

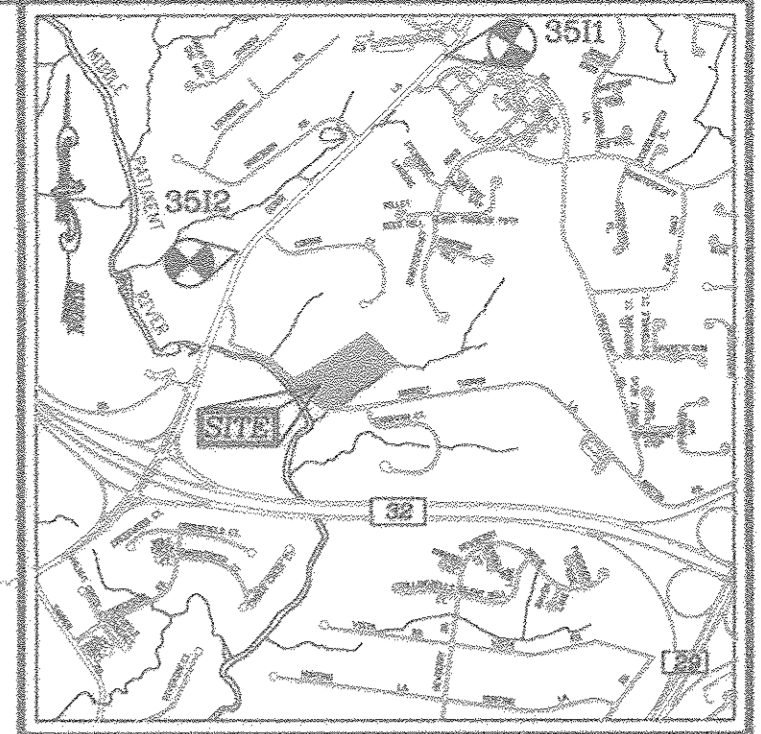
GENERAL NOTES

- 1. THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS...

SITE DEVELOPMENT PLAN
PASS PROPERTY
NEW SINGLE FAMILY DWELLING
7831 HARRIET TUBMAN LANE
COLUMBIA, MD. 21044
HOWARD COUNTY, MD

BENCHMARKS

HOWARD COUNTY BENCHMARK 3511 (CONG. MON.)
N 557110.306 E 1344893.621 ELEV. 400.055
LOCATION: CORNER CEDAR LA. & FREETOWN RD.



VICINITY MAP
SCALE: 1"=2,000'
ADC MAP COORDINATE: 32, D-4

LEGEND

- PROPERTY LINE
RIGHT-OF-WAY LINE
ADJACENT PROPERTY LINE
EXISTING STREAM
EXISTING STREAM BANK

COORDINATE TABLE with columns: NO., NORTH, EAST, DESC. listing specific coordinate points.

ADDRESS CHART with columns: LOT No., STREET ADDRESS. Lot 1: 7851 HARRIET TUBMAN LANE.

OWNER/DEVELOPER
BRYAN AND EMILY PASS
7715 SUFFOLK WAY
HANOVER, MD 21076
240-481-6971

SITE ANALYSIS DATA

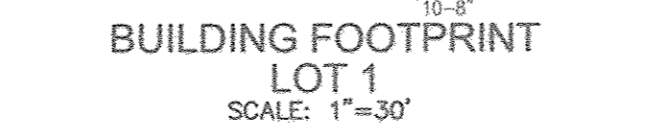
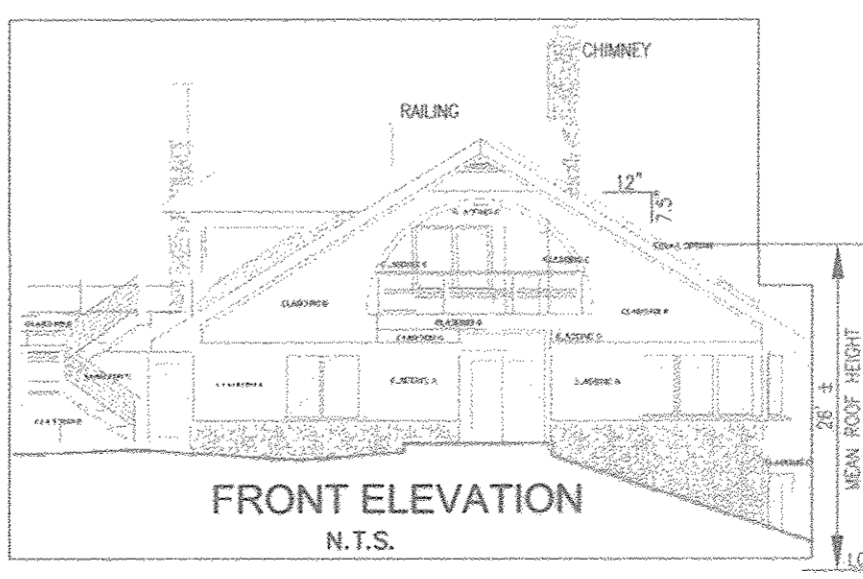
- A. TOTAL PROJECT AREA: 10.19 AC
B. AREA OF PLAN SUBMISSION: 10.19 AC
C. LIMIT OF DISTURBANCE: 114,245 S.F./ 2.62 AC

PARKING TABULATION:

TOTAL NUMBER OF DWELLING UNITS PROPOSED : 2
1. OFF-STREET PARKING SPACES REQUIRED: 2 SPACES PER UNIT = 4 SPACES

LOT AREA TABULATION

Table with columns: LOT, GROSS AREA, PIPESTEM AREA, NET AREA, MIN. LOT SIZE. Lot 1: 289,400 SF Gross Area.



SHEET INDEX

Table with columns: DESCRIPTION, SHEET NO. Listing sheets for COVER SHEET AND SITE LAYOUT, PROFILES AND SITE DETAILS, etc.

PERMIT INFORMATION CHART

Table with columns: SUBDIVISION NAME, SECTION/AREA, LOT/PARCELS, PLAT REF #, BLOCK NO, ZONE, TAX MAP, ELECT DIST, CENSUS TR.

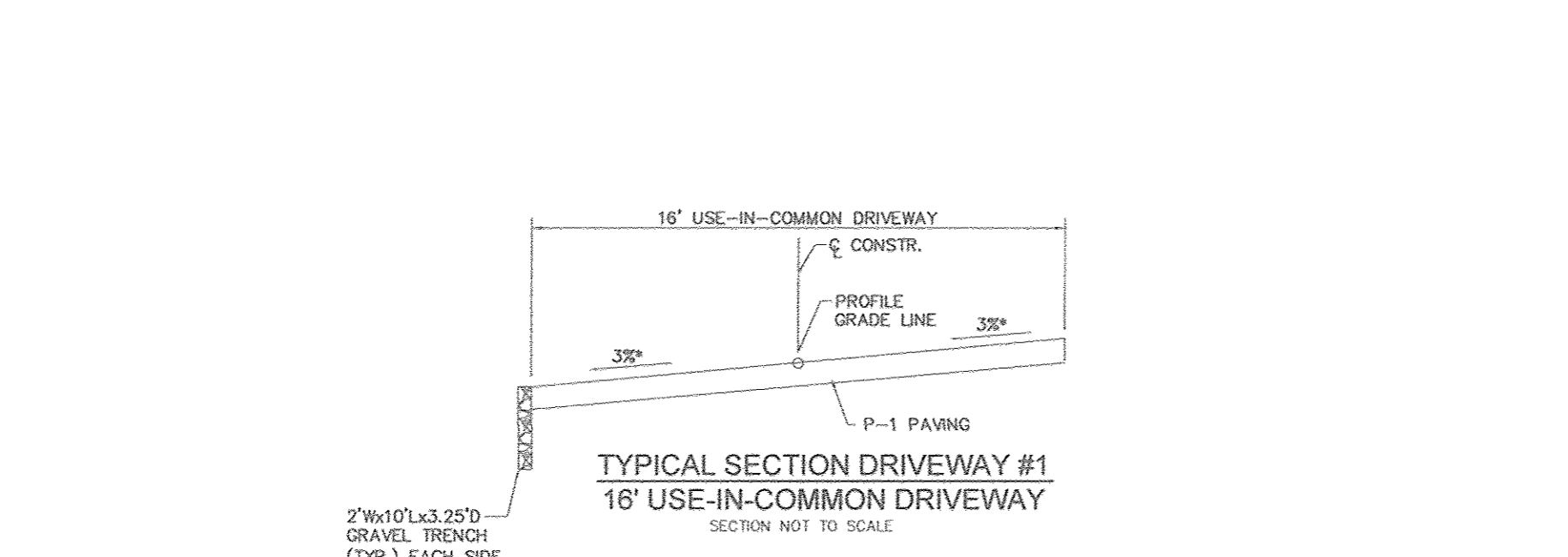
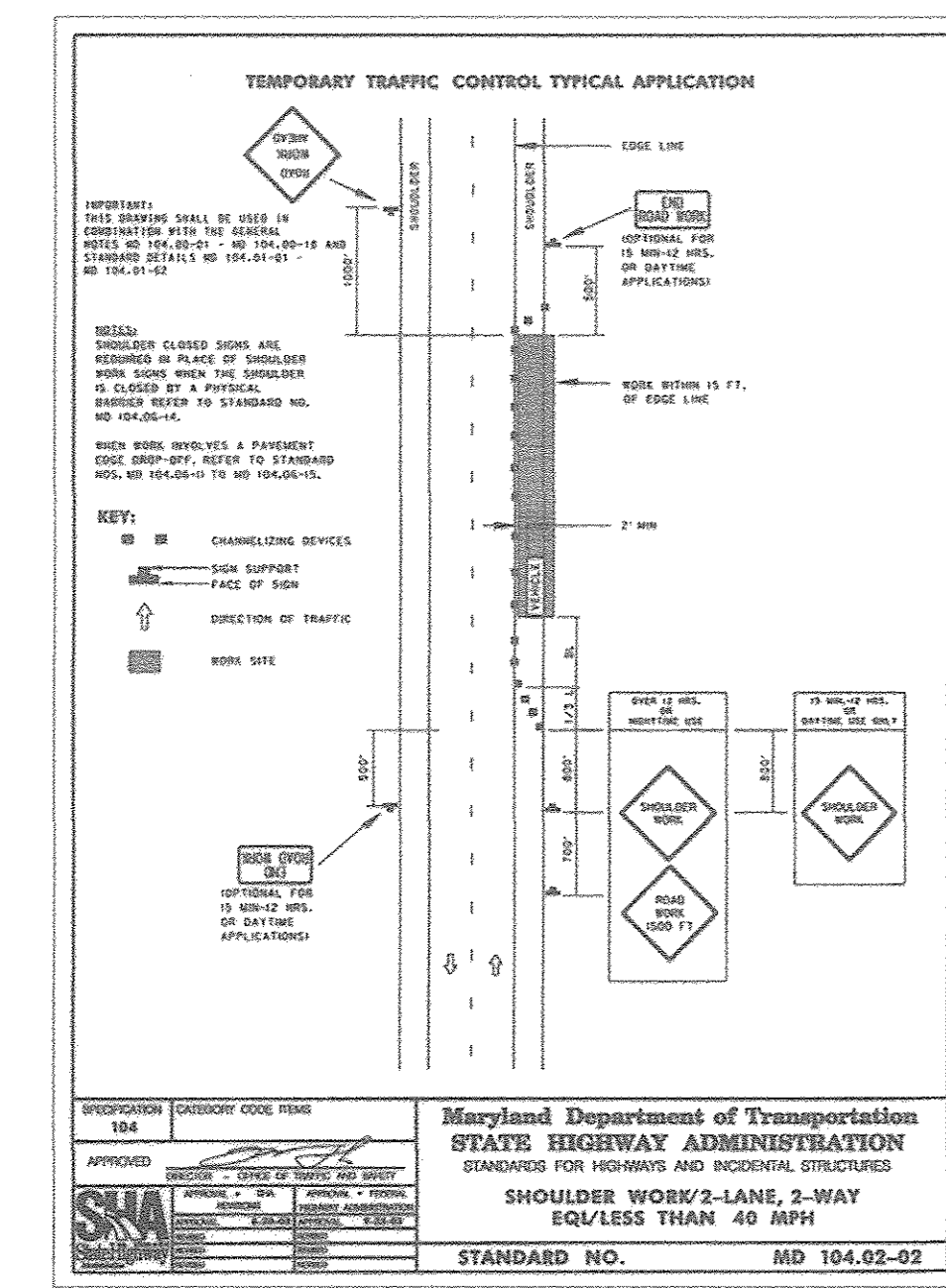
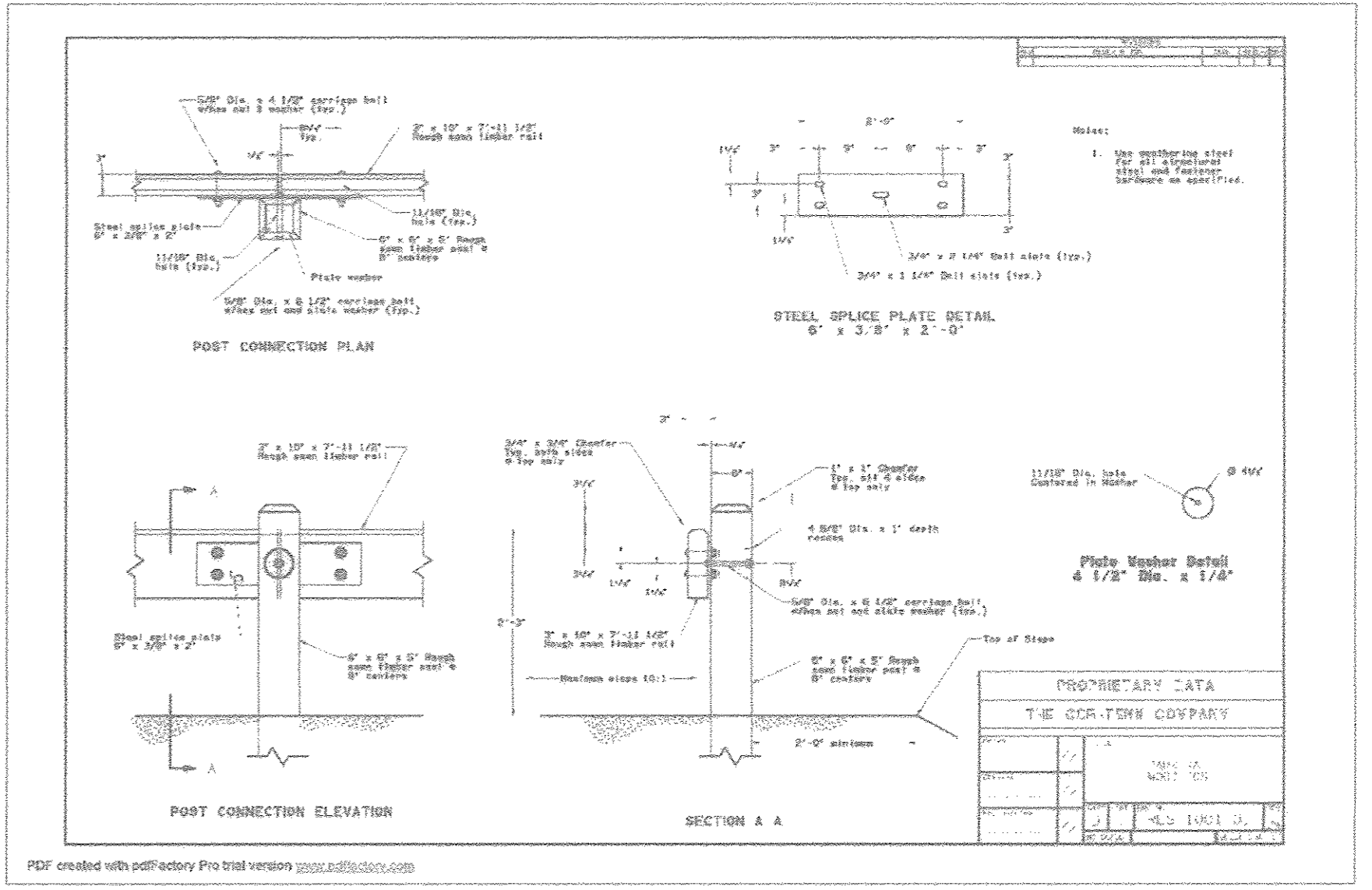
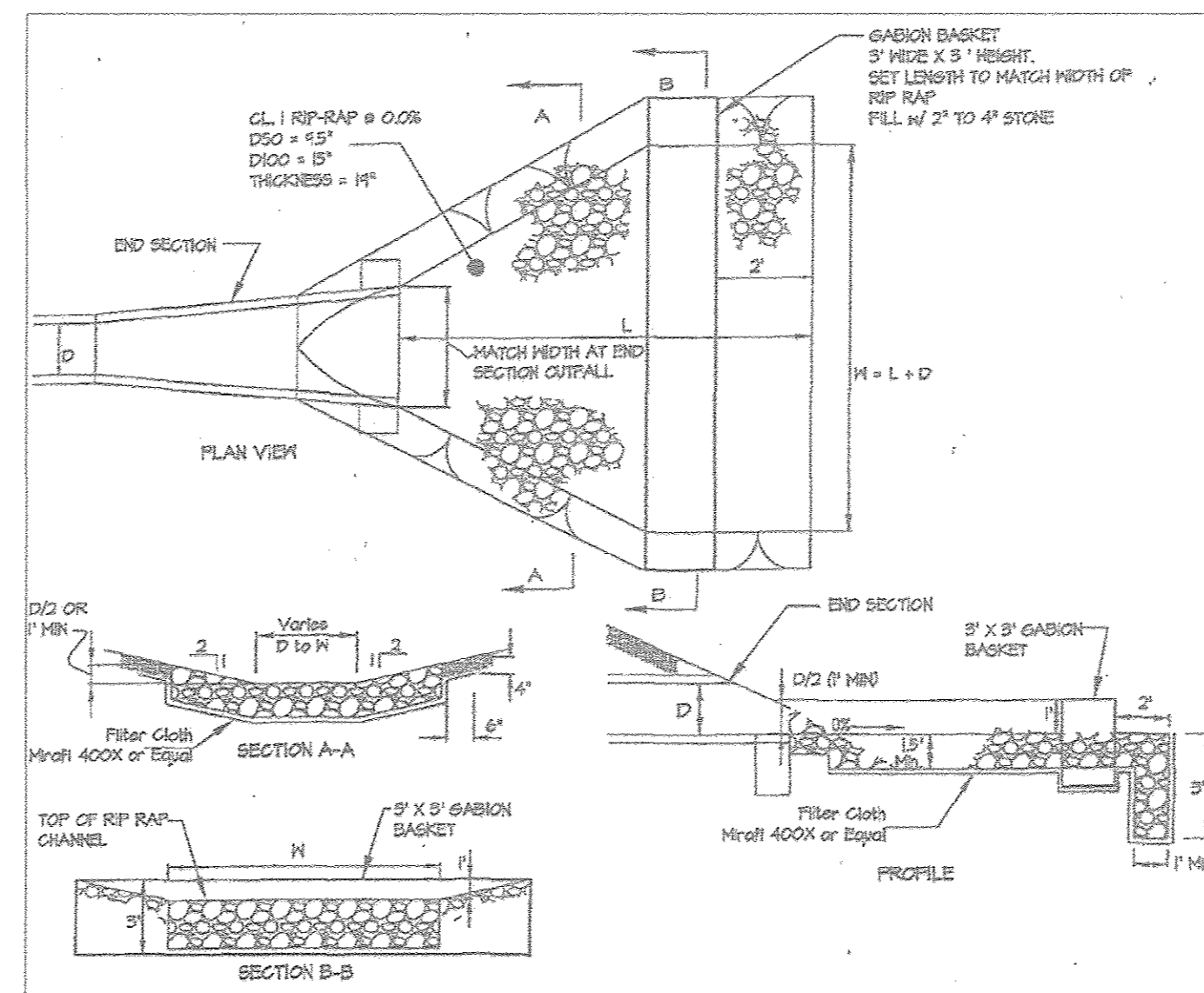
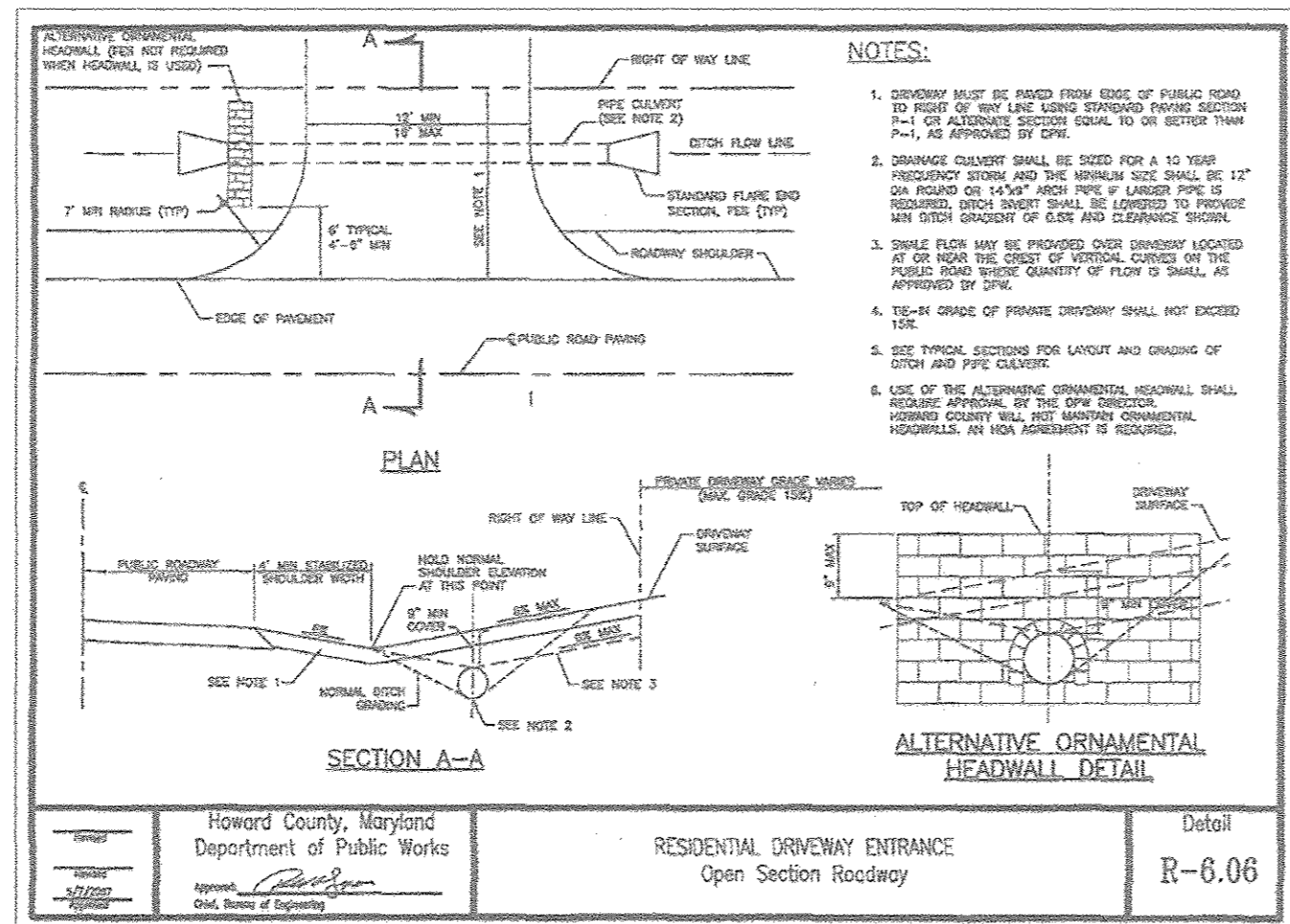
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Signature of Chief, Development Engineering Division dated 1-23-18.
Signature of Chief, Division of Land Development dated 1-25-18.

NOTES:

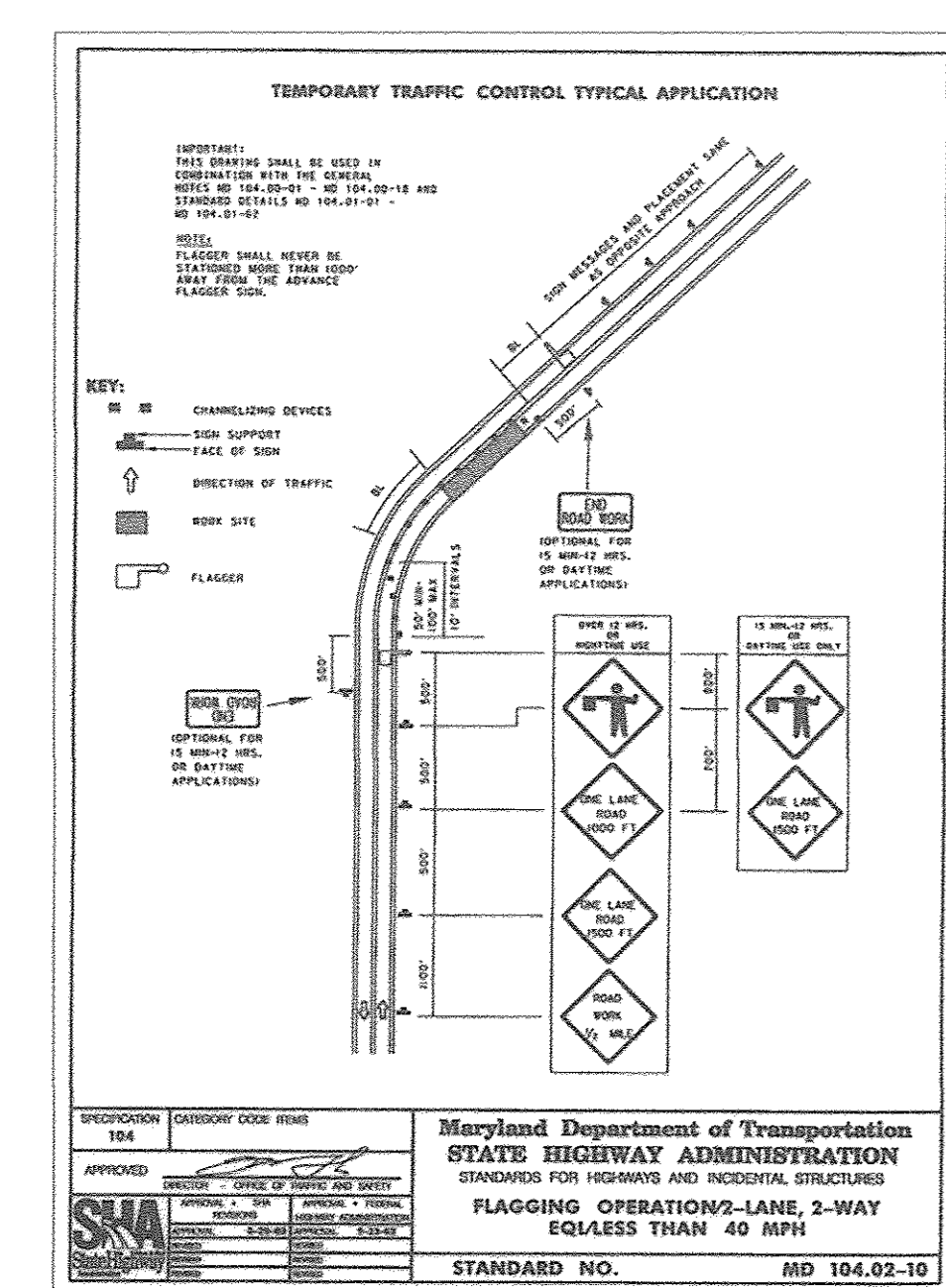
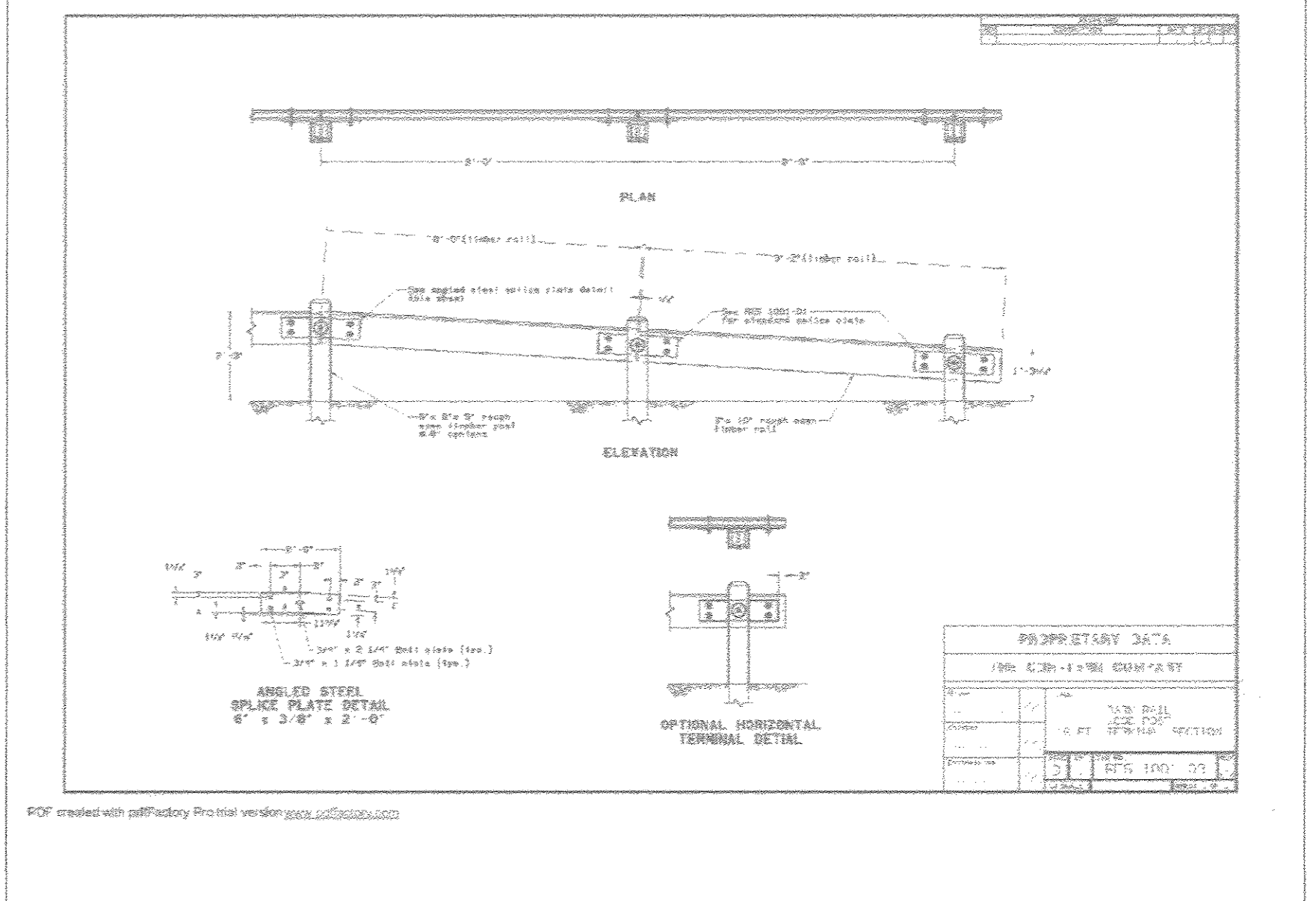
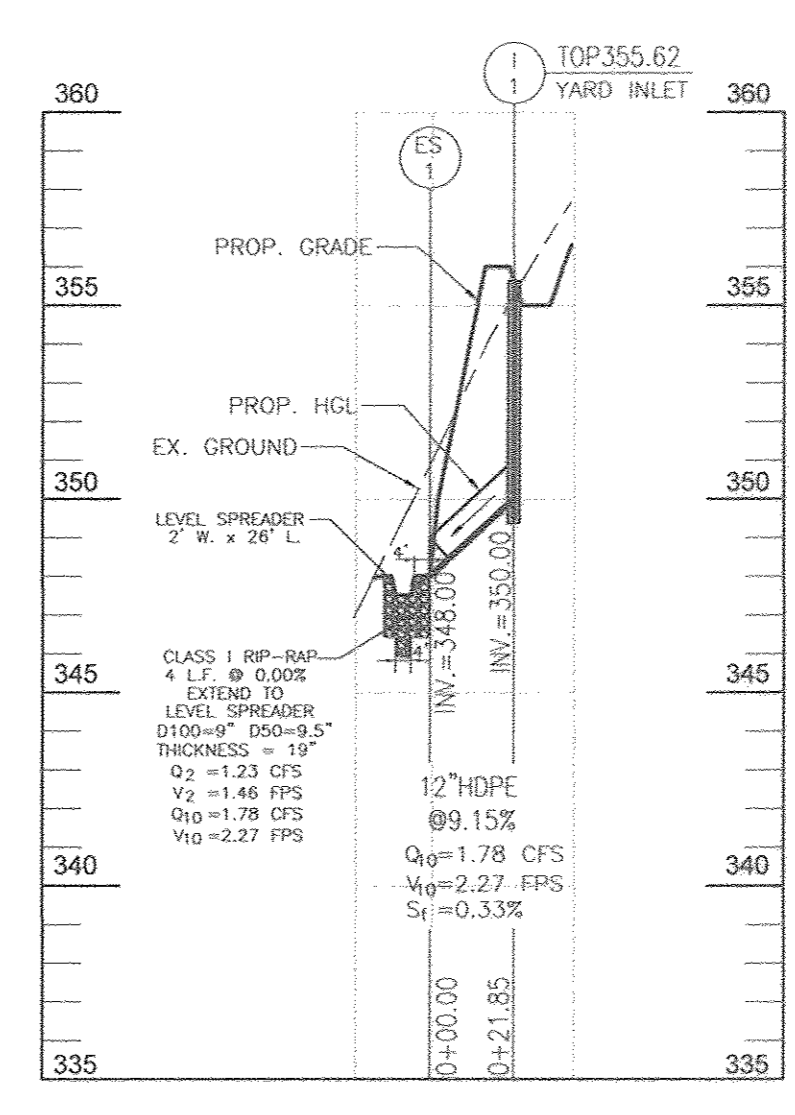
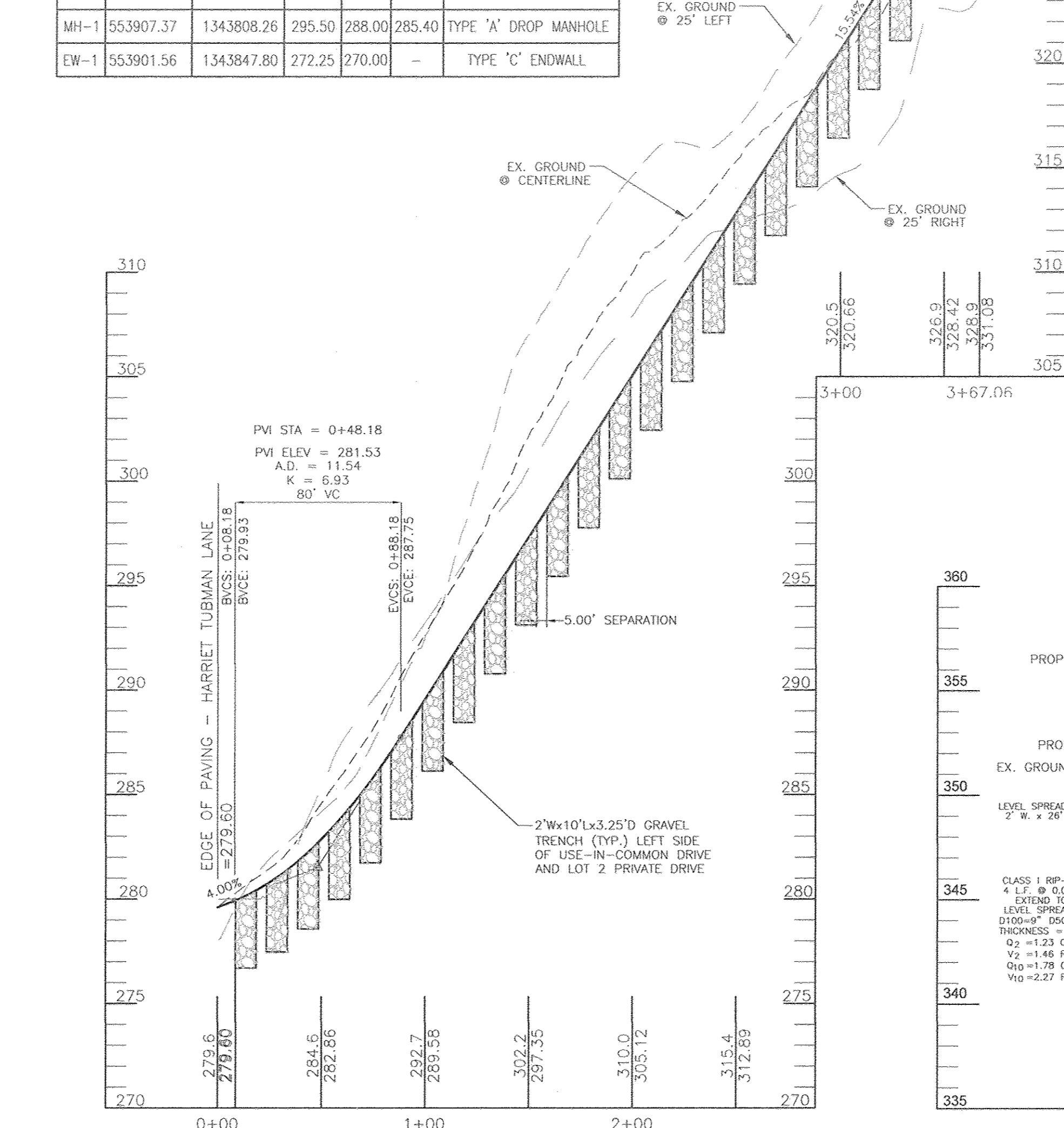
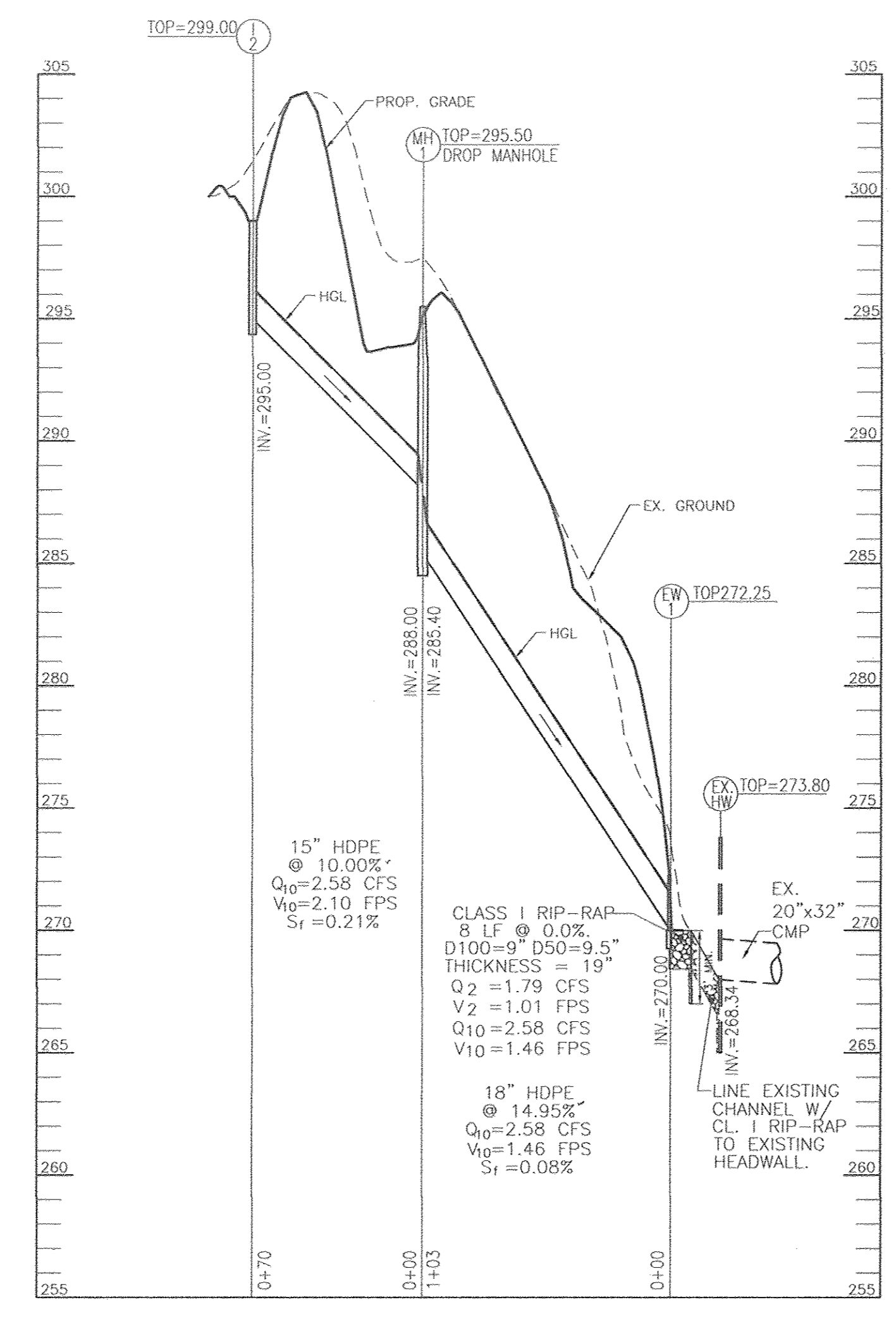
- 1. ALL WATER CONNECTIONS SHALL BE 1-1/2" WITH 1" OUTSIDE METER SETTINGS, UNLESS OTHERWISE NOTED.
REFER TO HOWARD COUNTY DETAILS W-3.2B OUTSIDE METER SETTINGS.

SECTION	ROAD AND STREET CLASSIFICATION	CALIFORNIA PAVING BOND (CPS)	3 TO 4.5 (3 TO 4.5)	4.5 TO 6 (4 TO 6)	6 TO 7 (6 TO 7)	7 TO 8 (7 TO 8)	8 TO 9 (8 TO 9)	9 TO 10 (9 TO 10)	10 TO 11 (10 TO 11)	11 TO 12 (11 TO 12)
P-1	PRINCIPAL ARTERIAL AND SUB-ARTERIAL	1.5" SUPERFINE PAVEMENT SURFACE 1.5" SUPERFINE INTERMEDIATE SURFACE (S1) 1.5" SUPERFINE BASE (S2)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
P-2	LOCAL ARTERIAL AND SUB-ARTERIAL WITH NO MORE THAN 25% TRUCKS PER DAY	1.5" SUPERFINE PAVEMENT SURFACE 1.5" SUPERFINE INTERMEDIATE SURFACE (S1) 1.5" SUPERFINE BASE (S2)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
P-3	LOCAL ARTERIAL AND SUB-ARTERIAL WITH NO MORE THAN 10% TRUCKS PER DAY	1.5" SUPERFINE PAVEMENT SURFACE 1.5" SUPERFINE INTERMEDIATE SURFACE (S1) 1.5" SUPERFINE BASE (S2)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
P-4	LOCAL ARTERIAL AND SUB-ARTERIAL WITH NO MORE THAN 5% TRUCKS PER DAY	1.5" SUPERFINE PAVEMENT SURFACE 1.5" SUPERFINE INTERMEDIATE SURFACE (S1) 1.5" SUPERFINE BASE (S2)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5



PIPE SIZE	TYPE	TOTAL LENGTH
18"	HDPE	103 LF
15"	HDPE	70 LF
12"	HDPE	22 LF

NO.	NORTHING	EASTING	TOP ELEV.	INV. IN	INV. OUT	DESCRIPTION
I-2	553859.84	1343787.14	299.00	-	295.00	YARD INLET
MH-1	553907.37	1343808.26	295.50	288.00	285.40	TYPE 'A' DROP MANHOLE
EW-1	553901.56	1343847.80	272.25	270.00	-	TYPE 'C' ENDWALL



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Edwards 1-23-18
CHIEF, DEVELOPMENT ENGINEERING DIVISION

J. Munchro 1-25-18
CHIEF, DIVISION OF LAND DEVELOPMENT

William J. Miller 1-24-18
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING

OWNER/DEVELOPER
BRYAN AND EMILY PASS
7715 SUFFOLK WAY
HANOVER, MD 21076
240-481-6971

NO. REVISION DATE

SITE DEVELOPMENT PLAN
USE-IN-COMMON DRIVEWAY PROFILES
AND MISCELLANEOUS DETAILS
PASS PROPERTY
NEW SINGLE FAMILY DWELLING
7831 HARRIET TUBMAN LANE
COLUMBIA, MD 21044
ZONED, R-20

TAX MAP 35 GRID 23
6TH ELECTION DISTRICT

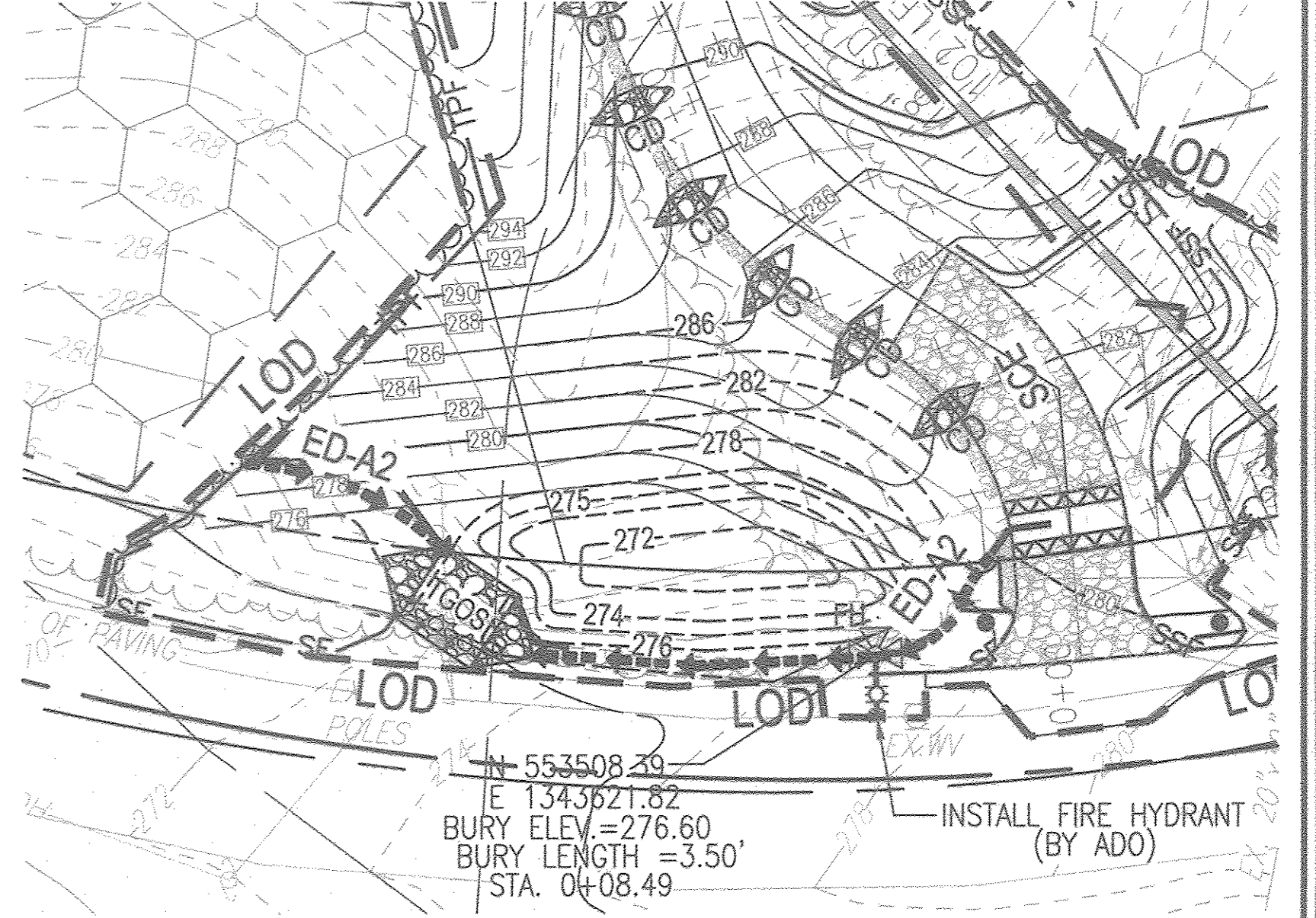
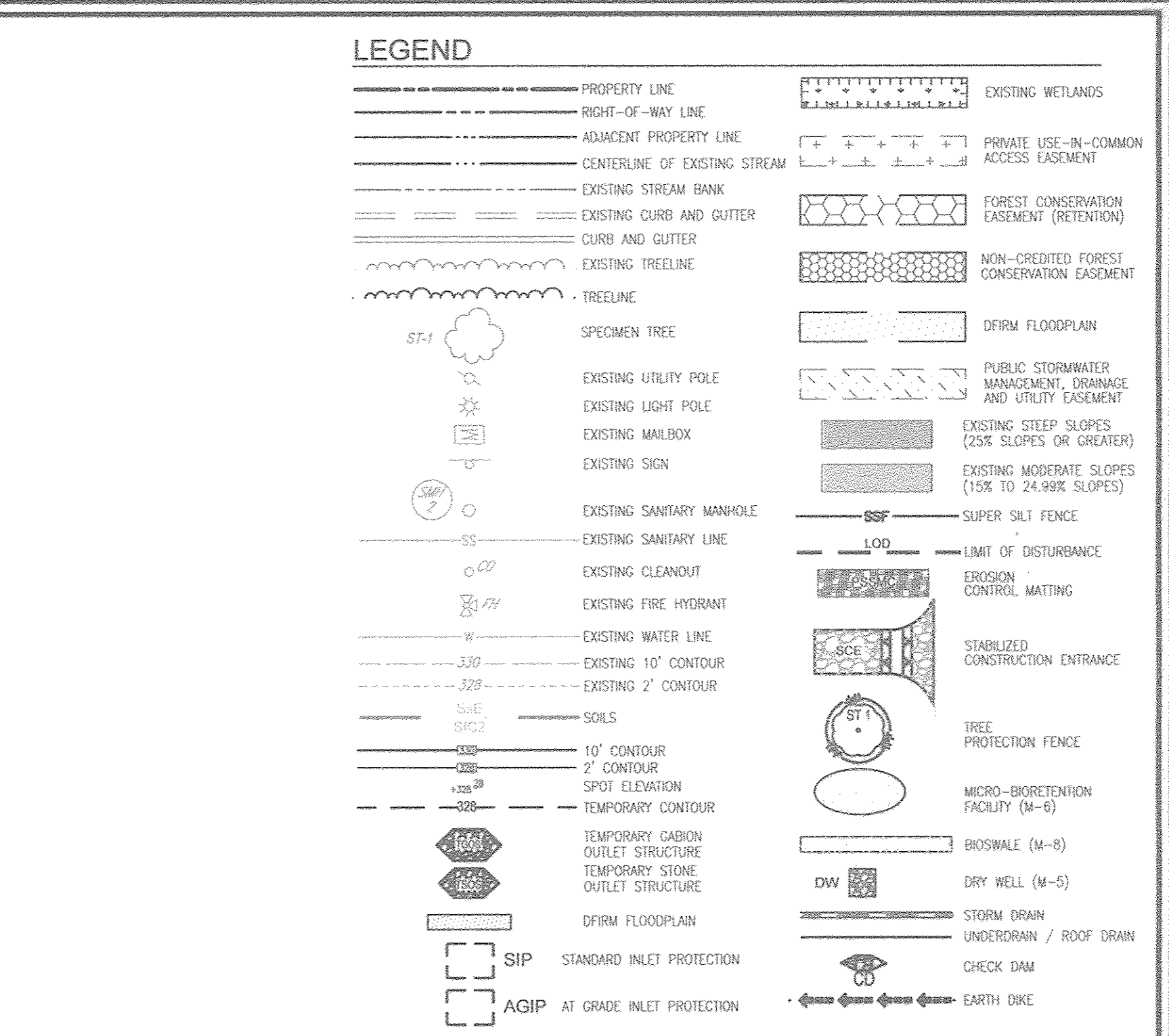
PARCEL 117
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELLIOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 18183 EXPIRATION DATE: 09-27-2018

DESIGN BY: RHVE
DRAWN BY: GAH
CHECKED BY: RHV
DATE: NOVEMBER 2017
SCALE: AS SHOWN
W.O. NO.: 14-15

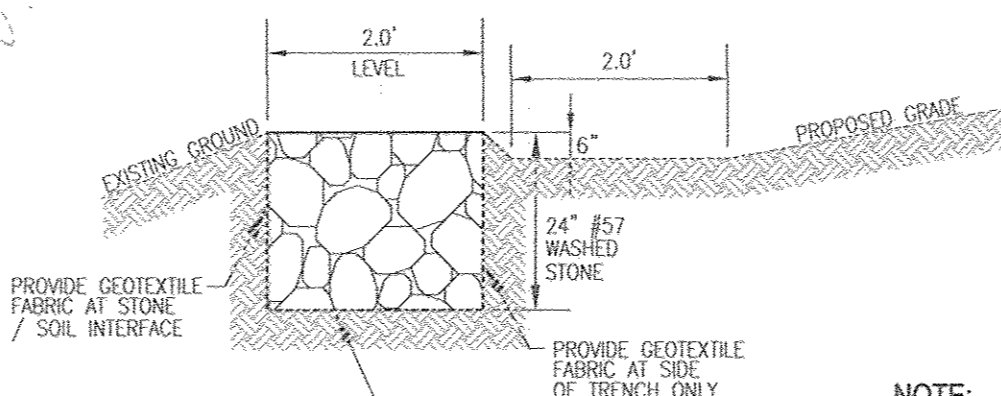
2 SHEET OF 8



TGOS, FIRE AND ENTRANCE DETAIL
 SCALE: 1" = 20'
 OWNER/DEVELOPER: BRYAN AND EMILY PASS, 7715 SUFFOLK WAY, HANOVER, MD 21076, 240-481-6971

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.
 - DIVERSION FENCE SHALL BE INSTALLED AS SHOWN HEREON OR AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
 - STABILIZATION IS TO BE DONE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS REQUIRED BY THE 2011 STDS. & SPECS. WHICHEVER IS MORE RESTRICTIVE.

GRADING PLAN
 SCALE: 1" = 50'



LEVEL SPREADER
 NOT TO SCALE

SEDIMENT CONTROL PRACTICE SUMMARY TABLE						
PRACTICE NO.	1	2	3	4	5	6
DRAINAGE AREA (AC)	0.85	0.82	0.37	0.27	0.84	0.30
RCN	83	35	30	77	61	77
AVG. SLOPE %	-	3.40	6.90	-	12.80	10.00
PRACTICE TYPE	GABION OUTLET STRUCTURE	EARTH DIKE-1 (A-2)	EARTH DIKE-2 (A-2)	STONE OUTLET STRUCTURE	AT GRADE INLET PROTECTION	STANDARD INLET PROTECTION
STORAGE DEPTH	3.00	-	-	2.00	-	-
BOTTOM ELEV.	272.00	-	-	361.00	-	-
WEIR ELEV.	275.00	-	-	363.00	-	-
BOTTOM AREA (S.F.)	240	-	-	112	-	-
STORAGE REQUIRED (C.F.)	1530	-	-	486	-	-
STORAGE PROVIDED (C.F.)	1672	-	-	514	-	-
DETAIL NO.	E-8	C-1	C-1	E-7	E-9-2	E-9-1

NOTE:
 SITES IS TO BE TEMPORARILY STABILIZED AT THE END OF EACH WORKING DAY.

MAPPED SOILS TYPES - HOWARD COUNTY SOIL MAP #17 CLARKSVILLE NE						
SYMBOL/NAME / DESCRIPTION	GROUP	HYDRIC	PERCENT SAND	PERCENT SILT	PERCENT CLAY	PERCENT ORGANIC
GbB GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	NO	NO	NO	0.28	YES
GbC GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	NO	NO	NO	0.28	YES
MbD MANOR LOAM, 15 TO 25 PERCENT SLOPES, VERY ROCKY	B	NO	NO	NO	0.28	NO
MbF MANOR-BANNERTOWN SANDY LOAMS, 25 TO 65 PERCENT SLOPES, ROCKY	B	NO	NO	NO	0.20	NO
GbB GLENVILLE - CODOBUS - SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	NO	NO	NO	0.43	YES
Cg COCORUS AND HASTROBRO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	NO	YES	NO	0.32	NO

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 J. Maunier for KS
 Chief, Division of Land Development
 Director, Department of Planning and Zoning

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

DESIGNER CERTIFICATION:
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
 Robert H. Vogel
 MD REGISTRATION NO. 16193
 R.L.S., OR R.L.A. (circle one)

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
 John L. Roberts
 Howard S.C.D.

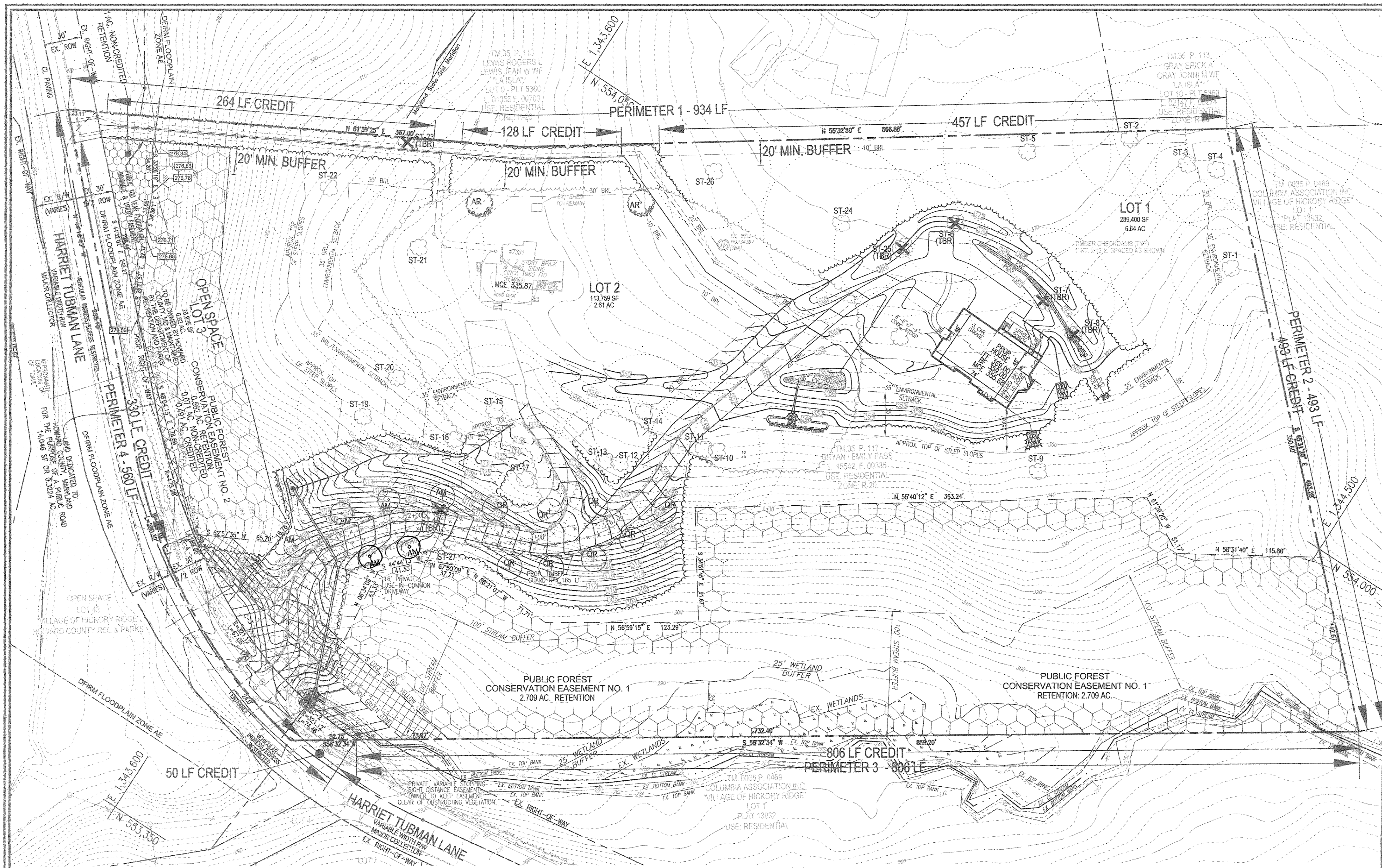
SITE DEVELOPMENT PLAN
GRADING, EROSION, SEDIMENT CONTROL PLAN, AND SOILS MAP
PASS PROPERTY
 NEW SINGLE FAMILY DWELLING
 7831 HARRIET TUBMAN LANE
 COLUMBIA, MD 21044
 ZONED: R-20

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET, ELLICOTT CITY, MD 21043
 TEL: 410-461-7566
 FAX: 410-461-8961

DESIGN BY: RHVE
 DRAWN BY: GAH
 CHECKED BY: RHV
 DATE: NOVEMBER 2017
 SCALE: AS SHOWN
 W.D. NO.: 14-15

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 09-27-2018.
 Robert H. Vogel, PE #16193

3 SHEET OF 8



LEGEND

	PROPERTY LINE
	RIGHT-OF-WAY LINE
	ADJACENT PROPERTY LINE
	CENTERLINE OF EXISTING STREAM
	EXISTING STREAM BANK
	EXISTING CURBS AND GUTTER
	EXISTING TREE LINE
	TREELINE
	SPECIMEN TREE
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	SOILS
	10' CONTOUR
	2' CONTOUR
	SPOT ELEVATION
	EXISTING WETLANDS
	PRIVATE USE-IN-COMMON ACCESS EASEMENT
	FOREST CONSERVATION EASEMENT (RETENTION)
	DFRM FLOODPLAIN
	PUBLIC STORMWATER MANAGEMENT, DRAINAGE AND UTILITY EASEMENT
	LIMIT OF DISTURBANCE
	TREE PROTECTION FENCE
	MICRO-BIOREMEDIATION FACILITY (M-6)
	DRY WELL (M-5)
	SHADE TREES
	EVERGREEN TREES
	SHRUB
	SPECIMEN TREE CRITICAL ROOT ZONE
	SPECIMEN TREE TO BE REMOVED
	BGE YELLOW ZONE
	BGE GREEN ZONE

OWNER/DEVELOPER
 BRYAN AND EMILY PASS
 7715 SUFFOLK WAY
 HANOVER, MD 21076
 242-481-6971

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
LANDSCAPE PLAN
PASS PROPERTY
 NEW SINGLE FAMILY DWELLING
 7831 HARRIET TUBMAN LANE
 COLUMBIA, MD 21044
 ZONED: R-20
 TAX MAP 35 GRID 23
 5TH ELECTION DISTRICT
 PARCEL 117
 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET
 ELLICOTT CITY, MD 21043
 TEL: 410.461.7666
 FAX: 410.461.8961

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. 18183, EXPIRATION DATE 07-27-2018.

DESIGN BY: RHV
 DRAWN BY: GAH
 CHECKED BY: RHV
 DATE: NOVEMBER 2017
 SCALE: AS SHOWN
 W.O. NO.: 14-15

5 SHEET OF 8

NOTE:
 REFER TO SHEET 7 OF 8 FOR LANDSCAPING NOTES AND DETAILS.

NOTE:
 LANDSCAPING FOR LOTS 1 & 2 IS PROVIDED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY IN THE AMOUNT OF \$ 84,200.00 FOR THE REQUIRED 14 SHADE TREES (\$600 FOR PERIMETER LANDSCAPING AND \$3,000 FOR SPECIMEN TREE REPLACEMENT) WILL BE PAID WITH THE DEVELOPER AGREEMENT UNDER F-15-113.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Old Blank
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 1-23-18

J. Matthews G. KS
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 1-25-18

William J. ...
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING
 DATE: 1-25-18

LANDSCAPE SCHEDULE

SYMBOL	KEY	QUAN.	BOTANICAL NAME	SIZE	REMARKS
	AR	2	ACER RUBRUM "RED SUNSET" RED SUNSET RED MAPLE	2 1/2"-3" CAL	B & B

DEVELOPER'S/BUILDER'S CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

[Signature]
 SIGNATURE OF DEVELOPER
 DATE: 12/1/17

LANDSCAPE PLAN
 SCALE: 1" = 40'

SCHEDULE 'A' PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO PERIMETER AND ROADS				TOTAL
	1	2	3	4	
PERIMETER/FRONTAGE DESIGNATION	A	A	A	B	
LANDSCAPE TYPE	A	A	A	B	
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	934 LF	493 LF	806 LF	560 LF	2800 LF
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	**YES	**YES	YES	**YES	560 LF
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	No	No	No	No	
NUMBER OF PLANTS REQUIRED (*)	85 LF	0 LF	0 LF	0 LF	2
SHADE TREES	1-60	2	-	-	2
EVERGREEN TREES	-	-	-	-	-
SHRUBS	-	-	-	-	-
NUMBER OF PLANTS PROVIDED	2	-	-	-	2
SHADE TREES	-	-	-	-	-
EVERGREEN TREES	-	-	-	-	-
EX SHADE TREES	-	-	-	-	-
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	-	-
SHRUBS (10:1 SUBSTITUTION)	-	-	-	-	-
DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED	-	-	-	-	-

*LINEAR FOOT OF PERIMETER AFTER CREDIT REDUCTION
 **PERIMETER A HAS BEEN GIVEN FULL CREDIT FOR VEGETATION AND TRASH PAD
 ***LANDSCAPING REQUIREMENT HAS BEEN REMOVED DUE TO SIGHT DISTANCE CONCERNS.

SPECIMEN TREE REPLACEMENT SCHEDULE

SYMBOL	KEY	QUAN.	BOTANICAL NAME	SIZE	REMARKS
	QR	8	QUERCUS RUBRA RED OAK	2 1/2"-3" CAL	B & B
	AM	6	ACER GINNALA AMUR MAPLE	2 1/2"-3" CAL	B & B

NOTE: PER THE CONDITIONS OF WP-16-118, AN ADDITIONAL 18 TREES WERE REQUIRED TO OFFSET THE REMOVAL OF 9 SPECIMEN TREES. THE PLAN HAS SINCE BEEN REVISED SUCH THAT WE ARE NOW REMOVING ONLY 6 SPECIMEN TREES, THEREFORE 12 REPLACEMENT TREES ARE PROVIDED.

MAPPED SOILS TYPES - HOWARD COUNTY SOIL MAP #17 CLARKSVILLE NE

SYMBOL NAME / DESCRIPTION	GROUP	HYDRIC	WETLANDS	K FACTOR	ERODIBLE	CRITICAL
GbB GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	NO	NO	0.28	YES	NO
GbC GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	NO	NO	0.28	YES	NO
MdD MANOR LOAM, 15 TO 25 PERCENT SLOPES, VERY ROCKY	B	NO	NO	0.28	NO	YES
McG MANOR-BANNERTOWN SANDY LOAMS, 25 TO 65 PERCENT SLOPES, ROCKY	B	NO	NO	0.20	NO	YES
GbB T CLEVELAND - CORDONIS - SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	NO	NO	0.43	YES	YES
CoC CORDONIS AND HATBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	NO	YES	0.32	NO	NO

TAKEN FROM: USDA, SOCS-WEB SOIL SURVEY, HOWARD COUNTY

NOTE: FOR SOILS ON SITE THAT WOULD BE CONSIDERED HIGHLY ERODIBLE BY THE HOWARD SOIL CONSERVATION DISTRICT, MORE STRINGENT SEEDING AND STABILIZATION METHODS MAY BE EXPECTED AT SITE DEVELOPMENT STAGE.

GENERAL NOTES

- NO RARE, THREATENED OR ENDANGERED SPECIES OR THEIR HABITAT WERE OBSERVED ON THE PROPERTY.
- SURROUNDING LAND USE IS PRIMARILY HIGH DENSITY RESIDENTIAL DEVELOPMENT.
- APPROXIMATELY 17 ACRES OF FOREST IS PRESENT WITHIN 100 FEET OF THE SUBJECT PROPERTY.
- ALL WETLANDS AND STREAMS ON THE PROPERTY ARE PART OF THE MIDDLE PATUXENT RIVER WATERSHED (02-13-11). THE STREAMS ON SITE ARE CONSIDERED TO BE USE 1A-P WATERS. PERENNIAL STREAMS WILL REQUIRE 100 FOOT BUFFERS, INTERMITTENT STREAMS WILL REQUIRE 50 FOOT BUFFERS AND WETLANDS WILL REQUIRE 25 FOOT BUFFERS.
- NO HISTORIC ELEMENTS OR CEMETERIES ARE KNOWN TO OCCUR ON THE PROPERTY.
- THE SITE DOES INCLUDE 0.31 ACRES +/- OF 100 YEAR FLOODPLAIN.
- THE SPECIMEN TREES TO BE REMOVED ARE:
- ST-6, ST-7, ST-8, ST-18, ST-23, & ST-25
- SPECIMEN TREES WITH ROOT SYSTEMS IMPACTED BY DEVELOPMENT ARE ST-9 THRU ST-17, ST-19, ST-21, ST-22, ST-24, ST-26 AND ST-27. THOSE SPECIMEN TREES TO REMAIN WHICH ARE INSIDE THE LIMIT OF DISTURBANCE SHALL BE PROTECTED WITH TREE PROTECTION FENCE AND ROOT PRUNING. SPECIMEN TREES OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE PROTECTED WITH ROOT PRUNING.
- ALL FOREST CONSERVATION REQUIREMENTS WERE MET UNDER THE FINAL PLAN, F-15-113.

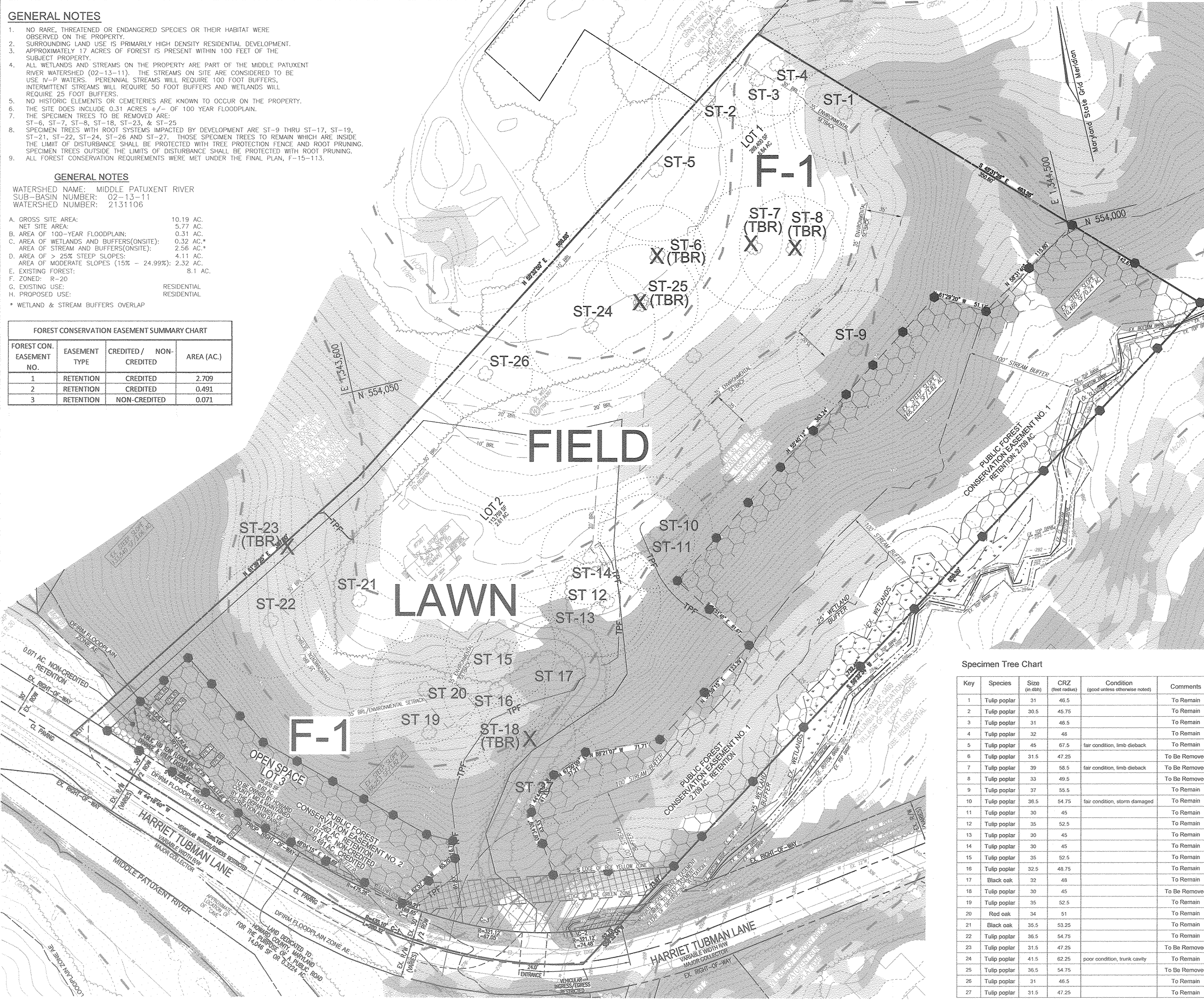
GENERAL NOTES

WATERSHED NAME: MIDDLE PATUXENT RIVER
 SUB-BASIN NUMBER: 02-13-11
 WATERSHED NUMBER: 2131106

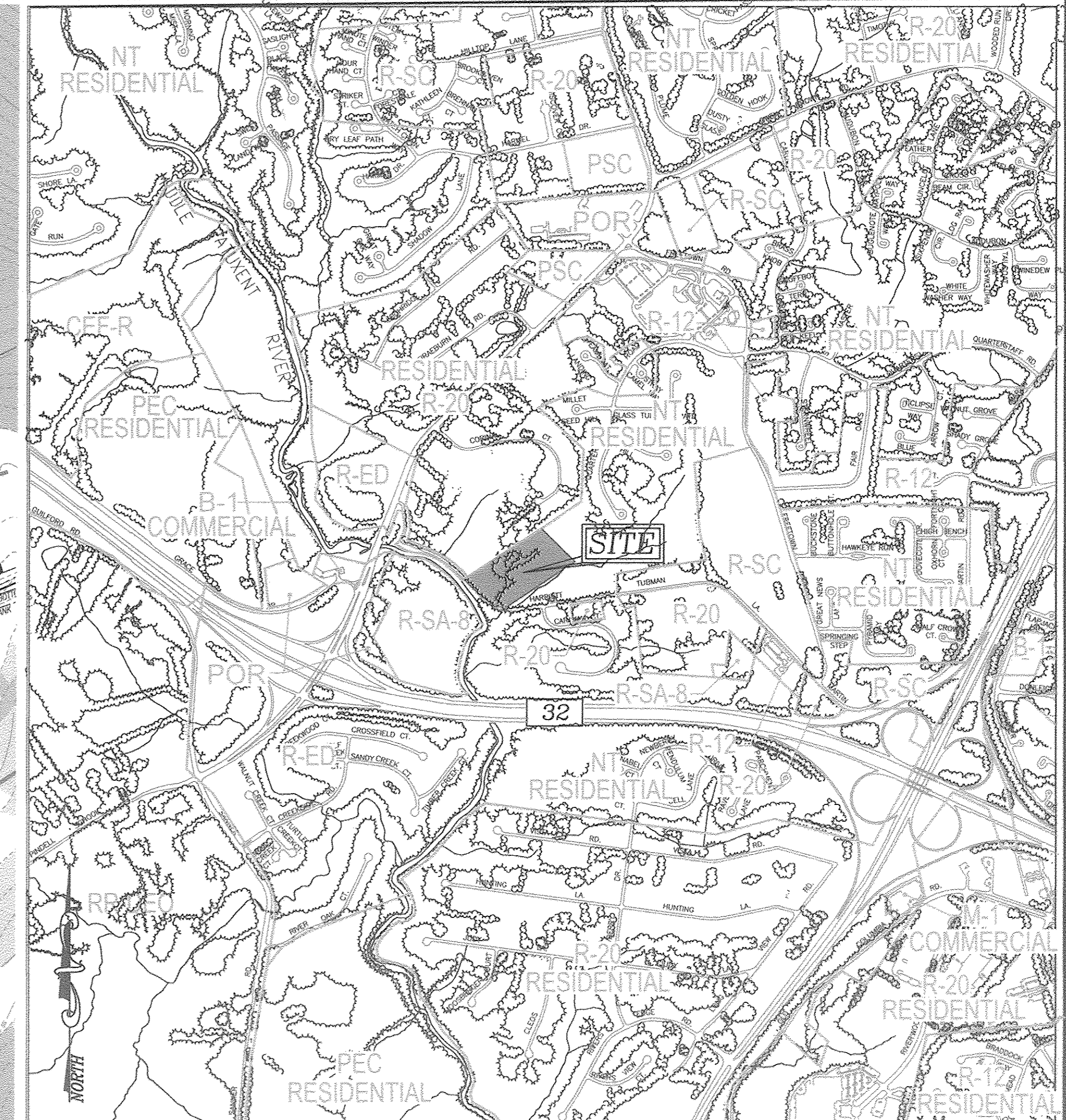
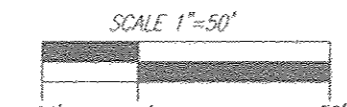
- A. GROSS SITE AREA: 10.19 AC.
 NET SITE AREA: 5.77 AC.
 B. AREA OF 100-YEAR FLOODPLAIN: 0.31 AC.
 C. AREA OF WETLANDS AND BUFFERS(ONSITE): 0.32 AC.
 AREA OF STREAM AND BUFFERS(ONSITE): 2.56 AC.
 D. AREA OF > 25% STEEP SLOPES: 4.11 AC.
 AREA OF MODERATE SLOPES (15% - 24.99%): 2.32 AC.
 E. EXISTING FOREST: 8.1 AC.
 F. ZONED: R-20
 G. EXISTING USE: RESIDENTIAL
 H. PROPOSED USE: RESIDENTIAL
 * WETLAND & STREAM BUFFERS OVERLAP

FOREST CONSERVATION EASEMENT SUMMARY CHART

FOREST CON. EASEMENT NO.	EASEMENT TYPE	CREDITED / NON-CREDITED	AREA (AC.)
1	RETENTION	CREDITED	2.709
2	RETENTION	CREDITED	0.491
3	RETENTION	NON-CREDITED	0.071



FOREST CONSERVATION PLAN
 SCALE: 1"=50'



VICINITY MAP

SCALE: 1"=1,000'
 ADC MAP COORDINATE: 32, D-4

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING EDGE OF PAVING
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EXISTING STREAM
- EXISTING STREAM BUFFER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING TREELINE
- EXISTING TREES
- EXISTING WOOD FENCE
- EXISTING METAL FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- EXISTING STEEP SLOPES (25% SLOPES OR GREATER)
- EXISTING MODERATE SLOPES (15% TO 24.99% SLOPES)
- FOREST CONSERVATION SIGN
- TREE PROTECTION FENCE
- EXISTING SPECIMEN TREE TO BE REMOVED
- EXISTING OPEN FLOODPLAIN
- PROPOSED CREDITED FOREST CONSERVATION EASEMENT
- NON-CREDITED FOREST CONSERVATION EASEMENT
- TREE PROTECTION FENCE
- LIMIT OF DISTURBANCE
- SPECIMEN TREE ORIGINAL ROOT ZONE

Specimen Tree Chart

Key	Species	Size (in dbh)	CRZ (feet radius)	Condition (good unless otherwise noted)	Comments
1	Tulip poplar	31	46.5		To Remain
2	Tulip poplar	30.5	45.75		To Remain
3	Tulip poplar	31	46.5		To Remain
4	Tulip poplar	32	48		To Remain
5	Tulip poplar	45	67.5	fair condition, limb dieback	To Remain
6	Tulip poplar	31.5	47.25		To Be Removed
7	Tulip poplar	39	58.5	fair condition, limb dieback	To Be Removed
8	Tulip poplar	33	49.5		To Be Removed
9	Tulip poplar	37	55.5		To Be Removed
10	Tulip poplar	38.5	57.75	fair condition, storm damaged	To Remain
11	Tulip poplar	30	45		To Remain
12	Tulip poplar	35	52.5		To Remain
13	Tulip poplar	30	45		To Remain
14	Tulip poplar	30	45		To Remain
15	Tulip poplar	35	52.5		To Remain
16	Tulip poplar	32.5	48.75		To Remain
17	Black oak	32	48		To Remain
18	Tulip poplar	30	45		To Be Removed
19	Tulip poplar	35	52.5		To Remain
20	Red oak	34	51		To Remain
21	Black oak	35.5	53.25		To Remain
22	Tulip poplar	36.5	54.75		To Remain
23	Tulip poplar	31.5	47.25		To Be Removed
24	Tulip poplar	41.5	62.25	poor condition, trunk cavity	To Remain
25	Tulip poplar	36.5	54.75		To Be Removed
26	Tulip poplar	31	46.5		To Remain
27	Tulip poplar	31.5	47.25		To Remain

FOR PROTECTION / TREATMENT OF TREES TO REMAIN SEE SHEET 7

Eco-Science Professionals, Inc.
 Consulting Ecologists
 P.O. Box 5006 Glen Arden, Maryland 21057 Telephone (410) 832-2495 Fax (410) 832-2495

OWNER/DEVELOPER
 BRYAN AND EMILY PASS
 7715 SUFFOLK WAY
 HANOVER, MD 21076
 240-481-6971

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
FOREST CONSERVATION PLAN
PASS PROPERTY
 NEW SINGLE FAMILY DWELLING
 7831 HARRIET TUBMAN LANE
 COLUMBIA, MD 21044
 ZONED: R-20
 TAX MAP 35 GRID 23
 5TH ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET
 ELLICOTT CITY, MD 21043
 TEL: 410.461.7666
 FAX: 410.461.8961

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. 11857, EXPIRATION DATE: 09-27-2018

DESIGN BY: RHVE
 DRAWN BY: GAH
 CHECKED BY: RHV
 DATE: NOVEMBER 2017
 SCALE: AS SHOWN
 W.O. NO.: 14-15

6 SHEET OF 8

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

John P. Edwards 1-23-18
 CHIEF, DEVELOPMENT ENGINEERING DIVISION JP DATE

J. M. ... 1-25-18
 CHIEF, DIVISION OF LAND DEVELOPMENT es DATE

Val ... 1-25-18
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING DATE

Forest Stand Data

Key	Community Type	Acreage (gross)	Dominant Vegetation	General Condition	Priority Acreage
F1	Poplar	8.1	Liriodendron tulipifera, Quercus alba, Quercus velutina, Quercus rubra, Acer rubrum, Platanus occidentalis	Good	5.0 acres +/- buffers, slopes

See accompanying report for complete stand descriptions

MAPPED SOILS TYPES - HOWARD COUNTY SOIL MAP #17 CLARKSVILLE NE

SYMBOL NAME / DESCRIPTION	GROUP	HYDRIC	MOISTURE REGIMEN	K FACTOR	SLOPE EROSION RISK	
					FAIR	POOR
GbB GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	NO	NO	0.28	YES	NO
GbC GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	NO	NO	0.28	YES	NO
MbD MANOR LOAM, 15 TO 25 PERCENT SLOPES, VERY ROCKY	B	NO	NO	0.28	NO	YES
MbF MANOR-BANNERTOWN SANDY LOAMS, 25 TO 65 PERCENT SLOPES, ROCKY	B	NO	NO	0.20	NO	YES
GoB GLENVILLE - CODOURUS - SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	NO	NO	0.43	YES	YES
CoC CODOURUS AND HATBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	NO	YES	0.32	NO	NO

TAKEN FROM: USDA, SCS-WE8 SOIL SURVEY, HOWARD COUNTY

NOTE: 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: FOR SOILS ON SITE THAT WOULD BE CONSIDERED HIGHLY ERODIBLE BY THE HOWARD COUNTY CONSERVATION DISTRICT, MORE STRINGENT SEEDING AND STABILIZATION METHODS MAY BE EXPECTED AT SITE DEVELOPMENT STAGE

**HOWARD COUNTY
FOREST CONSERVATION WORKSHEET**

ZONED R-20
NET TRACT AREA:
A. TOTAL TRACT AREA 10.19 AC.
B. AREA WITHIN 100 YEAR FLOODPLAIN 0.311 AC.
C. AREA IN PRESERVATION PARCEL 0.00 AC.
D. NET TRACT AREA 9.88 AC.

LAND USE CATEGORY
INPUT THE NUMBER "1" UNDER THE APPROPRIATE LAND USE ZONING, AND LIMIT TO ONLY ONE ENTRY. ZONED R-20

ARA	MDR	IDA	HDR	MPD	CIA
0	0	0	1	0	0

E. FOREST THRESHOLD 15% X 9.88 = 1.5 AC.
F. CONSERVATION THRESHOLD 20% X 9.88 = 2.0 AC.

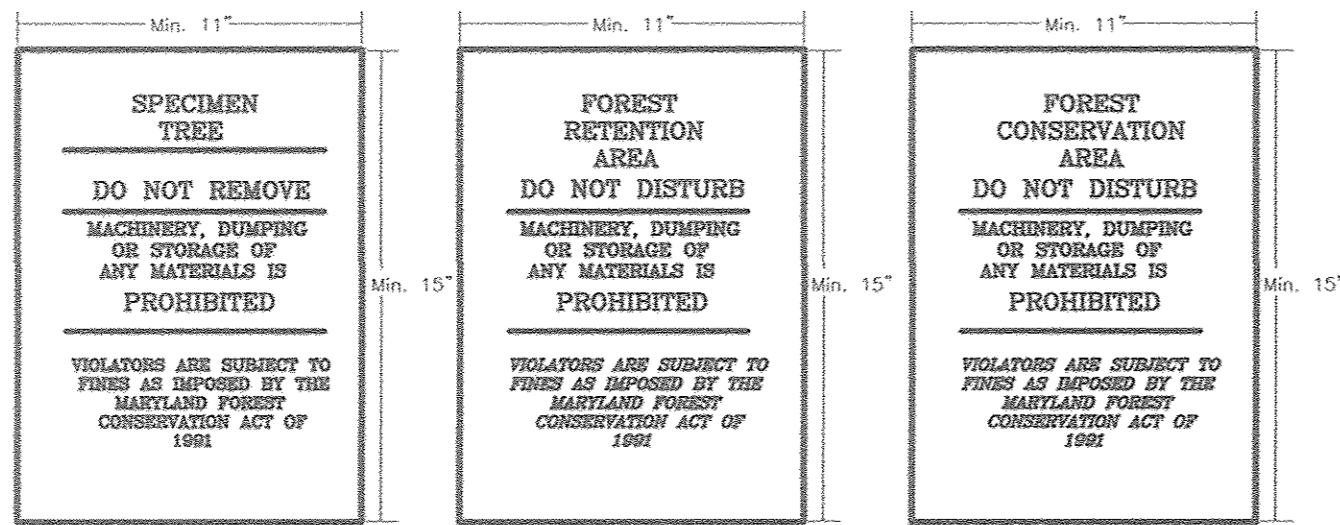
EXISTING FOREST COVER:
G. EXISTING FOREST COVER = 7.90 AC. (FSD REPORT)
H. AREA OF FOREST ABOVE AFFORESTATION THRESHOLD = 6.31 AC.
I. AREA OF FOREST ABOVE CONSERVATION THRESHOLD = 5.81 AC.

BREAK EVEN POINT:
(2 X I) + F = BREAK EVEN POINT (3.14 AC)

J. FOREST RETENTION WITH NO MITIGATION = 1.20 AC.
K. CLEARING PERMITTED WITHOUT MITIGATION = 4.65 AC.

PROPOSED FOREST CLEARING:
L. TOTAL AREA OF FOREST TO BE CLEARED = 4.60 AC (MAX. NOT PLANNED)
M. TOTAL AREA OF FOREST TO BE RETAINED = 3.20 AC (FC EASEMENT)

PLANTING REQUIREMENTS:
N. REFORESTATION FOR CLEARING ABOVE CONSERVATION THRESHOLD (L X .25) = 1.15 AC
P. REFORESTATION FOR CLEARING BELOW CONSERVATION THRESHOLD = 0.00 AC
Q. CREDIT FOR RETENTION ABOVE CONSERVATION THRESHOLD (M-F) = 1.22 AC
R. TOTAL REFORESTATION REQUIRED (N+P-Q) = 0.00 AC
S. TOTAL AFFORESTATION REQUIRED = 0.00 AC
T. TOTAL REFORESTATION AND AFFORESTATION REQUIRED = 0.00 AC



- NOTES:**
- BOTTOM OF SIGNS TO BE HIGHER THAN TOP OF TREE PROTECTION FENCE.
 - 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 SHALL BE APPROX. 25-30 FT.
 - ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.
 - ALL FOREST CONSERVATION SIGNAGE SHALL BE IN PLACE FOR PERPETUITY.
 - SIGN LOCATION SYMBOL = ●

FOREST CONSERVATION AREA SIGNS

SEQUENCE OF CONSTRUCTION-FOREST CONSERVATION

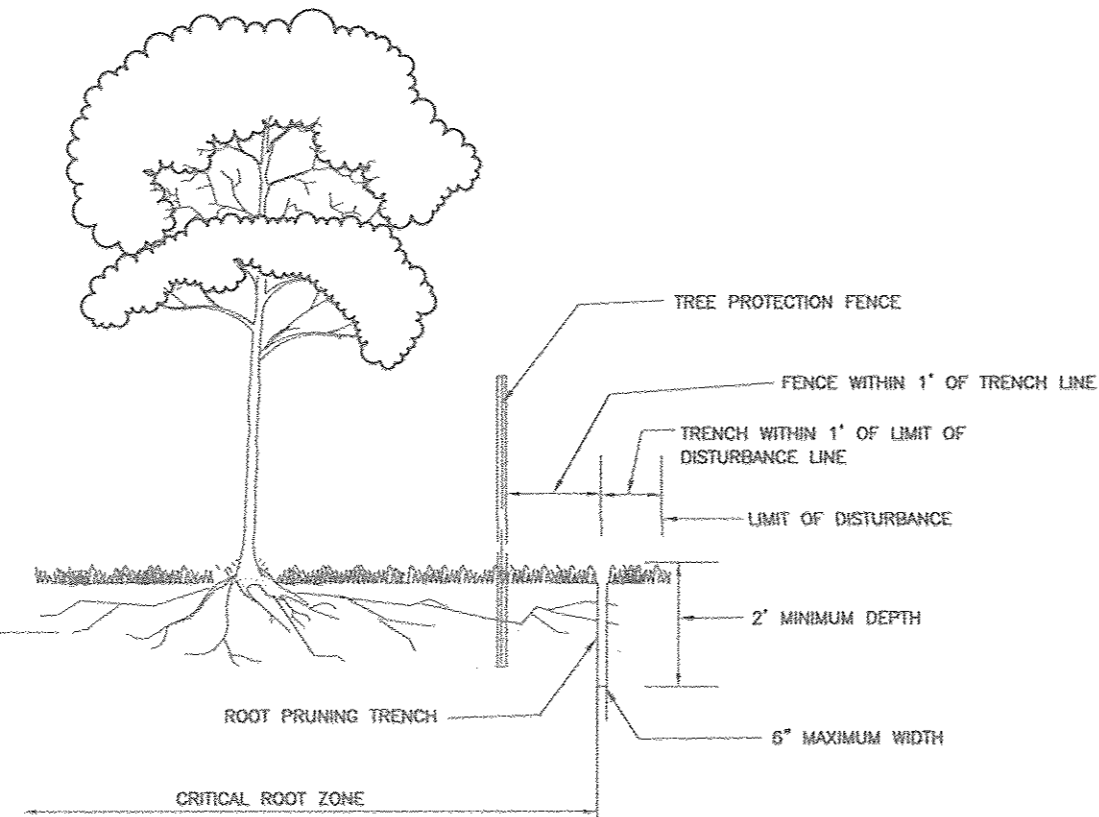
- PRECONSTRUCTION MEETING, SITE WALK WITH CONTRACTORS AND OTHER RESPONSIBLE PARTIES TO DEFINE PROTECTION MEASURES TO BE UTILIZED AND TO POINT OUT PARTICULAR TREES TO BE SAVED.
- STAKE OUT LIMITS OF DISTURBANCE AND TREE PROTECTION FENCING LOCATIONS.
- INSTALL TREE PROTECTION FENCING; FENCING TO BE INSPECTED BY THE PROJECT ENGINEER OR THE PROJECT ECOLOGIST AND HOWARD COUNTY PLANNING AND ZONING.
- PROCEED WITH TREE REMOVAL AND SITE IMPROVEMENTS AS PER APPROVED SEDIMENT CONTROL PLAN - TO BE INSPECTED BY HOWARD COUNTY PLANNING AND ZONING.
- TEMPORARY TREE PROTECTION DEVICES SHALL BE REMOVED AFTER ALL FINISHED GRADING AND UTILITY CONSTRUCTION HAS OCCURRED AND WITH APPROVAL FROM THE HOWARD COUNTY OFFICE OF PLANNING AND ZONING.

FOREST CONSERVATION:
FOREST CONSERVATION REQUIREMENTS AS SET FORTH IN SECTION 16.1202 OF THE HOWARD COUNTY CODE 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.

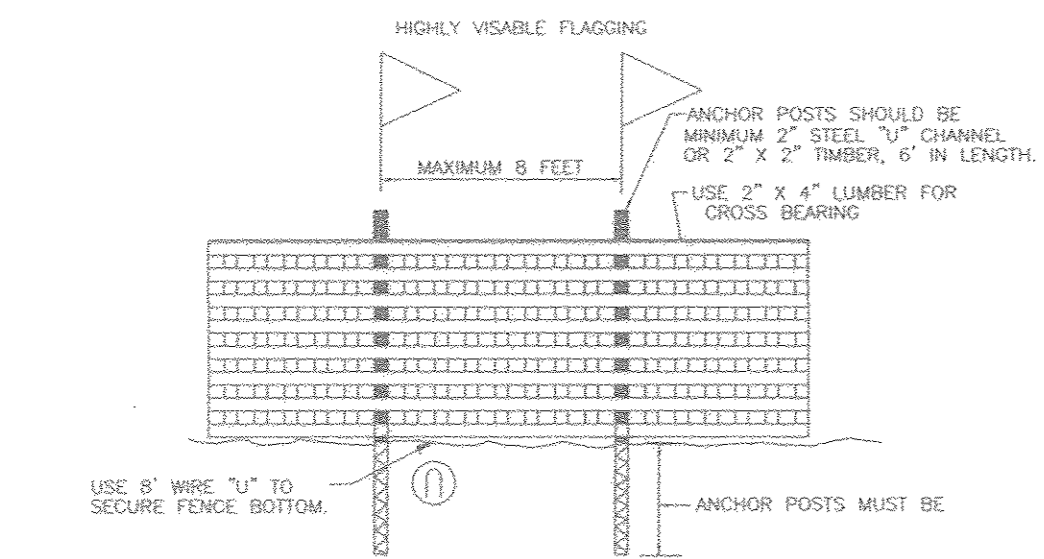
THE FOREST CONSERVATION OBLIGATION TO BE FULFILLED BY THE PLACEMENT OF 3.20 AC. INTO A RETENTION EASEMENT.
- NO SURETY IS REQUIRED.

CONSTRUCTION PERIOD PROTECTION AND MANAGEMENT NOTES FOR FOREST CONSERVATION

- PRE-CONSTRUCTION PHASE**
- FOR RETENTION AREAS, INSTALL BLAZE ORANGE FENCE, SUPER SILT FENCE, AND RETENTION SIGNS BEFORE CONSTRUCTION BEGINS.
 - FENCING SHALL BE MAINTAINED IN GOOD CONDITION AND PROMPTLY REPAIRED OR RESTORED AS THE SITUATION WARRANTS.
 - A QUALIFIED TREE CARE EXPERT SHALL DETERMINE IF ROOT PRUNING IS REQUIRED ALONG THE LIMIT OF DISTURBANCE. ROOT PRUNING TREES AS REQUIRED. WATER ANY ROOT-PRUNED TREES IMMEDIATELY AFTER ROOT-PRUNING AND MONITOR FOR SIGNS OF STRESS DURING CONSTRUCTION.
- CONSTRUCTION PHASE**
- NO DISTURBANCE OR DUMPING IS ALLOWED INSIDE THE TREE RETENTION AREA.
 - NO EQUIPMENT SHALL BE OPERATED INSIDE THE TREE RETENTION AREA INCLUDING TREE CANOPIES.
 - IN THE EVENT OF DROUGHT, THE PROTECTED TREES SHALL BE MONITORED FOR SIGNS OF STRESS AND WATERED AS NEEDED.
- POST-CONSTRUCTION PHASE**
- AT THE DIRECTION OF A QUALIFIED TREE CARE EXPERT, DAMAGES TO RETAINED TREES SHALL BE REPAIRED BY THE CONTRACTOR.
 - FENCE REMOVAL AND STABILIZATION SHALL BE AS PER THE SEDIMENT AND EROSION CONTROL PLAN.
 - DO NOT REMOVE SIGNS.



- NOTES:**
- RETENTION AREAS HAVE BEEN ESTABLISHED AS PART OF THE FOREST CONSERVATION PLAN APPROVAL.
 - BOUNDARIES OF RETENTION AREAS TO BE STAKED, FLAGGED AND/OR FENCED PRIOR CONSTRUCTION.
 - EXACT LOCATION OF ROOT PRUNING TRENCH SHOULD BE IDENTIFIED.
 - TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH SOIL REMOVED OR ORGANIC SOIL.
 - ROOTS SHOULD BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT.
- SPECIMEN TREES:**
ST-17: PROVIDE TREE PROTECTION FENCING AND CARRY OUT REQUIRED ROOT PRUNING PRIOR TO ANY GRADING OPERATIONS AND/OR INSTALLATION OF UTILITIES.
ST-9, ST-15, ST-20, ST-22, ST-27: PROVIDE SUPER SILT FENCE AND CARRY OUT REQUIRED ROOT PRUNING PRIOR TO ANY GRADING OPERATIONS AND/OR INSTALLATION OF UTILITIES.
ST-10, ST-14, ST-18: PROVIDE SUPER SILT FENCE AND TREE PROTECTION FENCE AND CARRY OUT REQUIRED ROOT PRUNING PRIOR TO ANY GRADING OPERATIONS, INSTALLATION OF UTILITIES AND/OR REMOVAL OF ADJACENT SPECIMEN TREES.
ST-24: CARRY OUT ROOT PRUNING REQUIRED FOR EARTH DIKE CONSTRUCTION PRIOR TO ANY GRADING OPERATIONS AND/OR INSTALLATION OF UTILITIES.



- NOTES:**
- FOREST PROTECTION DEVICE ONLY.
 - RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
 - BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
 - ROOT DAMAGE SHOULD BE AVOIDED.

**BLAZE ORANGE PLASTIC MESH
TYPICAL TREE PROTECTION FENCE DETAIL**

FOREST CONSERVATION DETAILS

JOHN CANOLES
DNR QUALIFIED PROFESSIONAL

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

1-23-18
1-25-18
1-25-18

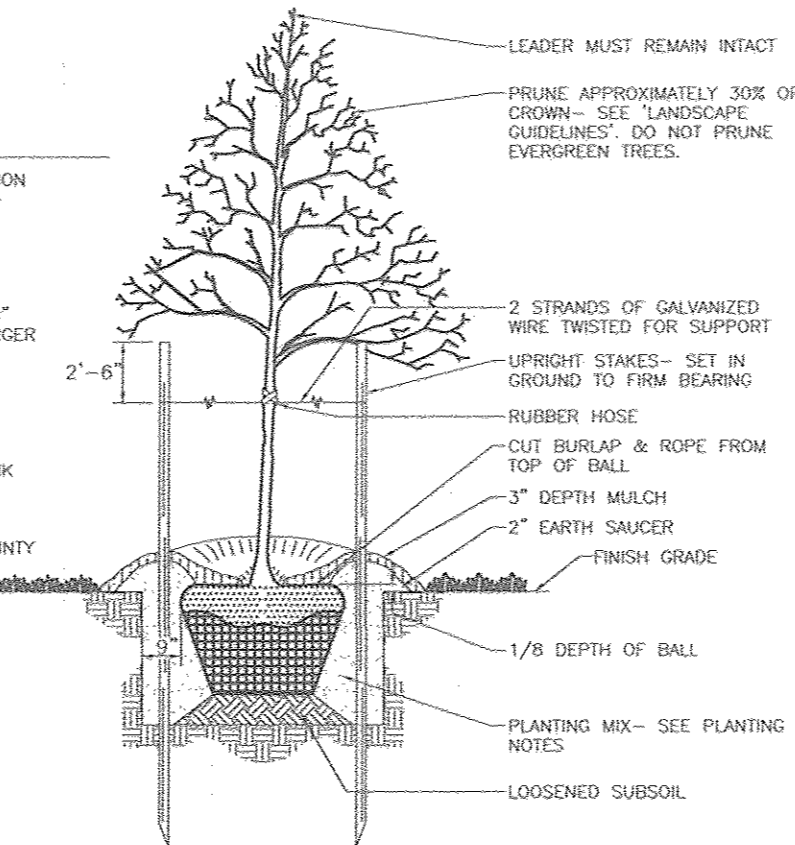
DEVELOPER'S/BUILDER'S CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

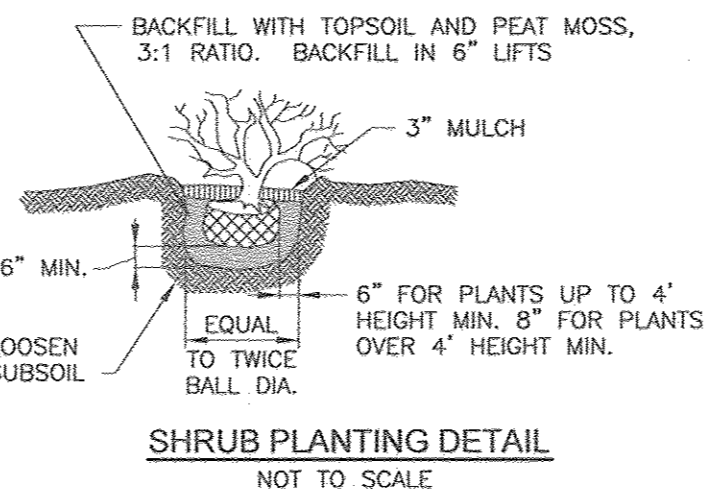
12/1/17

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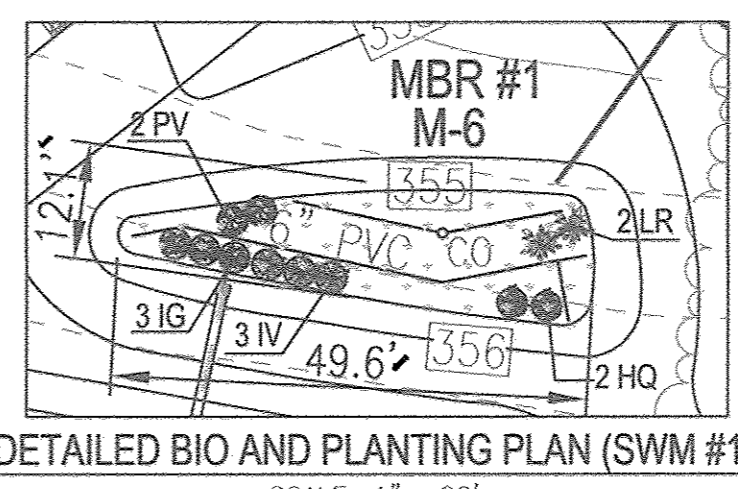
- SEE "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREA" FOR ALL MATERIAL, PRODUCT, AND PROCEDURE SPECIFICATIONS.
- SEE "LANDSCAPE GUIDELINES" FOR SUPPORTING TREES LARGER THAN 2-1/2" CALIPER.
- PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
- KEEP MULCH 1" FROM TRUNK.
- SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
- 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**



**SHRUB PLANTING DETAIL
NOT TO SCALE**



**DETAILED BIO AND PLANTING PLAN (SWM #1)
SCALE: 1" = 20'**

BIORETENTION PLANTING SCHEDULE				
KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
IG	14	ILEX VERTICILLATA "WINTERBERRY"	1 GALLON	18" O.C.
IV	16	VIBURNUM DENTATUM ARROWWOOD VIBURNUM	1 GALLON	18" O.C.
HQ	13	ASTER NOVAE-ANGLIAE NEW ENGLAND ASTER	1 GALLON	30" O.C.
LR	13	LOBELIA CARDINALIS CARDINAL FLOWER	4" HT	SPECIMEN QUALITY STRAIGHT LEADER
PV	13	KALMIA LATIFOLIA MOUNTAIN LAUREL	4" HT	SPECIMEN QUALITY STRAIGHT LEADER

PERENNIALS/GROUNDCOVER PLANTING SCHEDULE				
LEGEND	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
[Symbol]	79	RUDBECKIA HIRTA BLACK EYED SUSAN	4" POT	12"-15" O.C. FOR SIDES AND BOTTOM OF MBR. MIX ALL SPECIES IN A NATURALIZED RANDOM PATTERN THROUGHOUT. PLANT IN GROUPS OF NO LESS THAN 9 PLANTS PER CLUMP
[Symbol]	79	PHLOX STOLONIFERA CREEPING PHLOX	1 QT.	

FACILITY #	MICRO-BIORETENTION PLANTING REQUIREMENTS				PLANTINGS PROVIDED					PERENNIALS/GROUNDCOVER PROVIDED		
	LF	AREA	STEMS REQUIRED (0.0229)	STEMS PROVIDED	IG	IV	HQ	LR	PV	BA	AG	TOTAL
BIO-SWALE #1	113	491	12	12	3	3	2	2	2	17	17	34
MBR #1	330	660	16	19	3	4	4	4	4	23	23	46
TOTALS:	443	1151	28	31	6	7	6	6	6	40	40	34

BIORETENTION AREAS ARE TO BE PLANTED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (0.0229 STEMS PER SQUARE FOOT).

MICRO-BIORETENTION PLANTING SCHEDULE (SHRUBS/ORNAMENTAL GRASSES)

LANDSCAPE DETAILS

LANDSCAPE NOTES:

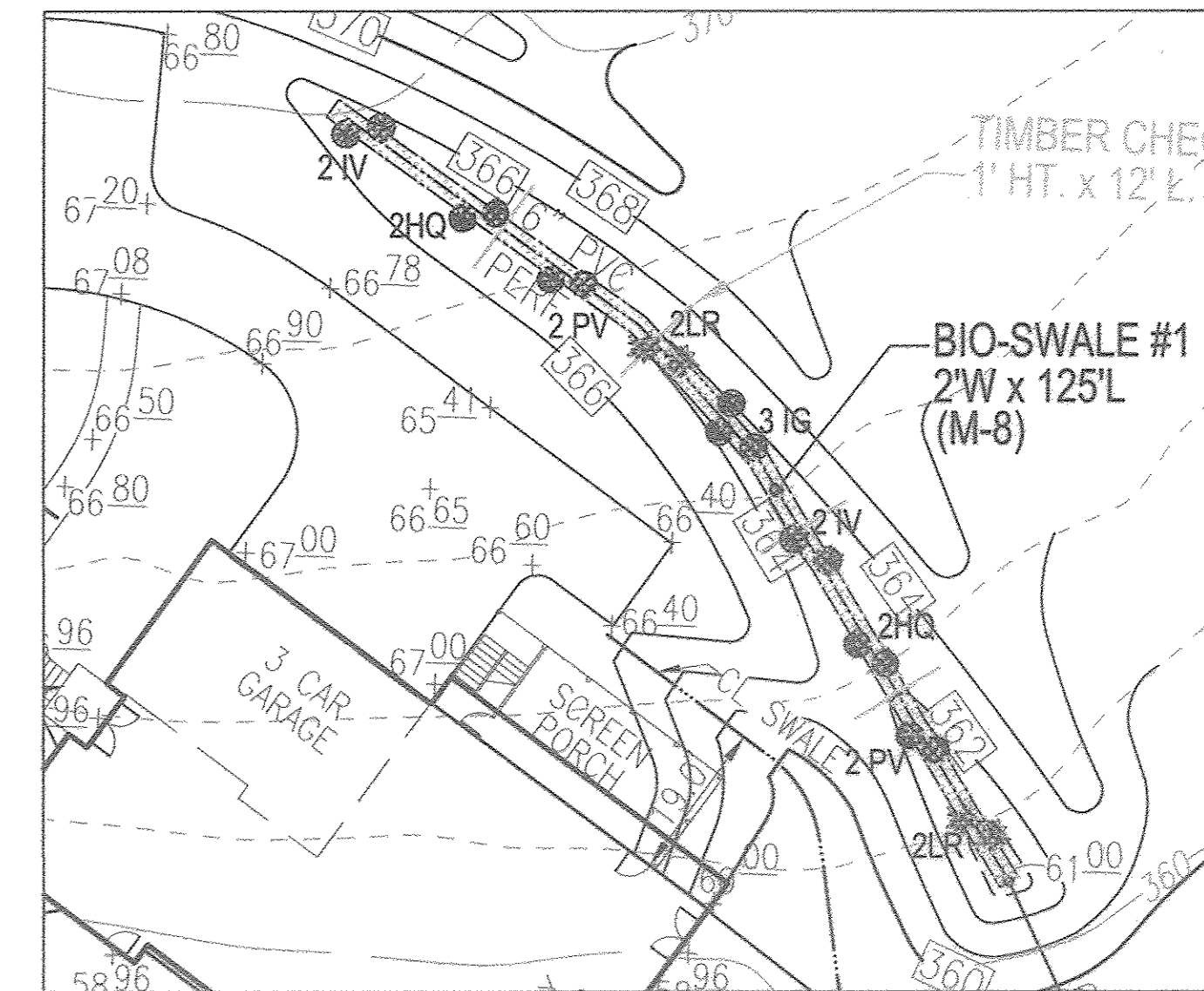
- AT THE TIME OF PLANT INSTALLATION, ALL SHRUBS AND TREES LISTED AND APPROVED ON THE LANDSCAPE PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATIONS OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR 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.
- THE OWNER, TENANT AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BEING, 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.
- 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.
- PLANTINGS SHOWN HEREON ARE THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL DURING THE CONSTRUCTION OF THE FINAL PLAN.

LANDSCAPE SCHEDULE NOTE:

- ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAS SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH IRO PLANTING SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
- 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.
- CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO ORDERING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.

GENERAL NOTES:

- THIS PLAN IS SUBJECT TO THE AMENDED 8TH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, DEVELOPMENT OR CONSTRUCTION OF THESE LOTS MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION, OR BUILDING AND GRADING PERMITS.
- THERE ARE NO BURIED GROUNDWATER CONDUITS, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
- NO LANDSCAPING TO BE INSTALLED WITHIN ANY PUBLIC EASEMENT FOR WATER, SEWER, OR STORMWATER.
- ANY EXISTING STREET TREES DAMAGED OR DESTROYED DURING CONSTRUCTION WILL BE REPLACED BY THE CONTRACTOR.
- LANDSCAPING IS NOT PERMITTED WITHIN 7.5' ON EACH SIDE OF THE FIRE DEPARTMENT CONNECTION, PROVIDE A CLEAR, UNOBSTRUCTED ACCESS PATH TO THE FIRE DEPARTMENT CONNECTION. NFPA-1 13.1.4



**DETAILED BIO SWALE AND PLANTING PLAN
SCALE: 1" = 20'**

OWNER/DEVELOPER

BRYAN AND EMILY PASS
7715 SUFFOLK WAY
HANOVER, MD 21076
240-481-6971

NO.	REVISION	DATE

**SITE DEVELOPMENT PLAN
LANDSCAPE, FOREST CONSERVATION PLAN AND
STORMWATER MANAGEMENT NOTES AND DETAILS
PASS PROPERTY**
NEW SINGLE FAMILY DWELLING
7831 HARRIET TUBMAN LANE
COLUMBIA, MD 21044
ZONED: R-20

TAX MAP 35 GRID 23
5TH ELECTION DISTRICT

PARCEL 117
HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL
ENGINEERING, INC.**
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELLIOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

PROFESSIONAL CERTIFICATE

DESIGN BY: RHVE
DRAWN BY: GAH
CHECKED BY: RHV
DATE: NOVEMBER 2017
SCALE: AS SHOWN
W.O. NO.: 14-18

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. MY LICENSE NO. IS 18193 EXPIRATION DATE 08-27-2018

7 SHEET OF 8

DRAINAGE AREAS FOR STORMWATER MANAGEMENT					
AREA NO.	AREA (AC.)	IMPERVIOUS (%)	STORMWATER MANAGEMENT PRACTICE	ESDv PROVIDED (C.F.)	ESDv PROVIDED (C.F.)
1-A	0.04	100.00	DRYWELLS	202	
1-B	0.55	15.16	MBR #1 (M-6)	653	
1-C	0.27	14.06	BIO-SWALE (M-8)	416	
1-D	0.19	30.44	GRAVEL TRENCHES	300	
TOTAL AREA # 1				1571	
2	0.58	26.30	GRAVEL TRENCHES	702	
TOTAL AREA # 2				702	
B-1	1.48	8.88	STORM DRAIN BYPASS	-	
TOTAL				2273	



ESDv DRAINAGE AREA MAP
SCALE 1"=50'

ENVIRONMENTAL SITE DESIGN PRACTICE VOLUMES PROVIDED												
DRAINAGE AREA #	TREATED AREA	SUBAREA NUMBER	PERMEABLE PAVEMENT	BIO RETENTION	LANDSCAPE INFILTRATION	GREEN ROOF	BIO SWALE	GRAVEL TRENCH	DRY WELLS	X	ESDv VOLUME	
1	46256	1A-1D	0	653	0	0	416	300	202	0	1571	
2	25211	2	0	0	0	0	0	702	0	0	702	
ESDv REQUIRED										2214 CF	TOTAL ESDv PROVIDED	2273

* STORAGE, 75% OF ESD TREATED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad R. ... 1-23-18
CHIEF, DEVELOPMENT ENGINEERING DIVISION

J. ... 1-25-18
CHIEF, DIVISION OF LAND DEVELOPMENT

Val ... 1-25-18
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING

MAPPED SOILS TYPES - HOWARD COUNTY SOIL MAP #17 CLARKSVILLE NE										
SYMBOL	NAME / DESCRIPTION	GROUP	HYDRO	PERCENT SAND	K FACTOR	PERCENT CLAY	PERCENT SILT	PERCENT ORGANIC	PERCENT ROCK	PERCENT COBBLES
GbC	GLAUSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	NO	NO	0.28	YES	NO	NO	NO	NO
GbD	GLAUSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	NO	NO	0.28	YES	NO	NO	NO	NO
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES, VERY ROCKY	B	NO	NO	0.28	NO	YES	NO	NO	NO
MdF	MANOR-BANKSTOWN SANDY LOAMS, 25 TO 65 PERCENT SLOPES, ROCKY	B	NO	NO	0.02	NO	YES	NO	NO	NO
GbB	GLENNVILLE - CODORUS - SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	NO	NO	0.43	YES	YES	NO	NO	NO
Co	CODORUS AND HARBOR SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	NO	YES	0.32	NO	NO	NO	NO	NO

PASS PROPERTY - FINAL ESDv COMPUTATIONS													
DA #	% IMPERVIOUS	Rv	DA (SF)	DA (AC)	MINIMUM VOLUME	1.10" VOLUME	VOLUME PROVIDED*	IMPERVIOUS (SF)	IMPERVIOUS (AC)	GREEN AREA	REMARKS		
AREA 1A REAR HSE	100.00	0.900	1045	0.02	83	215	98	1045	0.02	0.00	MICROSCALE - DRYWELL (M-5)	12	3.5
AREA 1B HSE/DRIVEWAY	100.00	0.900	1045	0.02	83	215	98	1045	0.02	0.00	MICROSCALE - DRYWELL (M-5)	12	3.5
AREA 1C REAR DRIVEWAY	15.16	0.1864	2304	0.55	371	966	442	653	0.08	0.47	MICRO-BIORETENTION #1 (M-6)	653	490 SF MICRO BIO
AREA 1D WEST OF DW	30.44	0.1240	8383	0.19	226	588	269	300	0.35	0.13	MICRO-BIO SWALE #1 (2 X 125)	416	312.5 SF BIO SWALE @ 1.0 PONDING
AREA 2 WEST OF UIC/ROW	26.30	0.2867	2511	0.58	602	1566	717	702	0.63	0.43	DRIVEWAY GRAVEL TRENCH - EAST SIDE	702	2
PROJECT TOTALS	23.2		71667	1.64			2273	16566	0.38	1.26			

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

1. MATERIAL SPECIFICATIONS
THE ALLOWED 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 QUARANTINED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH OR PROVE A HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BENTONITE GRASS, QUINQUAGRASS, JOINTED GRASS, OR OTHER NOxious WEEDS AS SPECIFIED UNDER COMAR 15.06.01.05. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:
• SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)
• ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (50%) AND COMPOST (50%) TO ADD TO SANDY LOAM (50%) COMPOST SAND (50%) AND COMPOST (50%)
• CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%
• PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMMONIUM (N) - LOW. ION SULFATE PLUS SALFUR (M) MAY BE MIXED TO THE SOIL TO INCREASE OR DECREASE PH.
THESE SHALL BE AT LEAST SOIL TEST PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER AND SOLUBLE SALTS. A TEXTURE 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.

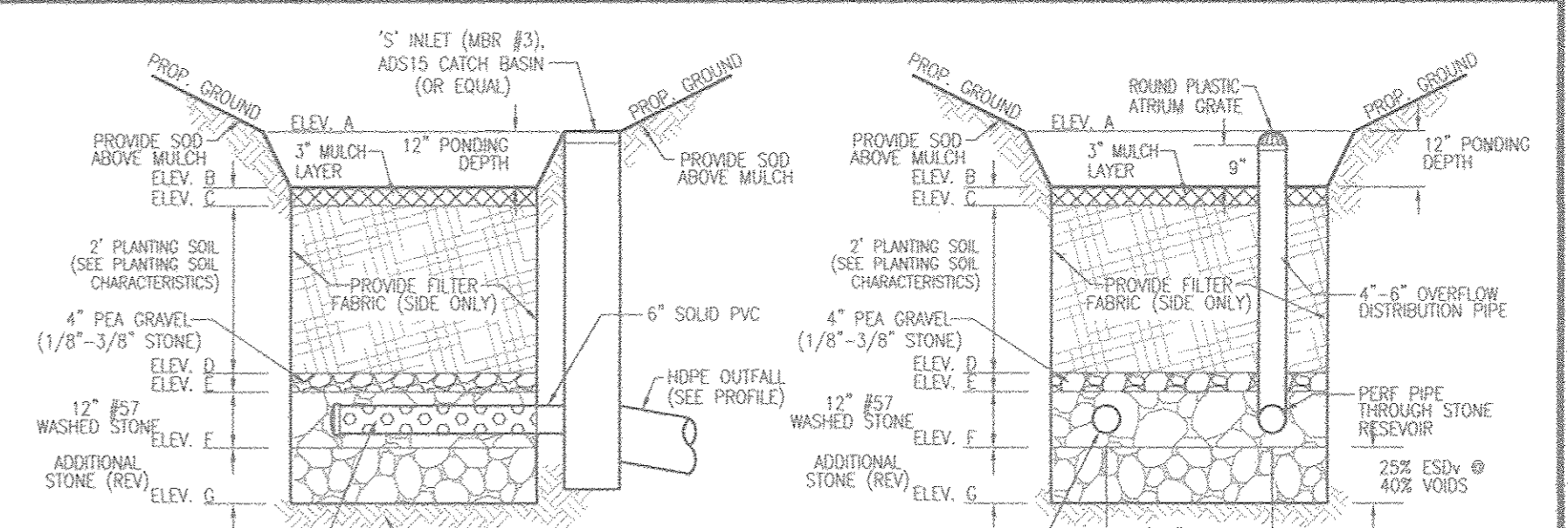
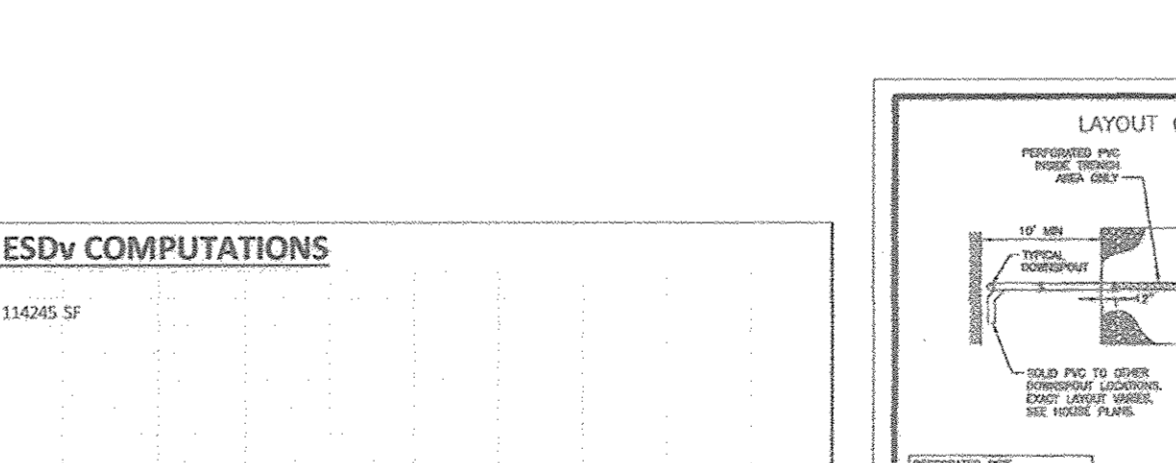
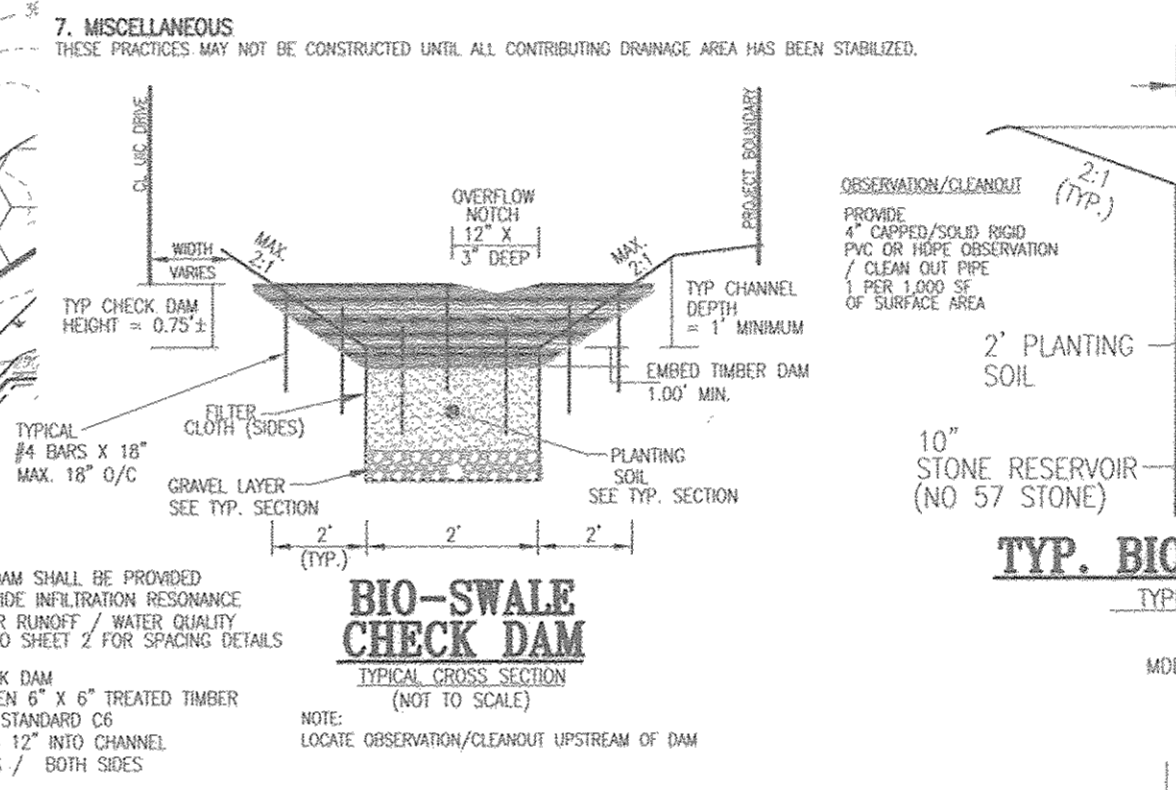
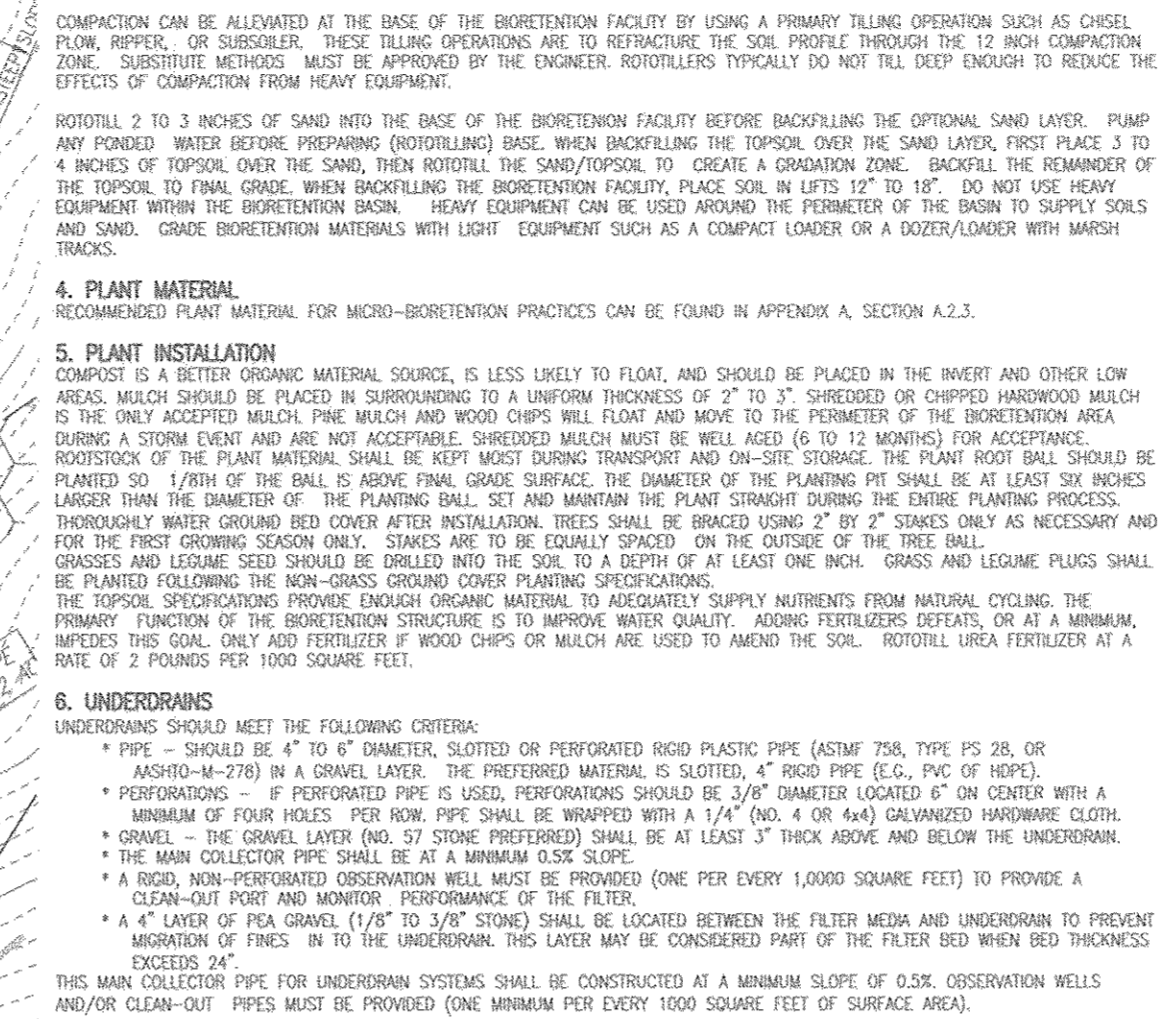
3. COMPACTION
IT IS MOST IMPORTANT TO MINIMIZE COMPACTON OF BOTH THE BASE OF BIORRETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE TRACKS OR WASH TRACKS TO PREVENT TRACKS FROM COMPACTING THE SOIL. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTON RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTON WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

4. PLANT MATERIAL
RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION
CONSIDER A BETER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SUBORDINATE TO A UNIFORM THICKNESS OF 2" TO 3" SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE BRANCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORRETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AIDED (6 TO 12 MONTHS) FOR ACCEPTANCE. ADDITIONS OF THE PLANT MATERIAL SHALL BE KEPT MOST 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 8X 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 BARRICADE USING 2" OR 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 ODDLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLANTS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

6. UNDERDRAINS
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
• PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 796, TYPE PS 28, OR 4" ANSDR-M-270) BY 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. FOR NON PIPE SHALL BE WRAPPED WITH A 1/4" (1" OR 4") GALVANIZED HARMONIC 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 1,000 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 2".
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.



MICRO-BIORETENTION DATA CHART

Facility #	Ponding Depth (ft)	Ponding Elevation (ft)	Top of Mulch (ft)	Bottom of Mulch (ft)	Depth of Plant Mix (ft)	Bottom of Plant Mix (ft)	Bottom of Stone (ft)	Bottom of Stone (ft)	Invert of Underdrain (ft)	Additional Depth Stone (ft)	Bottom of Res. Area (ft)	Surface Area (sq ft)	Approx. Dimensions (ft midpoint)
1	1.00	356.00	356.00	354.75	2.00	352.75	352.42	1.00	351.42	351.67	0.83	350.59	490

BIO-SWALE DATA CHART

Facility #	Ponding Depth (ft)	Ponding Elevation (ft)	Top of Mulch (ft)	Bottom of Mulch (ft)	Depth of Plant Mix (ft)	Bottom of Plant Mix (ft)	Bottom of Stone (ft)	Bottom of Stone (ft)	Invert of Underdrain (ft)	Additional Depth Stone (ft)	Bottom of Res. Area (ft)	Surface Area (sq ft)	Approx. Dimensions (ft midpoint)
1*	1.00	352.00	351.00	350.75	2.00	348.75	348.42	1.00	347.42	347.67	-	313	128 x 2.5

* Top of Mulch Elevation given at lowest point in swale

Appendix B.4 Construction Specifications for Environmental Site Design Practices

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

Material	Specification	Quantity per sq-ft
Planting Soil	See Appendix A, Table A.4	See Appendix A, Table A.4
Planting Soil	Loamy sand (60-65%) & coarse sand (35%) & compost (5%)	1.00 cft per sq-ft
Mulch	Shredded hardwood	2.00 cft per sq-ft
Organic content	Min. 10% by dry weight (ASTM D 2974)	See Appendix A, Table A.4
Free gravel (diaphragm)	See Appendix A, Table A.4	See Appendix A, Table A.4
Catchment drain	Unperforated stone-washed	See Appendix A, Table A.4
Geotextile	See Appendix A, Table A.4	See Appendix A, Table A.4
Gravel (underdrain and infiltration berms)	See Appendix A, Table A.4	See Appendix A, Table A.4
Underdrain piping	See Appendix A, Table A.4	See Appendix A, Table A.4
Placed in place concrete (if required)	See Appendix A, Table A.4	See Appendix A, Table A.4
Sand	See Appendix A, Table A.4	See Appendix A, Table A.4

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED STORMWATER INFILTRATION TRENCHES (I-1) AND DRY WELLS (M-5)

- THE OWNER SHALL INSPECT THE MONITORING WELLS AND STRUCTURES ON A QUARTERLY BASIS AND AFTER EVERY LARGE STORM EVENT.
- THE OWNER SHALL RECORD THE WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS OVER A PERIOD OF SEVERAL DAYS TO DETERMINE DAMAGE.
- THE OWNER SHALL MAINTAIN A LOG BOOK TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN WITHIN A SEVENTY-TWO (72) HOUR TIME PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.
- THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION FACILITY HAVE BEEN VERIFIED IN THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
ESDv DRAINAGE AREA MAP
NOTES AND DETAILS

PASS PROPERTY
NEW SINGLE FAMILY DWELLING
7831 HARRIET TUBMAN LANE
COLUMBIA, MD 21044
ZONED: R-20

TAX MAP 35 GRID 23
5TH ELECTION DISTRICT

PARCEL 117
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS - SURVEYORS - PLANNERS

8407 MAIN STREET
ELICOTT CITY, MD 21043
TEL: 410.461.7866
FAX: 410.461.1966

DESIGN BY: RHVE
DRAWN BY: GAH
CHECKED BY: RHV

DATE: NOVEMBER 2017
SCALE: AS SHOWN
W.O. NO.: 14-15

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 LAW OF THE STATE OF MARYLAND, LICENSE NO. 121718
SUPERVISION DATE 07-27-2018

8 SHEET OF 8