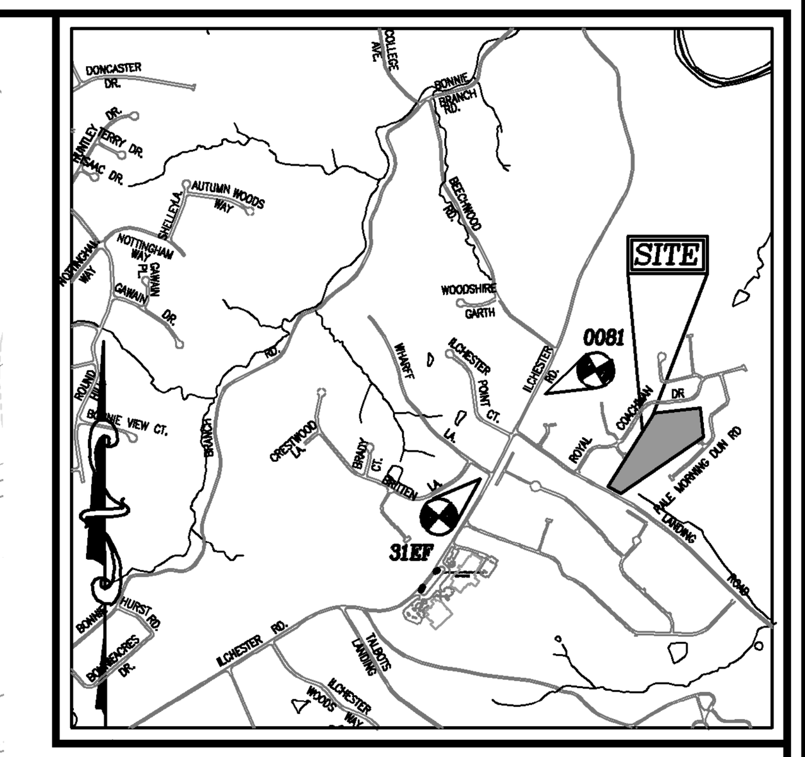


VICINITY MAP
SCALE: 1"=2,000'
ADC MAP COORDINATE: MAP 28, GRID 5E

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING UTILITY POLE
- EXISTING 10' CONTOUR (330)
- EXISTING 2' CONTOUR (328)
- EXISTING TREELINE
- CENTERLINE OF EXISTING STREAM
- EXISTING SPECIMEN TREE TO REMAIN
- EXISTING WETLANDS
- PROPOSED SIDEWALK
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED 10' CONTOUR (430)
- PROPOSED 2' CONTOUR (432)
- PROPOSED MICRO-BIORETENTION FACILITY
- PROPOSED STREET LIGHT
- PROPOSED STREET SIGN

CASCADE RIDGE ZONED R-ED
HOWATD COUNTY PLANNING BOARD EXHIBIT
HOWATD COUNTY ZONING REGULATIONS SECTION 107.0.F

SCALE: 1"=50'

50' 0 50' 100' 150'

OWNER/DEVELOPER
JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869-0134

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN

PLANNING BOARD EXHIBIT

CASCADE RIDGE

LOTS 1-18 AND OPEN SPACE LOTS 19 & 20
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075

PARCEL: 474
TAX MAP: 31 GRID: 11
1ST ELECTION DISTRICT

ZONED: R-ED
L. 362 / F. 260
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
+
TIMMONS GROUP
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
P: 410.461.7666 F: 410.461.8961 www.timmons.com

STATE OF MARYLAND – ROBERT HARRIS VOGEL – NO.16193 REGISTERED – PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: KG
CHECKED BY: RHV
DATE: MARCH 2021
SCALE: AS SHOWN
W.O. NO.: 42148

PROFESSIONAL CERTIFICATE

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. 16193 EXPIRATION DATE: 09-27-2022

SHEET 1 OF 1

SP-19-004

PRELIMINARY EQUIVALENT SKETCH PLAN

CASCADE RIDGE

LOTS 1-16 AND OPEN SPACE LOTS 17 - 19

PARCEL 474 (L. 362 / F. 260)
7330 GREEN DRAKE RD
ELKRIDGE, MD 21075

GENERAL NOTES

1. PROJECT BACKGROUND:
   SUBDIVISION NAME: CASCADE RIDGE
   - TAX MAP 31 GRID 11
   - SECTION/AREA N/A
   - LOT/PARCEL P. 474
   - ZONING R-ED
   - ZB/BA REFERENCE N/A
   - ELECTION DISTRICT 1ST
   - TOTAL TRACT AREA 9.09 ACRES
   - SECTION/AREA N/A
   - NUMBER OF PROPOSED LOTS 16 SFD / 3 O.S.
   - NET AREA OF PROJECT 8.722 ACRES
   - AREA OF PROPOSED SFD 2.56 ACRES
   - AREA OF PROPOSED SFA 0 ACRES
   - AREA OF R/W DEDICATION 0.11 ACRES (LANDING ROAD)
   - AREA OF PROPOSED ROAD R/W 1.04 ACRES
   - OPEN SPACE REQ. 4.54 ACRES (SEE NOTE 23)
   - OPEN SPACE PROVIDED 5.38 ACRES (SEE TABULATION)
   - MAX. PERMITTED DENSITY 2 DWELLING UNITS PER NET ACRE = 2*8.722 ACRES = 17 DWELLING UNITS
   - PUBLIC WATER & SEWER WATER CONTRACT NO. 14-4080-D SEWER CONTRACT NO. 14-4080-D
   - DPZ REF.'S ECP-19-051, HPC-19-35, WP-20-036
2. THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
3. THE SUBJECT PROPERTY IS ZONED R-ED IN ACCORDANCE WITH THE OCT. 06, 2013 ZONING REGULATIONS, AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNCIL BILL 75-2003.
4. THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A FIELD RUN SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING+TIMMONS GROUP INC., DATED JANUARY 2019.
5. THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING+TIMMONS GROUP, INC., DATED JANUARY 2019.
6. SOIL TYPES SHOWN HEREON ARE IN ACCORDANCE WITH THE WEB SOIL SURVEY HOWARD COUNTY, MARYLAND AND HOWARD COUNTY SOIL CONSERVATION DISTRICT DOCUMENTS.
7. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 31EF AND 0081 WERE USED FOR THIS PROJECT.
8. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, STREAM(S) OR THEIR REQUIRED BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN.
9. THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
   -WATER FOR THIS PROJECT IS TO BE PUBLIC EXTENSIONS OF CONTRACT NO. 14-4080-D.
   -SEWER FOR THIS PROJECT IS TO BE PUBLIC EXTENSIONS OF CONTRACT NO. 14-4080-D.
10. EXISTING UTILITIES LOCATED FROM TOPOGRAPHIC SURVEY AND AS-BUILT DRAWINGS. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE.
11. STEEP SLOPES 15% AND GREATER ARE LOCATED AND SHOWN HEREON.
12. THE FOLLOWING ENVIRONMENTAL FEATURES ARE LOCATED ON OPEN SPACE LOT 19.
    -THERE ARE WETLANDS, STREAMS AND THEIR BUFFERS ONSITE.
    -WETLANDS, STREAMS OR THEIR REQUIRED BUFFERS SHOWN ONSITE ARE BASED ON ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, FEBRUARY 2019.
13. THE FOREST STAND DELINEATION PLAN PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, MARCH 2019 IS CERTIFIED HEREON BY MYRA BROSIUS - CERTIFIED ARBORIST.
14. FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL A PORTION OF THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, THE FOREST CONSERVATION MANUAL AND CB-62-2019.
    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.
    THE FOREST CONSERVATION OBLIGATION TO BE FULFILLED BY:
    a. 3.56 ACRES (3.29 AC. CREDITED) OF FOREST RETENTION (NO SURETY REQUIRED)
    b. 0.7 ACRES OF REFORESTATION VIA PURCHASE IN AN ESTABLISHED APPROVED FOREST BANK WITHIN THE WATERSHED.
    c. FOREST BANK TO BE DETERMINED UNDER FINAL PLAN.
15. -LANDING ROAD IS CLASSIFIED AS A MINOR COLLECTOR AND A SCENIC ROAD. NO IMPROVEMENTS ARE PROPOSED. GREEN DRAKE ROAD IS CLASSIFIED AS A 40' R/W ACCESS PLACE (F03-134). THE PROPOSED EXTENSIONS OF GREEN DRAKE ROAD SHALL CONFORM WITH GUIDELINES WITHIN THE HOWARD COUNTY DESIGN MANUAL VOLUME 3 / ACCESS STREET.
    -A 100 FOOT CONTINUOUS VEGETATED BUFFER SHALL BE MAINTAINED BETWEEN LANDING ROAD AND THE SUBDIVISION TO PRESERVE OR ENHANCE THE VISUAL CHARACTER OF THE ROAD, PER SECTION 16.125(C)(2) OF THE SUBDIVISION REGULATIONS.
16. DRIVEWAY(S) SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS
    A) WIDTH- 12 FEET (16 FEET SERVING MORE THAN ONE RESIDENCE).
    B) SURFACE - 6 INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING. (1-½ MIN)
    C) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% CHANGE AND MINIMUM OF 45-FOOT DEPTH TURNING RADIUS.
    D) STRUCTURES (CULVERT/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).
    E) DRAINAGE ELEMENTS-CAPABLE OF SAFELY PASSING 100-YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY SURFACE.
    F) STRUCTURE CLEARANCES-MINIMUM 12 FEET.
    G) MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE.
17. IN ACCORDANCE WITH THE HOWARD COUNTY - VOLUME III DESIGN MANUAL - ROADS AND BRIDGES, SECTION 4.3.C.; NO INTERSECTIONS OF MAJOR COLLECTOR OR HIGHER CLASSIFICATION ROADS ARE WITHIN A 1.5 MILE TRAVEL DISTANCE FROM THE SITE, THIS DEVELOPMENT SATISFIES HOWARD COUNTY ADEQUATE ROAD FACILITY TEST EVALUATION REQUIREMENTS. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
18. IN ACCORDANCE WITH THE HOWARD COUNTY - VOLUME III DESIGN MANUAL - ROADS AND BRIDGES, SECTION 5.2.F.2, A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
19. THE HISTORIC PRESERVATION COMMISSION (HPC) MEETING HPC-19-35 WAS HELD ON JULY 11, 2019 FOR ADVISORY COMMENTS FOR SUBDIVISION AND DEMOLITION. SECTION 16.118 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS DOES NOT APPLY AS THE SITE IS NOT LISTED ON THE HOWARD COUNTY HISTORIC SITE INVENTORY. HPC COMMENTED "...THE HOUSE IN QUESTION WAS NOT AN ARCHITECTURAL SPECIMEN AND IT WAS NOT ON THE HOWARD COUNTY HISTORIC SITE INVENTORY." THE COMMISSION HAD NO FURTHER COMMENTS.
20. TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS / CEMETERIES LOCATED ON THIS PROPERTY. THE EXISTING HOME (1904 SDAT) IS CLASSIFIED AS A HISTORIC STRUCTURES. THE EXISTING HOME AND GARAGE ARE TO BE REMOVED.
    - ANY WELL AND/OR SEPTIC SYSTEM SERVING THE EXISTING HOUSE MUST BE PROPERLY ABANDONED WITH DOCUMENTATION SUBMITTED TO THE HEALTH DEPARTMENT PRIOR TO HEALTH SIGNATURE OF THE FINAL RECORD PLAT.
21. THE OFFICIAL PRE-SUBMISSION COMMUNITY MEETING WAS HELD FOR THIS PROJECT AT THE PHELPS LUCK NEIGHBORHOOD CENTER ON FEBRUARY 15, 2019 AT 6:00PM.
22. AN ENVIRONMENTAL CONCEPT PLAN (ECP-19-051) WAS APPROVED ON NOVEMBER 7, 2019.
23. IN ACCORDANCE WITH SECTION 16.121(A)(2) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, THE OPEN SPACE REQUIREMENTS FOR THIS R-ED PROJECT (6,000 SF MIN LOT SIZE) IS 50% OF GROSS AREA (9.085 AC. GROSS AREA x 50% = 4.54 AC.+/-).
24. IN ACCORDANCE WITH SECTION 16.121(A)(4) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, RECREATION OPEN SPACE FOR THIS R-ED PROJECT IS 300 SF / UNIT (16 X 300 = 4,800 SF) OF LAND AREA.
25. THE PROPOSED UNITS SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
26. STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE M-2 SUBMERGED GRAVEL WETLAND, M-6 MICRO-BIORETENTION, M-8 BIOSWALES, AND M-5 DRY WELLS. ON LOT THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED. MICRO-SCALE FACILITIES MANAGING ROAD RUNOFF SHALL BE DESIGNATED AS A PRIVATELY OWNED AND JOINTLY MAINTAINED FACILITIES (H.O.A. AND HOWARD COUNTY); HOWARD COUNTY WILL MAINTAIN OUTLET STRUCTURES AND PIPES WHILE THE H.O.A. SHALL MAINTAIN MULCH, WEEDING, PLANTINGS, PERFORATED UNDERDRAINS, FEEDER PIPES, AND ROUTINE SOIL REPLACEMENT.
27. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
    A FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED AS PART OF THE FINAL PLAN DEVELOPER'S AGREEMENT IN THE AMOUNT OF $ 10,350 FOR THE REQUIRED 21 SHADE TREES, 6 REPLACEMENT SPECIMEN TREES AND 15 EVERGREEN TREES. SURETY IS NOT REQUIRED FOR EXISTING TREES USED FOR CREDIT.
28. PUBLIC STREET TREES ARE PROVIDED FOR THIS PROJECT IN ACCORDANCE WITH SECTION 16.124(E)(1) OF THE SUBDIVISION REGULATIONS AND THE LANDSCAPE MANUAL. FINANCIAL SURETY IN THE AMOUNT OF $ 13,800 ($300 PER STREET TREE) WILL BE POSTED AS PART OF THE FINAL PLAN DEVELOPER'S AGREEMENT FOR THE REQUIRED 46 STREET TREES.
29. A TEST PIT REPORT FOR THIS PROJECT WAS PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED FEBRUARY 2019.
30. - IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL - VOLUME 3, CHAPTER 2 - SECTION 2.9.B. PARKING IS REQUIRED AT 2.5 SPACES PER UNIT. OFF STREET PARKING TO INCLUDE GARAGE SPACES, DRIVEWAY, PARKING PADS AND COURTS. GARAGES COUNT AS TWO SPACES. SEE TABULATION THIS SHEET.
    THE H.O.A SHALL BE RESPONSIBLE FOR ENFORCING THE PARKING REQUIREMENTS ON EACH RESIDENTIAL LOT. THE GARAGE SPACES SHALL REMAIN OPEN FOR VEHICLE PARKING USE AND MAY NOT BE CONVERTED TO LIVING SPACE AND SHALL ONLY BE UTILIZED FOR VEHICULAR PARKING SPACE
31. STREET LIGHTING IS REQUIRED FOR THIS SITE IN ACCORDANCE WITH SECTION 16.135 OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURES AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III, SECTION 5.5.A. A MINIMUM OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
32. IN ACCORDANCE WITH SECTION 107.0.G OF THE 10/06/13 ZONING REGULATIONS, THIS SUBDIVISION IS SUBJECT TO MODERATE INCOME HOUSING UNITS. A MIHU AGREEMENT AND MIHU COVENANTS WILL BE REQUIRED IN ACCORDANCE WITH SECTION 13.402 OF THE HOWARD COUNTY CODE. THE MIHU REQUIREMENTS FOR THIS SUBDIVISION WILL BE 2 UNITS (10% OF 16 UNITS). MIHU UNITS TO BE PROVIDED UNDER THIS PLAN.
33. ON THE APPROACH SIDE OF A "STOP" SIGN, NO STREET TREE CAN BE PLANTED WITHIN 30' OF THE "STOP" SIGN.
34. THE R1-1 (STOP) SIGN AND THE STREET NAME SIGN (SNS) ASSEMBLY MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETE.
35. THE TRAFFIC CONTROL DEVICES LOCATIONS (I.E. SIGNS, PAVEMENT MARKINGS, ETC.) SHOWN ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2430) PRIOR TO INSTALLATION.
36. ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL CONFORM TO THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" - (MdMUTCD)

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR _____ DATE _____

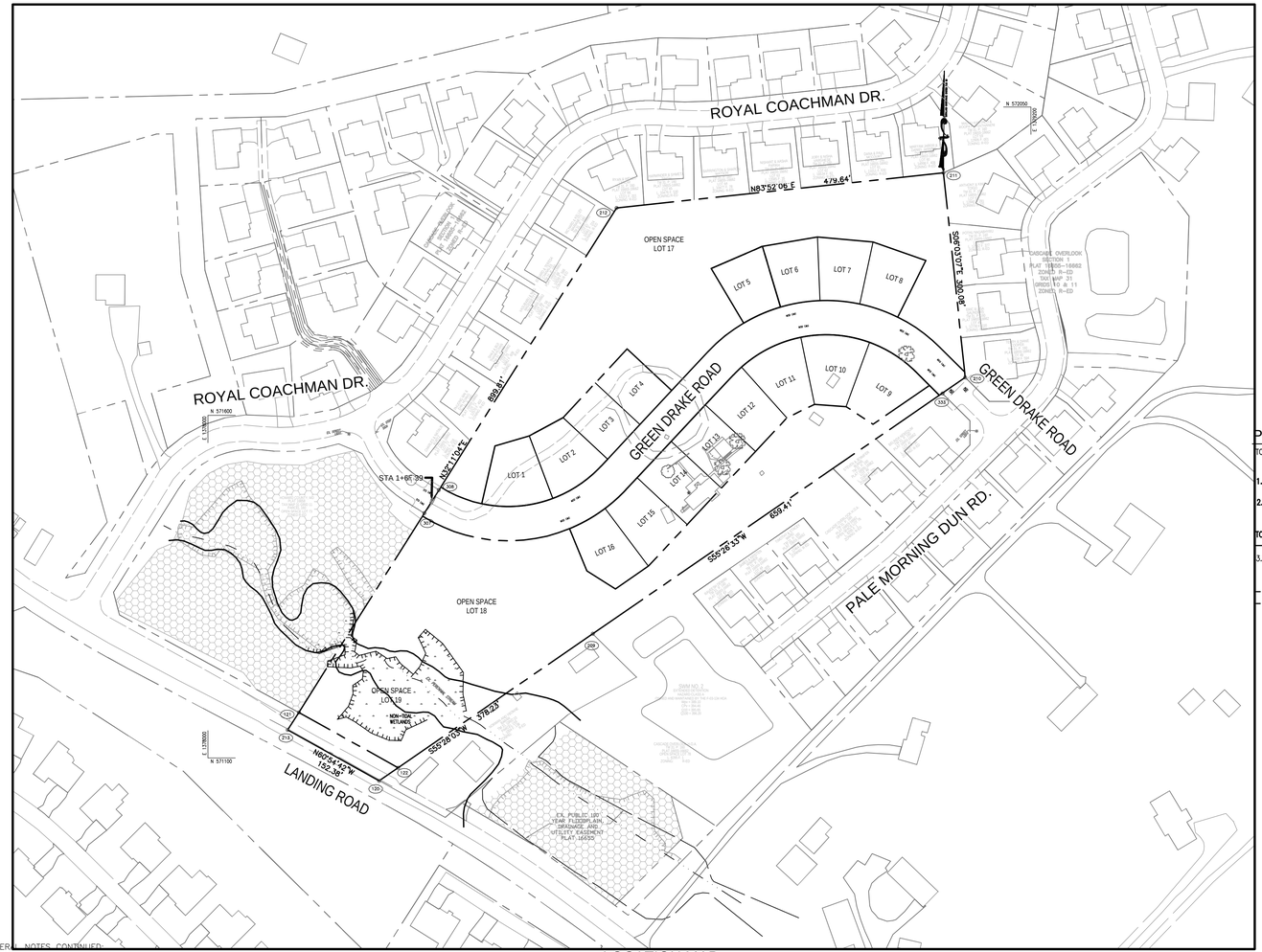
NET TRACT AREA

GROSS AREA = 9.085 AC
AREA OF 100 YEAR FLOODPLAIN = 0.31 AC
AREA OF STEEP SLOPES (25% GREATER) = 0.053 AC
NET AREA = 8.722 AC

APPROVAL OF THESE PLANS DOES NOT GRANT PERMISSION FOR OFFSITE DISTURBANCE. AUTHORIZATION IS REQUIRED FROM THE OWNER PRIOR TO ANY DISTURBANCE. THIS REQUIREMENT REMAINS THE SAME FOR ITEMS LOCATED WITHIN OFFSITE PUBLIC EASEMENTS.

NOTE:

1. ALL WATER CONNECTIONS SHALL BE 1-1/2" WITH 1" OUTSIDE METER SETTINGS, UNLESS OTHERWISE NOTED. REFER TO HOWARD COUNTY DETAILS W-3.28 OUTSIDE METER SETTINGS.



LOCATION MAP

SCALE: 1"=100'

100' 0 100' 200' 300'

GENERAL NOTES CONTINUED:

37. 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 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) 3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "QUICK PUNCH" HOLES ABOVE THE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
38. TRAFFIC ENGINEERING RESERVES THE RIGHT TO POST "NO PARKING" SIGNAGE ALONG THE ENTIRE LENGTH OF GREEN DRAKE ROAD (ONE SIDE), AS NEEDED, TO INSURE EMERGENCY VEHICLE AND SNOW PLOW ACCESSIBILITY IS MAINTAINED.
39. TRAFFIC ENGINEERING RESERVES THE RIGHT TO POST "NO PARKING" SIGNAGE (BOTH SIDES) OF GREEN DRAKE ROAD AS NEEDED, TO INSURE SIGHT VISIBILITY FOR DRIVERS EXISTING THEIR DRIVEWAYS IS MAINTAINED.
40. THIS SITE IS LOCATED IN THE PATAPSCO RIVER WATERSHED.
41. IN ACCORDANCE WITH THE HOWARD COUNTY - VOLUME I DESIGN MANUAL - STORM DRAINAGE, SECTION 6.4, A FLOODPLAIN STUDY HAS BEEN PERFORMED FOR THIS PROJECT IN CONJUNCTION WITH THIS PRELIMINARY EQUIVALENT SKETCH PLAN.
42. THIS PROJECT IS NOT SUBJECT TO CB-76-2018, WHICH REQUIRES CHARGING STATIONS, AS THERE ARE LESS THAN 25 UNITS PROPOSED.
43. -THIS PROJECT IS SUBJECT TO WP-20-036.
    - ON FEBRUARY 12, 2020, THE PLANNING DIRECTOR DETERMINED THAT THIS PROJECT DOES NOT MEET THE GRANDFATHERING REQUIREMENTS ESTABLISHED IN SECTION 16.102(h) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE PETITION MUST BE RESUBMITTED UNDER THE NEW REVIEW AND APPROVAL CRITERIA OUTLINED IN CB-61-2019 AND CB-62-2019.
    -ON NOVEMBER 19, 2020; DIRECTOR OF THE PLANNING AND ZONING, DIRECTOR OF THE DEPARTMENT OF RECREATION AND PARKS, AND THE ADMINISTRATOR OF THE OFFICE OF COMMUNITY SUSTAINABILITY CONSIDERED AND APPROVED THE REQUEST FOR ALTERNATIVE COMPLIANCE TO THE SECTION 16.1205(A)(7) REMOVAL OF SPECIMEN TREES 30" IN DIAMETER OR GREATER. APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:
    1. THE REMOVAL OF THE 3 SPECIMEN TREES SHALL BE REPLACED AT A MITIGATION RATE OF 2:1, PER SECTION 16.1216(D) OF THE COUNTY CODE. THEREFORE, A TOTAL OF 6 NATIVE TREES WITH A DBH OF AT LEAST 3 INCHES MUST BE PLANTED AS PART OF THE SUBDIVISION'S MITIGATION PLAN FOR SPECIMEN TREE REMOVAL.
    2. THE 6 NATIVE TREES MUST BE DEPICTED ON THE CASCADE RIDGE FOREST CONSERVATION PLAN AND LANDSCAPE PLAN, WITH NOTES AND TREE DETAILS INCLUDED ON BOTH PLANS FOR THIS TREE MITIGATION REQUIREMENT. THE 6 NATIVE TREES SHALL BE BONDED AS PART OF THE CASCADE RIDGE LANDSCAPING REQUIREMENTS. THE APPLICANT MUST RECEIVE APPROVAL OF A FINAL SUBDIVISION PLAN AND GRADING PERMIT PRIOR TO REMOVING THE SPECIMEN TREES.
    3. ONLY THOSE SPECIMEN TREES REQUESTED FOR REMOVAL IN THIS PETITION ARE PERMITTED FOR REMOVAL: SPECIMEN TREES 1, 12 AND 13. NO OTHER SPECIMEN TREES ARE APPROVED TO BE REMOVED FROM THIS SITE AND SHALL REMAIN UNDISTURBED. THE SPECIMEN TREES TO REMAIN MUST BE PROTECTED WITH TREE PROTECTION DEVICES/METHODS DURING CONSTRUCTION AND THESE PROTECTION PRACTICES MUST BE DETAILED ON THE SUBDIVISION AND SITE DEVELOPMENT PLANS.
    4. INCLUDE THIS ALTERNATIVE COMPLIANCE PETITION DECISION AS A GENERAL NOTE ON THE PRELIMINARY EQUIVALENT SKETCH PLAN, THE FINAL PLAN AND SITE DEVELOPMENT PLAN. THIS NOTE SHALL INCLUDE THE ALTERNATIVE COMPLIANCE PETITION FILE NUMBER, THE REGULATORY SECTION, THE DECISION DATE AND THE CONDITIONS OF APPROVAL.

GENERAL NOTES CONTINUED:

44. IN ACCORDANCE WITH CB-63-2019, PLANNING BOARD APPROVAL IS REQUIRED FOR ALL SUBDIVISIONS THAT ABOUT OR ADJOINS A SCENIC ROAD, PER SECTION 16.125(C)(1) OF THE SUBDIVISION REGULATIONS. ON , 2021 THIS PLAN WAS HEARD BY THE PLANNING BOARD. REFER TO PB # . ON , 2021, THE PLANNING BOARD OF HOWARD COUNTY, MARYLAND

OWNER/DEVELOPER

JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869-0134

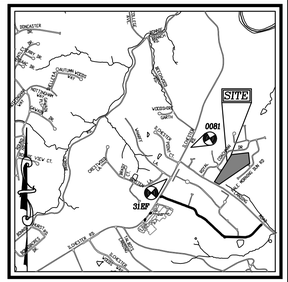
COORDINATE TABLE

POINT	NORTHING	EASTING
120	N 571066.9197	E 1378249.6263
121	N 571166.4528	E 1378132.4857
122	N 571085.9219	E 1378277.2412
209	N 571281.3290	E 1378561.2150
210	N 571655.3690	E 1379104.2810
211	N 571953.7760	E 1379072.6430
212	N 571902.5430	E 1378595.7450
213	N 571140.9995	E 1378116.4666
307	N 571457.2201	E 1378315.4736
308	N 571491.0826	E 1378336.7651
333	N 571632.0299	E 1379070.9916

BENCHMARKS

HOWARD COUNTY CONTROL STATION 31EF (CONC. MON.)
N 571267.917 E 1376907.417 ELEV. 469.471
LOCATION: INTERSECTION OF ILCHESTER ROAD AND WHARFF LANE

HOWARD COUNTY CONTROL STATION 0081 (CONC. MON.)
N 572335.338 E 1377504.092 ELEV. 477.92
LOCATION: ILCHESTER ROAD SOUTH OF BEECHWOOD ROAD



VICINITY MAP

SCALE: 1"=2,000'
ADC MAP COORDINATE: MAP 28, GRID 5E

SHEET INDEX

PARKING TABULATION:

TOTAL NUMBER OF DWELLING UNITS PROPOSED : 16
SINGLE FAMILY DETACHED (SFD) = 16 LOTS

1. **OFF-STREET PARKING SPACES REQUIRED: 2 SPACES PER UNIT**
   16 x 2 = 32 SPACES REQUIRED
2. **OVERFLOW / GUEST PARKING SPACES REQUIRED:**
   SFD - 16 UNITS @ 0.5 SPACES PER UNIT
   16 x 0.5 = 8 SPACES REQUIRED

TOTAL OFF STREET PARKING SPACES REQUIRED: = 40 SPACES

3. PARKING SPACES PROVIDED:
   2 SPACES IN GARAGE = 32 SPACES (FOR 16 UNITS)
   2 SPACES ON DRIVEWAY = 32 SPACES (FOR 16 UNITS)

- **TOTAL OFF STREET PARKING SPACES PROVIDED: = 64 SPACES**
- **TOTAL GUEST PARKING SPACES PROVIDED: = 24 SPACES**
  64 - 40 = 24 (REFER TO OFF-STREET EXCESS)

OPEN SPACE TABULATION:

IN ACCORDANCE WITH SECTION 16.121(A)(2) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS

THE OPEN SPACE REQUIREMENTS FOR THIS R-ED PROJECT IS 50% OF GROSS AREA (9.085 AC. GROSS AREA x 50% = 4.54 AC.).

OPEN SPACE LOT 17 = 2.53 AC
OPEN SPACE LOT 18 = 1.82 AC
OPEN SPACE LOT 19 = 1.03 AC

TOTAL OPEN SPACE PROVIDED IS 5.38 ACRES.
NON CREDITED OPEN SPACE PROVIDED: 0.052 ACRES.

CREDITED OPEN SPACE PROVIDED: 5.328 ACRES.

MODERATE INCOME HOUSING UNIT (MIHU) APPLICATION EXEMPTIONS TRACKING

TOTAL NUMBER OF LOTS/UNITS PROPOSED	16
NUMBER OF MIHU REQUIRED	2
NUMBER OF MIHU PROVIDED ONSITE (EXEMPT FROM APFO ALLOCATIONS)	2 (TBD)
NUMBER OF APFO ALLOCATIONS REQUIRED (REMAINING LOTS/UNITS)	16
MIHU FEE-IN-LIEU (INDICATE LOT/UNIT NUMBERS)	TBD

RECREATION OPEN SPACE TABULATION:

TOTAL RECREATION OPEN SPACE REQUIRED:

R-ED - SINGLE FAMILY HOMES SFD
= 300 SF/UNIT X 16 UNITS = 4,800 SF

TOTAL RECREATION OPEN SPACE TO BE PROVIDED:

LAND AREAS:
1. P/O OPEN SPACE 17 - 2,250 SF+/-
PLUS AMENITIES: SEE BELOW

REQUIREMENT SHALL BE MET IN COMBINATION WITH THE JUNE 2012 POLICY REGARDING THE ALLOWANCE OF A MAXIMUM 50% CREDIT FOR RECREATIONAL OPEN SPACE AMENITIES IN LIEU OF LAND AREA.

- AMENITIES INCLUDE OR EQUAL:
  PLAY/TOT LOT EQUIPMENT (2) = 2,000 SF EA = 4,000 SF
  BENCH (2) = 400 SF
  TOTAL AMENITIES PROVIDED = 4,400 SF

TOTAL RECREATION OPEN SPACE (INCLUDING CREDIT)
= 2,250 SF + 4,400 SF = 6,650 SF
DESIGN SHALL BE FINALIZED UNDER FINAL PLAN

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN

COVER SHEET

CASCADE RIDGE
LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075

PARCEL: 474
TAX MAP: 31 GRID: 11
1ST ELECTION DISTRICT

ZONED: R-ED
L. 362 / F. 260
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
⊕
TIMMONS GROUP
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
P: 410.461.7666 F: 410.461.8961 www.timmons.com

STATE OF MARYLAND
ROBERT HARRIS VOGEL
NO.16193
REGISTERED
PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MDL VETG
CHECKED BY: RHV
DATE: JANUARY 2020
SCALE: AS SHOWN
W.O. NO.: 42148

PROFESSIONAL CERTIFICATE

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. 16193 EXPIRATION DATE: 09-27-2022

SHEET 1 OF 10

SP-19-004

DETAIL A

SCALE: 1"=30'

CURVE TABLE							
ROAD	CURVE	LENGTH	RADIUS*	DELTA ANGLE*	TANGENT	CHORD DIRECTION	CHORD LENGTH
GREEN DRAKE ROAD	C1	290.00	210.00	79°07'22"	173.49	N82°35'56"E	267.50
GREEN DRAKE ROAD	C2	336.66	210.00	91°51'09"	216.90	S88°57'49"W	301.75

PRELIMINARY LAYOUT

SCALE: 1"=50'

50' 0 50' 100' 150'

STREET LIGHT LOCATIONS			
ROAD NAME	STATION	OFFSET	FIXTURE/POLE TYPE
GREEN DRAKE ROAD	1+55	18.00' R	LED-100 WATT PREMIER COLONIAL FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE
GREEN DRAKE ROAD	3+25	18.00' R	
GREEN DRAKE ROAD	4+85	18.00' R	
GREEN DRAKE ROAD	6+90	18.00' L	
GREEN DRAKE ROAD	8+45	18.00' L	
GREEN DRAKE ROAD	9+80	18.00' L	

SIGNAGE LOCATION CHART			
ROAD NAME	STATION	OFFSET	TYPE
GREEN DRAKE ROAD	2+00.00	18.00' R	R2-1 SPEED LIMIT SIGN
GREEN DRAKE ROAD	2+00.00	14.00' L	W3-1 STOP AHEAD
GREEN DRAKE ROAD	0+10	13.00' R&L	NO PARKING
	0+85	12.00' R&L	NO PARKING
	1+50	12.00' R&L	NO PARKING
	2+25	13.00' R&L	NO PARKING
GREEN DRAKE ROAD	9+10.00	14.00' R	W3-1 STOP AHEAD
GREEN DRAKE ROAD	9+50	13.00' R&L	NO PARKING
	10+20	13.00' R&L	NO PARKING
	11+63	11.00' R&L	NO PARKING
	12+25	13.00' R&L	NO PARKING
GREEN DRAKE ROAD	10+40.00	16.34' L	R2-1 SPEED LIMIT SIGN
GREEN DRAKE ROAD	12+20.00	13.50' R	R1-1 STOP (W/ STREET NAME SIGN)

** PROVIDE NEW STREET NAME SIGN ON EXISTING STOP SIGN AT GREEN DRAKE ROAD AND ROYAL COACHMAN DRIVE

LANDING ROAD SCENIC ROAD NOTE:

RIGHT-OF-WAY DEDICATION SHALL OCCUR UNDER FUTURE F-PLAN SUBMISSION.

NO WIDENING OR ROAD IMPROVEMENTS ARE PROPOSED.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR DATE

FLOODPLAIN LEGEND:

100 YEAR FLOODPLAIN

RIVER STA 3 392.50 — FLOODPLAIN CROSS SECTION FLOODPLAIN ELEVATION

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- EXISTING TREELINE
- CENTERLINE OF EXISTING STREAM
- EXISTING SPECIMEN TREE
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EX. PUBLIC 100-YEAR FLOOD PLAIN
- EXISTING FOREST CONSERVATION EASEMENT (PLAT 16655)
- PROPOSED STORMDRAIN
- PROPOSED SIDEWALK
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED PRIVATE DRAINAGE & UTILITY EASEMENT
- PROPOSED PUBLIC DRAINAGE & UTILITY EASEMENT
- PROPOSED MICRO-BIORETENTION FACILITY
- PROPOSED STORMWATER DRYWELL
- PROPOSED 8" PVC PUBLIC SANITARY SEWER
- PROPOSED 8" DIP PUBLIC WATER
- EXISTING PUBLIC SEWER, WATER DRAINAGE & UTILITY EASEMENT (PLAT 16655)
- PROPOSED STREET LIGHT
- PROPOSED STREET SIGN
- PROPOSED SPEED LIMIT SIGN (R2-1)

DETAIL B

SCALE: 1"=30'

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN

PRELIMINARY LAYOUT

CASCADE RIDGE

LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075

PARCEL: 474
TAX MAP: 31 GRID: 11
1ST ELECTION DISTRICT

ZONED: R-ED
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STATE OF MARYLAND — ROBERT HARRIS VOGEL — NO. 16193 — REGISTERED PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.16193

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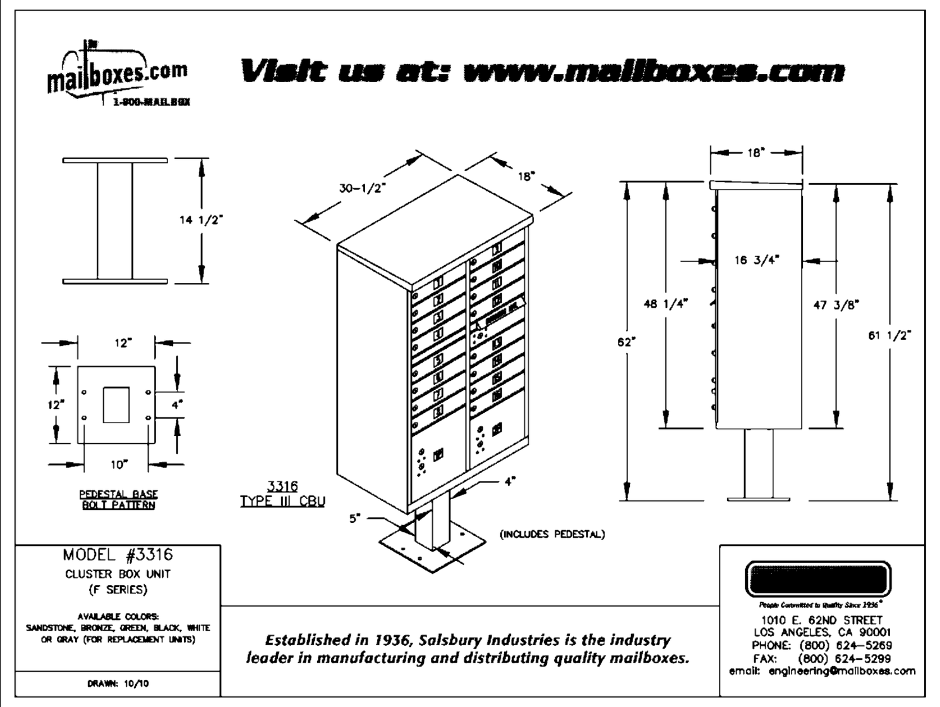
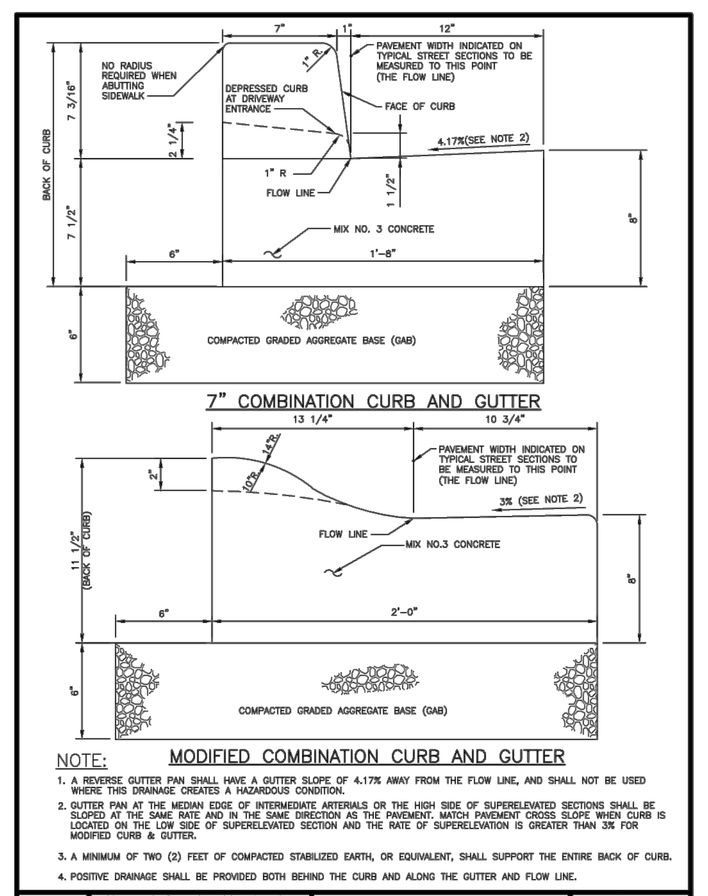
SHEET 2 OF 10

SP-19-004

TYPICAL CENTRAL MAIL DELIVERY BOX (CBU)
OR APPROVED EQUAL

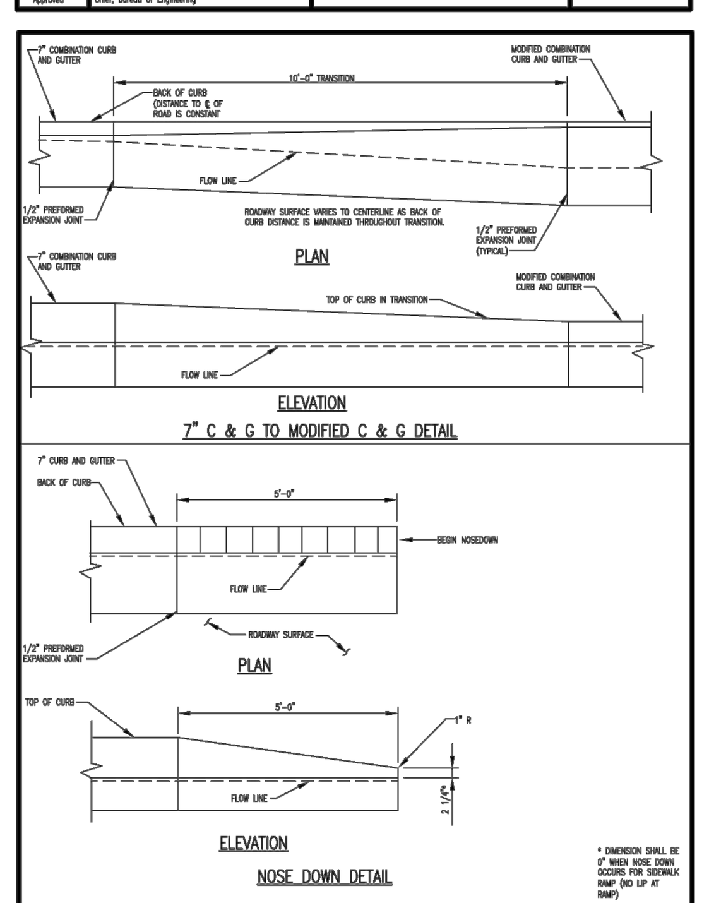


ONE 8 UNIT BOX NEAR LOT 2 TO SERVE LOTS 1-4, AND 15-17
ONE 12 UNIT BOX NEAR LOT 13 TO SERVE LOTS 5-10, AND 11-14

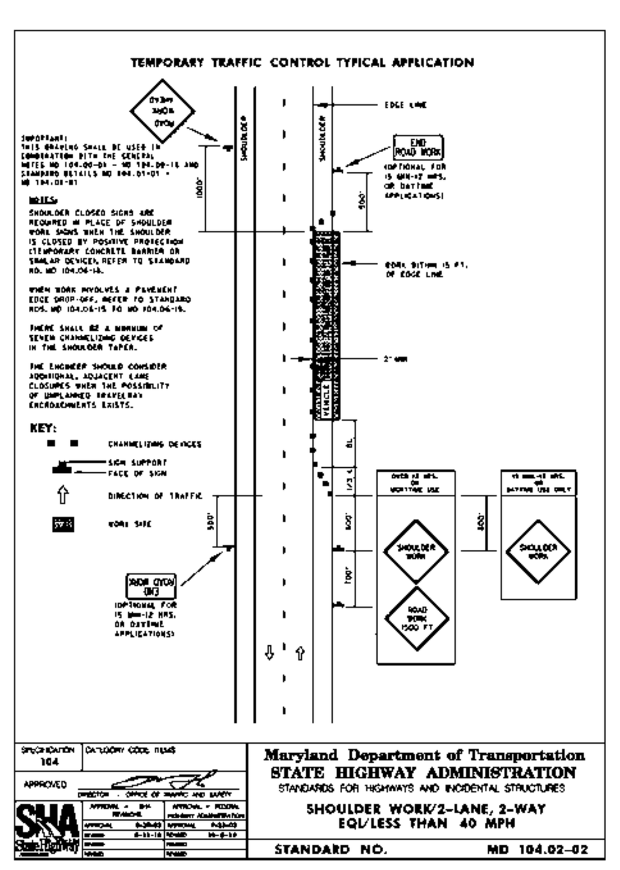


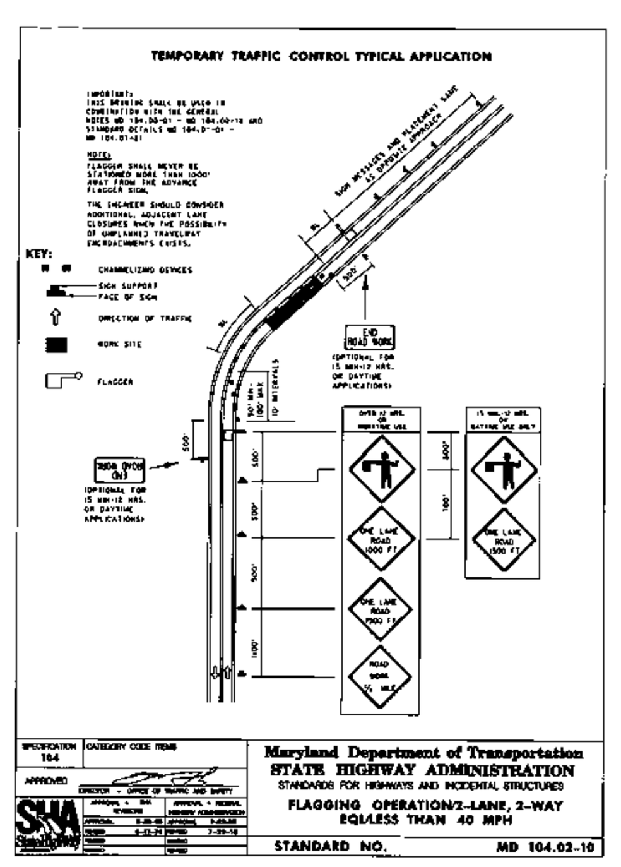
NOTE:
1. A REVERSE GUTTER PAN SHALL HAVE A GUTTER SLOPE OF 4.17% AWAY FROM THE FLOW LINE, AND SHALL NOT BE USED WHERE THIS DRAINAGE CREATES A HAZARDOUS CONDITION.
2. GUTTER PAN AT THE MEDIAN EDGE OF INTERMEDIATE ARTERIALS OR THE HIGH SIDE OF SUPERELEVATED SECTIONS SHALL BE SLOPED AT THE SAME RATE AND IN THE SAME DIRECTION AS THE PAVEMENT. MATCH PAVEMENT CROSS SLOPE WHEN CURB IS LOCATED ON THE LOW SIDE OF SUPERELEVATED SECTION AND THE RATE OF SUPERELEVATION IS GREATER THAN 3% FOR MODIFIED CURB & GUTTER.
3. A MINIMUM OF TWO (2) FEET OF COMPACTED STABILIZED EARTH, OR EQUIVALENT, SHALL SUPPORT THE ENTIRE BACK OF CURB.
4. POSITIVE DRAINAGE SHALL BE PROVIDED BOTH BEHIND THE CURB AND ALONG THE GUTTER AND FLOW LINE.

Revised 5/30/2017 | Approved 5/7/2007 | Howard County, Maryland Department of Public Works | Approved: [illegible] Chief, Bureau of Engineering | CURB AND GUTTER 7" & Modified | Detail R-3.01



Revised 5/30/2017 | Approved 5/7/2007 | Howard County, Maryland Department of Public Works | Approved: [illegible] Chief, Bureau of Engineering | CURB AND GUTTER 7" Transition to Modified & Nose Down | Detail R-3.02



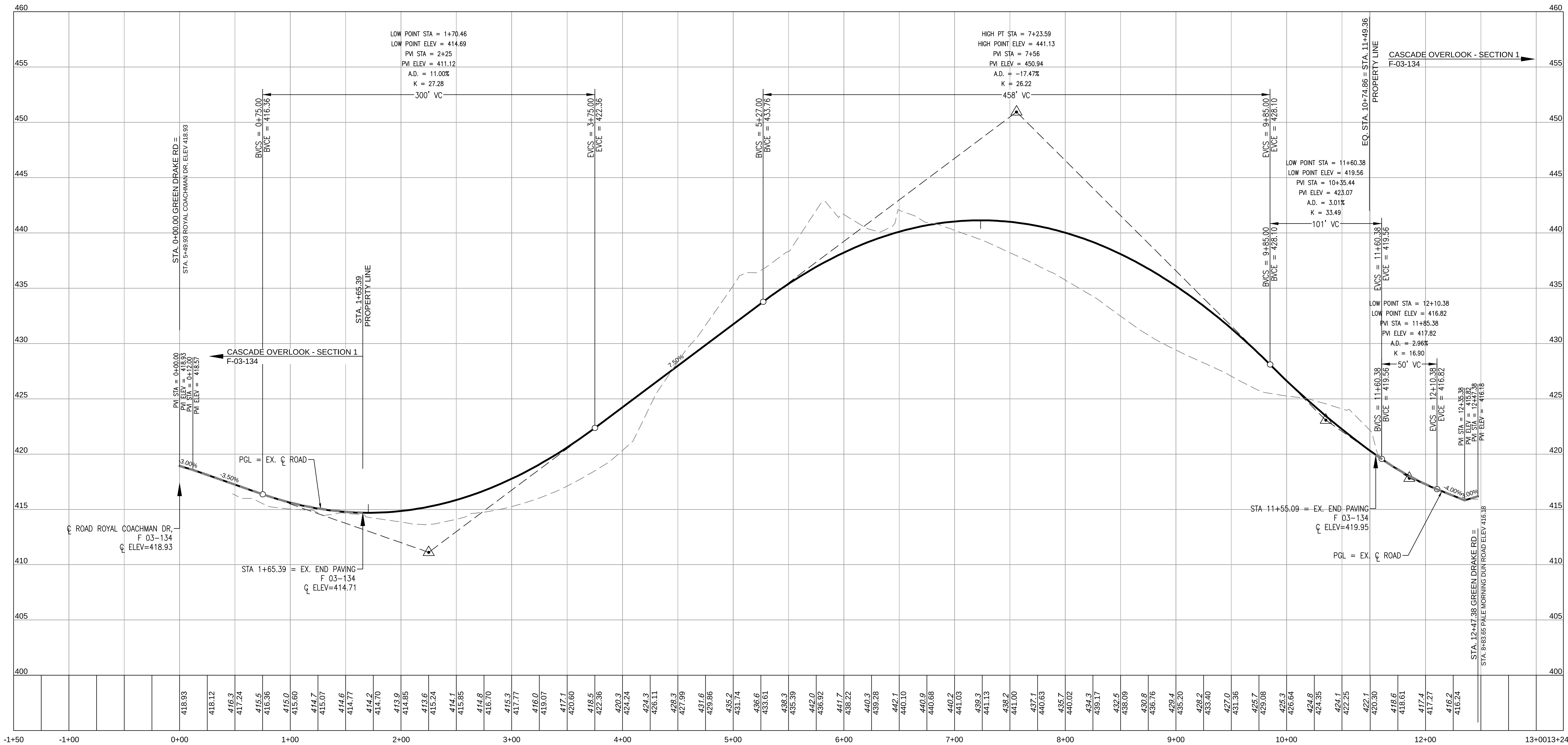


ROYAL COACHMAN DRIVE & PALE MORNING ROAD
TYPICAL WORK ZONE
TRAFFIC CONTROL DETAILS

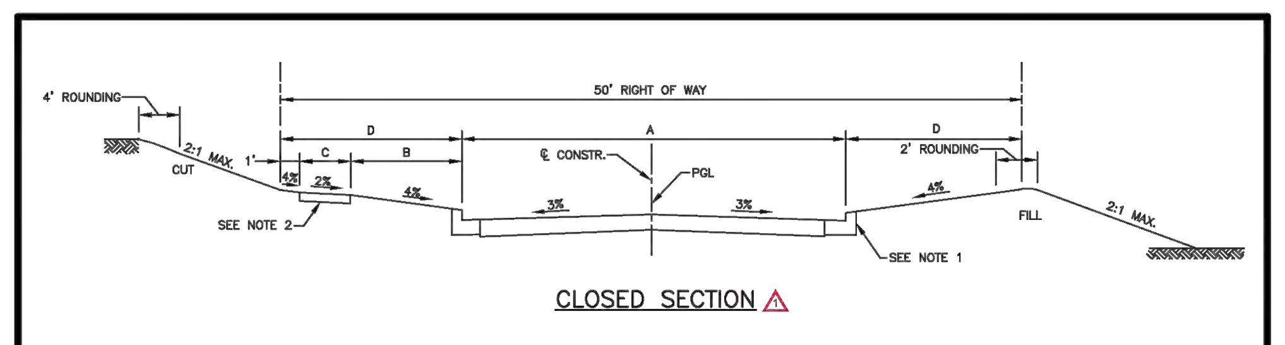
ALL WORK WITHIN THE ROYAL COACHMAN DRIVE AND/OR PALE MORNING ROAD PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE STANDARD MARYLAND STATE HIGHWAY ADMINISTRATION DETAILS: MD 104.02-02 & MD 104.02-10 OR AS DIRECTED BY THE HOWARD COUNTY - TRAFFIC ENGINEERING DIVISION.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR ____________ DATE ____________



GREEN DRAKE RD PROFILE
HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5
ACCESS STREET / ACCESS PLACE EXTENSIONS
DESIGN SPEED = 25MPH



NOTES:
1. TYPE OF CURB VARIES (MODIFIED COMBINATION CURB & GUTTER OR COMBINATION CURB & GUTTER - SEE DESIGN MANUAL VOLUME III FOR CRITERIA).
2. 4" CONCRETE SIDEWALK AS REQUIRED BY SUB-DIVISION REGULATIONS.
3. 4'-0" SIDEWALK REQUIRES A PASSING AREA (SEE DETAIL R-4.01).
4. SEE R-3.05 FOR WHERE SIDEWALK IS AGAINST CURB.

CLASSIFICATION	A	B	C	D	PAVING SECTION
MINOR COLLECTOR 2000 ADT	28'	6'	4'	11'	P-3
ACCESS STREET 1000 ADT	24'*	8'	4'	13'	P-2
ACCESS PLACE 200 ADT	24'*	8'	4'	13'	P-2

PROPOSED ROAD EXTENSION/CONNECTION

*TOWNHOUSES, CONDOMINIUM / APARTMENT DEVELOPMENTS REQUIRE 26' MINIMUM PAVING WIDTH (P-2 PAVING SECTION)

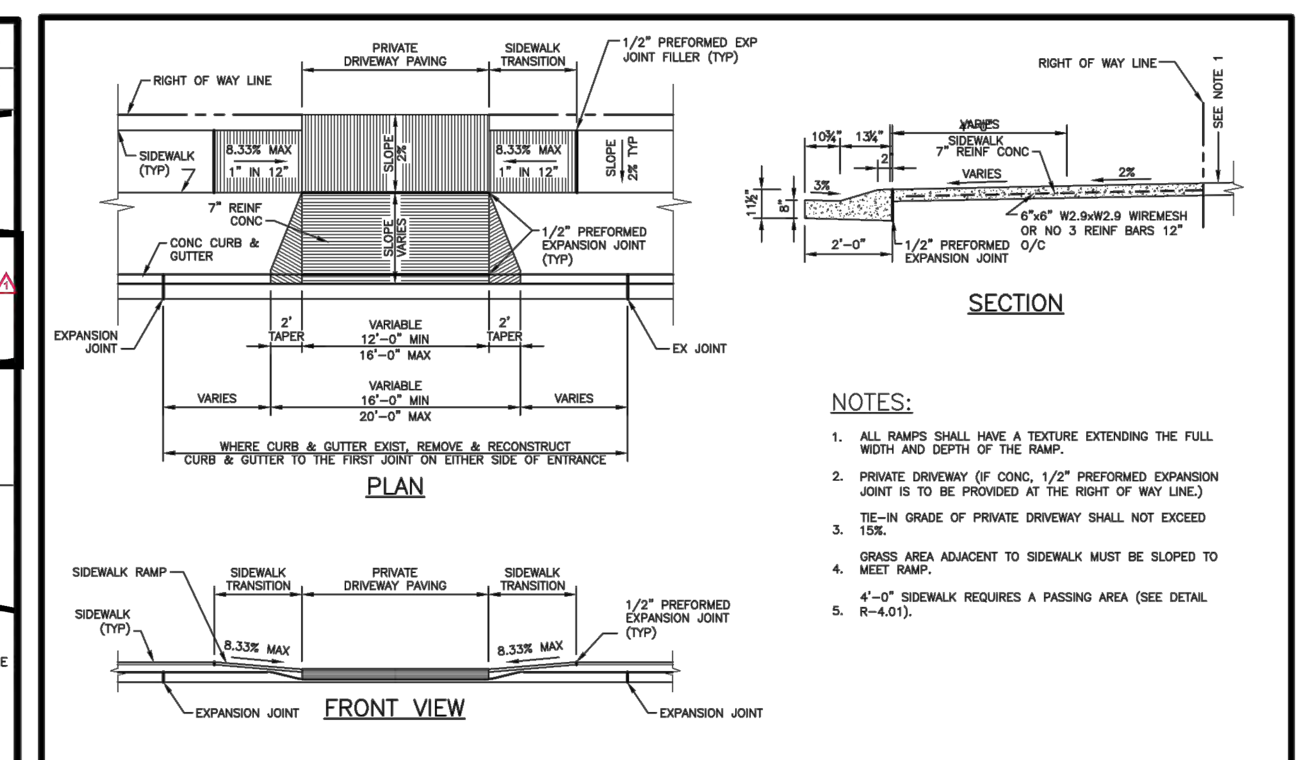
Revised 5/30/2017 | Revised 1/2/2007 Approved | Howard County, Maryland Department of Public Works | Approved: [illegible] Chief, Bureau of Engineering | TYPICAL SECTIONS - RESIDENTIAL STREETS Access Place, Access Streets, Minor Collector (Closed Section) | Detail R-1.02

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR) / PAVEMENT MATERIAL (INCHES)	MIN. SUPERPAVE ASPHALT MIX WITH GAB 3 TO <5	5 TO <7	≥ 7	SUPERPAVE ASPHALT MIX WITH CONSTANT GAB 3 TO <5	5 TO <7	≥ 7
P-1	PARKING BAYS: RESIDENTIAL AND NON-RESIDENTIAL; PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 2 HEAVY TRUCKS PER DAY	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE	NA	NA	NA	NA	NA	NA
		SUPERPAVE ASPHALT MIX BASE 19.0 MM, PG 64-22S, LEVEL 1 (ESAL)	2.0	2.0	2.0	3.5	3.0	2.5
		GRADED AGGREGATE BASE (GAB)	8.5	7.0	6.0	4.0	4.0	4.0
P-2	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY; LOCAL ROADS: ACESS PLACE, ACCESS STREET; CUL-DE-SACS: RESIDENTIAL	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX BASE 19.0 MM, PG 64-22S, LEVEL 1 (ESAL)	2.0	2.0	2.0	3.5	2.0	2.0
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	4.0
P-3	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY; LOCAL ROADS: ACCESS PLACE, ACCESS STREET; CUL-DE-SACS: NON-RESIDENTIAL; MINOR COLLECTORS: RESIDENTIAL	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		SUPERPAVE ASPHALT MIX BASE 19.0 MM, PG 64-22S, LEVEL 1 (ESAL)	3.0	3.0	3.0	4.5	3.0	2.0
		GRADED AGGREGATE BASE (GAB)	10.0	6.0	3.0	6.0	6.0	6.0
P-4	MINOR COLLECTORS: NON-RESIDENTIAL; MAJOR COLLECTORS	SUPERPAVE ASPHALT MIX FINAL SURFACE 12.5 MM, PG 64-22S, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	2.0
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 12.5 MM, PG 64-22S, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	2.0
		SUPERPAVE ASPHALT MIX BASE 19.0 MM, PG 64-22S, LEVEL 2 (LOW ESAL)	4.0	4.0	3.0	6.0	5.0	3.0
		GRADED AGGREGATE BASE (GAB)	13.0	7.0	4.0	6.0	6.0	6.0

NOTES
1. HEAVY TRUCKS ARE DEFINED AS THOSE WITH SIX (6) WHEELS OR MORE INCLUDING GARBAGE TRUCKS.
2. SUPERPAVE ASPHALT MIX LAYERS SHALL BE PLACED IN APPROPRIATE COMPACTED LIFT THICKNESS: 19.0 MM BASE (2.0" MIN. TO 4.0" MAX.), 12.5 MM SURFACE (1.5" MIN. TO 3.0" MAX.), AND 9.5 MM SURFACE (1.0" MIN. TO 2.0" MAX.)
3. GRADED AGGREGATE BASE (GAB) TO BE PLACED AND COMPACTED IN 6" MAX. COMPACTED THICKNESS LAYERS.
4. THE INTERMEDIATE SURFACE COURSE LAYER MUST BE PLACED WITHIN 2 WEEKS OF PLACEMENT OF BASE COURSE, AND IS REQUIRED PRIOR TO SUBSTANTIAL COMPLETION INSPECTION AND BOND REDUCTION.
5. IN LIEU OF PLACING THE INTERMEDIATE SURFACE COURSE LAYER FOR COMMERCIAL/INDUSTRIAL ENTRANCE APRONS WITHIN THE COUNTY RIGHT-OF-WAY WHERE AUXILIARY LANES ARE NOT REQUIRED, THE THICKNESS OF THE INTERMEDIATE PAVEMENT LAYER CAN BE ADDED TO THE REQUIRED THICKNESS OF THE BASE ASPHALT LAYER.
6. THE CONSTRUCTION DRAWINGS SHALL SHOW THE PAVING SECTION, ROAD CLASSIFICATION AND CBR VALUE FOR EACH ROADWAY.

SUPERPAVE ASPHALT MIX FINAL SURFACE
SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE
SUPERPAVE ASPHALT MIX BASE
GRADED AGGREGATE BASE (GAB)

Revised 5/30/2017 | Approved 5/7/2007 | Howard County, Maryland Department of Public Works | Approved: [illegible] Chief, Bureau of Engineering | PAVING SECTIONS P-1 to P-4 | Detail R-2.01



NOTES:
1. ALL RAMPS SHALL HAVE A TEXTURE EXTENDING THE FULL WIDTH AND DEPTH OF THE RAMP.
2. PRIVATE DRIVEWAY (IF CONC, 1/2" PREFORMED EXPANSION JOINT IS TO BE PROVIDED AT THE RIGHT OF WAY LINE.)
3. TIE-IN GRADE OF PRIVATE DRIVEWAY SHALL NOT EXCEED 15%.
4. GRASS AREA ADJACENT TO SIDEWALK MUST BE SLOPED TO MEET RAMP.
5. 4'-0" SIDEWALK REQUIRES A PASSING AREA (SEE DETAIL R-4.01).

Revised 5/30/2017 | Approved 5/7/2007 | Howard County, Maryland Department of Public Works | Approved: [illegible] Chief, Bureau of Engineering | RESIDENTIAL DRIVEWAY ENTRANCE Modified Combination Curb and Gutter Sidewalk Setback from Curb | Detail R-6.03

OWNER/DEVELOPER
JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869-0134

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN
PRELIMINARY ROAD PROFILE & DETAILS
CASCADE RIDGE
LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075

PARCEL: 474
TAX MAP: 31 GRID: 11
1ST ELECTION DISTRICT

ZONED: R-ED
L. 362 / F. 260
HOWARD COUNTY, MARYLAND

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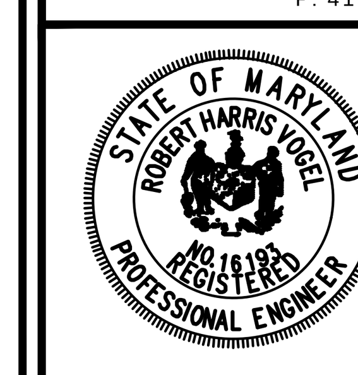

ROBERT H. VOGEL, PE No.16193

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SHEET 3 OF 10

SP-19-004

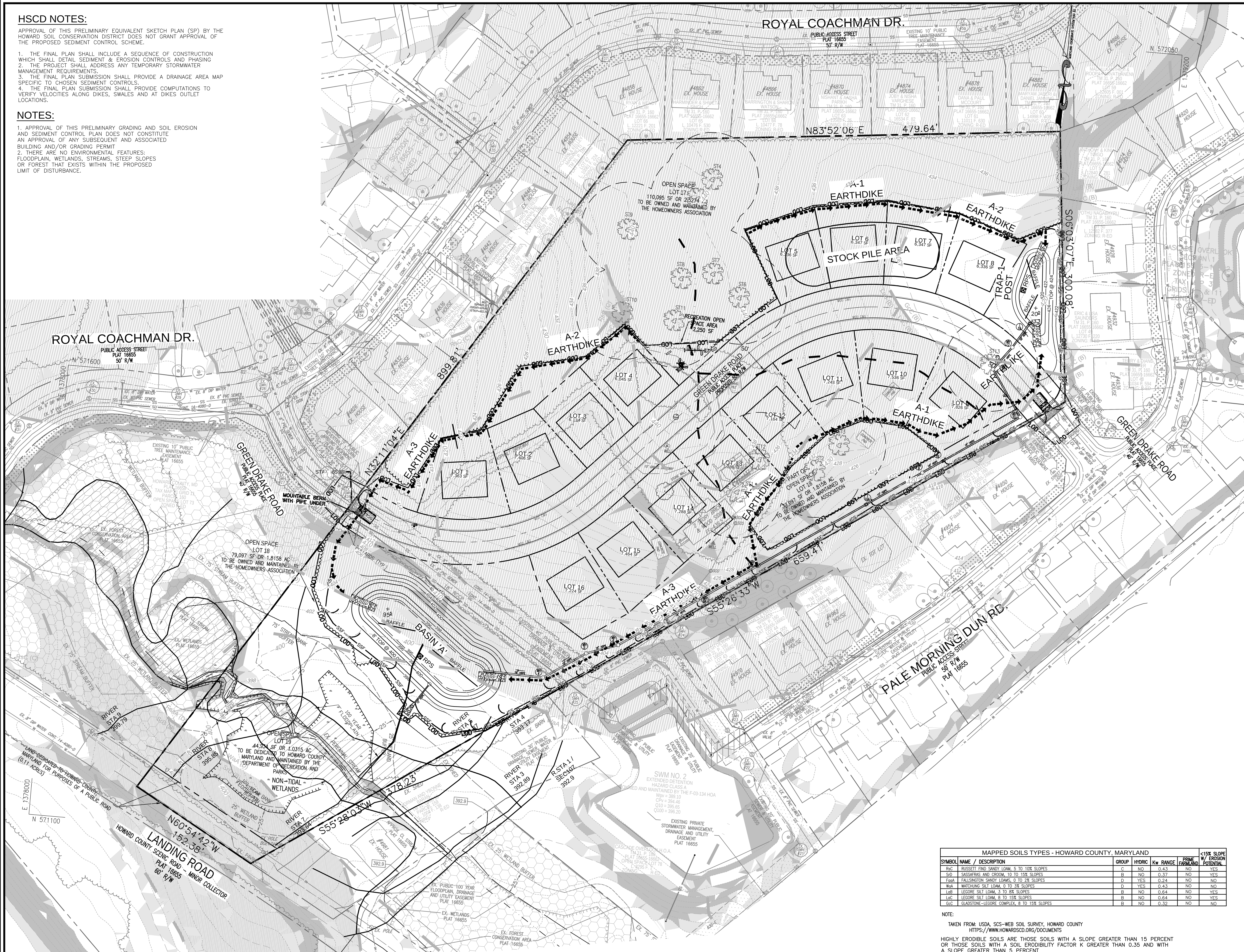
HSCD NOTES:

APPROVAL OF THIS PRELIMINARY EQUIVALENT SKETCH PLAN (SP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME.

1. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING
2. THE PROJECT SHALL ADDRESS ANY TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.
3. THE FINAL PLAN SUBMISSION SHALL PROVIDE A DRAINAGE AREA MAP SPECIFIC TO CHOSEN SEDIMENT CONTROLS.
4. THE FINAL PLAN SUBMISSION SHALL PROVIDE COMPUTATIONS TO VERIFY VELOCITIES ALONG DIKES, SWALES AND AT DIKES OUTLET LOCATIONS.

NOTES:

1. APPROVAL OF THIS PRELIMINARY GRADING AND SOIL EROSION AND SEDIMENT CONTROL PLAN DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED BUILDING AND/OR GRADING PERMIT
2. THERE ARE NO ENVIRONMENTAL FEATURES: FLOODPLAIN, WETLANDS, STREAMS, STEEP SLOPES OR FOREST THAT EXISTS WITHIN THE PROPOSED LIMIT OF DISTURBANCE.



LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- EXISTING TREELINE
- CENTERLINE OF EXISTING STREAM
- EXISTING SPECIMEN TREE WITH CRITICAL ROOT ZONE
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EX. PUBLIC 100-YEAR FLOOD PLAIN
- EXISTING FOREST CONSERVATION EASEMENT (PLAT 16655)
- PROPOSED STORMDRAIN
- PROPOSED SIDEWALK
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- LIMIT OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE W/ MOUNTABLE BERM
- RIPRAP PROTECTION
- BAFFLE
- REMOVABLE PUMPING STATION
- SUPER SILT FENCE
- SILT FENCE
- EARTHDIKE
- HIGHLY ERODIBLE SOILS
- EXISTING PUBLIC SEWER, WATER DRAINAGE & UTILITY EASEMENT (PLAT 16655)
- MODERATE SLOPES (15%-24.9%)
- STEEP SLOPES (>25%)
- DRAINAGE DIVIDE

NOTE:
- SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
- SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 35 FEET APART
- DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

NOTE:
EITHER PERMANENT OR TEMPORARY STABILIZATION IS TO BE APPLIED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR REGARDLESS OF DAYS/DATES IN THE STANDARD SEDIMENT CONTROL NOTES AND/OR SEEDING SPECIFICATIONS.

MAPPED SOILS TYPES - HOWARD COUNTY, MARYLAND						
SYMBOL	NAME / DESCRIPTION	GROUP	HYDRIC	Kw RANGE	PRIME FARMLAND	<15% SLOPE W/ EROSION POTENTIAL
RsC	RUSSETT FIND SANDY LOAM, 5 TO 10% SLOPES	C	NO	0.43	NO	YES
SrD	SASSAFRAS AND CROOM, 10 TO 15% SLOPES	B	NO	0.37	NO	YES
FaaA	FALLSINGTON SANDY LOAMS, 0 TO 2% SLOPES	D	YES	0.24	NO	NO
WaA	WATCHUNG SILT LOAM, 0 TO 3% SLOPES	D	YES	0.43	NO	NO
LaB	LEGORE SILT LOAM, 3 TO 8% SLOPES	B	NO	0.64	NO	YES
LaC	LEGORE SILT LOAM, 8 TO 15% SLOPES	B	NO	0.64	NO	YES
GcC	GLADSTONE-LEGORE COMPLEX, 8 TO 15% SLOPES	B	NO	0.32	NO	NO

NOTE:

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY
HTTPS://WWW.HOWARDSCD.ORG/DOCUMENTS

HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

SOILS MAP, PRELIMINARY GRADING AND SOIL EROSION & SEDIMENT CONTROL PLAN
SCALE: 1"=50'

50' 0 50' 100' 150'

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR DATE

OWNER/DEVELOPER
JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869-0134

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN

PHASE 1 - SOILS MAP, PRELIMINARY GRADING AND SOIL EROSION & SEDIMENT CONTROL PLAN

CASCADE RIDGE

LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
7330 GREEN DRAKE ROAD
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3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
P: 410.461.7666 F: 410.461.8961 www.timmons.com

STATE OF MARYLAND ROBERT HARRIS VOGEL NO.16193 REGISTERED PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MDL VETG
CHECKED BY: RHV
DATE: JANUARY 2020
SCALE: AS SHOWN
W.O. NO.: 42148

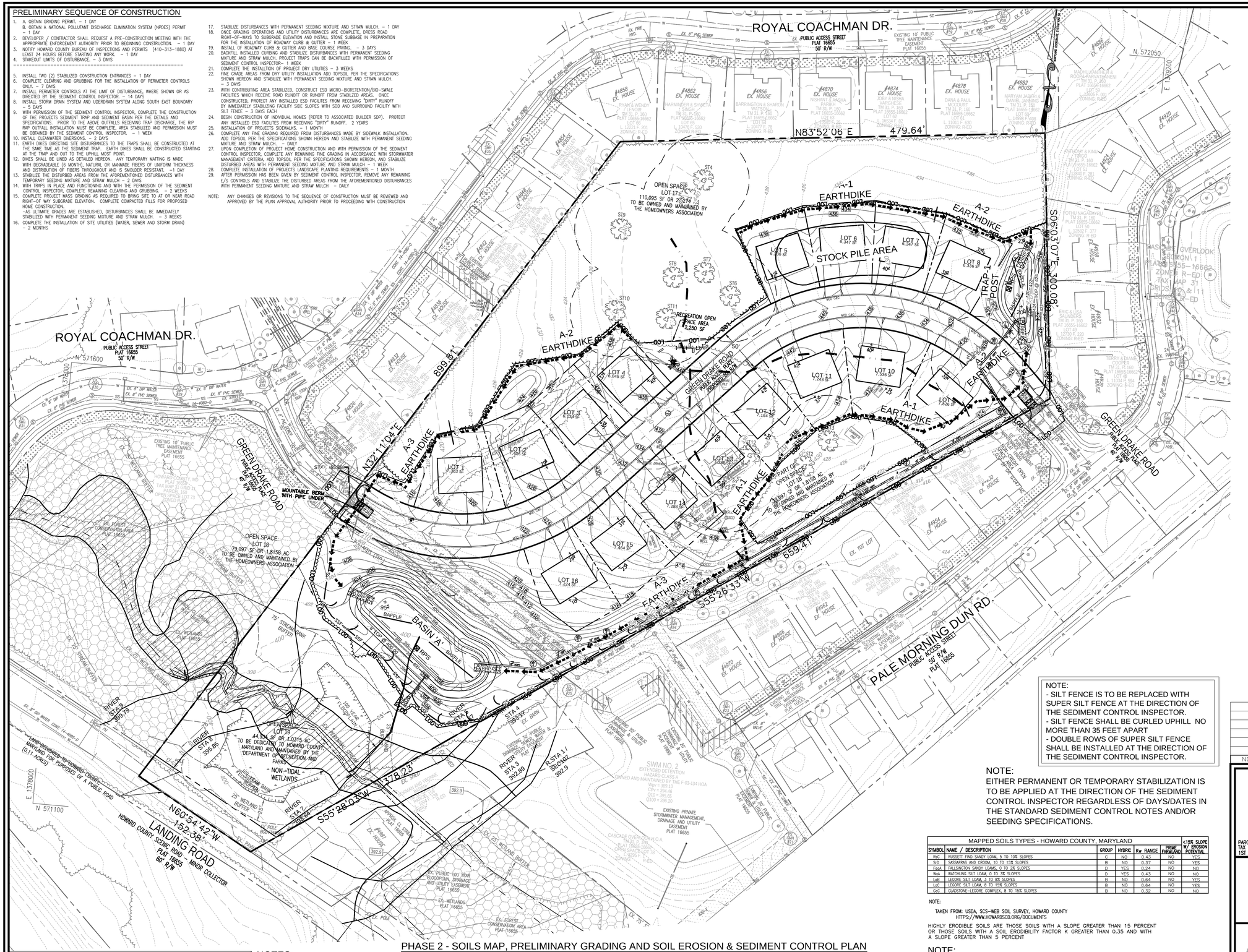
PROFESSIONAL CERTIFICATE

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. 16193 EXPIRATION DATE: 09-27-2022

PRELIMINARY SEQUENCE OF CONSTRUCTION

1. A. OBTAIN GRADING PERMIT. – 1 DAY
   B. OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT – 1 DAY
2. DEVELOPER / CONTRACTOR SHALL REQUEST A PRE–CONSTRUCTION MEETING WITH THE APPROPRIATE ENFORCEMENT AUTHORITY PRIOR TO BEGINNING CONSTRUCTION. – 1 DAY
3. NOTIFY HOWARD COUNTY BUREAU OF INSPECTIONS AND PERMITS (410–313–1880) AT LEAST 24 HOURS BEFORE STARTING ANY WORK. – 1 DAY
4. STAKEOUT LIMITS OF DISTURBANCE. – 3 DAYS
5. INSTALL TWO (2) STABILIZED CONSTRUCTION ENTRANCES – 1 DAY
6. COMPLETE CLEARING AND GRUBBING FOR THE INSTALLATION OF PERIMETER CONTROLS ONLY. – 7 DAYS
7. INSTALL PERIMETER CONTROLS AT THE LIMIT OF DISTURBANCE, WHERE SHOWN OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR. – 14 DAYS
8. INSTALL STORM DRAIN SYSTEM AND UDERDRAIN SYSTEM ALONG SOUTH EAST BOUNDARY – 5 DAYS
9. WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, COMPLETE THE CONSTRUCTION OF THE PROJECTS SEDIMENT TRAP AND SEDIMENT BASIN PER THE DETAILS AND SPECIFICATIONS. PRIOR TO THE ABOVE OUTFALLS RECEIVING TRAP DISCHARGE, THE RIP RAP OUTFALL INSTALLATION MUST BE COMPLETE, AREA STABILIZED AND PERMISSION MUST BE OBTAINED BY THE SEDIMENT CONTROL INSPECTOR. – 1 WEEK
10. INSTALL CLEANWATER DIVERSIONS. – 2 DAYS
11. EARTH DIKES DIRECTING SITE DISTURBANCES TO THE TRAPS SHALL BE CONSTRUCTED AT THE SAME TIME AS THE SEDIMENT TRAP. EARTH DIKES SHALL BE CONSTRUCTED STARTING AT THE TRAP AND OUT TO THE UPHILL MOST POINT.
12. DIKES SHALL BE LINED AS DETAILED HEREON. ANY TEMPORARY MATTING IS MADE WITH DEGRADEABLE (6 MONTH), NATURAL OR MANMADE FIBERS OF UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND IS SMOLDER RESISTANT. –1 DAY
13. STABILIZE THE DISTURBED AREAS FROM THE AFOREMENTIONED DISTURBANCES WITH TEMPORARY SEEDING MIXTURE AND STRAW MULCH – 2 DAYS
14. WITH TRAPS IN PLACE AND FUNCTIONING AND WITH THE PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, COMPLETE REMAINING CLEARING AND GRUBBING. – 2 WEEKS
15. COMPLETE PROJECT MASS GRADING AS REQUIRED TO BRING SITE TO AT OR NEAR ROAD RIGHT–OF WAY SUBGRADE ELEVATION. COMPLETE COMPACTED FILLS FOR PROPOSED HOME CONSTRUCTION.
    –AS ULTIMATE GRADES ARE ESTABLISHED, DISTURBANCES SHALL BE IMMEDIATELY STABILIZED WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. – 3 WEEKS
16. COMPLETE THE INSTALLATION OF SITE UTILITIES (WATER, SEWER AND STORM DRAIN) – 2 MONTHS
17. STABILIZE DISTURBANCES WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. – 1 DAY
18. ONCE GRADING OPERATIONS AND UTILITY DISTURBANCES ARE COMPLETE, DRESS ROAD RIGHT–OF–WAYS TO SUBGRADE ELEVATION AND INSTALL STONE SUBBASE IN PREPARATION FOR THE INSTALLATION OF ROADWAY CURB & GUTTER – 1 WEEK
19. INSTALL OF ROADWAY CURB & GUTTER AND BASE COURSE PAVING. – 3 DAYS
20. BACKFILL INSTALLED CURBING AND STABILIZE DISTURBANCES WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. PROJECT TRAPS CAN BE BACKFILLED WITH PERMISSION OF SEDIMENT CONTROL INSPECTOR– 1 WEEK
21. COMPLETE THE INSTALLTION OF PROJECT DRY UTILITIES – 3 WEEKS
22. FINE GRADE AREAS FROM DRY UTILITY INSTALLATION ADD TOPSOIL PER THE SPECIFICATIONS SHOWN HEREON AND STABILIZE WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. – 3 DAYS
23. WITH CONTRIBUTING AREA STABILIZED, CONSTRUCT ESD MICRO–BIORETENTION/BIO–SWALE FACILITIES WHICH RECEIVE ROAD RUNOFF OR RUNOFF FROM STABILIZED AREAS. ONCE CONSTRUCTED, PROTECT ANY INSTALLED ESD FACILITES FROM RECEIVING "DIRTY" RUNOFF BY IMMEDIATELY STABILIZING FACILITY SIDE SLOPES WITH SOD AND SURROUND FACILITY WITH SILT FENCE – 3 DAYS EACH
24. BEGIN CONSTRUCTION OF INDIVIDUAL HOMES (REFER TO ASSOCIATED BUILDER SDP). PROTECT ANY INSTALLED ESD FACILITES FROM RECEIVING "DIRTY" RUNOFF. 2 YEARS
25. INSTALLATION OF PROJECTS SIDEWALKS. – 1 MONTH
26. COMPLETE ANY FINE GRADING REQUIRED FROM DISTURBANCES MADE BY SIDEWALK INSTALLATION. ADD TOPSOIL PER THE SPECIFICATIONS SHOWN HEREON AND STABILIZE WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. – DAILY
27. UPON COMPLETION OF PROJECT HOME CONSTRUCTION AND WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, COMPLETE ANY REMAINING FINE GRADING IN ACCORDANCE WITH STORMWATER MANAGEMENT CRITERIA. ADD TOPSOIL PER THE SPECIFICATIONS SHOWN HEREON, AND STABILIZE DISTURBED AREAS WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH – 1 WEEK
28. COMPLETE INSTALLATION OF PROJECTS LANDSCAPE PLANTING REQUIREMENTS – 1 MONTH
29. AFTER PERMISSION HAS BEEN GIVEN BY SEDIMENT CONTROL INSPECTOR, REMOVE ANY REMAINING E/S CONTROLS AND STABILIZE THE DISTURBED AREAS FROM THE AFOREMENTIONED DISTURBANCES WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH – DAILY

NOTE: ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION



LEGEND:

- PROPERTY LINE
- RIGHT–OF–WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- EXISTING TREELINE
- CENTERLINE OF EXISTING STREAM
- EXISTING SPECIMEN TREE WITH CRITICAL ROOT ZONE
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EX. PUBLIC 100–YEAR FLOOD PLAIN
- EXISTING FOREST CONSERVATION EASEMENT (PLAT 16655)
- PROPOSED STORMDRAIN
- PROPOSED SIDEWALK
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- LIMIT OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE W/ MOUNTABLE BERM
- RIPRAP PROTECTION
- BAFFLE
- REMOVABLE PUMPING STATION
- SUPER SILT FENCE
- SILT FENCE
- EARTHDIKE
- HIGHLY ERODIBLE SOILS
- EXISTING PUBLIC SEWER, WATER DRAINAGE & UTILITY EASEMENT (PLAT 16655)
- MODERATE SLOPES (15%–24.9%)
- STEEP SLOPES (>25%)
- DRAINAGE DIVIDE

SEQUENCE OF CONSTRUCTION NOTES:

1. THE SEDIMENT SHALL BE REMOVED FROM THE SEDIMENT TRAPS WHEN THE CLEANOUT ELEVATION HAS BEEN REACHED. – DAILY
   –THE CONTRACTOR SHALL INSPECT AND PROVIDE NECESSARY MAINTENANCE ON THE SEDIMENT AND EROSION CONTROLS SHOWN HEREON AFTER EACH RAINFALL AND ON A DAILY BASIS. – DAILY
   –THE SEDIMENT TRAPS SHALL BE DEWATERED BY PUMPING. THE ACCUMULATED SEDIMENT SHALL BE PLACED UP GRADE FROM THE STRUCTURE IN SUCH A MANNER AS NOT TO INTERFERE WITH CONSTRUCTION OPERATIONS OR CAUSE EROSION DOWN GRADE FROM THE STRUCTURE. – DAILY
2. EARTH DIKES DIRECTING SITE DISTURBANCES TO THE TRAPS SHALL BE CONSTRUCTED AT THE SAME TIME AS THE SEDIMENT TRAPS. EARTH DIKES SHALL BE CONSTRUCTED STARTING AT THE TRAPS AND OUT TO THE UPHILL MOST POINT. EARTH DIKES SHALL BE LINED AS DETAILED HEREON. TEMPORARY MATTING IS MADE WITH DEGRADEABLE (6 MONTH), NATURAL OR MANMADE FIBERS OF UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND IS SMOLDER RESISTANT. – 1 DAY
3. AS ULTIMATE GRADES BETWEEN CONTROLS AND THE LOD ARE ESTABLISHED, THESE DISTURBANCES SHALL BE IMMEDIATELY STABILIZED WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. CONSTRUCTION IN TRAP AREAS SHALL BE DELAYED UNTIL ALL CONTRIBUTING AREAS ARE STABILIZED OR PERMISSION HAS BEEN GIVEN BY THE SEDIMENT CONTROL INSPECTOR. – DAILY
4. PLACE MICROBIORETENTION FACILITIES TO GRADE WHICH ALLOWS FEEDING STORM DRAINS TO FUNCTION. THESE FACILITIES SHALL BE CONSTRUCTED AT A LATER STAGE. STABILIZE DISTURBANCES WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. MICROBIORETENTION FACILITIES SHOULD NOT BE EXCAVATED TO BOTTOM ELEVATION ONLY THE MULCH ELEVATION WHICH WILL ALLOW THE INCOMING PIPES TO FUNCTION AND DRAIN TO THE FACILITY OUTLET – DAILY.
5. TRAPS SHALL REMAIN AS DIRECTED BY SEDIMENT CONTROL INSPECTOR AND SHALL BE BACKFILLED WITH PERMISSION OF SEDIMENT CONTROL INSPECTOR AS ULTIMATE GRADES ARE ESTABLISHED ALL CONTRIBUTING AREAS ARE STABILIZED. TRAPS SHALL BE REPLACED WITH SUPER SILT FENCE AT THE LIMITS OF DISTURBANCE AS SUPPORTING SLOPES ARE SET TO FINAL GRADE. WITH SLOPES AT GRADE, IMMEDIATELY STABILIZE WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. – 2 WEEK

NOTE:
- SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
- SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 35 FEET APART
- DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

NOTE:
EITHER PERMANENT OR TEMPORARY STABILIZATION IS TO BE APPLIED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR REGARDLESS OF DAYS/DATES IN THE STANDARD SEDIMENT CONTROL NOTES AND/OR SEEDING SPECIFICATIONS.

MAPPED SOILS TYPES - HOWARD COUNTY, MARYLAND

SYMBOL	NAME / DESCRIPTION	GROUP	HYDRIC	Kw RANGE	PRIME FARMLAND	<15% SLOPE W/ EROSION POTENTIAL
RuC	RUSSETT AND SANDY LOAM, 5 TO 10% SLOPES	C	NO	0.43	NO	YES
SaD	SASSAFRAS AND CROOM, 10 TO 15% SLOPES	B	NO	0.37	NO	YES
FooA	FALLSINGTON SANDY LOAMS, 0 TO 2% SLOPES	D	YES	0.24	NO	NO
WaA	WATCHUNG SILT LOAM, 0 TO 3% SLOPES	D	YES	0.43	NO	NO
LoB	LEGORE SILT LOAM, 3 TO 8% SLOPES	B	NO	0.64	NO	YES
LoC	LEGORE SILT LOAM, 8 TO 15% SLOPES	B	NO	0.64	NO	YES
GoC	GLADSTONE–LEGORE COMPLEX, 8 TO 15% SLOPES	B	NO	0.32	NO	NO

NOTE:
TAKEN FROM: USDA, SCS–WEB SOIL SURVEY, HOWARD COUNTY
HTTPS://WWW.HOWARDSCD.ORG/DOCUMENTS

HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

NOTE:
AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR, MORE STRINGENT SEEDING AND STABILIZATION MAY BE EXPECTED FOR AREAS OF HIGHLY ERODIBLE SOILS.

OWNER/DEVELOPER
JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869–0134

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN

PHASE 2 - SOILS MAP, PRELIMINARY GRADING AND SOIL EROSION & SEDIMENT CONTROL PLAN

CASCADE RIDGE

LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075

PARCEL: 474
TAX MAP: 31 GRID: 11
1ST ELECTION DISTRICT

ZONED: R–ED
L. 362 / F. 260
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
TIMMONS GROUP
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STATE OF MARYLAND
ROBERT HARRIS VOGEL
No. 16193
REGISTERED PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
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SHEET 5 OF 10

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE

NOTES:

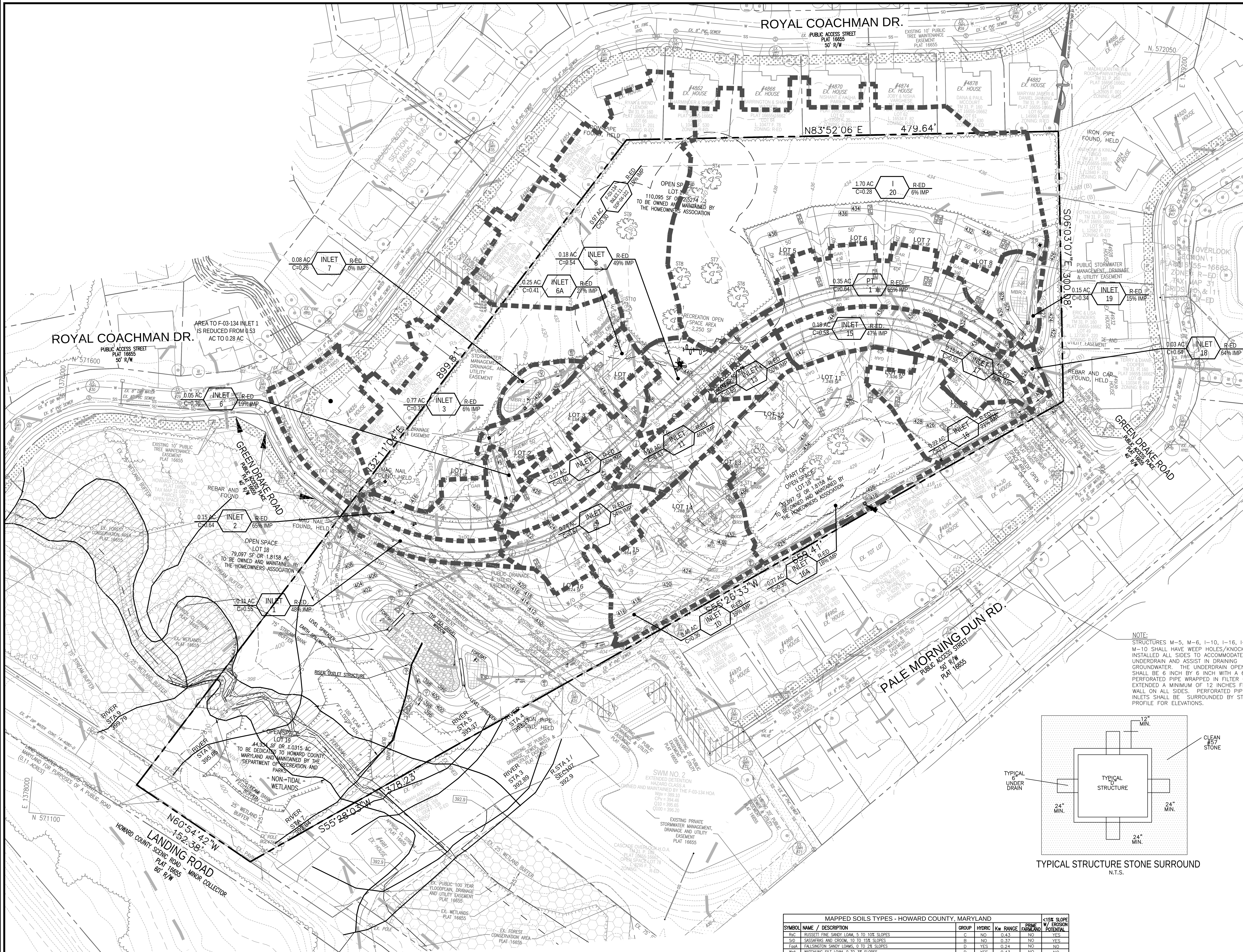
1. APPROVAL OF THIS PRELIMINARY GRADING AND SOIL EROSION AND SEDIMENT CONTROL PLAN DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED BUILDING AND/OR GRADING PERMIT
2. THERE ARE NO ENVIRONMENTAL FEATURES: FLOODPLAIN, WETLANDS, STREAMS, STEEP SLOPES OR FOREST THAT EXISTS WITHIN THE PROPOSED LIMIT OF DISTURBANCE.

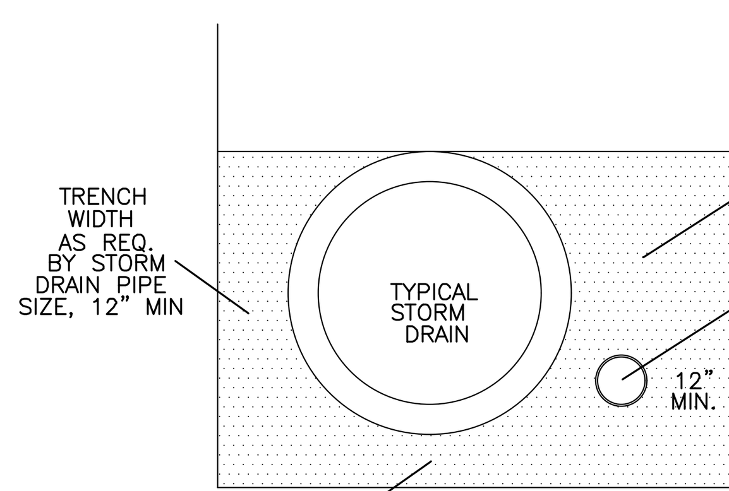
PHASE 2 - SOILS MAP, PRELIMINARY GRADING AND SOIL EROSION & SEDIMENT CONTROL PLAN

SCALE: 1"=50'

50' 0 50' 100' 150'

SP-19-004





TYPICAL 6" UNDER DRAIN
N.T.S.

NOTE:
6" PERF. PVC UNDER DRAIN RUN PARALLEL IN TRENCH
MATCH INVERTS
WRAP PIPE IN 1/4" HARDWARE CLOTH PER APPENDIX B.4. SHEET 17

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE (EX. SMH #47)
- EXISTING SANITARY LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 10' CONTOUR (330)
- EXISTING 2' CONTOUR (328)
- SOILS (SsE / SfC2)
- EXISTING TREELINE
- CENTERLINE OF EXISTING STREAM
- EXISTING SPECIMEN TREE (ST10)
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EX. PUBLIC 100-YEAR FLOOD PLAIN
- EXISTING FOREST CONSERVATION EASEMENT (PLAT 16655)
- PROPOSED STORMDRAIN
- PROPOSED SIDEWALK
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED 10' CONTOUR (430)
- PROPOSED 2' CONTOUR (432)
- SPLITTER MANHOLE
- DRAINAGE AREA
- AREA / C — INLET — ZONE / % IMP
- EXISTING PUBLIC SEWER, WATER DRAINAGE & UTILITY EASEMENT (PLAT 16655)
- MODERATE SLOPES (15%-24.9%)
- STEEP SLOPES (>25%)

NOTE:
STRUCTURES M-5, M-6, I-10, I-16, I-16A AND M-10 SHALL HAVE WEEP HOLES/KNOCK OUTS INSTALLED ALL SIDES TO ACCOMMODATE UNDERDRAIN AND ASSIST IN DRAINING GROUNDWATER. THE UNDERDRAIN OPENINGS SHALL BE 6 INCH BY 6 INCH WITH A 6 INCH PERFORATED PIPE WRAPPED IN FILTER CLOTH, EXTENDED A MINIMUM OF 12 INCHES FROM THE WALL ON ALL SIDES. PERFORATED PIPE AND INLETS SHALL BE SURROUNDED BY STONE. SEE PROFILE FOR ELEVATIONS.

12" MIN.
CLEAN #57 STONE
TYPICAL 6" UNDER DRAIN
TYPICAL "D" STRUCTURE
24" MIN.
24" MIN.
24" MIN.

TYPICAL STRUCTURE STONE SURROUND
N.T.S.

PRELIMINARY STORM DRAIN DRAINAGE AREA MAP
SCALE: 1"=50'
50' 0 50' 100' 150'

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LaC	LEGORE SILT LOAM, 8 TO 15% SLOPES	B	NO	0.64	NO	YES
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DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR DATE

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN
PRELIMINARY STORM DRAIN DRAINAGE AREA MAP

CASCADE RIDGE

LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
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PARCEL: 474
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SP-19-004

LANDSCAPE NOTES

1. AT THE TIME OF PLANT INSTALLATION, ALL SHRUBS AND TREES LISTED AND APPROVED ON THE LANDSCAPE PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATIONS OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING, ANY DEVIATION FROM THE APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO THE APPLICABLE PLANS.
2. THE OWNER, TENANT AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
3. SHOULD ANY TREE DESIGNATED FOR PRESERVATION FOR WHICH LANDSCAPING CREDIT IS GIVEN, DIE PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD, AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE HOWARD COUNTY LANDSCAPE MANUAL.
4. PLANTINGS SHOWN HEREON ARE THE RESPONSIBLITY OF THE DEVELOPER TO INSTALL DURING THE CONSTRUCITON OF THE FINAL PLAN.
5. SPECIFIC TREE TYPES AND SPECIES SHALL BE PROVIDED WITH THE FINAL PLAN LANDSCAPE PLAN AND DETAILS.

SPECIMEN TREE CHART

TREE	SPECIES	SIZE (IN. DBH)	CRZ (FT. RADIUS)	COMMENTS
ST–1	SILVER MAPLE	53	79.5	POOR CONDITION, MAJOR DIEBACK – TO BE REMOVED
ST–2	ENGLISH WALNUT	37	55.5	POOR CONDITION, OLD LIGHTENING STRIKE, DIEBACK AND ROT – TO REMAIN
ST–3	ENGLISH WALNUT	35.5	53.25	FAIR CONDITION – TO REMAIN
ST–4	TULIP POPLAR	30	45	GOOD CONDITION – TO REMAIN
ST–5	TULIP POPLAR	34.5	51.75	GOOD CONDITION – TO REMAIN
ST–6	AMERICAN BEECH	43.5	65.25	VERY POOR, MAJOR ROT – TO REMAIN
ST–7	TULIP POPLAR	53.3	79.95	VERY POOR, MAJOR ROT – TO REMAIN
ST–8	TULIP POPLAR	58	87	FAIR CONDITION, LIMB DAMAGE, LIMITED CROWN – TO REMAIN
ST–9	TULIP POPLAR	34	51	FAIR CONDITION, DIEBACK, LIMITED CROWN – TO REMAIN
ST–10	WHITE ASH	43	64.5	POOR CONDITION, NOTABLE DIEBACK, BORER ACTIVITY NOTED – TO REMAIN
ST–11	AMERICAN BEECH	36.5	54.75	POOR CONDITION, SEVERE TRUNK ROT – TO REMAIN
ST–12	SILVER MAPLE	48	72	POOR CONDITION, MAJOR DIEBACK, FENCED INTO OLD PET RUN – TO BE REMOVED
ST–13	TULIP POPLAR	33	49.5	FAIR CONDITION, SOME DIEBACK NOTED – TO BE REMOVED

GENERAL NOTE:

1. LANDSCAPING IS PROVIDED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. A FINANCIAL SURETY IN THE AMOUNT OF $ 10,350.00 FOR THE REQUIRED 21 SHADE TREES, 6 SHADE REPLACEMENT SPECIMEN TREES AND 15 EVERGREEN TREES SHALL BE POSTED WITH THE FINAL PLAN DEVELOPERS AGREEMENT.

SCHEDULE 'A' PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES				TOTAL
PERIMETER/FRONTAGE DESIGNATION LANDSCAPE TYPE	1 NONE	2 A	3 A	4 B	5 A	
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	166'	339'	1261'	594'	364'	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	YES 166 LF	YES 232 LF	YES 1,015 LF	NO	YES 211 LF	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	
NUMBER OF PLANTS REQUIRED SHADE TREES / EVERGREEN TREES / SHRUBS	– / – / –	1:60 2 / – / –	1:60 5 / – / –	1:50 12 / 1:40 15 / –	1:60 3 / – / –	21 / 15 / –
NUMBER OF PLANTS PROVIDED SHADE TREES / EVERGREEN TREES / OTHER TREES (2:1 SUBSTITUTION) / SHRUBS (10:1 SUBSTITUTION) / DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	– / – / – / –	2 / – / – / –	5 / – / – / –	12 / 15 / – / –	3 / – / – / –	21 / 15 / – / –

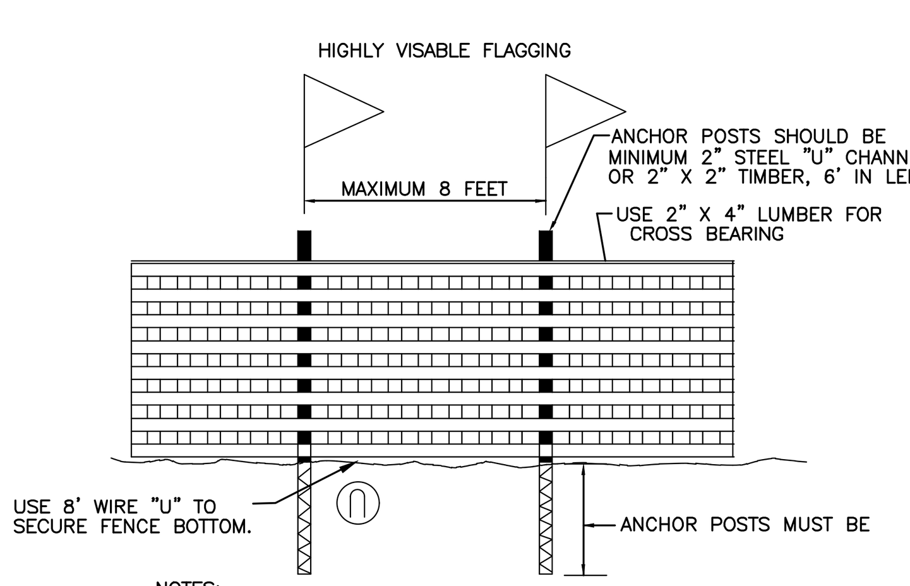
LANDSCAPE SCHEDULE NOTE:

1. ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HRD PLANTING SPECIFICATIONS.
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
3. FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
4. CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.

SPECIMEN TREE - REPLACEMENT CALCULATIONS		
NO. TO BE REMOVED	NO. REPLACEMENT REQUIRED	NO. PROVIDED
3	6 NATIVE	6
		3" CALIPER REQ.

SEE WP–20–036 NOTE 43, SHEET 1.
FUTURE FINAL PLAN SHALL PROVIDE LOCATIONS AND SPECIES

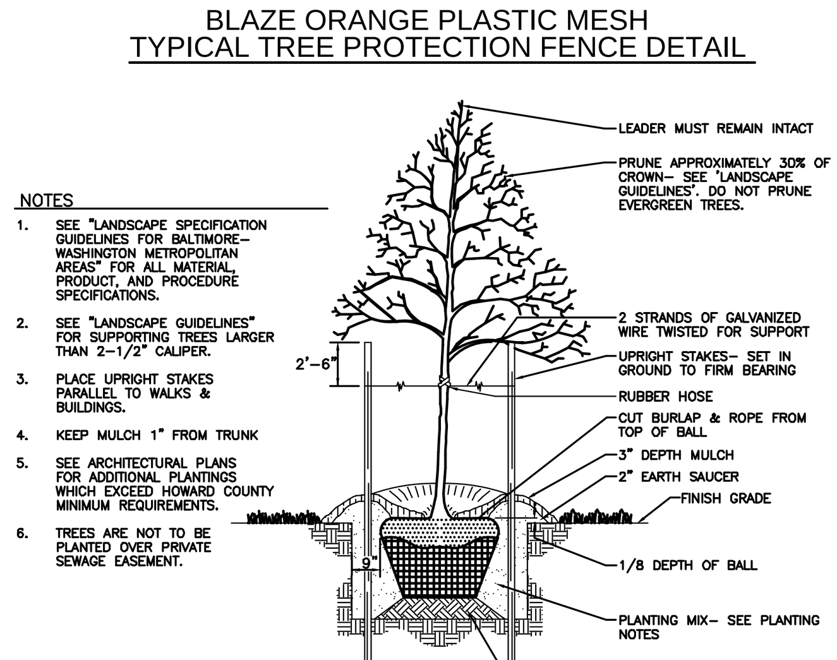
STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
GREEN DRAKE ROAD	910/40	46	46



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 DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. REFER TO HOWARD COUNTY STANDARAD DETAIL L–9.02

BLAZE ORANGE PLASTIC MESH
TYPICAL TREE PROTECTION FENCE DETAIL

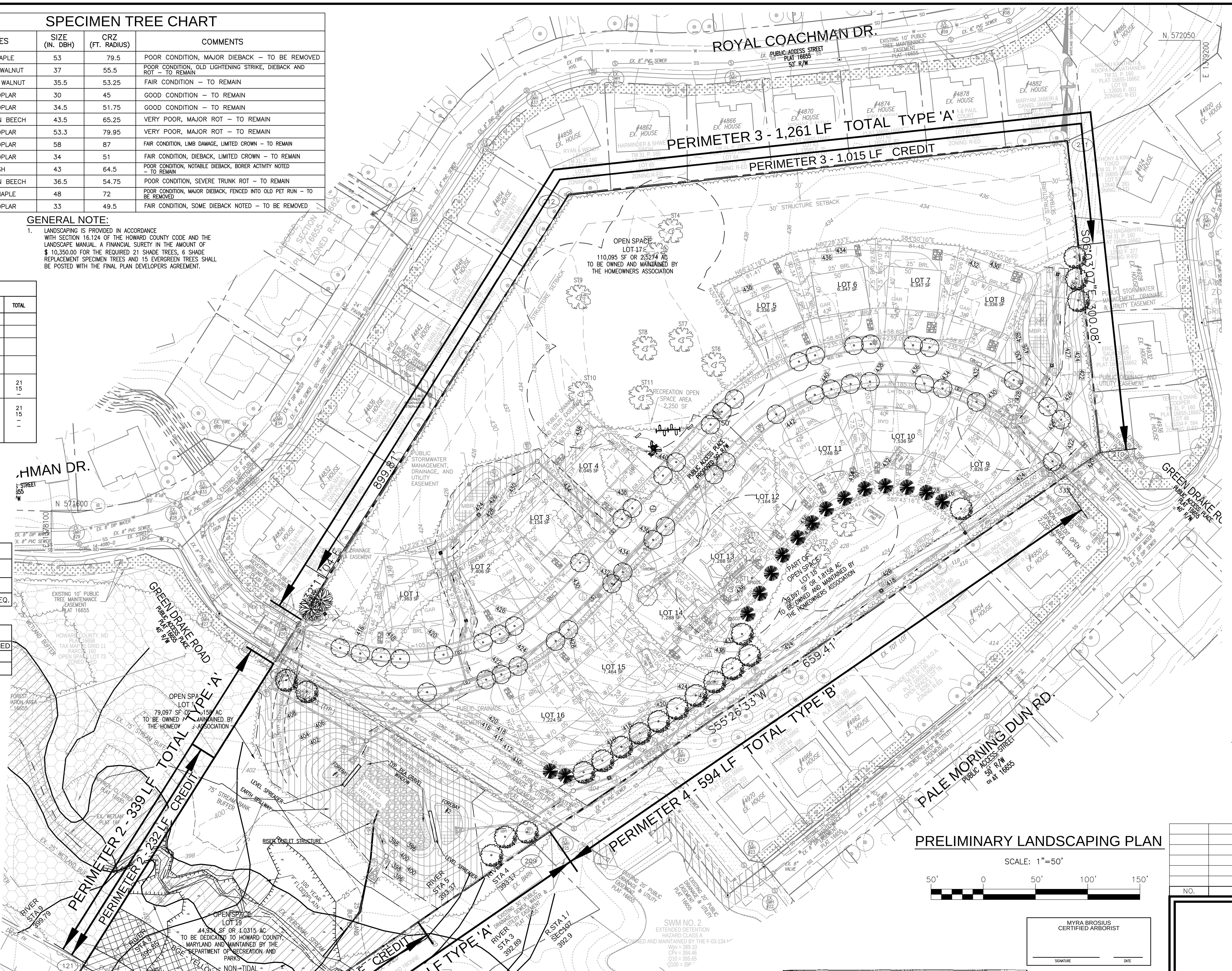
NOTES
1. SEE "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE–WASHINGTON METROPOLITAN AREAS" FOR ALL MATERIAL, PRODUCT, AND PROCEDURE SPECIFICATIONS.
2. SEE "LANDSCAPE GUIDELINES" FOR SUPPORTING TREES LARGER THAN 2–1/2" CALIPER.
3. PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
4. KEEP MULCH 1" FROM TRUNK
5. SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
6. TREES ARE NOT TO BE PLANTED OVER PRIVATE SEWAGE EASEMENT.



TREE PLANTING AND STAKING
DECIDUOUS TREES UP TO 2–1/2" CALIPER — NOT TO SCALE

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE



LEGEND:

- PROPERTY LINE
- RIGHT–OF–WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING TREELINE
- CENTERLINE OF EXISTING STREAM
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EX. PUBLIC 100–YEAR FLOOD PLAIN
- EXISTING FOREST CONSERVATION EASEMENT (PLAT 16655)
- PROPOSED TREELINE
- ST10 EXISTING SPECIMEN TREE
- EXISTING LANDSCAPING UNDER F–03–134
- PERIMETER OR STREET TREE PLANTING OBLIGATION
- PERIMETER 3 — LANDSCAPE PERIMETER
- BGE GREEN ZONE
- BGE YELLOW ZONE

DPZ'S POLICIES GOVERNING THE PLACEMENT OF LANDSCAPING AND STREET TREES IN PROXIMITY TO BGE'S POWER LINES OR TRANSMISSION RIGHT–OF–WAY ARE BASED ON BGE'S PUBLISHED "PLANTING ZONE CONCEPT" WHICH STIPULATES THE MAXIMUM ALLOWABLE SIZE OF PLANT MATERIALS FOR THREE DEFINED ZONES. AS THE DISTANCE FROM BGE EQUIPMENT INCREASES, SO DOES THE SIZE OF THE ALLOWABLE PLANT MATERIALS. THESE THREE ZONES AREA DEFINED AS FOLLOWS:

ZONE	DISTANCE FROM THE BGE POWER LINE OR TRANSMISSION RIGHT–OF–WAY	MAXIMUM HEIGHT OF VEGETATION
GREEN	UP TO 20 FEET	25 FEET
YELLOW	BETWEEN 20 FEET AND 45 FEET	40 FEET
RED	BEYOND 45 FEET	ABOVE 40 FEET

B G & E NOTES:

1. BGE RESERVES THE RIGHT TO TRIM, TOP OR CUT DOWN ANY TREE IN PROXIMITY TO THE LINE THAT IN THE OPINION OF BGE SHALL BE DEEMED A HAZARD TO THE SAFE AND RELIABLE DELIVERY OF ELECTRICITY.
2. THE DEPARTMENT OF PLANNING AND ZONING MAY AUTHORIZE THE TRIMMING OR REMOVAL OF TREES OR VEGETATION IMMEDIATELY ADJACENT TO THE BGE R/W OR EASEMENT, IF BGE DETERMINES THE TREES ARE COMPROMISING THE SAFETY OR A TRANSMISSION LINE LOCATED WITHIN THEIR UTILITY R/W OR EASEMENT. IF BGE INTENDS TO TRIM OR REMOVE TREES WITHIN A FOREST CONSERVATION EASEMENT, A LETTER SPECIFYING THE LOCATION AND SCOPE OF WORK NEEDS TO BE SENT TO DPZ AT LEAST 30 DAYS IN ADVANCE OF UNDERTAKING THE WORK. DPZ UNDERSTANDS CONSTELLATION ENERGY'S NEED TO PROTECT ITS TRANSMISSION LINES AND WILL NOT UNREASONABLE WITHHOLD PERMISSION.
3. CALL MISS UTILITY TO MARK UP THE LOCATION OF EXISTING GAS LINE BEFORE PLANTING STREET TREES ALONG LANDING ROAD & PLANT STREET TREES 10'AWAY FROM EXISTING GASLINE AS REQUIRED.

NOTE:

1. IN THE DIRECTION FACING A TRAFFIC CONTROL SIGN:
   1) THERE SHALL BE A MINIMUM OF 40' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL STOP SIGNS.
   2) THERE SHALL BE A MINIMUM OF 35' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL SIGNS OTHER THAN A STOP SIGN.
   3) A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

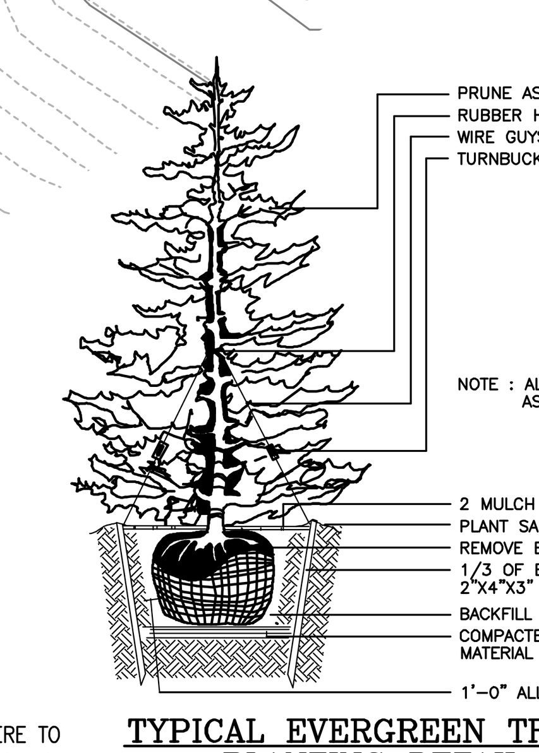
PRELIMINARY LANDSCAPING PLAN

SCALE: 1"=50'

50' 0 50' 100' 150'

NOTE:

STREET LIGHT PLACEMENT, FIXTURE TYPES, AND POLES SHALL ADHERE TO HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006), SECTION 5.5.A. A MINIMUM OF 20 FT SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.



TYPICAL EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

Eco-Science Professionals, Inc.
Consulting Ecologists
P.O. Box 5006 Glen Arm, Maryland 21057 Telephone (410) 832-2480 Fax (410) 832-2488

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # WDCP93MD0610044B2
John P. Canoles

MYRA BROSIUS
CERTIFIED ARBORIST
SIGNATURE — DATE

1. *NO RARE, THREATENED OR ENDANGERED SPECIES OR THEIR HABITATS AS DEFINED BY THE US FISH AND WILDLIFE SERVICE OR MD DNR WERE OBSERVED ON THE PROPERTY. NO SENSITIVE SPECIES REVIEW AREAS ARE PRESENT ON THE SITE PER THE MARYLAND DNR MERLIN MAPPING.*
2. *SURROUNDING LAND USE IS HIGH DENSITY RESIDENTIAL DEVELOPMENT.*
3. *APPROXIMATELY 0.8 ACRES OF FOREST IS PRESENT WITHIN 100 FEET OF THE SUBJECT PROPERTY.*
4. *THERE ARE WETLANDS, STREAMS AND BUFFERS ON THE PROPERTY. THE PROPERTY IS WITHIN THE USE I WATERSHED OF DEEP RUN (02–13–09). WETLANDS WILL REQUIRE 25' BUFFERS, THE STREAM WILL REQUIRE 75 FOOT BANK BUFFERS.*
5. *A 100 YEAR FLOODPLAIN IS PRESENT ON THE SUBJECT PROPERTY.*
6. *THERE ARE STEEP SLOPES (25% OR GREATER) ON THE PROPERTY.*
7. *THERE ARE HISTORIC STRUCTURES ON THE PROPERTY.*
8. *THERE ARE NO KNOWN CEMETERIES ON THE PROPERTY.*
9. *THERE ARE SPECIMEN TREES, STATE CHAMPION TREES AND/OR TREES 75% OF THE SIZE OF THE STATE CHAMPION TREE ON THE PROPERTY.*

OWNER/DEVELOPER
JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869–0134

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN
PRELIMINARY LANDSCAPING PLAN

CASCADE RIDGE

LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075

PARCEL: 474
TAX MAP: 31 GRID: 11
1ST ELECTION DISTRICT

ZONED: R–ED
L. 362 / F. 260
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
TIMMONS GROUP
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
P: 410.461.7666 F: 410.461.8961 www.timmons.com

STATE OF MARYLAND — ROBERT HARRIS VOGEL — NO. 16193 REGISTERED — PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MDL VETG
CHECKED BY: RHV
DATE: JANUARY 2020
SCALE: AS SHOWN
W.O. NO.: 42148

PROFESSIONAL CERTIFICATE
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. 16193 EXPIRATION DATE: 09–27–2022

SP-19-004

FOREST CONSERVATION AREA SIGNS

SPECIMEN TREE	FOREST RETENTION AREA
DO NOT REMOVE	DO NOT DISTURB
MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS PROHIBITED	MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS PROHIBITED
VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE MARYLAND FOREST CONSERVATION ACT OF 1991	*VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE MARYLAND FOREST CONSERVATION ACT OF 1991*

Min. 11" — Min. 15"

NOTE:
1. BOTTOM OF SIGNS TO BE HIGHER THAN TOP OF TREE PROTECTION FENCE.
2. SIGNS TO BE PLACED APPROXIMATELY 50–100' FEET APART. CONDITIONS ON SITE AFFECTING VISIBILITY MAY WARRANT PLACING SIGNS CLOSER OR FARTHER APART. WHERE SIGNS ARE TO BE PLACED AT THE REAR OF PROPOSED LOTS, SPACING SHAL BE APPROX. 25–30'+/–
3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.
4. ALL FOREST CONSERVATION SIGNAGE SHALL BE IN PLACE FOR PERPETUITY.
5. SIGN LOCATION SYMBOL = ⬢

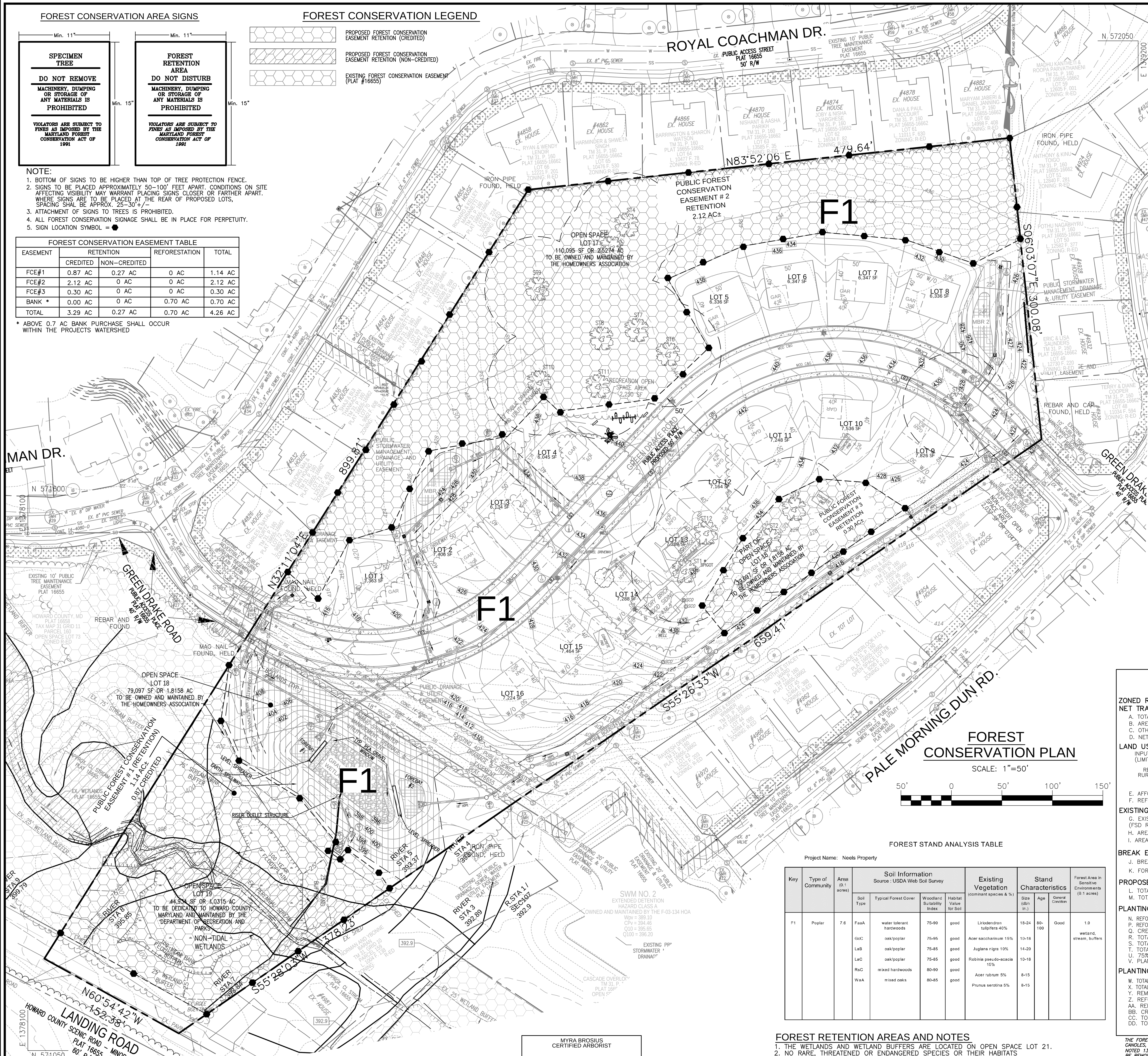
FOREST CONSERVATION LEGEND

- PROPOSED FOREST CONSERVATION EASEMENT RETENTION (CREDITED)
- PROPOSED FOREST CONSERVATION EASEMENT RETENTION (NON–CREDITED)
- EXISTING FOREST CONSERVATION EASEMENT (PLAT #16655)

FOREST CONSERVATION EASEMENT TABLE

EASEMENT	RETENTION		REFORESTATION	TOTAL
	CREDITED	NON–CREDITED		
FCE#1	0.87 AC	0.27 AC	0 AC	1.14 AC
FCE#2	2.12 AC	0 AC	0 AC	2.12 AC
FCE#3	0.30 AC	0 AC	0 AC	0.30 AC
BANK *	0.00 AC	0 AC	0.70 AC	0.70 AC
TOTAL	3.29 AC	0.27 AC	0.70 AC	4.26 AC

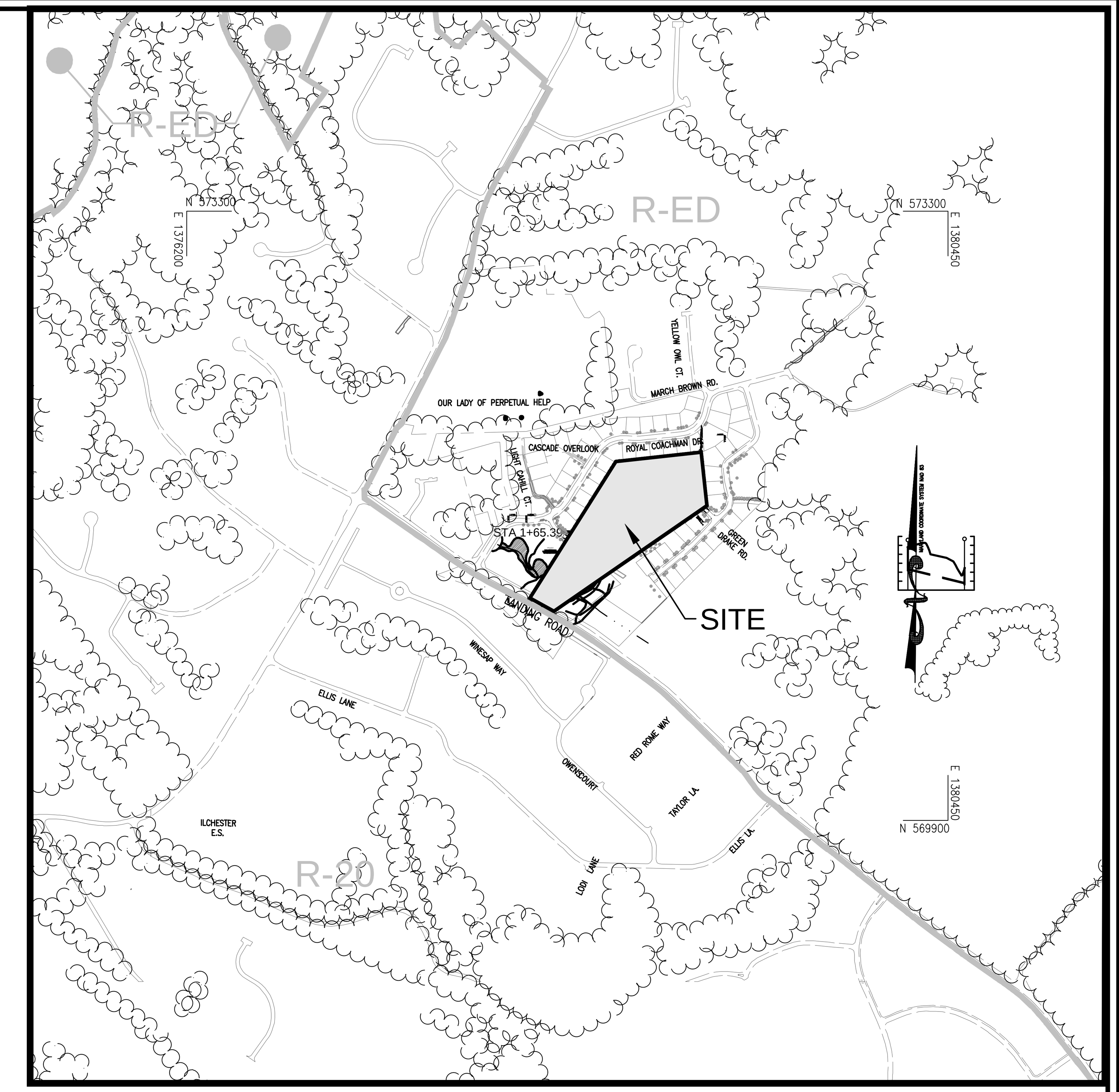
* ABOVE 0.7 AC BANK PURCHASE SHALL OCCUR WITHIN THE PROJECTS WATERSHED



FOREST CONSERVATION PLAN

SCALE: 1"=50'

50' 0 50' 100' 150'



LOCATION MAP

SCALE: 1"=600'

ADC MAP COORDINATE: PAGE: 28, 5–E

GENERAL NOTES

WATERSHED NAME: USE 1 WATERSHED DEEP RUN (02–13–09)

A. GROSS SITE AREA:	9.09 AC.
NET SITE AREA:	9.09 AC.
B. AREA OF 100–YEAR FLOODPLAIN:	0.30 AC.
C. AREA OF WETLANDS AND BUFFERS:	0.82 AC.
D. AREA OF > 15% STEEP SLOPES:	1.10 AC.
E. EXISTING FOREST WITHIN NET AREA:	7.6 AC.
F. ZONED:	
G. EXISTING USE:	RESIDENTIAL
H. PROPOSED USE:	RESIDENTIAL

LEGEND:

- PROPERTY LINE
- RIGHT–OF–WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING TREELINE
- CENTERLINE OF EXISTING STREAM
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EX. PUBLIC 100–YEAR FLOOD PLAIN

HOWARD COUNTY CASCADE RIDGE FOREST CONSERVATION WORKSHEET

ZONED R–ED

NET TRACT AREA:

A. TOTAL GROSS TRACT AREA	A = 9.1 AC
B. AREA WITHIN 100 YEAR FLOODPLAIN	B = 0.3 AC
C. OTHER DEDUCTIONS (IDENTIFY)	C = 0.0 AC
D. NET TRACT AREA	D = 8.8 AC

LAND USE CATEGORY:

INPUT THE NUMBER "1" UNDER THE APPROPIATE LAND USE (LIMIT TO ONLY ONE ENTRY): ZONED R–ED

RESID. RURAL LD	RESID. RURAL MD	RESID. SUBURBAN	INST./ LINEAR	RETAIL/IND./ OFFICE	MIXED USE/ PUD
0	0	1	0	0	0

E. AFFORESTATION THRESHOLD	NET TRACT AREA X 15% =	E = 1.3 AC
F. REFORESTATION THRESHOLD	NET TRACT AREA X 20% =	F = 1.8 AC

EXISTING FOREST COVER:

G. EXISTING FOREST COVER WITHIN THE NET TRACT AREA (FSD REPORT)	G = 7.3 AC
H. AREA OF FOREST ABOVE AFFORESTATION THRESHOLD	H = 6.0 AC
I. AREA OF FOREST ABOVE REFORESTATION THRESHOLD	I = 5.5 AC

BREAK EVEN POINT:

J. BREAK EVEN POINT	J = 3.63AC
K. FOREST CLEARING PERMITTED WITHOUT MITIGATION	K = 3.67AC

PROPOSED FOREST CLEARING:

L. TOTAL AREA OF FOREST TO BE CLEARED	L = 4.1 AC
M. TOTAL AREA OF FOREST TO BE RETAINED	M = 3.2 AC

PLANTING REQUIREMENTS INSIDE WATERSHED:

N. REFORESTATION FOR CLEARING ABOVE THE REFORESTATION THRESHOLD	N = 2.1 AC
P. REFORESTATION FOR CLEARING BELOW THE REFORESTATION THRESHOLD	P = 0.0 AC
Q. CREDIT FOR RETENTION ABOVE REFORESTATION THRESHOLD	Q = 1.4 AC
R. TOTAL REFORESTATION REQUIRED	R = 0.7 AC
S. TOTAL AFFORESTATION REQUIRED	S = 0.0 AC
T. TOTAL REFORESTATION AND AFFORESTATION REQUIREMENT	T = 0.7 AC
U. 75% OF TOTAL OBLIGATION (RETENTION + PLANTING)	U = 2.9 AC
V. PLANTING REQUIRED ONSITE TO MEET 75% OBLIGATION	V = 0.0 AC

PLANTING REQUIREMENTS OUTSIDE WATERSHED:

W. TOTAL PLANTING WITHIN DEVELOPMENT SITE WATERSHED	W = 0.7 AC
X. TOTAL AFFORESTATION REQUIRED	X = 0.0 AC
Y. REMAINING PLANTING WITHIN WATERSHED FOR REFORESTATION CREDIT	Y = 0.7 AC
Z. REFORESTATION FOR CLEARING ABOVE THE REFORESTATION THRESHOLD	Z = 0.0 AC
AA. REFORESTATION FOR CLEARING BELOW THE REFORESTATION THRESHOLD	AA = 0.0 AC
BB. CREDIT FOR RETENTION ABOVE THE REFORESTATION THRESHOLD	BB = 0.0 AC
CC. TOTAL REFORESTATION REQUIRED	CC = 0.0 AC
DD. TOTAL AFFORESTATION AND REFORESTATION REQUIREMENT	DD = 0.0 AC

THE FOREST STAND DELINEATION PLAN PREPARED BY ECO–SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, ON MARCH 2019 IS CERTIFIED HEREON BY MYRA BROSIUS – CERTIFIED ARBORIST. MR. CANOLES NOTED 13 SPECIMEN TREES ON THE PROJECT SITE (REFER TO SHEET 7). THERE ARE 3 SPECIMEN TREES TO BE REMOVED WITH THIS PLAN PROPOSAL.

THIS PROJECT COMPLIES WITH THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, THE HOWARD COUNTY FOREST CONSERVATION MANUAL AND CB–62–2019.

FOREST CONSERVATION OBLIGATION TO BE FULFILLED BY:
1. *3.56 AC. (3.29 AC CREDITED) OF FOREST RETENTION (NO SURETY REQUIRED)*
2. *0.7 AC OF REFORESTATION VIA PURCHASE IN AN ESTABLISHED FOREST BANK WITHIN THE WATERSHED. FOREST BANK TO BE DETERMINED UNDER FINAL PLAN.*

FOREST STAND ANALYSIS TABLE

Project Name: Neels Property

Key	Type of Community	Area (0.1 acres)	Soil Information Source : USDA Web Soil Survey				Existing Vegetation (dominant species & %)	Stand Characteristics			Forest Area in Sensitive Environments (0.1 acres)
			Soil Type	Typical Forest Cover	Woodland Suitability Index	Habitat Value for Soil		Size (dbh in.)	Age	General Condition	
F1	Poplar	7.6	FaaA	water tolerant hardwoods	75-90	good	Liriodendron tulipifera 40%	18-24	80-100	Good	1.0 wetland, stream, buffers
			GcC	oak/poplar	75-95	good	Acer saccharinum 15%	10-18			
			LaB	oak/poplar	75-85	good	Juglans nigra 10%	14-20			
			LaC	oak/poplar	75-85	good	Robinia pseudo-acacia 15%	10-18			
			RsC	mixed hardwoods	80-90	good	Acer rubrum 5%	8-15			
			WaA	mixed oaks	80-85	good	Prunus serotina 5%	8-15			

FOREST RETENTION AREAS AND NOTES

1. THE WETLANDS AND WETLAND BUFFERS ARE LOCATED ON OPEN SPACE LOT 21.
2. NO RARE, THREATENED OR ENDANGERED SPECIES OR THEIR HABITATS WERE OBSERVED ON THIS SITE.
3. FORESTED AREAS ADJACENT TO FLOODPLAINS AND STREAM BUFFERS ARE SUBSTANTIALLY RETAINED IN OPEN SPACE LOTS.
4. CHANGES IN GRADING AND RUNOFF WITHIN CONSTRUCTION/INSTALLATION AREAS WILL NOT ADVERSELY AFFECT THE SOILS WITHIN THE FOREST RETENTION AREA. SEDIMENT CONTROL MEASURES WILL REDIRECT CONCENTRATED FLOW RUNOFF TO STORMWATER MANAGEMENT FACILITIES, RETAIN SEDIMENT WITHIN THE CONSTRUCTION SITE, AND/OR REDIRECT CLEAN WATER AWAY FROM CONSTRUCTION AREAS.
5. THE FOREST CONSERVATION EASEMENT HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE FOREST CONSERVATION MANUAL. 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.

NOTE:
IN ACCORDANCE WITH SECTION 16.1205(A) THE COUNTY CODE, THE PROJECTS SPECIMEN TREES ARE DETAILED ON SHEET 7

MYRA BROSIUS
CERTIFIED ARBORIST

SIGNATURE — DATE

Eco-Science Professionals, Inc.
Consulting Ecologists
P.O. Box 5006 Glen Arm, Maryland 21057 Telephone (410) 832-2480 Fax (410) 832-2488

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # WDCP93MD0610044B2
John P. Canoles

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE

OWNER/DEVELOPER

JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869–0134

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN
FOREST CONSERVATION PLAN

CASCADE RIDGE

LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075

PARCEL: 474
TAX MAP: 31 GRID: 11
1ST ELECTION DISTRICT

ZONED: R–ED
L. 362 / F. 260
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
⊕
TIMMONS GROUP
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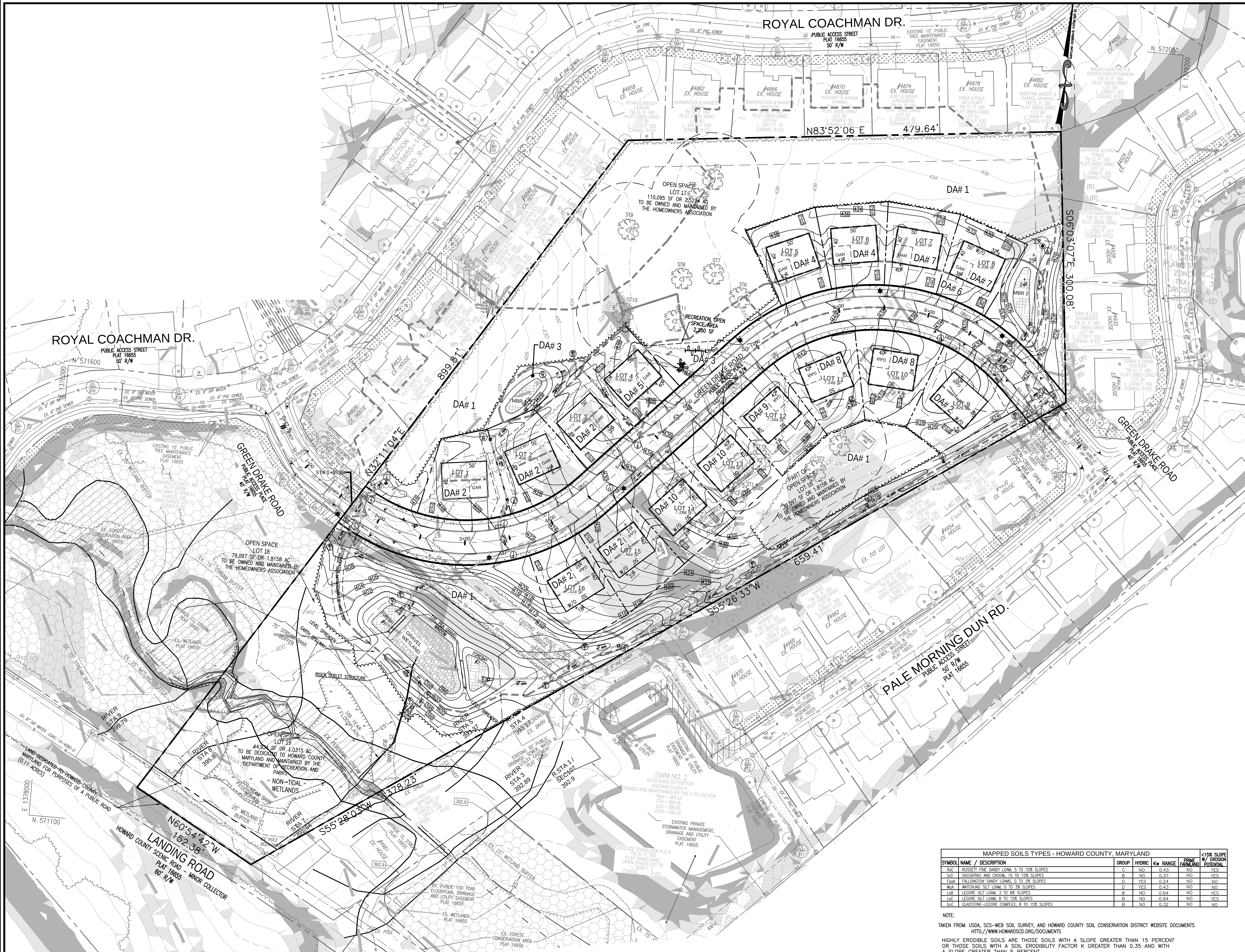
STATE OF MARYLAND — ROBERT HARRIS VOGEL — NO.16193 REGISTERED — PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.16193

DESIGN BY:	RHV
DRAWN BY:	MDL VETG
CHECKED BY:	RHV
DATE:	JANUARY 2020
SCALE:	AS SHOWN
W.O. NO.:	42148

PROFESSIONAL CERTIFICATE

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. 16193 EXPIRATION DATE: 09–27–2022



LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS (SsE / SfC2)
- EXISTING TREELINE
- CENTERLINE OF EXISTING STREAM
- EXISTING SPECIMEN TREE (ST10)
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EX. PUBLIC 100-YEAR FLOOD PLAIN
- EXISTING FOREST CONSERVATION EASEMENT (PLAT 16655)
- PROPOSED STORMDRAIN
- PROPOSED SIDEWALK
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED 10' CONTOUR (430)
- PROPOSED 2' CONTOUR (432)
- DRAINAGE AREA DESIGNATION (DA# 1)
- DRAINAGE AREA
- EXISTING PUBLIC SEWER, WATER DRAINAGE & UTILITY EASEMENT (PLAT 16655)

STORMWATER MANAGEMENT DRAINAGE AREA MAP

SCALE: 1"=50'

50' 0 50' 100' 150'

MAPPED SOILS TYPES - HOWARD COUNTY, MARYLAND						<15% SLOPE W/ EROSION POTENTIAL
SYMBOL	NAME / DESCRIPTION	GROUP	HYDRIC	Kw RANGE	PRIME FARMLAND	
RsC	RUSSETT FINE SANDY LOAM, 5 TO 10% SLOPES	C	NO	0.43	NO	YES
SrD	SASSAFRAS AND CROOM, 10 TO 15% SLOPES	B	NO	0.37	NO	YES
FaaA	FALLSINGTON SANDY LOAMS, 0 TO 2% SLOPES	D	YES	0.24	NO	NO
WaA	WATCHUNG SILT LOAM, 0 TO 3% SLOPES	D	YES	0.43	NO	NO
LaB	LEGORE SILT LOAM, 3 TO 8% SLOPES	B	NO	0.64	NO	YES
LaC	LEGORE SILT LOAM, 8 TO 15% SLOPES	B	NO	0.64	NO	YES
GcC	GLADSTONE-LEGORE COMPLEX, 8 TO 15% SLOPES	B	NO	0.32	NO	NO

NOTE:

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, AND HOWARD COUNTY SOIL CONSERVATION DISTRICT WEBSITE DOCUMENTS HTTS://WWW.HOWARDSCD.ORG/DOCUMENTS

HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR DATE

OWNER/DEVELOPER
JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869-0134

NO.	REVISION	DATE

PRELIMINARY EQUIVALENT SKETCH PLAN
STORMWATER MANAGEMENT
DRAINAGE AREA MAP

CASCADE RIDGE

LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
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STATE OF MARYLAND ROBERT HARRIS VOGEL NO.16193 REGISTERED PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MDL VETG
CHECKED BY: RHV
DATE: JANUARY 2020
SCALE: AS SHOWN
W.O. NO.: 42148

PROFESSIONAL CERTIFICATE

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. 16193 EXPIRATION DATE: 09-27-2022

SP-19-004

APPENDIX B.4.C SPECIFICATIONS FOR MICRO–BIORETENTION. RAIN GARDEN, 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 CONTEN – MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%–65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
* CLAY CONTENT – MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
* PH RANGE – SHOULD BE BETWEEN 5.5 – 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO 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 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 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 BIORETENION 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 OF HDPE).
* PERFORATIONS – IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (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 (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THIS 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.

Appendix B.4. Construction Specifications for Environmental Site Design Practices

Table B.4.1 Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration-

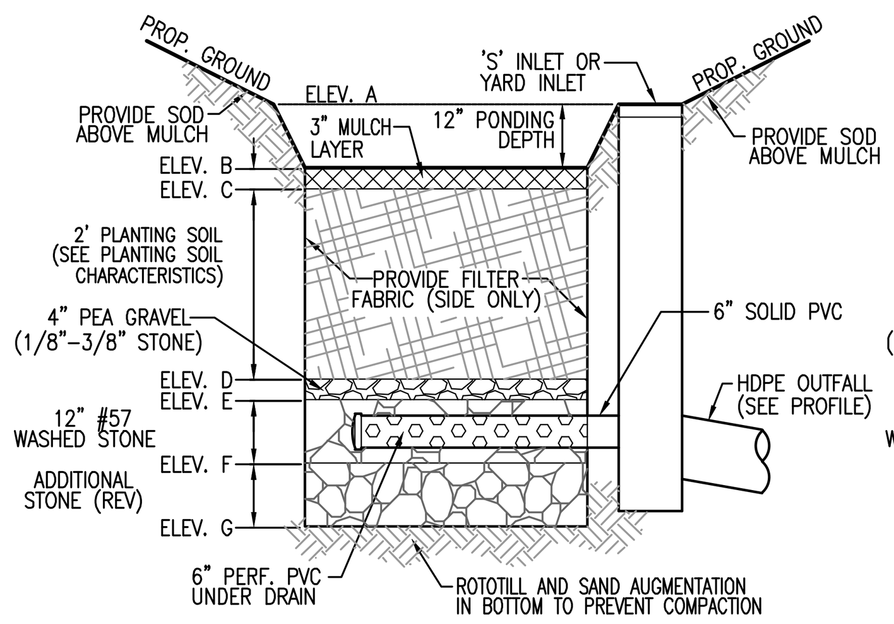
Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 – 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with ¼-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) *not using previously approved State or local standards* requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (**AASHTO**) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

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

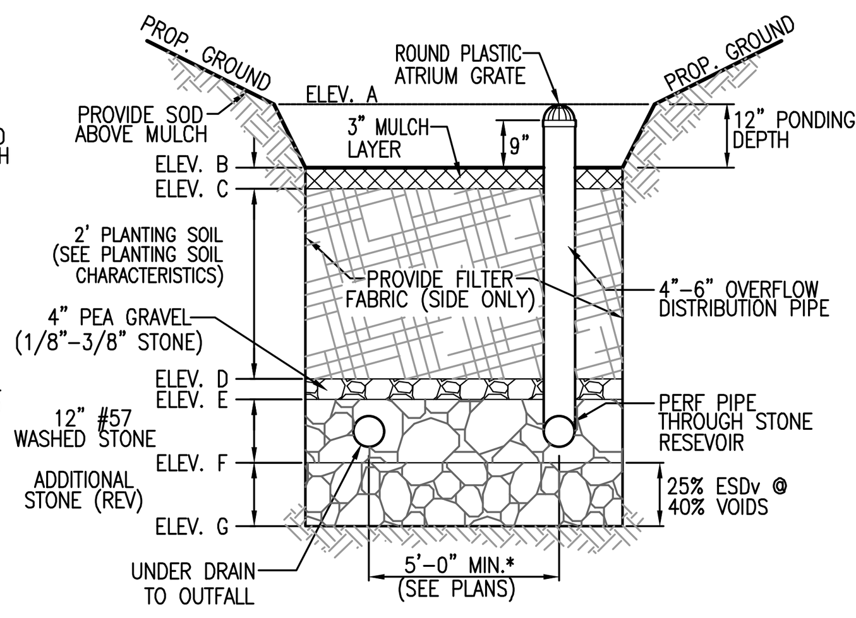
1. THE MONITORING WELLS AND STRUCTURES SHALL BE INSPECTED ON A QUARTERLY BASIS AND AFTER EVERY LARGE STORM EVENT.
2. WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS SHALL BE RECORDED OVER A PERIOD OF SEVERAL DAYS TO INSURE TRENCH DRAINAGE.
3. A LOG BOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
4. WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN DOWN WITHIN THE 72 HOUR TIME PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.
5. THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
6. ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION FACILITY HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE

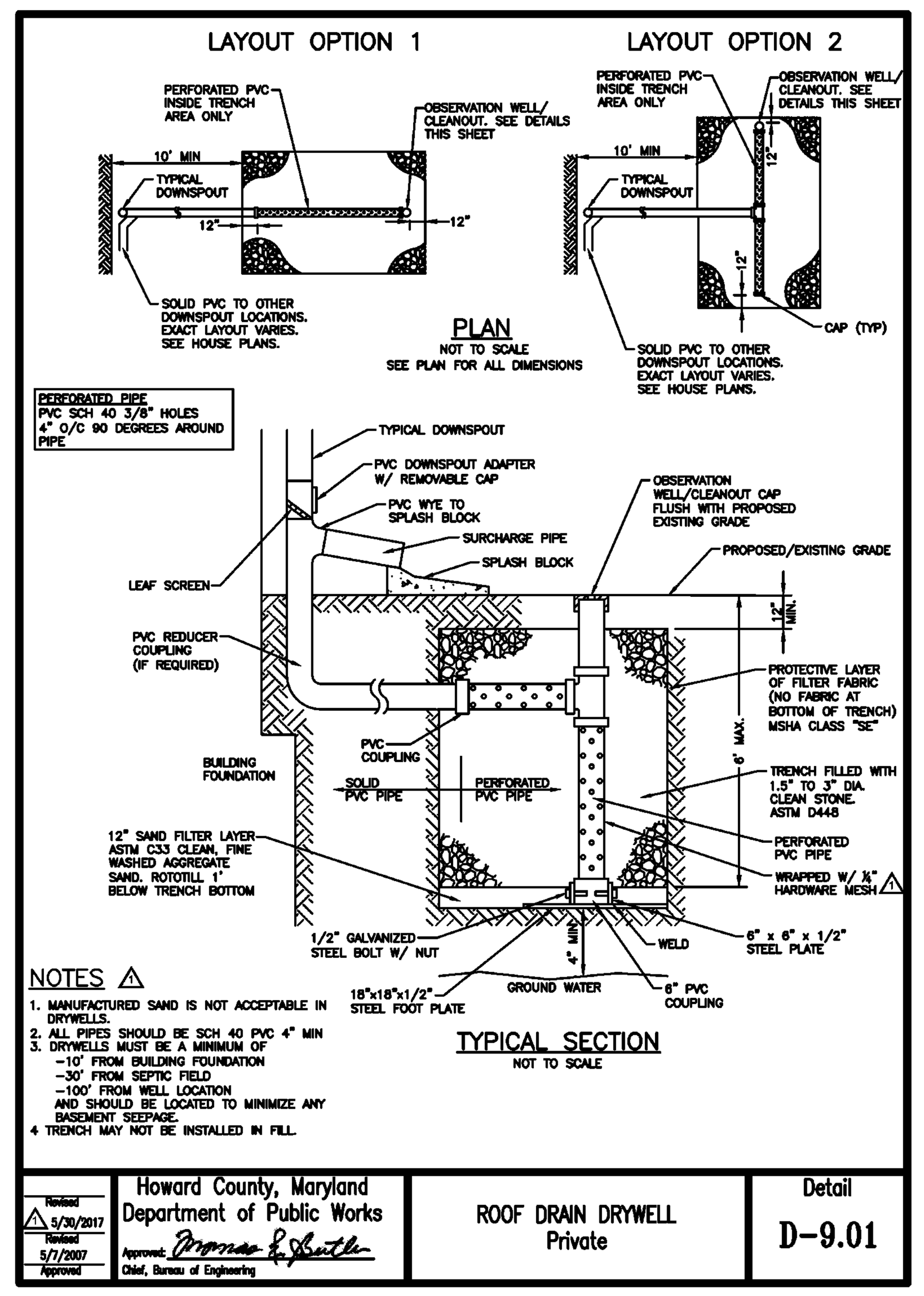


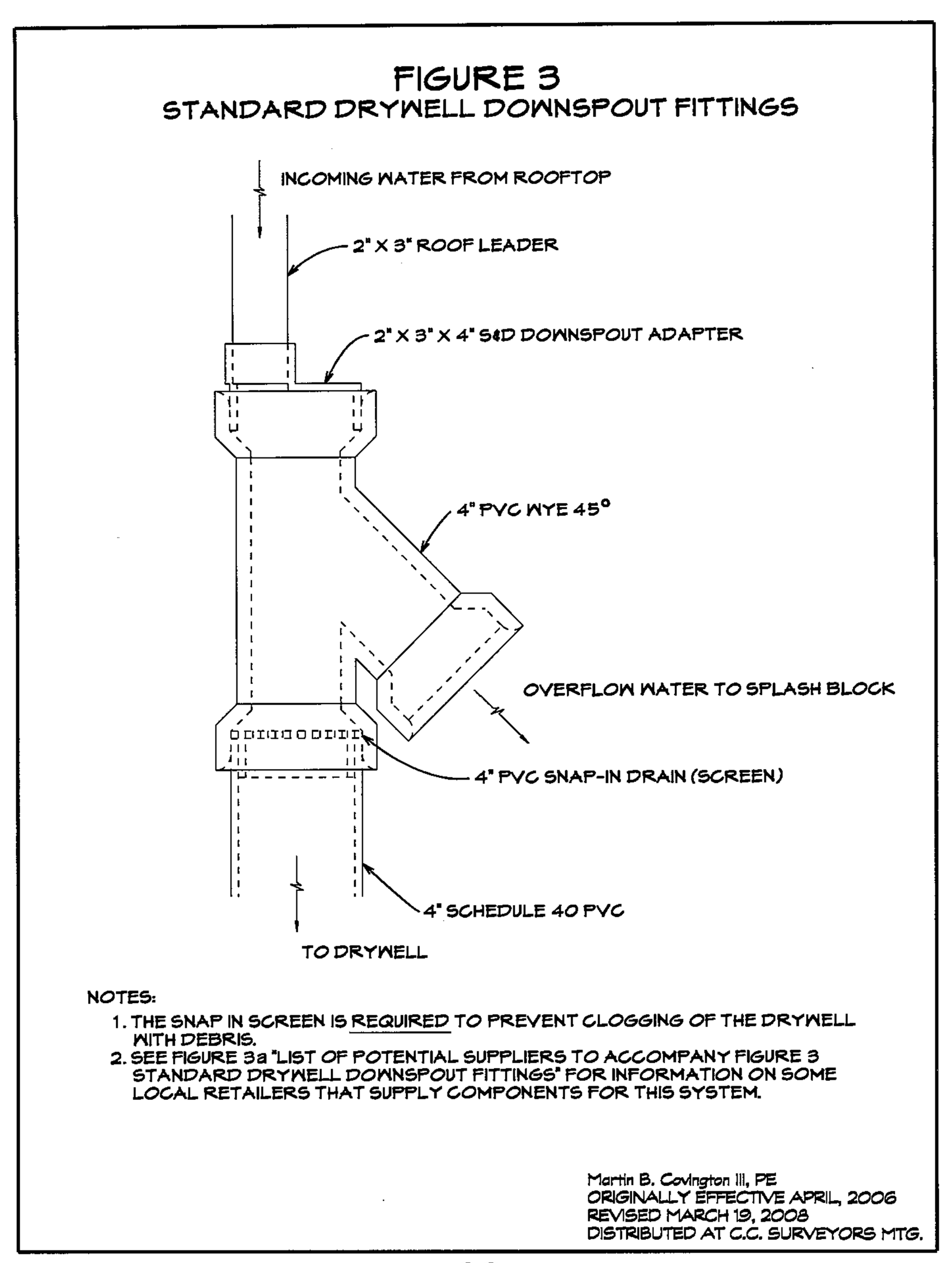
MICRO-BIORETENTION (UNDERDRAIN) (M-6)
NOT TO SCALE



MICRO-BIORETENTION (OVERFLOW) (M-6)
NOT TO SCALE

MICROBIORETENTION NOTES:
1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETNTION WILL CAUSE THE MBR TO FAIL, AND THEREFORE SHALL NOT BE INSTALLED.
2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH.
3. PROVIDE 5' MINIMUM SPACING BETWEEN UNDER DRAIN AND PERFORATED PIPE THROUGH STONE RESIVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL BIOS. (SEE PLANS)





OPERATION AND MAINTENANCE SCHEDULE FOR LANSCAPE INFILTRATION (M-3), MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIORETENTION SWALE (M-8), AND ENHANCED FILTERS (M-9)

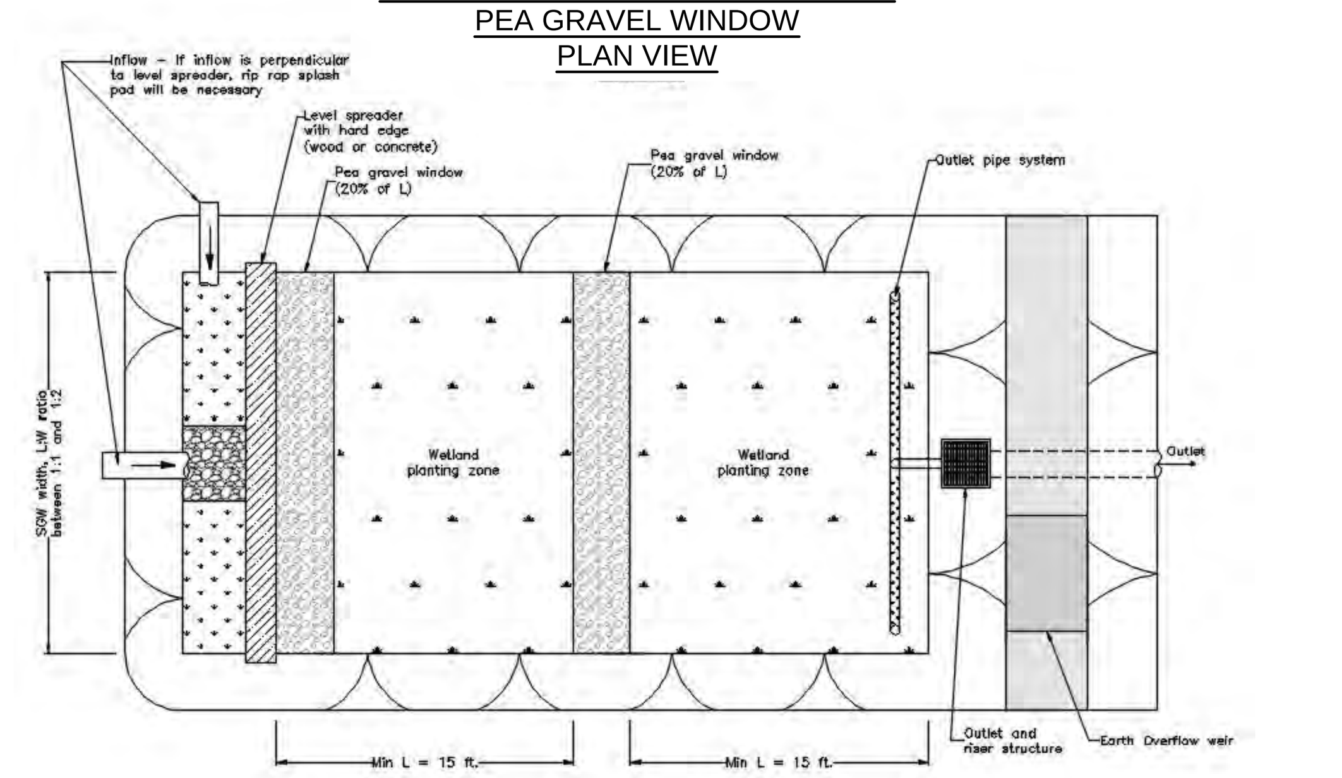
1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULTCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE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

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

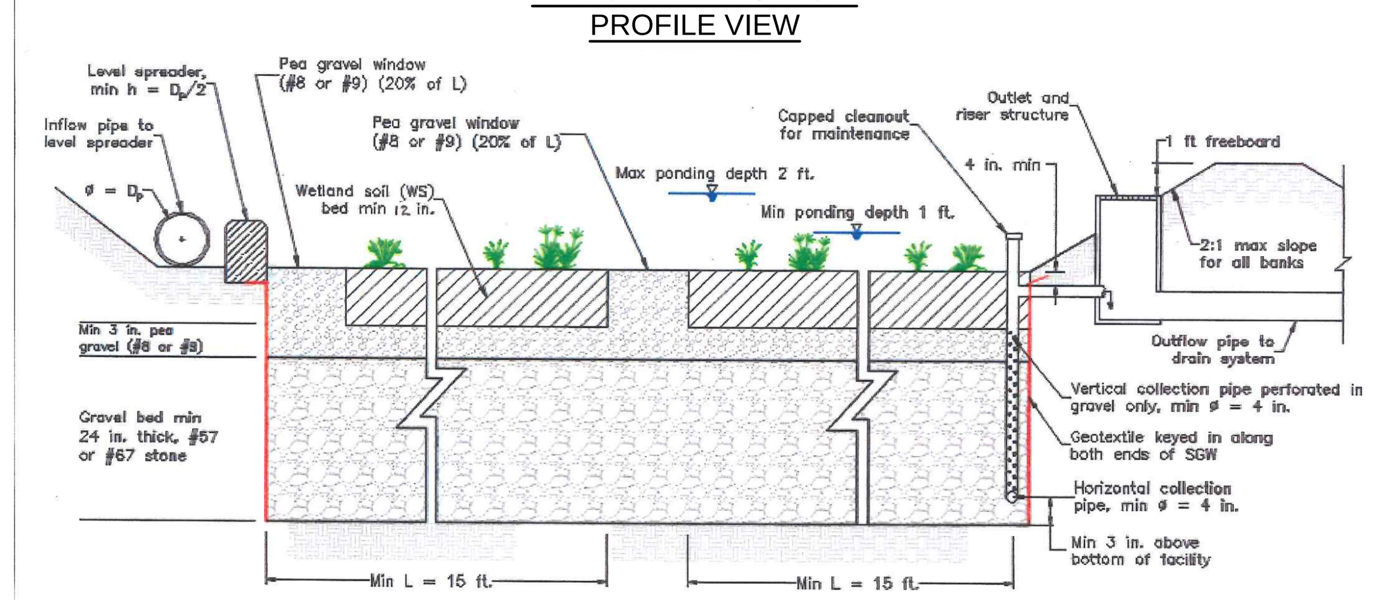
3. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.

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

SUBMERGED GRAVEL WETLAND W/ PEA GRAVEL WINDOW PLAN VIEW



SUBMERGED GRAVEL WETLAND W/ PEA GRAVEL WINDOW PROFILE VIEW



M–2. SUBMERGED GRAVEL WETLANDS
CONSTRUCTION CRITERIA:
THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING THE CONSTRUCTION OF PROJECTS WITH SUBMERGED GRAVEL WETLANDS:

1. SITE DISTURBANCE: ALL ON–SITE DISTURBED AREAS SHOULD BE STABILIZED PRIOR TO ALLOWING RUNOFF TO ENTER THE NEWLY CONSTRUCTED WETLAND.

2. EROSION AND SEDIMENT CONTROL: THE PROPOSED LOCATION OF A SUBMERGED GRAVEL WETLAND SHALL BE PROTECTED DURING CONSTRUCTION. SURFACE RUNOFF SHALL BE DIVERTED AWAY FROM THE PRACTICE DURING GRADING OPERATIONS. FLOW SPLITTERS AND OTHER CONVEYANCE INFRASTRUCTURE SHALL BE BLOCKED.

WETLAND CONSTRUCTION SHALL BE PERFORMED WITH LIGHTWEIGHT, WIDE–TRACKED EQUIPMENT TO MINIMIZE DISTURBANCE AND COMPACTION. EXCAVATED MATERIALS SHALL BE PLACED IN A CONTAINED AREA. ANY PUMPING OPERATIONS SHALL DISCHARGE FILTERED WATER TO A STABLE OUTLET.

3. GRAVEL MEDIA: THE AGGREGATE SHALL BE COMPOSED OF AN 18 TO 48 INCH LAYER OF CLEAN WASHED, UNIFORMLY GRADED MATERIAL WITH A POROSITY OF 40%. ROUNDED BANK RUN GRAVEL IS RECOMMENDED (E.G., ASTM D448 4,5, OR 6 STONE OR EQUAL).

INSPECTION:
REGULAR INSPECTIONS SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:
A. DURING EXCAVATION TO SUBGRADE.
B. DURING PLACEMENT OF BACKFILL OF PERFORATED INLET PIPE AND OBSERVATION WELLS.
C. DURING PLACEMENT OF GEOTEXTILES AND ALL FILTER MEDIA.
D. DURING CONSTRUCTION OF ANY APPURTENANT CONVEYANCE SYSTEMS SUCH AS DIVERSION STRUCTURES, INLETS, OUTLETS, AND FLOW DISTRIBUTION STRUCTURES.
E. UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION, AND BEFORE ALLOWING RUNOFF TO ENTER THE WETLAND.

NOTES:
(1) PROVIDE "GRAVEL JACKET" THROUGH SOIL LAYER TO KEEP SOIL FROM MIGRATING IN TO GRAVEL LAYER.
(2) SLOTTED RIGID PVC OR HDPE OR PERFORATED SCH 40 PVC PIPE TO BE WRAPPED W/ 1/4" GALVANIZED HARDWARE CLOTH OR EQUAL MATERIAL, SEE APPENDIX B.4.C.

WETLAND SOIL SPECIFICATIONS
THE SURFACE INFILTRATION RATES OF THE GRAVEL WETLAND SOIL SHOULD BE SIMILAR TO A LOW HYDRAULIC CONDUCTIVITY WETLAND SOIL (0.1–0.01 FT/DAY = 3.5 X 10^5 CM/SEC TO 3.5 X 10^6 CM/SEC)). THIS SOIL CAN BE MANUFACTURED USING COMPOST, SAND, AND SOME FINE SOILS TO BLEND TO A HIGH % ORGANIC MATTER CONTENT SOIL (>15% ORGANIC MATTER).
AVOID USING CLAY CONTENTS IN EXCESS OF 15% BECAUSE OF POTENTIAL MIGRATION OF FINES INTO SUBSURFACE GRAVEL LAYER .
DO NOT USE GEOTEXTILES BETWEEN THE HORIZONTAL LAYERS OF THIS SYSTEM AS THEY WILL CLOG DUE TO FINES AND MAY RESTRICT ROOT GROWTH.

IMPERVIOUS LINER:

IF NATIVE A LOW HYDRAULIC CONDUCTIVITY NATIVE SOIL IS NOT PRESENT BELOW THE GRAVEL LAYER, A LOW PERMEABILITY LINER OR SOIL SHOULD BE USED TO:
– MINIMIZE INFILTRATION
– PRESERVE HORIZONTAL FLOW IN THE GRAVEL,
– MAINTAIN THE WETLAND PLANTS.
IF GEOTECHNICAL TESTS CONFIRM THE NEED FOR A LINER, ACCEPTABLE OPTIONS INCLUDE:
(A) 6 TO 12 INCHES (15 – 30 CM) OF CLAY SOIL (MINIMUM 15% PASSING THE #200 SIEVE AND A MINIMUM PERMEABILITY OF 1 X 10^5 CM/SEC),
(B) A 30 ML HDPE LINER,
(C) BENTONITE,
(D) USE OF CHEMICAL ADDITIVES (SEE NRCS AGRICULTURAL HANDBOOK NO. 386, DATED 1961, OR ENGINEERING FIELD MANUAL),
(E) A DESIGN PREPARED BY A PROFESSIONAL ENGINEER.

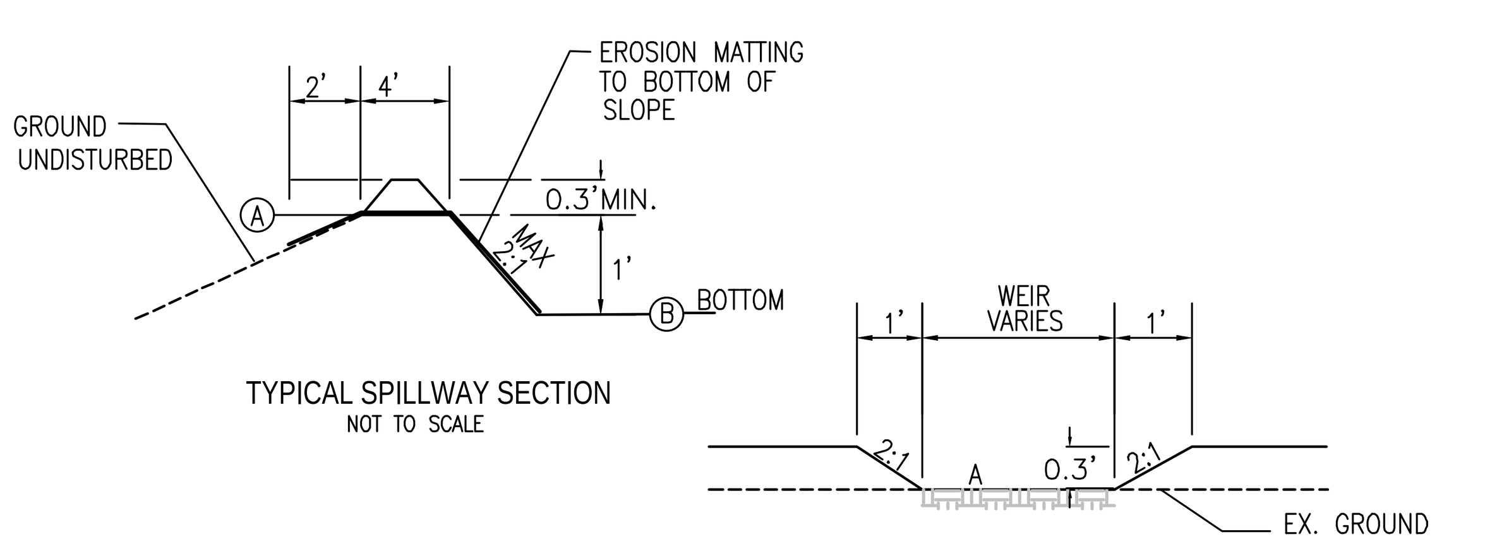
OWNER/DEVELOPER
JOHN NEELS
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075
(410) 869–0134

CASCADE RIDGE - ESDv COMPUTATIONS

DEVELOPED / SITE AREA:	6.96	AC 303359 SF
TARGET Pe:	1.55	IN
SITE IMPERVIOUS:	24.9	PERCENT ESTIMATED
SITE Rv:	0.2741	ESTIMATED

Rv=0.05+0.009XI
V min=1.0" rainfall (1.0x0.95xA)/12
Vmax= 1yr rainfall=2.6" (2.6x0.95xA)/12

DA #	% IMPERV	Rv	DA (SF)	DA (AC)	MINIMUM VOLUME	MAXIMUM VOLUME	1.55" VOLUME	VOLUME PROVIDED*	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS
AREA 1												
HALF LOT 1, 2, 3, 9, 15, 16	13.43	0.1709	262064	6.02	3732	9702	5784	6824	35195	0.81	5.21	MICROSCALE GRAVEL WETLAND
PART OF +ROAD R/W												6824 5118 SF SGW @ 1.0 PONDING
PART OF OS 17 AND OS18												
AREA 2												
HALF LOT 1 HOUSE	100.00	0.9500	1000	0.02	79	206	123	88	1000	0.02	0.00	MICROSCALE PRAC. (DRY WELL)
HALF LOT 2 HOUSE	100.00	0.9500	1000	0.02	79	206	123	88	1000	0.02	0.00	88 CF FOR EACH (5x11x4) DRYWELL
HALF LOT 3 HOUSE	100.00	0.9500	1000	0.02	79	206	123	88	1000	0.02	0.00	
HALF LOT 9 HOUSE	100.00	0.9500	1000	0.02	79	206	123	88	1000	0.02	0.00	
HALF LOT 15 HOUSE	100.00	0.9500	1000	0.02	79	206	123	88	1000	0.02	0.00	
HALF LOT 16 HOUSE	100.00	0.9500	1000	0.02	79	206	123	88	1000	0.02	0.00	
						TOTAL	736	528				
AREA 3												
FRONT 4	31.57	0.3341	13366	0.31	372	968	577	892	4219	0.10	0.21	MICROSCALE MICRO-BIO RETENTION #1
+ROAD R/W												892 669 SF MICRO BIO
AREA 4												
LOT 5 HOUSE	100.00	0.9500	2000	0.05	158	412	245	176	2000	0.05	0.00	MICROSCALE PRAC. (DRY WELL)
LOT 6 HOUSE	100.00	0.9500	2000	0.05	158	412	245	176	2000	0.05	0.00	88 CF FOR EACH (5x11x4) DRYWELL
						TOTAL	491	352				
AREA 5												
LOT 4 HOUSE	100.00	0.9500	2000	0.05	158	412	245	176	2000	0.05	0.00	MICROSCALE PRAC. (DRY WELL)
												88 CF FOR EACH (5x11x4) DRYWELL
AREA 6												
FRONT 5-8	40.98	0.4188	18930	0.43	661	1718	1024	1197	7757	0.18	0.26	MICROSCALE MICRO-BIO RETENTION #2
+ ROAD R/W												1197 897.75 SF MICRO BIO
AREA 7												
LOT 7 HOUSE	100.00	0.9500	2000	0.05	158	412	245	288	2000	0.05	0.00	MICROSCALE PRAC. (DRY WELL)
LOT 8 HOUSE	100.00	0.9500	2000	0.05	158	412	245	288	2000	0.05	0.00	
						TOTAL	491	576				144 CF FOR EACH (9x10x4) DRYWELL
AREA 8												
LOT 10 HOUSE	100.00	0.9500	2000	0.05	158	412	245	176	2000	0.05	0.00	MICROSCALE PRAC. (DRY WELL)
LOT 11 HOUSE	100.00	0.9500	2000	0.05	158	412	245	176	2000	0.05	0.00	88 CF FOR EACH (5x11x4) DRYWELL
						TOTAL	491	352				
AREA 9												
LOT 12 HOUSE	100.00	0.9500	2000	0.05	158	412	245	176	2000	0.05	0.00	MICROSCALE PRAC. (DRY WELL)
												88 CF FOR EACH (5x11x4) DRYWELL
AREA 10												
LOT 13 HOUSE	100.00	0.9500	2000	0.05	158	412	245	176	2000	0.05	0.00	MICROSCALE PRAC. (DRY WELL)
LOT 14 HOUSE	100.00	0.9500	2000	0.05	158	412	245	176	2000	0.05	0.00	88 CF FOR EACH (5x11x4) DRYWELL
						TOTAL	491	352				
MEASURED PROJECT TOTALS	22.84	0.2556	320360	7.35	-	-	10575	**11425**	73171	1.68	5.67	



DETAILS OF WEIR OUTLET
MICRO-BIORETENTION

NO.	REVISION	DATE

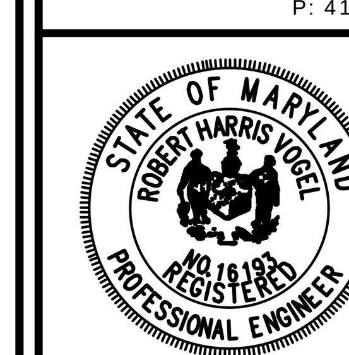
PRELIMINARY EQUIVALENT SKETCH PLAN
STORMWATER MANAGEMENT DETAILS

CASCADE RIDGE
LOTS 1-16 AND OPEN SPACE LOTS 17 - 19
7330 GREEN DRAKE ROAD
ELKRIDGE, MD 21075

PARCEL: 474
TAX MAP: 31 GRID: 11
1ST ELECTION DISTRICT

ZONED: R–ED
L. 362 / F. 260
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
⊕
TIMMONS GROUP
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
P: 410.461.7666 F: 410.461.8961 www.timmons.com



ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MDL VETG
CHECKED BY: RHV
DATE: JANUARY 2020
SCALE: AS SHOWN
W.O. NO.: 42148

PROFESSIONAL CERTIFICATE
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. 16193 EXPIRATION DATE: 09–27–2022