ROAD CONSTRUCTION PLANS
THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
HOWARD COUNTY, MARYLAND

GENERAL NOTES

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

2.) BOUNDARY IS BASED ON A FIELD RUN MONUMENTED SUBURBAN BOUNDARY SURVEY PERFORMED BY JOHN A. MILDENBERG IN MARCH, 2006.

3.) THE SUBJECT PROPERTY IS ZONED PGCC PER THE 10-6-2013 COMPREHENSIVE ZONING PLAN.

4.) THE EXISTING TOPOGRAPHY SHOWN IS BASED ON AERIAL TOPOGRAPHIC SURVEY PERFORMED BY WINGS AERIAL MAPPING CO., INC. FLOWN ON OR ABOUT JANUARY, 2006. TOPOGRAPHY WITHIN THE STREAM CHANNEL IS BASED ON FIELD RUN SURVEY PERFORMED BY BENCHMARK ENGINEERING, INC. IN MAY, 2015.

5.) THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 161A AND 161B WERE USED FOR THIS PROJECT.

6.) WATER IS PUBLIC. THE CONTRACT NUMBER IS 44-4934-D. THE DRAINAGE AREA IS LITTLE PATUXENT.

7.) SEWER IS PUBLIC. THE CONTRACT NUMBER IS 24-4354-D. THE DRAINAGE AREA IS LITTLE PATUXENT.

8.) THIS PROJECT IS LOCATED WITHIN THE METROPOLITAN DISTRICT.

9.) EXISTING UTILITIES SHOWN ARE BASED ON CONTRACT DRAWINGS, AERIAL AND FIELD SURVEYED LOCATIONS.

10.) THE FLOODPLAIN STUDY FOR THIS PROJECT WAS PREPARED BY BENCHMARK ENGINEERING, INC. IN JULY, 2015 AND APPROVED BY THE DEPARTMENT OF PLANNING AND ZONING ON SEPTEMBER 30, 2015.

11.) A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT SINCE NO RESIDENTIAL LOTS/UNITS ARE PROPOSED.

12.) A TRAFFIC STUDY IS NOT NEEDED FOR THIS PROJECT AS IT CREATES NO NEW (ADDITIONAL) LOTS.

13.) A GEOTECHNICAL REPORT WAS PREPARED BY HILLIS-CARNES ENGINEERING ASSOCIATES, INC. IN JUNE, 2015 AND BY BENCHMARK ENGINEERING, INC. IN JULY 2015.

14.) THERE ARE NO EXISTING STRUCTURES LOCATED ON-SITE.

15.) TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES OR HISTORIC STRUCTURES LOCATED ON THIS SITE.

16.) THE GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, AND PAVING ASSOCIATED WITH THE CONSTRUCTION OF RESORT ROAD WITHIN THE LIMITS OF WETLANDS, STREAM, THEIR BUFFERS, 100-YEAR FLOODPLAIN AND STEEP SLOPES GREATER THAN 25% IN EXCESS OF 20,000 CONTIGUOUS SQUARE FEET HAS BEEN DEEMED NECESSARY BY THE DEPARTMENT OF PLANNING AND ZONING BASED ON THE APPROVAL OF THE FOURTH AMENDMENT TO THE TURF VALLEY COMPREHENSIVE SKETCH PLAN (S-86-013, PB 368) ON 7-28-2006. THE MDE PERMIT ASSOCIATED WITH THIS DISTURBANCE IS #02-NT-009/200261464.

17.) LANDSCAPING FOR THIS SUBDIVISION IS PROVIDED IN ACCORDANCE WITH A CERTIFIED LANDSCAPE PLAN INCLUDED WITH THIS ROAD CONSTRUCTION PLAN SET IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED STREET TREES SHALL BE POSTED AS A PART OF THE DPW DEVELOPER'S AGREEMENT.

18.) THIS PROJECT IS SUBJECT TO THE REQUIREMENTS OF SECTION 16.1202 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION. THE REQUIREMENT HAS BEEN DEFERRED PER APPROVAL OF WP-15-153. SEE GENERAL NOTE #27 BELOW.

19.) THE FOREST STAND DELINEATION FOR THIS PARCEL WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. ON JULY 16 2007.

20.) THE WETLANDS DELINEATION FOR THIS PARCEL WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. ON SEPTEMBER 29, 2009.

21.) STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURES AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006), SECTION 5.5.A. A MINIMUM OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

22.) TRAFFIC CONTROL DEVICES:

A) THE R1-1 "STOP" SIGN AND STREET NAME SIGN (SNS) ASSEMBLY FOR THIS DEVELOPMENT MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETED.

B) THE TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2430) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES.

C) ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MdMUTCD).

D) ALL SIGN 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 THEN TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.

23.) THE PROJECT SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 16.129 OF THE HOWARD COUNTY CODE.

24.) PROPERTIES DEPICTED ON THESE PLANS ARE ZONED "PGCC" UNLESS OTHERWISE NOTED.

25.) ALL FILL AREAS SHALL BE AT 95% COMPACTION IN ACCORDANCE WITH AASHTO T-180 STANDARDS

26.) STORMWATER MANAGEMENT IS PROVIDED BY TWO (M-6) MICRO BIO-RETENTION PRACTICES AND ONE (F-6) BIO-RETENTION FACILITY. THESE PRACTICES SHALL BE PRIVATELY OWNED AND JOINTLY MAINTAINED.

27.) WP-15-153, TO WAIVE SECTION 16.146 AND SECTION 16.1202(a) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS WAS APPROVED ON JUNE 16, 2015 WITH THE FOLLOWING CONDITIONS:

A. THE PETITIONER SHALL SUBMIT TO DPZ A PRELIMINARY PLAN IN ACCORDANCE WITH S-11-002 AND THE REQUIREMENTS OF SECTION 16.146 OF THE COUNTY CODE ON OR BEFORE JUNE 5, 2016. THIS PLAN MAY OMIT THE AREA WITHIN THE LIMITS OF THE BLUFFS AT TURF VALLEY, RESORT ROAD EXTENSION FINAL SUBDIVISION PLAN.

B. THE PETITIONER SHALL INDICATE THE BULK PARCELS RECORDED AS PART OF THE FINAL SUBDIVISION PLAN FOR THE BLUFFS AT TURF VALLEY, RESORT ROAD EXTENSION AS NON-BUILDBLE.

C. THE PETITIONER SHALL SUBMIT A FOREST CONSERVATION PLAN TO INCLUDE THE RELATED DATA WITHIN THE LIMITS OF DISTURBANCE OF THE FINAL SUBDIVISION PLAN SUBMITTED FOR THE BLUFFS AT TURF VALLEY, RESORT ROAD EXTENSION UPON SUBMISSION OF THE FIRST OF THE FOLLOWING:
1. A FINAL SUBDIVISION PLAN SUBDIVIDING PARCEL 706
2. A FINAL SUBDIVISION PLAN RESUBDIVIDING BULK PARCELS RECORDED AS PART OF THE BLUFFS AT TURF VALLEY, RESORT ROAD EXTENSION; OR
3. A SITE DEVELOPMENT PLAN LOCATED ON PARCEL 706.

28.) THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE 2ND AMENDMENT TO THE TURF VALLEY RESIDENTIAL SUBDISTRICT FINAL DEVELOPMENT PLAN.

29.) RESORT ROAD IS CLASSIFIED AS A LOCAL ROAD PER THE HOWARD COUNTY GENERAL PLAN. IT SHALL BE DESIGNED AND CONSTRUCTED AS A MINOR COLLECTOR.

30.) BULK PARCELS 'A' AND 'B' SHALL BE RE-SUBDIVIDED UNDER A FUTURE PHASE.

31.) WP-16-029, TO WAIVE SECTION 16.1205(a)(7) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS WAS APPROVED ON SEPTEMBER 15, 2015 WITH THE FOLLOWING CONDITION:

1. THE PETITIONER SHALL PLANT TWO SHADE TREES AS REPLACEMENTS FOR THE SPECIMEN TREE REMOVED. THE REPLACEMENT PLANTINGS SHALL BE ADDED TO THE F-16-004 LANDSCAPE PLAN OR TO LANDSCAPE PLANS SUBMITTED AS PART OF THE FUTURE THE BLUFFS AT TURF VALLEY SUBDIVISION. LANDSCAPING SURETY SHALL BE POSTED FOR THE REPLACEMENT PLANTINGS.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-22

STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER

[illegible]

AS-BUILT

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 9/20/21

APPROVED: DEPARTMENT OF PUBLIC WORKS

[illegible] 10/19/2015
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

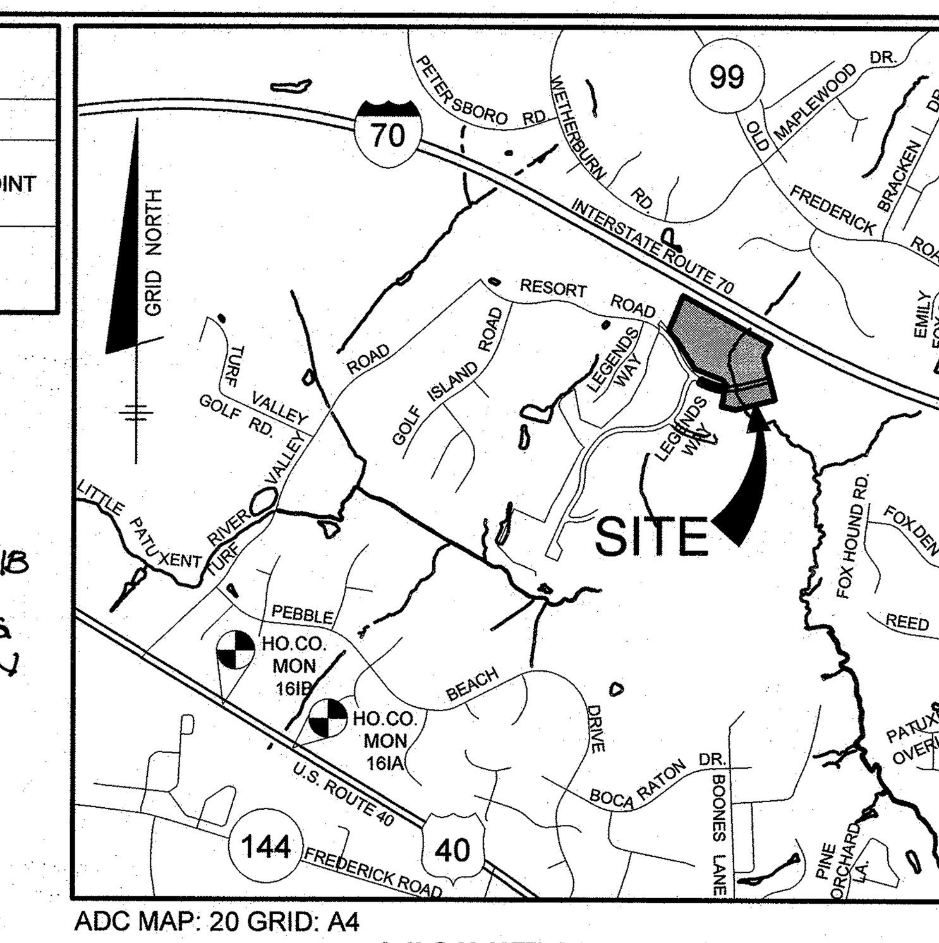
[illegible] 10.22.15
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[illegible] 10.19.15
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

J:\2697 The Bluffs at Turf Valley\dwg\7000.dwg, 9/29/2015 9:34:59 AM

BENCHMARKS

NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
16IA	589,509.3676	1,346,343.632	462.988	RT. 40 0.35 MILES WEST OF RT-144 JOINT
16IB	590,475.2538	1,344,753.9350	469.892	RT.40 0.8 MILES EAST OF MARRIOTTSVILLE ROAD



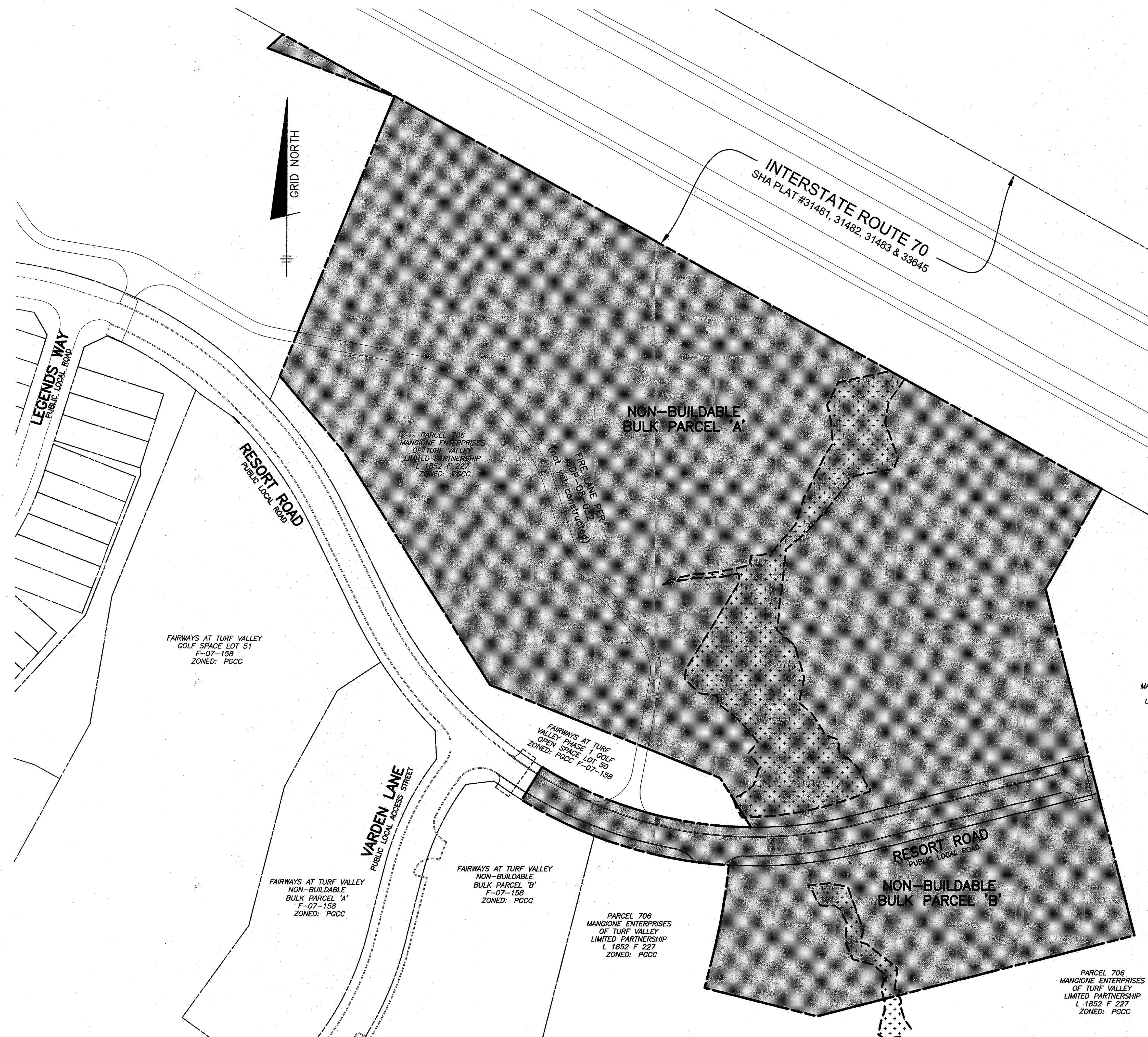
ADC MAP: 20 GRID: A4

VICINITY MAP
SCALE: 1"=2000'

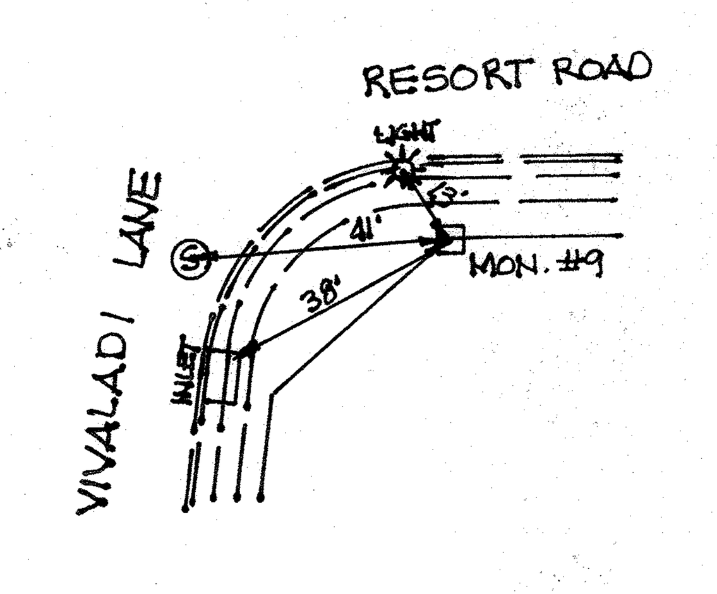
AS-BUILT NOTES:
1.) HORIZONTAL AND VERTICAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD 83/ ADJ 07 AS PROJECTED FROM HO.CO. GEODETIC CONTROL STATIONS 16IB AND 17AB.
2.) THE INSTRUMENTS USED IN PERFORMING THE AS-BUILT WERE A 5" TOTAL STATION AND PRISM AND RTK GPS.
3.) THIS AS-BUILT WAS PERFORMED BY BENCHMARK ENGINEERING, INC.

LEGEND

— — —	PROJECT BOUNDARY
▨	SITE
⁘	100YR FLOODPLAIN LIMIT



100 0 50 100 200 400
1 inch = 100 ft.



CONC. MON. #9

RIGHT OF WAY ELEVATION		
R/W PT.NO.	DESCRIPTION	ELEVATION
809	REBAR & CAP	446.07'
810	REBAR & CAP	446.21'
811	REBAR & CAP	444.48'
818	REBAR & CAP	449.29'
819	REBAR & CAP	449.03'
820	REBAR & CAP	462.80'
821	REBAR & CAP	462.36'
9	CONC. MON.	444.27'

SHEET INDEX

SHEET	TITLE
1	TITLE SHEET
2	ROAD PLAN, PROFILE AND DETAILS
3	STRIPING, SIGNAGE, & STREET LIGHTING PLAN AND CURB FILLET PROFILES
4	STORM DRAIN DRAINAGE AREA MAP
5	100YR FLOODPLAIN CROSS-SECTION & ELEVATION PLAN
6	STORM DRAIN PROFILES AND DETAILS
7	TWIN 60" CULVERT PROFILE AND DETAILS
8	ESD STORMWATER MANAGEMENT NOTES AND DETAILS
9	ESD STORMWATER MANAGEMENT NOTES AND DETAILS
10	LANDSCAPE PLAN
11	GRADING, SEDIMENT & EROSION CONTROL PLAN
12	SEDIMENT & EROSION CONTROL NOTES AND SEQUENCE OF CONSTRUCTION
13	SEDIMENT & EROSION CONTROL DETAILS
14	TEMPORARY STREAM DIVERSION PLAN & DETAILS
15	SOIL BORING LOGS

SITE ANALYSIS DATA CHART

GENERAL SITE DATA

1.) PRESENT ZONING: PGCC
2.) APPLICABLE DPZ FILE REFERENCES: S-86-13, S-11-002, ECP-11-053 ECP-11-062, F-07-158, WP-15-153 WP-16-029
3.) PROPOSED USE OF SITE: PUBLIC ROAD
4.) PROPOSED WATER AND SEWER SYSTEMS: PUBLIC

AREA TABULATION

1.) GROSS TRACT AREA 16.19± AC.
2.) AREA WITHIN 100-YEAR FLOODPLAIN 1.27± AC.
3.) TOTAL AREA OF 25% OR GREATER STEEP SLOPES AREA NOT IN FLOODPLAIN (FOR NTA CALC) 0.78± AC.
4.) NET TRACT AREA 14.14± AC.
5.) TOTAL NUMBER OF LOTS ALLOWED PER ZONING N/A
6.) TOTAL NUMBER OF RESIDENTIAL UNITS/LOTS PROPOSED ON THIS SUBMISSION 0
7.) AREA OF BUILDABLE LOTS 0
AREA OF OPEN SPACE LOTS 0
AREA OF BULK PARCELS 15.33± AC.
AREA OF PUBLIC RIGHT-OF-WAY 0.86± AC.

SWM DESIGN NARRATIVE:

NATURAL RESOURCES SHALL BE PRESERVED AS NO RESOURCES ARE BEING IMPACTED BY THE IMPLEMENTATION OF THE SWM ESD PRACTICES.

EXISTING FLOW PATTERNS SHALL BE MAINTAINED. THE SITE HAS A STREAM BI-SECTING IT THAT FLOWS FROM THE NORTH TO THE SOUTH. THE ESD PRACTICE UNDERDRAINS SHALL DISCHARGE TOWARDS THE STREAM CHANNEL. THIS MIMICS THE EXISTING CONDITION DRAINAGE PATTERN.

IMPERVIOUS AREA IS BEING HELD TO A MINIMUM BY UTILIZING THE SMALLEST ROAD PAVEMENT WIDTH (24 FEET) ALLOWED BASED ON ROAD CLASSIFICATION.

SEDIMENT AND EROSION CONTROL SHALL BE PROVIDED MAINLY THROUGH THE IMPLEMENTATION OF SUPER SILT FENCES AROUND THE PERIMETER EDGE. OFF-SITE DRAINAGE SHALL BE BYPASSED AROUND THE SITE VIA CLEAN WATER DIVERSION DIKES OR THROUGH THE SITE VIA DIKES DISCHARGING TO A TEMPORARY DIVERSION PIPE. NO TRAPS OR BASINS SHALL BE NEEDED. THERE ARE NO IMPACTS TO SWM DESIGN BASED ON SEDIMENT AND EROSION CONTROL.

THE PROPOSED TWO (M-6) MICRO BIO-RETENTION PRACTICES AND ONE (F-6) BIO-RETENTION PRACTICE ADEQUATELY TREAT THE PROPOSED IMPERVIOUS AREAS. THE PRACTICES SHALL ALL DISCHARGE AT A LOCATION THAT IS NOT DETRIMENTAL TO THE ADJACENT PROPERTIES. INLETS SHALL BE PLACED IN THE MB's WHERE HIGHER STORMS MIGHT CREATE OVERFLOW ISSUES. FULL TREATMENT IS BEING PROVIDED THEREFORE THIS PROJECT CAN BE CONSIDERED TO BE TREATED TO THE MAXIMUM EXTENT PRACTICAL.

THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.

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

ESD STORMWATER MANAGEMENT SUMMARY TABLE

Practice		DA to practice (sf)	Imp Area to practice (sf)	Pe	Qe	Af (s.f.) Required	Af Provided	Af 2% DA?	ESDv Required*	ESDv Provided	ESDv Pe Provided	REv Required	REv Provided	Ownership
(M-6) MicroBioretenion	#1	12,651	4,520	1.8	0.74	253	460	PASS	584	593	1.8	459 cf or 0.13 acres	461 cf	Private
(M-6) MicroBioretenion	#2	13,732	4,520	1.8	0.66	275	448	PASS	564	588	1.8			Private
(F-6) Bioretention	#1	30,701	18,371	1.9	1.12	614	1988	PASS	2151	2269	1.9			Private
Total Treated ⟶		57,084	27,411			1142	2896		3298	3450				

* Required ESDv for Bio-Retentions and Micro Bio-Retentions is based on 75% of total ESDv calculated per MDE treatment criteria
Rev is met via 7" stone chamber below outlet pipe in F-6 Bio-Retention Facility

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND
CHRISTOPHER ALAN MALAGO
PROFESSIONAL ENGINEER

[illegible] 9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

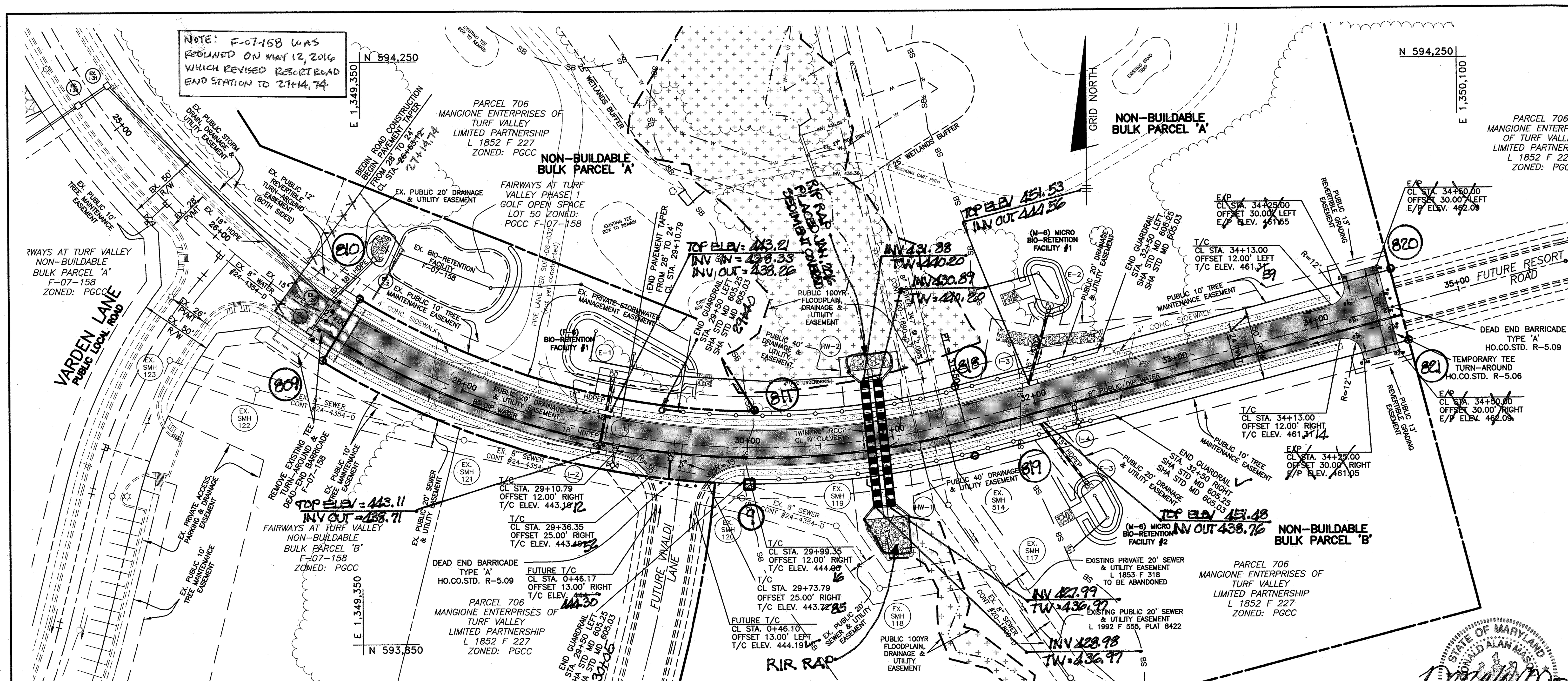
TAX MAP: 17 - GRID: 13 - PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 - HOWARD COUNTY, MARYLAND

TITLE SHEET

DATE: SEPTEMBER, 2015 | BEI PROJECT NO. 2697
DESIGN: DBT | DRAFT: DBT | SCALE: AS SHOWN | SHEET 1 OF 15

AS-BUILT F-16-004

NOTE: F-07-158 WAS REDLINED ON MAY 12, 2016 WHICH REVISED RESORT ROAD END STATION TO 27+14.74



50 0 25 50 100 200

1 inch = 50 ft.

RESORT ROAD
PUBLIC LOCAL ROAD
DESIGNED AS MINOR COLLECTOR
DESIGN SPEED: 35 MPH

LEGEND

- SITE BOUNDARY
- PROPOSED PAVING
- 100YR FLOODPLAIN LIMIT
- EXISTING WETLANDS
- EXISTING CL STREAM
- 75' STREAM BUFFER
- EXISTING TREELINE
- PROPOSED GUARDRAIL
- PROPOSED SIDEWALK

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

License No. 21443, Expiration Date: 12-21-22

AS-BUILT

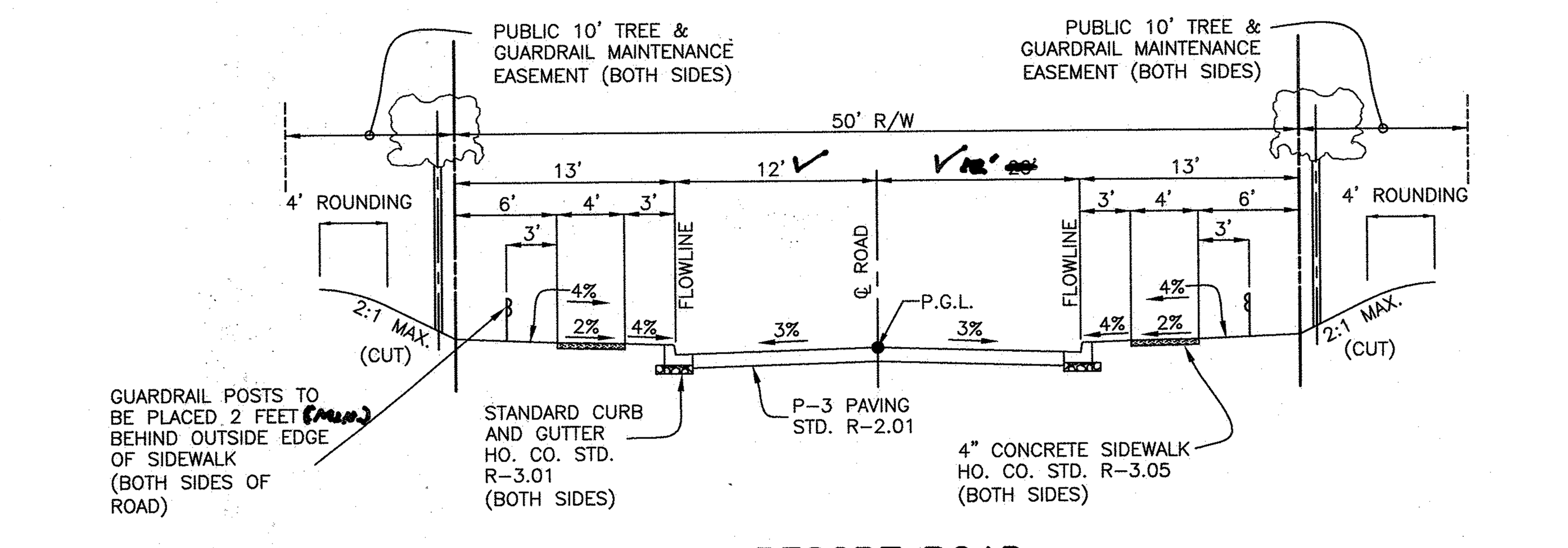
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 9-20-21

ROAD CHART				
ROAD	LIMITS	CLASSIFICATION	DESIGN SPEED	PVMT TYPE
RESORT ROAD	26+92.88 TO 34+50.00	PUBLIC LOCAL ROAD	35 MPH	P-3

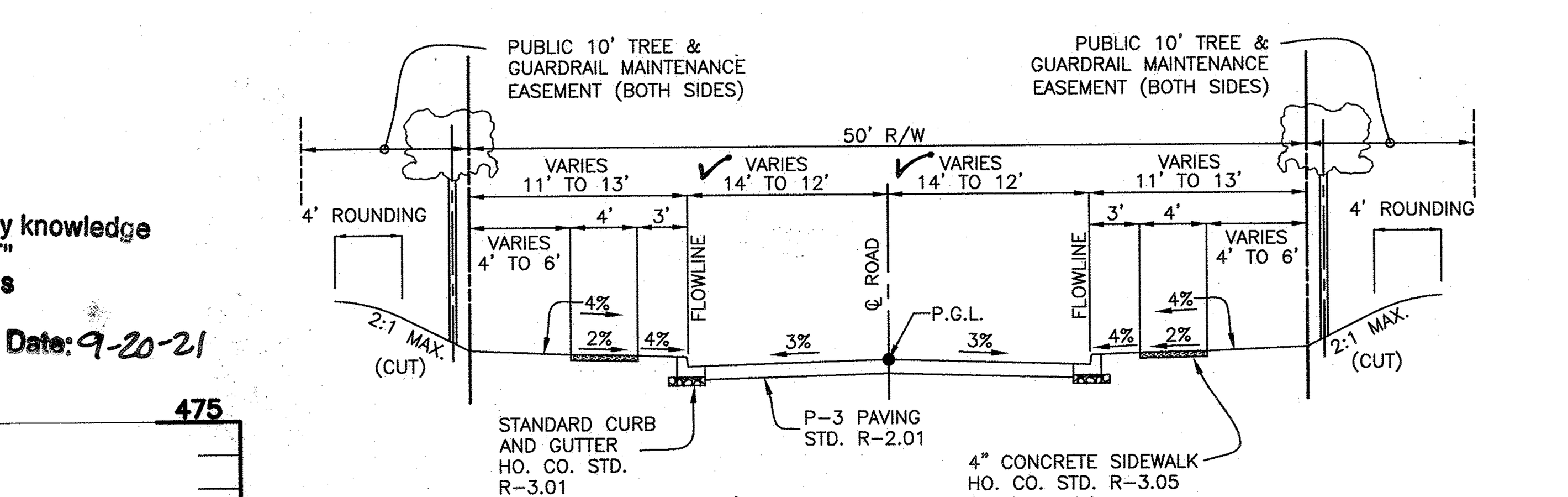
CENTER LINE CURVE DATA							
CURVE	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD	
1	26+92.88 TO 31+50.00	550.00'	457.12'	47°37'14"	242.70'	S80°44'15"E	444.08'

CENTER CONTROL DATA			
	STATION	NORTHING	EASTING
RESORT ROAD	26+82.88	594073.98	1349323.64
	29+55.51	593987.60	1349569.03
	31+50.00	594002.50	1349761.93
	34+50.00	594071.85	1350052.31



*STREET TREES TO BE PLANTED 1' OUTSIDE RIGHT-OF-WAY

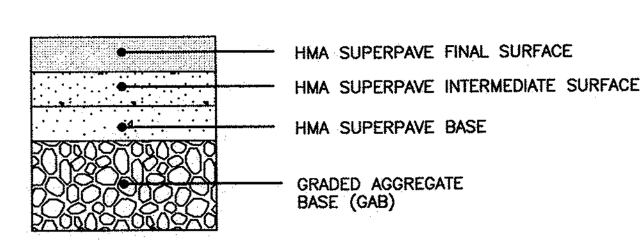
RESORT ROAD
STA. 29+10.79 TO 34+13.00
TYPICAL ROADWAY SECTION
PUBLIC LOCAL ROAD
DESIGNED AS MINOR COLLECTOR
DESIGN SPEED: 35 MPH
SCALE: 1" = 10'



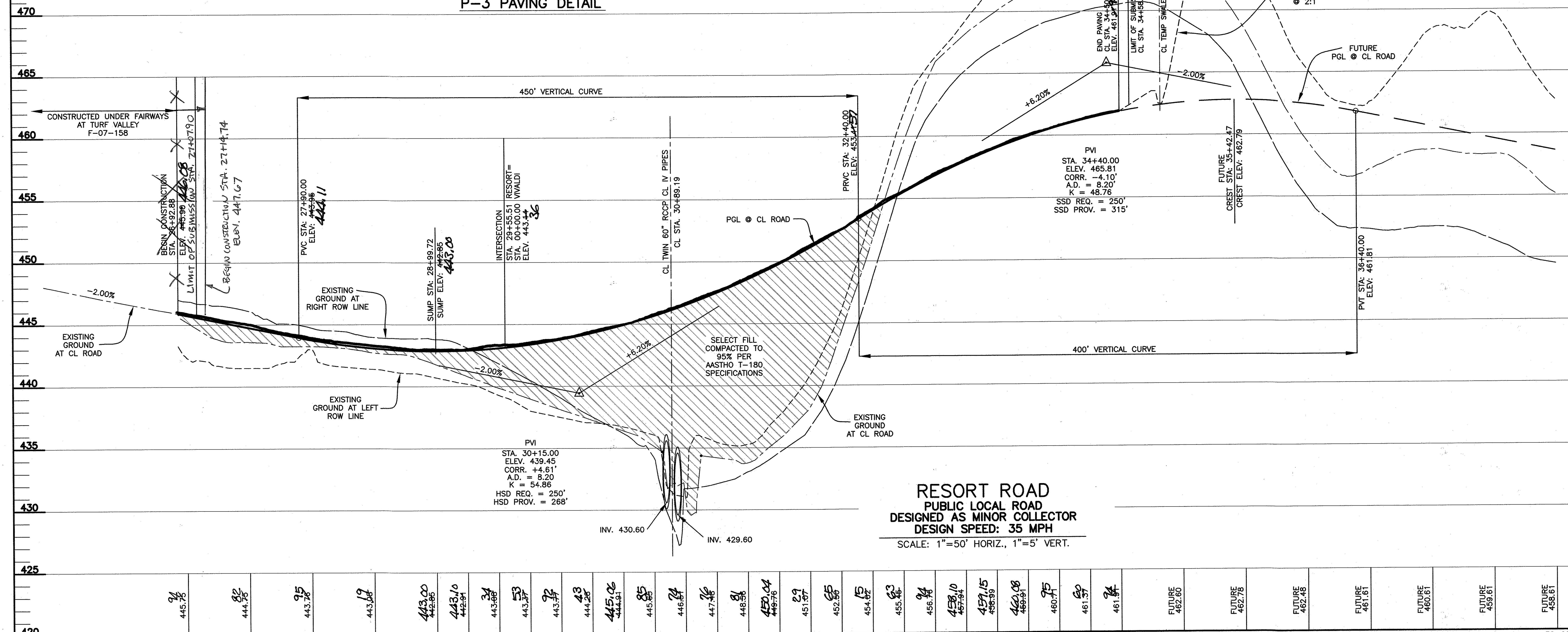
*STREET TREES TO BE PLANTED 1' OUTSIDE RIGHT-OF-WAY

27+14.74
RESORT ROAD
STA. ~~26+63.12~~ TO 29+10.79
TYPICAL ROADWAY SECTION
PUBLIC LOCAL ROAD
DESIGNED AS MINOR COLLECTOR
DESIGN SPEED: 35 MPH
SCALE: 1" = 10'

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 TO <5	5 TO <7	≥7	3 TO <5	5 TO <7	≥7
		PAVEMENT MATERIAL (INCHES)	MIN HMA WITH GAB			HMA WITH CONSTANT GAB		
P-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	HMA SUPERPAVE FINAL SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		HMA SUPERPAVE BASE 19.0 MM PG 64-22, LEVEL 1 (LOW ESAL)	3.0	3.0	3.0	4.5	3.0	2.0
		GRADED AGGREGATE BASE (GAB)	10.0	8.0	3.0	6.0	6.0	6.0



P-3 PAVING DETAIL



RESORT ROAD
PUBLIC LOCAL ROAD
DESIGNED AS MINOR COLLECTOR
DESIGN SPEED: 35 MPH
SCALE: 1"=50' HORIZ., 1"=5' VERT.

APPROVED: DEPARTMENT OF PUBLIC WORKS	
CHIEF, BUREAU OF HIGHWAYS	DATE 10/19/2015
APPROVED: DEPARTMENT OF PLANNING AND ZONING	
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 10.27.15
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 10.19.15

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

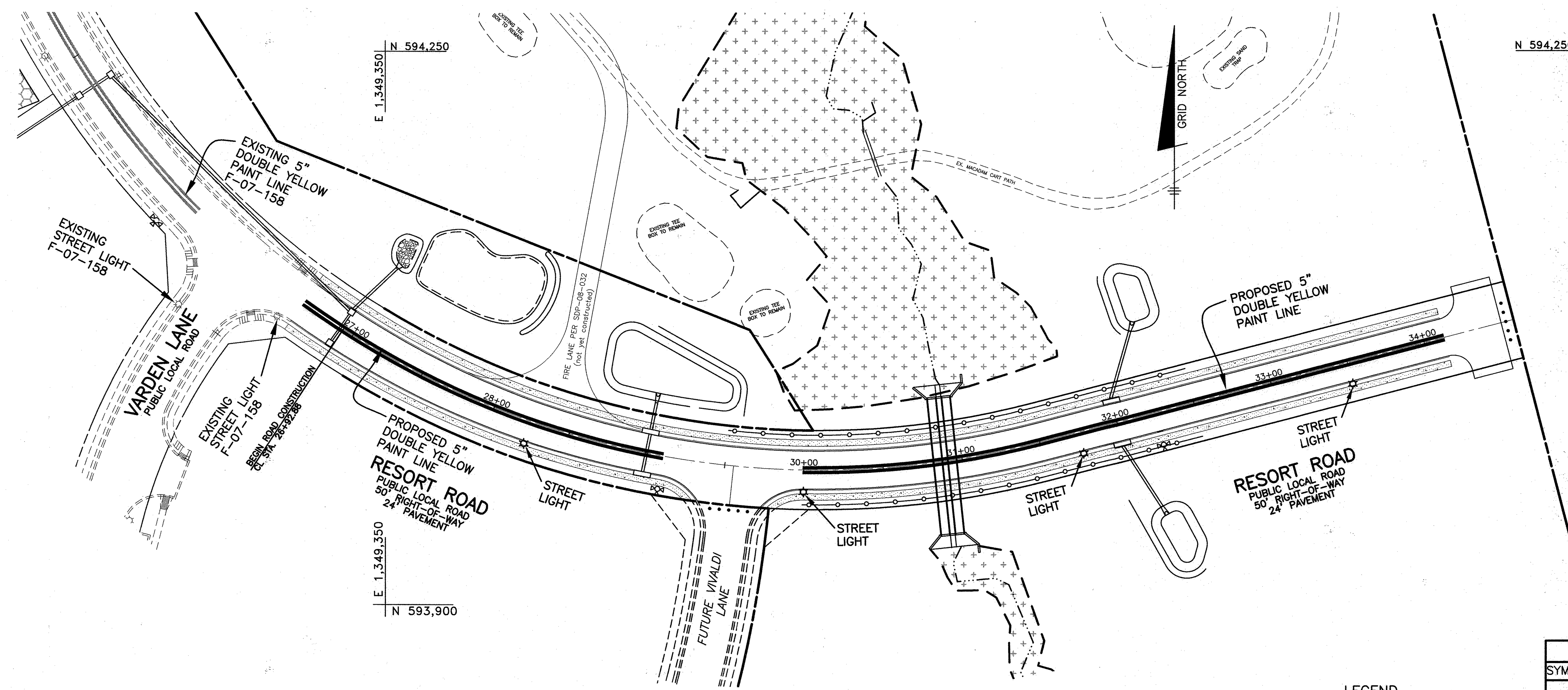
ROAD PLAN, PROFILE AND DETAILS

DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
DESIGN: DBT / DRAFT: DBT / SCALE: AS SHOWN	SHEET 2 OF 15

AS-BUILT

F-16-004

J:\2697 The Bluffs at Turf Valley\dwg\7000.dwg, 9/29/2015 9:35:33 AM



STRIPING, SIGNAGE, & STREET LIGHT PLAN

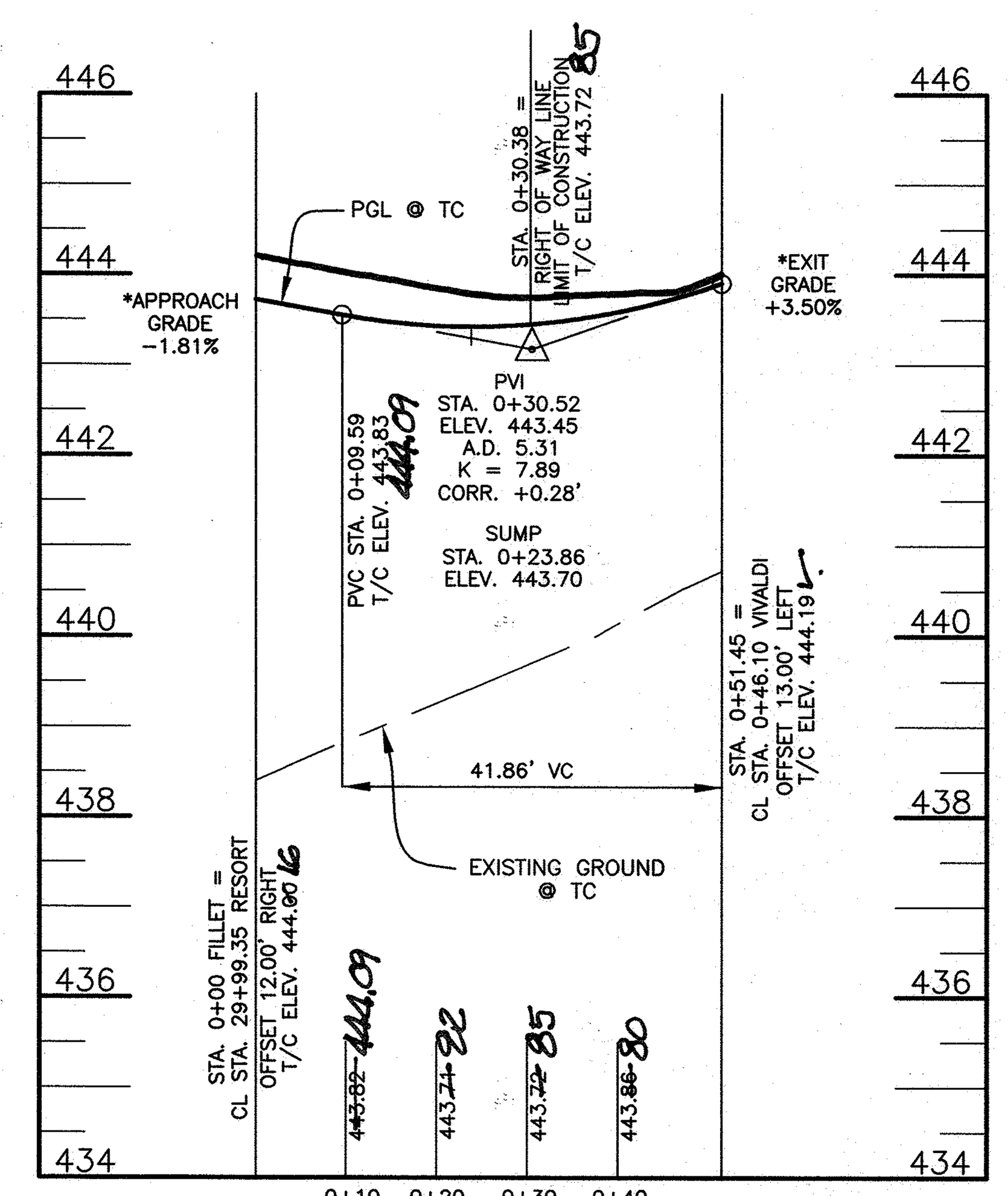
50 0 25 50 100 200

1 inch = 50 ft.

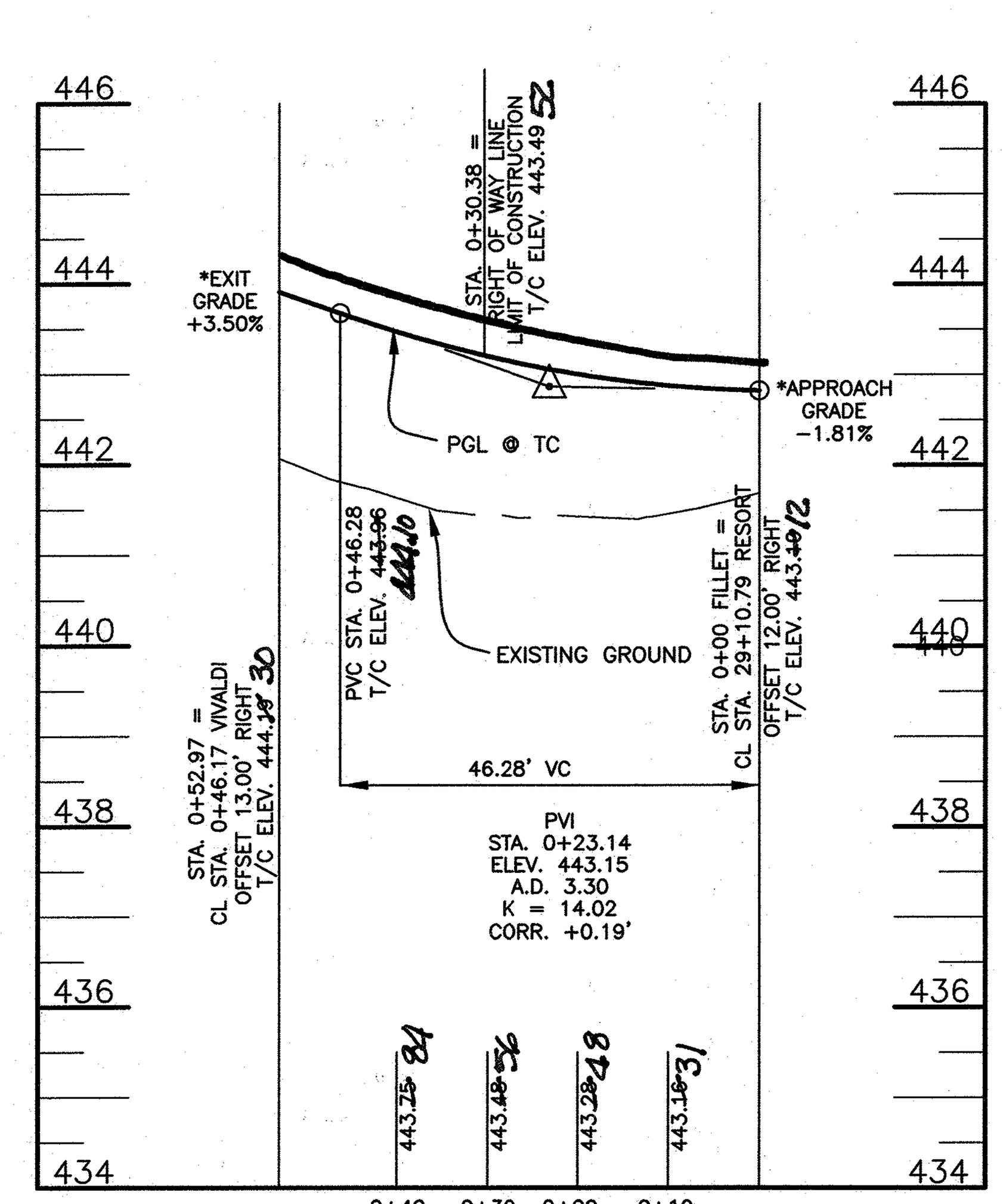
LEGEND

- SITE BOUNDARY
- 100YR FLOODPLAIN
- 4' CONC. SIDEWALK
- GUARDRAIL
- FIRE HYDRANT LOCATION

PUBLIC STREET LIGHT SCHEDULE			
SYMBOL	LOCATION		DESCRIPTION
☼	RESORT ROAD	STA. 28+25 RIGHT	LED-150 COLONIAL POST-TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE
	RESORT ROAD	STA. 30+00 RIGHT	
	RESORT ROAD	STA. 31+75 RIGHT	
	RESORT ROAD	STA. 33+50 RIGHT	



FILLET PROFILE
EAST CORNER
RESORT RD./VIVALDI LA.
SCALE: 1"=20' HORIZ., 1"=2' VERT.



FILLET PROFILE
WEST CORNER
RESORT RD./VIVALDI LA.
SCALE: 1"=20' HORIZ., 1"=2' VERT.

APPROVED: DEPARTMENT OF PUBLIC WORKS

[illegible] 10/19/2015
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[illegible] 10-23-15
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[illegible] 10-19-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

J:\2697 The Bluffs at Turf Valley\dwg\7017.dwg, 9/29/2015 9:37:30 AM

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

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

License No. 21443, Expiration Date: 12-21-22

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. **Date:** 9/20/21

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND
CHRISTOPHER ALAN MALAGARI
No. 22390
REGISTERED
PROFESSIONAL ENGINEER
[illegible] 9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 - GRID: 13 - PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 - HOWARD COUNTY, MARYLAND

STRIPING, SIGNAGE, & STREET LIGHT PLAN AND CURB FILLET PROFILES

DESIGN: DBT	DRAFT: DBT	SCALE: AS SHOWN	SHEET 3 OF 15
		DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697

AS-BUILT F-16-004

NRCS SOILS CHART - HoCo Soils Map No. 12				
SYMBOL	HYDRIC	GROUP	Kw	MAP UNIT NAME
GbA		B	0.28	GLADSTONE LOAM, 0 TO 3 PERCENT SLOPES
GbB		B	0.28	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES
GbC		B	0.28	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES
GnB*	YES	C	0.43	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES
BaA*	YES	D	0.43	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES
GfB		B	0.28	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES
GfC		B	0.28	GLADSTONE-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES
UaF		-	-	UDORTHENTS, HIGHWAY, 0 TO 65 PERCENT

LEGEND

- DRAINAGE AREA
- ZONING LINE
- Tc TRAVEL PATH
- EXISTING TOPOGRAPHY ON-SITE (AERIAL) OFF-SITE (HO.CO. GIS)
- EXISTING TREELINE
- NRCS SOILS LINE
- GbB — NRCS SOILS TYPE
- 100YR FLOODPLAIN
- I-3 — DRAINAGE AREA DESIGNATION

PHASE	INLET #	ZONING (Z)	SUBAREA (B)	AREA (Ac) (A)	"C" FACTOR (C)<25		% IMPERVIOUS (P)<25
NA	I-1	PGCC	NA	0.29	0.86		100.0
NA	I-2	PGCC	NA	0.30	0.86		100.0
NA	I-3	PGCC	NA	0.16	0.86		100.0
NA	I-4	PGCC	NA	0.16	0.86		100.0

* NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET

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

AS-BUILT 9/20/21

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-22

NOTE:

SEE SHEET 5 FOR 100-YEAR FLOODPLAIN CROSS-SECTION AND ELEVATION INFORMATION

1 inch = 100 ft.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10/19/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-23-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10-19-15

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
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STATE OF MARYLAND — CHRISTOPHER ALAN MACE — No. 22390 — REGISTERED PROFESSIONAL ENGINEER — 9-30-15

OWNER:
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410-825-8400

DEVELOPER:
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THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 - GRID: 13 - PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 - HOWARD COUNTY, MARYLAND

STORM DRAIN DRAINAGE AREA MAP

DESIGN: DBT	DRAFT: DBT	DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
		SCALE: AS SHOWN	SHEET 4 OF 15

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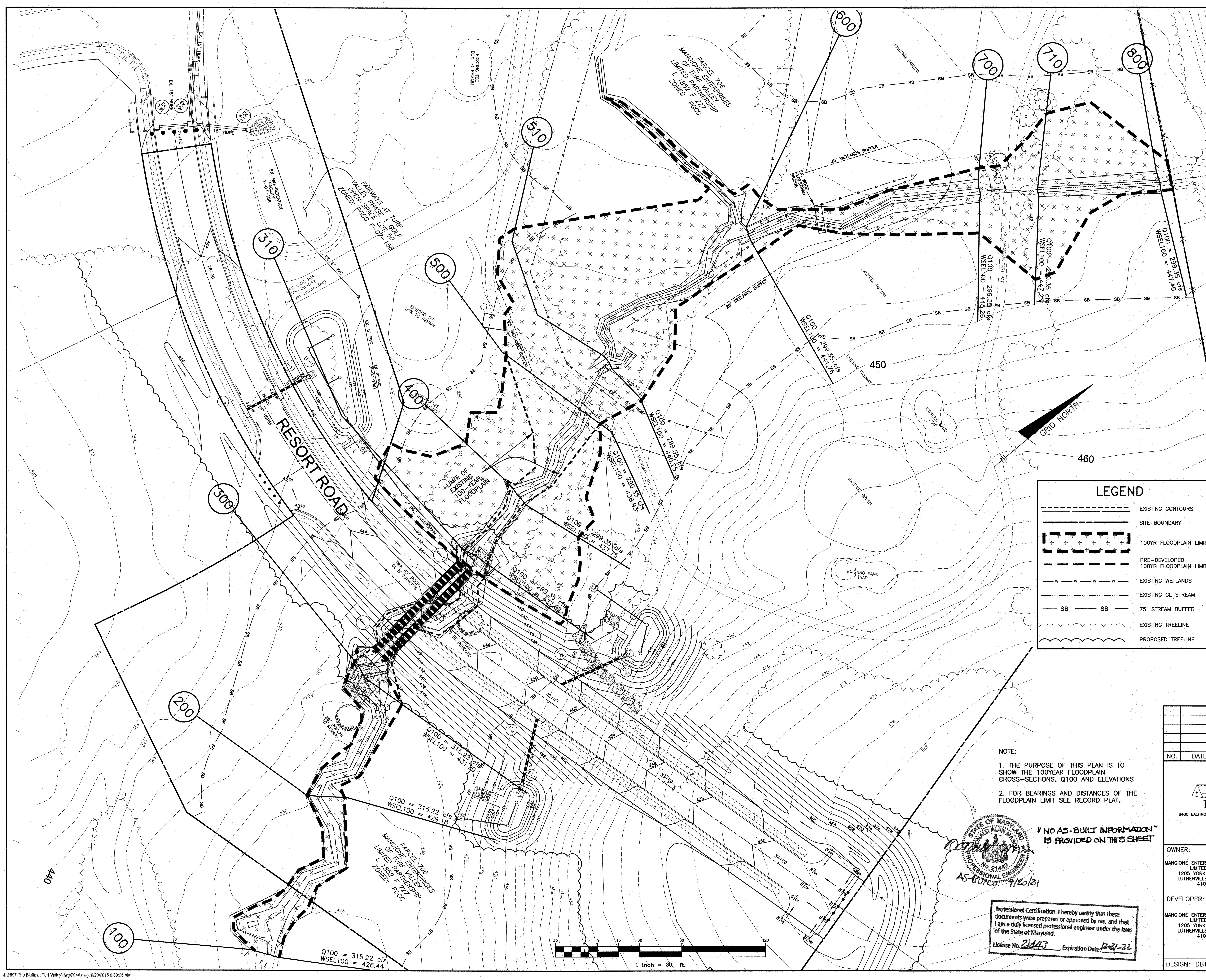
AS-BUILT

F-16-004



100-yr WSEL Comparison Table				
Cross Section	Existing Q (cfs)	Proposed Q (cfs)	Existing WSEL	Proposed WSEL
800	296.29	299.35	447.42	447.46
710	296.29	299.35	447.21	447.23
700	296.29	299.35	445.24	445.26
600	296.29	299.35	441.75	441.76
510	296.29	299.35	440.24	440.25
500	296.29	299.35	438.91	438.93
400	296.29	299.35	435.75	437.75
310	296.29	299.35	433.95	437.82
300	311.35	315.22	431.27	431.29
200	311.35	315.22	429.16	429.18
100	311.35	315.22	426.42	426.44

The drainage area and Tc from cross section 500 and higher is the same under existing and proposed conditions. Thus, the minute increase in WSEL at cross-section 500-800 is a result of the location of study point B located downstream of cross-section 500.

LEGEND

- EXISTING CONTOURS
- SITE BOUNDARY
- 100YR FLOODPLAIN LIMIT
- PRE-DEVELOPED 100YR FLOODPLAIN LIMIT
- EXISTING WETLANDS
- EXISTING CL STREAM
- 75' STREAM BUFFER
- EXISTING TREELINE
- PROPOSED TREELINE

NOTE:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE 100YEAR FLOODPLAIN CROSS-SECTIONS, Q100 AND ELEVATIONS
2. FOR BEARINGS AND DISTANCES OF THE FLOODPLAIN LIMIT SEE RECORD PLAT.

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

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

AS-BUILT 9/20/21

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

License No. 21443 Expiration Date: 12-21-22

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10/19/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10.22.15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.19.15

NO.	DATE	REVISION

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9-30-15

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TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

100yr FLOODPLAIN CROSS-SECTION AND ELEVATION PLAN

DATE: SEPTEMBER, 2015 | BEI PROJECT NO. 2697
DESIGN: DBT | DRAFT: DBT | SCALE: AS SHOWN | SHEET 5 OF 15

AS-BUILT F-16-004

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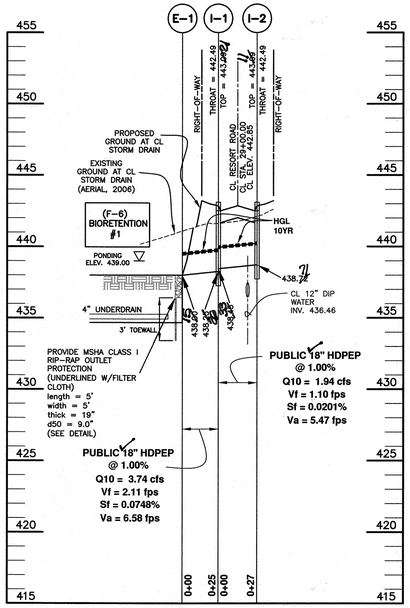
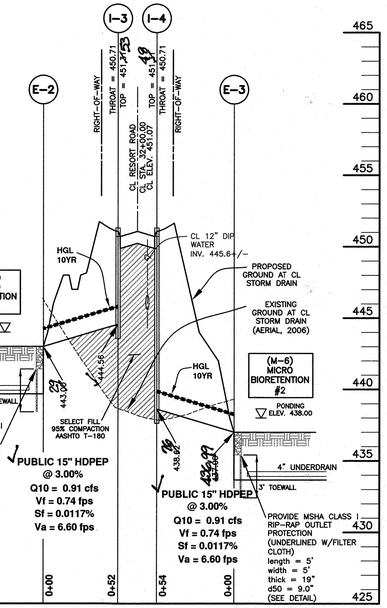


STORM DRAIN PROFILE

SCALE: 1" = 50' HORZ., 1" = 5' VERT.



STORM DRAIN PROFILE

SCALE: 1" = 50' HORZ., 1" = 5' VERT.

CONSTRUCTION SPECIFICATIONS

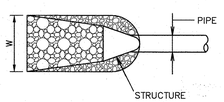
1. THE SUBGRADE FOR THE FILTER, RIP–RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.

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

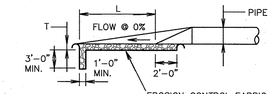
3. GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS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

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

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



PLAN



SECTION

STRUCTURE	V10 fps	d10 (ft)	d50	LENGTH(L)	WIDTH(W)	THICK.(T)	SHA CLASS
E–1	NA	NA	9.0"	6.8	4.5	19"	I
E–2	NA	NA	9.0"	5'	5'	19"	I
E–3	NA	NA	9.0"	5'	5'	19"	I
HW–1	16.0	2.26'	16"	26'	CHANNEL	32"	II
HW–2	NA	NA	16"	10'	CHANNEL	32"	II

OUTLET PROTECTION DETAIL

NOT TO SCALE

PIPE SCHEDULE

SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
15"	HDPEP	106	PUBLIC
18"	HDPEP	52	PUBLIC
60"	RCCP CL IV	176	PUBLIC

All HDPEP pipes shall have smooth interior. No interior corrugations.

STRUCTURE TABLE

STRUCTURE	TYPE	LOCATION	INVERT (IN)		INVERT (OUT)		TOP ELEV.	THROAT ELEV.	STD. DETAIL	INLET NOTES	MAINTENANCE
INLETS											
I-1	A-10	CL STA. 29+00 RESORT ROAD, OFFSET 12.09' LEFT	- 438.33 ~~438.45~~ (18")		438.26 ~~438.25~~ (18")		443.09	442.49	HO.CO.STD. D-4.03	3.0' WIDTH	PUBLIC
I-2	A-10	CL STA. 29+00 RESORT ROAD, OFFSET 12.09' RIGHT	-	-	438.71 ~~438.72~~ (18")		443.09	442.49	HO.CO.STD. D-4.03	3.0' WIDTH	PUBLIC
I-3	A-10	CL STA. 32+00 RESORT ROAD, OFFSET 12.00' LEFT	-	-	444.56 (15")		451.19	450.71	HO.CO.STD. D-4.03	3.0' WIDTH	PUBLIC
I-4	A-10	CL STA. 32+00 RESORT ROAD, OFFSET 12.00' RIGHT	-	-	438.62 (15")		451.19	450.71	HO.CO.STD. D-4.03	3.0' WIDTH	PUBLIC
END SECTIONS & HEADWALLS											
E-1	18" HDPE	N 594033.58 E 1349521.83	-	-	438.00				NA		PUBLIC
E-2	15" HDPE	N 594078.56 E 1349820.04	-	-	443.06				NA		PUBLIC
E-3	15" HDPE	N 593958.65 E 1349845.70	-	-	~~437.00~~ 436.99				NA		PUBLIC
HW-1	CONCRETE	CL STA. 30+87.17 RESORT ROAD, OFFSET 54.60' RIGHT	-	-	-				NA		PUBLIC
HW-2	CONCRETE	CL STA. 30+91.34 RESORT ROAD, OFFSET 48.32' LEFT	432.00 (pipe 1)	431.00 (pipe 2)	429.00 (pipe 1)	428.00 (pipe 2)			NA		PUBLIC

STRUCTURE LOCATION FOR INLETS IS AT THE CENTER OF THE INLET FACE.
STRUCTURE LOCATION FOR THE END-SECTIONS/HEADWALLS IS AT THE MIDPOINT OF THE END OF THE STRUCTURE.
PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-22

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

AS-BUILT

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 9/20/21

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10/19/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-22-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.19.15

NO.	DATE	REVISION

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STATE OF MARYLAND · CHRISTOPHER ALAN WALSH · 22390 · REGISTERED PROFESSIONAL ENGINEER

7-3-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410–825–8400

DEVELOPER:
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THE BLUFFS AT TURF VALLEY
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NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

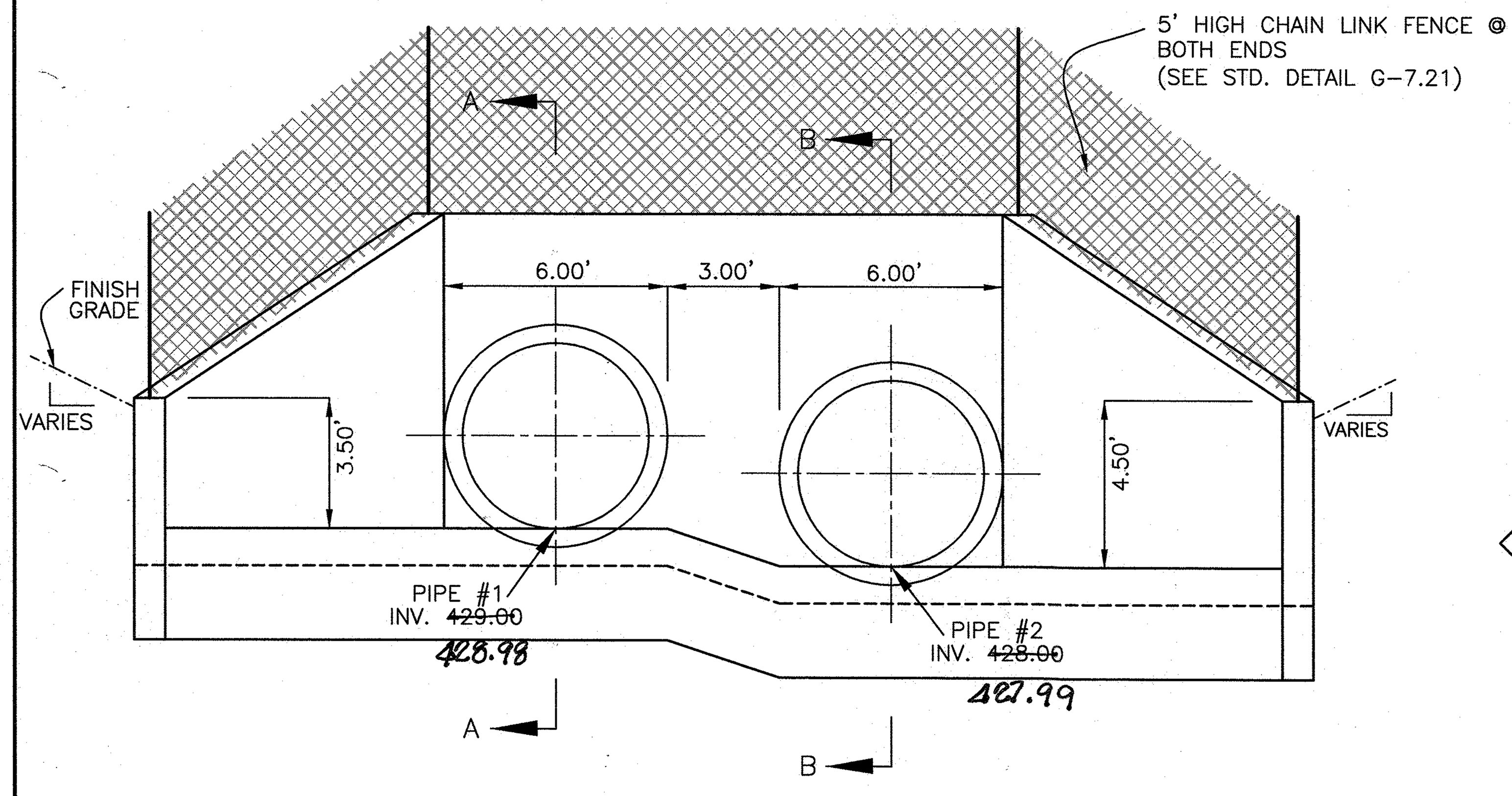
TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: POSC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

STORM DRAIN PROFILES AND DETAILS

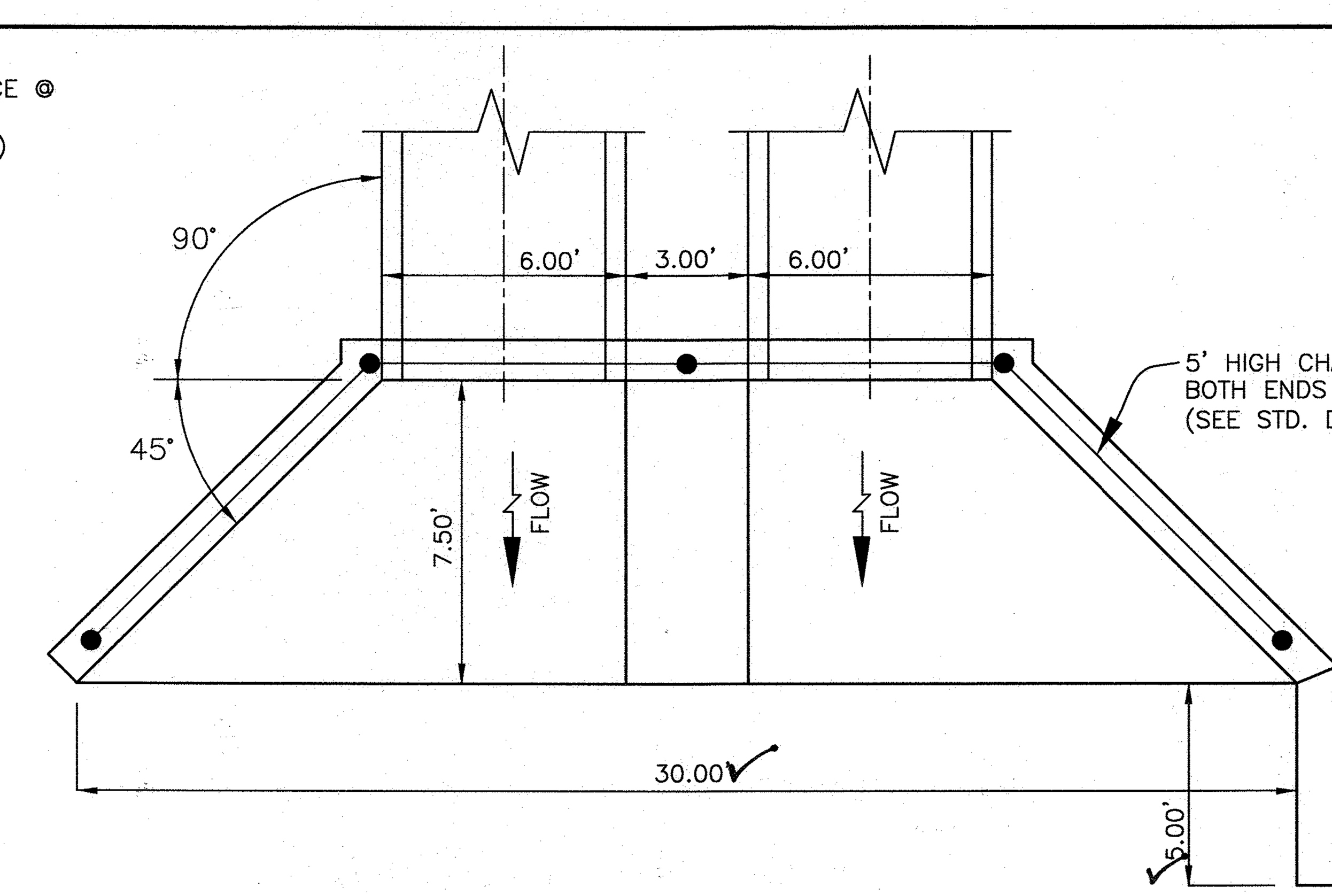
DATE: SEPTEMBER, 2015 | BEI PROJECT NO. 2697
DESIGN: DBT | DRAFT: DBT | SCALE: AS SHOWN | SHEET 6 OF 15

AS-BUILT F-16-004

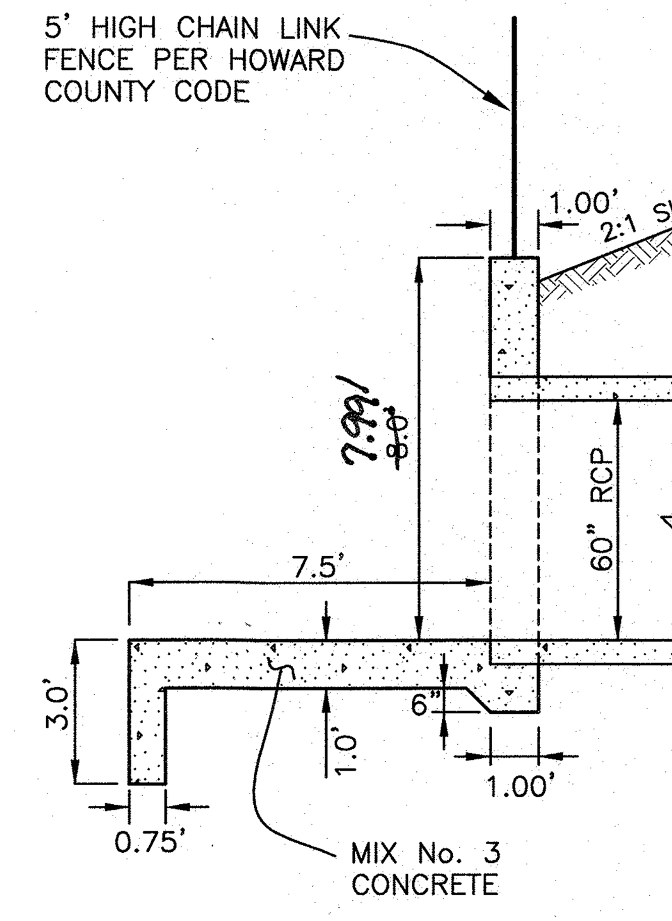
J:\2697 The Bluffs at Turf Valley\dwg\7044.dwg, 9/29/2015 9:41:43 AM



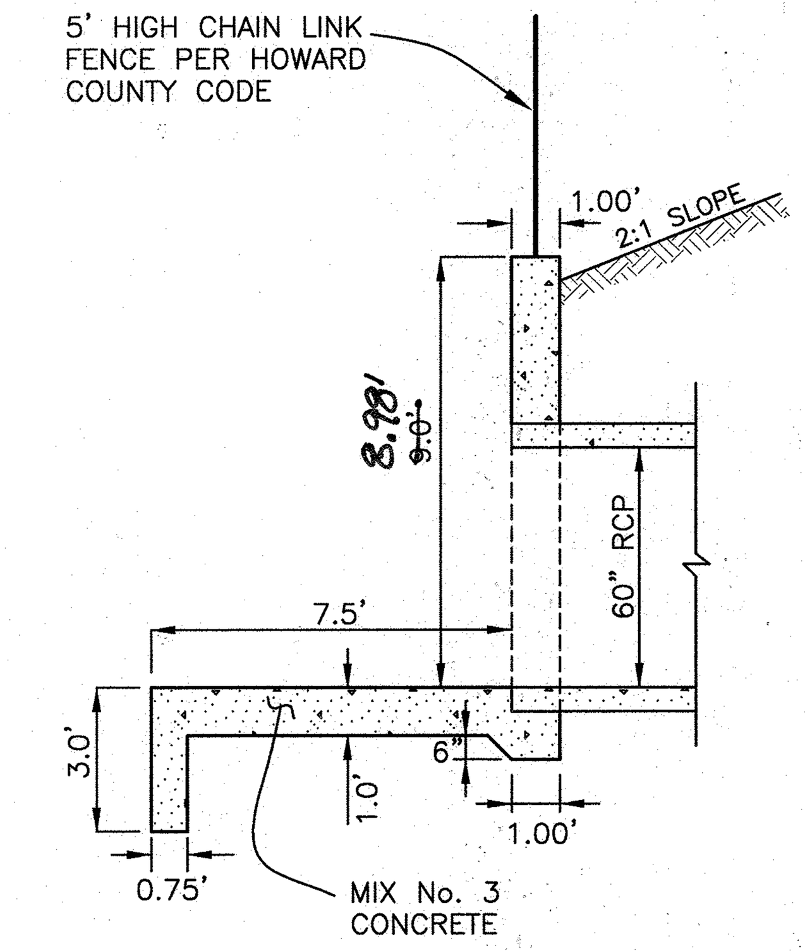
HW-1: LOOKING UPSTREAM



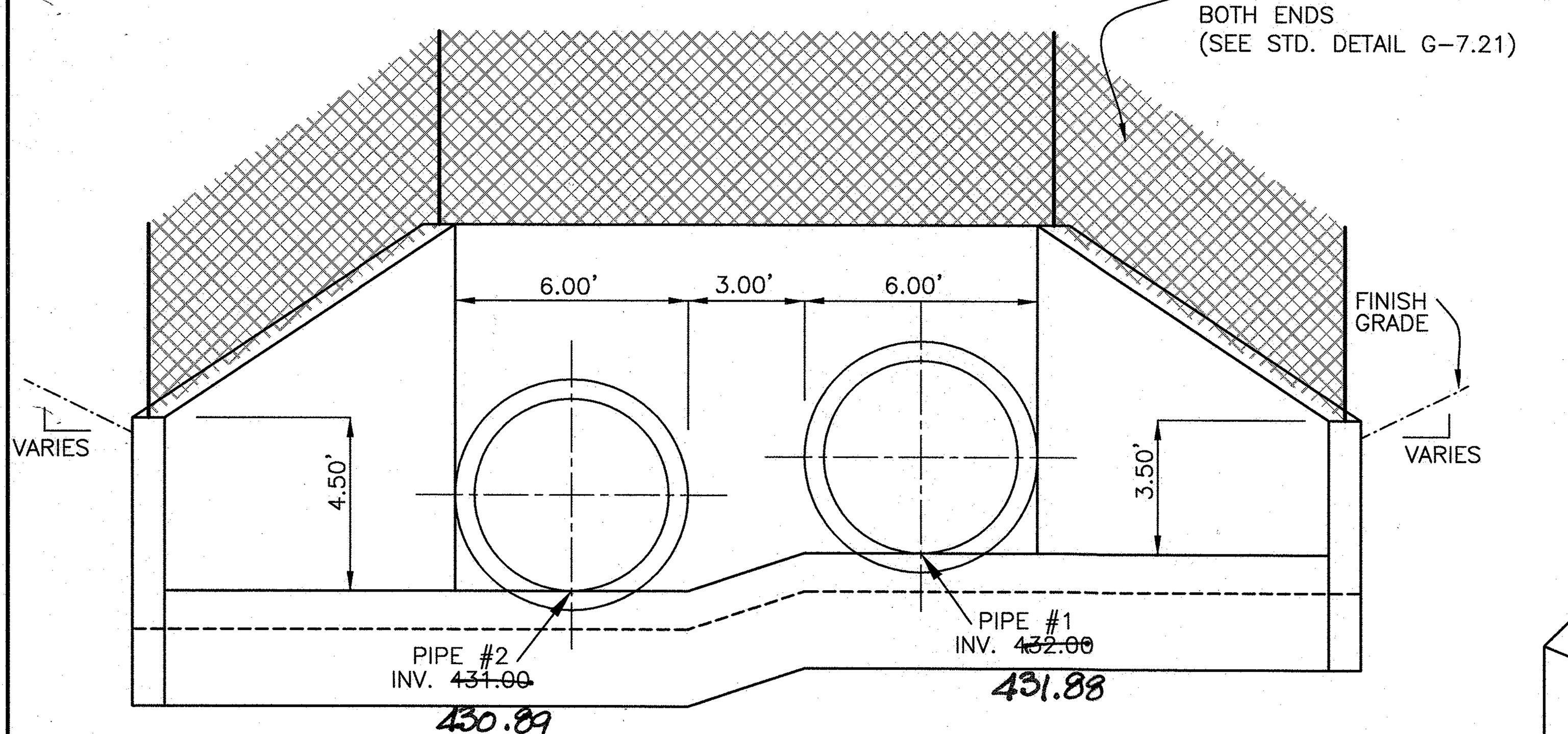
HW-1: PLAN VIEW



SECTION A-A

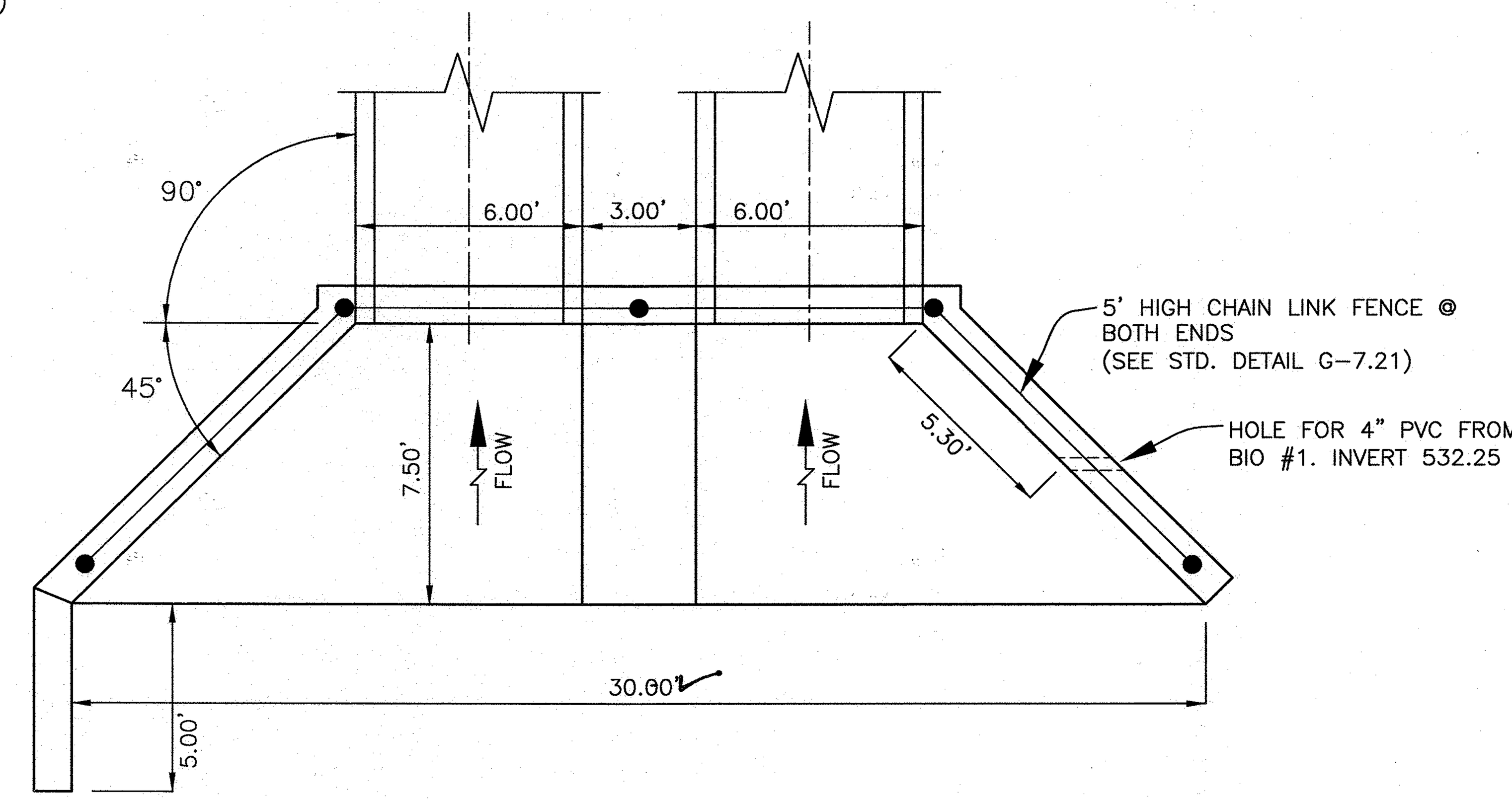


SECTION B-B



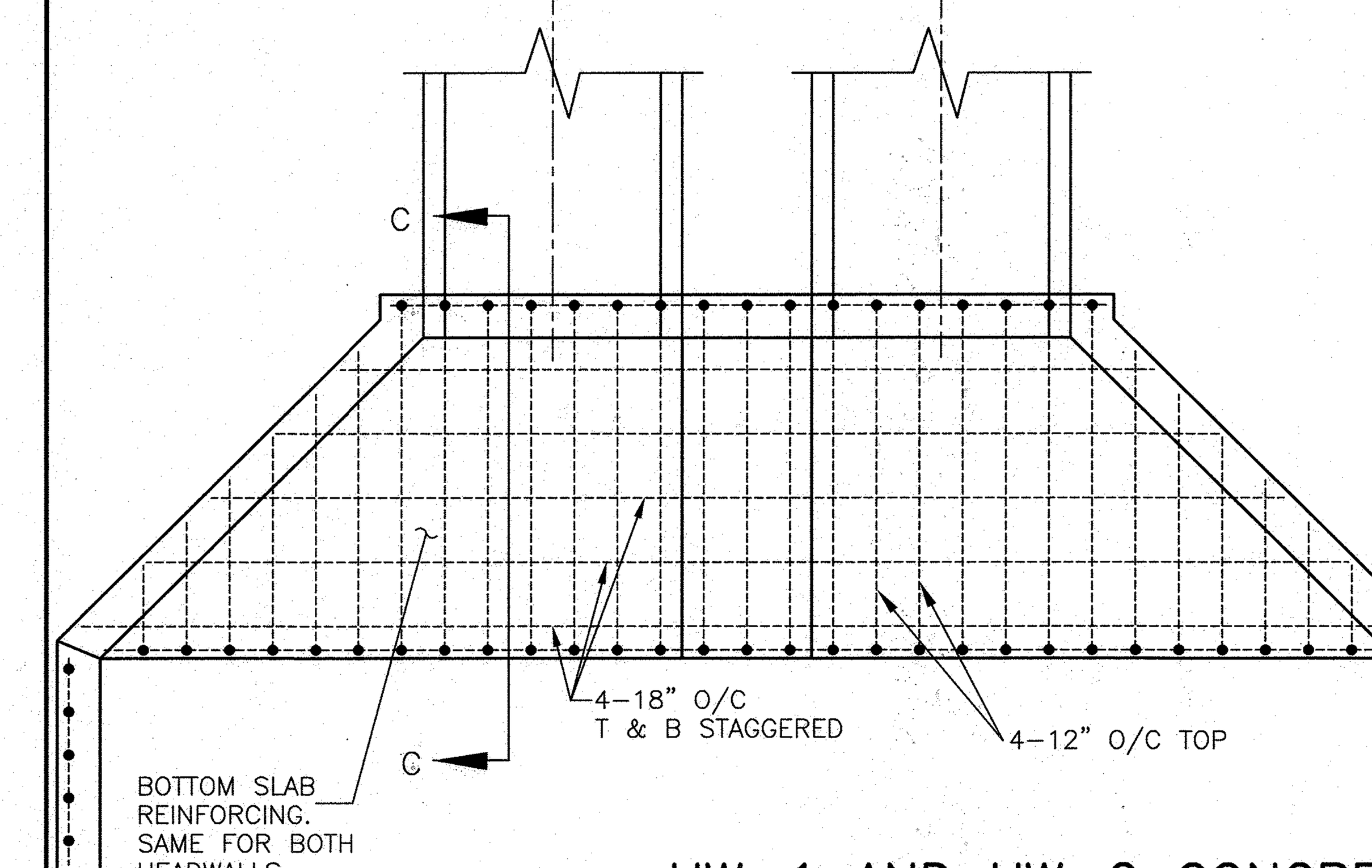
HW-2: LOOKING DOWNSTREAM

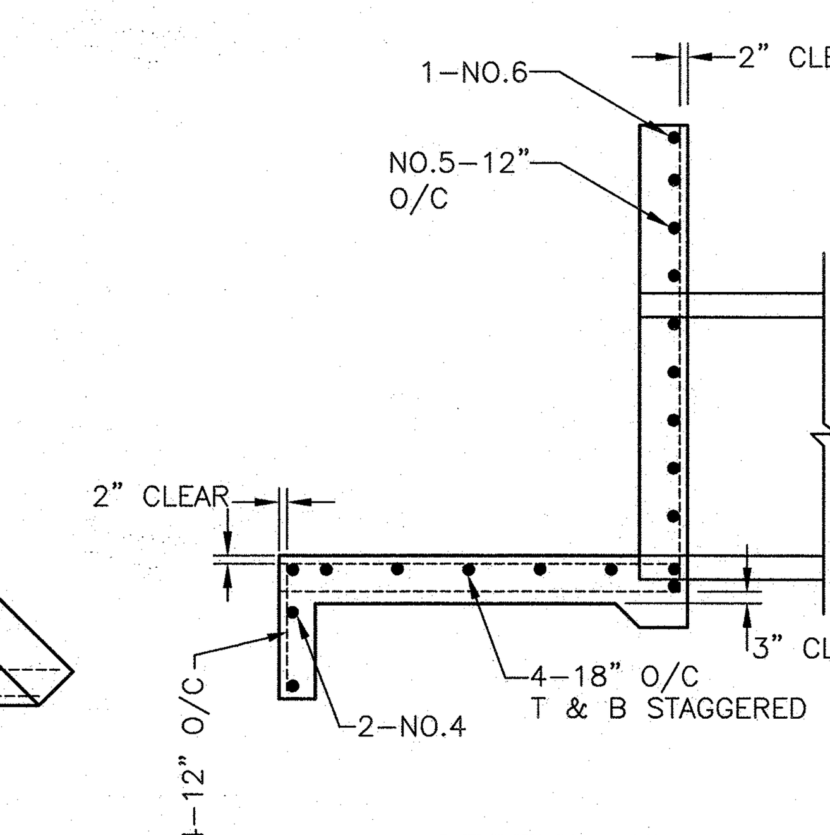
NOTE:
CONTRACTOR SHALL PROVIDE 3"-45° BEVEL AROUND PIPE OPENINGS ON UP-STREAM HEADWALL.



HW-2: PLAN VIEW

HW-1 AND HW-2 CONCRETE HEADWALL DETAIL
MODIFIED HO.CO.STD. D-5.11
SCALE: 1" = 4'

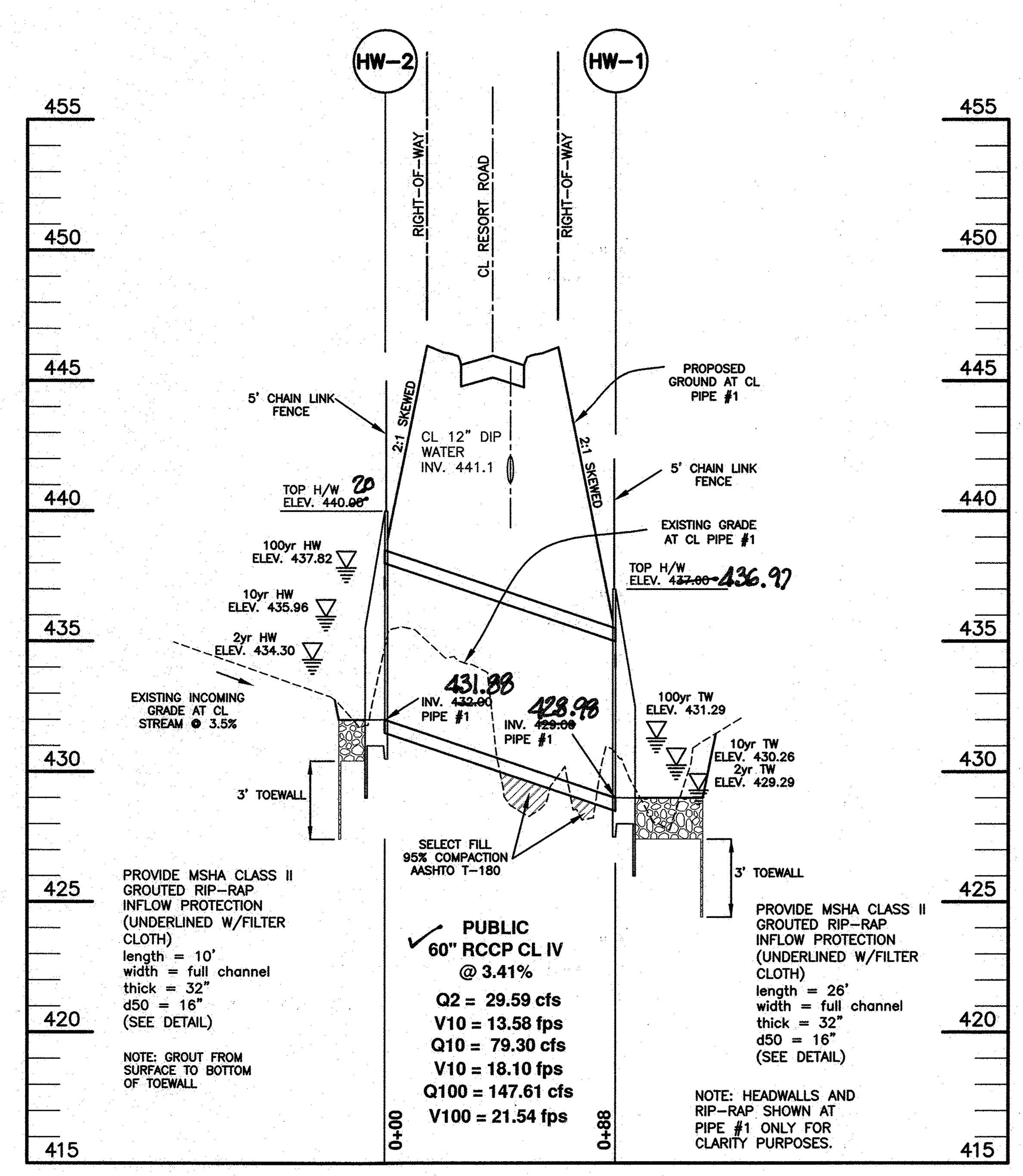




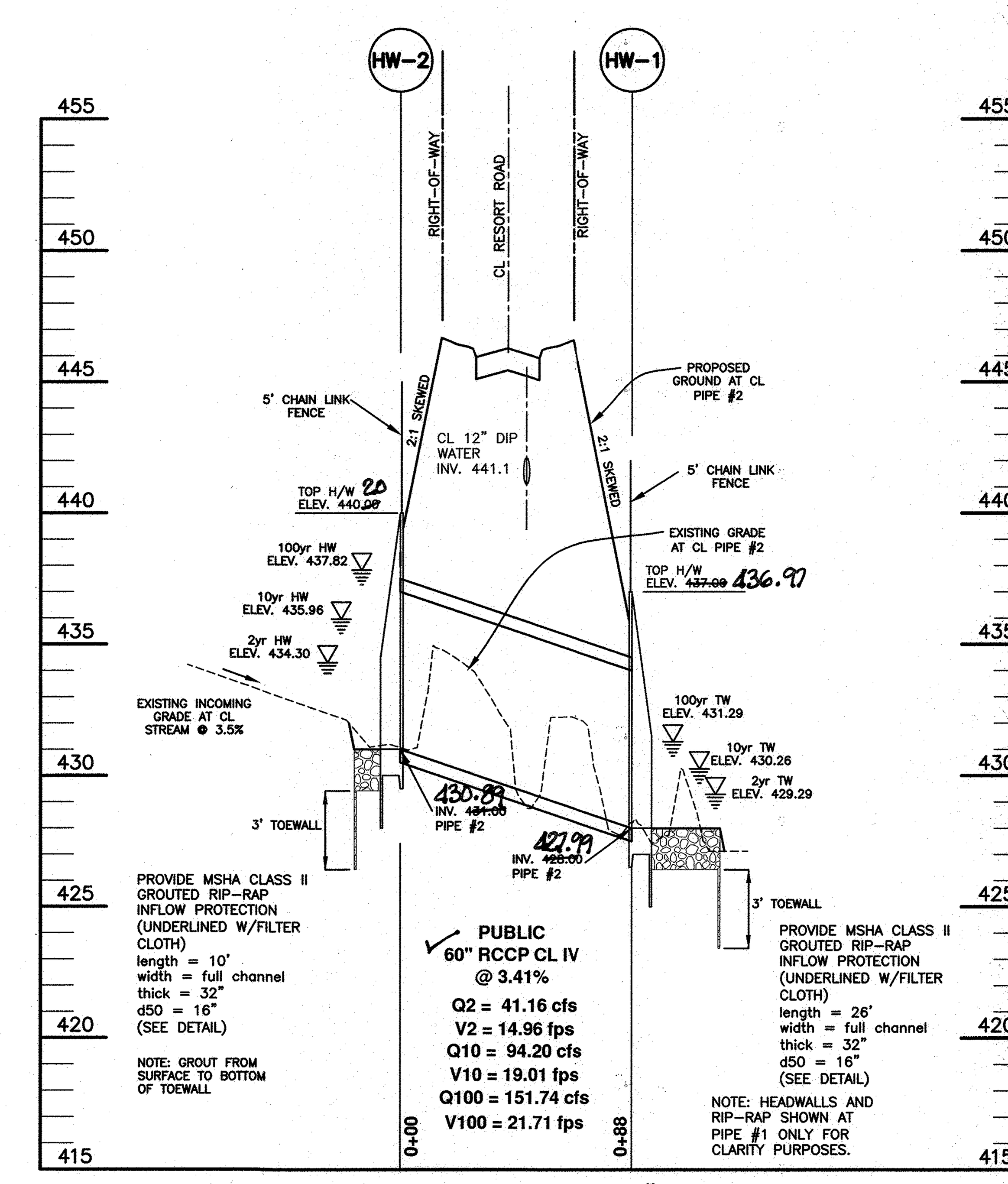
SECTION C-C

HW-1 AND HW-2 CONCRETE HEADWALL
STEEL REINFORCING DETAIL
SCALE: 1" = 4'

NOTE:
CONTRACTOR SHALL VERY REBAR SIZE AND SPACING ON THE SHOP DRAWINGS.



STORM DRAIN PROFILE - TWIN 60" CULVERT #1
SCALE: 1" = 50' HORZ., 1" = 5' VERT.



STORM DRAIN PROFILE TWIN 60" CULVERT #2
SCALE: 1" = 50' HORZ., 1" = 5' VERT.

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

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 9/20/21

APPROVED: DEPARTMENT OF PUBLIC WORKS

[illegible]	10/19/2015
CHIEF, BUREAU OF HIGHWAYS	DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[illegible]	10-22-15
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
[illegible]	10-19-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND CHRISTOPHER ALAN MALAGARI No. 22390 REGISTERED PROFESSIONAL ENGINEER
9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 - GRID: 13 - PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 - HOWARD COUNTY, MARYLAND

TWIN 60" CULVERT
PROFILE AND DETAILS

DESIGN: DBT	DRAFT: DBT	DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
		SCALE: AS SHOWN	SHEET 7 OF 15

AS-BUILT
F-16-004

J:\2697 The Bluffs at Turf Valley\dwg\7044.dwg, 9/29/2015 9:42:14 AM

CONSTRUCTION SPECIFICATIONS

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

1. Material Specifications:

The allowable materials to be used in these practices are detailed in Table B.4.1.

2. Filtering Media or Planting Soil:

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the micro-bioretention practice that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05. The planting soil shall be tested and shall meet the following criteria:

Soil Component - Loamy Sand or Sandy Loam (USDA Soil Textural Classification)
Organic Content - Minimum 10% by dry weight (ASTM D 2974). In general, this can be met with a mixture of loamy and(60%-65%) and compost (35% to 40%) or sandy loam (30%), coarse sand (30%), and compost (40%).
Clay Content - Media shall have a clay content of less than 5%.
pH Range - Should be between 5.5 - 7.0. Amendments (e.g., lime, iron sulfate plus sulfur) may be mixed into the soil to increase or decrease pH.

There shall be at least one soil test per project. Each test shall consist of both the standard soil test for pH, and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the topsoil was excavated.

3. Compaction:

It is very important to minimize compaction of both the base of bioretention practices and the required backfill. When possible, use excavation hoes to remove original soil. If practices are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base.

When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

4. Plant Material:

Recommended plant material for micro-bioretention practices can be found in Appendix A, Section A.2.3.

5. Plant Installation:

Compost is a better organic material source, is less likely to float, and should be placed in the invert and other low areas. Mulch should be placed in surrounding to a uniform thickness of 2" to 3". Shredded or chipped hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Rootstock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8th of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.

6. Underdrains:

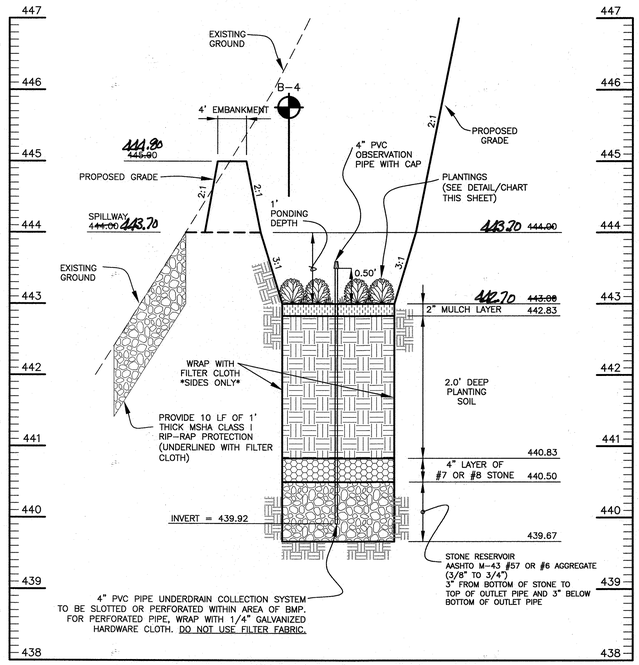
Underdrains should meet the following criteria:

- Pipe- Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTMF 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted. 4" rigid pipe (e.g., PVC or HDPE).
- Perforations - If perforated pipe is used, perforations should be ⅜" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a ¼" (No. 4 or 4x4) galvanized hardware cloth.
- Gravel - The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain
- The main collector pipe shall be at a minimum 0.5% slope.
- A rigid, non-perforated observation well must be provided (one per every 1,0000 square feet) to provide a clean-out port and monitor performance of the filter.
- A 4" layer of pea gravel (⅛" to ⅜" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

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

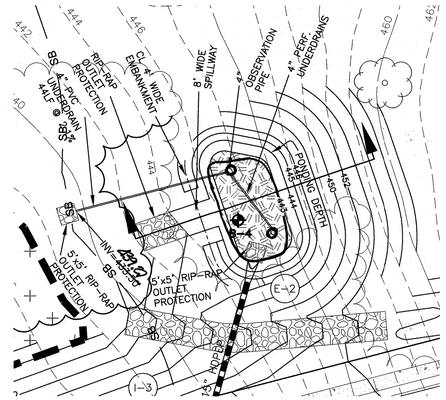
7. Miscellaneous:

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



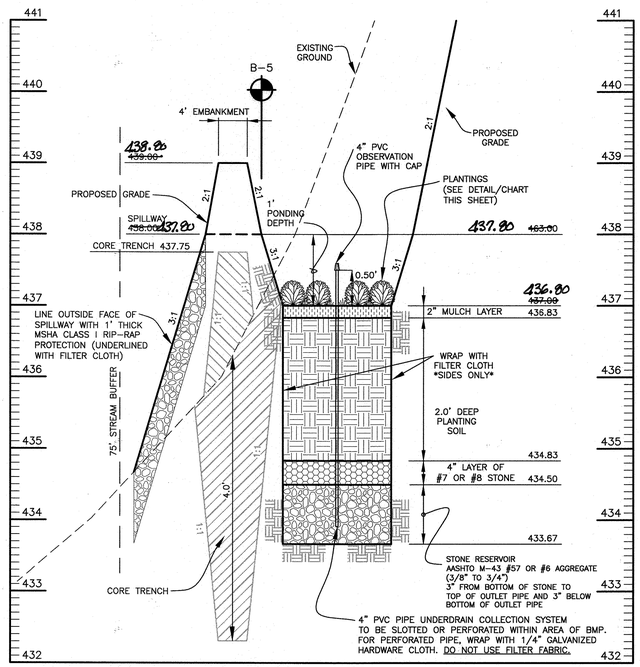
CROSS-SECTION THROUGH (M-6) MICRO-BIORETENTION #1

SCALE: 1"=10' HORZ., 1"=1' VERT.



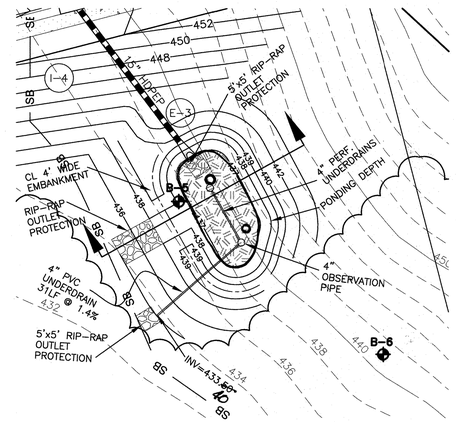
PLAN VIEW (M-6) MICRO-BIORETENTION #1

SCALE: 1"=20'



CROSS-SECTION THROUGH (M-6) MICRO-BIORETENTION #2

SCALE: 1"=10' HORZ., 1"=1' VERT.



PLAN VIEW (M-6) MICRO-BIORETENTION #2

SCALE: 1"=20'

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. **Date: 9/20/21**

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 21443, Expiration Date: 12/21/22

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND JOINTLY MAINTAINED MICRO BIO-RETENTION (M-6) AND BIO-RETENTION (F-6),

Routine - (H.O.A.)

1. Annual maintenance of plant material, mulch layer and soil layer is required. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.
2. Schedule of plant inspection will be twice a year in spring and fall. This inspection will include removal of dead and diseased vegetation considered beyond treatment, treatment of all diseased trees and shrubs and replacement of all deficient stakes and wires.
3. Mulch shall be inspected each spring. Remove previous mulch layer before applying new layer once every 2 to 3 years.
4. Soil erosion to be addressed on an as needed basis, with a minimum of once per month and after heavy storm events.

Non-Routine - (Howard County)

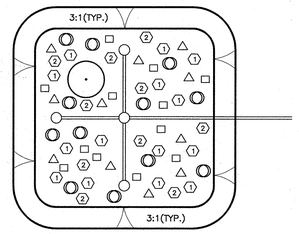
1. Maintenance of public storm drain pipe and end-section from public right-of-way to facility.

ESD PRACTICE INTERNAL LANSCAPING CHART

				BIO #1	MB #1	MB #2	TOTAL
Facility square footage			→	1988	460	448	2896
PLANT NAME	COMMON NAME	TYPE	SIZE	QUANTITY	QUANTITY	QUANTITY	QUANTITY
Ilex verticillata	Common Winterberry	shrub	2.5'-3' ht	20	5	4	29
Lobelia cardinalis	Cardinal flower	perennial herbaceous plant	quart bulb	133	31	30	193
Lobelia siphilitica	Great Blue Lobelia	perennial herbaceous plant	quart bulb	133	31	30	193
Carex stricta	Uptight Sedge	grass	quart bulb	133	31	30	193
Iris versicolor	Blue Water Iris	perennial herbaceous plant	quart bulb	133	31	30	193
Liatris spicata	Prairie Gay Feather	perennial herbaceous plant	quart bulb	133	31	30	193

PLANTING LEGEND

SYMBOL	NAME
①	LOBELIA CARDINALIS
②	LOBELIA SIPHILITICA
□	CAREX STRICTA
△	IRIS VERSICOLOR
◎	LIATRIS SPICATA
·	ILEX VERTICILLATA



SCHEMATIC PLANTING DETAIL FOR (M-6) MICRO-BIORENTION & (F-6) BIORETENTION FACILITIES

NOT TO SCALE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10/19/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-22-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.19.15

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
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WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22308, Expiration Date: 6-30-2017. 9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 - GRID: 13 - PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 - HOWARD COUNTY, MARYLAND

ESD STORMWATER MANAGEMENT NOTES AND DETAILS

DESIGN: DBT	DRAFT: DBT	DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
		SCALE: AS SHOWN	SHEET 8 OF 15

AS-BUILT

F-16-004

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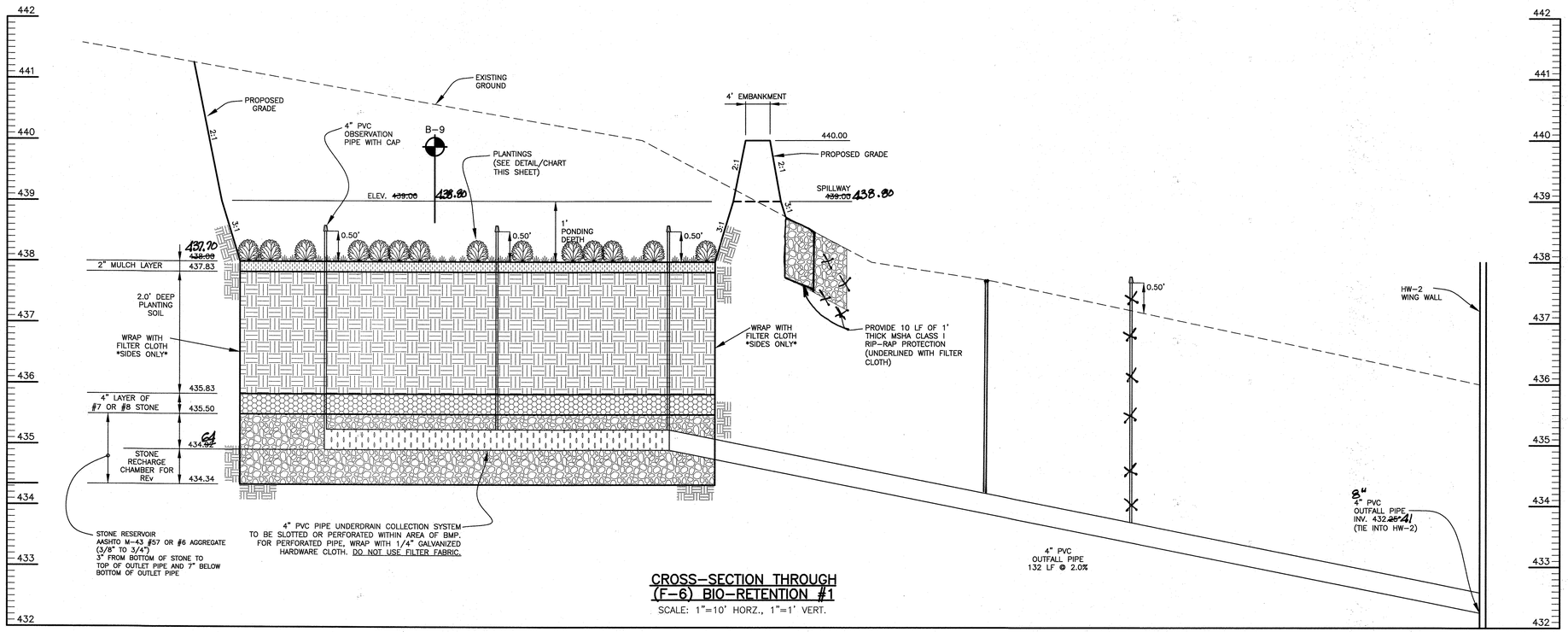
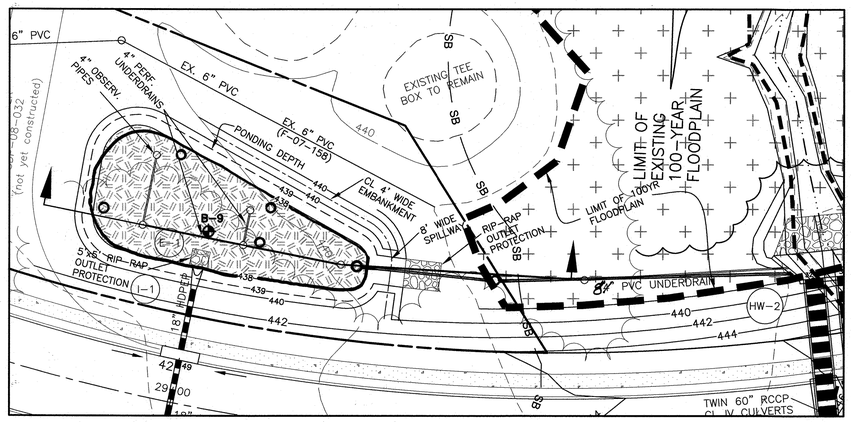


CROSS-SECTION THROUGH (F-6) BIO-RETENTION #1

SCALE: 1"=10' HORZ., 1"=1' VERT.



PLAN VIEW (F-6) BIORETENTION #1

SCALE: 1"=20'

NOTE:
SEE SHEET 8 FOR CONSTRUCTION SPECIFICATIONS, PLANTING SCHEDULE, AND OPERATION & MAINTENANCE SCHEDULE.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10/19/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10.28.15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.19.15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12/21/22

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 9/28/21

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
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THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 - GRID: 13 - PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 - HOWARD COUNTY, MARYLAND

ESD STORMWATER MANAGEMENT NOTES AND DETAILS

DESIGN: DBT	DRAFT: DBT	DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
		SCALE: AS SHOWN	SHEET 9 OF 15

AS-BUILT

F-16-004

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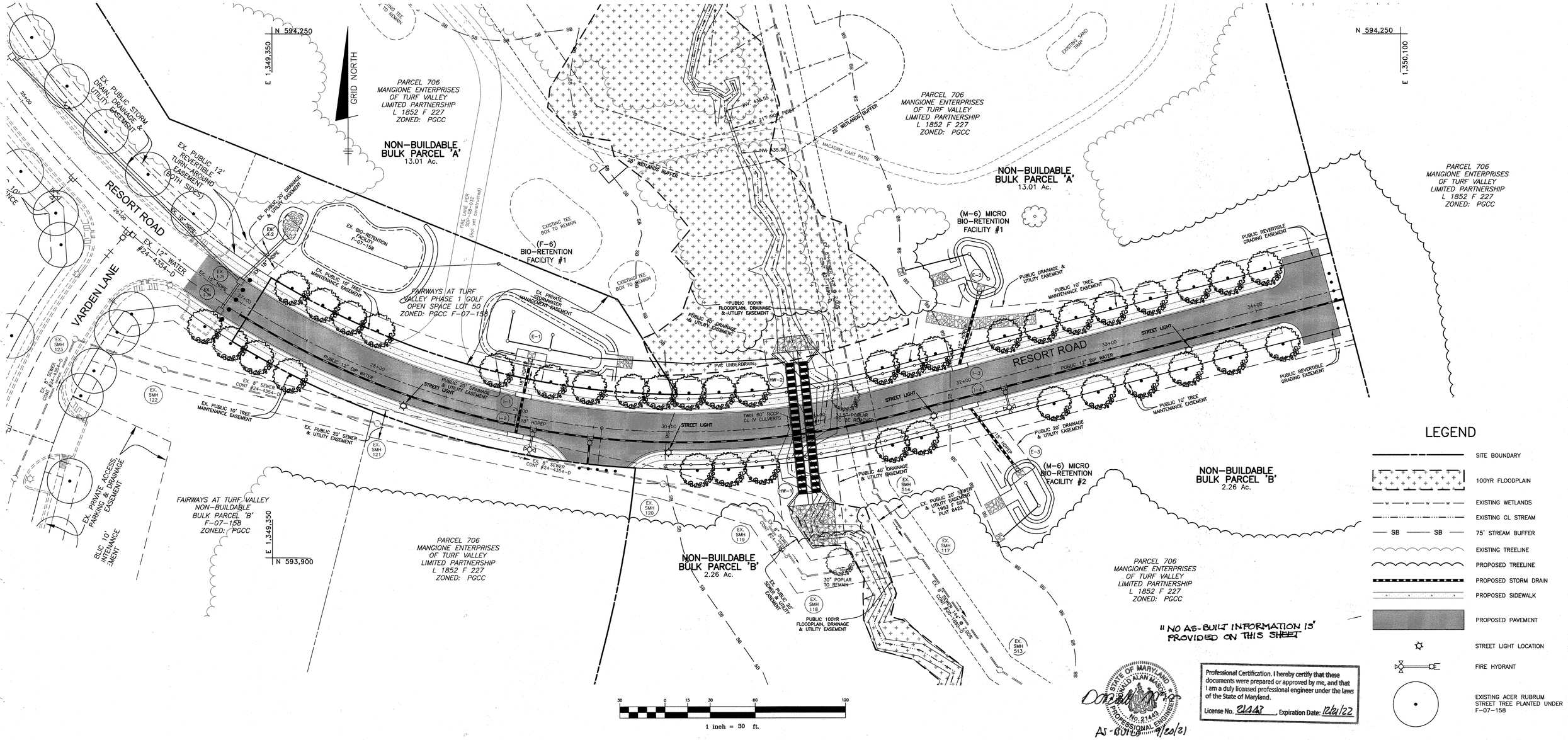


LEGEND

- SITE BOUNDARY
- 100YR FLOODPLAIN
- EXISTING WETLANDS
- EXISTING CL STREAM
- 75' STREAM BUFFER
- EXISTING TREELINE
- PROPOSED TREELINE
- PROPOSED STORM DRAIN
- PROPOSED SIDEWALK
- PROPOSED PAVEMENT
- STREET LIGHT LOCATION
- FIRE HYDRANT
- EXISTING ACER RUBRUM STREET TREE PLANTED UNDER F-07-158

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

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

AS-BUILT 9/20/21

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12/8/22

DEVELOPER'S/BUILDER'S CERTIFICATE

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

LOUIS MANGIONE — DATE 9/30/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10/9/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-22-15

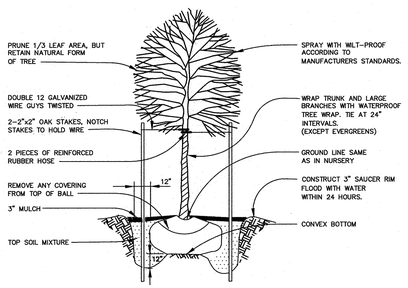
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10.19.15

STREET TREE SCHEDULE

ROAD NAME	PERIMETER	TREES REQ.	SIZE
RESORT ROAD	1500	38	LARGE

STREET TREE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	38	TILIA CORDATA "GREENSPIRE" (Greenspire Littleleaf Linden)	2 1/2" -3" cal.	TO BE PLANTED ALONG RESORT ROAD BY THE DEVELOPER.



TREE PLANTING DETAIL

NOT TO SCALE

LANDSCAPE NOTES:

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

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

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

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

5. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING SHALL BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT.

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22138, Expiration Date: 6-30-2017.
STATE OF MARYLAND — CHRISTOPHER ALAN MASON — No. 22138 — REGISTERED PROFESSIONAL ENGINEER
7-30-15

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NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

LANDSCAPE PLAN

DESIGN: DBT	DRAFT: DBT	DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
		SCALE: AS SHOWN	SHEET 10 OF 15

AS-BUILT

F-16-004

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NRCS SOILS CHART - HoCo Soils Map No. 12				
SYMBOL	HYDRIC	GROUP	Kw	MAP UNIT NAME
GbA		B	0.28	GLADSTONE LOAM, 0 TO 3 PERCENT SLOPES
GbB		B	0.28	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES
GbC		B	0.28	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES
GnB*	YES	C	0.43	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES
BaA*	YES	D	0.43	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES

GbB

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

License No. 21443, Expiration Date: 12/21/22

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 9/20/21

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

ENGINEER'S CERTIFICATE

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

ENGINEER — DATE 9-30-15

DEVELOPER'S CERTIFICATE

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

DEVELOPER — DATE 9/30/15

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 10/14/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10/19/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

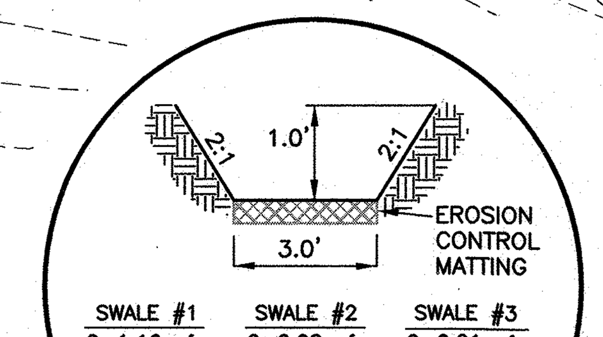
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-22-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10-19-15

LEGEND

- LIMIT OF DISTURBANCE
- EXISTING CONTOURS
- SITE BOUNDARY
- 100YR FLOODPLAIN
- EXISTING WETLANDS
- EXISTING CL STREAM
- 75' STREAM BUFFER
- EXISTING TREELINE
- PROPOSED TREELINE
- SOILS DIVISION LINE
- GbB — SOILS TYPE
- B-X — SOIL BORING TEST

30 0 15 30 60 120
1 inch = 30 ft.



SWALE #1	SWALE #2	SWALE #3
Q=1.16 cfs	Q=0.28 cfs	Q=0.21 cfs
V=1.26 fps	V=0.92 fps	V=0.77 fps
SLOPE: 2.5%	SLOPE: 5.0%	SLOPE: 4.0%

SWALE DETAIL
NOT TO SCALE

NOTES:

1. UTILIZE PERMANENT SOIL STABILIZATION MATTING SLOPE APPLICATION ALONG THE SIDE SLOPES OF THE ROADWAY WITHIN THE STREAM BUFFER AREAS.
2. SUPER SILT FENCING TO BE CURLED UPHILL EVERY 6 FEET IN ELEVATION FORMING A 'J' SHAPE WHERE FENCING RUNS DOWNHILL.
3. SEE SHEET 12 FOR PROFILE OF CLEANWATER DIVERSION PIPE.
4. SEE SHEET 14 FOR TEMPORARY STREAM DIVERSION PLAN AND DETAILS.

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.
9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

GRADING, SEDIMENT AND EROSION CONTROL PLAN

DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
SCALE: AS SHOWN	SHEET 11 OF 15

DESIGN: DBT DRAFT: DBT

AS-BUILT F-16-004

B-4 STANDARDS AND SPECIFICATIONS
FOR
VEGETATIVE STABILIZATION
Definition
Using vegetation as cover to protect exposed soil from erosion.
Purpose
To promote the establishment of vegetation on exposed soil.
Conditions Where Practice Applies
On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental
stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization;
and permanent stabilization.
Effects on Water Quality and Quantity
Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby
reducing sediment loads and runoff to downstream areas.
Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of
runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will
increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.
Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present
within the root zone.
Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.
Adequate Vegetative Establishment
Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the
planting season.
1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

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

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

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

AS-BUILT 9/20/21

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12/21/22

ENGINEER'S CERTIFICATE

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

ENGINEER 9-30-15 DATE

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DEVELOPER 9/30/15 DATE

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

HOWARD SOIL CONSERVATION DISTRICT 10/14/15 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS 10/19/2015 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT 10-22-15 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION 10-19-15 DATE

B-4-2 STANDARDS AND SPECIFICATIONS
FOR
SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS
Definition
The process of preparing the soils to sustain adequate vegetative stabilization.
Purpose
To provide a suitable soil medium for vegetative growth.
Conditions Where Practice Applies
Where vegetative stabilization is to be established.
Criteria
A. Soil Preparation
1. Temporary Stabilization
a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
b. Apply fertilizer and lime as prescribed on the plans.
c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
i. Soil pH between 6.0 and 7.0.
ii. Soluble salts less than 500 parts per million (ppm).
iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
iv. Soil contains 1.5 percent minimum organic matter by weight.
v. Soil contains sufficient pore space to permit adequate root penetration.
b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.
B. Topsoiling
1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
c. The original soil to be vegetated contains material toxic to plant growth.
d. The soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
6. Topsoil Application
a. Erosion and sediment control practices must be maintained when applying topsoil.
b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
C. Soil Amendments (Fertilizer and Lime Specifications)
1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS
FOR
SEEDING AND MULCHING
Definition
The application of seed and mulch to establish vegetative cover.
Purpose
To protect disturbed soils from erosion during and at the end of construction.
Conditions Where Practice Applies
To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.
Criteria
A. Seeding
1. Specifications
a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
2. Application
a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P2O5 (phosphorous), 200 pounds per acre; K2O (potassium), 200 pounds per acre.
ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
iii. Mix seed and fertilizer on site and seed immediately and without interruption.
iv. When hydroseeding do not incorporate seed into the soil.
B. Mulching
1. Mulch Materials (in order of preference)
a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
a. Apply mulch to all seeded areas immediately after seeding.
b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring
a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

Table B.1: Temporary Seeding for Site Stabilization

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

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

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

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

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

Permanent Seeding Summary

Hardiness Zone (from Figure B.3): 6b
Seed Misture (from Table B.3): Tall Fescue/Kentucky Bluegrass

No.	Species	Application Rate (lb/ac.)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20) N	P2O5	K2O	Lime Rate
9	Fescue, Tall	60	Mar 1 to May 15 Aug 1 to Oct 15	1/4 - 1/2 in	45 pounds per acre (1.0 lb/ 100 sf)	90 lb/ac (2 lb/ 1000 sf)	90 lb/ac 2 lb/ 1000 sf)	2 tons/ac (90lb/ 1000 sf)
	Bluegrass, Kentucky	40	Mar 1 to May 15 Aug 1 to Oct 15	1/4 - 1/2 in				
				1/4 - 1/2 in				

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

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF WORK

1. Obtain grading permit. (day 1)

2. Hold on-site pre-construction meeting. (day 2)

3. Clear and Grub as necessary to install stabilized construction entrance and perimeter controls (super silt fencing, diversion fencing, clean water diversion dikes and pipe, and temporary asphalt berm above the SCE) (day 3-6)

4. Construct the temporary stream diversion/pump around practice. See Sequence of Construction for practice on sheet 14. No disturbance shall occur within the stream channel from March 1st to June 15th of any year. The MDE Permit number is #02-NT-009/200261464. Limit amount of disturbance to the stream channel to the minimum necessary to construction proposed culverts. (day 7-8)

5. Upon approval from the Howard County sediment control inspector, install the twin 60" culverts, headwalls and rip-rap protection. Backfill to stabilize pipes. Once installed, remove the temporary stream diversion. (day 9-20)

6. Bring roadbed to subgrade and utilize permanent soil stabilization matting slope protection with the limits of the stream buffers. Grade the swales at the end of Resort Road and along the north side of Resort Road and install erosion control matting and the rip-rap slope protection. (Note: These swale will not receive any runoff until the earth dike is removed. Do NOT remove earth dike at this time). (day 21-30)

7. Construct Bio-Retention Facility #1 and Micro Bio-Retention Facilities #1 and #2 including all underdrains, stone and planting soil. Wrap perimeter with silt fence. Do NOT install the plantings at this time. (day 31-40)

8. Construct the water main. (day 41-50).

9. Install the inlets and storm drain pipes. Utilize inlet protection. Install temporary asphalt berm for inlets I-3 and I-4. (day 51-56)

10. Install curb and gutter and base pave the roadway. (day 57-61)

11. Install guardrails. (day 62-65)

12. Install the sidewalks and street lights. (day 66-70)

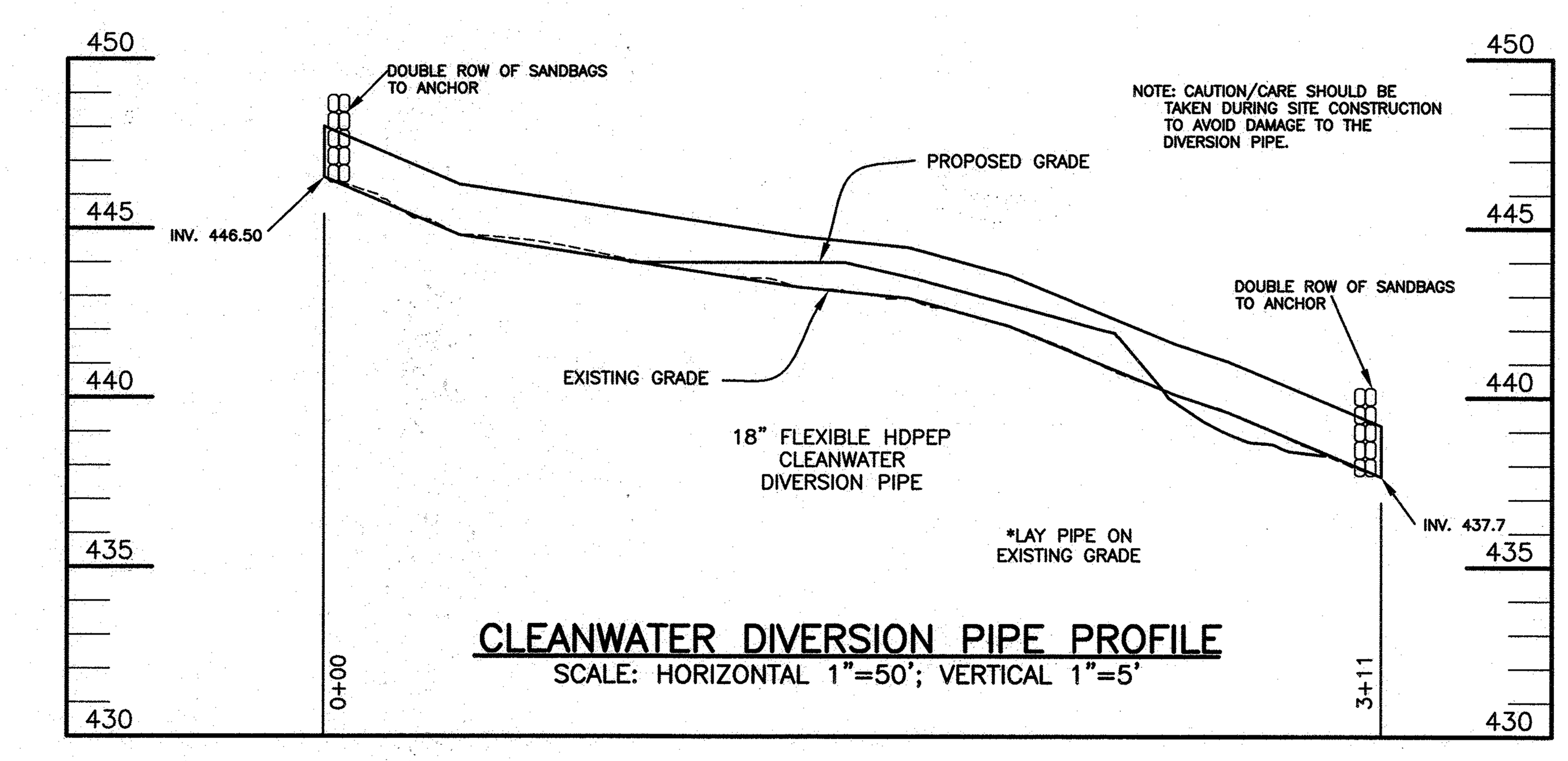
13. Once drainage areas to the SWM practices have been stabilized, remove the silt fence around them and install the final plantings for the storm water management practices and street trees. (day 71-74)

14. Upon approval from the Howard County sediment control inspector, remove sediment control devices and stabilize any remaining disturbed areas in accordance with the permanent seedbed notes. (day 75-80)

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

B-4-8 STANDARDS AND SPECIFICATIONS
FOR
STOCKPILE AREA
Definition
A mound or pile of soil protected by appropriately designed erosion and sediment control measures.
Purpose
To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.
Conditions Where Practice Applies
Stockpile areas are utilized when it is necessary to salvage and store soil for later use.
Criteria
1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.
Maintenance
The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

H-5 STANDARDS AND SPECIFICATIONS
FOR
DUST CONTROL
Definition
Controlling the suspension of dust particles from construction activities.
Purpose
To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and traffic hazards.
Conditions Where Practice Applies
Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.
Specifications
1. Mulches: See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
2. Vegetative Cover: See Section B-4-4 Temporary Stabilization.
3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment that may produce the desired effect.
4. Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
5. Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
6. Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority.



CLEANWATER DIVERSION PIPE PROFILE
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).

2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.

5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

6. SITE ANALYSIS:

TOTAL AREA OF SITE:	16.19	ACRES
AREA DISTURBED:	2.89	ACRES
AREA TO BE ROOFED OR PAVED:	0.63	ACRES
AREA TO BE VEGETATIVELY STABILIZED:	2.26	ACRES
TOTAL CUT:	11,760	CY*
TOTAL FILL:	10,041	CY*

OFFSITE WASTE/BORROW LOCATION: AREA WITHIN TURF VALLEY WITH ACTIVE GRADING PERMIT.

7. ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.

8. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

9. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

10. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.

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

12. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 ACRES PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE ENFORCEMENT AUTHORITY. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE APPROVAL AUTHORITY, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

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

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND · CHRISTOPHER ALAN MALAGARI · No. 22390 · PROFESSIONAL ENGINEER 9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

SEDIMENT & EROSION CONTROL NOTES AND SEQUENCE OF CONSTRUCTION

DATE: SEPTEMBER, 2015		BEI PROJECT NO. 2697	
DESIGN: DBT	DRAFT: DBT	SCALE: AS SHOWN	SHEET 12 OF 15

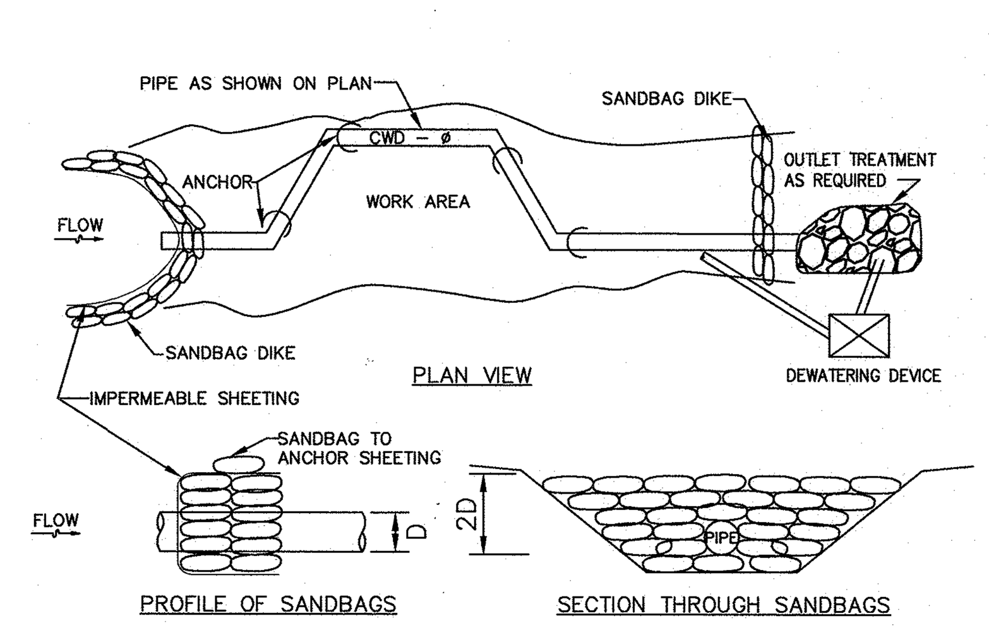
AS-BUILT F-16-004

I:\2697 The Bluffs at Turf Valley\dwg\7026.dwg, 9/29/2015 9:57:11 AM

DETAIL C-6 CLEAR WATER DIVERSION PIPE

STANDARD SYMBOL: CWD – 12

DESIGNATION CWD–12 REFERS TO 12 INCH CLEAR WATER DIVERSION.



CONSTRUCTION SPECIFICATIONS

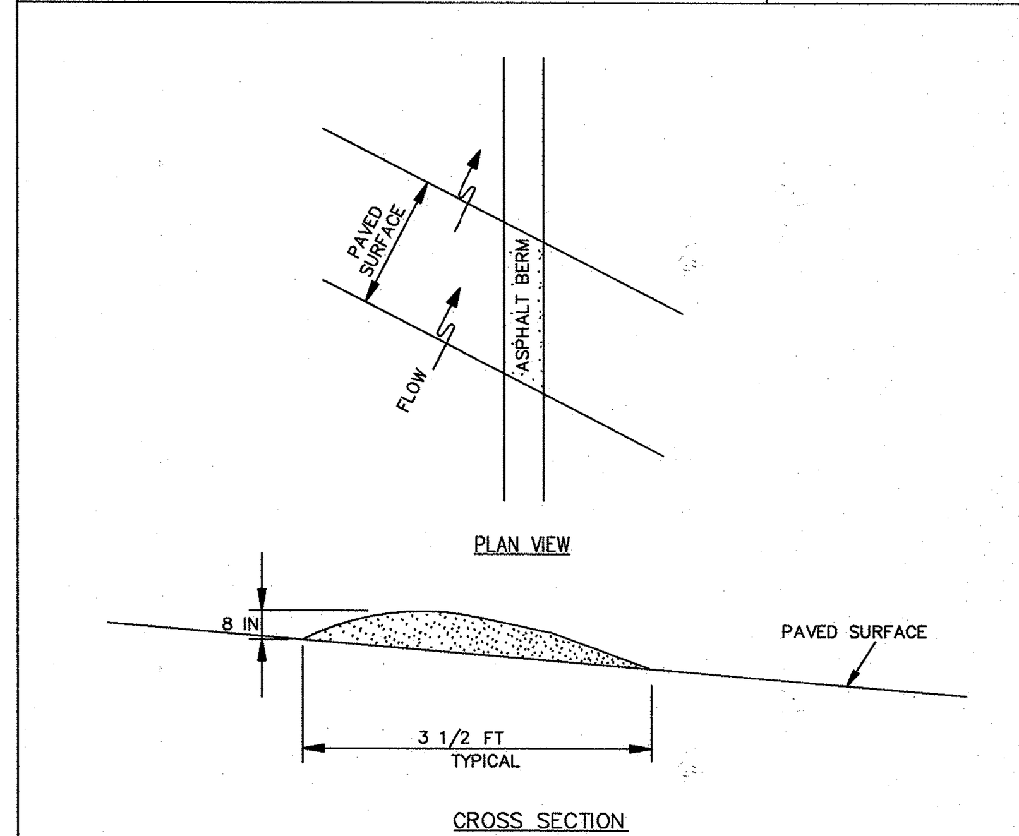
1. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. MAKE ALL JOINTS WATERTIGHT.
2. FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA–VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
3. USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNTURING AND TEARING.
4. PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A MINIMUM OF 18 INCHES.
5. SET HEIGHT OF SANDBAG DIKE AT TWICE THE PIPE DIAMETER. MAINTAIN HEIGHT ALONG LENGTH OF SANDBAG DIKE. PLACE DOUBLE ROW OF SANDBAGS.
6. AT A MINIMUM, SECURELY ANCHOR DIVERSION PIPE AT EACH DOWNGRADE JOINT.
7. SET OUTLET END OF DIVERSION PIPE LOWER THAN INLET END.
8. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
9. DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED ON APPROVED PLAN.
10. KEEP POINT OF DISCHARGE FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL C-5 TEMPORARY ASPHALT BERM

STANDARD SYMBOL: TAB



CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT BERM ON AN UNINTERRUPTED, CONTINUOUS GRADE.
2. INSTALL BERM TO CONFORM TO CROSS SECTION DIMENSIONS OF A UNIFORM HEIGHT OF 8 INCHES MINIMUM AND APPROXIMATE WIDTH OF 3½ FEET.
3. PROVIDE OUTLET PROTECTION AS REQUIRED ON PLAN.
4. COMPACT ASPHALT BERM.
5. REPAIR DAMAGED ASPHALT. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.
6. UPON REMOVAL OF ASPHALT BERM, RETURN TO ORIGINAL CONDITIONS OR AS SPECIFIED ON APPROVED PLAN.

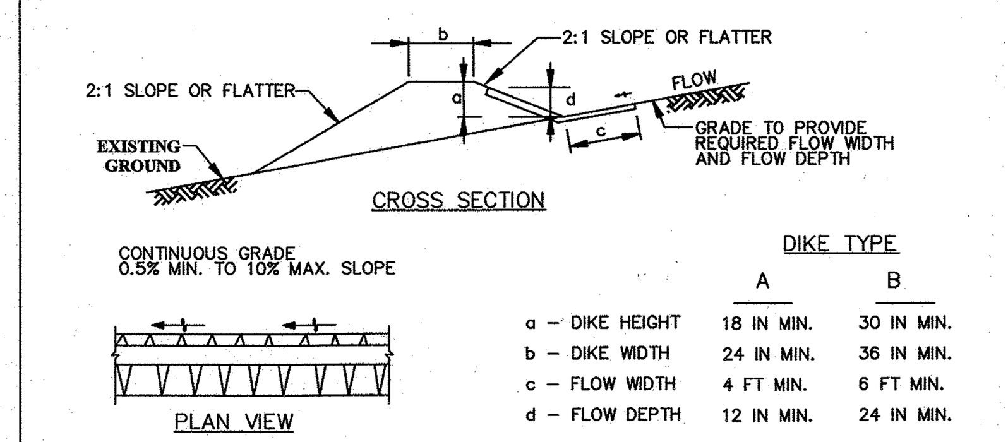
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL: A–1

PLACE DESIGNATION (e.g. A–1) ON FLOW CHANNEL SIDE OF DIKE.



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

FLOW CHANNEL STABILIZATION

A–1 SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)

A–2/B–2 SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.

A–3/B–3 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

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

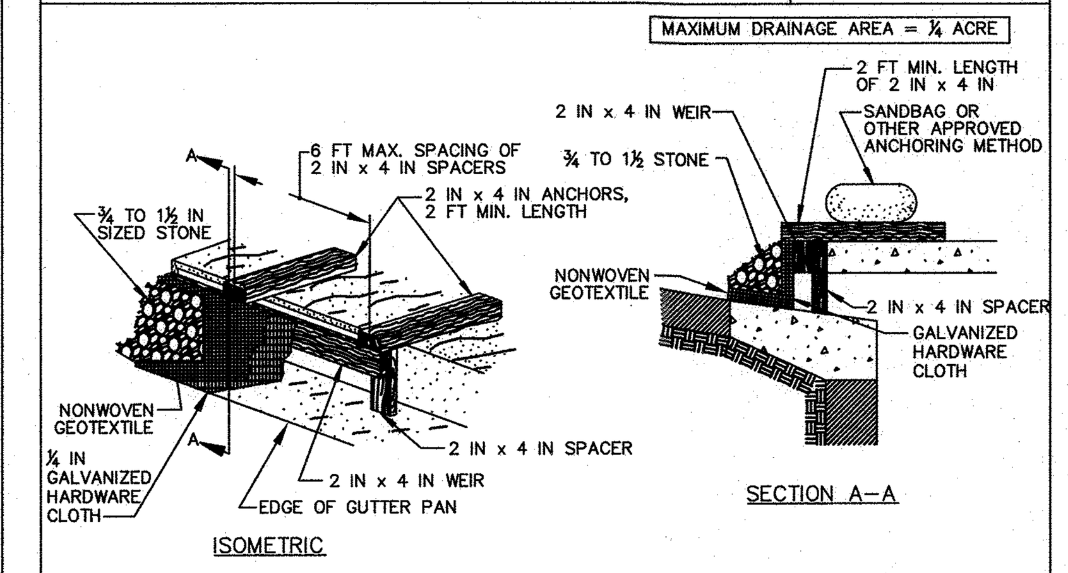
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-9-3 CURB INLET PROTECTION

STANDARD SYMBOL: CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



CONSTRUCTION SPECIFICATIONS

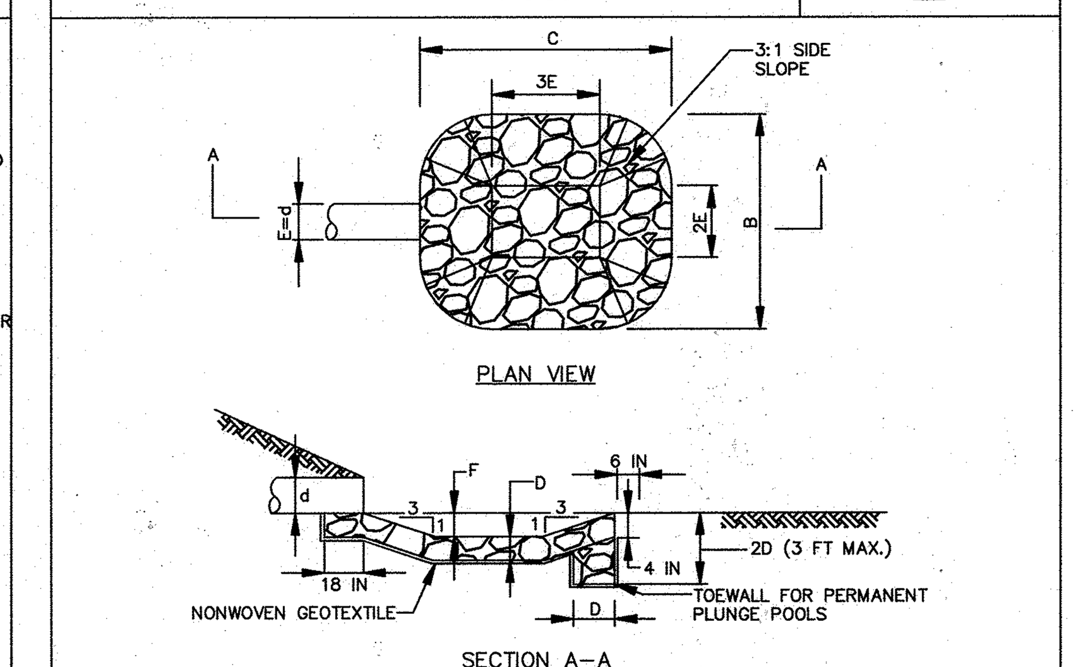
1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING IT 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON–SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL D-4-2 PLUNGE POOL

STANDARD SYMBOL: PP



CONSTRUCTION SPECIFICATIONS

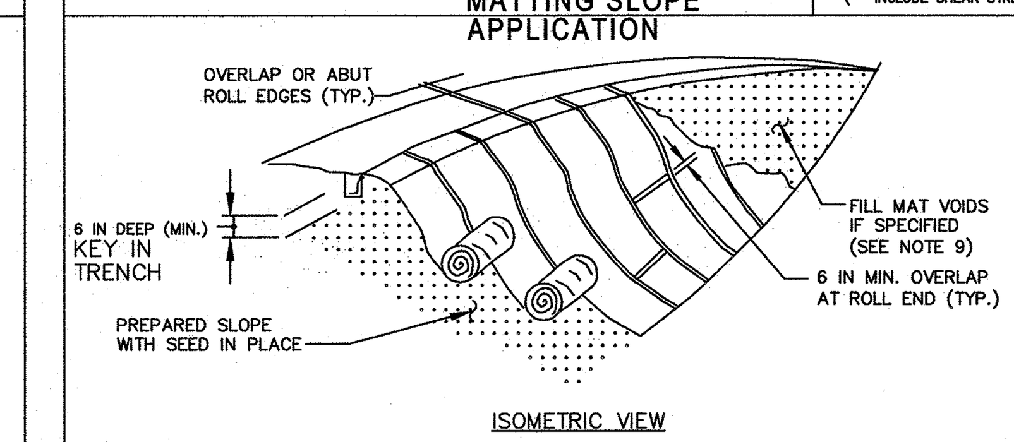
1. USE SPECIFIED CLASS OF RIPRAP.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE.
3. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 6 INCHES BEYOND THE EDGE OF THE SCOUR HOLE.
5. STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL B-4-6-D PERMANENT SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL: PSSMS – * lb/ft² (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

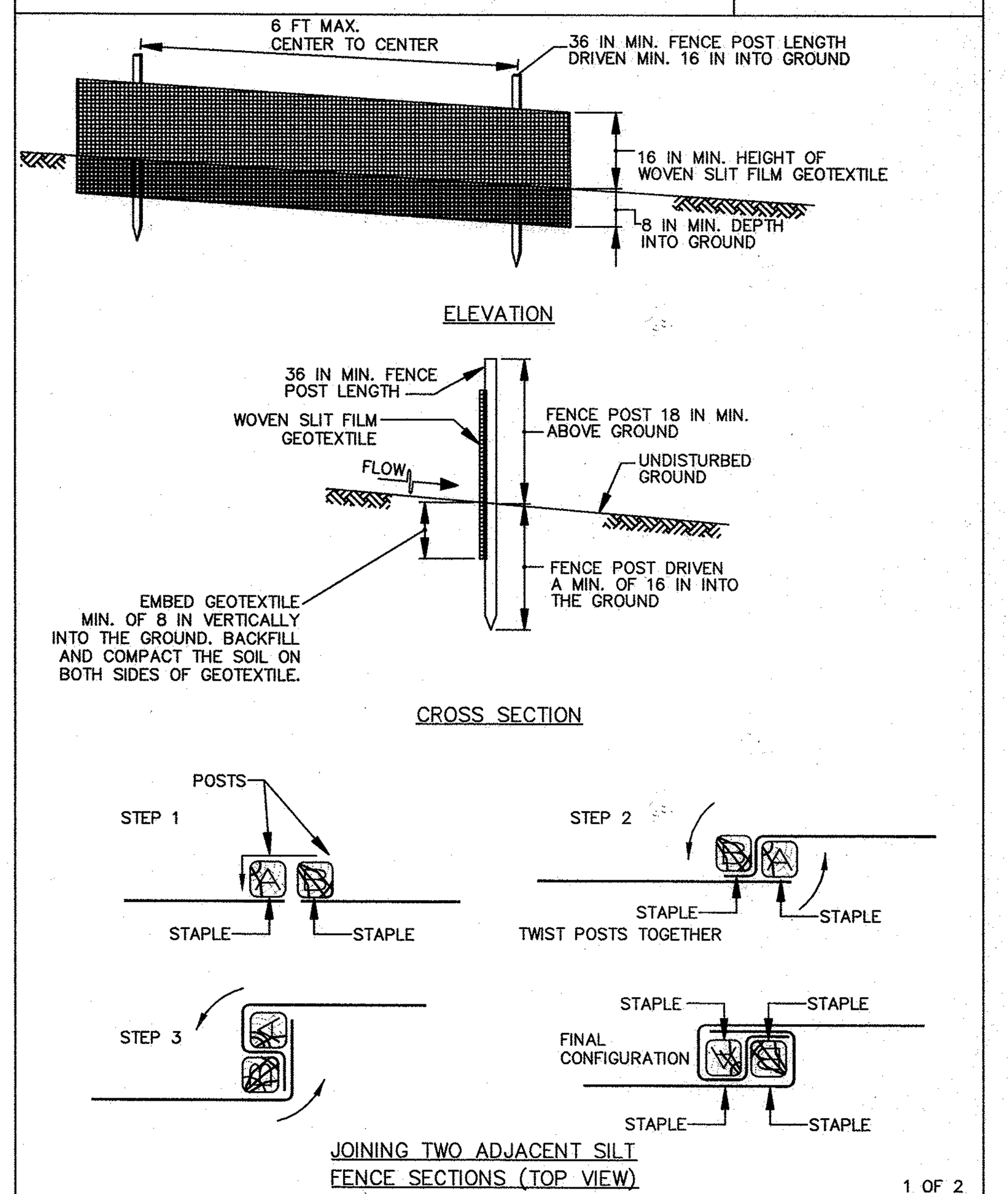
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON–DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON–LEACHING AND NON–TOXIC TO VEGETATION AND SEED GERMINATION AND NON–INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWN SLOPE. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ——SF——



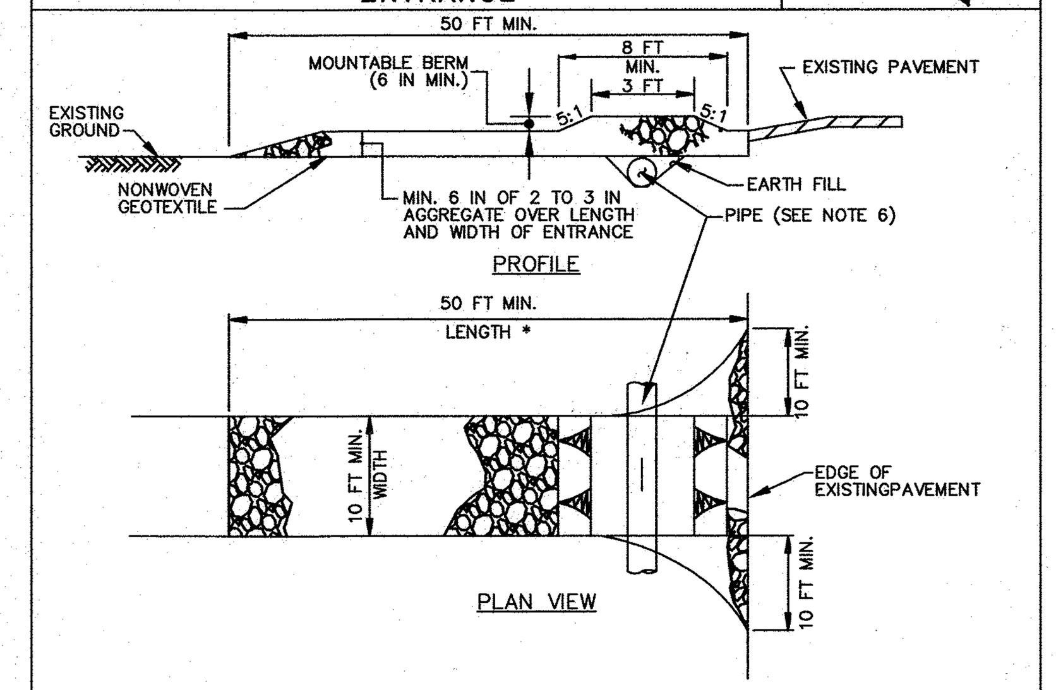
1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

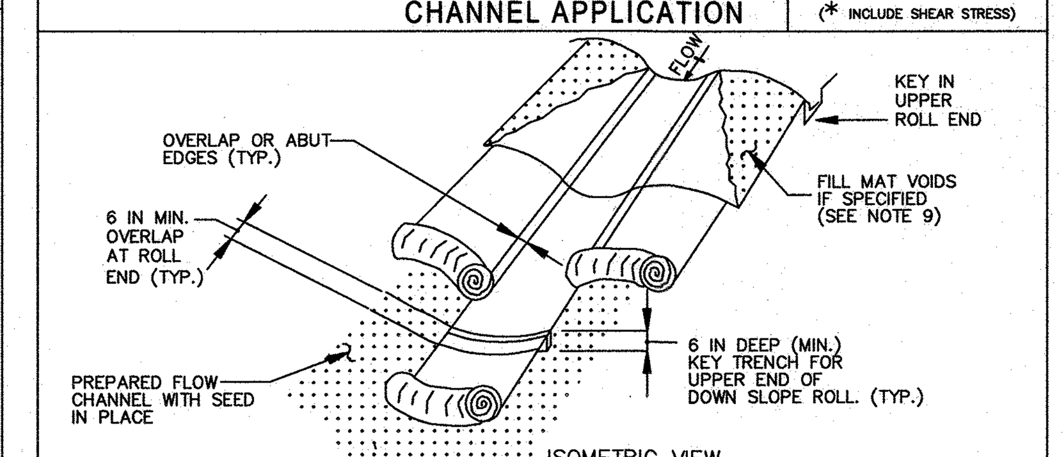
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

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

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



CONSTRUCTION SPECIFICATIONS

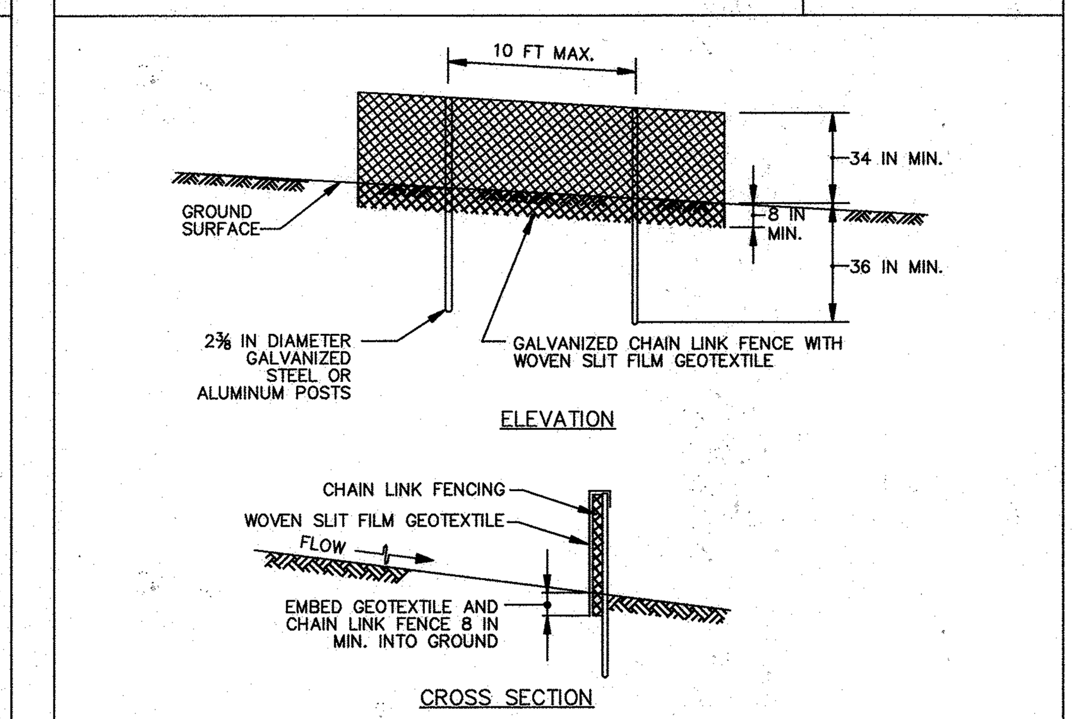
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON–DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: ——SSF——



CONSTRUCTION SPECIFICATIONS

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

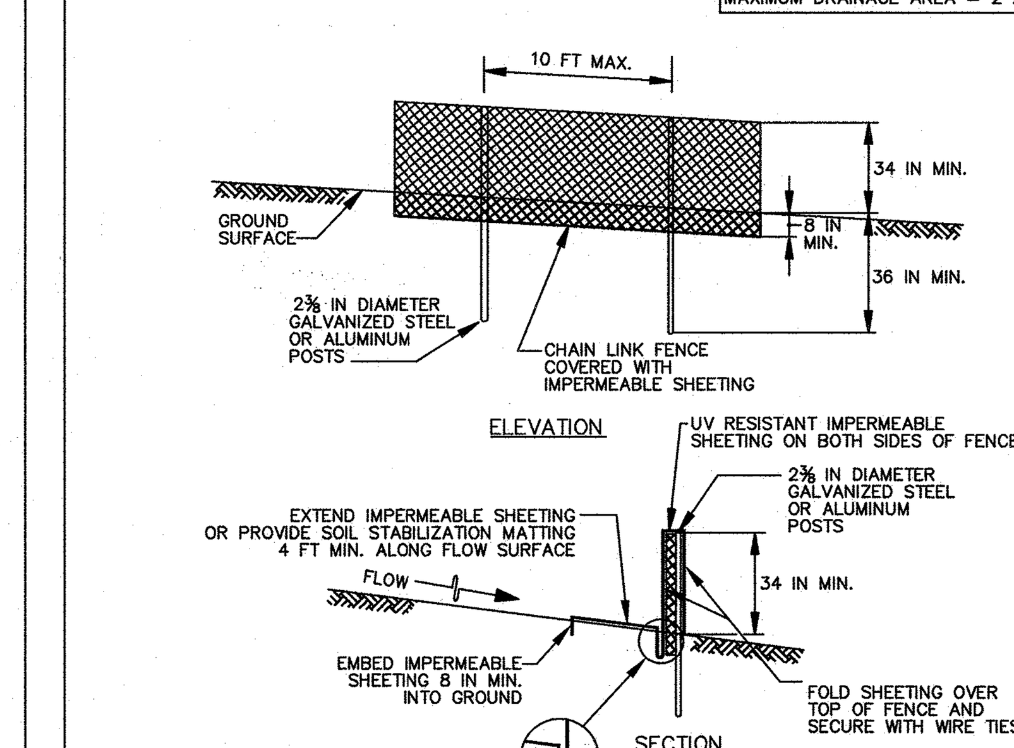
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL C-9 DIVERSION FENCE

STANDARD SYMBOL: —— DF ——

MAXIMUM DRAINAGE AREA = 2 ACRES



CONSTRUCTION SPECIFICATIONS

1. USE 42 INCH HIGH, 9 GAUGE OR THICKER CHAIN LINK FENCING (2⅜ INCH MAXIMUM OPENING).
2. USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
4. SECURE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP, MID SECTION, AND BELOW GROUND SURFACE.
5. EXTEND SHEETING A MINIMUM OF 4 FEET ALONG FLOW SURFACE AND EMBED END A MINIMUM OF 8 INCHES INTO GROUND. SOIL STABILIZATION MATTING MAY BE USED IN LIEU OF IMPERMEABLE SHEETING ALONG FLOW SURFACE.
6. WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM FACING DOWNGRADE.
7. KEEP FLOW SURFACE ALONG DIVERSION FENCE AND POINT OF DISCHARGE FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE. REPLACE IMPERMEABLE SHEETING IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

ENGINEER'S CERTIFICATE

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

ENGINEER [signature] DATE 9-30-15

DEVELOPER'S CERTIFICATE

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

DEVELOPER [signature] DATE 9/30/15

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

HOWARD SOIL CONSERVATION DISTRICT [signature] DATE 10/14/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS [signature] DATE 10/19/2015

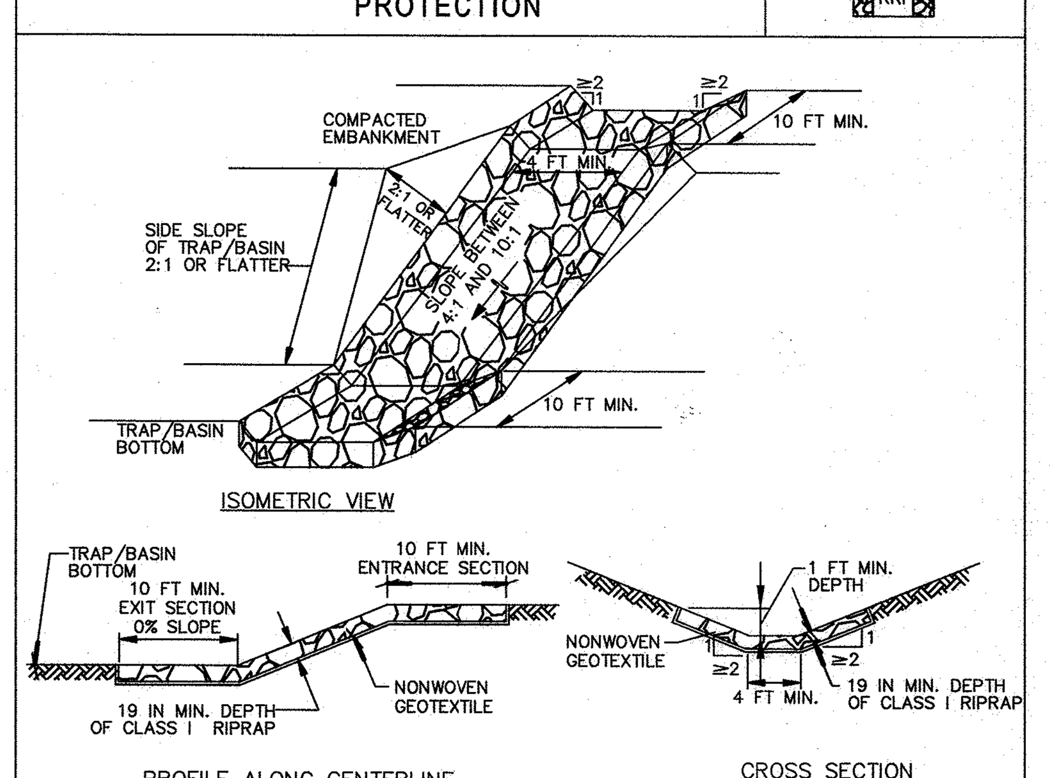
APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT [signature] DATE 10-22-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION [signature] DATE 10.19.15

DETAIL D-3-1 RIPRAP INFLOW PROTECTION

STANDARD SYMBOL: RRP



CONSTRUCTION SPECIFICATIONS

1. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
2. CONSTRUCT INFLOW CHANNEL WITH CLASS I RIPRAP OR EQUIVALENT RECYCLED CONCRETE LINING TO A MINIMUM DEPTH OF 19 INCHES (2 x D_{50}) AND A 1 FOOT DEEP FLOW CHANNEL. INFLOW RIPRAP PROTECTION CHANNEL MUST HAVE A TRAPEZOIDAL CROSS SECTION WITH 2:1 OR FLATTER SIDE SLOPES AND A 4 FOOT MINIMUM BOTTOM WIDTH.
3. INSTALL ENTRANCE AND EXIT SECTIONS AS SHOWN ON THE PROFILE.
4. BLEND RIPRAP INTO EXISTING GROUND.
5. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION.

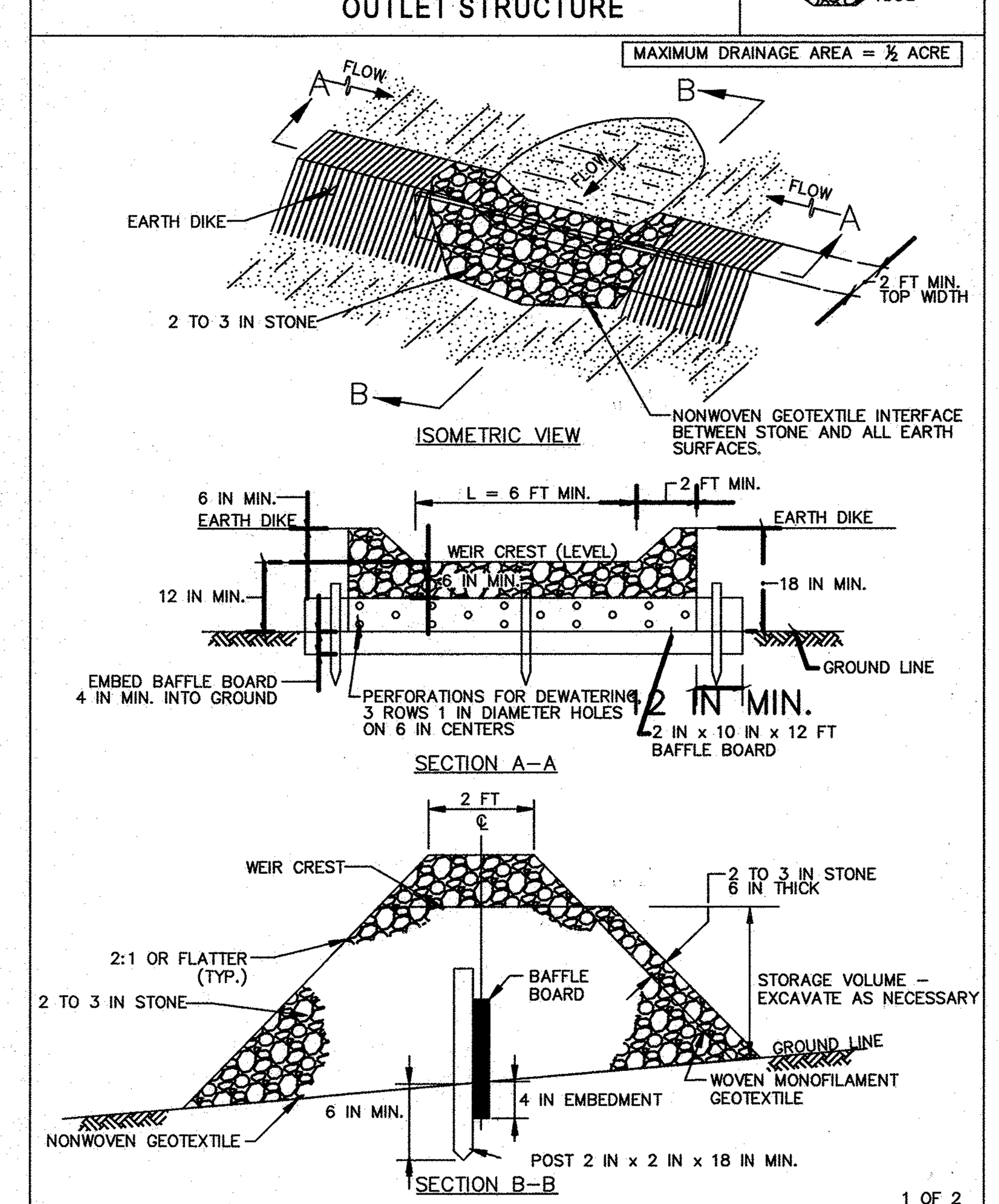
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-7 TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS

MAXIMUM DRAINAGE AREA = ½ ACRE



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-7 TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS

CONSTRUCTION SPECIFICATIONS

1. PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
2. USE NONWOVEN GEOTEXTILE ON INTERFACE BETWEEN GROUND AND STONE.
3. PERFORATE BAFFLE BOARD WITH 3 ROWS OF 1 INCH DIAMETER HOLES 6 INCHES ON CENTER, EMBED A MINIMUM OF 4 INCHES INTO GROUND, AND EXTEND BAFFEL BOARD MINIMUM OF 12 INCHES INTO EARTH DIKE.
4. USE CLEAN 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE. PLACE WOVEN MONOFILAMENT GEOTEXTILE ON UPSTREAM FACE AND COVER WITH A MINIMUM OF 6 INCHES OF ADDITIONAL STONE.
5. USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H–1 MATERIALS.
6. SET WEIR CREST OF STONE 6 INCHES LOWER THAN THE TOP OF EARTH DIKE. USE MINIMUM LENGTH OF 6 FEET FOR WEIR CREST.
7. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 6 INCHES OF WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO DRAIN. MAINTAIN LINE, GRADE, AND CROSS SECTION.
8. UPON REMOVAL OF STONE OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

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

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

AS-BUILT 9/20/21

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

License No. 21443, Expiration Date: 12-21-22

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — PROFESSIONAL ENGINEER — 9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410–825–8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410–825–8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

SEDIMENT & EROSION CONTROL DETAILS

DESIGN: DBT	DRAFT: DBT	DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
		SCALE: AS SHOWN	SHEET 13 OF 15

AS-BUILT

F-16-004

MGWC 1.2: Pump-Around Practice

Temporary measure for dewatering in-channel construction sites

Description

The work should consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction sites.

Implementation Sequence

Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.

2. The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.

3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.

4. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.

5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.

6. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.

MGWC 1.2: Pump-Around Practice

7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.

8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (*See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction*).

9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross- sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.

10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.

11. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.

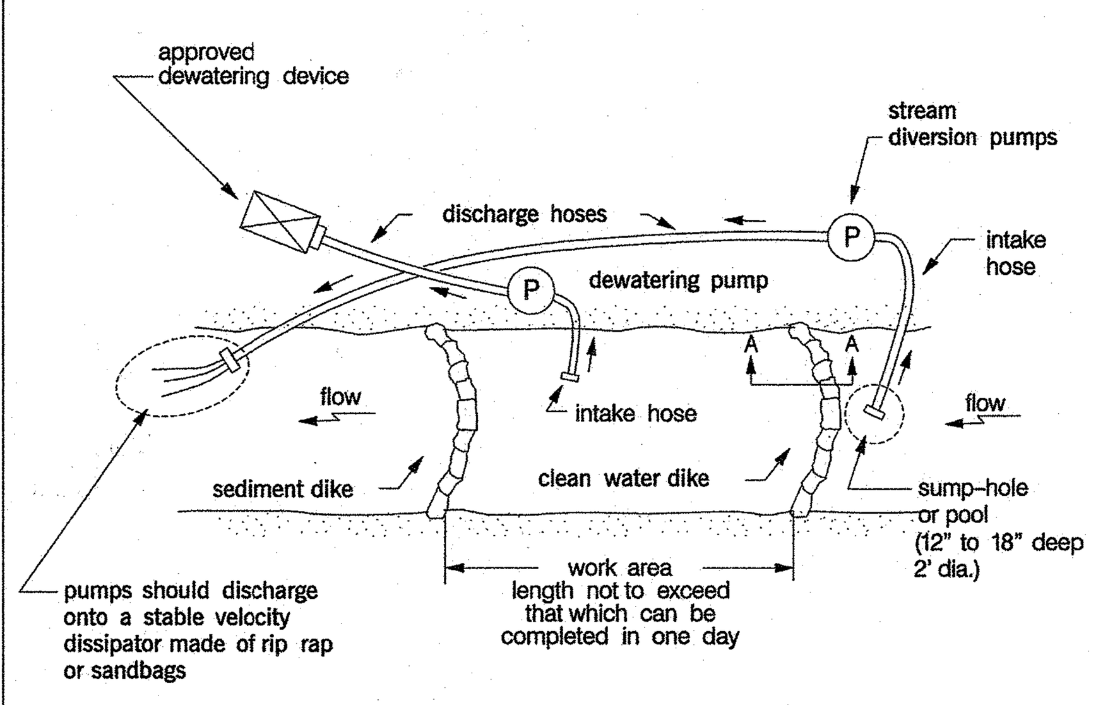
12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.

13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.

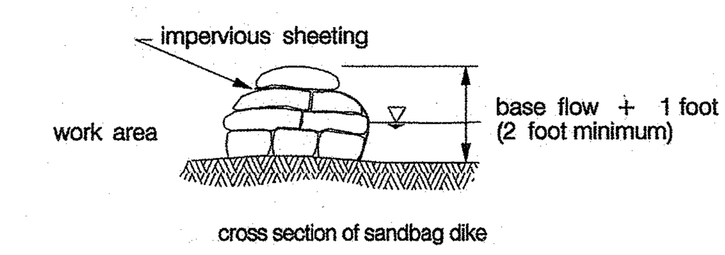
14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

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

PLAN VIEW

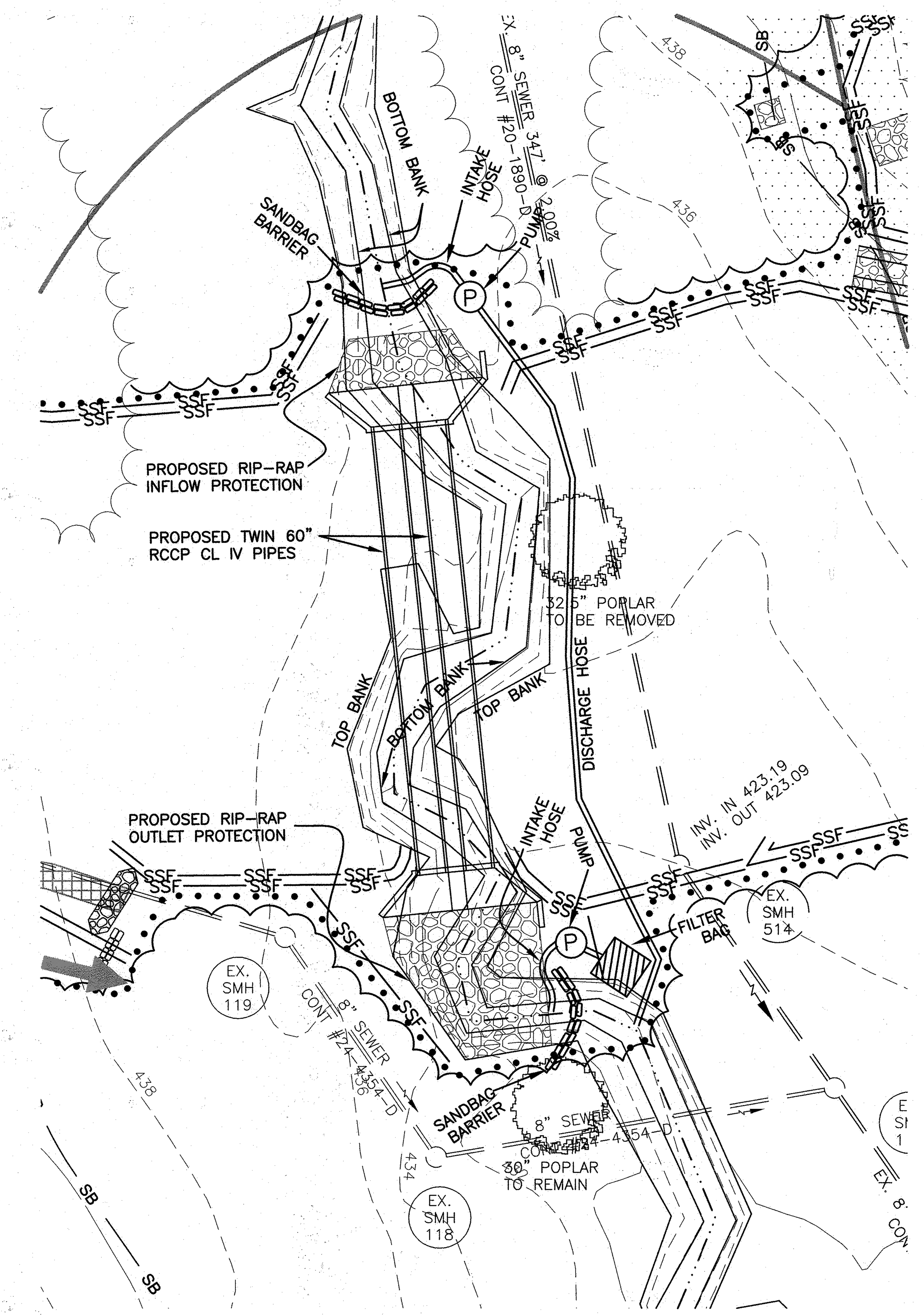


SECTION A–A



cross section of sandbag dike

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



PLAN VIEW
PUMP AROUND PRACTICE

20 0 10 20 40 80

1 inch = 20 ft.

NOTE:
SEE MDE PERMIT #02–NT–009/200261464 FOR GENERAL REQUIREMENTS AS THEY RELATE TO THE ISSUANCE OF THE PERMIT.

ENGINEER'S CERTIFICATE

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

[illegible] 9-30-15
ENGINEER DATE

DEVELOPER'S CERTIFICATE

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

[illegible] 9/30/15
DEVELOPER DATE

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

[illegible] 10/14/15
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

[illegible] 10/19/2015
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[illegible] 10-23-15
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[illegible] 10.19.15
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER

[illegible]
AS-BUILT 9/20/21

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-22

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND
CHRISTOPHER ALAN MALAGARI
No. 22390
REGISTERED
PROFESSIONAL ENGINEER

[illegible] 9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410–825–8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410–825–8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

TEMPORARY STREAM DIVERSION PLAN & DETAILS

DESIGN: DBT	DRAFT: DBT	DATE: SEPTEMBER, 2015	BEI PROJECT NO. 2697
		SCALE: AS SHOWN	SHEET 14 OF 15

AS-BUILT

F-16-004

:\2697 The Bluffs at Turf Valley\dwg\7026.dwg, 9/29/2015 10:09:43 AM

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: The Bluffs at Turf Valley — Boring No. B-1
Location: Howard County, MD — Job # 15271A

SAMPLER
Datum ____ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman M. Stawas
Surf. Elev. ____ ft Hammer Drop 30 in. Rock Core Diameter N/A Inspector ____
Date Started 6/4/15 Pipe Size 2.0 in. Boring Method HSA Date Completed 6/4/15

Elevation/ Depth	Soil Symbols/ Sample Conditions	Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
0	D	Orange-Brown, moist, soft clayey SILT with trace gravel and mica (CL-ML)	4" of Topsoil	17"		1-1-3	4
	D	Orange-Brown, moist, stiff micaceous SILT with trace clay (ML)		18"		4-5-6	11
5	D	Orange-Brown, moist, stiff sandy SILT (SM-ML)	No groundwater encountered while drilling	17"		4-6-7	13
	D	Brown/Gray/Orange-Brown, moist, medium stiff micaceous SILT (ML)		15"		4-5-5	10
10							
	D			18"		5-6-11	17
15	D			17"		7-8-13	21
		Bottom of boring at 16.5 ft	Boring backfilled after 24 hours				

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	14.0 ft.
AFTER 24 HRS.	11.25 ft.	11.5 ft.
AFTER ___ HRS.	ft.	ft.

BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGERS; DC - DRIVING CASING; MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1" WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: The Bluffs at Turf Valley — Boring No. B-2
Location: Howard County, MD — Job # 15271A
Hammer Wt. 140 lbs. Hole Diameter 6" Foreman M. Stawas; Hammer Drop 30 in. Rock Core Diameter N/A; Date Started 6/19/15 Pipe Size 2.0 in. Boring Method HSA Date Completed 6/19/15

Elevation/ Depth	Soil Symbols/ Sample Conditions	Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
0	D	Brown/Orange-Brown to Light Gray, moist, very dense silty SAND (SM)	3" of Topsoil	14"		6-14-50/2"	64+
	D	-Decomposed Rock	No groundwater encountered while drilling	11"		32-50/5"	50+
5	D			4"		50/4"	50+
		Bottom of boring at 5.5 ft Auger Refusal at 5.5 ft	Boring backfilled after 24 hours				

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	3.5 ft.
AFTER 24 HRS.	Dry ft.	2.5 ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: The Bluffs at Turf Valley — Boring No. B-3
Location: Howard County, MD — Job # 15271A
Hammer Wt. 140 lbs. Hole Diameter 6" Foreman M. Stawas; Hammer Drop 30 in. Rock Core Diameter N/A; Date Started 6/19/15 Pipe Size 2.0 in. Boring Method HSA Date Completed 6/19/15

Elevation/ Depth	Soil Symbols/ Sample Conditions	Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
0	I	Orange-Brown, moist, soft CLAY with silt (CL)	3" of Topsoil	17"		1-1-3	4
	D	Light Gray, dry, very dense silty fine SAND (SM)		10"		27-50/4"	50+
5	D	-Decomposed Rock	No groundwater encountered while drilling	3"		50/3"	50+
	D			15"		26-24-50/3"	74+
10		Bottom of boring at 11 ft Auger Refusal at 11 ft	Boring backfilled after 24 hours				

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	9.5 ft.
AFTER 24 HRS.	Dry ft.	9.5 ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: The Bluffs at Turf Valley — Boring No. B-4
Location: Howard County, MD — Job # 15271A
Hammer Wt. 140 lbs. Hole Diameter 6" Foreman M. Stawas; Hammer Drop 30 in. Rock Core Diameter N/A; Date Started 6/19/15 Pipe Size 2.0 in. Boring Method HSA Date Completed 6/19/15

Elevation/ Depth	Soil Symbols/ Sample Conditions	Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
0	D	Brown to Brown/Orange-Brown, moist, very loose silty SAND (SM; Possible FILL or ALLUVIUM)	3" of Topsoil	18"		1-1-2	3
	I			12"		2-2-2	4
5	D		No groundwater encountered while drilling	14"		2-2-2	4
	D	Gray/Orange-Brown, moist, very dense silty SAND (SM)		18"		18-24-27	51
10	D	-Decomposed Rock		15"		29-37-50/3"	87+
		Bottom of boring at 12.0 ft	Boring backfilled after 24 hours				

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	8.5 ft.
AFTER 24 HRS.	Dry ft.	8.0 ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: The Bluffs at Turf Valley — Boring No. B-5
Location: Howard County, MD — Job # 15271A
Hammer Wt. 140 lbs. Hole Diameter 6" Foreman M. Stawas; Hammer Drop 30 in. Rock Core Diameter N/A; Date Started 6/19/15 Pipe Size 2.0 in. Boring Method HSA Date Completed 6/19/15

Elevation/ Depth	Soil Symbols/ Sample Conditions	Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
0	I	Brown-Orange, moist, medium dense silty SAND with gravel (SM; FILL or ALLUVIUM)	4" of Topsoil	16"		3-7-10	17
	D	Gray, moist, medium dense silty SAND (SM)		18"		12-10-12	22
5	D	Gray, moist, medium dense angular silty GRAVEL and SAND (GM-SM)	No groundwater encountered while drilling	15"		10-12-13	25
	D	Orange-Brown/Brown, moist medium dense, silty SAND with weathered material (SM)	Boring backfilled after 24 hours	15"		6-10-11	21
10		Bottom of boring at 10 ft					

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	8.5 ft.
AFTER 24 HRS.	Dry ft.	8.0 ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: The Bluffs at Turf Valley — Boring No. B-6
Location: Howard County, MD — Job # 15271A
Hammer Wt. 140 lbs. Hole Diameter 6" Foreman M. Stawas; Hammer Drop 30 in. Rock Core Diameter N/A; Date Started 6/19/15 Pipe Size 2.0 in. Boring Method HSA Date Completed 6/19/15

Elevation/ Depth	Soil Symbols/ Sample Conditions	Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
0	I	Brown, moist, very loose to loose silty SAND with clay (SM)	4" of Topsoil	18"		1-1-2	3
	I			16"		2-3-3	6
5	D	Brown to Orange-Brown, moist, medium dense to loose, silty fine to coarse SAND with clay and weathered material (SM)	Groundwater encountered at 9 ft while drilling	18"		6-10-13	23
	D			18"		3-5-5	10
10		Bottom of boring at 10 ft	Boring backfilled after 24 hours				

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	8.5 ft.
AFTER 24 HRS.	Dry ft.	8.0 ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: The Bluffs at Turf Valley — Boring No. B-7
Location: Howard County, MD — Job # 15271A
Hammer Wt. 140 lbs. Hole Diameter 6" Foreman M. Stawas; Hammer Drop 30 in. Rock Core Diameter N/A; Date Started 6/19/15 Pipe Size 2.0 in. Boring Method HSA Date Completed 6/19/15

Elevation/ Depth	Soil Symbols/ Sample Conditions	Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
0	I	Dark Brown, moist, medium stiff SILT (ML)	4" of Topsoil	18"		1-1-6	7
	D	Brown/Gray/Orange-Brown, moist, medium dense to loose silty SAND with weathered material (SM)	No groundwater encountered while drilling	18"		7-9-9	18
	D			18"		6-4-4	8
5		Bottom of boring at 5.5 ft	Boring back filled after 24 hours				

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	3.5 ft.
AFTER 24 HRS.	Dry ft.	5.0 ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: The Bluffs at Turf Valley — Boring No. B-8
Location: Howard County, MD — Job # 15271A
Hammer Wt. 140 lbs. Hole Diameter 6" Foreman M. Stawas; Hammer Drop 30 in. Rock Core Diameter N/A; Date Started 6/19/15 Pipe Size 2.0 in. Boring Method HSA Date Completed 6/19/15

Elevation/ Depth	Soil Symbols/ Sample Conditions	Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
0	I	Dark Brown, moist, soft SILT (ML)	4" of Topsoil	13"		1-2-2	4
	I	Bluish-Gray to Light Gray, moist, loose to medium dense micaceous silty SAND (SM)	No groundwater encountered while drilling	18"		3-3-4	7
5	D			15"		4-4-7	11
		Bottom of boring at 5.5 ft	Boring back filled after 24 hours				

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	3.5 ft.
AFTER 24 HRS.	Dry ft.	3.5 ft.

NOTE:
BORING #9 WAS DRILLED UNDER THE OBSERVATION AND INSPECTION OF BENCHMARK ENGINEERING, INC.

FIELD TEST BORING LOG

1 OF 1

BORING NO.: B-9 DRILLER: JFC START DATE: ____
PROJECT NAME: The Bluffs at Turf Valley COMPLETION DATE: 6/22/2015
PROJECT NO.: 2697 PROJECT LOCATION: ____
CLIENT: Mangione Enterprises of Turf Valley, LP DRILLING METHOD: Backhoe

DEPTH (FT)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE DEPTH FROM	SAMPLE DEPTH TO	BLOW COUNT	RECOVERY (IN)	POCKET PENETROMETER (TSF)	REMARKS
0	starting elevation = 440.50							
1	6" topsoil							
2	Reddish brown silty sand							
3								
4								
5								
6								
7								
8								
9								
10	no water encountered during drilling Bottom or Boring = 430.50							
11								
12								
13								
14								
15								BORING COMPLETED AT A DEPTH OF ____ FEET.
16								GROUNDWATER WAS NOT ENCOUNTERED DURING OR UPON COMPLETION OF DRILLING.
17								GROUNDWATER WAS ENCOUNTERED AT A DEPTH OF ____ FEET DURING DRILLING.
18								CAVE IN DEPTH ____
19								ELEVATION ____
20								

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

STATE OF MARYLAND — No. 21443 — PROFESSIONAL ENGINEER
[illegible]
AS-BUILT 9/20/21

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-22

APPROVED: DEPARTMENT OF PUBLIC WORKS

[illegible] 10/19/2015
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[illegible] 10-22-15
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[illegible] 10-19-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

NO.	DATE	REVISION

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.
STATE OF MARYLAND — PROFESSIONAL ENGINEER
[illegible] 9-30-15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE BLUFFS AT TURF VALLEY
RESORT ROAD EXTENSION
NON-BUILDABLE BULK PARCELS 'A' AND 'B'
A SUBDIVISION OF PART OF PARCEL 706

TAX MAP: 17 – GRID: 13 – PARCEL: p/o 706
ZONED: PGCC
ELECTION DISTRICT NO. 2 – HOWARD COUNTY, MARYLAND

SOILS BORING LOGS

DATE: SEPTEMBER, 2015 — BEI PROJECT NO. 2697
DESIGN: DBT — DRAFT: DBT — SCALE: AS SHOWN — SHEET 15 OF 15

AS-BUILT F-16-004

I:\2697 The Bluffs at Turf Valley\dwg\7033.dwg, 9/29/2015 10:10:38 AM