIDTH (ft)	AREA (sf)	PLANTINGS 1	2	3	LINER REQ'D
MBR-6	534.25	534.00	533.00	532.83	530.83	[illegible]	[illegible]	528.83	21.6	6.5	140	13	12	6	YES
MBR-7	552.25	552.00	551.00	550.83	[illegible]	548.50	547.83	[illegible]	24.7	13.7	340	33	29	15	YES
MBR-8	537.25	537.00	[illegible]	535.83	533.83	533.50	532.83	531.75	20.0	[illegible]	100	10	8	5	NO
MBR-9	540.75	[illegible]	539.50	539.33	537.33	537.00	536.33	535.58	13.6	11.8	103	[illegible]	[illegible]	5	NO
[illegible]	540.25	540.00	539.00	538.83	536.83	536.50	535.83	534.83	26.6	8.2	215	21	18	10	[illegible]

FACILITY NUMBER	AS BUILT FACILITY DIMENSIONS LENGTH	WIDTH	AREA (Af)
MBR-6	23'	8'	184
MBR-6DW-3	7'	7'	
MBR6DW4	7'	7'	
MBR-9	15'	12'	130
MBR-10	35'	12'	298

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS + REMOVE CONCEPTUAL DESIGN

BENCHMARK
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STATE OF MARYLAND JOHN M. CARNEY No. 45577 PROFESSIONAL ENGINEER
5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

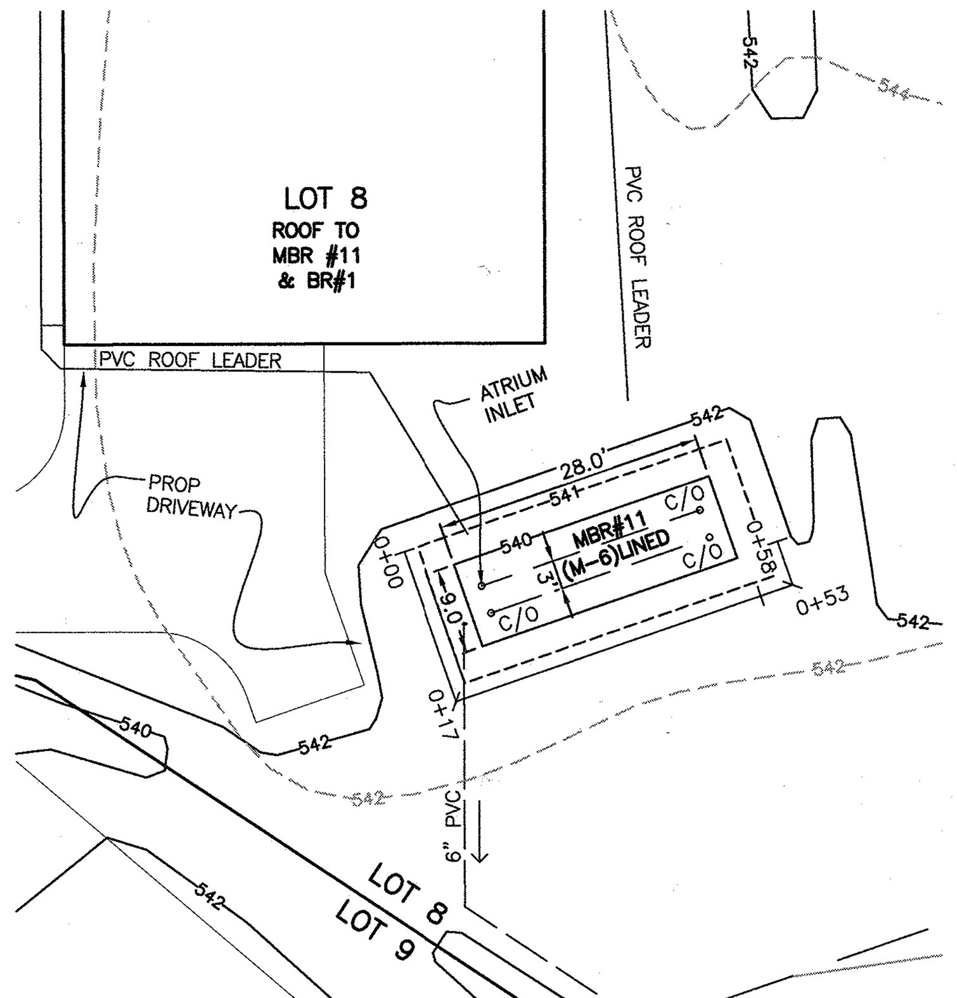
TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
STORMWATER MANAGEMENT NOTES & DETAILS

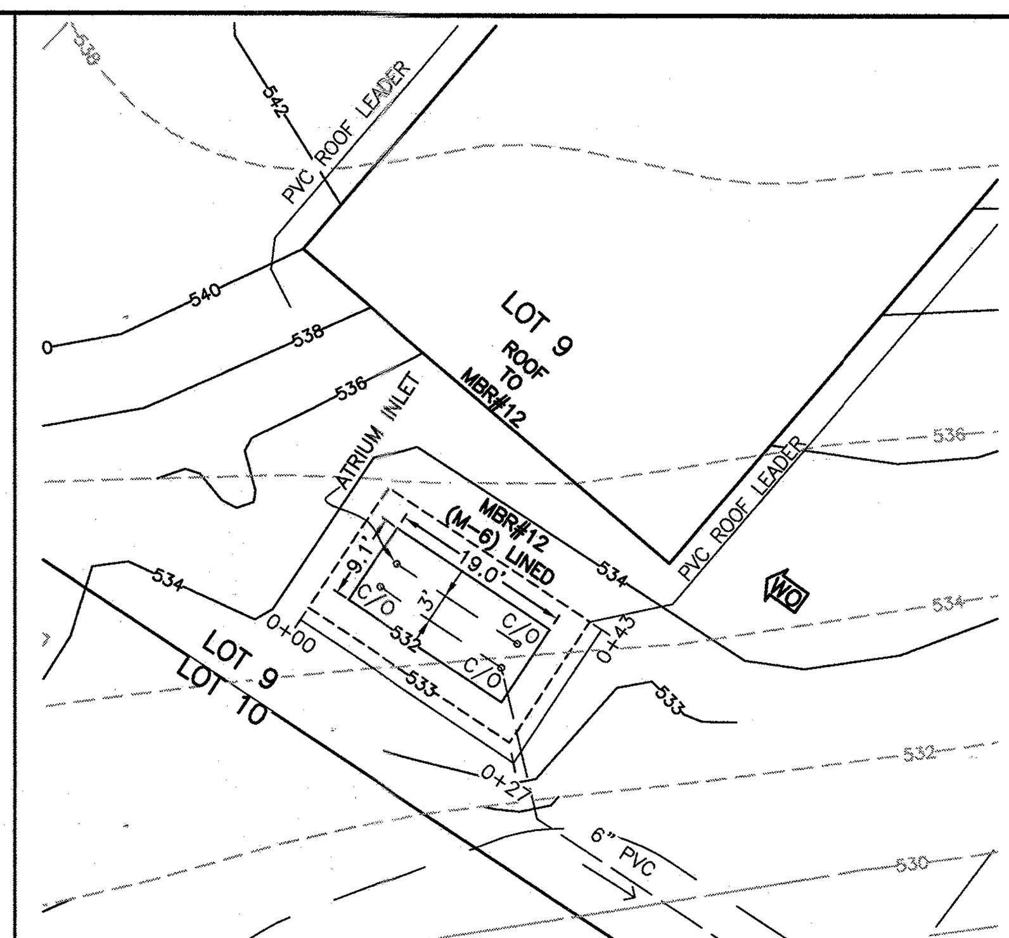
DATE: MAY, 2017	BEI PROJECT NO. 2627
SCALE: AS SHOWN	SHEET 19 OF 23

DESIGN: JC/NAF DRAFT: JC/NAF

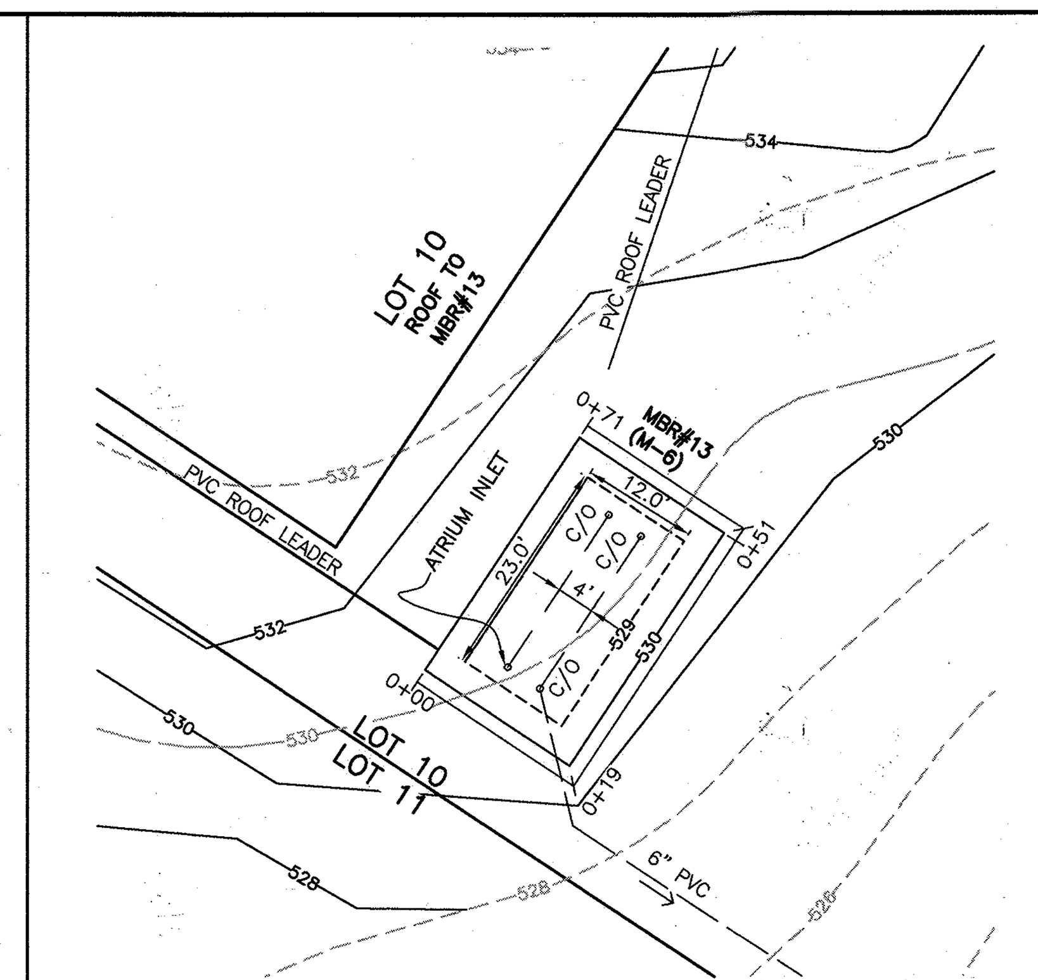
AS-BUILT F-17-054



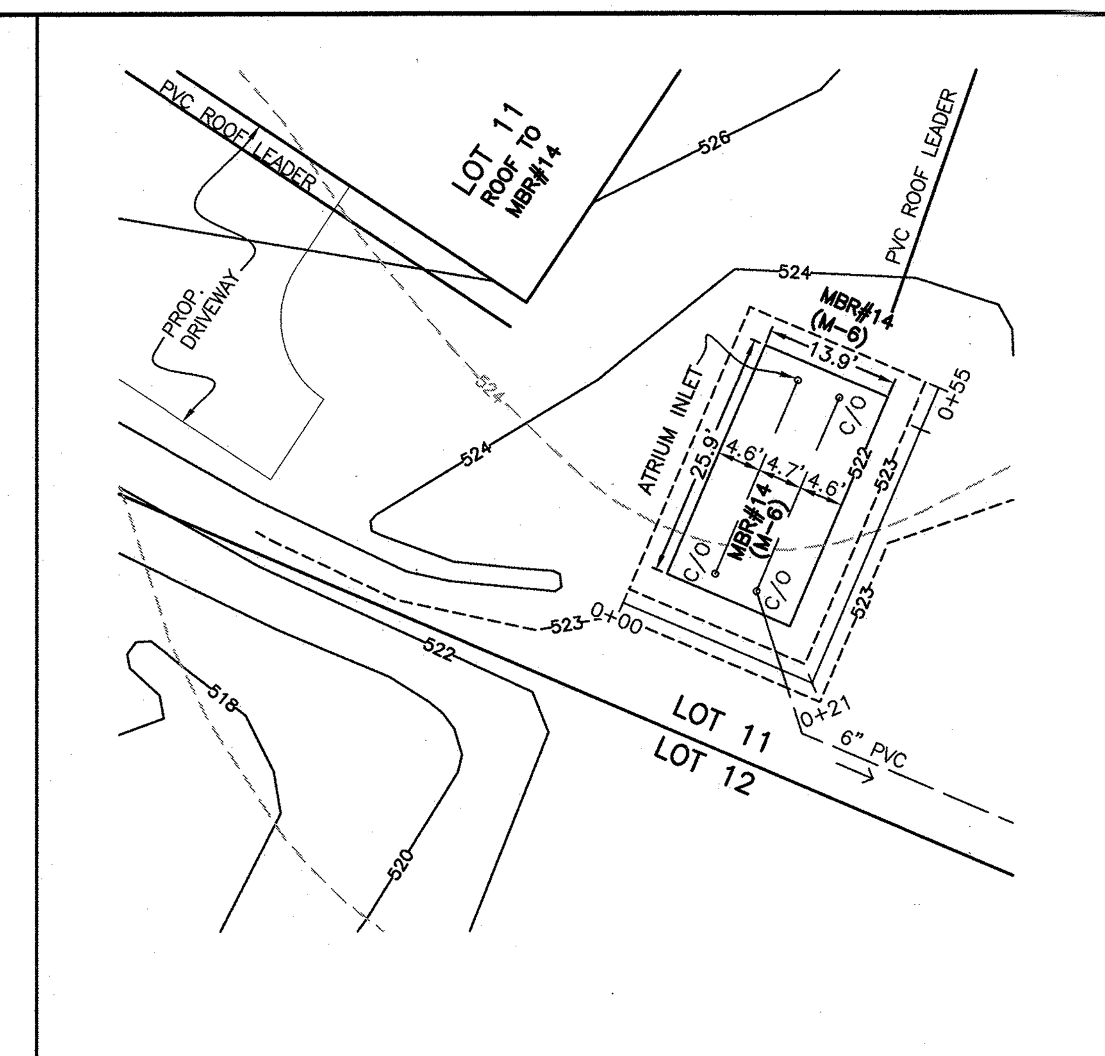
LOT 8
MBR#11 DETAIL
SCALE: 1" = 20'



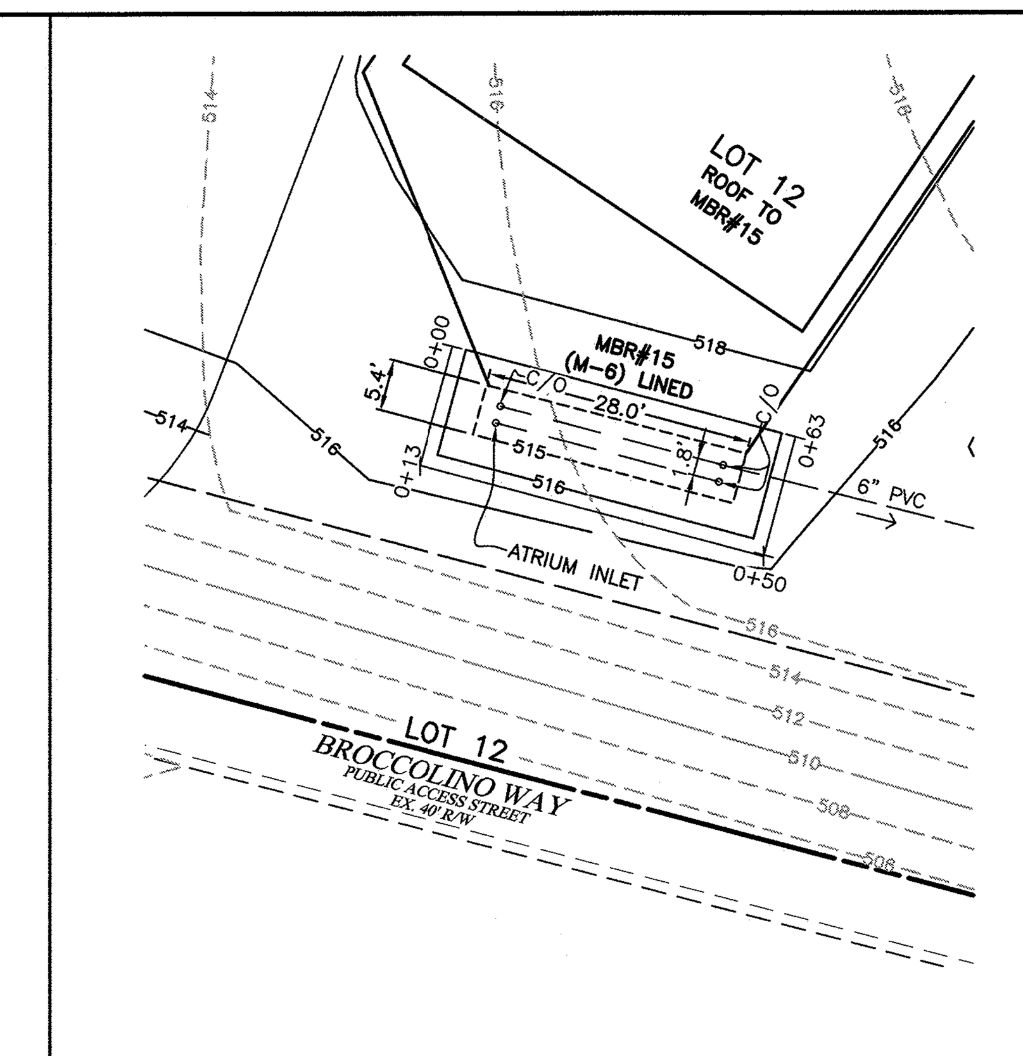
LOT 9
MBR#12 DETAIL
SCALE: 1" = 20'



LOT 10
MBR#13 DETAIL
SCALE: 1" = 20'



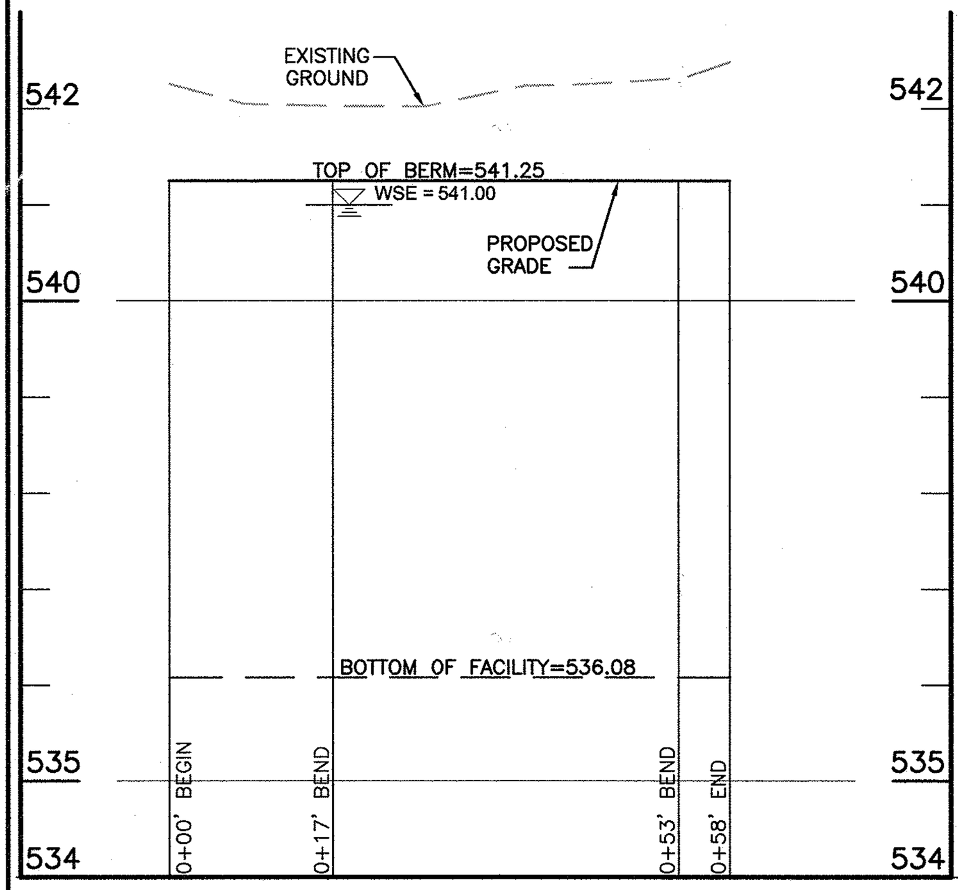
LOT 11
MBR#14 DETAIL
SCALE: 1" = 20'



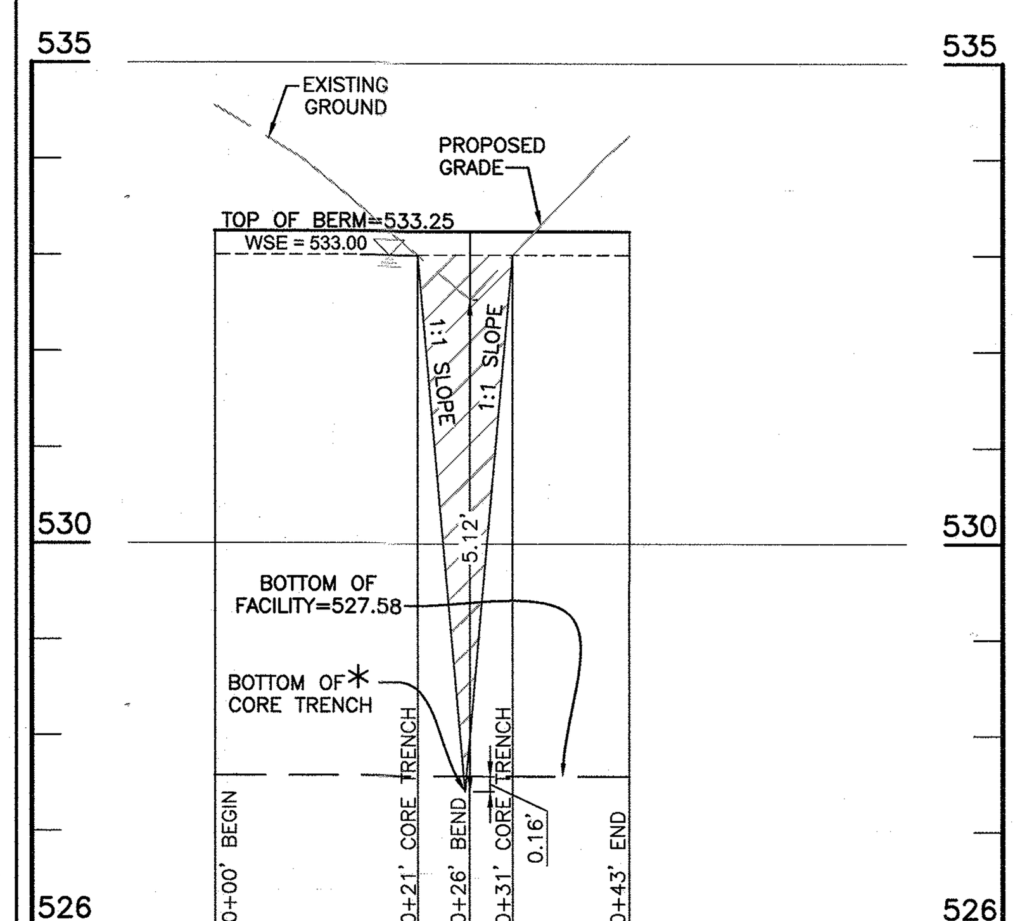
LOT 12
MBR#15 DETAIL
SCALE: 1" = 20'

LEGEND

SOILS CLASSIFICATION / SOILS DELINEATION	GaC
EXISTING CONTOURS (AERIAL 12/02)	500
LIMIT OF WETLANDS	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
EXISTING STRUCTURE	



MBR #11 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.



MBR #12 EMBANKMENT
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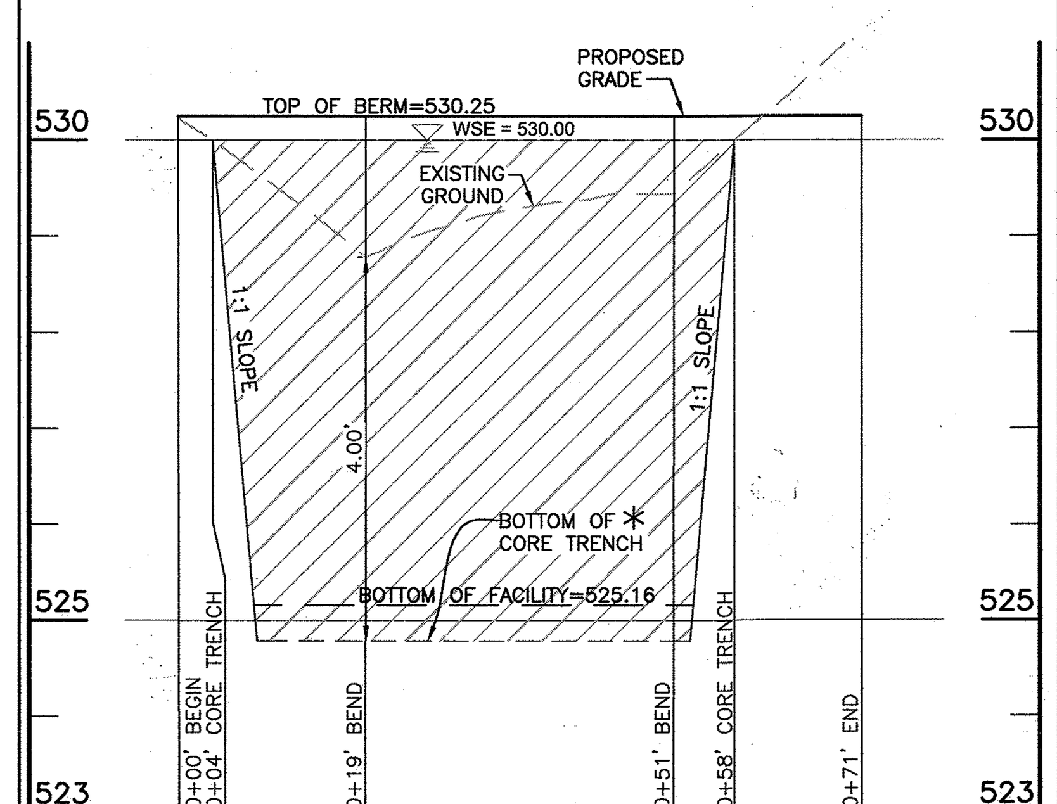

MBR #13 EMBANKMENT
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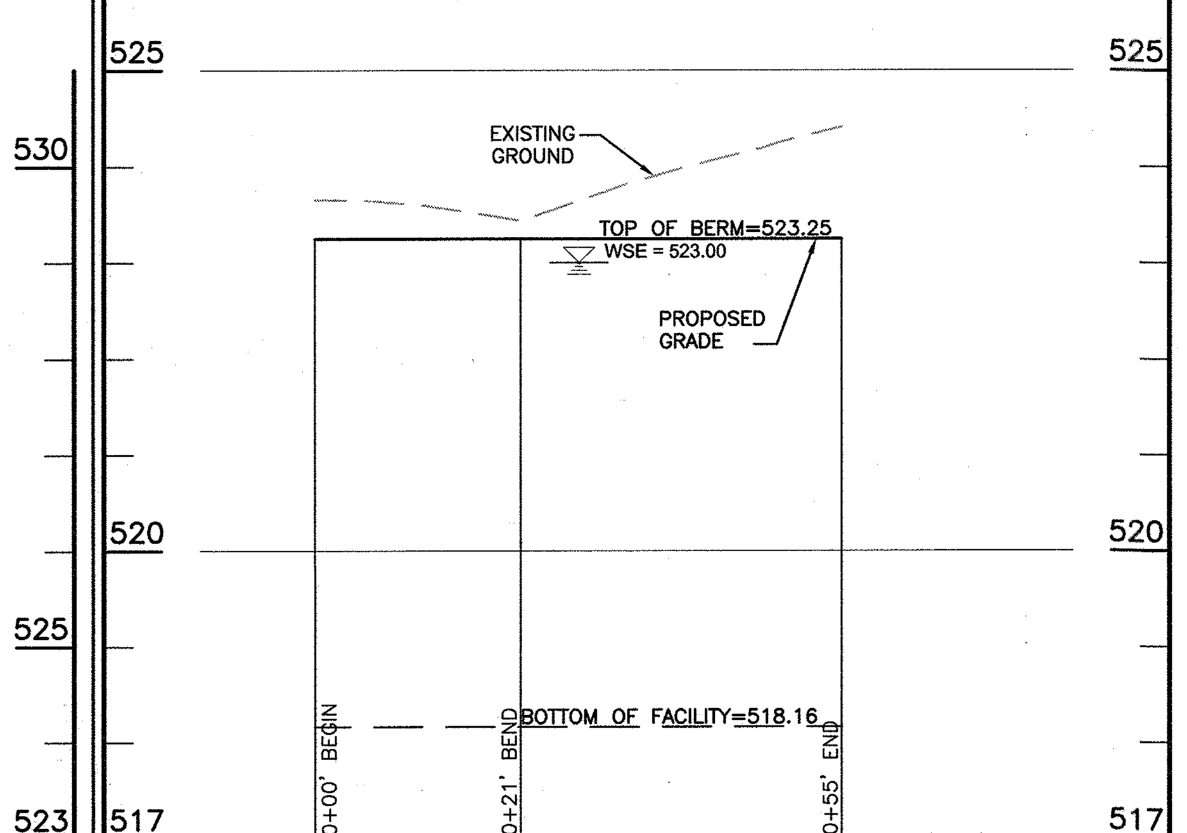
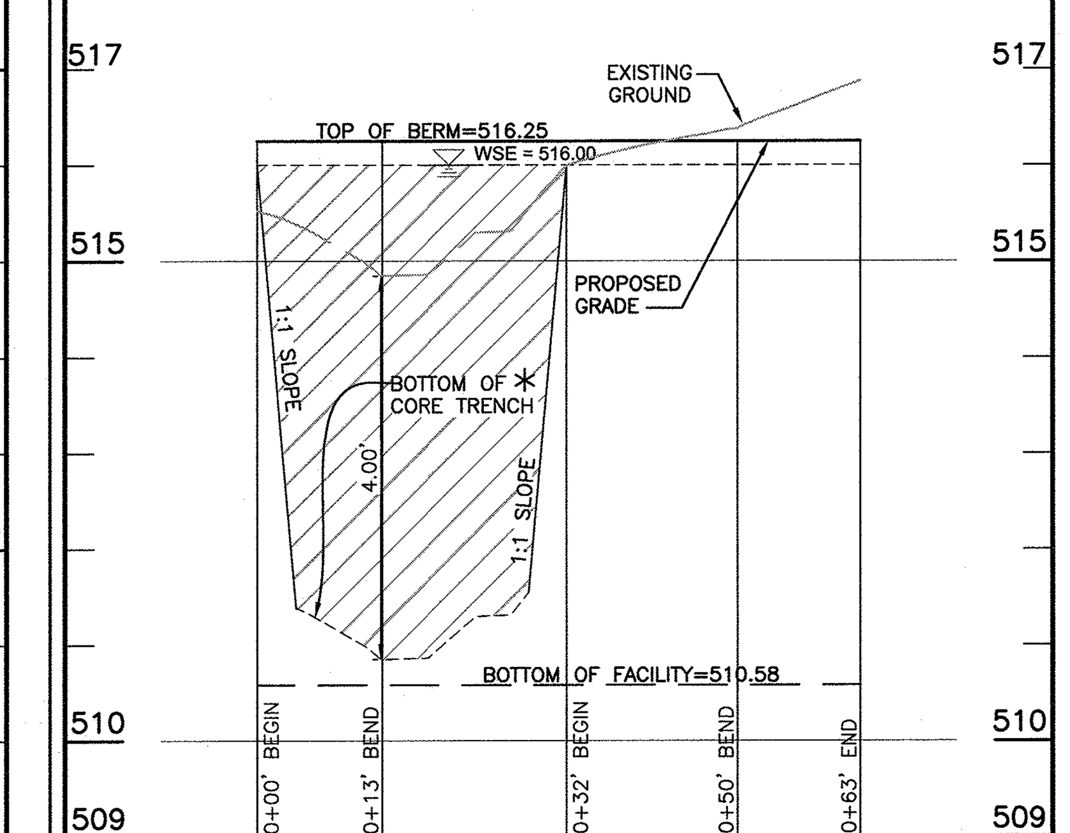


MBR #14 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.



MBR #15 EMBANKMENT
SCALE: 1"=20' HORIZ., 1"=2' VERT.

LOT 8
MBR#12 - ASBUILT
SCALE: 1" = 20'

LOT 9
MBR#13 - ASBUILT
SCALE: 1" = 20'

LOT 10
MBR #14 - ASBUILT
SCALE: 1" = 20'

LOT # 11
MBR #15 - ASBUILT
SCALE: 1" = 20'

LOT 12
MBR#16 - ASBUILT
SCALE: 1" = 20'

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: 9/10/19

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER
AS-BUILT

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: 12/21/20

FACILITY NUMBER	AS BUILT FACILITY DIMENSIONS		
	LENGTH	WIDTH	AREA (Af)
MBR-11	28'	12'	336
MBR-12	20'	10'	200
MBR-13	23'	12'	276
MBR-14	26.5'	14.5'	384
MBR-15	28'	5.5'	434

* APPROXIMATE BOTTOM OF CORE TRENCH IS SHOWN (CONSTRUCTION ELEVATION TO BE DETERMINED BY THE ENGINEER IN THE FIELD). CORE TRENCH MATERIAL MUST BE CL OR CH ONLY.

BIORETENTION FACILITIES

FACILTY	ELEVATIONS (SEE TYPICAL BIORETENTION DETAIL)								FILTER			PLANTINGS			LINER REQ'D
	A	B	C	D	E	F	G	H	LENGTH (ft)	WIDTH (ft)	AREA (sf)	1	2	3	
MBR-11	541.25	541.00	540.00	539.83	537.83	[illegible]	536.83	536.08	28.0	9.0	252	24	21	11	YES
MBR-12	533.25	533.00	532.00	531.83	529.83	529.50	528.83	527.58	19.0	9.1	173	17	15	8	YES
MBR-13	530.25	530.00	[illegible]	528.83	526.83	526.50	525.83	525.16	23.0	[illegible]	276	26	23	12	NO
MBR-14	[illegible]	[illegible]	522.00	521.83	519.83	519.50	518.83	518.16	25.9	13.9	359	[illegible]	30	16	NO
[illegible]	516.25	516.00	515.00	514.83	512.83	512.50	511.83	510.58	28.0	5.4	150	14	13	7	YES

FOR FINAL HOUSE SITE, GRADING, AND SWM, SEE SHEETS 22 AND 23

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

HOWARD SOIL CONSERVATION DISTRICT 5/30/17 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS 6/14/2017 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT 6-29-17 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION 6-28-17 DATE

DEVELOPER'S CERTIFICATE

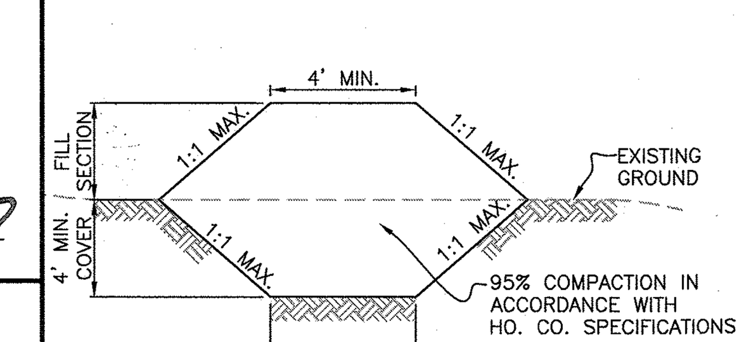
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE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

DEVELOPER 5-26-17 DATE

ENGINEER'S CERTIFICATE

"I 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 – JOHN M. CARNEY # 45577 5/16/17 DATE



NOTES:
1. IF WATER IS ENCOUNTERED DURING THE CONSTRUCTION OF THE CORE TRENCH, IT IS TO BE REMOVED BY PUMPING.
2. CORE TRENCH SHALL CONSIST OF IMPERVIOUS MATERIAL (GC, SC, CL, CH) AS DIRECTED BY A GEOTECHNICAL ENGINEER ONSITE AND MAY REQUIRE TO BE HAULED FROM AN OFFSITE LOCATION.

CORE TRENCH SECTION
NOT TO SCALE

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEETS & REMOVE CONCEPTUAL SWM DESIGN

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
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(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

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: 06-08-2018.
STATE OF MARYLAND JOHN M. CARNEY No. 45577 PROFESSIONAL ENGINEER 5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
STORMWATER MANAGEMENT
NOTES & DETAILS

DATE:	MAY, 2017	BEI PROJECT NO.	2627
DESIGN: JC/NAF	DRAFT: JC/NAF	SCALE: AS SHOWN	SHEET 20 OF 23

AS-BUILT F-17-054

BORING LOG — GEOLAB, INC.

Report No.: Date: 2/17/2017

Client: Highland Development Corp.

Project: Brighton Mill II — Project No. 117-025

Boring No.: B-1 (1 of 1) Total Depth 10 — Elev: 476.0 +/- — Location: See boring location plan

Type of Boring: Hand-Auger — Started: 2/3/2017 — Completed: 2/3/2017 — Driller: B. Walsh & G. Andrabi

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
476	0.0	Topsoil with root matter and organic soil.				Ground water was not encountered during drilling.
475.75	0.25	Brown gravelly micaceous fine sandy SILT, moist. (SM, USDA: Loam)				
474	2.0	Reddish-brown SILT with with some fine sand, moist. (ML, USDA: Loam)				
472	4.0	Reddish-brown fine to medium silty SAND with some gravel, moist. (SM, USDA: Loam)				
470	6.0	Light-brown to brown silty fine to medium SAND, moist. (SM, USDA: Sandy Loam)				
466	10.0	End of boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG — GEOLAB, INC.

Report No.: Date: 2/17/2017

Client: Highland Development Corp.

Project: Brighton Mill II — Project No. 117-025

Boring No.: B-2 (1 of 1) Total Depth 4 — Elev: 470.0 — Location: See boring location plan

Type of Boring: Hand-Auger — Started: 2/3/2017 — Completed: 2/3/2017 — Driller: B. Walsh & G. Andrabi

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
470	0.0	Topsoil with root matter and organic soil.				Ground water was not encountered during drilling.
469	1.0	Brown micaceous SILT, moist. (ML, USDA: Loam)				
468	2.0	Brown micaceous SILT with gravel, moist. (ML, USDA: Loam)				
466	4.0	Auger Refusal - End of boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG — GEOLAB, INC.

Report No.: Date: 2/17/2017

Client: Highland Development Corp.

Project: Brighton Mill II — Project No. 117-025

Boring No.: B-3 (1 of 1) Total Depth 12 — Elev: 470.5 +/- — Location: See boring location plan

Type of Boring: Hand-Auger — Started: 2/3/2017 — Completed: 2/3/2017 — Driller: B. Walsh & G. Andrabi

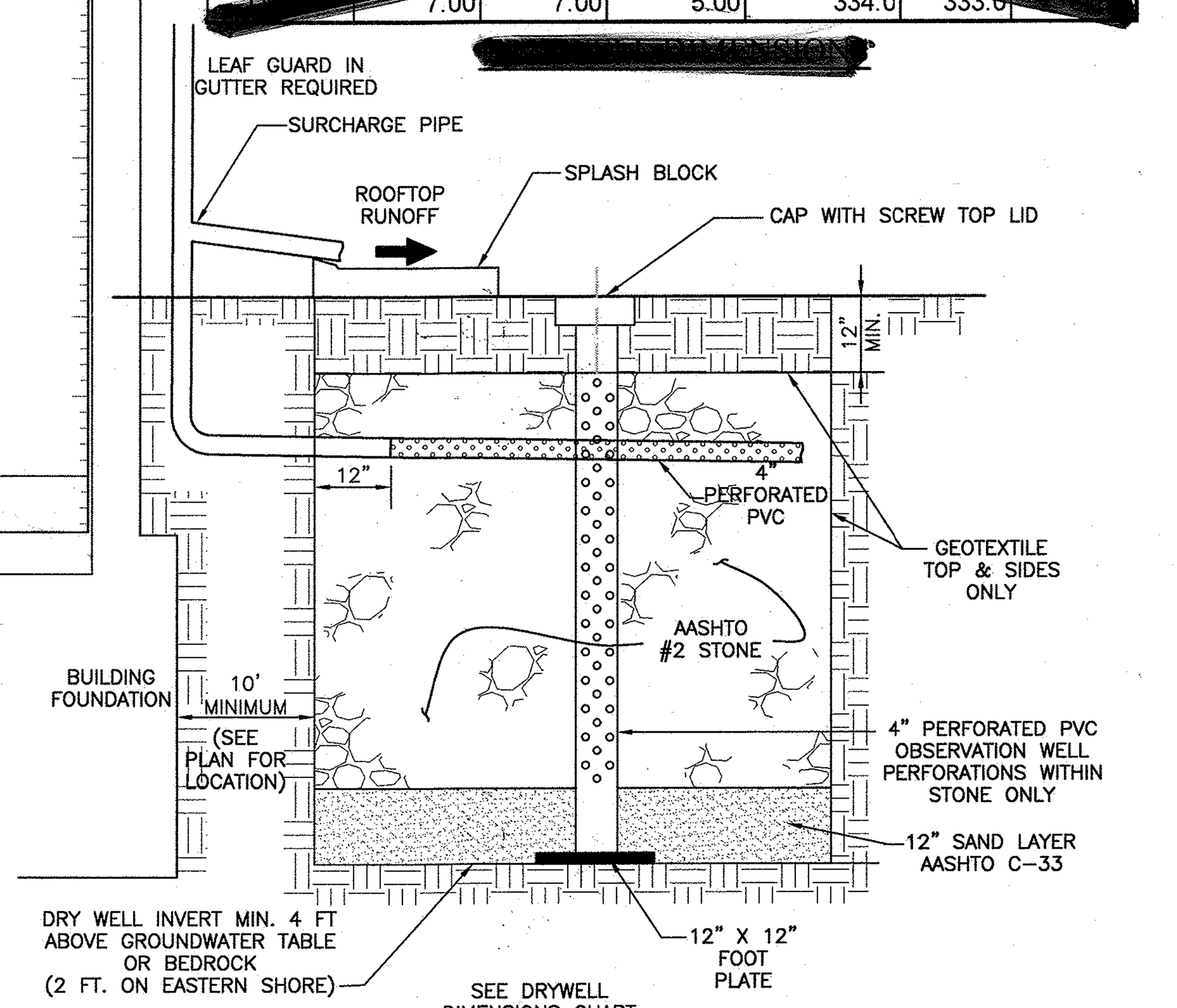
Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
470.5	0.0	Topsoil with root matter and organic soil.				Ground water was not encountered during drilling.
469.5	1.0	Reddish-brown micaceous fine to medium silty SAND, moist. (SM, USDA: Loam)				
468	2.5	Brown micaceous course SAND with gravel, moist. (SM, USDA: Sandy Loam)				
465.5	5.0	Brown and off-white micaceous medium to coarse SAND with some gravel, moist. (SM, USDA: Sandy Loam)				
464	6.5	Brown to orange-brown micaceous medium to course SAND with gravel, moist. (SM, USDA: Sandy Loam)				
458.5	12.0	End of boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

FOR FINAL HOUSE SITE GRADING, AND SWM, SEE SHEETS 22 AND 23.

Drywell Designation	Length (ft)	Width (ft)	Depth (ft)	Grade	Top of Stone	Bottom of Sand
DW-1	7.00	[illegible]	5.00	332.0	331.0	326.0
DW-2	7.00	7.00	5.00	334.0	333.0	328.0
DW-3	[illegible]	7.00	5.00	334.0	333.0	328.0
[illegible]	7.00	7.00	5.00	334.0	333.0	[illegible]

[redacted]



DRY WELL DETAIL
NOT TO SCALE

MATERIALS & SPECIFICATIONS FOR DRY WELLS

MATERIAL	SPECIFICATION	SIZE	NOTES:
GEOTEXTILE (CLASS "C")		N/A	PE TYPE 1 NONWOVEN
GRAVEL	AASHTO M 43	1 1/2" TO 2 1/2"	
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M-278	4" TO 6" RIGID SCH.40 PVC, SDR35 OR HDPE	3/8" PERF. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 2" OF GRAVEL OVER PIPES.
SAND	AASHTO M-6 OR ASTM-C-33	.02" TO .04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE (AASHTO) #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NT ROCK DUST CAN BE USED FOR SAND.

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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."

[signature] 5-16-17

DEVELOPER — DATE

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[signature] 5/16/17

ENGINEER – JOHN M. CARNEY # 45577 — DATE

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

[signature] 5/30/17

HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

[signature] 6/14/2017

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 6-29-17

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 6-28-17

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

CONSTRUCTION SPECIFICATIONS

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 ⅜" 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

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, SDR35 OR HDPE	3/8" PERF. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 2" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES.
IMPERVIOUS LINER	ASTM-D-4833 (THICKNESS) ASTM-D-412 (TENSILE STRENGTH 1,100 LB., ELONGATION 200%) ASTM-D-624 (TEAR RESISTANCE - 150 LB./IN) ASTM-D-471 (WATER ADSORPTION: +8 TO -2% MASS)	30 MIL. THICK	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
GEOTEXTILE (BELOW IMPERV. LINER)	ASTM-D-4833 (PUNCTURE STRENGTH 125LB) ASTM-D-4632 (TENSILE STRENGTH 300 LB.)		

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DRY WELLS (M-5)

1. THE MONITORING WELLS AND STRUCTURES SHALL BE INSPECTED ON A QUARTERLY BASIS AND AFTER EVERY LARGE STORM EVENT.
2. WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS SHALL BE RECORDED OVER A PERIOD OF SEVERAL DAYS TO INSURE TRENCH DRAINAGE.
3. A LOG BOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
4. WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN DOWN WITHIN THE 72 HOUR TIME PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.
5. THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
6. 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 MICRO-BIORETENTION (M-6)

1. 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.
2. 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.
3. 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.
4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND JOINTLY MAINTAINED SURFACE STORMWATER FILTRATION SYSTEMS (F-6)

1. THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
2. THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE PER YEAR, WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.
3. FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF THREE (3) TIMES PER GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 12 INCHES.
4. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
5. VISIBLE SIGNS OF EROSION IN THE FACILITY SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
6. REMOVE SILT WHEN IT EXCEEDS FOUR (4) INCHES DEEP IN THE FOREBAY.
7. WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.
8. A LOGBOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
9. THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
10. ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM 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 AND MAINTAINED DISCONNECTION OF ROOFTOP RUNOFF (N-1), DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2)

A. MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF ARE PROTECTED FROM FUTURE COMPACTION OR DEVELOPMENT OF IMPERVIOUS AREA. IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

"NO AS-BUILT INFORMATION IS" PROVIDED ON THIS SHEET

STATE OF MARYLAND — No. 21443 — 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. 21443, Expiration Date: 12/2/20

AS-BUILT 9/10/19

FOR SEQUENCE OF OPERATIONS PLEASE SEE SEDIMENT CONTROL NOTES AND DETAILS.

NO.	DATE	REVISION
1	7/18/18	CHANGE TOTAL SHEET & REMOVE CONCEPTUAL DESIGN

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

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: 06-08-2018.

[signature] 5/16/17

OWNER:
DAVID A. AND DALE E. CURTIS
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WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
STORMWATER MANAGEMENT
NOTES & DETAILS

DESIGN: JC/NAF	DRAFT: JC/NAF	DATE: MAY, 2017	BEI PROJECT NO. 2627
		SCALE: AS SHOWN	SHEET 21 OF 23

AS-BUILT F-17-054

SEQUENCE OF CONSTRUCTION PER GP-18-023 – INDIVIDUAL HOUSE

DAY 1 OBTAIN GRADING PERMIT AND HOLD A PRE-CONSTRUCTION MEETING. STEP DURATION 1 DAY.

DAY 2 THE CONTRACTOR(S) IS TO IDENTIFY AND MARK ANY HAZARDOUS CONDITIONS THAT MAY EXIST ONSITE, SUCH AS OVERHEAD POWERLINES, OLD WELLS, GAS LINES, ETC. STEP DURATION 1 DAY.

DAY 3–4 CLEAR AND GRUB THE LOT BEING CONSTRUCTED AS NECESSARY FOR THE INSTALLATION OF PERIMETER CONTROLS FOR THAT LOT. INSTALL STABILIZED CONSTRUCTION ENTRANCE, SUPER SILT FENCE, AND SILT FENCES FOR THE LOT BEING CONSTRUCTED. STEP DURATION 2 DAYS.

DAY 4–10 CLEAR AND GRUB REMAINDER OF THE LOT BEING CONSTRUCTED WITHIN INSTALLED PERIMETER CONTROLS. GRADE SITE AND STABILIZE THE LOT BEING CONSTRUCTED IN ACCORDANCE WITH PERMANENT SEEDBED NOTES. STEP DURATION 6 DAYS.

DAY 11 INSTALL EROSION CONTROL MATTING FOR THE LOT BEING CONSTRUCTED IN THE DITCHES AND SWALES. STEP DURATION 1 DAY

DAY 12–60 CONSTRUCT HOUSE FOR THE LOT BEING CONSTRUCTED, INSTALL DRIVEWAY AND UTILITIES. SPOIL FROM THE TRENCHING OF THE SEPTIC AREA IS TO BE PLACED ON THE UPHILL SIDE OF THE EXCAVATION. STEP DURATION 49 DAYS.

DAY 61–63 INSTALL ON-LOT STORMWATER MANAGEMENT PRACTICES FOR THE LOT BEING CONSTRUCTED, LANDSCAPING, FINE GRADE AND STABILIZE ANY REMAINING DISTURBED AREAS FOR THE LOT BEING CONSTRUCTED IN ACCORDANCE WITH PERMANENT SEEDBED NOTES. STEP DURATION 3 DAYS.

DAY 64–66 REMOVE PERIMETER CONTROLS AND PERMANENTLY STABILIZE ANY DISTURBED AREAS FOR THE LOT BEING CONSTRUCTED. STEP DURATION 3 DAYS.

DAY 67–68 UPON APPROVAL OF HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE ALL SEDIMENT CONTROL DEVICES FOR THE LOT BEING CONSTRUCTED . PERMANENTLY STABILIZE AS REQUESTED. STEP DURATION 2 DAYS.

LEGEND

- SOILS CLASSIFICATION / SOILS DELINEATION (GgC)
- PROPOSED CONTOURS (480, 478)
- EXISTING CONTOURS (480, 478)
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- EXISTING STRUCTURE
- EXISTING WELL
- EXISTING SEWAGE DISPOSAL AREA
- EXISTING PRIVATE PIPE LINE EASEMENT AREA
- SWM DRAINAGE AREA
- LIMIT OF DISTURBANCE
- EFFECTIVE AREA

GENERAL NOTES:

1. THIS PLAN REFLECTS THE SITE CONDITIONS AFTER THE CONSTRUCTION OF THE ROADS, MASS GRADING, STORM DRAIN AND ASSOCIATED STORM WATER MANAGEMENT.
2. THIS PLAN IS FOR GRADING PERMIT AND BUILDING PERMIT PROCESSING.
3. SEE THE LATEST SIGNED REVISED PERCOLATION CERTIFICATION PLAN AND ONSITE SEWAGE DISPOSAL SYSTEM PERMIT PLAN FOR WELL AND SEPTIC INFORMATION.
4. ALL CONTRACTORS ARE TO AVOID DAMAGE TO SPECIMEN TREES TO THE AMOUNT POSSIBLE.
5. ALL LOTS WILL REQUIRE A STABILIZED CONSTRUCTION ENTRANCE AT THE LOCATION OF THE DRIVEWAY AND THE PUBLIC ROADWAY. SEE GP-18-023 FOR LOCATION AND DETAILS.

"NO AS BUILT INFORMATION IS" PROVIDED ON THIS SHEET

AS-BUILT 9/10/19

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: 12/31/20

THE PURPOSE OF THIS PLAN IS TO SHOW THE SPECIFIC HOUSE, GRADING AND STORMWATER MANAGEMENT FOR THESE LOTS. THIS PLAN SHEET AND THE NEXT INCLUDE THE FINAL STORMWATER DESIGN.

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 12/4/18

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12.7.18

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12.6.18

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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/BUILDER — DATE 11/27/18

ENGINEER'S CERTIFICATE

"I 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 – JOHN M. CARNEY #45577 — DATE 11/19/18

NO.	DATE	REVISION
4	2.23.19	REVISE LOT 4 SWM LOCATION
3	10-25-18	REVISE GRADING AND REVISED IMPROVEMENTS ON LOTS 7 AND 8.
2	8-27-18	REVISE GRADING ON LOT 12, REVISED IMPROVEMENTS ON LOTS 1, 4, 5, 10, AND 11, REVISE ELEVATION OF HOUSE MODEL ON LOT 9.
1	7-9-18	ADD BUILDING PERMIT PLAN SHEET TO SET

BENCHMARK ENGINEERING, INC.
ENGINEERS LAND SURVEYORS PLANNERS
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WWW.BEI-CIVILENGINEERING.COM

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: 06-08-2020.

11/19/18

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II

LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FINAL ROAD CONSTRUCTION PLANS
REVISED BUILDING PERMIT PLAN AND SEQUENCE OF CONSTRUCTION

DATE:	AUGUST, 2018	BEI PROJECT NO.	2627
DESIGN: JC	DRAFT: JC	SCALE: AS SHOWN	SHEET 22 OF 23

AS-BUILT GP-18-023 F-17-054

PROJECT:	Brighton Mill II	DATE: 06/04/18
	Facility Summary	

Pe (LOTS): 1.0 inches   Pe (BR#1): 1.6 inches

BIORETENTION FACILITIES

Facility	Drainage Area	Impervious	I (%)	Rv	ESDv Req'd (cf)	Req'd Ponded Storage (75%)	Ponded Volume Provided (cf)	Req'd Stone Storage (cf)	Stone Storage Provided (cf)	Total ESDv	Pe Prov.	Rev (cf)	Notes
BR-1 (F-6)	162,219	34,420	21%	0.241	5212	3909	4070	1303	1474	5544	1.70	1474	
MBR-2 (M-6)	18,746	5,902	31%	0.333	521	391	548	130	165	713	1.37		LINED
MBR-3 (M-6)	10,883	5,126	47%	0.474	430	322	540	107	144	684	1.59	144	
MBR-4 (M-6)	6,589	3,782	57%	0.567	311	233	321	78	99	420	1.35		LINED
MBR-5 (M-6)	8,704	4,906	56%	0.557	404	404	469	101	136	605	1.50		LINED
MBR-6 (M-6)	3,603	2,136	59%	0.584	175	131	242	44	56	298	1.70		LINED
MBR-7 (M-6)	14,863	5,020	34%	0.354	438	329	473	110	136	609	1.39		LINED
MBR-8 (M-6)	5,313	1,996	38%	0.388	172	129	193	43	52	245	1.43	52	
MBR-9 (M-6)	5,133	1,369	27%	0.29	199	149	215	50	41	256	2.06	34	
MBR-10 (M-6)	6762	3729	55%	0.55	554	416	435	139	142	577	1.68		LINED
MBR-11 (M-6)	8,424	4,388	52%	0.52	656	492	474	164	188	662	1.90		LINED
MBR-12 (M-6)	6,612	3,785	57%	0.565	311	234	275	78	87	362	1.16		LINED
MBR-13 (M-6)	5305	3,839	72%	0.701	310	233	399	78	92	491	1.58	92	
MBR-14 (M-6)	11,337	4,153	37%	0.380	359	269	496	90	119	615	1.71	119	
MBR-15 (M-6)	4,567	3,413	75%	0.723	275	206	268	69	84	352	1.28		LINED
TOTALS		87,964			10,327		9,418		3015	12,433		1915	

Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Length (ft)	Width (ft)	Depth (ft)	Volume CF	Rev Provided (CF)	Full ESDv Provided?
DW-1 (M-5)	962.8	962.8	0.95	76.22	9.5	4.5	5	85.5	85.5	yes
DW-2 (M-5)	1205.1	1205.1	0.95	95.40	7	9	5	126	126	yes
DW-3 (M-5)	751.4	751.4	0.95	59.49	7	7	5	98	98	yes
DW-4 (M-5)	925	925	0.95	73.23	7	7	5	98	98	yes
Totals	3844.3							407.5	407.5	

Non-Rooftop Disconnection (N-2)

Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Contrib. Per. Length (ft)	Contrib. Imp. Length (ft)	Disconnection Length (ft)	Ratio 0	Pe Treated (inches)	Volume Provided (CF)
NR-1 (N-2)	1102	2297	0.48	92.22	2	16	16	1.0	1.0	92.22
NR-2 (N-2)	615	1529	0.41	52.50	0	25	26	1.0	1.0	52.50
NR-3 (N-2)	505	1515	0.35	44.19	0	23	23	1.0	1.0	44.19
NR-4 (N-2)	587	1661	0.37	50.95	0	37	37	1.0	1.0	50.95
NR-5 (N-2)	1046	2358	0.45	88.28	6	12	12	1.0	1.0	88.28
NR-6 (N-2)	1125	1999	0.56	92.70	0	28	29	1.0	1.0	92.70
NR-7 (N-2)	635	1300	0.49	53.04	0	23	24	1.0	1.0	53.04
Totals	5,615									474

The total ESDv provided by this design is: 13,313 CF
The total Rev provided by this design is: 2,804 CF
Micro-Bioretention facilities within the 100' well radius must be provided with an impermeable liner.

*The ESDv summary table portrays storage in excess of that required for Environmental Site Design requirements.

Target Pe = 1.00   Porosity = 0.4   (M-5)

Drywell Designation	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Length (ft)	Width (ft)	Depth (ft)	Volume Provided (CF)	Full ESDv Provided?
DW-1	962.8	962.8	0.95	76.22	9.50	4.50	5.00	85.5	yes
DW-2	1205.1	1205.1	0.95	95.46	7.00	9.00	5.00	126.0	yes
DW-3	751.4	751.4	0.95	59.49	7.00	7.00	5.00	98.00	yes
DW-4	925	925	0.95	73.23	7.00	7.00	5.00	98.00	yes
								407.5	

Drywell Designation	Length (ft)	Width (ft)	Depth (ft)	Grade	Top of Stone	Bottom of Stone
DW-1	9.5	4.50	5.00	493.6	492.6	487.6
DW-2	7.00	9.00	5.00	509.0	507.0	502.0
DW-3	7.00	7.00	5.00	528.0	527.0	522.0
DW-4	7.00	7.00	5.00	533.0	532.0	527.0

Non-Rooftop Discon.   Target Pe = 1.00   (N-2)

Disconnection Designation	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Contrib. Per. Length (ft)	Contrib. Imp. Length (ft)	Disconnection Length (ft)	Ratio	Pe Treated (inches)	Volume Provided (CF)
NR-1	1102	2296	0.48	92.22	2	16	16	1.0	1.0	92.22
NR-2	615	1529	0.41	52.50	0	25	26	1.0	1.0	52.50
NR-3	505	1515	0.35	44.19	0	23	23	1.0	1.0	44.19
NR-4	587	1661	0.37	50.95	0	37	37	1.0	1.0	50.95
NR-5	1046	2358	0.45	88.28	6	12	12	1.0	1.0	88.28
NR-6	1125	1999	0.56	92.70	0	28	29	1.0	1.0	92.70
NR-7	635	1300	0.49	53.04	0	23	24	1.0	1.0	53.04
										473.87

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 7-26-18
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 7-24-18
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

PROJECT:	Brighton Mill II	DATE: 06/04/18
	Facility Dimensions	

BIORETENTION FACILITIES

	ELEVATIONS (SEE TYPICAL BIORETENTION DETAIL)								FILTER			PLANTINGS			LINER
FACILTY	A	B	C	D	E	F	G	H	LENGTH (ft)	WIDTH (ft)	AREA (sf)	1	2	3	REQ'D
BR-1	~~474.50~~ 473.5	~~474.00~~ 473.0	~~473.00~~ 472.0	472.83	470.33	470.00	~~469.25~~ 468.18	~~468.25~~ 467.25	77.7	59.0	3685	354	310	166	NO
MBR-2	502.50	502.50	501.50	501.25	499.25	498.92	498.25	497.25	23.4	21.4	413	92	92	46	YES
MBR-3	510.00	510.00	509.00	508.75	506.75	506.42	505.75	504.85	22.3	18.0	401	89	89	45	NO
MBR-4	510.25	510.00	509.00	508.75	506.75	506.42	505.75	504.58	19.7	10.7	211	47	47	23	YES
MBR-5	511.25	511.00	510.00	509.75	507.75	507.42	506.75	505.75	21.8	15.9	341	76	76	38	YES
MBR-6	534.25	534.00	533.00	532.75	530.75	530.42	529.75	528.75	21.6	6.5	140	31	31	16	YES
MBR-7	552.25	552.00	551.00	550.75	548.75	548.42	547.75	546.75	24.7	13.7	340	76	76	38	YES
MBR-8	537.00	537.00	536.00	535.75	533.75	533.42	532.75	531.45	20.0	5.0	100	22	22	11	NO
MBR-9	540.50	540.50	539.50	539.25	537.25	536.92	536.25	535.42	13.6	11.8	124	28	28	14	NO
MBR-10	539.00	539.00	538.00	537.75	535.75	535.42	534.75	533.55	26.6	8.2	295	66	66	33	YES
MBR-11	541.00	541.00	540.00	539.75	537.75	537.42	536.92	535.52	28.0	9.0	336	75	75	37	YES
MBR-12	533.25	533.00	532.00	531.75	529.75	529.42	528.75	527.50	19.0	9.1	173	38	38	19	YES
MBR-13	530.25	530.00	529.00	528.75	526.75	526.42	525.75	524.92	23.0	12.0	276	61	61	31	NO
MBR-14	523.00	523.00	522.00	521.75	519.75	519.42	518.75	517.92	25.9	13.9	359	80	80	40	NO
MBR-15	516.00	516.00	515.00	514.75	512.75	512.42	511.75	510.35	28.0	5.4	150	33	33	17	YES

2 SHRUBS + 1 TREE PER MBR

Rev = 7/6/2018   Project: Brighton Mill II   2627

Recharge Volume Calculations

Drainage Area = SITE

A = 17.77 Area in Acres

I = 14% Impervious

S = 0.26 %

Rv = 0.17

HSG	% Of Site	Soil Specific Recharge Factor
A	0%	0.38
B	100%	0.26
C	0%	0.13
D	0%	0.06

Recharge Using Percent Volume Method
Rev = 0.0673 ac-ft or 2933 cf
Recharge Using Percent Area Method
Rev = 0.6412 acres

Requirement may be met by either;
a) treating 0.0673 ac-ft using structural methods,
b) treating 0.6412 acres using non-structural methods, or
c) a combination of both

Recharge Provided	ESD THE MEP		
Vol. =	0.0538	ac-ft	80 %
Area =	0.1289	ac-ft	20 %
Total =			100 %

Equations
2000 Maryland Stormwater Design Manual Volume II

$Rev = [(S)(Rv)(A)]/12$ (percent volume method)

$Rev = (S)(Ai)$ (percent area method)

$S = (soil\ S)(\%\ soil) + (soil\ S)(\%\ soil)$

"ON-LOT SWMF'S WERE AS-BUILT AS PART OF THE INDIVIDUAL GRADE CERTIFICATION FOR THE LOTS"

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: 12/21/20

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER
AS-BUILT

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: 9/10/19

NO.	DATE	REVISION
4	2.23.19	REVISE SWM LOT 4
3	11-18-18	REVISED SWM CHARTS FOR LOTS 7 & 8 REVISIONS
2	8-27-18	REVISED FACILITIES ON LOTS 1, 4, 5, 10 & 12
1	7-9-18	ADD BUILDING PERMIT NOTES AND DETAILS PLAN SHEET TO SET

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
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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: 06-08-2020.
STATE OF MARYLAND JOHN M. CARNEY No. 45577 PROFESSIONAL ENGINEER
7/19/18

OWNER:
DAVID A. AND DALE E. CURTIS
304 KLINGER DRIVE
WESTMINSTER, MD 21157
410-751-5686

DEVELOPER:
HIGHLAND DEVELOPMENT CORP
P.O. BOX 228
CLARKSVILLE, MARYLAND 21029
410-365-0414

BRIGHTON MILL II
LOTS 1 THROUGH 12, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THROUGH 'E'

TAX MAP: 34, GRID: 2, PARCEL: 16 ZONED: RR-DEO
BROCCOLINO WAY
CLARKSVILLE, MD 21029
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

REVISED FINAL ROAD CONSTRUCTION PLANS
BUILDING PERMIT PLAN NOTES AND DETAILS

THE PURPOSE OF THIS PLAN IS TO SHOW THE FINAL STORMWATER MANAGEMENT REQUIREMENTS FOR THESE LOTS. THE PREVIOUS PLAN SHEET SHOWS THE FINAL STORMWATER LOCATION AND DRAINAGE AREAS.

DESIGN: JC	DRAFT: JC	DATE: JUNE, 2018	BEI PROJECT NO. 2627
		SCALE: AS SHOWN	SHEET 23 OF 23

AS-BUILT   F-17-054