SUPPLEMENTAL PLAN
CLARKSVILLE CROSSING
LOTS 1 THRU 4
TAX MAP 34, GRID 23, PARCEL 301
5TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.

2. SUBJECT PROPERTY ZONED RR-DEO PER THE 10-6-2013 COMPREHENSIVE ZONING PLAN.

3. THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.

4. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NO. 341A AND 341B WERE USED FOR THIS PROJECT.

5. TRACT BOUNDARY IS BASED ON FIELD RUN BOUNDARY SURVEY PERFORMED ON OR ABOUT SEPTEMBER, 2013 BY BENCHMARK ENGINEERING, INC.

6. TOPOGRAPHY SHOWN IS BASED ON FIELD-RUN SURVEY PERFORMED ON OR ABOUT AUGUST, 2017 BY BENCHMARK ENGINEERING, INC.

7. EXISTING UTILITIES SHOWN ARE BASED ON FIELD LOCATIONS BY BENCHMARK ENGINEERING, INC, HOWARD COUNTY GIS, AND SP-07-013.

8. WETLAND AND FOREST STAND DELINEATION WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC., DATED MARCH 2018.

9. THE GEOTECHNICAL REPORT WAS PREPARED BY HILLLIS-CARNES ENGINEERING ASSOCIATES, INC. IN APRIL, 2007 AND BY GEOLAB GEOTECHNICAL LABORATORIES, INC. IN OCTOBER, 2013.

10. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, THEIR REQUIRED BUFFERS, 100YR FLOODPLAIN, STEEP SLOPES OR FOREST CONSERVATION EASEMENTS. EXCEPTAS APPROVED BY THE HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

11. THE 100-YEAR FLOODPLAIN STUDY WAS PREPARED BY BENCHMARK ENGINEERING, INC. IN MARCH, 2018.

12. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERIES OR HISTORIC STRUCTURES LOCATED ON THIS SITE.

13. THIS SITE IS NOT LOCATED WITHIN THE METROPOLITAN DISTRICT. WATER AND SEWER WILL BE PRIVATE ON-SITE FACILITIES AND IN ACCORDANCE WITH THE PERCOLATION CERTIFICATION PLAN APPROVED AS PART OF SP-07-013 AND AS REVISED.

14. A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.

15. A TRAFFIC STUDY IS NOT REQUIRED FOR THIS MINOR SUBDIVISION, IT IS EXEMPTED PER HOWARD COUNTY DESIGN VOLUME III, ROADS AND BRIDGES, SECTION 4.7(B)(5).

16. STORMWATER MANAGEMENT ENVIRONMENTAL SITE DESIGN (ESD) HAS BEEN PROVIDED TO THE MAXIMUM EXTENT PRACTICAL (MEP). THE DECLARATION OF CONVENANTS SHALL BE RECORDED FOR ON-LOT DEVICES AND ALL SHARED SWM DEVICES SHALL BE PRIVATELY OWNED AND MAINTAINED IN ACCORDANCE WITH MAINTENANCE EASEMENT AGREEMENT.

17. THIS SUBDIVISION COMPLIES WITH THE REQUIREMENTS OF SECTION 16.200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION VIA THE ON-SITE RETENTION OF 3.36 ACRES OF FOREST WITHIN A FOREST CONSERVATION EASEMENT AND BY THE ON-SITE REFORESTATION OF 4.84 ACRES. SURETY, IN THE AMOUNT OF $105,415.20, MUST BE POSTED WITH THE DPW DEVELOPER'S AGREEMENT.

18. 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 $22,500 FOR 51 PERIMETER SHADE TREES AND 24 MITIGATION TREES FOR REMOVAL OF SPECIMEN TREES (WP-18-099). FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING MUST BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT.

19. 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.

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

21. 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 DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2430)
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 POSTS 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 GA) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GA) - 3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO (QUICK PUNCH) HOLES ABOVE GROUND LEVEL.

22. THE EXISTING STRUCTURES TO BE REMOVED LOCATED ON LOTS 1-4 ARE TO BE REMOVED PRIOR TO THE SUBMITTAL OF THE RECORD PLAT FOR SIGNATURE.

23. [hatched area symbol] THIS AREA DESIGNATES A PRIVATE SEWAGE DISPOSAL AREA OF AT LEAST 10,000 SQUARE FEET AS REQUIRED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED. THIS SEWAGE DISPOSAL AREA SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWERAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWAGE DISPOSAL AREA. RECORDATION OF A REVISED SEWAGE DISPOSAL AREA SHALL NOT BE NECESSARY.

24. THE LOTS SHOWN HEREON COMPLY WITH THE MINIMUM OWNERSHIP WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.

25. ALL WELLS AND SEPTIC FIELDS WITHIN 100 FEET OF THE PROPERTY HAVE BEEN SHOWN.

26. ALL WELLS ARE TO BE DRILLED PRIOR TO SUBMITTAL OF THE RECORD PLAT FOR SIGNATURE. IT IS THE DEVELOPERS RESPONSIBILITY TO SCHEDULE THE WELL DRILLING PRIOR TO THE FINAL PLAT SUBMISSION. IT WILL NOT BE CONSIDERED 'GOVERNMENT DELAY' IF THE WELL DRILLING HOLDS UP THE HEALTH DEPARTMENT'S SIGNATURE OF THE RECORD PLAT.

27. THE PRESERVATION OBLIGATION FOR THE CLUSTER SUBDIVISION IS DEFERRED UNTIL THE FURTHER SUBDIVISION OF LOT 3 PER ZONING REGULATION 105.0.G(1)(h). THIS SUBDIVISION CREATES A PRESERVATION OBLIGATION OF 8.96 ACRES FOR LOTS 1, 2 & 4.

28. WAIVER PETITION WP-13-075, A REQUEST TO WAIVE SUBSECTIONS 16.144(K)(3)(i) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS WAS APPROVED ON DECEMBER 20, 2012 SUBJECT TO THE FOLLOWING CONDITIONS:
1. THE ENVIRONMENTAL CONCEPT PLAN WAS SUBMITTED 30-DAYS PRIOR TO THE SUBMISSION OF THE FINAL PLAN.
2. THE FINAL PLAN SUBMISSION WAS SUBMITTED TO DPZ ON JULY 28, 2013.
3. COMPLIANCE WITH PREVIOUS COMMENTS FROM THE DEVELOPMENT ENGINEERING DIVISION AND THE HEALTH DEPARTMENT.

29. WAIVER PETITION WP-14-006, A REQUEST TO WAIVE SUBSECTIONS 16.144(K)(3)(I) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS WAS APPROVED ON AUGUST 22, 2013 SUBJECT TO THE FOLLOWING CONDITIONS:
1. THE APPLICANT MUST REDESIGN THE STORMWATER MANAGEMENT FOR THIS SUBDIVISION TO MEET THE CURRENT ENVIRONMENTAL SITE DESIGN (ESD) REQUIREMENTS, AND THEREFORE, THE MAY 4, 2013 MDE GRAND-FATHERING DEADLINE IS NO LONGER APPLICABLE TO THIS PROJECT'S DEADLINE.
2. THE ENVIRONMENTAL CONCEPT PLAN MUST BE APPROVED PRIOR TO THE SUBMISSION OF THE FINAL PLAN.
3. THE FINAL PLAN SUBMISSION WAS SUBMITTED TO DPZ ON JANUARY 28, 2014.
4. COMPLIANCE WITH PREVIOUS COMMENTS FROM THE DEVELOPMENT ENGINEERING DIVISION AND THE HEALTH DEPARTMENT PER WP-13-075.
5. ADVISORY: FUTURE REQUESTS FOR ADDITIONAL EXTENSIONS TO THE VARIOUS DEADLINE DATES WILL NOT BE GRANTED.

30. WAIVER PETITION (WP-14-053) WAS APPROVED ON JANUARY 6, 2014 TO SECTION 16.116(a)(1) AND 16.116(a)(2)(i) WHICH STATES GRADING, REMOVAL OF VEGETATIVE COVER AND TREES, PAVING AND NEW STRUCTURES SHALL NOT BE PERMITTED WITHIN 25' OF A WETLAND AND WITHIN 50' OF AN INTERMITTENT STREAMBANK; SECTION 16.120(b)(4)(iii)b WHICH PROHIBITS STREAM BUFFERS ON RESIDENTIAL LOTS LESS THAN 10 ACRES; AND SECTION 16.1205(a)(10) WHICH CONSIDERS SPECIMEN TREES A PRIORITY. SINCE SP-07-013 RECEIVED SIGNATURE APPROVAL ON OCTOBER 10, 2008 PRIOR TO THE STATES ADOPTION OF SB-666 IT WAS DETERMINED THAT THE WAIVER FOR SPECIMEN TREE REMOVAL IS NOT REQUIRED SINCE THIS PROJECT WOULD BE CONSIDERED GRAND-FATHERED.
APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:
1. THE APPLICANT MUST CONTACT MDE FOR ANY NECESSARY PERMITS FOR DISTURBANCES TO THE ENVIRONMENTAL FEATURES. THE MDE TRACKING PERMIT NUMBER MUST BE ADDED TO ALL PLAN SUBMISSIONS.
2. COMPLIANCE WITH PREVIOUS COMMENTS FROM THE DEVELOPMENT ENGINEERING DIVISION ISSUED UNDER F-14-048 AND ECP-13-072
3. ON ALL FUTURE SUBDIVISION PLANS AND BUILDING PERMIT PLANS, PROVIDE A BRIEF DESCRIPTION OF WAIVER PETITION WP-14-053, AS A GENERAL NOTE TO INCLUDE REQUESTS, SECTIONS OF THE REGULATIONS AND DATE.
4. THE LIMIT OF DISTURBANCE WITHIN THE WETLANDS/STREAMBANK BUFFER IS THE MINIMUM NECESSARY TO AFFORD RELIEF AS SHOWN ON THE F-14-048 ROAD CONSTRUCTION DRAWINGS.

31. WAIVER PETITIONS WP-13-075, WP-14-006, AND WP-14-053 HAVE EXCEEDED THE MILESTONE DATES ASSOCIATED WITH THEIR VALIDITY.

32. DRIVEWAYS SHALL BE PROVIDED PRIOR TO ISSUANCE OF A USE AND OCCUPANCY PERMIT FOR ANY NEW DWELLINGS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
A) WIDTH - 12' SERVING MORE THAN ONE RESIDENCE).
B) SURFACE - 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING.
C) GEOMETRY - MAX. 15% GRADE, MAX. 10% GRADE CHANGE & MIN. 45' TURNING RADIUS.
D) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOAD)
E) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOOD PLAIN WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY.
F) STRUCTURE CLEARANCES - MINIMUM 12 FEET. G) MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.

33. PREVIOUS HOWARD COUNTY FILE NUMBERS: ECP-13-077, SP-07-013, F-14-048, WP-13-075, WP-14-006, WP-14-053, WP-18-099.

34. THE APPROVAL AND USE OF THE SEWAGE DISPOSAL AREAS (SDA) FOR LOTS 1 AND 2 AS ILLUSTRATED HEREON IS PREDICATED UPON THE PREMISE THAT THE POND SHALL BE DRAINED AND THAT THE BANK OF THE REMAINING INTERMITTENT STREAM SHALL BE AT LEAST 100 FEET DISTANCE FROM THE SDA FOR LOTS 1 AND 2, RESPECTIVELY, PRIOR TO HEALTH DEPARTMENT SIGNATURE OF THE RECORD PLAT. THE BOUNDARIES OF THE SDA FOR LOTS 1 AND 2 SHALL BE MARKED AND HEALTH DEPARTMENT INSPECTORS SHALL CONFIRM THAT THE DISTANCES FROM THE RESPECTIVE SDA TO THE INTERMITTENT STREAM BANK ARE AT LEAST 100 FEET.

35. THE STRUCTURE WITHIN THE LOT 1 SEWAGE DISPOSAL AREA MUST BE REMOVED WITH MINIMAL DISTURBANCE TO THE SOIL RESOURCE. A HEALTH DEPARTMENT INSPECTOR SHALL INSPECT THE SEWAGE DISPOSAL AREA AFTER REMOVAL OF THE STRUCTURE AND PRIOR TO HEALTH DEPARTMENT SIGNATURE OF THE RECORD PLAT.

36. WATER SAMPLES FROM WELLS INSTALLED FOR LOTS 1, 2, AND 4 MUST BE ANALYZED FOR VOLATILE ORGANIC COMPOUNDS (VOC) PRIOR TO RELEASE OF USE AND OCCUPANCY BY THE HEALTH DEPARTMENT.

37. ALTERNATIVE COMPLIANCE, WP-18-099, HAS BEEN APPROVED BY HOWARD COUNTY DIRECTOR OF PLANNING AND ZONING DATED JUNE 13, 2018.

APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. THE ALTERNATIVE COMPLIANCE PETITION NUMBER (WP-18-099) AND ITS CONDITIONS OF APPROVAL MUST BE ADDED TO ALL SUBDIVISION PLANS AND FINAL PLAT, F-18-081.
2. THE DEVELOPER SHALL PLANT TWENTY-FOUR (24) 3" MINIMUM CALIPER NATIVE SHADE TREES IN ADDITION TO THE REQUIRED PERIMETER LANDSCAPING TO MITIGATE THE REMOVAL OF THE SPECIMEN TREES WILL BE BOUNDED WITH THE DEVELOPER'S AGREEMENT UNDER THE FINAL SUBDIVISION PLAN.
3. PROTECTIVE MEASURES SHALL BE UTILIZED DURING CONSTRUCTION TO PROTECT THE SPECIMEN TREES THAT ARE PROPOSED TO REMAIN. INCLUDE DETAILS OF THE PROPOSED TREE PROTECTION MEASURES ON THE FINAL PLAN.
4. THE ALTERNATIVE COMPLIANCE APPROVAL APPLIES ONLY TO THE TWELVE (12) SPECIMEN TREES ON THE PROPERTY IS NOT PERMITTED UNLESS IT CAN BE SUFFICIENTLY DEMONSTRATED BY THE APPLICANT TO BE JUSTIFIED.
5. NO DISTURBANCE SHALL BE PERMITTED WITHIN ENVIRONMENTAL FEATURES AND REQUIRED BUFFERS EXCEPT FOR THE NECESSARY ENVIRONMENTAL DISTURBANCES FOR THE USE-IN-COMMON DRIVEWAY ENTRANCE AS SHOWN ON FINAL PLAN, F-18-081.

38. THE EXISTING WELL, HO-81-1246, SHALL BE SEALED AND THE WELL ABANDONMENT REPORT SUBMITTED TO THE HEALTH DEPARTMENT PRIOR TO HEALTH DEPARTMENT SIGNATURE OF THE RECORD PLAT.

39. ALL WELLS ESTABLISHED IN THIS SUBDIVISION MUST BE SAMPLED AT YIELD TEST AND SAMPLES ANALYZED FOR RADIUM AND/OR DEGRADATION PRODUCTS GROSS ALPHA AND GROSS BETA.

40. THE DEVELOPER REQUESTED A WAIVER TO DESIGN MANUAL, VOLUME III, SECTION 2.6.B, THAT REQUIRES A SHARED DRIVEWAY THAT CROSSES A 100-YEAR FLOODPLAIN TO BE A PUBLIC ACCESS PLACE AND THE DRAINAGE ELEMENT WITHIN THE 100-YEAR FLOODPLAIN TO OVERTOP THE EXISTING DRIVEWAY BY NO MORE THAN 1'. BASED ON THE INFORMATION PROVIDED WITH THE SUBMITTAL, HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING HAS APPROVED THE REQUEST IN A LETTER DATED JUNE 20, 2018.

SITE DATA TABULATION

1) GENERAL SITE DATA
a. PRESENT ZONING: RR-DEO
b. LOCATION: TAX MAP 34 - GRID 23 - PARCEL 301
c. APPLICABLE DPZ FILE REFERENCES: ECP-13-077, SP-07-013, F-14-048, WP-13-075, WP-14-006, WP-14-053, WP-18-099
d. DEED REFERENCE: L. 17842 F. 0470
e. PROPOSED USE OF SITE: 4 SFD LOTS;
f. PROPOSED WATER AND SEWER: PRIVATE WATER AND PRIVATE SEWER SYSTEMS

2) AREA TABULATION
a. TOTAL AREA OF SITE .... 24.23 Ac.±
b. AREA OF 100 YEAR FLOODPLAIN (APPROX.) .... 2.1 Ac.±
c. AREA OF STEEP SLOPES (25% OR GREATER) .... 0.16 Ac.±
AREA OF STEEP SLOPES LESS THAN 10 VERT. FEET PLUS AREAS OF STEEP SLOPES WITHIN FLOODPLAIN.... 0.16 Ac.±
d. NET AREA OF SITE .... 22.13 Ac.±
e. AREA OF THIS PLAN SUBMISSION .... 24.23 Ac.±
f. LIMIT OF DISTURBANCE (APPROX.) .... 5.6 Ac.±
g. AREA OF PROPOSED BUILDABLE LOTS .... 24.21 Ac.±
h. AREA OF BUILDABLE PRESERVATION PARCELS .... 0.00 Ac.
i. AREA OF NON-BUILDABLE PRESERVATION PARCELS ..... 0.00 Ac.
j. AREA OF PROPOSED PUBLIC ROAD .... 0.00 Ac.
k. AREA OF PROPOSED PUBLIC R/W DEDICATION .... 0.02 Ac.±

3) DENSITY TABULATION
a. NET AREA OF SITE .... 24.23 Ac.±
b. TOTAL NUMBER OF LOTS ALLOWED PER ZONING
1 UNIT PER 4.25 GROSS ACRES ALLOWED BY RIGHT.......... 5
1 UNIT PER 2 NET ACRES (MAX) PER DEO PROVISION.......... 11
4) UNIT/LOT TABULATION
a. TOTAL NUMBER OF BUILDABLE LOTS PROPOSED ON THIS SUBMISSION 4
b. TOTAL NUMBER OF NON-BUILDABLE PRESERVATION PARCELS PROPOSED ON THIS SUBMISSION 0
c. TOTAL NUMBER OF BUILDABLE PRESERVATION PARCELS PROPOSED ON THIS SUBMISSION 0

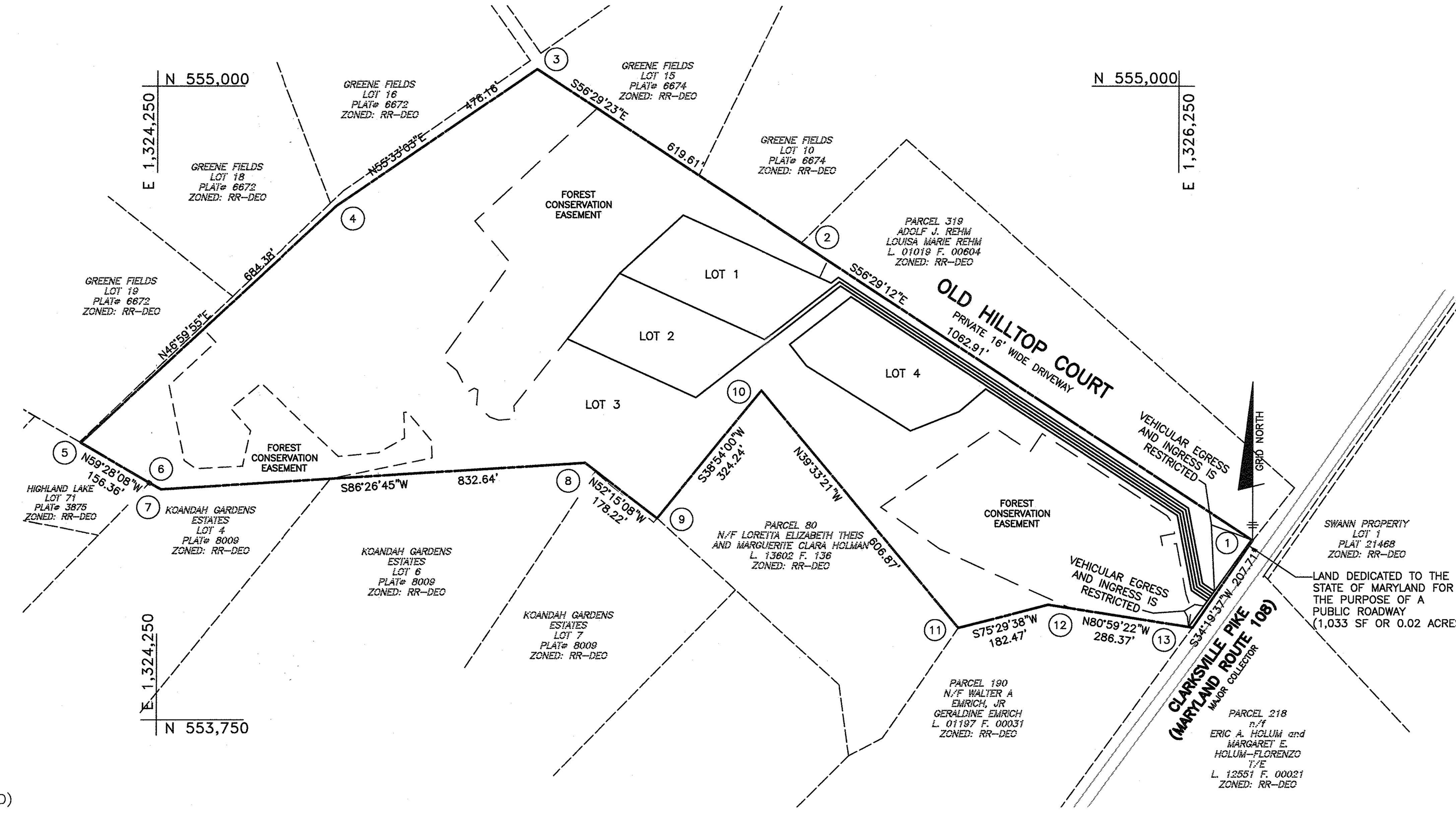
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 10.2.18
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

[signature] 10-03-18
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.2
GnB*	YES	C	D	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32
GoB**		C	C	GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.2

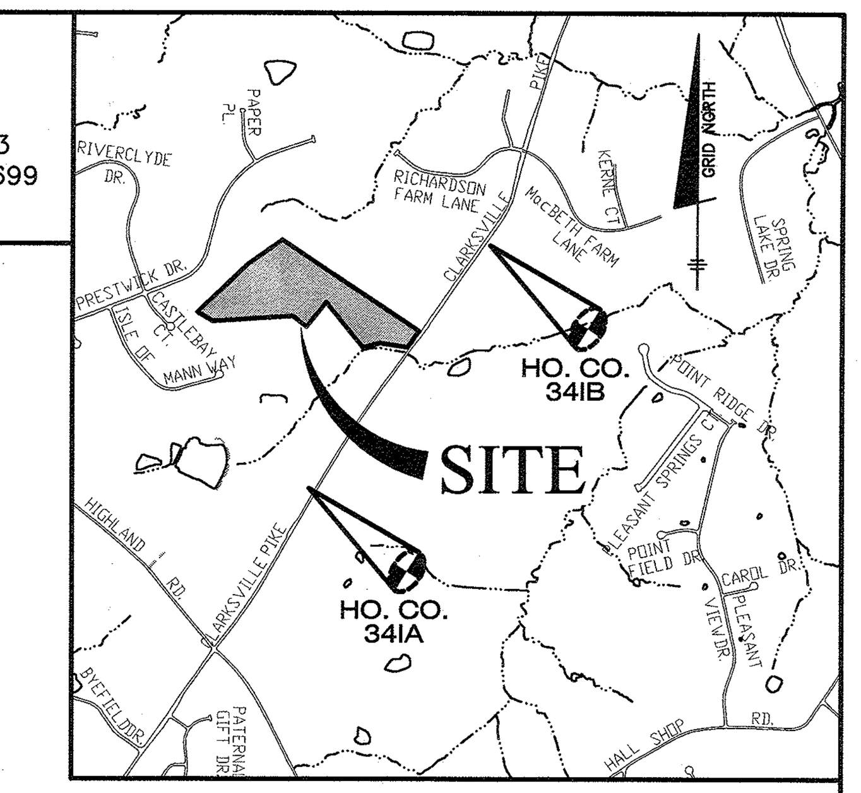
** HIGHLY ERODIBLE, K>0.35, AND STEEPER THAN 5% OR 15% AND GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY AUGUST 2014, MAP 23.



PLAN
SCALE: 1" = 200'

200 0 100 200 400 800
(IN FEET)
1 inch = 200 ft.

HOWARD COUNTY BENCHMARKS	
34IA: N 553,271.9128 E 1,325,838.7488 ELEV. 471.944	34IB: N 554,973.5233 E 1,327,078.7699 ELEV. 442.801



VICINITY MAP
SCALE: 1" = 2000'
ADC MAP 31; GRID C4

BOUNDARY COORDINATES		
POINT #	NORTHING	EASTING
1	554115.9674	1326414.8984
2	554702.8376	1325528.6870
3	555044.9172	1325012.0619
4	554775.5743	1324619.4123
5	554308.8150	1324118.8987
6	554229.3810	1324253.5834
7	554216.6258	1324276.2396
8	554268.2421	1325107.2782
9	554159.1374	1325248.1999
10	554411.4735	1325451.8093
11	553943.5768	1325838.2797
12	553989.2829	1326014.9349
13	553944.4334	1326297.7679

STORMWATER MANAGMENT PRACTICES					
LOT NO.	ADDRESS	NON-ROOFTOP DISCONNECT (N-2)	DRYWELLS (M-5)	MICRO-BIORENTION (M-6)	GRASS SWALE
1	OLD HILLTOP CT.	3	0	1	0
2	OLD HILLTOP CT.	2	0	1	0
3	OLD HILLTOP CT.	2	4	0	0
4	OLD HILLTOP CT.	4	4	1	0

MINIMUM LOT SIZE CHART			
LOT	GROSS AREA (SF)	PIPESTEM AREA (SF)	MINIMUM LOT SIZE (SF)
1	55,979	6,110	49,868
2	55,260	7,414	47,846
3	889,173	10,291	878,882
4	53,810	3,834	49,976

Specimen Tree Chart

Key (X#)	Species	Size (in.dbh)	CRZ (feet radius)	Comments (good condition unless otherwise noted)
1	Tulip poplar	31	46.5	
2	Tulip poplar	36	54	
3	Tulip poplar	31	46.5	
4	Tulip poplar	40	60	
5	Red oak	33	49.5	
6	Tulip poplar	30	45	
7	Red oak	30	45	
8	Red oak	30	45	
9	Tulip poplar	33	49.5	
10	Red oak	31	46.5	
11	Red oak	36	54	
12	Red oak	30	45	
13	Tulip poplar	35	52.5	
14	Red oak	37	55.5	
15	Tulip poplar	32	48	
16	Tulip poplar	33	49.5	Fair, dieback noted
17	Tulip poplar	32	48	
18	Tulip poplar	32	48	
19	Tulip poplar	34	51	
20	Tulip poplar	35	52.5	
21	Tulip poplar	30	45	
22	Tulip poplar	30	45	
23	Tulip poplar	36	54	
24	Tulip poplar	30	45	
25	Tulip poplar	39	58.5	
26	Tulip poplar	32	48	Fair, dieback noted
27	Tulip poplar	34	51	
28	Tulip poplar	31	46.5	
29	Tulip poplar	32	48	
30	Tulip poplar	30	45	
31	Tulip poplar 31	31	46.5	
32	Tulip poplar	33	49.5	
33	Tulip poplar	30	45	
34	Tulip poplar	31	46.5	
35	Tulip poplar	30	45	
36	Tulip poplar	34	51	
37	Tulip poplar	34	51	
38	Tulip poplar	33	49.5	
39	Tulip poplar	31	46.5	
40	Tulip poplar	31	46.5	
41	Tulip poplar	30	45	
42	Tulip poplar	30	45	
43	Tulip poplar	32	48	
44	Tulip poplar	75	112.5	fair, dieback noted
45	Tulip poplar	62	93	fair, dieback noted
46	Tulip poplar	31	46.5	

LEGEND

SOILS CLASSIFICATION — GgB
SOILS DELINEATION
EXISTING CONTOURS — 480 / 478
PROPOSED CONTOURS — 480 / 478
EXISTINGTREE LINE
PROPOSED TREE LINE
LIMIT OF DISTURBANCE
DRAINAGE AREA
PROPOSED STRUCTURE
EXISTING STRUCTURE
WELL BOX
SEWAGE DISPOSAL AREA
NON ROOFTOP DISCONNECT
100 YR FLOODPLAIN
SLOPES 15% TO 19.99%
SLOPES 20% TO 24.99%
SLOPES 25% AND GREATER

SHEET INDEX	
NO.	DESCRIPTION
1	COVER SHEET
2	EXISTING CONDITIONS PLAN AND SOILS MAP
3	EXISTING CONDITIONS PLAN AND SOILS MAP
4	SUPPLEMENTAL GRADING AND STORMWATER MANAGEMENT PLAN
5	SUPPLEMENTAL PLAN STORMWATER MANAGEMENT, STORM DRAIN, NOTES AND DETAILS
6	SUPPLEMENTAL LANDSCAPE PLAN
7	FOREST STAND DELINEATION PLAN
8	FOREST STAND DELINEATION PLAN
9	FOREST CONSERVATON PLAN, NOTES AND DETAILS
10	FOREST CONSERVATION PLAN
11	FOREST CONSERVATION NOTES AND DETAILS
12	STREAM RECONSTRUCTION DRAINAGE AREA MAP
13	STREAM RECONSTRUCTION PLAN NOTES AND DETAILS
14	STATE HIGHWAY ACCESS PERMIT ENTRANCE PLAN

NO.	DATE	REVISION

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

[seal: STATE OF MARYLAND JOHN M. CARNEY No. 45577 PROFESSIONAL ENGINEER] [signature] 10/1/18

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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC.
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

SUPPLEMENTAL PLAN
COVER SHEET

DATE: AUGUST, 2018	BEI PROJECT NO: 2525
SCALE: AS SHOWN	SHEET 1 OF 14

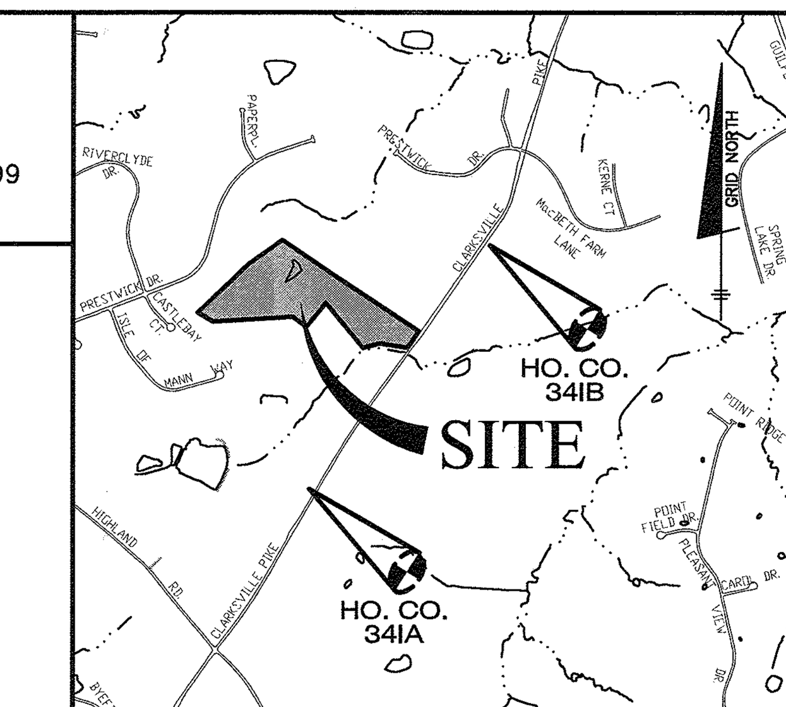
DESIGN: JC DRAWN: LDD

F-18-081

HOWARD COUNTY BENCHMARKS

34IA: N 553,271.9128
E 1,325,838.7488
ELEV. 471.944

34IB: N 554,973.5233
E 1,327,078.7699
ELEV. 442.801



VICINITY MAP
SCALE: 1" = 2000'
ADC MAP 31; GRID C4

LEGEND

- SOILS CLASSIFICATION — GgB
- SOILS DELINEATION
- EXISTING CONTOURS — 480 / 478
- SEWAGE DISPOSAL AREA
- EXISTING TREE LINE
- LIMIT OF WETLANDS
- STREAM
- EXISTING STRUCTURE
- EXISTING DRIVEWAY TO BE REMOVED
- 100 YR FLOODPLAIN
- SLOPES 15% TO 19.99%
- SLOPES 20% TO 24.99%
- SLOPES 25% AND GREATER
- SPECIMEN TREE

PLAN
SCALE: 1" = 50'
(IN FEET)
1 inch = 50 ft.

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.2
GnB	YES	C	D	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32
GoB		C		GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.2

** HIGHLY ERODIBLE, K>0.35, AND STEEPER THAN 5% OR 15% AND GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY AUGUST 2014, MAP 23.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 10-2-18

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 10-03-18

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
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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: 06-08-2020.
8/27/18

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC,
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

EXISTING CONDITIONS PLAN AND SOILS MAP

DATE:	AUGUST, 2018	BEI PROJECT NO:	2525
SCALE:	AS SHOWN	SHEET	2 OF 13

DESIGN: JC DRAWN: LDD

F-18-081

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.2
GnB	YES	C	D	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32
GoB		C		GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.2

** HIGHLY ERODIBLE, K>0.35, AND STEEPER THAN 5% OR 15% AND GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY AUGUST 2014, MAP 23.

Specimen Tree Chart

Key (X#)	Species	Size (in.dbh)	CRZ (feet radius)	Comments (good condition unless otherwise noted)
1	Tulip poplar	31	46.5	
2	Tulip poplar	36	54	
3	Tulip poplar	31	46.5	
4	Tulip poplar	40	60	
5	Red oak	33	49.5	
6	Tulip poplar	30	45	
7	Red oak	30	45	
8	Red oak	30	45	
9	Tulip poplar	33	49.5	
10	Red oak	31	46.5	
11	Red oak	36	54	
12	Red oak	30	45	
13	Tulip poplar	35	52.5	
14	Red oak	37	55.5	
15	Tulip poplar	32	48	
16	Tulip poplar	33	49.5	Fair, dieback noted
17	Tulip poplar	32	48	
18	Tulip poplar	32	48	
19	Tulip poplar	34	51	
20	Tulip poplar	35	52.5	
21	Tulip poplar	30	45	
22	Tulip poplar	30	45	
23	Tulip poplar	36	54	
24	Tulip poplar	30	45	
25	Tulip poplar	39	58.5	
26	Tulip poplar	32	48	Fair, dieback noted
27	Tulip poplar	34	51	
28	Tulip poplar	31	46.5	
29	Tulip poplar	32	48	
30	Tulip poplar	30	45	
31	Tulip poplar 31	31	46.5	
32	Tulip poplar	33	49.5	
33	Tulip poplar	30	45	
34	Tulip poplar	31	46.5	
35	Tulip poplar	30	45	
36	Tulip poplar	34	51	
37	Tulip poplar	34	51	
38	Tulip poplar	33	49.5	
39	Tulip poplar	31	46.5	
40	Tulip poplar	31	46.5	
41	Tulip poplar	30	45	
42	Tulip poplar	30	45	
43	Tulip poplar	32	48	
44	Tulip poplar	75	112.5	fair, dieback noted
45	Tulip poplar	62	93	fair, dieback noted
46	Tulip poplar	31	46.5	

FOR CONTINUATION SEE SHEET 2

LEGEND

- SOILS CLASSIFICATION — GgB
- SOILS DELINEATION
- EXISTING CONTOURS — 480 / 478
- SEWAGE DISPOSAL AREA
- EXISTING TREE LINE
- LIMIT OF WETLANDS
- STREAM
- EXISTING STRUCTURE
- EXISTING DRIVEWAY TO BE REMOVED
- 100 YR FLOODPLAIN
- SLOPES 15% TO 19.99%
- SLOPES 20% TO 24.99%
- SLOPES 25% AND GREATER
- SPECIMEN TREE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.2.18

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-03-18

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
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STATE OF MARYLAND — KEITH M. GARNER — PROFESSIONAL ENGINEER — No. 45577

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. 6/7/18

OWNER:
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SUITE 100
ELKRIDGE, MD 21075
410-579-2442

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SUITE #100
ELKRIDGE, MARYLAND 21075
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CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

EXISTING CONDITIONS PLAN AND SOILS MAP

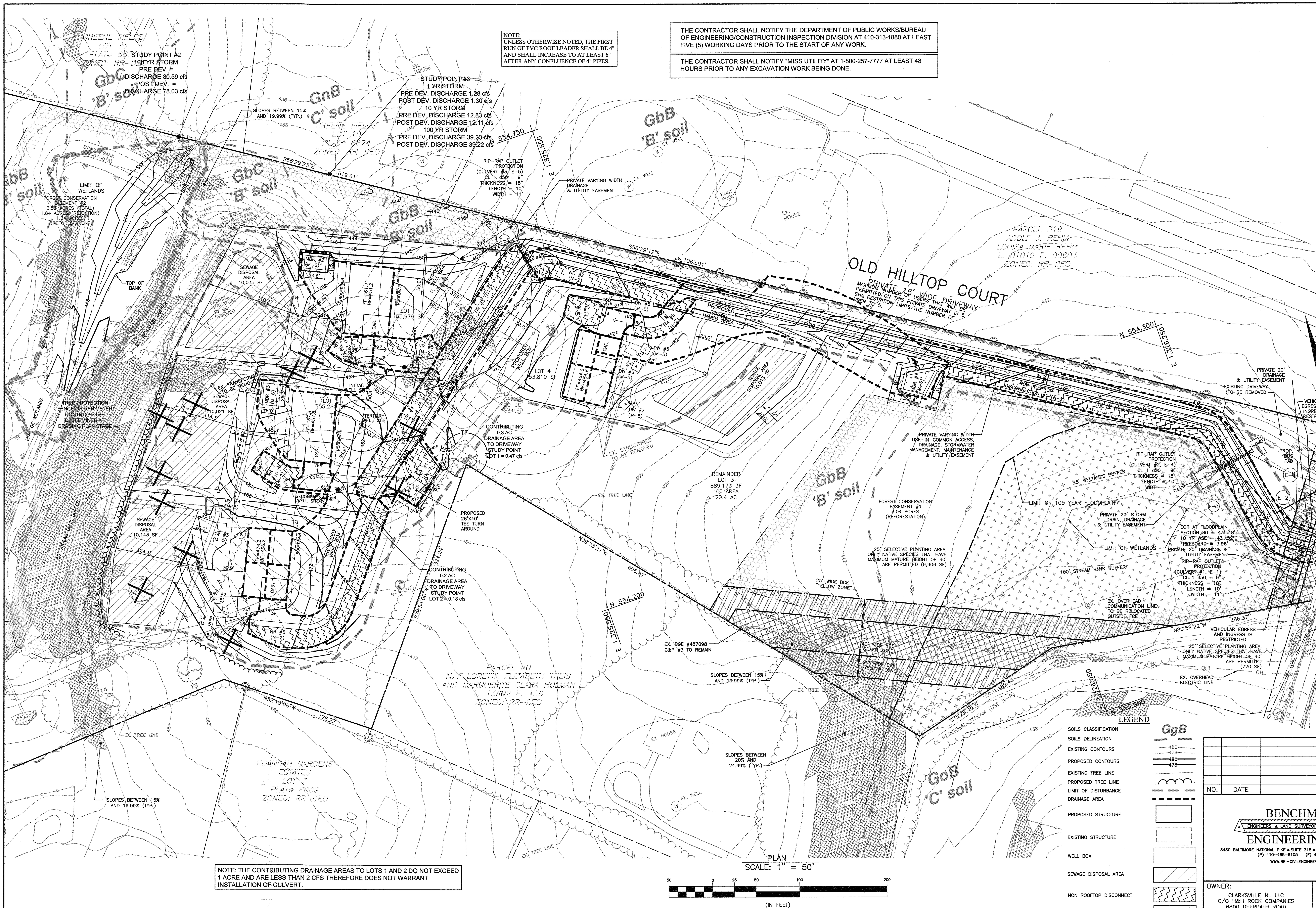
DESIGN: JC	DRAWN: LDD	DATE: AUGUST, 2018	BEI PROJECT NO: 2525
		SCALE: AS SHOWN	SHEET 3 OF 14

F-18-081

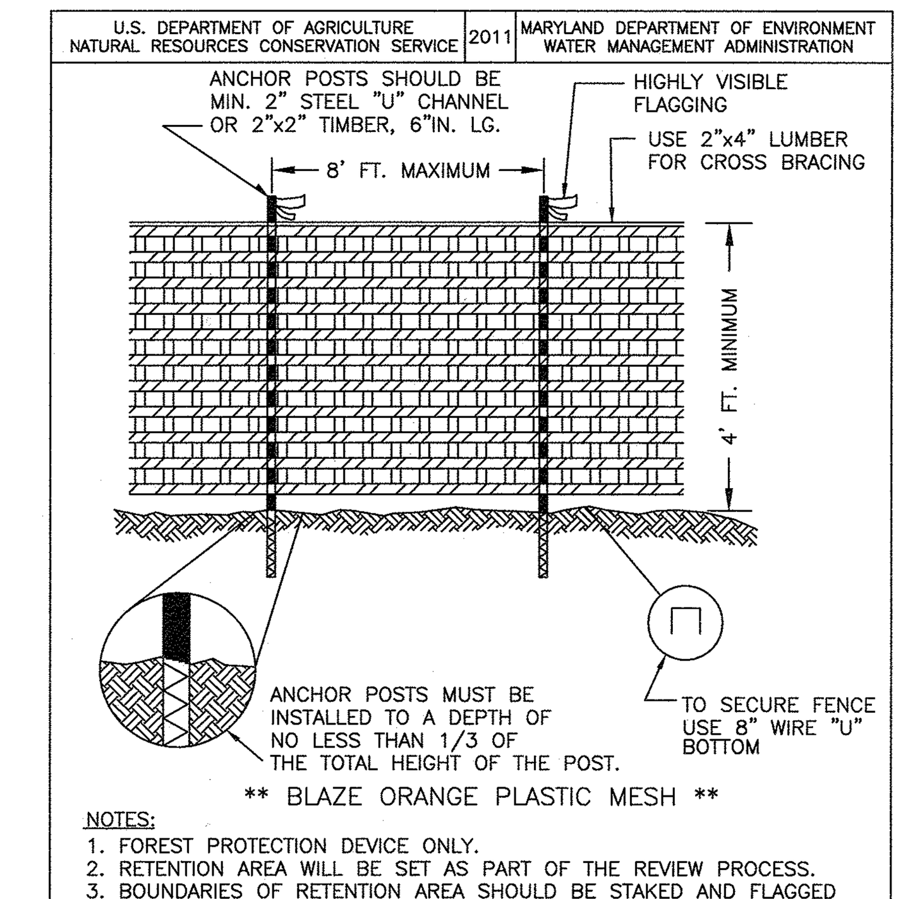
NOTE:
UNLESS OTHERWISE NOTED, THE FIRST RUN OF PVC ROOF LEADER SHALL BE 4" AND SHALL INCREASE TO AT LEAST 6" AFTER ANY CONFLUENCE OF 4" PIPES.

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.

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



NOTE: THE CONTRIBUTING DRAINAGE AREAS TO LOTS 1 AND 2 DO NOT EXCEED 1 ACRE AND ARE LESS THAN 2 CFS THEREFORE DOES NOT WARRANT INSTALLATION OF CULVERT.



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

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature]	10.03.18
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
[signature]	10.2.18
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.2
GnB	YES	C	D	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32
GoB		C		GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.2

** HIGHLY ERODIBLE, K>0.35, AND STEEPER THAN 5% OR 15% AND GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY AUGUST 2014, MAP 23.

LEGEND

- SOILS CLASSIFICATION
- SOILS DELINEATION
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING TREE LINE
- PROPOSED TREE LINE
- LIMIT OF DISTURBANCE
- DRAINAGE AREA
- PROPOSED STRUCTURE
- EXISTING STRUCTURE
- WELL BOX
- SEWAGE DISPOSAL AREA
- NON ROOFTOP DISCONNECT
- 100 YR FLOODPLAIN
- SLOPES 15% TO 19.99%
- SLOPES 20% TO 24.99%
- SLOPES 25% AND GREATER
- FOREST CONSERVATION EASEMENT

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
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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.

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CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

SUPPLEMENTAL GRADING AND STORMWATER MANAGEMENT PLAN

DESIGN: JC	DRAWN: LDD	DATE: AUGUST, 2018	BEI PROJECT NO: 2525
		SCALE: AS SHOWN	SHEET 4 OF 14

F-18-081

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:

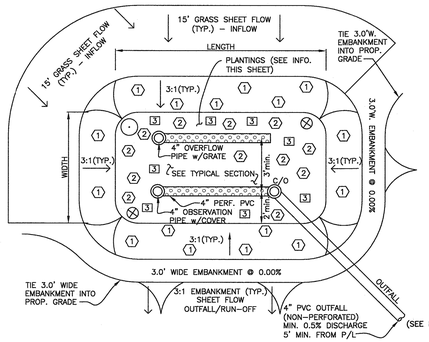
Underdrains should meet the following criteria:

- 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 ¾" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

7. Miscellaneous:

These practices may not be constructed until all contributing drainage area has been stabilized



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.

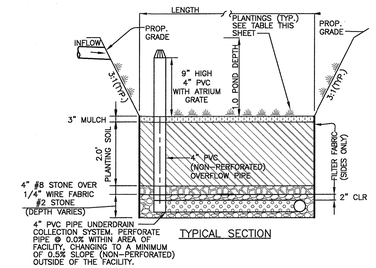
MICROBIORETENTION PLANTING DATA

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.

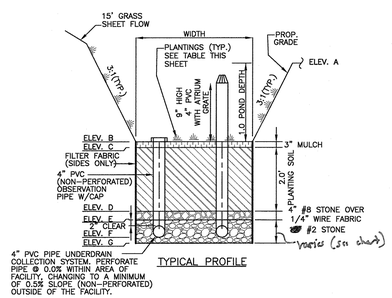
MICROBIORETENTION PLANTING SCHEDULE

(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)
4. CALLUNA VULGARIS (HEATHER) (2 PER FACILITY)
5. RIVER BIRCH (BETULA NIGRA) (1 PER FACILITY)



TYPICAL SECTION



TYPICAL PROFILE

BIO-RETENTION DIMENSION LEGEND	
FACILITY	NAME
A	TOP OF EMBANKMENT
B	TOP OF MULCH
C	TOP OF SOIL
D	TOP OF STONE FILTER
E	TOP OF STONE STORAGE
F	UNDERDRAIN INVERT
G	BOTTOM OF STONE
H	OUTFALL ELEVATION

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

A. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.

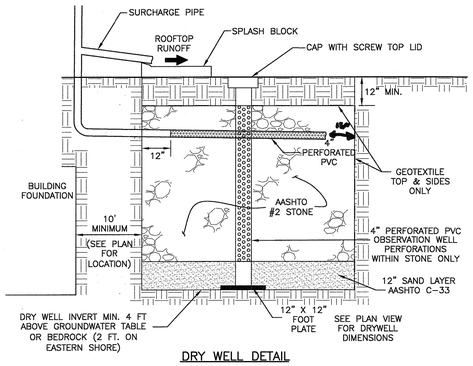
B. THE OWNER SHALL PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

C. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.

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

MICRO-BIORETENTION DETAILS (TYPICAL)

NOT TO SCALE



DRY WELL DETAIL

NOT TO SCALE

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

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.

Drywell Designation	Length (ft)	Width (ft)	Depth (ft)	Grade	Top of Stone	Bottom of Stone
DW-1	9.00	9.00	5.00	475.8	474.8	469.8
DW-2	9.00	9.00	5.00	475.6	474.6	469.6
DW-3	9.00	9.00	5.00	473.5	472.5	467.5
DW-4	9.00	9.00	5.00	472.0	471.0	466.0
DW-5	9.00	9.00	5.00	462.0	461.0	456.0
DW-6	9.00	9.00	5.00	462.5	460.5	455.5
DW-7	9.00	9.00	5.00	461.5	459.5	454.5
DW-8	9.00	9.00	5.00	459.5	457.5	452.5

MICROBIORETENTION PLANTING SCHEDULE

(ESTIMATED PLANTINGS TABULATED, THIS SHEET. SPECIFIC NUMBER OF PLANTINGS SHALL BE DETERMINED WITH FINAL DESIGN AT PLOT PLAN PHASE)

IRIS VERSICOLOR (IRIS)

LOBELIA CARDINALIS CARDINAL FLOWER

RUDBECKIA SUBTOMENTOSA – SWEET CONEFLOWER

CALLUNA VULGARIS (HEATHER) (2 PER FACILITY)

SALIX NIGRA (BLACK WILLOW) (1 PER FACILITY)

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.

ON-LOT BIORETENTION CONCEPTUAL DIMENSIONS*															
FACILITY	LENGTH (FT)	WIDTH (FT)	A	B	C	D	E	F	G	H	FILTER (Af)	PLANTINGS			
MB-1	23	17	440.00	439.00	438.83	436.83	436.50	435.83	434.92	434.92	598	57	50	27	
MB-2	24.5	15	450.00	449.00	448.83	446.83	446.50	445.83	444.83	444.83	368	35	31	27	
MB-3	25.3	16	461.50	460.50	460.33	458.33	458.00	457.50	456.67	456.67	404	39	34	18	

PROJECT:	Clarksville Crossing Lots 1-4	DATE: 05/21/18
	Facility Summary	

Pe (LOTS): 1.18 inches

BIORETENTION FACILITIES (M-6)												
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
MBR-1 (M-6)	24,808	6,051	24%	0.270	656	492	775	164	218	992	1.78	218	
MBR-2 (M-6)	8,874	4,000	45%	0.456	397	298	505	99	147	652	1.94	147	
MBR-3 (M-6)	6,531	4,000	61%	0.601	385	289	546	96	134	680	2.08	134	
TOTALS		14,051			1439		1825		499	2324		499	

DRY WELL FACILITY (M-5)									
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)	1000	1000	0.95	93.27	9.00	9.00	5.00	162	162	yes
DW-2 (M-5)	1000	1000	0.95	93.27	9.00	9.00	5.00	162	162	yes
DW-3 (M-5)	1000	1000	0.95	93.27	9.00	9.00	5.00	162	162	yes
DW-4 (M-5)	1000	1000	0.95	93.27	9.00	9.00	5.00	162	162	yes
DW-5 (M-5)	1000	1000	0.95	93.27	9.00	9.00	5.00	162	162	yes
DW-6 (M-5)	1000	1000	0.95	93.27	9.00	9.00	5.00	162	162	yes
DW-7 (M-5)	1000	1000	0.95	93.27	9.00	9.00	5.00	162	162	yes
DW-8 (M-5)	1000	1000	0.95	93.27	9.00	9.00	5.00	162	162	yes
Totals	8000							1296	1296	

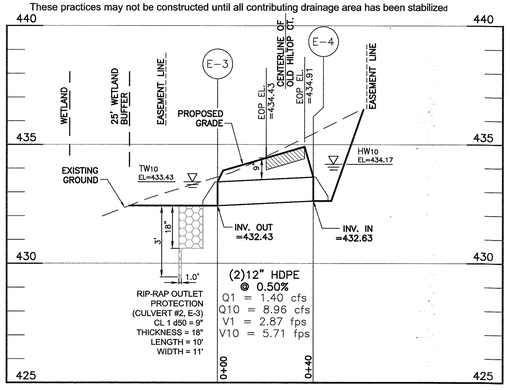
Non-Rooftop Disconnection (N-2)										
Facility	Impervious Area (SF)	Drainage Area (SF)	Volumetric Runoff	ESDv Required (CF)	Contrib. Per. Length (ft)	Contrib. Imp. Length (ft)	Disconnection Length (ft)	Ratio	Pe Treated (inches)	Volume Provided (CF)
NR-1 (N-2)	8404	16335	0.51	822.75	2	16	16	1.0	1.0	698.36
NR-2 (N-2)	2941	5738	0.51	288.03	2	16	16	1.0	1.0	244.48
NR-3 (N-2)	3164	6201	0.51	310.01	2	16	16	1.0	1.0	263.14
NR-4 (N-2)	2517	5125	0.49	247.56	2	16	16	1.0	1.0	210.13
NR-5 (N-2)	4262	8626	0.49	418.93	3	12	12	1.0	1.0	355.59
NR-6 (N-2)	658	1736	0.39	66.66	0	12	12	1.0	1.0	56.58
NR-7 (N-2)	1092	2340	0.47	107.97	0	39	42	1.0	1.0	91.65
NR-8 (N-2)	996	2148	0.47	98.55	8	26	36	1.0	1.0	83.65
NR-9 (N-2)	557	1526	0.38	56.71	7	24	24	1.0	1.0	48.13
NR-10 (N-2)	1131	2687	0.43	113.12	5	42	49	1.0	1.0	96.02
NR-11 (N-2)	1212	2543	0.48	119.57	0	24	26	1.0	1.0	101.50
Totals	25722									2249

The total ESDv provided by this design is: 5870 CF -58
The total Rev provided by this design is: 4044 CF
Micro-Bioretention facilities within the 100' well radius must be provided with an impermeable liner.

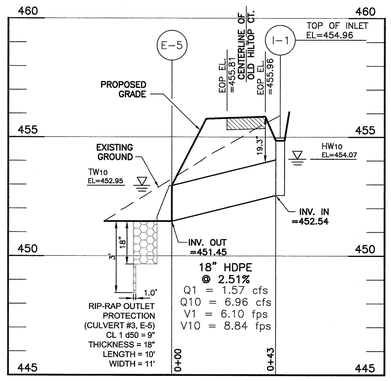
*The ESDv summary table portrays storage in excess of that required for Environmental Site Design requirements.

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.



CULVERT 2
SCALE: 1"=30' (H) 1"=3' (V)



CULVERT 3
SCALE: 1"=30' (H) 1"=3' (V)

STORM DRAIN STRUCTURE SCHEDULE					
STRUCTURE NO.	TYPE	HO. CO. STD. DETAIL	LOCATION	INVERT IN	INVERT OUT
END SECTION					
E-3	12" HDPE	N/A	N 554,119.52 E 1,326,261.58	-	432.43
E-4	12" HDPE	N/A	N 554,126.91 E 1,326,300.89	432.63	-
E-5	18" HDPE	N/A	N 554,636.51 E 1,325,593.03	-	451.45
INLET					
I-1	YARD	D-4.14	N 554,591.27 E 1,325,594.57	452.54	451.45

PIPE SCHEDULE			
PIPE	SIZE / MAT'L	LENGTH	SLOPE
E-3 TO E-4	(2) 12" HDPE	40.00'	0.50%
I-1 TO E-5	18" HDPE	43.43'	2.51%

DISCHARGE SUMMARY TABLE		
	1yr (cfs)	10yr (cfs)
CULVERT 1	1.30	3.17
CULVERT 2	1.40	8.96
CULVERT 3	1.57	6.96

CULVERT #1
DA = 0.69 AC — DA 1 — RCN = 86, Tc = 0.17 Hr

CULVERT #2
DA = 4.39 AC — DA 2 — RCN = 64, Tc = 0.17 Hr

CULVERT #3
DA = 2.69 AC — DA 3 — RCN = 69, Tc = 0.17 Hr

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.2.18

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-03-18

NO.	DATE	REVISION

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

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — REGISTERED PROFESSIONAL ENGINEER — 10/1/18

Professional Certification. I hereby certify that these documents were prepared or approved by me, that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 45577, Expiration Date: 06-08-2020.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC.
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

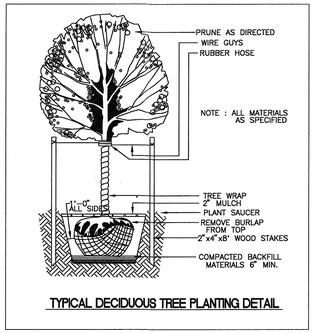
SUPPLEMENTAL PLAN
STORMWATER MANAGEMENT, STORM DRAIN, NOTES AND DETAIL

DATE: AUGUST, 2018 BEI PROJECT NO: 2525

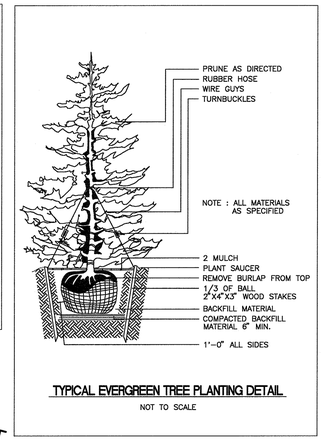
DESIGN: JC DRAWN: LDD SCALE: AS SHOWN SHEET 5 OF 14

F-18-081

STREET TREE PLANTING LIST				
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	5	"SARGENT CHERRY" (Prunus Sargentii)	2.5" – 3" cal.	TREES TO BE PLANTED ALONG CLARKSVILLE PIKE (PROVIDED BY THE DEVELOPER)



TYPICAL DECIDUOUS TREE PLANTING DETAIL



TYPICAL EVERGREEN TREE PLANTING DETAIL

NOT TO SCALE

LANDSCAPE NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.

2. STREET TREE LOCATIONS:
   A. WHEN THE DISTANCE BETWEEN THE CURB AND SIDEWALK IS 6 FEET OR GREATER, THE TREES SHALL BE LOCATED WITHIN THE RIGHT-OF-WAY AND SHALL BE CENTERED BETWEEN THE CURB AND SIDEWALK.
   B. WHEN THE DISTANCE BETWEEN THE CURB AND SIDEWALK IS LESS THAN 6 FEET, TREES MAY BE PLANTED 3 FEET FROM THE SIDEWALK IN THE DIRECTION AWAY FROM THE ROAD. A 10-FOOT WIDE TREE MAINTENANCE EASEMENT SHALL BE REQUIRED IF THE RIGHT-OF-WAY IS LIMITED.
   C. TREES SHALL BE PLANTED 6 FEET BEHIND CURB WHEN THERE ARE NO SIDEWALKS.
   D. TREES TO BE PLANTED MINIMUM 30 FEET FROM SIGNS AND INTERSECTIONS WHEN PLANTED BETWEEN SIDEWALK AND CURB, TREES MAY NOT BE PLANTED WITHIN 5 FEET OF A STORM DRAIN INLET, OPEN SPACE ACCESS STRIP, OR 10 FEET OF A DRIVEWAY.

3. AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.

4. THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

5. FINANCIAL SURETY IN THE AMOUNT OF $22,500.00 FOR THE REQUIRED PERIMETER LANDSCAPING (51 PERIMETER SHADE TREES AND 24 MITIGATION TREES FOR REMOVAL OF SPECIMEN TREES (WP-18-099) @ $300 PER TREE) SHALL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT.

PLAN
SCALE: 1" = 50'

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

LEGEND

WELL BOX — PROPOSED WELL BOX
PROPOSED PAVING
PERIMETER DESIGNATION — P-2
EXISTING TREE LINE
PROPOSED TREE LINE
PROPOSED STRUCTURE
SEWAGE DISPOSAL AREA
LIMIT OF WETLANDS
STREAM
EXISTING STRUCTURE
100 YR FLOODPLAIN
FOREST CONSERVATION EASEMENT
SPECIMEN TREE (TO BE REMOVED)
SPECIMEN TREE

STREET TREE SCHEDULE		
	CLARKSVILLE PIKE PUBLIC ROAD	TOTAL
LINEAR FEET OF RIGHT-OF-WAY	183'	
LINEAR FEET OF CREDIT	0	
LINEAR FEET OF REQUIRED PLANTING	183'	
TREE SIZE	MEDIUM 1:40 LF	
TREES REQUIRED	5	5

PERIMETER LANDSCAPE PLANTING LIST				
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	51	CLADRASTIS KENTUKEA LUTEA (Yellowwood)	2.5" – 3"cal.	SHADE TREES FOR INTERNAL LANDSCAPING REQUIREMENT TO BE PROVIDED AS PART OF THE DPW DEVELOPERS AGREEMENT
	24	QUERCUS RUBRA (Red Oak)	3"cal. (min.)	SHADE TREES AS MITIGATION FOR REMOVAL OF SPECIMEN TREES (WP-18-099)

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.2
GnB	YES	C	D	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32
GoB		C		GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.2

** HIGHLY ERODIBLE, K>0.35, AND STEEPER THAN 5% OR 15% AND GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY AUGUST 2014, MAP 23.

SCHEDULE A PERIMETER LANDSCAPE EDGE					
CATEGORY	ADJACENT TO PERIMETER PROPERTIES	①	②	③	TOTAL
PERIMETER NO. / LANDSCAPE TYPE		A 1:60 shade	A 1:60 shade	A 1:60 shade	
LINEAR FEET OF PERIMETER (FRONTAGE/ROADWAY)		1340	333	1622	3295
CREDIT FOR EXISTING VEGETATION: NO OR YES (✱/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		NO –	YES 166	YES 44	210
LINEAR FEET OF REQUIRED PERIMETER LANDSCAPING		1340	167	1578	3085
CREDIT FOR WALL, FENCE OR BERM: NO OR YES (✱/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		NO –	NO –	NO –	
NUMBER OF PLANTS REQUIRED: SHADE TREES 1:60		22	3	26	51
EVERGREEN TREES –		–	–	–	–
OTHER TREES (2:1 SUBSTITUTE)		–	–	–	–
SHRUBS		–	–	–	–
NUMBER OF PLANTS PROVIDED: SHADE TREES		22	3	26*	51
EVERGREEN TREES		–	–	–	–
OTHER TREES (2:1 SUBSTITUTE)		–	–	–	–
SHRUBS (10:1 SUBSTITUTE)		–	–	–	–
(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)		–	–	–	–

*NOTE: 4 SHADE TREES IN PERIMETER 3 ARE MOVED TO THE OPENING IN THE TREE LINE AT THE BOUNDARY FOR GREATEST VISUAL MITIGATION FOR KOANDAH GARDENS ESTATE, LOT 7.

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 – ROCK REALTY, INC. — DATE 8/23/18

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-03-18

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.2.18

NO.	DATE	REVISION

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

STATE OF MARYLAND — ERIC M. CAY — PROFESSIONAL ENGINEER

8/24/18

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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC.
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

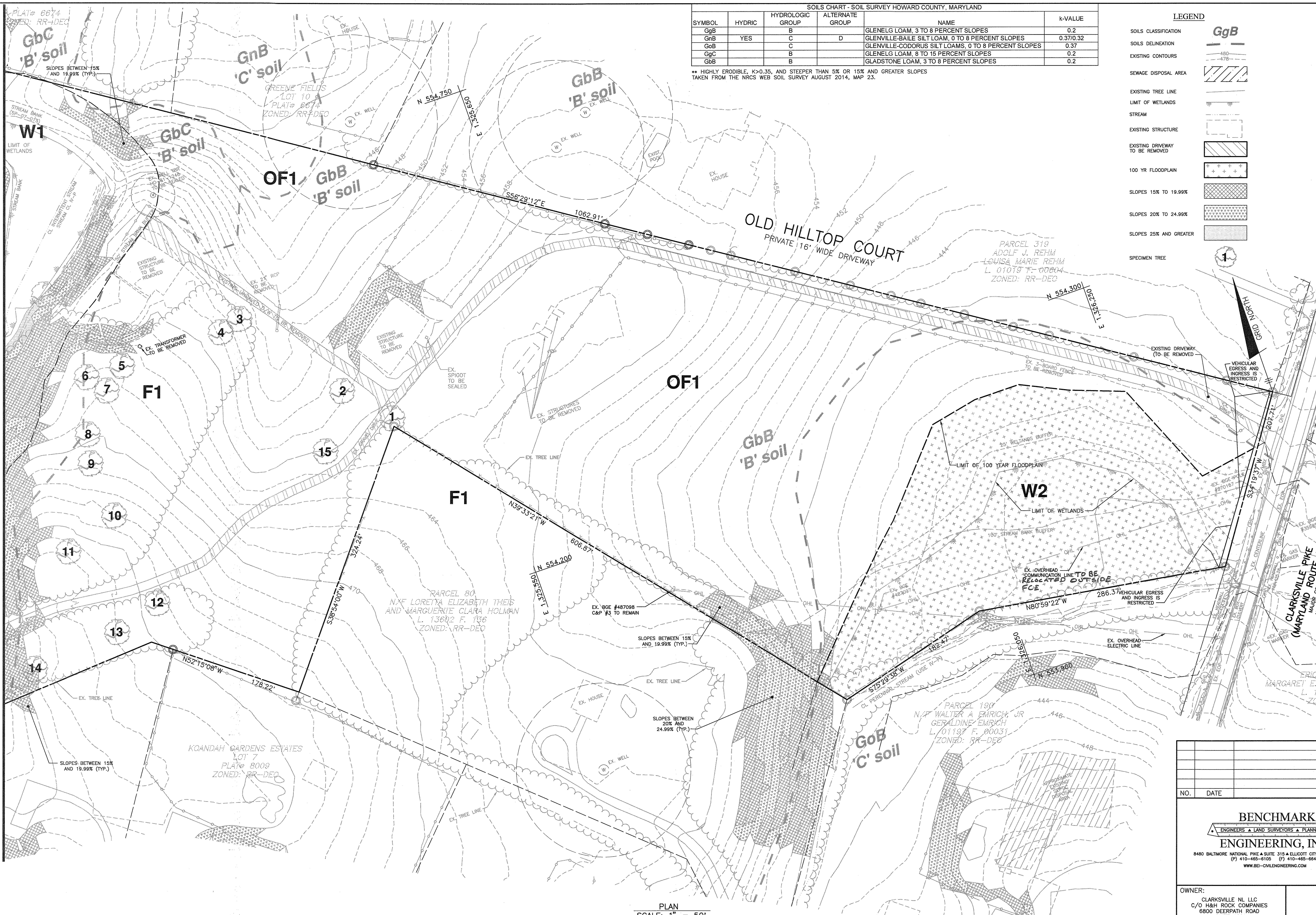
SUPPLEMENTAL LANDSCAPE PLAN, NOTE AND DETAILS

DATE: AUGUST, 2018 — BEI PROJECT NO: 2525
DESIGN: JC — DRAWN: LDD — SCALE: AS SHOWN — SHEET 6 OF 14

F-18-081

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.2
GnB	YES	C	D	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32
GoB		C		GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.2

** HIGHLY ERODIBLE, K>0.35, AND STEEPER THAN 5% OR 15% AND GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY AUGUST 2014, MAP 23.

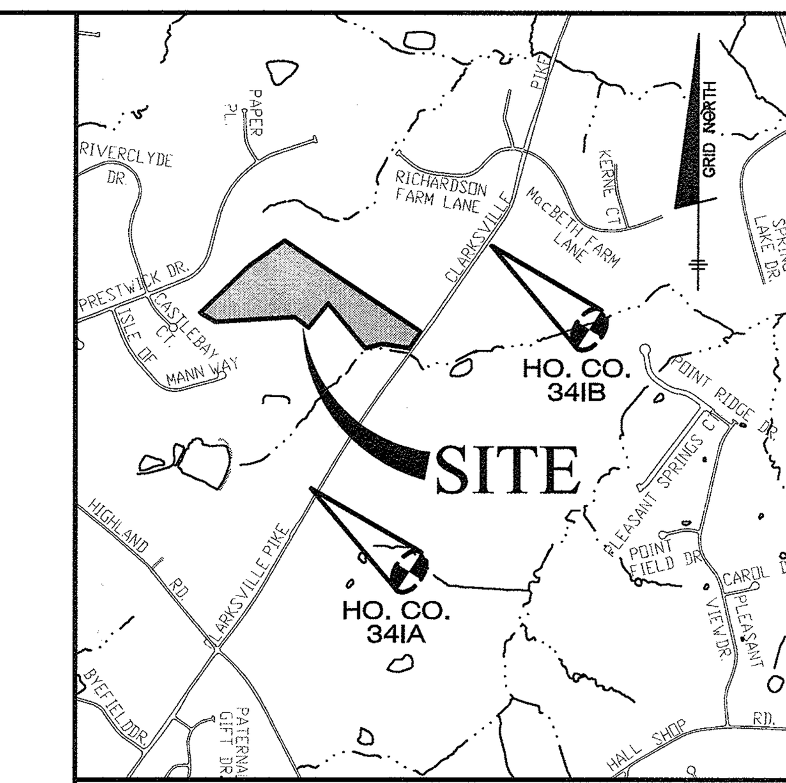


PLAN
SCALE: 1" = 50'

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

LEGEND

- SOILS CLASSIFICATION — GgB
- SOILS DELINEATION
- EXISTING CONTOURS — 480 / 478
- SEWAGE DISPOSAL AREA
- EXISTING TREE LINE
- LIMIT OF WETLANDS
- STREAM
- EXISTING STRUCTURE
- EXISTING DRIVEWAY TO BE REMOVED
- 100 YR FLOODPLAIN
- SLOPES 15% TO 19.99%
- SLOPES 20% TO 24.99%
- SLOPES 25% AND GREATER
- SPECIMEN TREE — 1



VICINITY MAP
SCALE: 1" = 2000'
ADC MAP 31; GRID C4

HOWARD COUNTY BENCHMARKS

34IA: N 553,271.9128 E 1,325,838.7488 ELEV. 471.944
34IB: N 554,973.5233 E 1,327,078.7699 ELEV. 442.801

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 10-03-18
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 10.2.18
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS
P.O. BOX 5006 GLEN ARM, MARYLAND 21057
Telephone (410) 683-7840
www.ecoscienceprofessionalsinc.com

PLAN PREPARED BY:
JOHN CANOLES
MD DNR FCA QUALIFIED PROFESSIONAL

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
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WWW.BEI-CIVILENGINEERING.COM

8/27/18
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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC,
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

FOREST STAND DELINEATION PLAN

DATE:	AUGUST, 2018	BEI PROJECT NO:	2525
SCALE:	AS SHOWN	SHEET	7 OF 14

DESIGN: JC DRAWN: LDD

F-18-081

Forest Stand Data

Key	Community Type	Acreage (nta)	Dominant Vegetation	General Condition	Priority Acreage
F1	Mix oak-Poplar	7.8	Liriodendron tulipifera, Quercus rubra, Quercus alba, Fagus grandiflora,	Good	1.4 +/- buffers slopes

See accompanying report for complete stand descriptions
*** Approximately 1.0 acres of offsite forest area is currently present within100 feet of the property**

FSD NOTES:

1. No rare, threatened or endangered species, or their habitats, were observed on the property.

2. Surrounding land use is medium density residential development.

3. Approximately 1.0 acre of forest is currently present within 100 feet of the subject property. This forest occurs on private residential lots.

4. The site lies within the Use IV-P watershed of the Carroll's Run (02-13-11). The wetlands will require a 25 foot buffer, intermittent streams 50 foot buffers, and perennial stream channels require a 100 foot buffer.

5. No historic elements or cemeteries are known to occur on the property.

6. There is 2.1 +/- acres of 100 year floodplain present on the property.

7. There are steep slopes present on the site.

8. Specimen trees are present on the subject property. Forty-six specimen trees have been identified outside of the stream buffers.

FOREST CONSERVATION WORKSHEET
Version 1.0

Project: Clarskville Crossing
Date: March 22, 2018

NET TRACT AREA			Acres
A. Total tract area			24.2
B. Area within 100 Year Floodplain			2.1
C. Area of existing impervious surface/unchanged use			0
D. Net Tract Area			22.1
LAND USE CATEGORY: (from table 3.2.1, page 40, Manual) ARA MDR IDA HDR MPD CIA X			
E. Afforestation Threshold	(percentage)	20	4.4
F. Conservation Threshold	(percentage)	25	5.5
EXISTING FOREST COVER:			
G. Existing forest cover (excluding floodplain)			7.8
H. Area of forest above afforestation threshold			3.4
I. Area of forest above conservation threshold			2.3
BREAK EVEN POINT:			
J. Forest retention above threshold with no mitigation			0.5
		Break-Even Point	6.0
K. Clearing permitted without mitigation			
PROPOSED FOREST CLEARING			
L. Total area of forest to be Cleared or Retained Outside FCE			4.4
M. Total area of forest to be Retained in FCE			3.4
PLANTING REQUIREMENTS			
N. Reforestation for clearing above Conservation Threshold			0.6
P. Reforestation for clearing below Conservation Threshold			4.2
Q. Credit for retention above conservation threshold			0
R. Total reforestation required			4.8
S. Total afforestation required			0
T. Total reforestation and afforestation required			4.8

Specimen Tree Chart

Key (X#)	Species	Size (in dbh)	CRZ (feet radius)	Comments (good condition unless otherwise noted)
1	Tulip poplar	31	46.5	
2	Tulip poplar	36	54	
3	Tulip poplar	31	46.5	
4	Tulip poplar	40	60	
5	Red oak	33	49.5	
6	Tulip poplar	30	45	
7	Red oak	30	45	
8	Red oak	30	45	
9	Tulip poplar	33	49.5	
10	Red oak	31	46.5	
11	Red oak	36	54	
12	Red oak	30	45	
13	Tulip poplar	35	52.5	
14	Red oak	37	55.5	
15	Tulip poplar	32	48	
16	Tulip poplar	33	49.5	Fair, dieback noted
17	Tulip poplar	32	48	
18	Tulip poplar	32	48	
19	Tulip poplar	34	51	
20	Tulip poplar	35	52.5	
21	Tulip poplar	30	45	
22	Tulip poplar	30	45	
23	Tulip poplar	36	54	
24	Tulip poplar	30	45	
25	Tulip poplar	39	58.5	
26	Tulip poplar	32	48	Fair, dieback noted
27	Tulip poplar	34	51	
28	Tulip poplar	31	46.5	
29	Tulip poplar	32	48	
30	Tulip poplar	30	45	
31	Tulip poplar 31	31	46.5	
32	Tulip poplar	33	49.5	
33	Tulip poplar	30	45	
34	Tulip poplar	31	46.5	
35	Tulip poplar	30	45	
36	Tulip poplar	34	51	
37	Tulip poplar	34	51	
38	Tulip poplar	33	49.5	
39	Tulip poplar	31	46.5	
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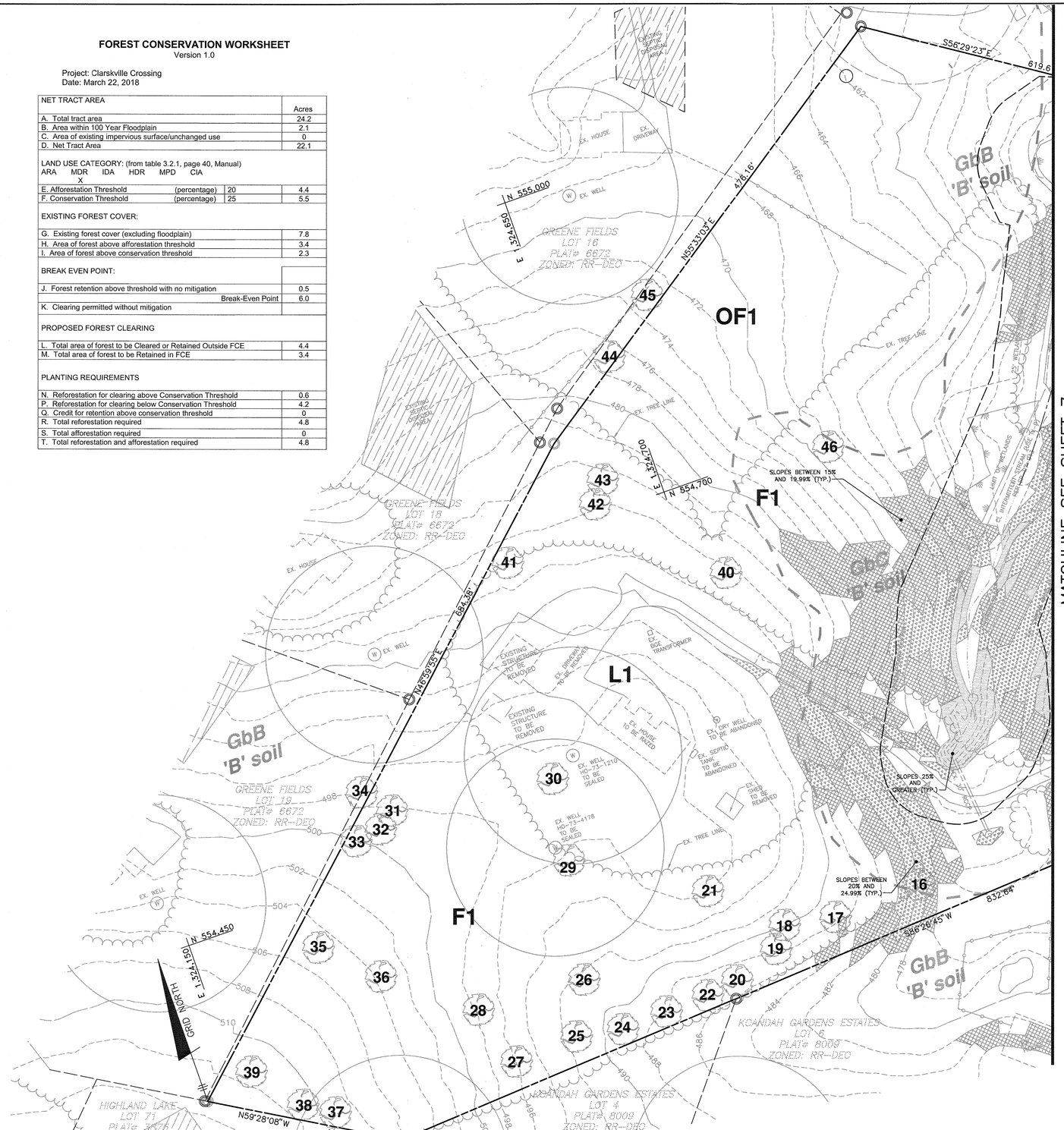
42	Tulip poplar	30	45	
43	Tulip poplar	32	48	
44	Tulip poplar	75	112.5	fair, dieback noted
45	Tulip poplar	62	93	fair, dieback noted
46	Tulip poplar	31	46.5	



MATCHLINE SEE SHEET 7

LEGEND

- SOILS CLASSIFICATION — GgB
- SOILS DELINEATION
- EXISTING CONTOURS — 480 / 478
- SEWAGE DISPOSAL AREA
- EXISTING TREE LINE
- LIMIT OF WETLANDS
- STREAM
- EXISTING STRUCTURE
- EXISTING DRIVEWAY TO BE REMOVED
- 100 YR FLOODPLAIN
- SLOPES 15% TO 19.99%
- SLOPES 20% TO 24.99%
- SLOPES 25% AND GREATER
- SPECIMEN TREE — 1

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.2
GnB	YES	C	D	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32
GoB		C		GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.2

** HIGHLY ERODIBLE, K>0.35, AND STEEPER THAN 5% OR 15% AND GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY AUGUST 2014, MAP 23.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-03-18

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10-2-18

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS
P.O. BOX 5066 GLEN ARM, MARYLAND 21057
Telephone (410) 683-7040
www.ecoscienceprofessionalsinc.com

PLAN PREPARED BY:
JOHN CANOLES
MD DNR FCA QUALIFIED PROFESSIONAL

PLAN
SCALE: 1" = 50'

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

NO.	DATE	REVISION

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

STATE OF MARYLAND — JOHN W. CANOLES — REG. NO. 45577 — PROFESSIONAL ENGINEER — 6/7/18

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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC,
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

FOREST STAND DELINEATION PLAN

DESIGN: JC	DRAWN: LDD	DATE: AUGUST, 2018	BEI PROJECT NO: 2525
		SCALE: AS SHOWN	SHEET 8 OF 14

F-18-081

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
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GoB		C		GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
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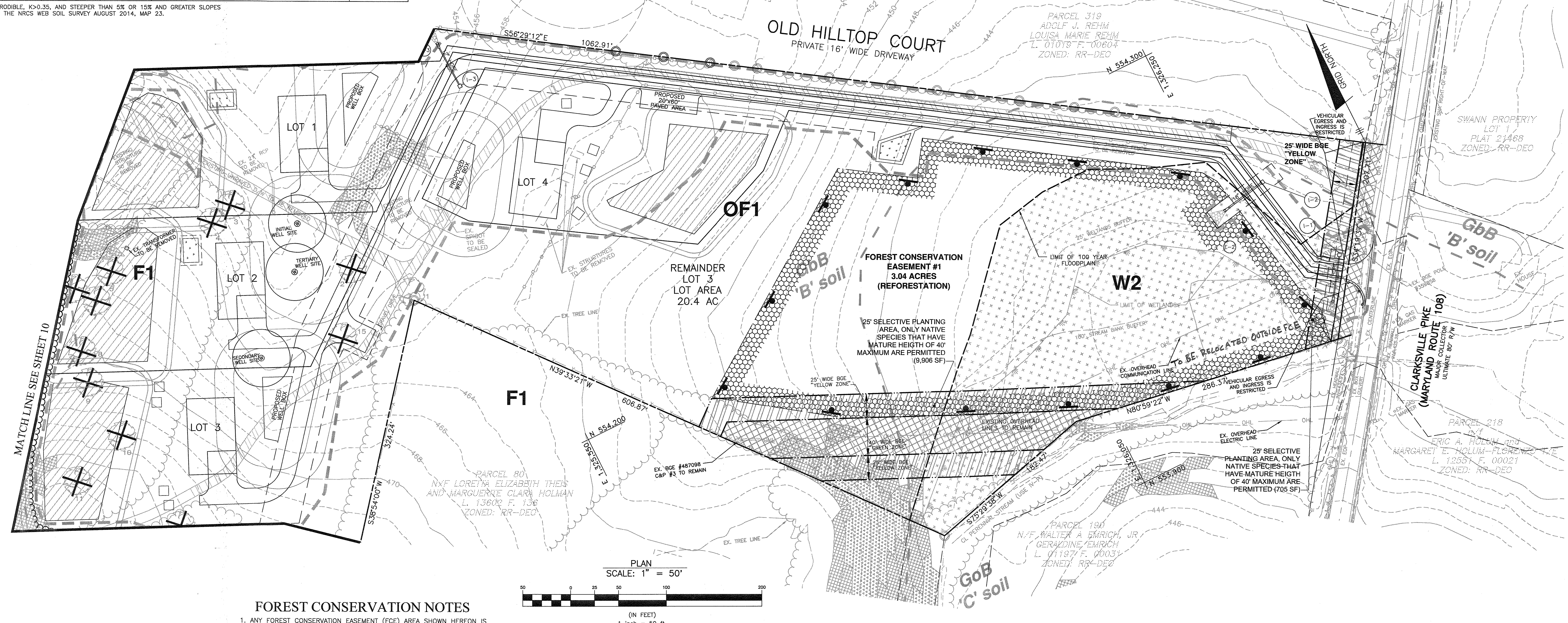

FOR BEARINGS AND DISTANCES OF FOREST CONSERVATION BOUNDARIES SEE RECORD PLAT

FOREST CONSERVATION NOTES

1. ANY FOREST CONSERVATION EASEMENT (FCE) AREA SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF HOWARD COUNTY WHICH RESTRICT THE DISTURBANCE AND USE OF THESE AREAS.

2. THE FOREST CONSERVATION EASEMENT HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

3. LIMITS OF DISTURBANCE SHALL BE RESTRICTED TO AREAS OUTSIDE THE LIMIT OF TEMPORARY FENCING OR THE FCE BOUNDARY, WHICHEVER IS GREATER.

4. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST CONSERVATION EASEMENT, EXCEPT AS PERMITTED BY HOWARD COUNTY DPZ. NO STOCKPILES, PARKING AREAS, EQUIPMENT CLEANING AREA, ETC. SHALL OCCUR WITHIN THE FOREST CONSERVATION EASEMENT.

5. TEMPORARY FENCING SHALL BE USED TO PROTECT FOREST RESOURCES DURING CONSTRUCTION. THE FENCING SHALL BE PLACED ALONG ALL FCE RETENTION BOUNDARIES WHICH OCCUR WITHIN 50 FEET OF THE PROPOSED LIMITS OF DISTURBANCE ThAT DOES NOT ALREADY HAVE A SUPER SILT FENCE PROPOSED.

6. PERMANENT SIGNAGE SHALL BE PLACED 50'–100' APART ALONG THE BOUNDARIES OF ALL FOREST CONSERVATION EASEMENTS. THIS SIGNAGE SHALL STAY IN PERPETUITY.

7. PORTIONS OF THE SITE OCCURRING WITHIN THE 100–YEAR FLOODPLAIN ARE NOT INCLUDED AS PART OF THE NET TRACT AREA OF THE SITE. AREAS OF FLOODPLAIN FOREST OCCURRING WITHIN THE LIMITS OF A FOREST CONSERVATION EASEMENT WILL BE PROTECTED BY THE EASEMENT RESTRICTIONS BUT HAVE NOT BEEN CREDITED TOWARD THE PROJECTS FCA OBLIGATIONS.

9. THE FOREST CONSERVATION WATERSHED FOR THIS PROJECT IS 02–13–09.

10. THERE ARE NO RARE, THREATENED OR ENDANGERED SPECIES LOCATED ON THIS SITE. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO HISTORIC STRUCTURES LOCATED ON THIS SITE. THERE ARE 46 SPECIMEN TREES LOCATED ON THIS SITE AS DESIGNATED ON THE FOREST STAND DELINEATION PLAN. SEE CHART ON THE NEXT SHEET.

11. THE AREA WITHIN THE BGE GREEN ZONE IS NOT INCLUDED AS A PLANTING AREA FOR FOREST CONSERVATION EASEMENT #1. THE AREA WITHIN THE 25' YELLOW ZONE IS DESIGNED FOR NATIVE SPECIES WITH A MATURE HEIGHT OF 40' OR LESS.

12. SPECIMEN TREES 2–12 AND 15 ARE PROPOSED TO BE REMOVED BECAUSE OF HOUSE, DRIVEWAY OR SEPTIC INSTALLATION. AN ALTERNATIVE COMPLIANCE REQUEST HAS BEEN SUBMITTED WITH FINAL PLANS.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-03-18

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.2.18

FOREST CONSERVATION WORKSHEET
Version 1.0

Project: Clarskville Crossing
Date: March 22, 2018

NET TRACT AREA		Acres
A. Total tract area		24.2
B. Area within 100 Year Floodplain		2.1
C. Area of existing impervious surface/unchanged use		0
D. Net Tract Area		22.1
LAND USE CATEGORY: (from table 3.2.1, page 40, Manual) ARA MDR IDA HDR MPD CIA X (under MDR)		
E. Afforestation Threshold (percentage)	20	4.4
F. Conservation Threshold (percentage)	25	5.5
EXISTING FOREST COVER:		
G. Existing forest cover (excluding floodplain)		7.8
H. Area of forest above afforestation threshold		3.4
I. Area of forest above conservation threshold		2.3
BREAK EVEN POINT:		
J. Forest retention above threshold with no mitigation		0.5
Break-Even Point		6.0
K. Clearing permitted without mitigation		
PROPOSED FOREST CLEARING		
L. Total area of forest to be Cleared or Retained Outside FCE		4.4
M. Total area of forest to be Retained in FCE		3.4
PLANTING REQUIREMENTS		
N. Reforestation for clearing above Conservation Threshold		0.6
P. Reforestation for clearing below Conservation Threshold		4.2
Q. Credit for retention above conservation threshold		0
R. Total reforestation required		4.8
S. Total afforestation required		0
T. Total reforestation and afforestation required		4.8

LEGEND

- SOILS CLASSIFICATION — GgB
- SOILS DELINEATION
- EXISTING CONTOURS — 480 / 478
- PROPOSED CONTOURS — 480 / 478
- EXISTING TREE LINE
- PROPOSED TREE LINE
- LIMIT OF DISTURBANCE
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- EXISTING STRUCTURE
- WELL BOX
- SEWAGE DISPOSAL AREA
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- SPECIMEN TREE (TO BE REMOVED)
- SPECIMEN TREE
- FOREST CONSERVATION EASEMENT
- FOREST CONSERVATION SIGNAGE

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PLAN PREPARED BY:
JOHN CANOLES
MD DNR FCA QUALIFIED PROFESSIONAL

NO.	DATE	REVISION

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8/27/18

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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC,
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

FOREST CONSERVATION PLAN AND NOTES

DATE: AUGUST, 2018 — BEI PROJECT NO: 2525
DESIGN: JC — DRAWN: LDD — SCALE: AS SHOWN — SHEET 9 OF 14

Specimen Tree Chart

Key (X#)	Species	Size (in.dbh)	CRZ (feet radius)	Comments (good condition unless otherwise noted)
1	Tulip poplar	31	46.5	
2	Tulip poplar	36	54	
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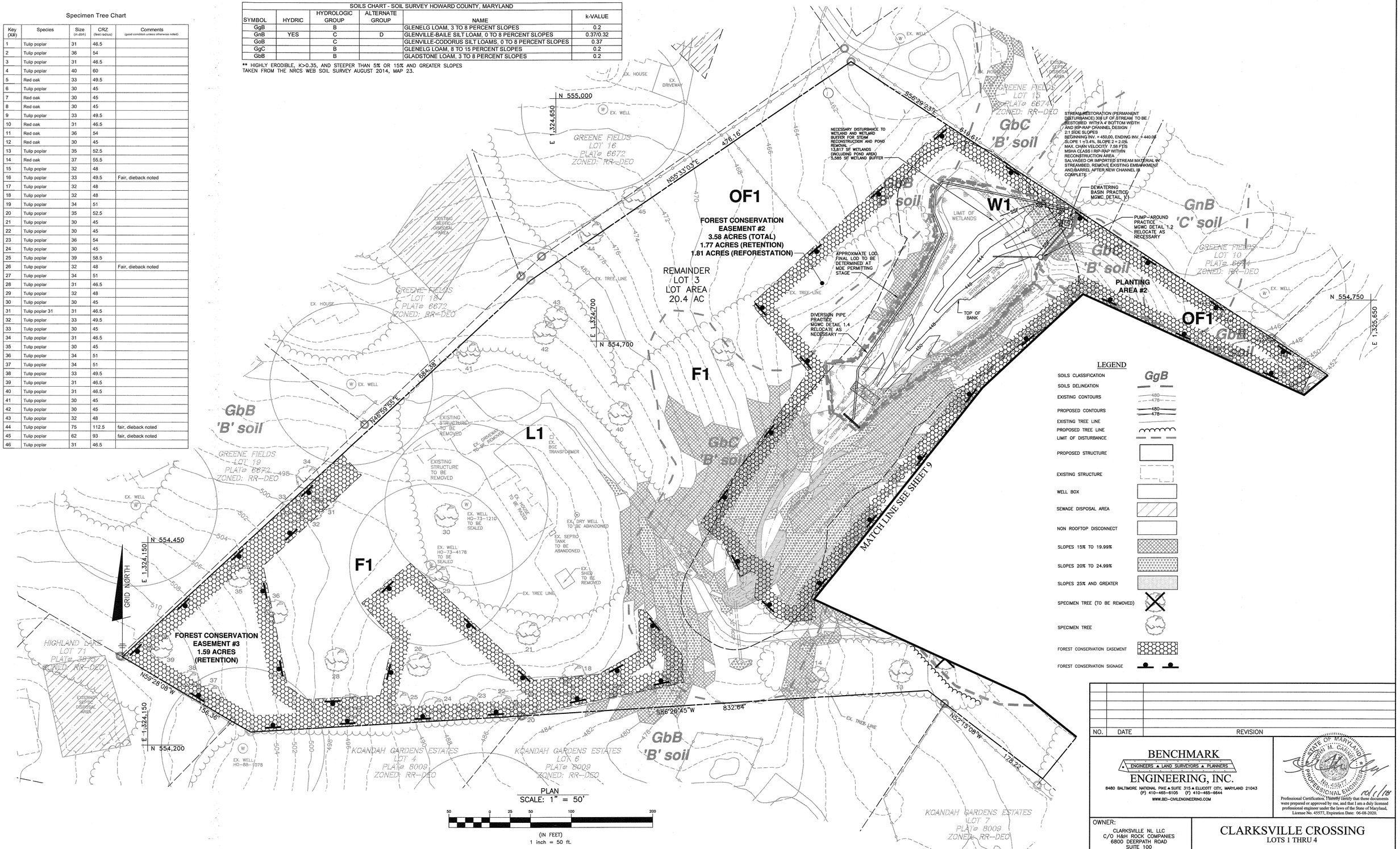

PLAN
SCALE: 1" = 50'

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

LEGEND

- SOILS CLASSIFICATION — GgB
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APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-03-18

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.2.18

FOR BEARINGS AND DISTANCES OF FOREST CONSERVATION BOUNDARIES SEE RECORD PLAT

SITE DATA TABULATION

1.	TOTAL AREA OF SITE	24.2± AC.
2.	AREA OF 100 YEAR FLOODPLAIN	2.1± AC.
3.	NET AREA OF SITE	22.0± AC.
4.	TOTAL FOREST ON NET AREA	7.8± AC.

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PLAN PREPARED BY:
JOHN CANOLES
MD DNR FCA QUALIFIED PROFESSIONAL

NO.	DATE	REVISION

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STATE OF MARYLAND — JOHN M. CANNOLES — No. 45577 — 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. 45577, Expiration Date: 06-08-2020.

10/1/18

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CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

FOREST CONSERVATION PLAN

DESIGN: JC	DRAWN: LDD	DATE: AUGUST, 2018	BEI PROJECT NO: 2525
		SCALE: AS SHOWN	SHEET 10 OF 14

F-18-081

REFORESTATION NOTES

A. Planting Plan and Methods

Plant species selection was based on our knowledge regarding plant communities in Maryland's Piedmont Plateau and information provided in the soil survey on typical vegetation for the soil type on the planting site. Species selection was also based on our knowledge of plant availability in the nursery industry.

Reforestation will be accomplished through a mixed planting of whips and branched transplants. Container grown stock is recommended but bareroot stock may be used to help control afforestation costs. If bareroot stock is used the root systems of all plants will be dipped in an anti-desiccant gel prior to planting to improve moisture retention in the root systems.

Prior to planting the proposed Forest Conservation Easements all multiflora rose in the planting area shall be removed. Removal of the rose may be performed with mowing and herbicide treatments. Physical removal of all top growth following by a periodic herbicide treatment of stump sprouts is recommended. Native tree and shrub species occurring within the rose thickets should be retained wherever possible. Herbicides treatments shall occur on 2 month intervals during the first growing season and once each in the spring and fall for subsequent years. Herbicide used shall be made specifically to address woody plant material and shall be applied as per manufacturers specifications, as needed. Care should be taken not to spray planted trees or naturally occurring native tree/shrub seedlings. It is recommended that initiation of rose removal begin at least six months prior to planting.

B. Planting and Soil Specifications

Plant material will be installed in accordance with the Planting Detail and Planting Specifications shown on the Forest Conservation Plan.

Amendments to existing soil will be in accordance with the Planting Specifications shown on the Forest Conservation Plan. Soil disturbance will be limited to individual planting locations.

C. Guarantee Requirements

A 90 percent survival rate of the reforestation plantings will be required after one growing season. All plant material below the 90 percent survival threshold will be replaced at the beginning of the second growing season. At the end of the second growing season, a 75 percent survival rate will be required. All plant material below the 75 percent survival threshold will be replaced by the beginning of the next growing season.

D. Security for Reforestation

Section 16-1209 of the Howard County Forest Conservation Act requires that a developer shall post a security (bond, letter of credit, etc.) with the County to insure that all work is done in accordance with the FCP.

CONSTRUCTION PERIOD PROTECTION PROGRAM

A. Forest Protection Techniques

1. Soil Protection Area (Critical Root Zone)

The soil protection area, or critical root zone, of a tree is that portion of the soil column where most of a its roots may be found. The majority of roots responsible for water and nutrient uptake are located just below the soil surface. Temporary fencing shall be placed around the critical root zone of the forest in areas where the forest limits occur within 50 feet of the limit of disturbance.

2. Fencing and Signage

Existing forest limits occurring within 50 feet of the limits of disturbance shall be protected using temporary protective fencing. Permanent signage shall be placed around the afforestation area prior to plant installation, as shown on the plan.

B. Pre-Construction Meeting

Upon staking of limits of disturbance a pre-construction meeting will be held between the developer, contractor and appropriate County inspector. The purpose of the meeting will be to
verify that all sediment control is in order, and to notify the contractor of possible penalties for non-compliance with the FCP.

C. Storage Facilities/Equipment Cleaning

All equipment storage, parking, sanitary facilities, material stockpiling, etc. associated with construction of the project will be restricted to those areas outside of the proposed Forest Conservation Easement. Cleaning of equipment will be limited to area within the LOD of the proposed homesites. Wastewater resulting from equipment cleaning will be controlled to prevent runoff into environmentally sensitive areas.

D. Sequence of Construction

The following timetable represents the proposed timetable for development. The items outlined in the Forest Conservation Plan will be enacted within two (2) years of subdivision approval.

Below find a proposed sequence of construction.

1. Install all signage and sediment control devices.

2. Hold pre-construction meeting between developer, contractor and County inspector.

3. Build access roads, install well and septic systems, and construct houses. Stabilize all disturbed areas accordingly.

4. Begin multiflora rose/invasive species removal, as needed. Install permanent protective signage for Easements and initiate plantings in accordance with Forest Conservation Plan. Plantings will be completed within two (2) years of subdivision approval.

5. Remove sediment control.

6. Hold post-construction meeting with County inspectors to assure compliance with FCP. Submit Certification of Installation.

7. Monitor and maintain plantings for 2 years.

E. Construction Monitoring

Eco-Science Professionals, or another qualified professional designated by the developer, will monitor construction of the project to ensure that all activities are in compliance with the Forest Conservation Plan.

F. Post-Construction Meeting

Upon completion of construction, Eco-Science Professionals, or another qualified professional designated by the developer, will notify the County that construction has been completed and arrange for a post-construction meeting to review the project site. The meeting will allow the County inspector to verify that afforestation plantings have been installed.

POST-CONSTRUCTION MANAGEMENT PLAN

Howard County requires a two year post-construction management plan be prepared as part of the forest conservation plan. The plan goes into effect upon acceptance of the construction certification of completion by the County. Eco-Science Professionals, or another qualified professional designated by the developer, will be responsible for implementation of the post-construction management plan.

The following items will be incorporated into the plan:

A. Fencing and Signage

Permanent signage indicating the limits of the retention/reforestation area shall be maintained.

B. General Site Inspections/Maintenance of Plantings

Site inspections will be performed a minimum of three times during the growing season. The purpose of the inspections will be to assess the health of the afforestation plantings. Appropriate measures will be taken to rectify any problems which may arise.

In addition, maintenance of the afforestation plantings will involve the following steps:

1. Watering - All plant material shall be watered twice a month during the 1st growing season, more or less frequently depending on weather conditions. During the second growing season, once a month during May-September, if needed.

2. Removal of invasive exotics and noxious weeds. Old field successional species will be retained.

3. Identification of serious plant pests and diseases, treatment with appropriate agent.

4. Pruning of dead branches.

5. After 12 and 24 months, replacement of plants, if required, in accordance with the Guarantee Requirements shown on the FCP.

C. Education

The developer will provide appropriate materials to property owners informing them of the location and purpose of the afforestation area. Materials may include site plans and information explaining the intent of the forest conservation law.

D. Final Inspection

At the end of the two year post-construction management period, Eco-Science Professionals, or another qualified professional, will submit to the administrator of the Howard County Forest Conservation Program certification that all retention/afforestation requirements have been met. Upon acceptance of this certification, the County will release the developer from all future obligations and release the developer's bond.

Planting/Soil Specifications

1. Installation of bareroot/plug plant stock shall take place between March 15 - April 20; b&b/container stock March 15 -May 30 or September 15 - November 15. Fall planting of B&B stock is not recommended.
2. Disturbed areas shall be seeded and stabilized as per general construction plan for project. Planting areas not impacted by site grading shall have no additional topsoil installed.
3. Bareroot plants shall be installed so that the top of root mass is level with the top of existing grade. Roots shall be dipped in an anti-desiccant gel prior to planting. Backfill in the planting pits shall consist of 3 parts existing soil to 1 part pine fines or equivalent.
4. Fertilizer shall consist of Agriform 22-8-2, or equivalent, applied as per manufacturer's specifications, for woody plants. Herbaceous plant shall be fertilized with Osmocote 8-6-12.
5. Plant material shall be transported to the site in a tarped or covered truck. Plants shall be kept moist prior to planting.
6. The contractor shall remove all non-organic debris associated with the planting operation from the site.

Sequence of Construction

1. Sediment control shall be installed in accordance with general construction plan for site.
2. Plants shall be installed as per Plant Schedule and the Planting/Soil Specifications for the project.
3. Upon completion of the planting, signage shall be installed as shown.
4. Plantings shall be maintained and guaranteed in accordance with the Maintenance and Guarantee requirements for project.

Maintenance of Plantings

1. Maintenance of plantings shall last for a period of (3) years.
2. Plantings must receive 2 gallons of water, either through precipitation or watering, weekly during the 1st growing season, as needed. During second growing season, once a month during May-September, if needed.
3. Invasive exotics and noxious weeds will be removed, as required, from planting areas mechanically and/or with limited herbicide. Old field successional species will be retained.
4. Plants shall be examined a minimum two times during the growing season for serious plant pests and diseases. Serious problems will be treated with the appropriate agent.
5. Dead branches will be pruned from plantings.

Guarantee Requirements

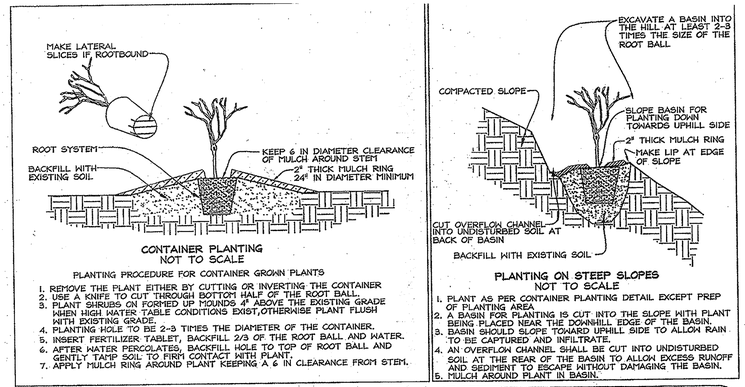
3. A 75 percent survival rate of forestation plantings will be required at the end of two growing seasons. All plant material below the 75 percent threshold will be replaced at the beginning of the next growing season. Wild trees arising from natural regeneration may be counted up to 50 percent towards the total survival number if they are healthy, native species at least 12 inches tall.

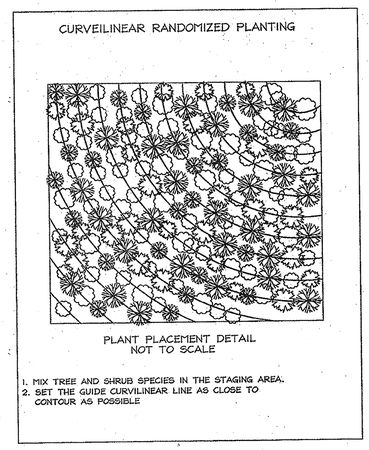
Education of New Occupants

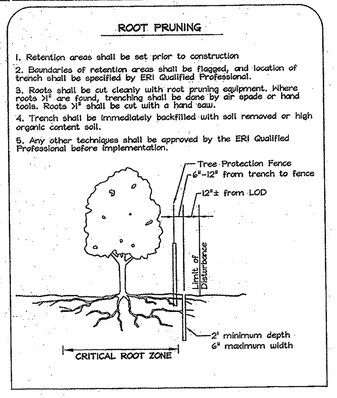
1. The developer shall provide educational information to all property owners within the new development/home about the proper use of forest conservation areas.

Final Inspection and Release of Obligations

1. At the end of the post-construction management and protection period the developer shall submit a certification to the County that all forest conservation areas have remained intact or have been restored to appropriate condition, that the stipulated survival rates have been achieved, and that any permanent protection measures required by the plan are in place. Upon review and acceptance, the County will inform the developed of their release the development of future obligations related to the Forest Conservation Act.







Forest Stand Data

Key	Community Type	Acreage (nta)	Dominant Vegetation	General Condition	Priority Acreage
F1	Mix oak-Poplar	7.8	Liriodendron tulipifera, Quercus rubra, Quercus alba, Fagus grandiflora,	Good	1.4 +/- buffers slopes

See accompanying report for complete stand descriptions

*** Approximately 1.0 acres of offsite forest area is currently present within100 feet of the property**

FSD NOTES:

1. No rare, threatened or endangered species, or their habitats, were observed on the property.

2. Surrounding land use is medium density residential development.

3. Approximately 1.0 acre of forest is currently present within 100 feet of the subject property. This forest occurs on private residential lots.

4. The site lies within the Use IV-P watershed of the Carroll's Run (02-13-11). The wetlands will require a 25 foot buffer, intermittent streams 50 feet buffers, and perennial stream channels require a 100 foot buffer.

5. No historic elements or cemeteries are known to occur on the property.

6. There is 2.1 +/- acres of 100 year floodplain present on the property.

7. There are steep slopes present on the site.

8. Specimen trees are present on the subject property. Forty-six specimen trees have been identified outside of the stream buffers.

Planting Notes:

Three planting options are provided so allow flexibility for the property owner. Only one planting option schedule needs to be followed.

Planting density based spacing requirements:1" caliper trees @ 15' on center, whips with shelter @ 11' on center.

1" caliper trees should be staggered along the perimeter of the planting area to serve as demarcation of the boundary. The trees should be no closer than 15 foot spacing.

Planting may be made in a curvilinear fashion along contour. The planting should avoid a grid appearance but should be spaced to facilitate maintenance

Multiflora rose/heavy brush removal/control may be required prior to installation of planting.

All whips are required to be installed with tree shelters per Howard County FCA requirements.

Planting units defined by the spacing requirements established in the FCA Manual. One plant unit is defined as 1 seedling or whip without shelter. The Manual states that 700 seedlings/whips without shelters are required per acre, or 350 whips w/shelters, or 200 1" caliper trees, or 100 2" caliper trees. By conversion it has been determined that a seeding or whip without shelter = 1 unit, whip with shelter = 2 units, 1"caliper tree = 3.5 units and 2" caliper tree =7 units. The use of plant units simplifies the plant density calculations when mixing stock size.

FCE 1 - Reforestation Area – 3.0 acres

Planting units Required: 2,121
Planting units Provided: 2,122

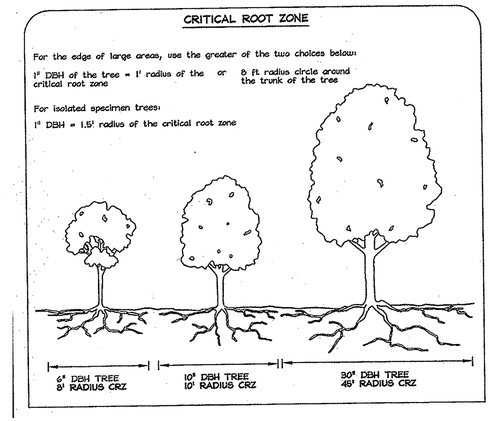
Qty	Species	Size	Spacing	Total FCA Units
12	Acer rubrum - Red maple	1" caliper	15' oc	
12	Liriodendron tulipifera	1" caliper	15' oc	
12	Platanus occidentalis - Sycamore	1" caliper	15' oc	
12	Quercus palustris - Pin Oak	1" caliper	15' oc	
48	Total 1" caliper plantings x 3.5 units /tree = FCA unit credit			168
75	Acer negundo – Box elder * #	2-3' whip	11' o.c.	
75	Acer rubrum - Red maple	2-3' whip	11' o.c.	
50	Carpinus caroliniana - Muscle wood #	2-3' whip	11' o.c.	
50	Chionanthus virginicus - Fringe tree #	2-3' whip	11' o.c.	
75	Juniperus virginiana – Red cedar #	2-3' whip	11' o.c.	
150	Liriodendron tulipifera - Tulip poplar *	2-3' whip	11' o.c.	
110	Nyssa sylvatica - Black gum	2-3' whip	11' o.c.	
72	Platanus occidentalis - Sycamore	2-3' whip	11' o.c.	
100	Prunus serotina - Black Cherry *	2-3' whip	11' o.c.	
120	Quercus palustris - Pin Oak	2-3' whip	11' o.c.	
100	Viburnum prunifolium - Blackhaw * #	2-3' whip	11' o.c.	
977	Total whip plantings x 2 units /tree = FCA unit credit			1954
	Total Unit Credit			2122

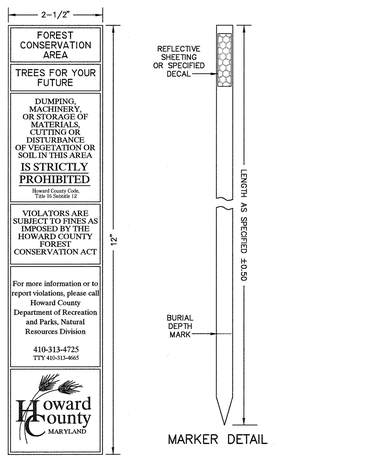
FCE 2 - Reforestation Area – 1.8 acres

Planting units Required: 1,126
Planting units Provided: 1,122

Qty	Species	Size	Spacing	Total FCA Units
6	Acer rubrum - Red maple	1" caliper	15' oc	
8	Liriodendron tulipifera	1" caliper	15' oc	
6	Platanus occidentalis - Sycamore	1" caliper	15' oc	
8	Quercus alba - White oak	1" caliper	15' oc	
28	Total 1" caliper plantings x 3.5 units /tree = FCA unit credit			98
25	Acer negundo – Box elder	2-3' whip	11' o.c.	
35	Acer rubrum - Red maple	2-3' whip	11' o.c.	
22	Carpinus caroliniana - Muscle wood	2-3' whip	11' o.c.	
20	Chionanthus virginicus - Fringe tree	2-3' whip	11' o.c.	
45	Juniperus virginiana – Red cedar *	2-3' whip	11' o.c.	
75	Liriodendron tulipifera - Tulip poplar *	2-3' whip	11' o.c.	
35	Nyssa sylvatica - Black gum	2-3' whip	11' o.c.	
25	Platanus occidentalis - Sycamore	2-3' whip	11' o.c.	
52	Prunus serotina - Black Cherry *	2-3' whip	11' o.c.	
75	Quercus alba - White oak *	2-3' whip	11' o.c.	
45	Salix nigra - Black willow ^^	2-3' whip	11' o.c.	
60	Viburnum prunifolium - Blackhaw *	2-3' whip	11' o.c.	
514	Total whip plantings x 2 units /tree = FCA unit credit			1028
	Total Unit Credit			1126

* - do not plant this species in wetland
# - this species acceptable for planting in BGE Yellow zone
^^ - plant only in former pond basin





FCE CARSONITE MARKER
NOT TO SCALE

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS
P.O. BOX 3006 GLEN ARM, MARYLAND 21057
Telephone (410) 683-7848
www.ecoscienceprofessionalsinc.com

PLAN PREPARED BY:
JOHN CANOLES
MD DNR FCA QUALIFIED PROFESSIONAL

NO.	DATE	REVISION

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

STATE OF MARYLAND — JOHN M. CANOLES — No. 45577 — PROFESSIONAL ENGINEER
6/27/18
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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC,
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

FOREST CONSERVATION NOTES AND DETAILS

DATE: AUGUST, 2018 | BEI PROJECT NO: 2525
DESIGN: JC | DRAWN: LDD | SCALE: AS SHOWN | SHEET 11 OF 14

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-03-18

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10-2-18

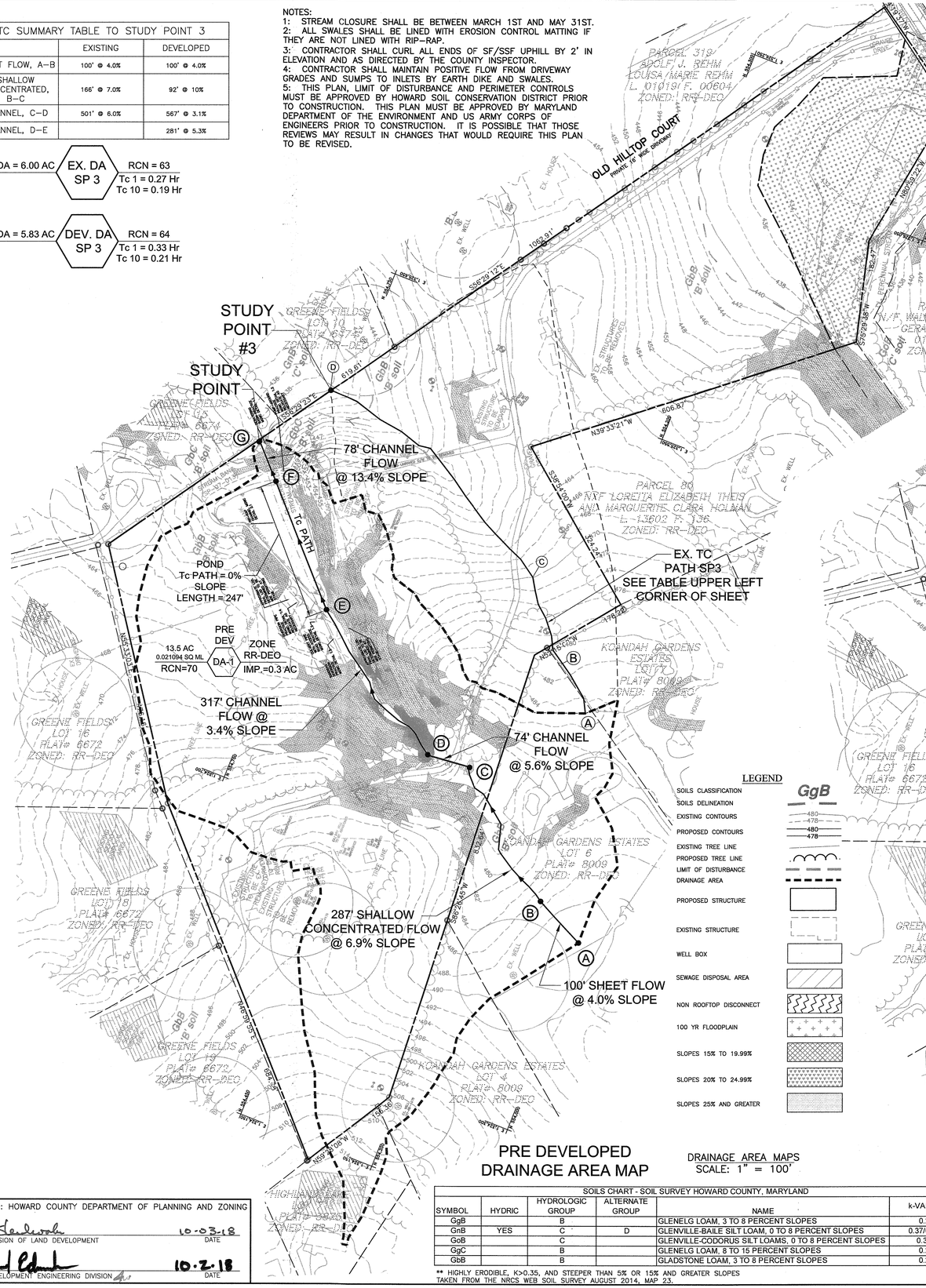
F-18-081

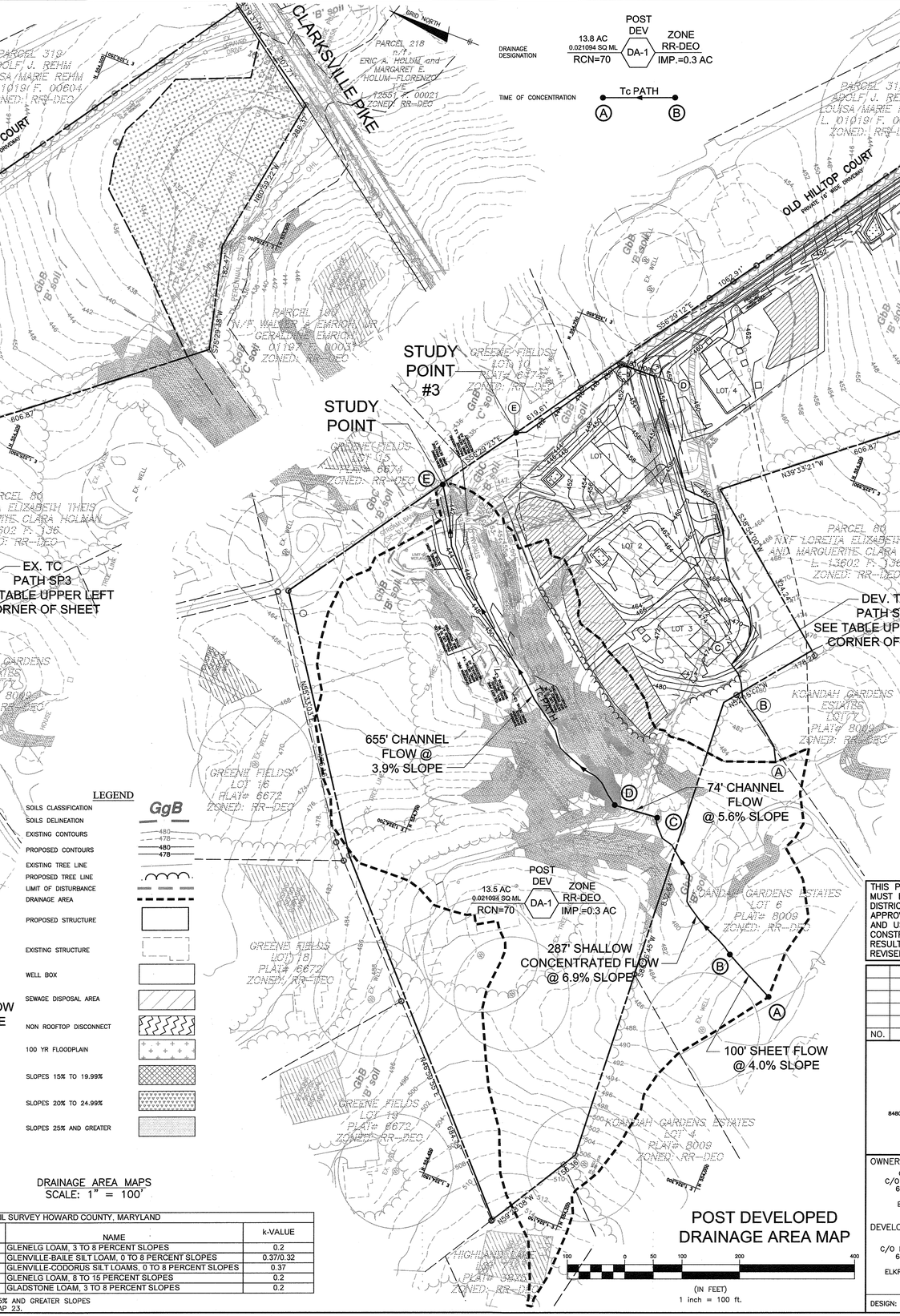
TC SUMMARY TABLE TO STUDY POINT 3		
	EXISTING	DEVELOPED
SHEET FLOW, A–B	100' @ 4.0%	100' @ 4.0%
SHALLOW CONCENTRATED, B–C	166' @ 7.0%	92' @ 10%
CHANNEL, C–D	501' @ 6.0%	567' @ 3.1%
CHANNEL, D–E		281' @ 5.3%

DA = 6.00 AC — EX. DA SP 3 — RCN = 63; Tc 1 = 0.27 Hr; Tc 10 = 0.19 Hr

DA = 5.83 AC — DEV. DA SP 3 — RCN = 64; Tc 1 = 0.33 Hr; Tc 10 = 0.21 Hr

NOTES:
1: STREAM CLOSURE SHALL BE BETWEEN MARCH 1ST AND MAY 31ST.
2: ALL SWALES SHALL BE LINED WITH EROSION CONTROL MATTING IF THEY ARE NOT LINED WITH RIP–RAP.
3: CONTRACTOR SHALL CURL ALL ENDS OF SF/SSF UPHILL BY 2' IN ELEVATION AND AS DIRECTED BY THE COUNTY INSPECTOR.
4: CONTRACTOR SHALL MAINTAIN POSITIVE FLOW FROM DRIVEWAY GRADES AND SUMPS TO INLETS BY EARTH DIKE AND SWALES.
5: THIS PLAN, LIMIT OF DISTURBANCE AND PERIMETER CONTROLS MUST BE APPROVED BY HOWARD SOIL CONSERVATION DISTRICT PRIOR TO CONSTRUCTION. THIS PLAN MUST BE APPROVED BY MARYLAND DEPARTMENT OF THE ENVIRONMENT AND US ARMY CORPS OF ENGINEERS PRIOR TO CONSTRUCTION. IT IS POSSIBLE THAT THOSE REVIEWS MAY RESULT IN CHANGES THAT WOULD REQUIRE THIS PLAN TO BE REVISED.





DRAINAGE DESIGNATION — 13.8 AC, 0.021094 SQ ML, RCN=70 — DA-1 — POST DEV ZONE RR-DEO, IMP.=0.3 AC

TIME OF CONCENTRATION — Tc PATH — A to B

LEGEND

SOILS CLASSIFICATION — GgB
SOILS DELINEATION
EXISTING CONTOURS
PROPOSED CONTOURS
EXISTING TREE LINE
PROPOSED TREE LINE
LIMIT OF DISTURBANCE
DRAINAGE AREA
PROPOSED STRUCTURE
EXISTING STRUCTURE
WELL BOX
SEWAGE DISPOSAL AREA
NON ROOFTOP DISCONNECT
100 YR FLOODPLAIN
SLOPES 15% TO 19.99%
SLOPES 20% TO 24.99%
SLOPES 25% AND GREATER

PRE DEVELOPED DRAINAGE AREA MAP

DRAINAGE AREA MAPS
SCALE: 1" = 100'

POST DEVELOPED DRAINAGE AREA MAP

100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GgB		B		GLENELG LOAM, 3 TO 8 PERCENT SLOPES	0.2
GnB	YES	C	D	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	0.37/0.32
GoB		C		GLENVILLE-CODORUS SILT LOAMS, 0 TO 8 PERCENT SLOPES	0.37
GgC		B		GLENELG LOAM, 8 TO 15 PERCENT SLOPES	0.2
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.2

** HIGHLY ERODIBLE, K>0.35, AND STEEPER THAN 5% OR 15% AND GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY AUGUST 2014, MAP 23.

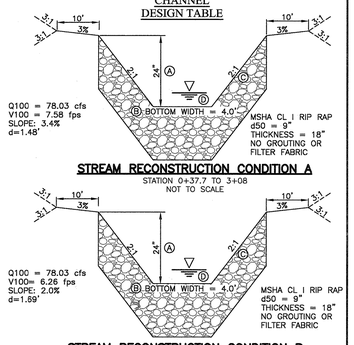
CONDITION A	
A	2.0'
B	4.0'
C	2:1
D	1.48'
SLOPE	3.4%
BOTTOM DIMS	
LENGTH	274'
WIDTH	4.0'

STORM Q (RUNOFF) VELOCITY
100YR 78.03 CFS 7.58 FPS

CONDITION B	
A	2.0'
B	4.0'
C	2:1
D	1.69'
SLOPE	2.0%
BOTTOM DIMS	
LENGTH	34'
WIDTH	4.0'

STORM Q (RUNOFF) VELOCITY
100YR 78.03 CFS 6.26 FPS

CHANNEL DESIGN TABLE



STREAM RECONSTRUCTION CONDITION A
STATION 0+37.7 TO 3+08
NOT TO SCALE

STREAM RECONSTRUCTION CONDITION B
STATION 0+00 TO 0+37.7
NOT TO SCALE

THIS PLAN, LIMIT OF DISTURBANCE AND PERIMETER CONTROLS MUST BE APPROVED BY HOWARD SOIL CONSERVATION DISTRICT PRIOR TO CONSTRUCTION. THIS PLAN MUST BE APPROVED BY MARYLAND DEPARTMENT OF THE ENVIRONMENT AND US ARMY CORPS OF ENGINEERS PRIOR TO CONSTRUCTION. IT IS POSSIBLE THAT THOSE REVIEWS MAY RESULT IN CHANGES THAT WOULD REQUIRE THIS PLAN TO BE REVISED.

NO.	DATE	REVISION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-03-18

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10-2-18

BENCHMARK
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WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER — 10/1/20

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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
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6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
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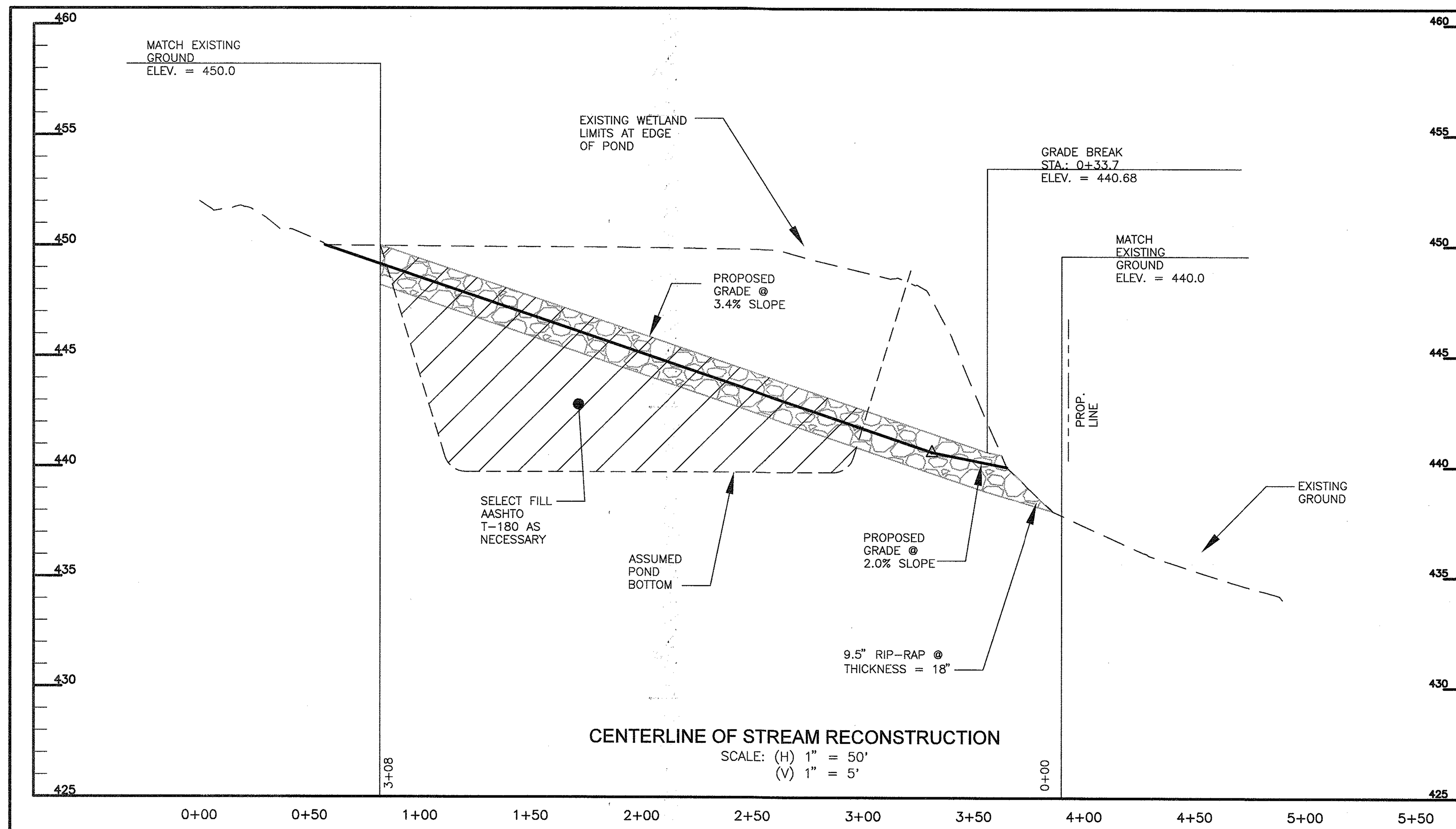
CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

STREAM RECONSTRUCTION DRAINAGE AREA MAP, PLAN AND PROFILE

DATE: AUGUST, 2018 — BEI PROJECT NO: 2525
DESIGN: JC — DRAWN: LDD
SCALE: AS SHOWN — SHEET 12 OF 14

F-18-081

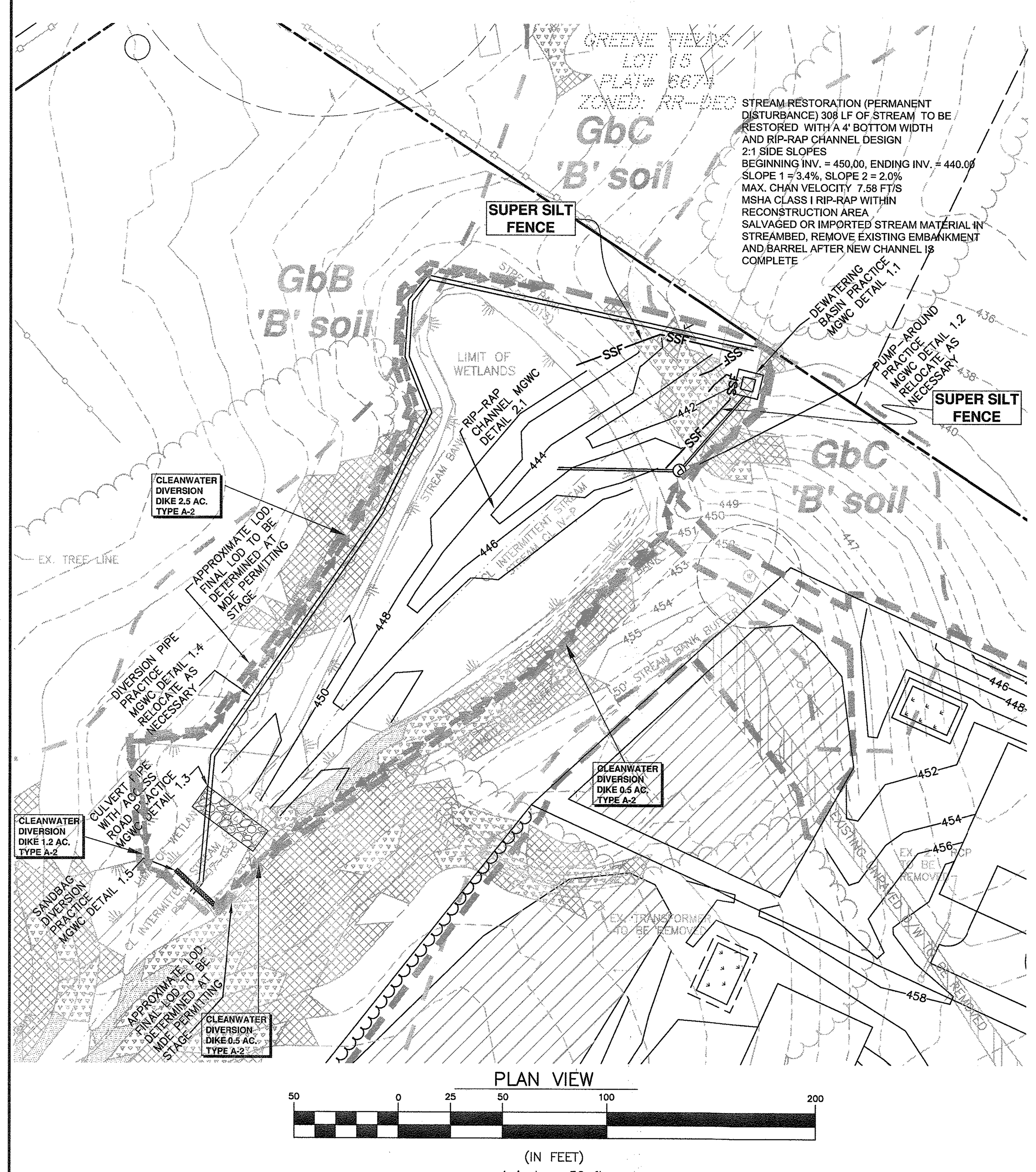


CENTERLINE OF STREAM RECONSTRUCTION
SCALE: (H) 1" = 50'
(V) 1" = 5'

LEGEND

- SOILS CLASSIFICATION — GgB
- SOILS DELINEATION
- EXISTING CONTOURS — 480, 478
- PROPOSED CONTOURS — 480, 478
- EXISTING TREE LINE
- PROPOSED TREE LINE
- LIMIT OF DISTURBANCE
- DRAINAGE AREA
- PROPOSED STRUCTURE
- EXISTING STRUCTURE
- WELL BOX
- SEWAGE DISPOSAL AREA
- NON ROOFTOP DISCONNECT
- 100 YR FLOODPLAIN
- SLOPES 15% TO 19.99%
- SLOPES 20% TO 24.99%
- SLOPES 25% AND GREATER

NOTES: 1. USE SALVAGED MATERIALS FROM THE EXISTING POND BOTTOM AS THE INVERT MATERIAL OF THE CHANNEL TO THE EXTENT POSSIBLE.
2. SMALL SALVAGED MATERIAL FROM THE POND BOTTOM SHALL BE PLACED IN THE RIP-RAP. WATER IS INTENDED TO FLOW ON THE SURFACE OF THE RIP-RAP. CLOG WITH NATIVE MATERIALS OR WITH SIMILARLY SIZED NEW MATERIALS.



PLAN VIEW

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

1) No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
2) Place materials in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
3) Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, unsightly debris, toxic material, or any other deleterious substance.
4) Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
5) Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
6) Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
7) All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (Lolium multiflorum), Millet (Setaria italica), Barley (Hordeum sp.), Oats (Uniola sp.), and/or Rye (Secale cereale). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-persistent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division. **Kentucky 31 fescue shall not be utilized in wetland or buffer areas.** The area should be seeded and mulched to reduce erosion after construction activities have been completed.
8) After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
9) To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:

   Use IV waters: In-stream work shall not be conducted during the period March 1 through May 31, inclusive, during any year.

10) Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
11) Culverts shall be constructed and any riprap placed so as not to obstruct the movement of aquatic species, unless the purpose of the activity is to impound water.

MGWC 2.1: RIPRAP

Rigid engineering technique for bank stabilization

DESCRIPTION

Riprap is used to protect and stabilize embankment soils from the erosive forces of flowing water and piping forces resulting from groundwater seepage. A well-engineered riprap system should consist of the following:

- a filter layer of gravel or cloth designed to prevent soil movement into or through the riprap layer while allowing water to drain from the embankment, and
- a stone layer of appropriate gradation and thickness to resist the shearing forces of channelized water.

EFFECTIVE USES & LIMITATIONS

When properly designed and installed, riprap is an effective method where soil conditions, water turbulence and velocity, expected vegetative cover, and groundwater conditions are such that the soil may erode under the design flow conditions. Some common areas of riprap applicability are:

- diversion channel banks and/or bottoms,
- roadside ditches,
- drop structure outlets, and
- laterally expanding banks threatening infrastructure or personal property.

Additionally, properly graded riprap forms a flexible, self-healing cover which can be easily repaired in localized areas by the timely replacement of stone. Uniform-grade riprap can also be used with a geotextile filter cloth.

Filter cloth should only be utilized when the bank material is noncohesive such as sand or gravel.

MATERIAL SPECIFICATIONS

- *Filters:* Material and design specifications for granular filters are found in Table 3.1a.

Table 3.1a: Granular Filter Material Grading Specifications

% less than	U.S. Standard sieve size
100	2 ½ in (64 mm)
85-100	1 in (25 mm)
60-100	½ in (13 mm)
35-70	No. 10
20-50	No. 40
3-20	No. 200

The thickness of the filter should not be less than 6 inches (15 cm). Generally, filters that are one-half the thickness of the riprap layer are satisfactory.

Synthetic filter cloth may be used cautiously based on the *1994 MD Standards and Specifications for Soil Erosion and Sediment Control*.

- *Riprap:* The maximum diameter or weight of stone for riprap should be based upon the design flow velocity using Figure 3.1. This chart is based on a maximum slope of 2H:1V. The stone gradations for Classes I - III are found in Table 3.1b.

MGWC 2.1: RIPRAP

Table 3.1b: Stone Gradations for Riprap Stone Classes

Class	Size	% Total Weight < Given Size
I	150 lb (70 kg)	100
	2 lb (1 kg)	10 max
II	700 lb (320 kg)	100
	20 lb (10 kg)	10 max
III	2000 lb (910 kg)	100
	40 lb (20 kg)	10 max

Uniform-grade riprap should incorporate angular rock to promote interlocking.

Approximate Cost ($1999):
$78 per linear ft

INSTALLATION GUIDELINES

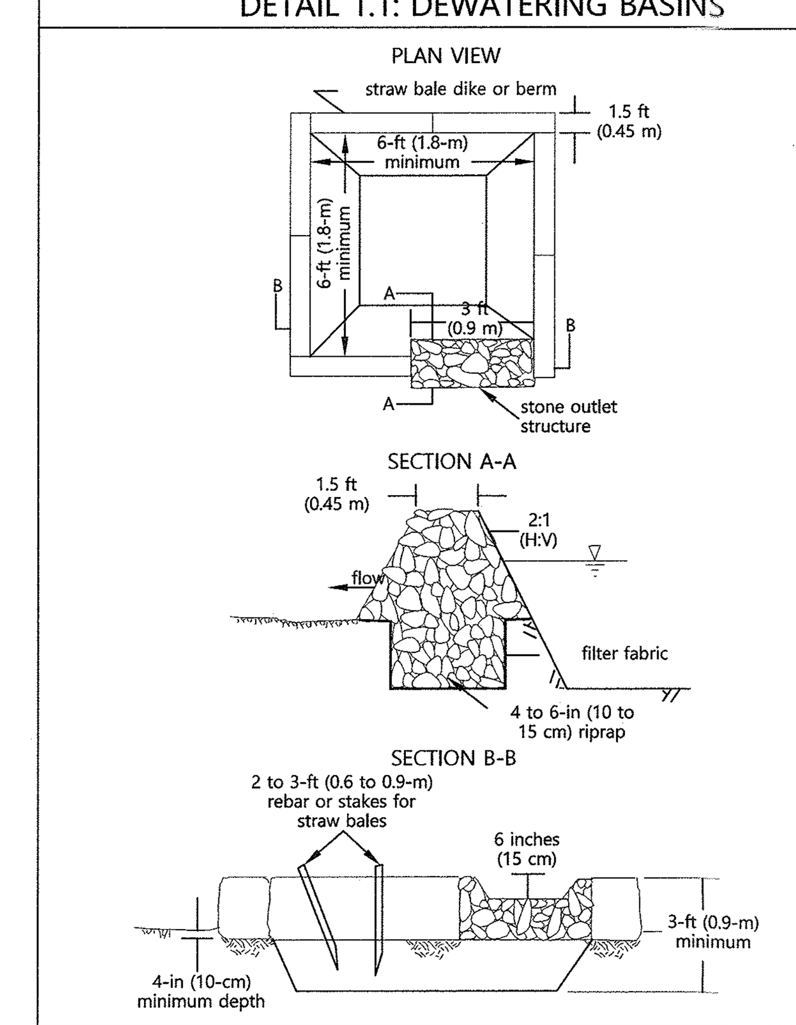
All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Once a slope stabilization project is initiated, preparation and placement of the riprap should immediately follow the initial disturbance to minimize the chances for further slope degradation. The recommended construction procedure for riprap is as follows beginning with initial slope preparations (refer to Detail 2.1):

1. The contractor should install all sediment and erosion control devices as the first order of business.
2. Excavation should be made in reasonably close conformity with the existing stream slope and bed.
3. All fill in the subgrade should be compacted to a density approximating that of the surrounding undisturbed material.
4. Provisions must be made to anchor the riprap at the stream bed so as to provide protection against undermining. If this cannot be accomplished by creating a toe trench, an alternative method of protection must receive prior written approval from the WMA or local authority.
5. The filter layer or blanket should be placed immediately after slope preparation.
   - The stone for granular filters should be spread in a uniform layer to the specified depth. Where more than one layer is employed, they should be spread such that there is minimal mixing.
   - When cloth filters are used, special care should be taken not to damage the fabric during riprap placement.
6. Riprap placement should begin with the toe. The larger stones, as specified by the design gradation, should be placed in the toe and along the perimeter of the slope and channel protection. The riprap should be placed with suitable equipment in such a manner as to produce a reasonably graded mass of stones with zero drop height. The placing of stones that cause extensive segregation is not allowed. Where appropriate, a low flow channel shall be constructed through the riprap.
7. Any excavation voids existing along the edges of the completed slope and channel protection should be backfilled and compacted.
8. All disturbed areas should be permanently stabilized in accordance with an approved sediment and erosion control plan.

Note: The use of rock vanes (MGWC 3.3: Rock Vanes) should be considered to redirect high-velocity flows at the toe.

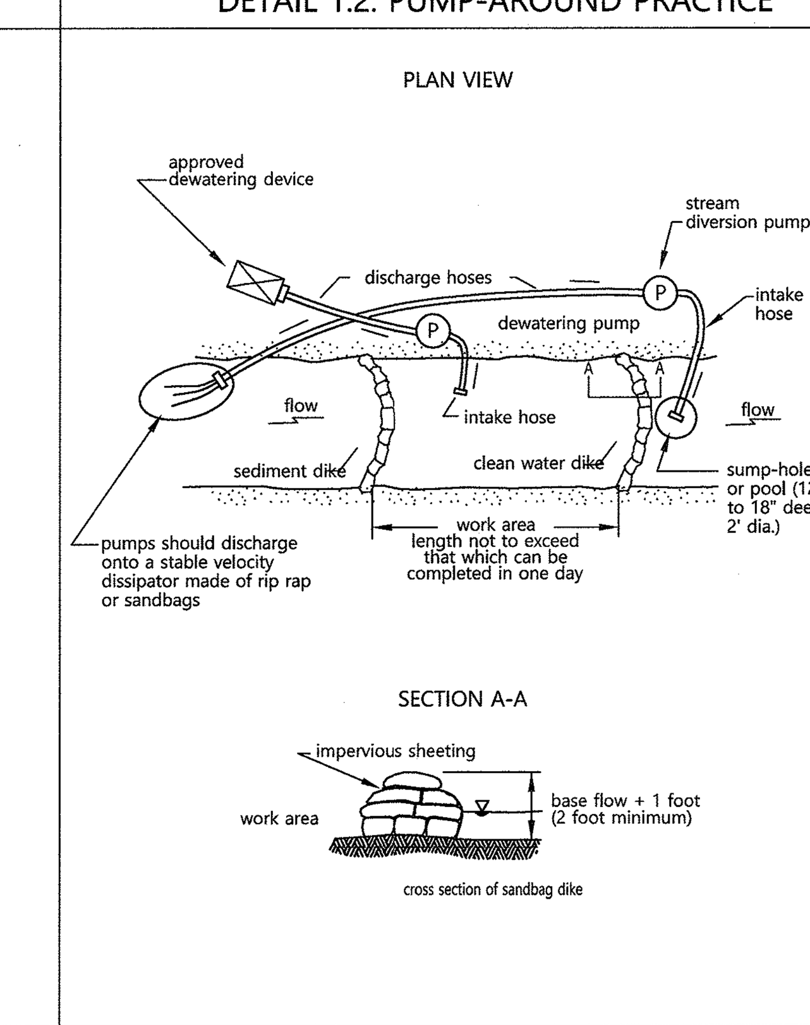
NOTES:
1: STREAM CLOSURE SHALL BE BETWEEN MARCH 1ST AND MAY 31ST.
2: ALL SWALES SHALL BE LINED WITH EROSION CONTROL MATTING IF THEY ARE NOT LINED WITH RIP-RAP.
3: CONTRACTOR SHALL CURL ALL ENDS OF SF/SSF UPHILL BY 2' IN ELEVATION AND AS DIRECTED BY THE COUNTY INSPECTOR.
4: CONTRACTOR SHALL MAINTAIN POSITIVE FLOW FROM DRIVEWAY GRADES AND SUMPS TO INLETS BY EARTH DIKE AND SWALES.
5: THIS PLAN, LIMIT OF DISTURBANCE AND PERIMETER CONTROLS MUST BE APPROVED BY HOWARD SOIL CONSERVATION DISTRICT PRIOR TO CONSTRUCTION. THIS PLAN MUST BE APPROVED BY MARYLAND DEPARTMENT OF THE ENVIRONMENT AND US ARMY CORPS OF ENGINEERS PRIOR TO CONSTRUCTION. IT IS POSSIBLE THAT THOSE REVIEWS MAY RESULT IN CHANGES THAT WOULD REQUIRE THIS PLAN TO BE REVISED.

Maryland's Guidelines To Waterway Construction
DETAIL 1.1: DEWATERING BASINS



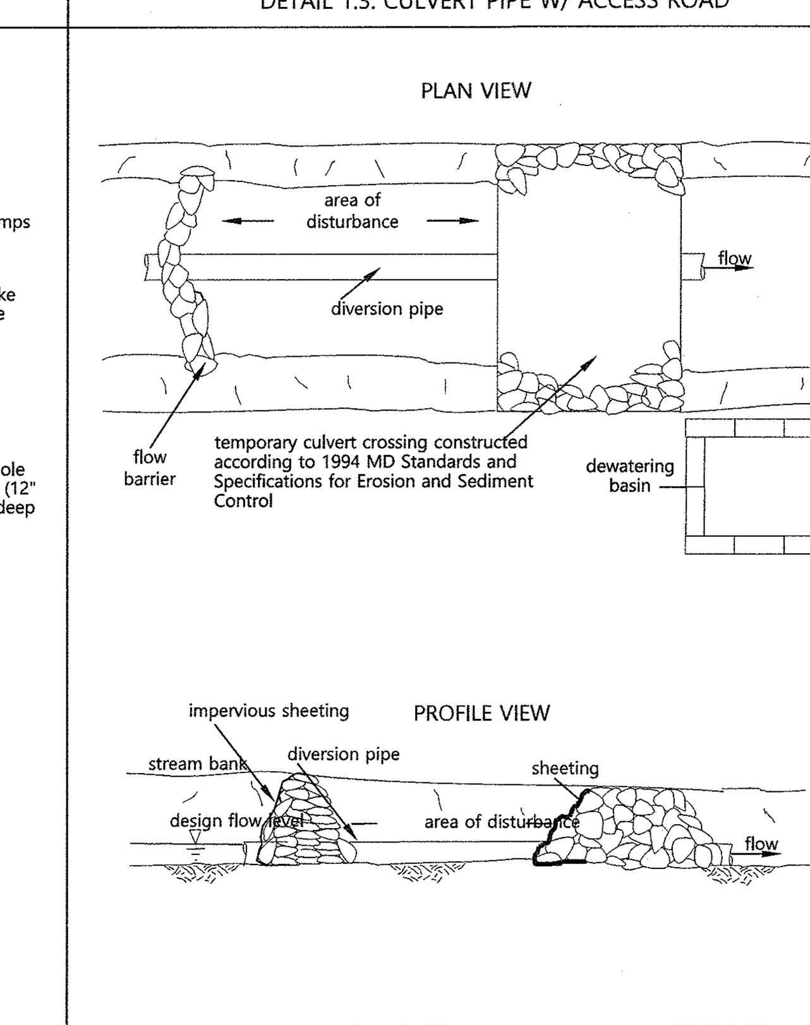
TEMPORARY INSTREAM CONSTRUCTION MEASURES | REVISED NOVEMBER 2000 PAGE 1.1 - 2 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Maryland's Guidelines To Waterway Construction
DETAIL 1.2: PUMP-AROUND PRACTICE



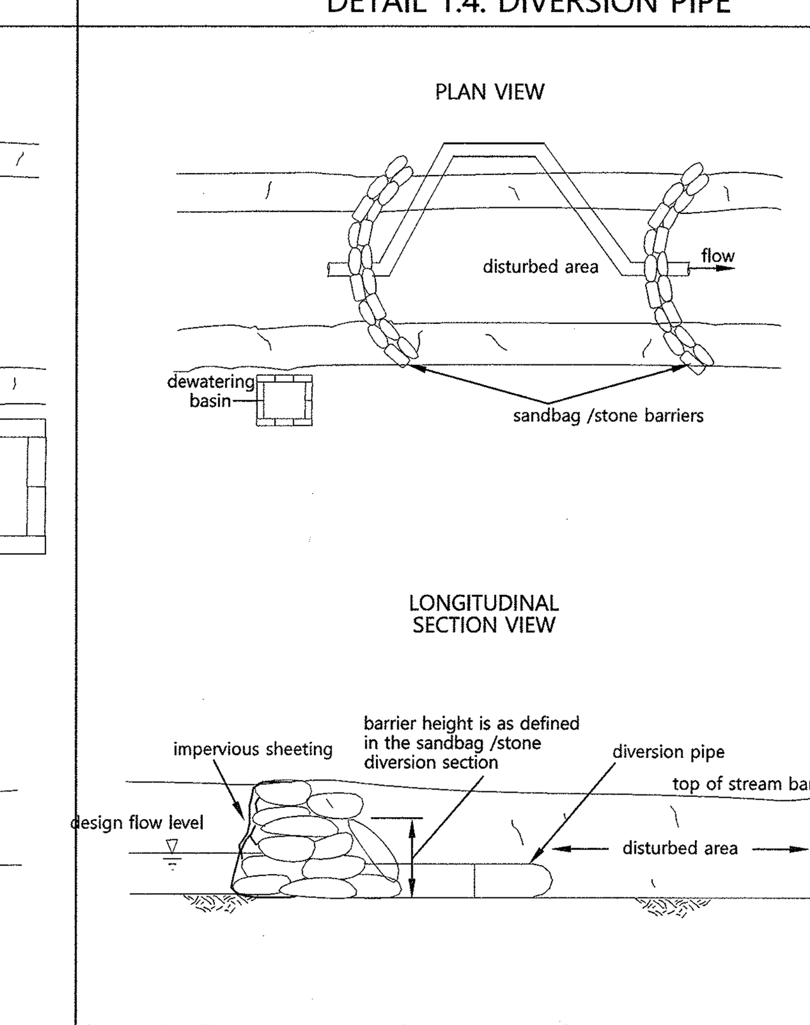
TEMPORARY INSTREAM CONSTRUCTION MEASURES | REVISED NOVEMBER 2000 PAGE 1.2 - 3 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Maryland's Guidelines To Waterway Construction
DETAIL 1.3: CULVERT PIPE W/ ACCESS ROAD



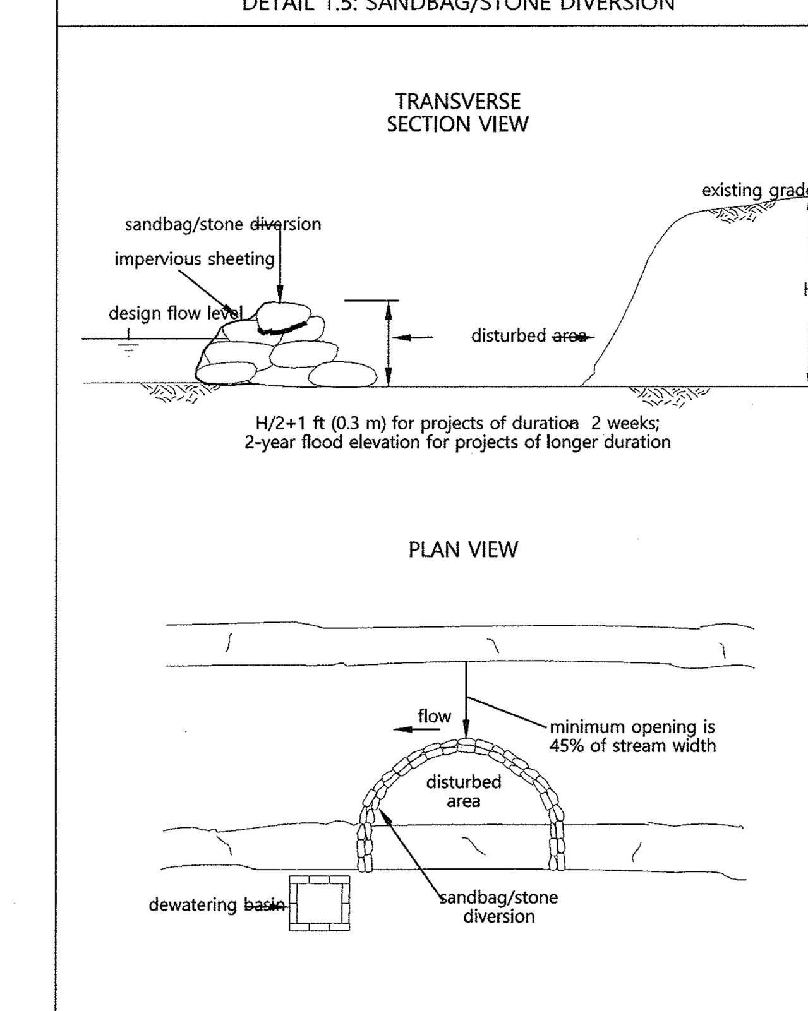
TEMPORARY INSTREAM CONSTRUCTION MEASURES | REVISED NOVEMBER 2000 PAGE 1.3 - 3 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Maryland's Guidelines To Waterway Construction
DETAIL 1.4: DIVERSION PIPE



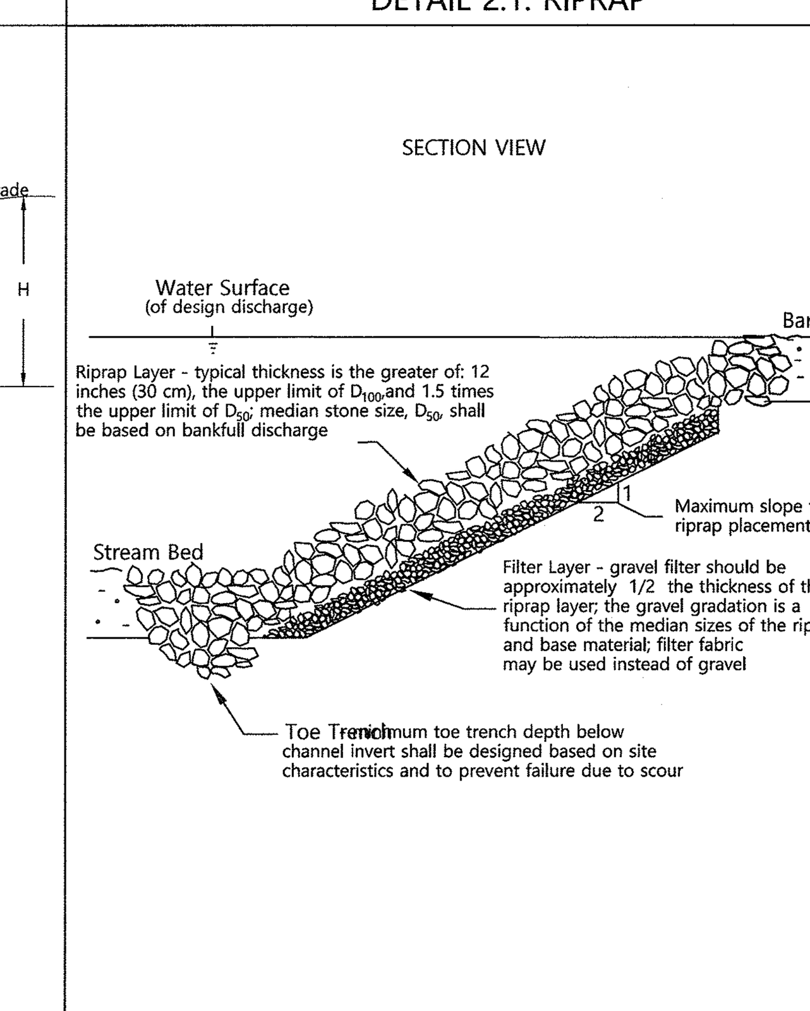
TEMPORARY INSTREAM CONSTRUCTION MEASURES | REVISED NOVEMBER 2000 PAGE 1.4 - 2 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Maryland's Guidelines To Waterway Construction
DETAIL 1.5: SANDBAG/STONE DIVERSION



TEMPORARY INSTREAM CONSTRUCTION MEASURES | REVISED NOVEMBER 2000 PAGE 1.5 - 3 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Maryland's Guidelines To Waterway Construction
DETAIL 2.1: RIPRAP



SLOPE PROTECTION AND STABILIZATION TECHNIQUES | REVISED NOVEMBER 2000 PAGE 2.1 - 4 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MGWC 1.4: DIVERSION PIPE

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

The work should consist of installing flow diversion pipes in combination with sandbag or stone diversions when construction activities occur within the stream channel.

EFFECTIVE USES & LIMITATIONS

Diversion pipes with an insufficient flow capacity can cause the channel diversion to fail thereby resulting in severe erosion of the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low flow.

MATERIAL SPECIFICATIONS

Materials for stream diversions should meet the following requirements:

- *Riprap*: Stone should be washed and have a minimum diameter of 6 inches (15 centimeters).
- *Sandbags*: Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
- *Sheeting*: Sheeting should consist of polyethylene or other material which is impervious and resistant to puncture and tearing.

INSTALLATION GUIDELINES

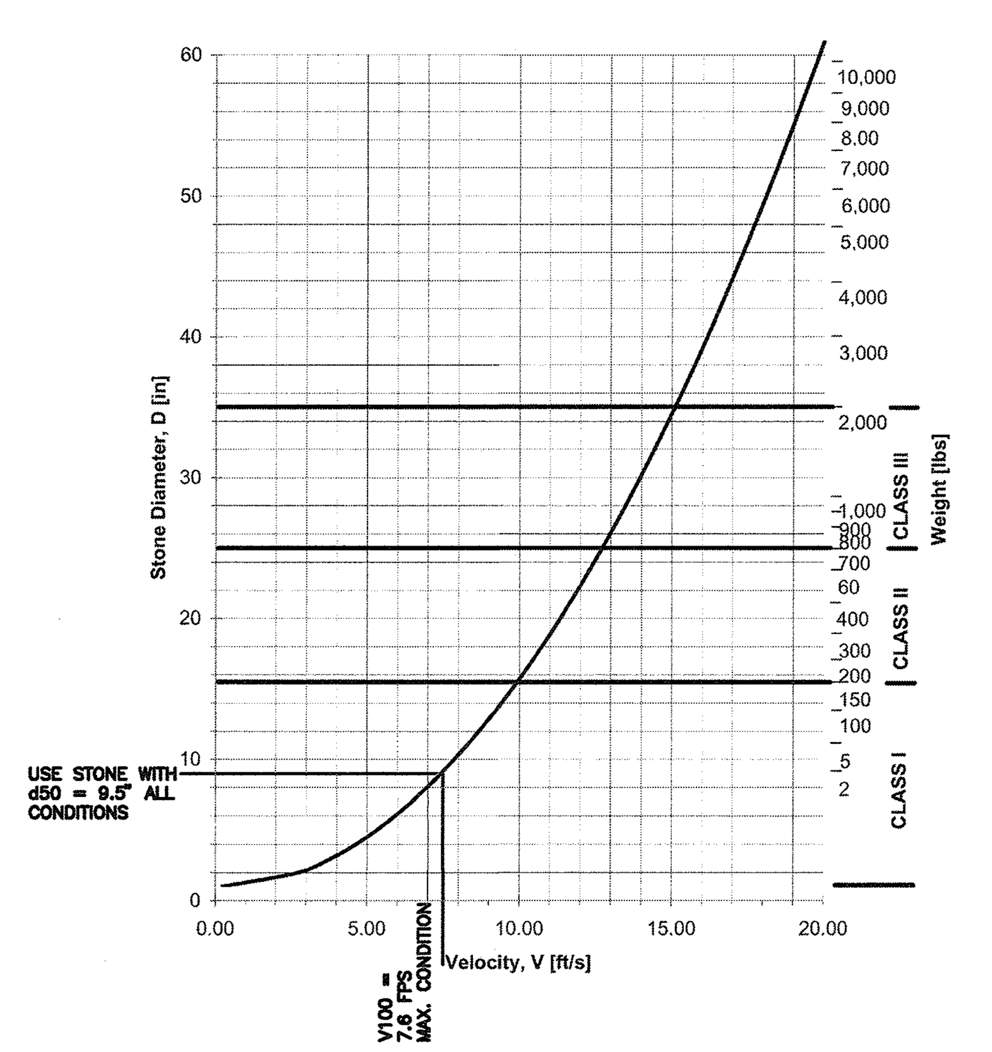
All erosion and sediment control devices including mandatory dewatering basins should be installed as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during low flow conditions. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Diversion pipes with sandbag or stone barriers should be completed as follows (refer to Detail 1.4):

1. Sandbag/stone barriers should be sized and installed as detailed in MGWC 1.5: Sandbag/Stone Diversion. The materials should be sized to withstand baseflow velocities.
2. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
3. Sediment-laden water from the construction area should be pumped to a dewatering basin.
4. The diversion pipe should have a minimum capacity sufficient to convey the 2-year flow for projects with a duration of two weeks or greater. For projects of shorter duration, the capacity of the pipe can be reduced accordingly.
5. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.
6. Sediment control devices are to remain in place until all disturbed areas are stabilized and the inspecting authority approves their removal.

THIS PLAN, LIMIT OF DISTURBANCE AND PERIMETER CONTROLS MUST BE APPROVED BY HOWARD SOIL CONSERVATION DISTRICT PRIOR TO CONSTRUCTION. THIS PLAN MUST BE APPROVED BY MARYLAND DEPARTMENT OF THE ENVIRONMENT AND US ARMY CORPS OF ENGINEERS PRIOR TO CONSTRUCTION. IT IS POSSIBLE THAT THOSE REVIEWS MAY RESULT IN CHANGES THAT WOULD REQUIRE THIS PLAN TO BE REVISED.

FIGURE 2.1: RIPRAP DIAMETER AS A FUNCTION OF STREAM VELOCITY (BASED ON ISHBASH EQUATION)



Sequence of Construction for Intermittent Stream Reconstruction

Day 1: Obtain grading permit. A letter of Authorization from MDE must be obtained prior to disturbances to the stream, floodplain or wetlands for the driveway and stream reconstruction. Stream closure shall be between March 1st and May 31st.

Day 2: Install sediment and erosion control measures at the driveway location and the pond breach.

Day 3-15: With the approval of the sediment control inspector install the storm drain inlets, pipes and outlet protection that divert flow from crossing the driveway (I-1 to E-1 and I-2 to E-2). Install the swales that lead to the inlets and stabilize with matting. Fill for the driveway and filter strip, install sub-base and base course of pavement.

Day 16-20: With the approval of the sediment control inspector install the sandbag diversion and the diversion pipe around the pond. Do not breach the embankment of the pond below the current water level. Install the pump around practice and dewatering basin or filter bag as necessary. Drain the pond.

Day 21-31: Upon the approval of the Howard County Sediment Control Inspector remove non-compactable soil and muck. Salvage material that could be used as the invert of the final channel from the pond bottom if possible. Fill and compact the pond area to the top of channel bank. Maintain and use pumps, dewatering basin and filter bags as necessary. breach the embankment. and remove the existing riser , any low flow pipes and existing principal spillway. Install the rip-rap channel, using the salvaged material to form or clog the channel invert.

Day 32-33: Upon the approval of the Howard County Sediment Control Inspector remove the pump around practice, dewatering basin and filter bags. Remove the sandbag diversion and the pipe diversion of the stream to allow flow in the new stream bed. If necessary fill any areas of the pipe diversion that were cut, return to original grade.

Day 34-35: Upon approval of the Howard County Sediment Control Inspector, remove remaining sediment control devices and stabilize disturbed areas in accordance with the permanent seedbed notes.

NO.	DATE	REVISION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 10-03-18
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 10-2-18

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

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER
8/27/18
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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC,
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

STREAM RECONSTRUCTION DRAINAGE AREA MAP, PLAN AND PROFILE

DATE: AUGUST, 2018	BEI PROJECT NO: 2525		
DESIGN: JC	DRAWN: LDD	SCALE: AS SHOWN	SHEET 13 OF 14

F-18-081

NOTES:
THE FOLLOWING STANDARDS (CONSTRUCTION AND TEMPORARY TRAFFIC CONTROL) ARE REQUIRED FOR THIS PROJECT:

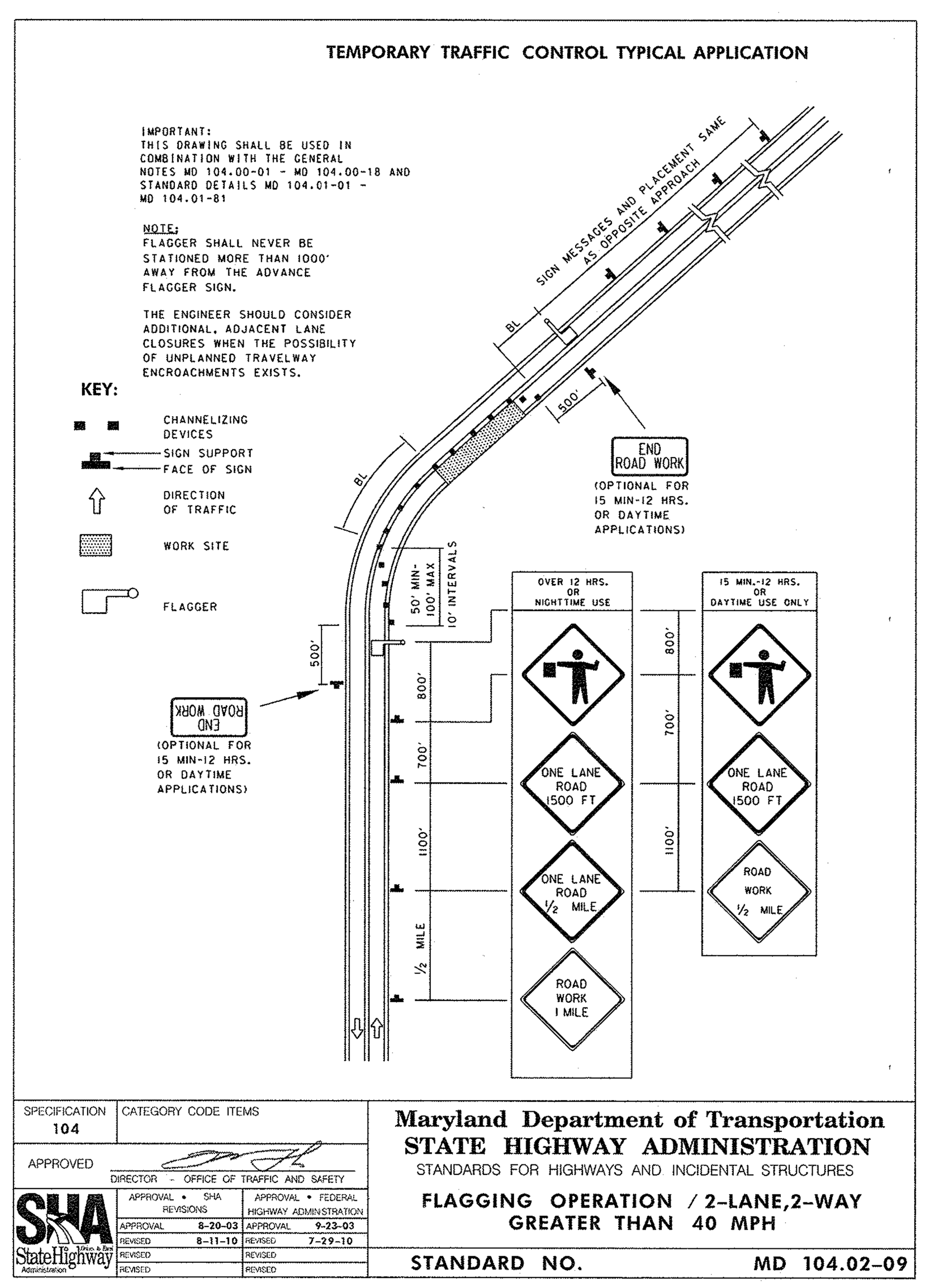
MD 104.02-09 – FLAGGING OPERATION /2-LANE,2-WAY GREATER THAN 40 MPH.
MD 605.13 – TYPE L TRAFFIC BARRIER ANCHORAGE.
MD 605.20 – TRAFFIC BARRIER END TREAMENT

FOR ALL STANDARDS REFERRED TO ON THE PLANS THE CONTRACTOR MUST GO TO THE BOOK OF STANDARDS WHICH WILL HAVE THE MOST CURRENT VERSION. THE BOOK OF STANDARDS CAN BE ACCESS AT: http://apps.roads.maryland.gov/businesswithsha/bizStdsSoecs.desManualStdPub/publicationsonline/ohd/bookstd/index.asp

ALL ITEMS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT VERSION OF THE REFERENCED STANDARDS AT THE TIME OF CONSTRUCTION.

NOTES:

1. OCLARKSVILLE PIKE IS AN URBAN MINOR ARTERIAL RUNNING IN AN NORTH/ SOUTH DIRECTION.
2. THE POSTED SPEED LIMIT ALONG CLARKSVILLE PIKE IS 45 MPH.
3. CONTRACTOR SHALL SAWCUT EXISTING ROAD AT LIMIT OF SHA PAVING PRIOR TO MILL AND OVERLAY.
4. DRAINAGE AREA NORTH OF PROPOSED ENTRANCE FLOWS INTO PROPOSED INLET I-1.
5. DRAINAGE AREA SOUTH OF PROPOSED ENTRANCE FLOWS ALONG THE WEST SIDE OF CLARKSVILLE PIKE TOWARDS EXISTING BOX CULVERT.
6. THERE NO IDENTIFIABLE UNDERGROUND UTILITIES WITHIN THE LIMITS OF SHA PROPOSED ENTRANCE.
7. ALLOWABLE WORK HOURS ALONG MD 108 SHALL BE IN ACCORDANCE WITH THE ACCESS PERMIT.



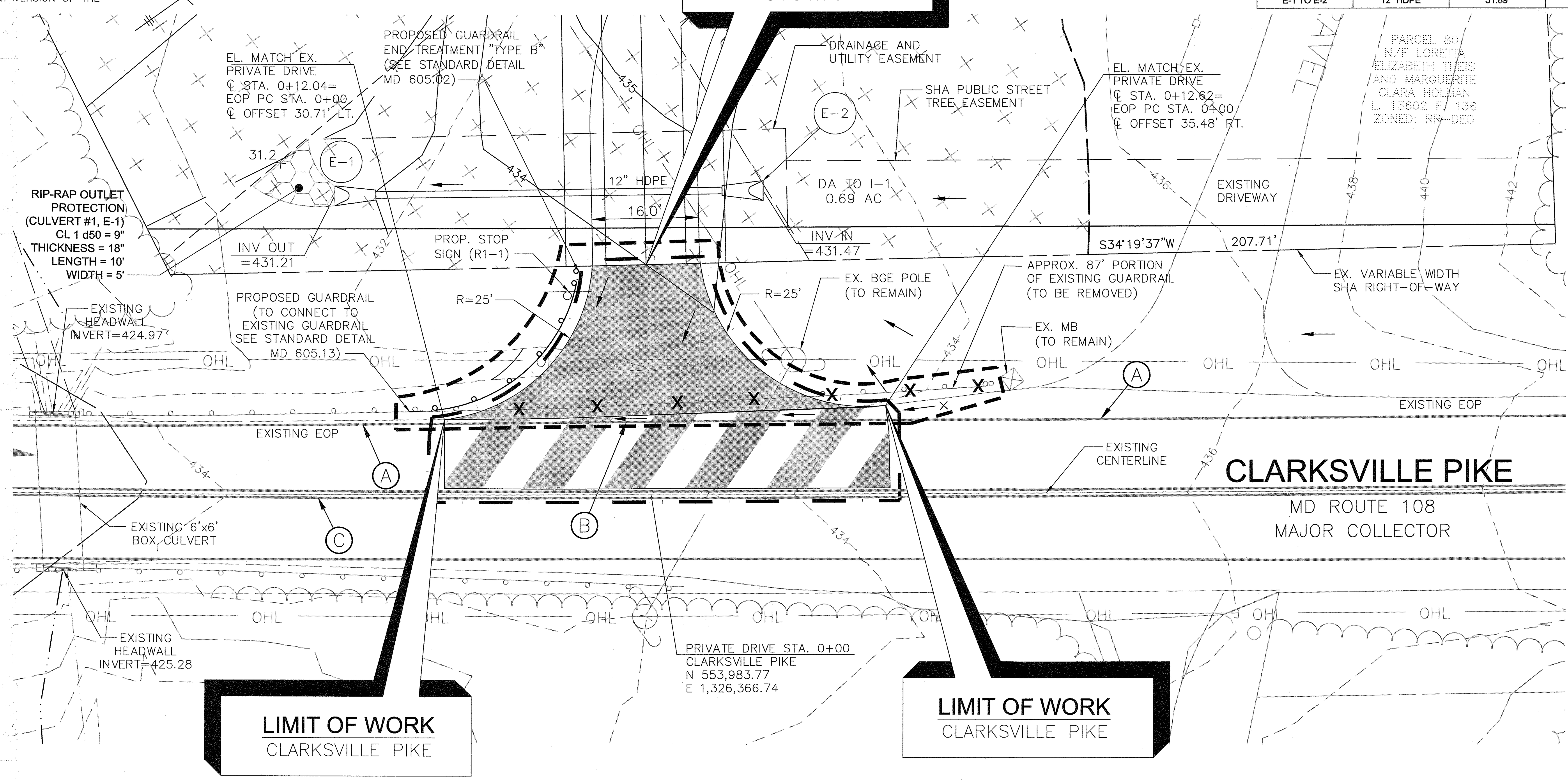
TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION
Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
FLAGGING OPERATION / 2-LANE,2-WAY GREATER THAN 40 MPH
STANDARD NO. MD 104.02-09

NOTE: IN THE EVENT FLAGGING IS REQUIRED REFER TO THE LATEST FLAGGING OPERATION STANDARD DETAIL MD 104.02-10.

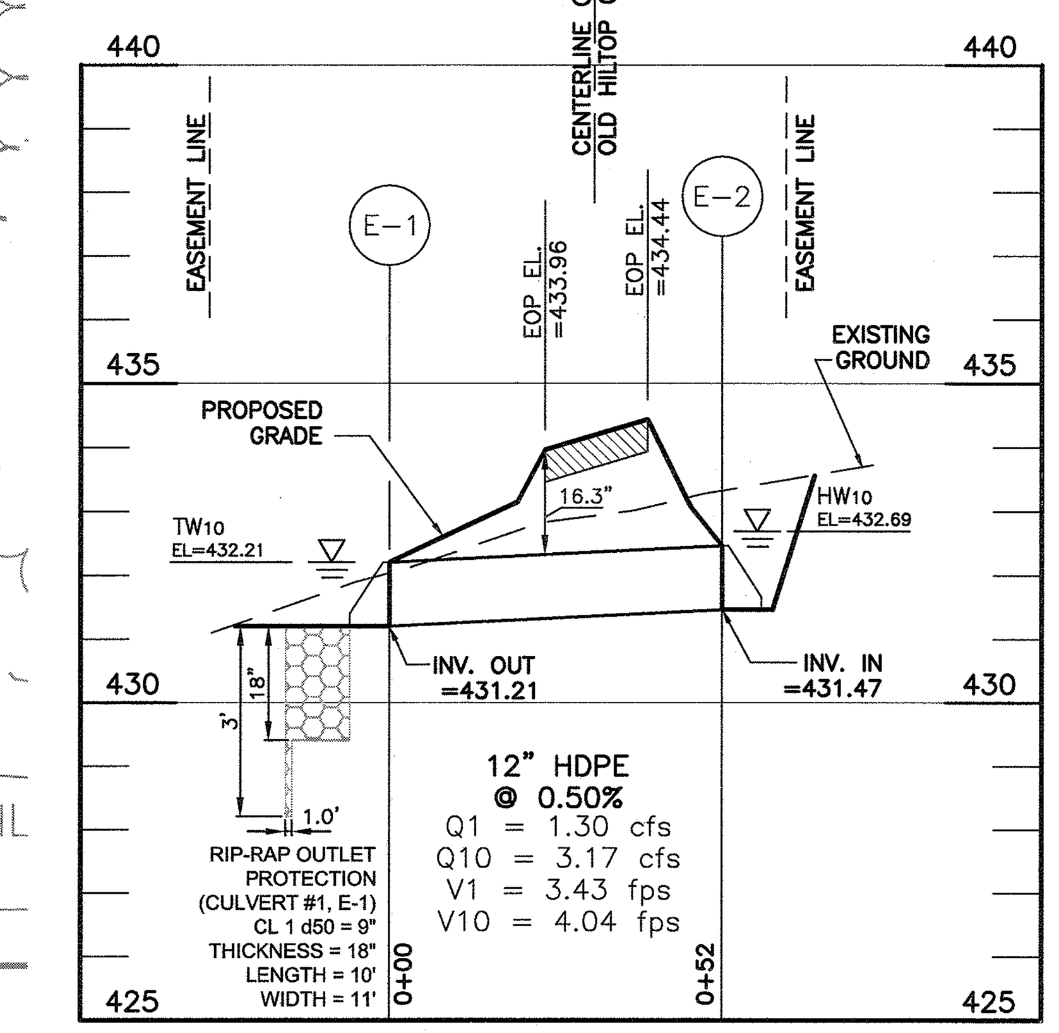
STORM DRAIN STRUCTURE SCHEDULE					
STRUCTURE NO.	TYPE	HO. CO. STD. DETAIL	LOCATION	INVERT IN	INVERT OUT
END SECTION					
E-1	12" HDPE	N/A	N 553,976.54 E 1,326,305.89	-	431.21
E-2	12" HDPE	N/A	N 554,019.10 E 1,326,335.57	431.47	-

PIPE SCHEDULE			
PIPE	SIZE / MAT'L	LENGTH	SLOPE
E-1 TO E-2	12" HDPE	51.89'	0.50%

PAVEMENT MARKING LEGEND	
A —	SOLID WHITE (5" WIDE)
B —	EXISTING PAVEMENT MARKING (TO BE REMOVED)
C —	EXISTING PAVEMENT MARKING (TO REMAIN)



GRID NORTH
LIMIT OF WORK
PRIVATE DRIVE
0+34.76
EL. MATCH EX. PRIVATE DRIVE
℄ STA. 0+12.04=
EOP PC STA. 0+00
℄ OFFSET 30.71' LT.
PROPOSED GUARDRAIL END TREATMENT "TYPE B" (SEE STANDARD DETAIL MD 605.02)
DRAINAGE AND UTILITY EASEMENT
SHA PUBLIC STREET TREE EASEMENT
EL. MATCH EX. PRIVATE DRIVE
℄ STA. 0+12.62=
EOP PC STA. 0+00
℄ OFFSET 35.48' RT.
PARCEL 80
N/F LORETTA
ELIZABETH THEIS
AND MARGUERITE
CLARA HOLMAN
L. 13602 F. 136
ZONED: RR-DEO
RIP-RAP OUTLET PROTECTION
(CULVERT #1, E-1)
CL 1 d50 = 9"
THICKNESS = 18"
LENGTH = 10'
WIDTH = 5'
12" HDPE
16.0'
DA TO I-1
0.69 AC
EXISTING DRIVEWAY
INV OUT =431.21
PROP. STOP SIGN (R1-1)
INV IN =431.47
S34°19'37"W 207.71'
EX. VARIABLE WIDTH SHA RIGHT-OF-WAY
EXISTING HEADWALL INVERT=424.97
PROPOSED GUARDRAIL (TO CONNECT TO EXISTING GUARDRAIL SEE STANDARD DETAIL MD 605.13)
R=25'
R=25'
EX. BGE POLE (TO REMAIN)
APPROX. 87' PORTION OF EXISTING GUARDRAIL (TO BE REMOVED)
EX. MB (TO REMAIN)
OHL
EXISTING EOP
EXISTING EOP
EXISTING CENTERLINE
CLARKSVILLE PIKE
MD ROUTE 108
MAJOR COLLECTOR
EXISTING 6'x6' BOX CULVERT
EXISTING HEADWALL INVERT=425.28
PRIVATE DRIVE STA. 0+00
CLARKSVILLE PIKE
N 553,983.77
E 1,326,366.74
LIMIT OF WORK
CLARKSVILLE PIKE
LIMIT OF WORK
CLARKSVILLE PIKE



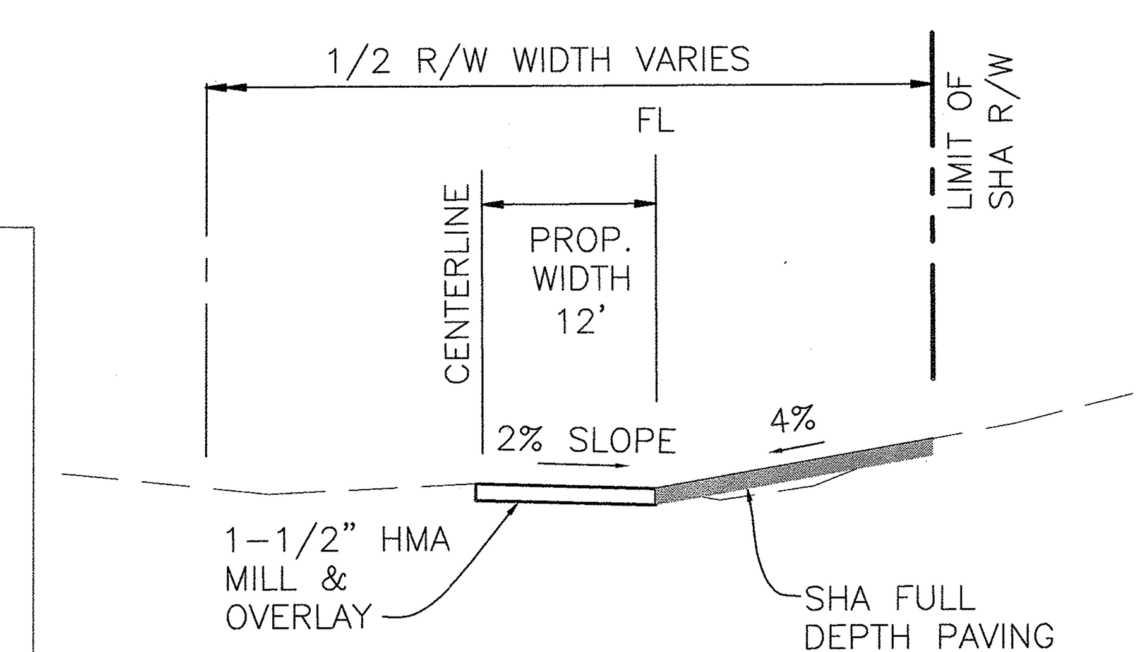
440
435
430
425
EASEMENT LINE
CENTERLINE OF OLD HILLTOP CT.
EASEMENT LINE
EOP EL. =433.96
EOP EL. =434.44
PROPOSED GRADE
EXISTING GROUND
TW10 EL=432.21
HW10 EL=432.69
16.3"
INV. OUT =431.21
INV. IN =431.47
12" HDPE
@ 0.50%
Q1 = 1.30 cfs
Q10 = 3.17 cfs
V1 = 3.43 fps
V10 = 4.04 fps
RIP-RAP OUTLET PROTECTION (CULVERT #1, E-1)
CL 1 d50 = 9"
THICKNESS = 18"
LENGTH = 10'
WIDTH = 11'
0+00
0+52

CULVERT 1
SCALE: 1"=30' (H) 1"=3' (V)

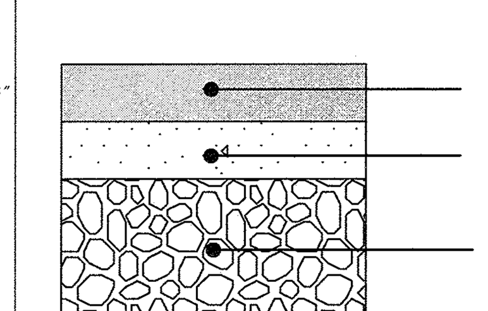
NOTE: SEE DRAINAGE MAP SHEET 1 OF 1 FOR DRAINAGE AREA TO CULVERT #1

LEGEND

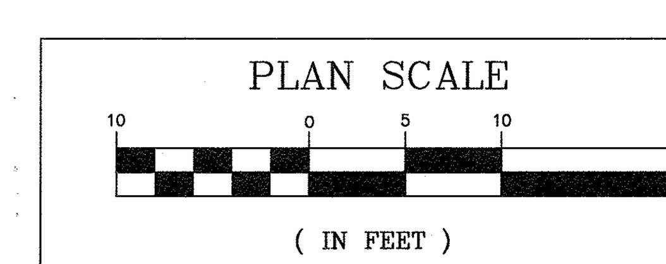
- PAVEMENT FULL DEPTH
- MILL & OVERLAY/ WEDGE & LEVEL
- SHA LIMIT OF PAVING
- SHA STD. NO. MD 605.13 TYPE L TRAFFIC BARRIER END TREATMENT
- SHA LIMIT OF DISTURBANCE
- FLOW ARROWS

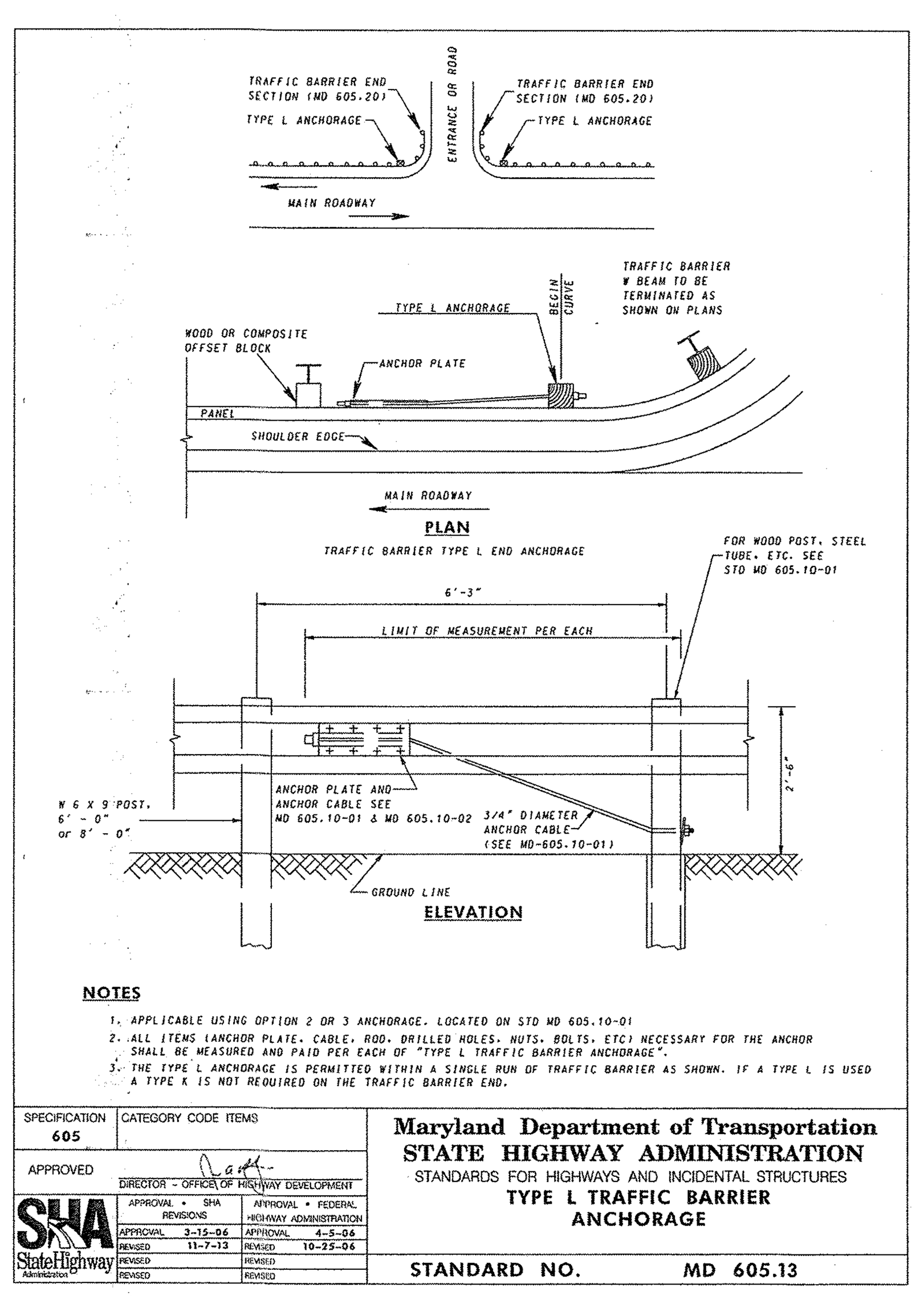


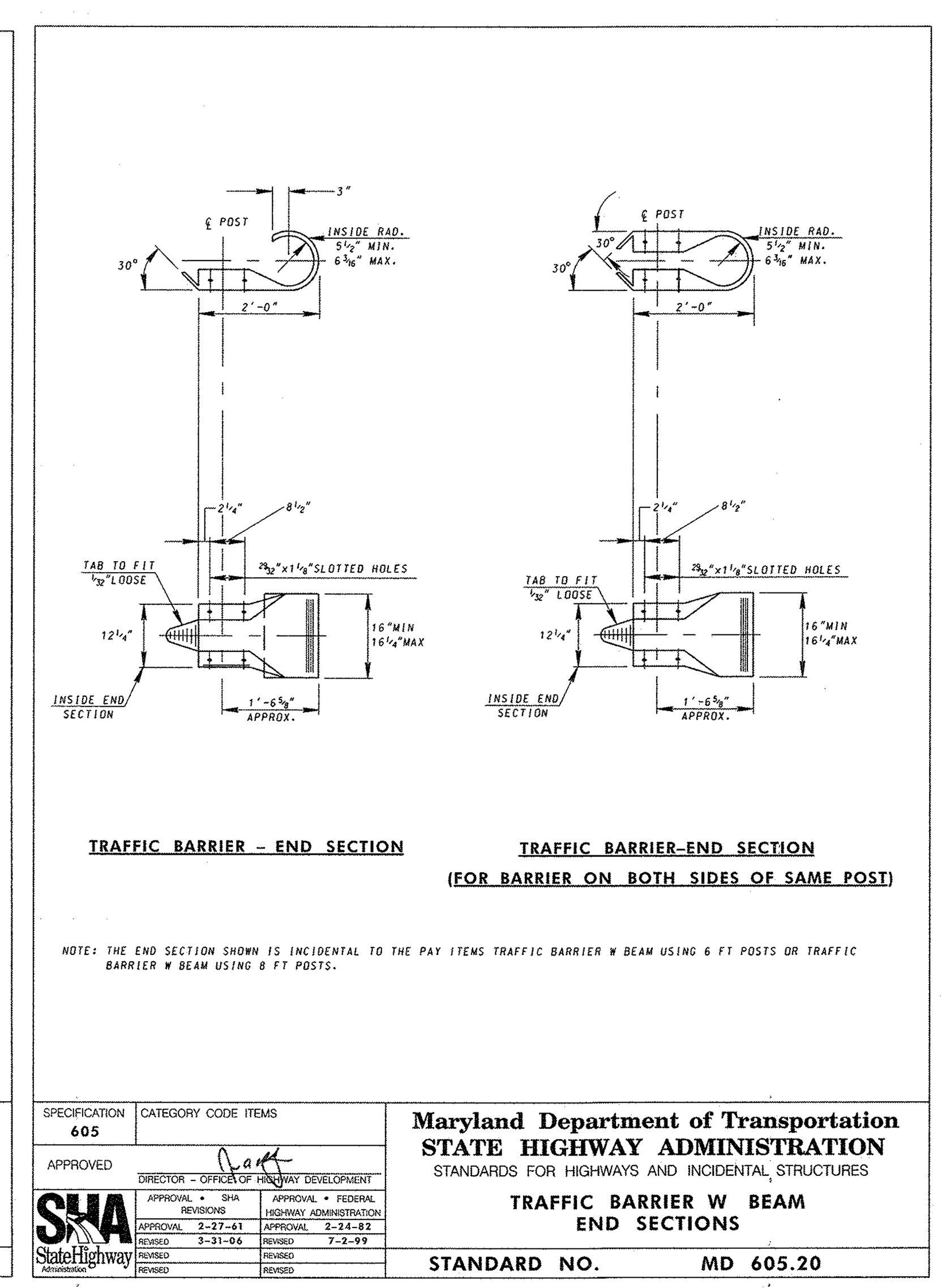
TYPICAL ROADWAY SECTION
MD-108 (CLARKSVILLE PIKE)
MAJOR COLLECTOR-POSTED SPEED: 45 MPH
NOT TO SCALE



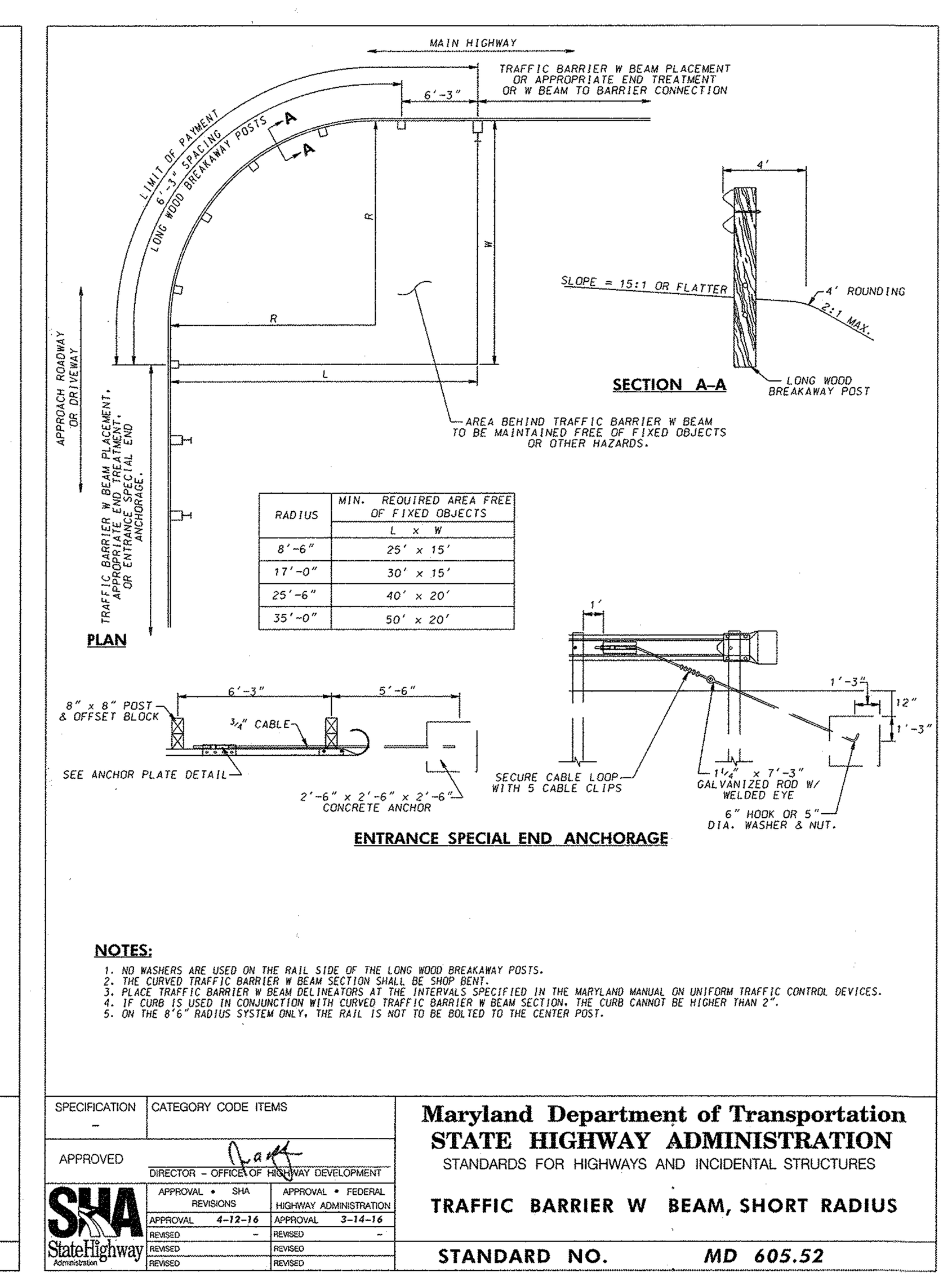
FULL DEPTH PAVING DETAIL
NOT TO SCALE







TRAFFIC BARRIER - END SECTION
TRAFFIC BARRIER-END SECTION
(FOR BARRIER ON BOTH SIDES OF SAME POST)
Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
TRAFFIC BARRIER W BEAM END SECTIONS
STANDARD NO. MD 605.20



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION (signature)	10.2.18 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT (signature)	10-03-18 DATE

NO.	DATE	REVISION

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

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER — 10/1/18

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.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC,
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1-4 USE NORTHERN ENTRANCE
LOTS 5-9 USE SOUTHERN ENTRANCE

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

STATE HIGHWAY ACCESS PERMIT ENTRANCE PLAN

DESIGN: JC	DRAWN: LDD	DATE: AUGUST, 2018	BEI PROJECT NO: 2525
		SCALE: AS SHOWN	SHEET 14 OF 14

NOTES:
THE FOLLOWING STANDARDS (CONSTRUCTION AND TEMPORARY TRAFFIC CONTROL) ARE REQUIRED FOR THIS PROJECT:
MD 104.02-09 – FLAGGING OPERATION /2-LANE,2-WAY GREATER THAN 40 MPH.
MD 605.13 – TYPE L TRAFFIC BARRIER ANCHORAGE.
MD 605.20 – TRAFFIC BARRIER END TREAMENT

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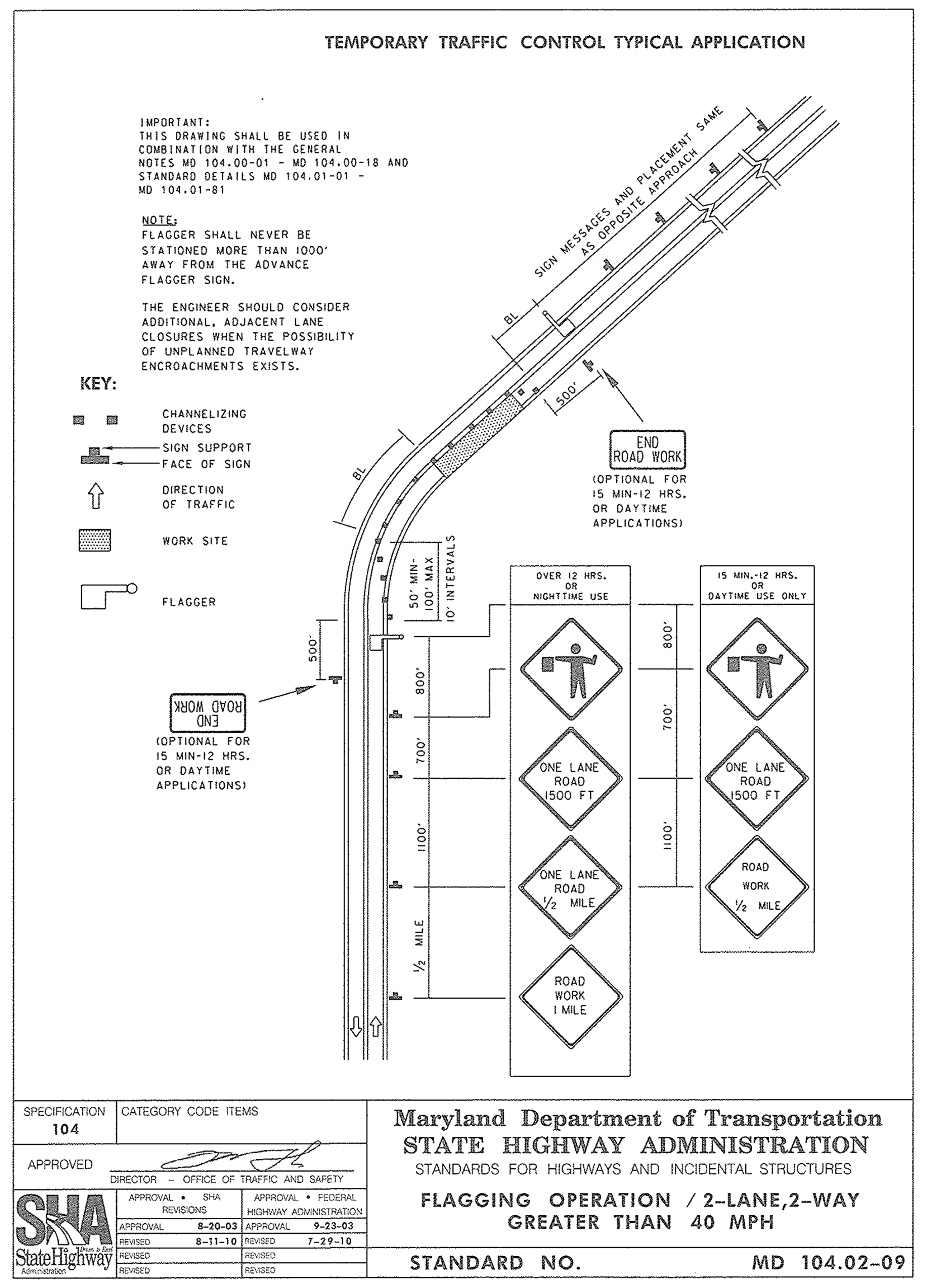
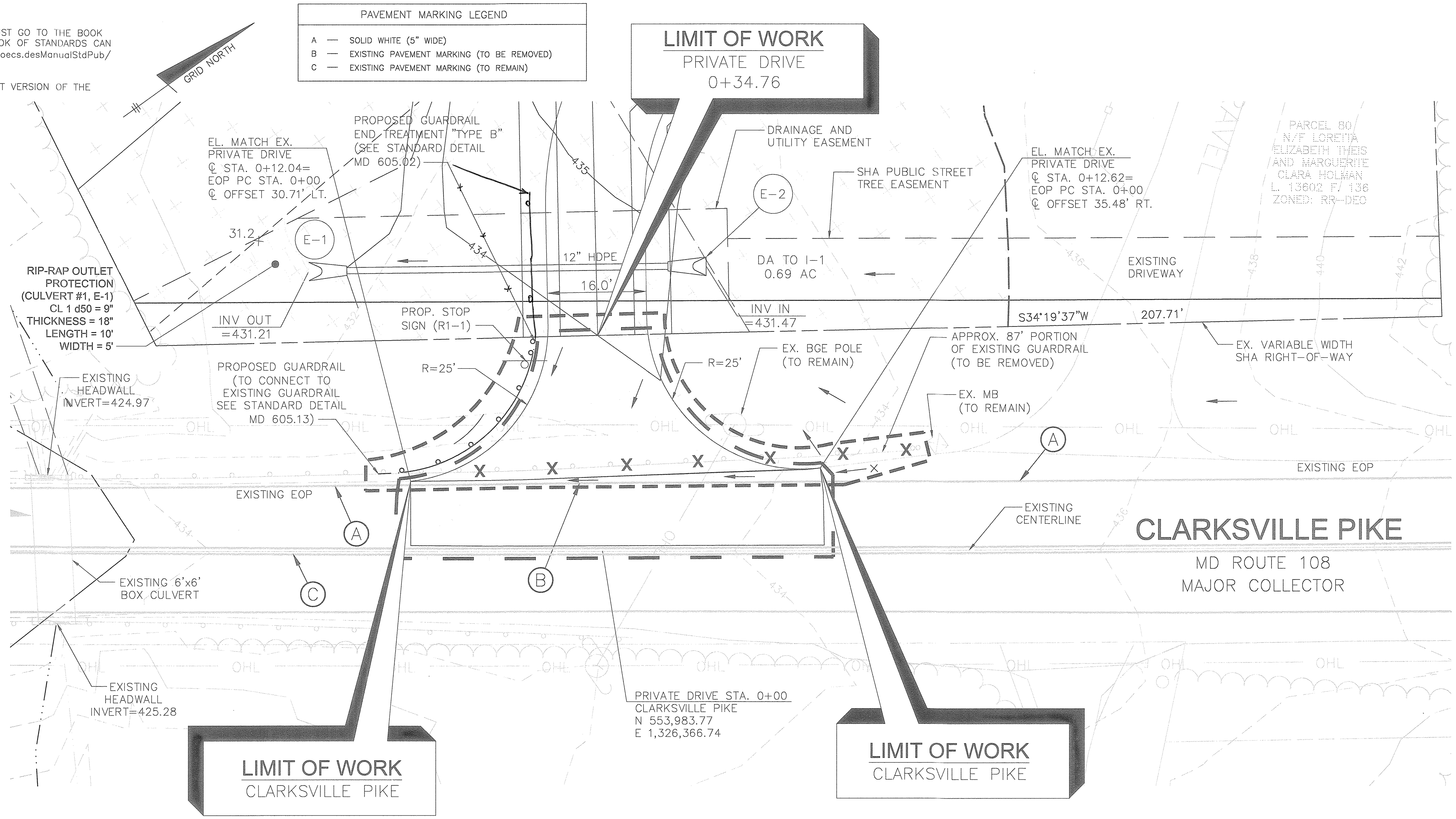


TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION
Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
FLAGGING OPERATION / 2-LANE,2-WAY GREATER THAN 40 MPH
STANDARD NO. MD 104.02-09

NOTE: IN THE EVENT FLAGGING IS REQUIRED REFER TO THE LATEST FLAGGING OPERATION STANDARD DETAIL MD 104.02-10.

PAVEMENT MARKING LEGEND
A — SOLID WHITE (5" WIDE)
B — EXISTING PAVEMENT MARKING (TO BE REMOVED)
C — EXISTING PAVEMENT MARKING (TO REMAIN)



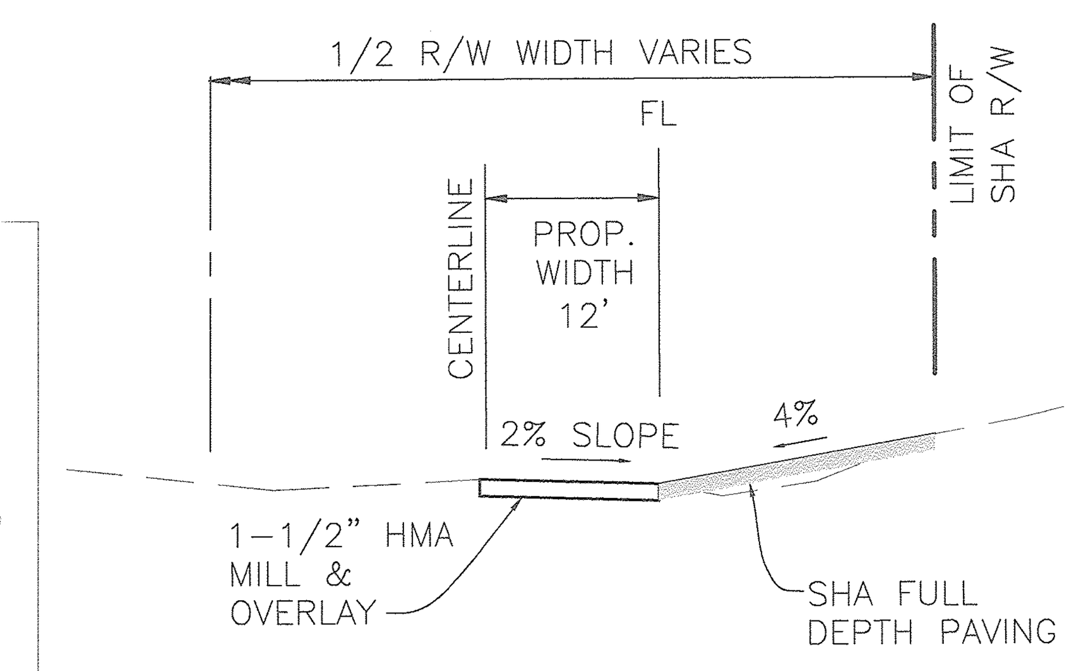
GRID NORTH
LIMIT OF WORK
PRIVATE DRIVE
0+34.76
EL. MATCH EX. PRIVATE DRIVE
℄ STA. 0+12.04= EOP PC STA. 0+00
℄ OFFSET 30.71' LT.
PROPOSED GUARDRAIL END TREATMENT "TYPE B" (SEE STANDARD DETAIL MD 605.02)
DRAINAGE AND UTILITY EASEMENT
SHA PUBLIC STREET TREE EASEMENT
EL. MATCH EX. PRIVATE DRIVE
℄ STA. 0+12.62= EOP PC STA. 0+00
℄ OFFSET 35.48' RT.
PARCEL 80 N/F LORETTA ELIZABETH THEIS AND MARGUERITE CLARA HOLMAN L. 13602 F. 136 ZONED: RR-DEO
E-1
E-2
12" HDPE
16.0'
DA TO I-1 0.69 AC
EXISTING DRIVEWAY
RIP-RAP OUTLET PROTECTION (CULVERT #1, E-1) CL 1 d50 = 9" THICKNESS = 18" LENGTH = 10' WIDTH = 5'
INV OUT =431.21
PROP. STOP SIGN (R1-1)
INV IN =431.47
S34°19'37"W 207.71'
APPROX. 87' PORTION OF EXISTING GUARDRAIL (TO BE REMOVED)
EX. VARIABLE WIDTH SHA RIGHT-OF-WAY
EXISTING HEADWALL INVERT=424.97
PROPOSED GUARDRAIL (TO CONNECT TO EXISTING GUARDRAIL SEE STANDARD DETAIL MD 605.13)
R=25'
R=25'
EX. BGE POLE (TO REMAIN)
EX. MB (TO REMAIN)
EXISTING EOP
EXISTING EOP
EXISTING CENTERLINE
CLARKSVILLE PIKE
MD ROUTE 108
MAJOR COLLECTOR
EXISTING 6'x6' BOX CULVERT
EXISTING HEADWALL INVERT=425.28
PRIVATE DRIVE STA. 0+00 CLARKSVILLE PIKE N 553,983.77 E 1,326,366.74
LIMIT OF WORK
CLARKSVILLE PIKE
LIMIT OF WORK
CLARKSVILLE PIKE

NOTE: SEE STORM DRAIN PROFILE SHEET 6 OF 15 FOR STORM DRAIN DESIGN

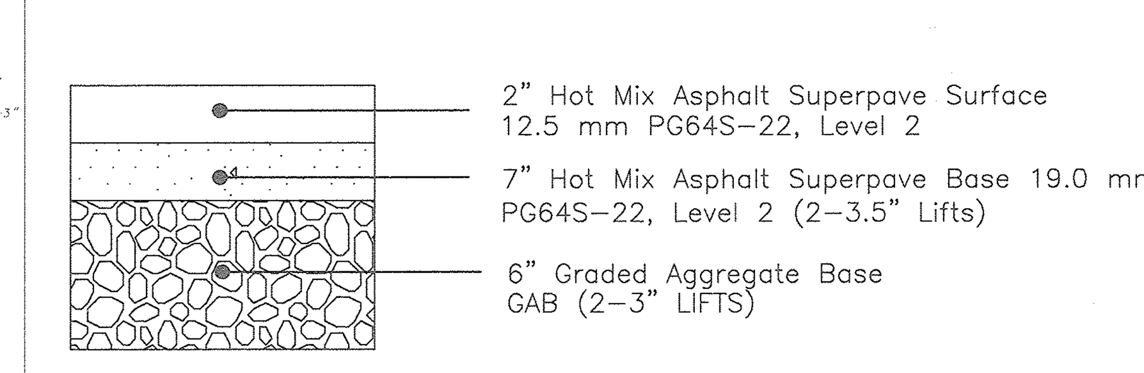
NOTE: SEE DRAINAGE MAP SHEET 1 OF 1 FOR DRAINAGE AREA TO CULVERT #1

LEGEND

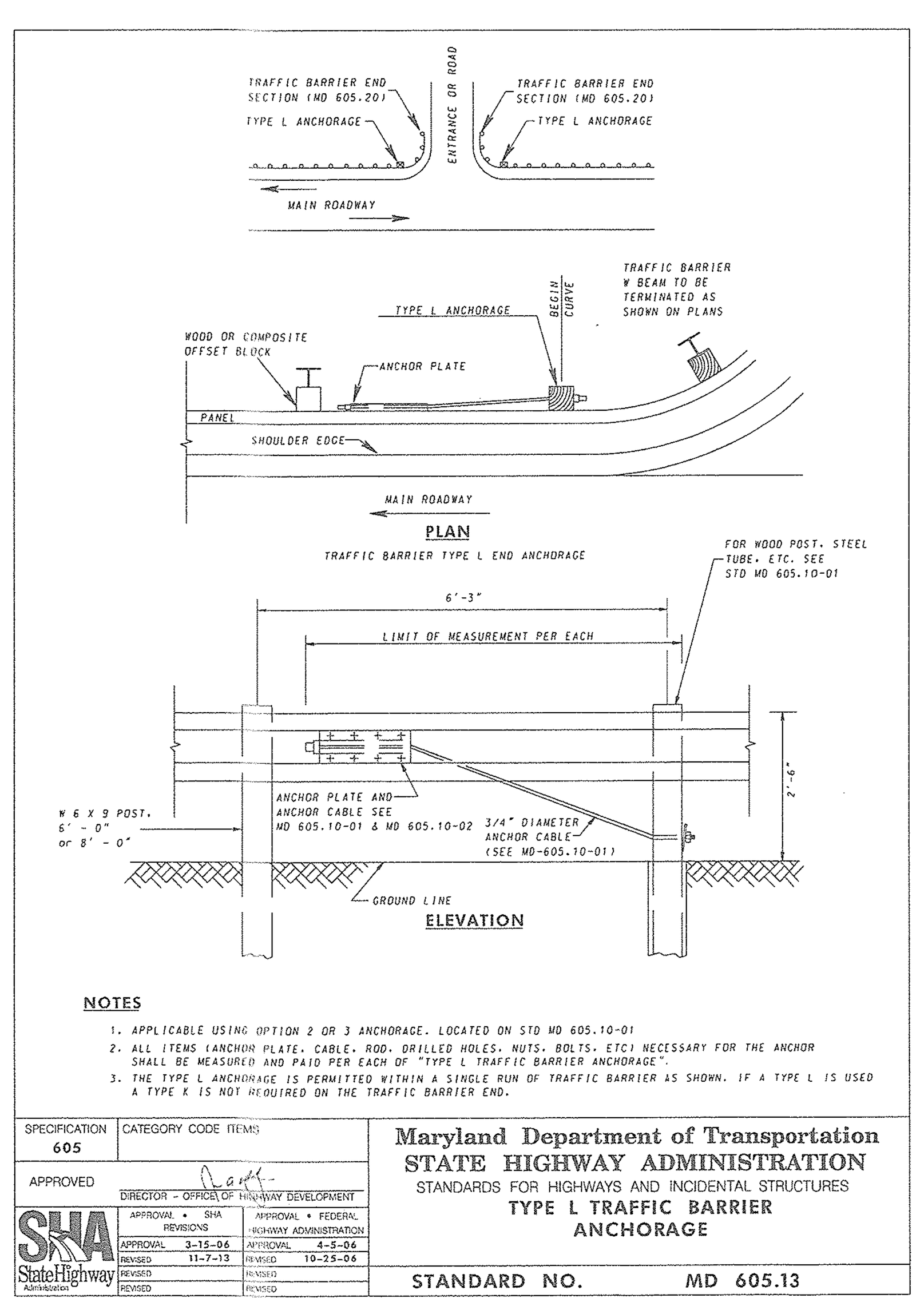
- PAVEMENT FULL DEPTH
- MILL & OVERLAY/ WEDGE & LEVEL
- SHA LIMIT OF PAVING
- SHA STD. NO. MD 605.13 TYPE L TRAFFIC BARRIER END TREATMENT
- SHA LIMIT OF DISTURBANCE
- FLOW ARROWS

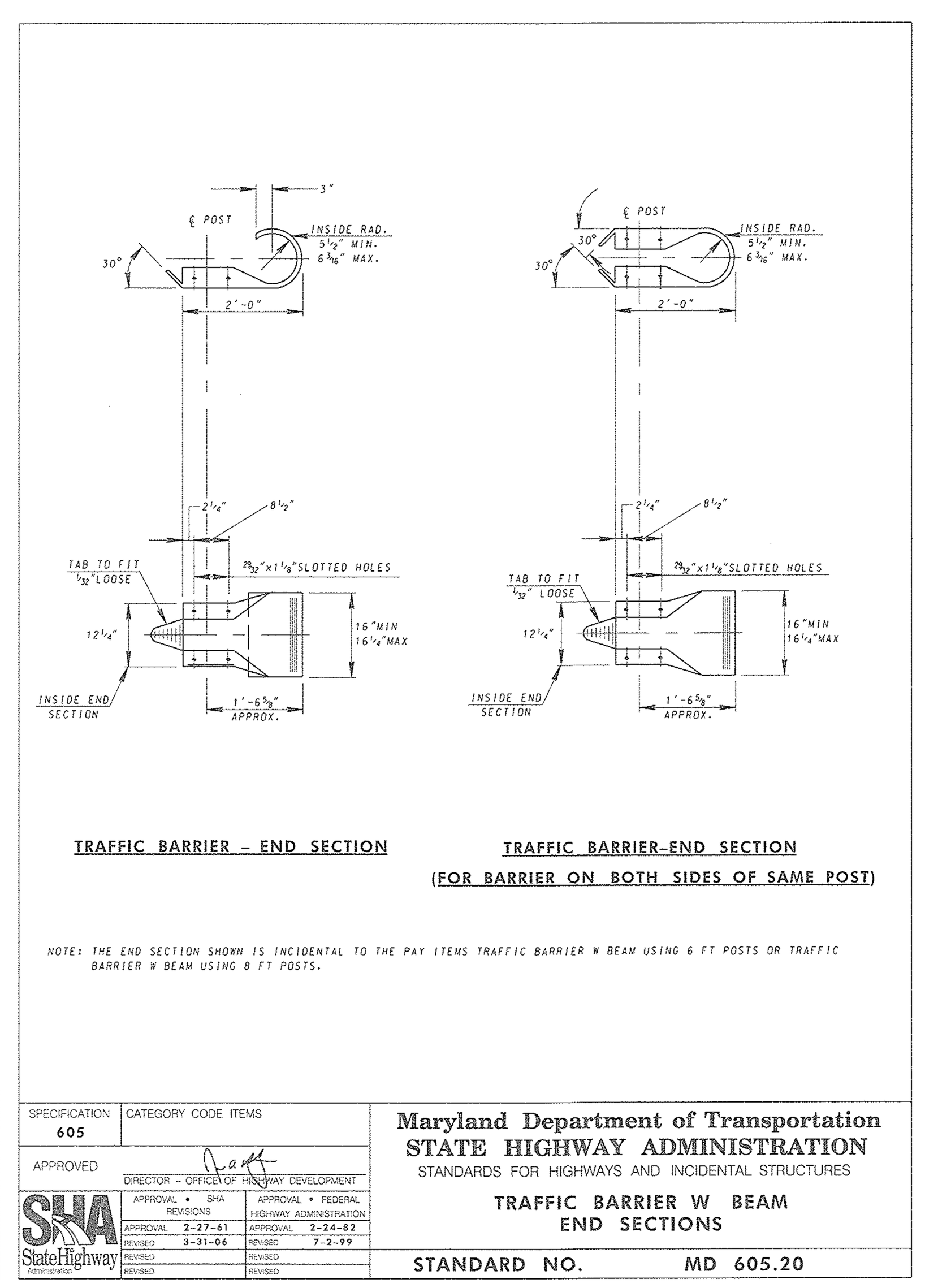


TYPICAL ROADWAY SECTION
MD-108 (CLARKSVILLE PIKE)
MAJOR COLLECTOR-POSTED SPEED: 45 MPH
NOT TO SCALE

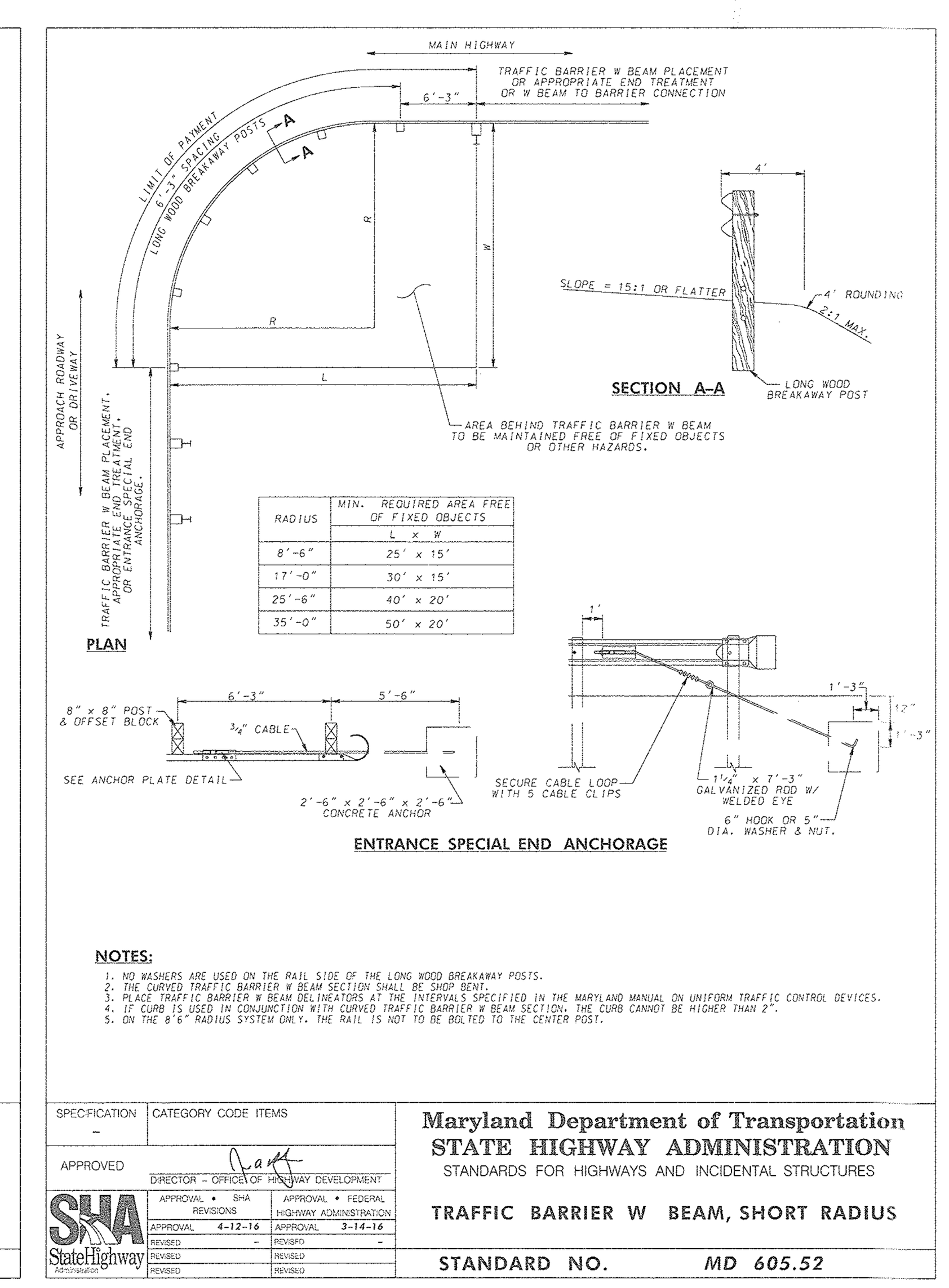


FULL DEPTH PAVING DETAIL
NOT TO SCALE





TRAFFIC BARRIER - END SECTION
TRAFFIC BARRIER-END SECTION (FOR BARRIER ON BOTH SIDES OF SAME POST)
Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
TRAFFIC BARRIER W BEAM END SECTIONS
STANDARD NO. MD 605.20



PLAN SCALE
10 0 5 10 20
(IN FEET)
1 inch = 10 ft.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 5-31-19 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT — 6-3-19 DATE

NO.	DATE	REVISION
1	4/24/19	Revise sheets in set, move S.D. profile to Sheet 6.

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. 43577, Expiration Date: 06-08-2020.

OWNER:
CLARKSVILLE NL LLC
C/O H&H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE 100
ELKRIDGE, MD 21075
410-579-2442

DEVELOPER:
ROCK REALTY, INC.
C/O H & H ROCK COMPANIES
6800 DEERPATH ROAD
SUITE #100
ELKRIDGE, MARYLAND 21075
410-579-2442

CLARKSVILLE CROSSING
LOTS 1 THRU 4

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

REVISED SUPPLEMENTAL PLAN
STATE HIGHWAY ACCESS PERMIT ENTRANCE PLAN

DATE:	APRIL, 2019	BEI PROJECT NO:	2525
SCALE:	AS SHOWN	SHEET	15 OF 15

DESIGN: JC DRAWN: LDD

F-18-081

J:\2525 Clarksville Crossing\dwg\1032v4.dwg, 4/23/2019 4:17:03 PM, jcarney