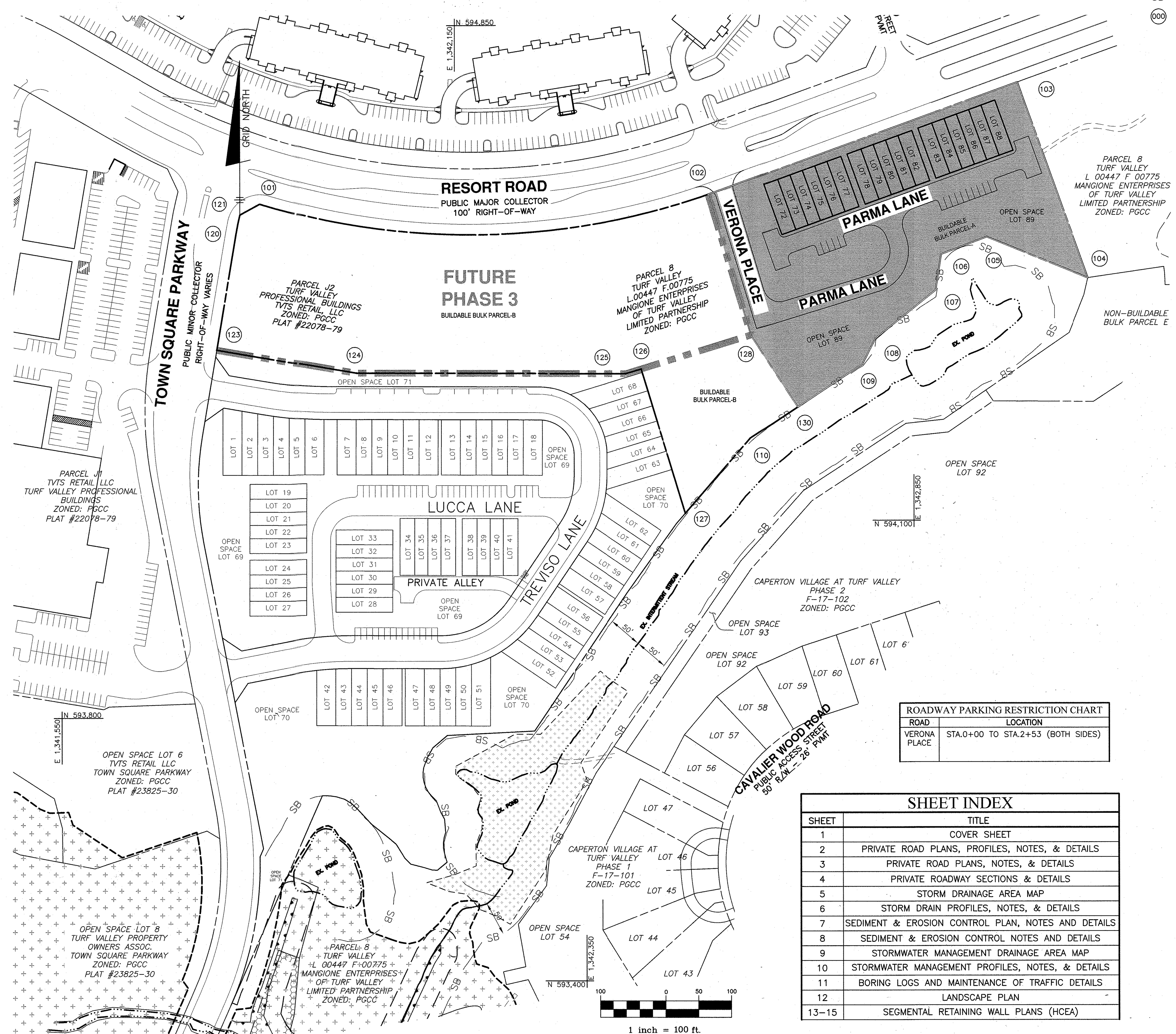
GENERAL NOTES

1. THIS PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS ALTERNATIVE COMPLIANCES HAVE BEEN APPROVED AND NOTED BELOW.
2. THE SUBJECT PROPERTY IS ZONED PGCC PER THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
3. THIS PROJECT IS SUBJECT TO THE 3RD AMENDED TURF VALLEY MULTI-USE SUB-DISTRICT FINAL DEVELOPMENT PLAN RECORDED AS PLAT NUMBERS 21029-21031 ON MARCH 26, 2010 AND THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
4. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NO. 16E1 AND 0012 WERE USED FOR THIS PROJECT.
5. TRACT BOUNDARY IS BASED ON A FIELD SURVEY PERFORMED BY JOHN B. MILDENBERG IN MARCH, 2006.
6. THE EXISTING TOPOGRAPHY SHOWN ON-SITE IS BASED ON AERIAL TOPOGRAPHIC SURVEY PERFORMED BY WINGS AERIAL MAPPING, CO., FLOWN ON OR ABOUT JANUARY, 2006. THE EXISTING TOPOGRAPHY ALONG TOWN SQUARE PARKWAY AND RESORT ROAD IS BASED ON THE RELATED ROAD CONSTRUCTION PLAN (F-02-074) OR SITE DEVELOPMENT PLAN (SDP-10-027).
7. THE EXISTING UTILITIES SHOWN ON THESE PLANS HAVE BEEN TAKEN FROM AERIAL SURVEY, APPROVED CONTRACT DRAWINGS, AND FIELD SURVEYED LOCATIONS. IF NECESSARY, THE CONTRACTOR SHALL ADJUST ANY OR ALL STRUCTURE TOP ELEVATIONS TO MATCH PROPOSED GRADES.
8. THERE ARE NO WETLANDS, STREAMS, THEIR REQUIRED BUFFERS, OR 100 YEAR-FLOODPLAIN LOCATED ON THIS SITE.
9. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES OR NEW STRUCTURES ARE PERMITTED WITH THE STEEP SLOPES 25% OR GREATER THAT ARE MORE THAN 20,000 SF OF CONTIGUOUS EXCEPT AS APPROVED BY WP-18-002. SEE GENERAL NOTE 10.
10. WP-18-002, AN ALTERNATIVE COMPLIANCE TO SECTION 16.116(b)(1)(i) WHICH PROHIBITS GRADING OF STEEP SLOPES THAT ARE 20,000 SF OF CONTIGUOUS AREA; AND SECTION 16.120(c)(4) WHICH REQUIRES THAT SINGLE FAMILY ATTACHED LOTS SHALL HAVE A MINIMUM OF 15 FEET OF FRONTAGE ON A PUBLIC ROAD WAS APPROVED ON 9-5-2017 SUBJECT TO THE FOLLOWING CONDITIONS:
    a. STEEP SLOPE IMPACT IS LIMITED TO 35,230 SF.
    b. A HOMEOWNERS ASSOCIATION WILL BE CREATED THAT WILL BE THE RESPONSIBLE PARTY FOR THE MAINTENANCE OF THE PRIVATE ROADS AND STORMWATER CONVEYANCE AND MANAGEMENT FACILITIES. WATER AND SEWER SHALL BE PUBLIC AND MAINTAINED FOR EACH UNIT WITHIN THE RECORDED PUBLIC EASEMENT.
11. THE WETLAND LIMITS FOR TURF VALLEY ARE BASED ON A STUDY CONDUCTED BY EXPLORATION RESEARCH, INC. AND VERIFIED BY ECO-SCIENCE PROFESSIONALS, INC. ON MAY 26, 2016. THE LIMITS SHOWN ARE IN ACCORDANCE WITH THOSE SHOWN ON THE 4TH AMENDMENT TO THE TURF VALLEY COMPREHENSIVE SKETCH PLAN (S-86-13, PB 368) APPROVED JULY 28, 2006.
12. THE OFFSITE 100-YEAR FLOODPLAIN LIMITS SHOWN ARE BASED ON A STUDY PREPARED BY BENCHMARK ENGINEERING, INC. UNDER F-15-056 AND APPROVED ON MAY 14, 2015.
13. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERIES, BURIAL GROUNDS OR HISTORIC STRUCTURES LOCATED ON THE SUBJECT PROPERTY.
14. A NOISE STUDY IS NOT REQUIRED FOR THIS DEVELOPMENT AS NONE OF THE PROPOSED LOTS ARE WITHIN 500 FEET OF THE INTERSTATE 70 OR ROUTE 40 RIGHTS-OF-WAY.
15. THE TRAFFIC STUDY WAS PREPARED BY TRAFFIC GROUP ON JANUARY 7, 2005 AND WAS APPROVED UNDER THE 4TH AMENDED COMPREHENSIVE SKETCH PLAN ON APRIL 27, 2006. THE TRAFFIC STUDY WAS PREPARED BY TRAFFIC GROUP ON JANUARY 7, 2005 AND WAS APPROVED UNDER THE 4TH AMENDED COMPREHENSIVE SKETCH PLAN ON APRIL 27, 2006. THE INFORMATION WAS UPDATED WITHIN CONFIRMATION LETTER DATED DECEMBER 30, 2020 AND FURTHER AMENDED BY REVISION LETTER DATED APRIL 9, 2021.
16. WATER & SEWER IS PUBLIC. THE CONTRACT NO. IS 24-5089-D. THIS SITE IS WITHIN THE METROPOLITAN DISTRICT. THE DRAINAGE AREA IS THE LITTLE PATUXENT.
17. THIS SUBDIVISION IS SUBJECT TO SECTION 18.122B OF THE HOWARD COUNTY CODE. PUBLIC WATER AND SEWER SERVICE HAS BEEN GRANTED UNDER THESE TERMS AND PROVISIONS. DEVELOPER AGREEMENT NUMBER F-20-072/24-5090-D SHALL BE EXECUTED AND FILED PRIOR TO RECORD PLAT SIGNATURE/RECORDATION.
18. THE GEO-TECHNICAL REPORT FOR STORMWATER MANAGEMENT AS PREPARED BY BENCHMARK ENGINEERING, INC. IN JULY, 2018.
19. THIS PROJECT IS EXEMPT FROM THE HOWARD COUNTY FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202(b)(1)(iv) OF THE HOWARD COUNTY CODE SINCE IT IS A PLANNED UNIT DEVELOPMENT WHICH HAD PRELIMINARY DEVELOPMENT PLAN APPROVAL AND 50% OR MORE OF THE LAND AS RECORDED AND SUBSTANTIALLY DEVELOPED BEFORE DECEMBER 31, 1992.
20. LANDSCAPING IS PROVIDED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL VIA A CERTIFIED LANDSCAPE PLAN AS PART OF THIS PLAN SET. FINANCIAL SURETY FOR THE REQUIRED PERIMETER AND INTERNAL RESIDENTIAL LANDSCAPE OBLIGATIONS SHALL BE POSTED AS PART OF THE GRADING PERMIT UNDER THE FUTURE SITE DEVELOPMENT PLAN. FINANCIAL SURETY FOR THE 21 STREET TREES IN THE AMOUNT OF $6,300 SHALL BE POSTED WITH THE DEVELOPER'S AGREEMENT FOR F-20-072.
21. STORMWATER MANAGEMENT ENVIRONMENTAL SITE DESIGN (ESD) HAS BEEN PROVIDED IN ACCORDANCE WITH THE "MARYLAND DEPARTMENT OF THE ENVIRONMENT STORMWATER MANAGEMENT ACT OF 2007" AND THE "HOWARD COUNTY DESIGN MANUAL VOLUME I, CHAPTER 5" TO THE MAXIMUM EXTENT PRACTICAL. STORMWATER MANAGEMENT IS PROVIDED BY ONE (F-6) BIORETENTION PRACTICE. THE FACILITY ARE PRIVATELY OWNED AND MAINTAINED.
22. THIS PROJECT IS EXEMPT FROM RECREATIONAL OPEN SPACE REQUIREMENTS SINCE IT IS ZONED PGCC.
23. THIS PROJECT IS EXEMPT FROM THE MODERATE INCOME HOUSING UNIT REQUIREMENT (COUNCIL BILL 35-2013) SINCE IT IS ZONED PGCC.
24. STREET LIGHT PLACEMENT AND 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.
25. ON THE APPROACH SIDE OF A STOP SIGN AND ALL OTHER TRAFFIC CONTROL SIGNS, NO STREET TREE CAN BE PLANTED WITHIN 30' OF THE SIGN.
26. A DESIGN MANUAL WAIVER WAS APPROVED ON JULY 13, 2017 TO DESIGN MANUAL VOLUME III, SECTION 2.3.A.1.a WHICH REQUIRES AN ACCESS STREET WITH A DESIGN SPEED OF 30mph TO HAVE A RADIUS OF 350ft AND AN ACCESS PLACE WITH A DESIGN SPEED OF 25mph TO HAVE A RADIUS OF 210ft TO ALLOW A RADIUS OF 100ft AT THE CURVES IN TREVISO LANE (PRIVATE ROAD), PARMA LANE (PRIVATE ROAD), AND THE CURVE ON VERONA PLACE (PUBLIC ROAD), TO SECTION 2.3.A.1.c WHICH REQUIRES THAT A MINIMUM LENGTH OF HORIZONTAL CURVES BE 100FT IN LENGTH TO ALLOW A REDUCTION OF THE LENGTH BASED ON THE GEOMETRICS OF THE ROADWAY CURVES, AND TO SECTION 2.5.B.9 WHICH REQUIRES THAT AN 85th PERCENTILE SPEED STUDY BE PROVIDED FOR ALL INTERSECTIONS TO ELIMINATE THE SPEED STUDY FOR TOWN SQUARE PARKWAY.
27. APPLICABLE PREVIOUS HOWARD COUNTY FILE REFERENCES: S-86-013, ECP-17-047, S-17-008, WP-18-002, F-12-055, F-15-056, P-18-004, 24-5089-D, 24-5090-D, 24-5091-D, F-20-072, WP-21-051
28. PRIOR TO GRADING PERMIT APPLICATION, THE PROJECT SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 16.129 OF THE HOWARD COUNTY CODE.
29. TRASH PICKUP FOR PHASE-2 AND WITHIN THE FUTURE PHASE-3 APARTMENT AREAS SHALL BE PRIVATE.
30. ANY DAMAGE TO THE PUBLIC RIGHT OF WAY, PAVING, OR EXISTING UTILITIES SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
31. THE HOMEOWNERS ASSOCIATION SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE PARKING LOTS INCLUDING PAVEMENT, STRIPING, CURB LITTER PICKUP, SIDEWALKS, AND SNOW REMOVAL.
32. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:
    AT&T....................1-800-252-1133
    BGE (CONTRACTOR SERVICES)....................410-637-8713
    BGE (EMERGENCY)....................410-685-0123
    BUREAU OF UTILITIES....................410-313-4900
    COLONIAL PIPELINE CO....................410-795-1390
    MISS UTILITY....................1-800-257-7777
    STATE HIGHWAY ADMINISTRATION....................410-531-5533
    VERIZON....................1-800-743-0033
33. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
34. PRIVATE RANGE OF ADDRESS SIGNAGE ASSEMBLY SHALL BE FABRICATED AND INSTALLED BY HOWARD COUNTY BUREAU OF HIGHWAYS AT THE DEVELOPER/OWNERS EXPENSE. CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-5752 FOR DETAILS AND COST ESTIMATES.
35. TRAFFIC CONTROL DEVICES:
    a) THE R1-1 ("STOP") SIGN AND THE STREET NAME SIGN(SNS) ASSEMBLY FOR THIS DEVELOPMENT MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETED.
    b) THE TRAFFIC CONTROL DEVICES LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2430) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES.
    c) ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES"(MdMUTCD).
    d) ALL SIGN 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 THAT TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLL CAP SHALL BE MOUNTED ON TOP OF EACH POST.
36. A DESIGN MANUAL WAIVER WAS APPROVED ON FEBRUARY 14, 2019 TO DESIGN MANUAL VOLUME III, SECTIONS 2.3.A.1.a & 2.3.A.1.c TO ALLOW FOR THE MINIMUM HORIZONTAL CURVE RADIUS TO BE REDUCED FOR PARMA LANE (PRIVATE ROAD), LUCA LANE (PRIVATE ROAD), AND TREVISO LANE (PUBLIC ROAD) SUBJECT TO THE WIDENING OF THE PAVEMENT AT ALL SUB-STANDARD CURVES TO 28' WITH PARKING RESTRICTIONS ON BOTH SIDES OF THE ROADWAY. IT IS ALSO RECOMMENDED THAT THE ROADWAYS BE WIDENED TO 28' FOR THE ENTIRE LENGTH AS TRANSITION FROM 26' TO 28' FOR THE CURVES APPROACH AND EXIT WOULD BE REQUIRED WHICH MAY IMPACT OFF-STREET PARKING.
37. A DESIGN MANUAL WAIVER WAS APPROVED ON JULY 15, 2019 TO DESIGN MANUAL VOLUME III, SECTIONS 2.3.A.1.a & 2.3.A.1.c TO ALLOW FOR THE MINIMUM HORIZONTAL CURVE RADIUS TO BE REDUCED FOR PARMA LANE (PRIVATE ROAD), LUCA LANE (PRIVATE ROAD), AND TREVISO LANE (PUBLIC ROAD) TO 50FT, 50FT, AND 150FT RESPECTIVELY; AND A WAIVER FROM DESIGN MANUAL VOLUME III, SECTIONS 2.5.B TO REDUCE INTERSECTION SPACING FROM 250FT TO 181FT ALONG TREVISO LANE. APPROVAL IS SUBJECT TO PROVIDING NO PARKING ZONES FOR TREVISO LANE BETWEEN STA.5+50(RT) TO STA.11+00(RT), AND FOR LUCA LANE BETWEEN STA.0+00(LT) TO STA.1+00(LT) & STA.0+00(RT) TO STA.0+65(RT), AND PROVIDING NO PARKING ON TREVISO LANE BETWEEN TOWN SQUARE PARKWAY & LUCA LANE(BOTH SIDES).
38. THE ARTICLES OF INCORPORATION FOR THE HOMEOWNERS ASSOCIATION SHALL BE ACCEPTED BY THE STATE DEPARTMENT OF ASSESSMENTS AND TAXATION PRIOR TO THE RECORDATION OF THE SUBDIVISION PLAT.
39. ALTERNATIVE COMPLIANCE, WP-21-051 WAS APPROVED ON JANUARY 19, 2020 WITH CONDITIONS TO REQUEST RELIEF FROM SECTION 16.116(a)(2)(i) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS TO DISTURB 3,894 SQUARE FEET OF OFFSITE INTERMITTENT STREAM BUFFER TO GRADE AND CONSTRUCT A 10 FOOT PAVED PATHWAY.

    APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:
    1. COMPLIANCE WITH ALL SRC AGENCY COMMENTS ON THE SUBMITTED FINAL PLANS, F-20-071.
    2. THE PROPOSED DISTURBANCES TO THE 50' STREAM BANK BUFFER AND 100-YEAR FLOODPLAIN ARE LIMITED TO THE AREAS SHOWN ON THE APPROVED PLANS FOR CONSTRUCTION OF THE NEW PATHWAY AND REMOVAL OF THE REMNANTS OF THE EXISTING GOLF CART PATHWAY. NO DISTURBANCE SHOULD OCCUR UNTIL THE FINAL PLAN IS SIGNED.
    3. THE EXISTING GOLF PATHWAY THAT DOES NOT PROVIDE CONNECTION BETWEEN THE NEW PEDESTRIAN PATHWAYS (AS SHOWN ON F-17-102 AND F-20-071) MUST BE REMOVED AND RETURNED TO A NATURAL VEGETATIVE STATE. THE LIMITS OF DISTURBANCE AND REMOVAL MUST BE SHOWN ON F-20-071.
    4. THE EXISTING 12" CONCRETE CULVERT ON PARCEL 8, ADJACENT TO OPEN SPACE LOT 93 (CAPERTON VILLAGE AT TURF VALLEY) AND TO THE REAR OF PROPOSED LOTS 58-63 (THE VILLAGE AT TOWN SQUARE) MUST BE REMOVED AND THE NATURAL STREAM CHANNEL MUST BE RESTORED. THE RESTORATION DETAILS MUST BE SHOWN ON F-20-071.
    5. THE APPLICANT SHALL OBTAIN ALL REQUIRED AUTHORIZATIONS AND PERMITS FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT AND U.S. ARMY CORPS OF ENGINEERS FOR DISTURBANCES WITHIN THE FLOODPLAIN, WETLANDS, STREAMS AND THEIR BUFFERS. REFERENCE THE APPLICABLE MDE OR USACOE PERMITS OR TRACKING NUMBERS ON THE FINAL PLAN AND ANY BUILDING OR GRADING PERMITS
    6. ALL GRADING AND DISTURBANCES OUTSIDE OF THE PROPOSED PATHWAY MUST BE STABILIZED AND RETURNED TO PREVIOUS CONDITIONS ONCE CONSTRUCTION IS COMPLETE. DISTURBANCES TO ANY EXISTING VEGETATED AREAS SHOULD BE TO THE MINIMUM NECESSARY TO CONSTRUCT THE NEW PATHWAY AND REMOVE THE EXISTING GOLF CART PATHWAY.
    7. ADD THE ALTERNATIVE COMPLIANCE REQUEST NUMBER, PURPOSE, SECTION, DATE, AND CONDITIONS ON ALL SUBSEQUENT PLAN SUBMISSIONS.

    W-21-051 WAS RESCINDED AND BECAME NULL & VOID BY DPZ LETTER DATED AUGUST 18 2021.
40. THE SUBMISSION OF FINAL ROAD CONSTRUCTION PLANS F-20-071 AND F-20-072 MEETS THE MILESTONE ESTABLISHED IN THE DEPARTMENT OF PLANNING AND ZONING LETTER DATED OCTOBER 3, 2019 FOR SIGNATURE OF THE PRELIMINARY PLAN (P-18-004) SINCE THESE TWO PLANS CONSIST OF THE ENTIRE AREA OF THE APPROVED PRELIMINARY PLAN. THE PRELIMINARY PLAN P-18-004 INDICATED A TOTAL OF 153 UNITS. THERE WILL BE 28 UNITS TRANSFERRED FROM F-97-158 FOR A TOTAL OF 181 UNITS IN THE VILLAGES AT TOWN SQUARE-PHASE 1-3. THE FINAL CONSTRUCTION PLANS FOR PHASE 1 AND 2 SHALL CONSISTS OF A TOTAL OF 85 SFA UNITS. THE REMAINDER OF 96 UNITS-PHASE 3, SHALL BE REFLECTED ON A FUTURE SDP FOR BUILDABLE BULK PARCEL 'B' AS SHOWN ON THESE PLANS.
41. DUE TO PARKING REQUIREMENTS, GARAGES MUST NOT BE CONVERTED TO STORAGE OR LIVABLE SPACE. GARGES AND DRIVEWAYS MUST BE KEPT SUFFICIENTLY CLEAR TO ALLOW FOR THE REQUIRED PARKING

SUPPLEMENTAL / CONSTRUCTION PLANS
THE VILLAGE AT TOWN SQUARE
PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

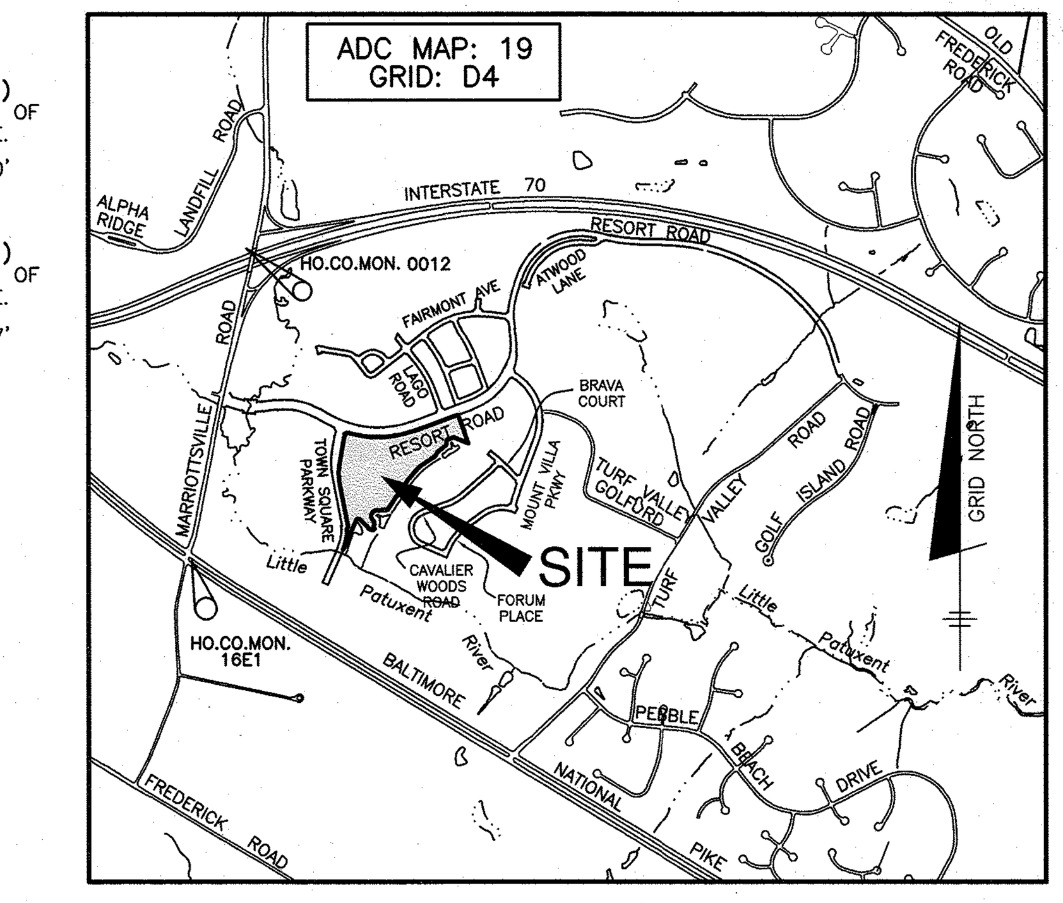


BENCHMARKS
NAD'83 HORIZONTAL

HO. CO. #16E1 (AKA: 3438001)
STAMPED BRASS DISK SET ON TOP OF A 3ft DEEP COLUMN OF CONCRETE.
N 593250.960' E 1340192.70'
ELEVATION: 463.981'

HO. CO. #0012 (AKA: 3439001)
STAMPED BRASS DISK SET ON TOP OF A 3ft DEEP COLUMN OF CONCRETE.
N 596502.760' E 1340864.37'
ELEVATION: 486.298'

LEGEND
- LIMIT OF SUBMISSION
- PHASE LINE
- LIMIT OF 100YR FLOODPLAIN
- CL STREAM
- SB — STREAM BUFFER
- (000) COORDINATE DESIGNATION



VICINITY MAP
SCALE: 1" = 2000'

PRIVATE ESD STORMWATER MANAGEMENT INFORMATION						
Phase	Lot	Street Address	Practice MDE	Practice Type	Ownership	Maintenance
1	BBP B	11061 Resort Road	(F-6)	Bioretention	Private	H.O.A.
1	BBP A	11033 Resort Road	(F-6)	Bioretention	Private	H.O.A.
2	OS LOT 89	N/A	(F-6)	Bioretention	Private	H.O.A.
1	OS LOT 69	N/A	(F-6)	Bioretention	Private	H.O.A.
1	OS LOT 69	N/A	(F-6)	Bioretention	Private	H.O.A.
1	OS LOT 70	N/A	(F-6)	Bioretention	Private	H.O.A.
3	BBP B	11061 Resort Road	(M-6)	Micro-Bioretention	Private	H.O.A.
3	BBP B	11061 Resort Road	(M-6)	Micro-Bioretention	Private	H.O.A.
3	BBP B	11061 Resort Road	(M-6)	Micro-Bioretention	Private	H.O.A.
1	OS LOT 70	N/A	(M-2)	Submerged Gravel Wetland	Private	H.O.A.

BOUNDARY COORDINATES		
POINT #	NORTHING	EASTING
101	594580.2975	1341852.6794
102	594598.2009	1342548.6595
103	594764.8710	1343008.5169
104	594468.0292	1343116.1039
105	594530.3608	1342961.6177
106	594504.1141	1342892.0662
107	594449.6240	1342883.5686
108	594376.6286	1342791.7425
109	594337.2223	1342771.4773
110	594224.3083	1342600.7149
120	594535.2635	1341816.7207
121	594563.7041	1341822.4535
123	594358.5897	1341787.0924
124	594322.7393	1342000.2069
125	594321.6709	1342410.4996
126	594334.8274	1342453.5735
127	594127.7101	1342516.8353
128	594380.1578	1342601.9840
129	594593.9870	1342536.8223
130	594272.3043	1342673.3004

TRIP GENERATION COMPARISON - TURF VALLEY

	MORNING PEAK HOUR IN	OUT	TOTAL	EVENING PEAK HOUR IN	OUT	TOTAL
Trips from Approved Study	301	450	751	574	511	1085
Current/Proposed						
159 SFD Units	29	89	118	100	59	159
957 TH/Condo units	94	314	408	278	163	441
58,800 sq.ft. Office	71	11	82	11	58	69
113,415 sq.ft. Retail	66	41	107	207	225	432
Pass-by Trips				-70	-77	-147
New Trips	*66*	*41*	*107*	*137*	*148*	*285*
Total Trips	**260**	**455**	**715**	**526**	**428**	**954**
Current/Proposed minus Appproved in Traffic Study						
Incremental Trips	**-41**	**5**	**-36**	**-48**	**-83**	**-131**

NOTE: ANY FUTURE DEVELOPMENT THAT GENERATES MORE THAN 46 MORNING PEAK HOUR TRIPS OR 143 EVENING PEAK HOUR TRIPS WILL REQUIRE IMPROVEMENTS TO MARRIOTTSVILLE ROAD

ROAD CHART				
ROAD	CLASSIFICATION	DESIGN SPEED	RIGHT-OF-WAY	PVMT TYPE
VERONA PLACE	PRIVATE ACCESS STREET	30 mph	28' PRIVATE ESMT	P-3
PARMA LANE	PRIVATE ACCESS PLACE	25 mph	28' PRIVATE ESMT	P-3

Site Analysis Data Chart Zoned: PGCC	Total	Phase 1	Phase 2	(Future) Phase 3
Gross Area	**17.03 acres**	**9.16 acres**	**3.20 acres**	**4.67 acres**
100yr Floodplain	0.00 acres	0.00 acres	0.00 acres	0.00 acres
Steep Slopes 25% or >(outside floodplain)	2.04 acres	0.77 acres	0.66 acres	0.61 acres
Net Area	14.99 acres	8.39 acres	2.54 acres	4.06 acres
Number of Proposed Units:				
Single Family Attached:	85	68	17	0
Apartments:	96	0	0	96
Total Units:	**181**	**68**	**17**	**96**
Area of Buildable Lots	4.02 acres	3.34 acres	0.68 acres	0.00 acres
Area of Buildable Bulk Parcels	4.67 acres	0.00 acres	0.00 acres	4.67 acres
Area of Proposed Right-of-way	1.59 acres	1.59 acres	0.00 acres	0.00 acres
Open Space Calculations				
Area of Open Space Required (15% of gross)	2.55 acres	1.37 acres	0.48 acres	0.70 acres
Area of Open Space Provided	6.75 acres	4.23 acres	2.52 acres	0.00 acres
Recreational Open Space Required	NA (PGCC)	NA (PGCC)	NA (PGCC)	NA (PGCC)
Parking Calculations				
Parking Required SFA Lots: 2.5 spaces per unit (Section 133.0.D.2.a)	213	170	43	NA
Parking Provided SFA Lots: 1 space per garage + 1 space per driveway + 68 offstreet parking spaces	239	190	49	NA

ROADWAY PARKING RESTRICTION CHART	
ROAD	LOCATION
VERONA PLACE	STA.0+00 TO STA.2+53 (BOTH SIDES)

SHEET INDEX

ESD STORMWATER MANAGEMENT SUMMARY TABLE

PHASE	Practice MDE	Practice Type	No.	DA (sf)	Imp Area (sf)	% Imp	Rv	Pe required	Af (sf) Required	Af (sf) Provided	2% DA?	ESDv (cf) Required	ESDv (cf) Provided	Pe Provided	REv Required	REv Provided	Ownership
1	(F-6)	Bioretention	#2	136,586	88,781	65%	0.64	2.0	2732	10840	PASS	14455	15152	2.1	8,140 cf	3614	Private
1	(F-6)	Bioretention	#3	55,590	36,134	65%	0.64	2.0	1112	4092	PASS	5883	6087	2.1		1964	Private
2	(F-6)	Bioretention	#4	41,908	27,240	65%	0.64	2.0	838	2719	PASS	4435	4443	2.0		0	Private
1	(F-6)	Bioretention	#5	23,864	15,512	65%	0.64	2.0	477	2644	PASS	2526	3708	2.9		631	Private
1	(F-6)	Bioretention	#6	28,900	18,785	65%	0.64	2.0	578	2427	PASS	3059	3582	2.3		765	Private
1	(F-6)	Bioretention	#7	18,644	12,119	65%	0.64	2.0	373	1239	PASS	1973	1998	2.0		493	Private
3	(M-6)	Micro-Bioretention	#8	13,063	8,491	65%	0.64	2.0	261	493	PASS	1383	1376	2.0		346	Private
3	(M-6)	Micro-Bioretention	#9	5,582	3,628	65%	0.64	2.0	112	349	PASS	591	623	2.1		148	Private
3	(M-6)	Micro-Bioretention	#10	6,067	3,944	65%	0.64	2.0	121	359	PASS	642	642	2.0		161	Private
1	(M-2)	Submerged Gravel Wetland	SG-1	328,980	213,837	65%	0.64	2.0				34817	40482	2.3		0	Private
Totals per individual Drainage Area																	
Totals per individual Drainage Area				659,184	428,470	65%	0.64					69764	78092				
Totals per Overall Site				734,505	440,703	60%	0.59	2.0				72226	78092			8121	

Notes:
1. The Pe required column is based on total site Pe calculation. The Rv is based on individual drainage area percent impervious (per DED)

APPROVED: DEPARTMENT OF PUBLIC WORKS

(signature) 09/21/2021
CHIEF, BUREAU OF HIGHWAYS MK — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

(signature) 1/21/22
CHIEF, DIVISION OF LAND DEVELOPMENT NH — DATE

(signature) 1.18.22
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: 6-30-2023.

(Seal: STATE OF MARYLAND — CHRISTOPHER A. MALAGARI — 22390 — PROFESSIONAL ENGINEER) (signature) 8-19-21

OWNER/DEVELOPER:

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

TVTS RETAIL, LLC.
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
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THE VILLAGE AT TOWN SQUARE
PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

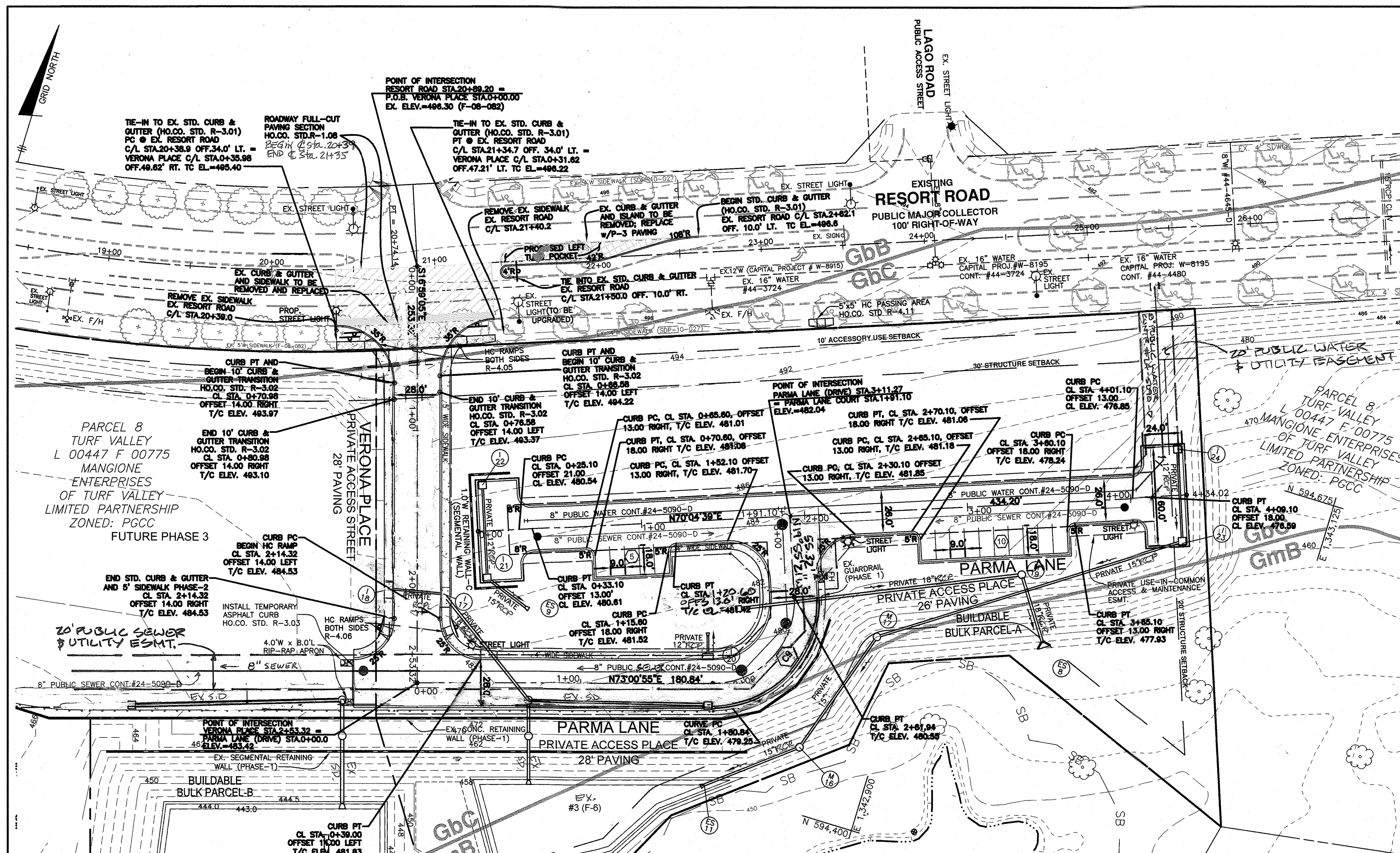
SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
ZONED: PGCC

COVER SHEET

DESIGN: DBT/MCR	DRAFT: DBT/MCR	DATE: AUGUST, 2021	BEI PROJECT NO. 2899
		SCALE: AS SHOWN	SHEET 1 OF 15

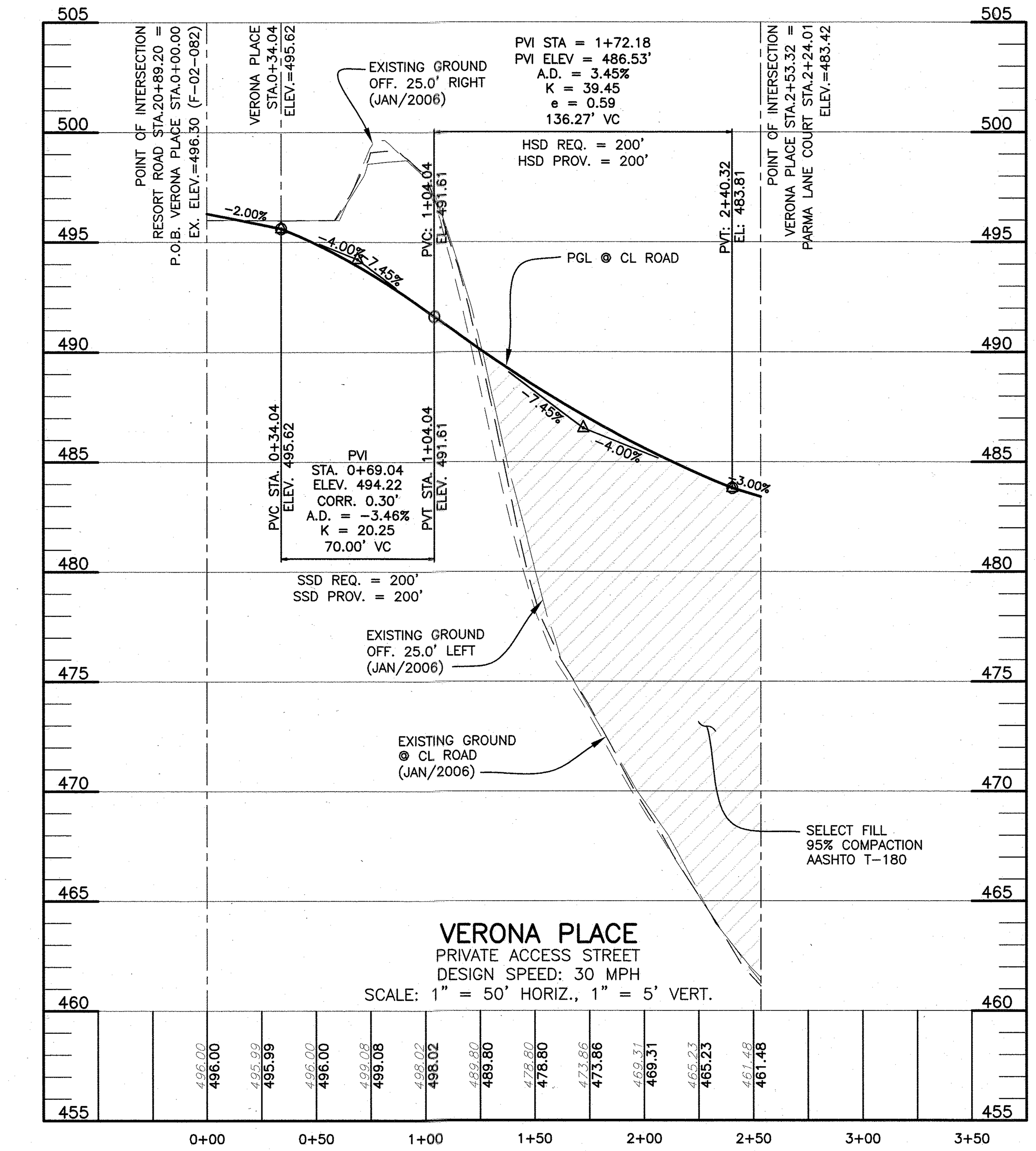
F-20-072



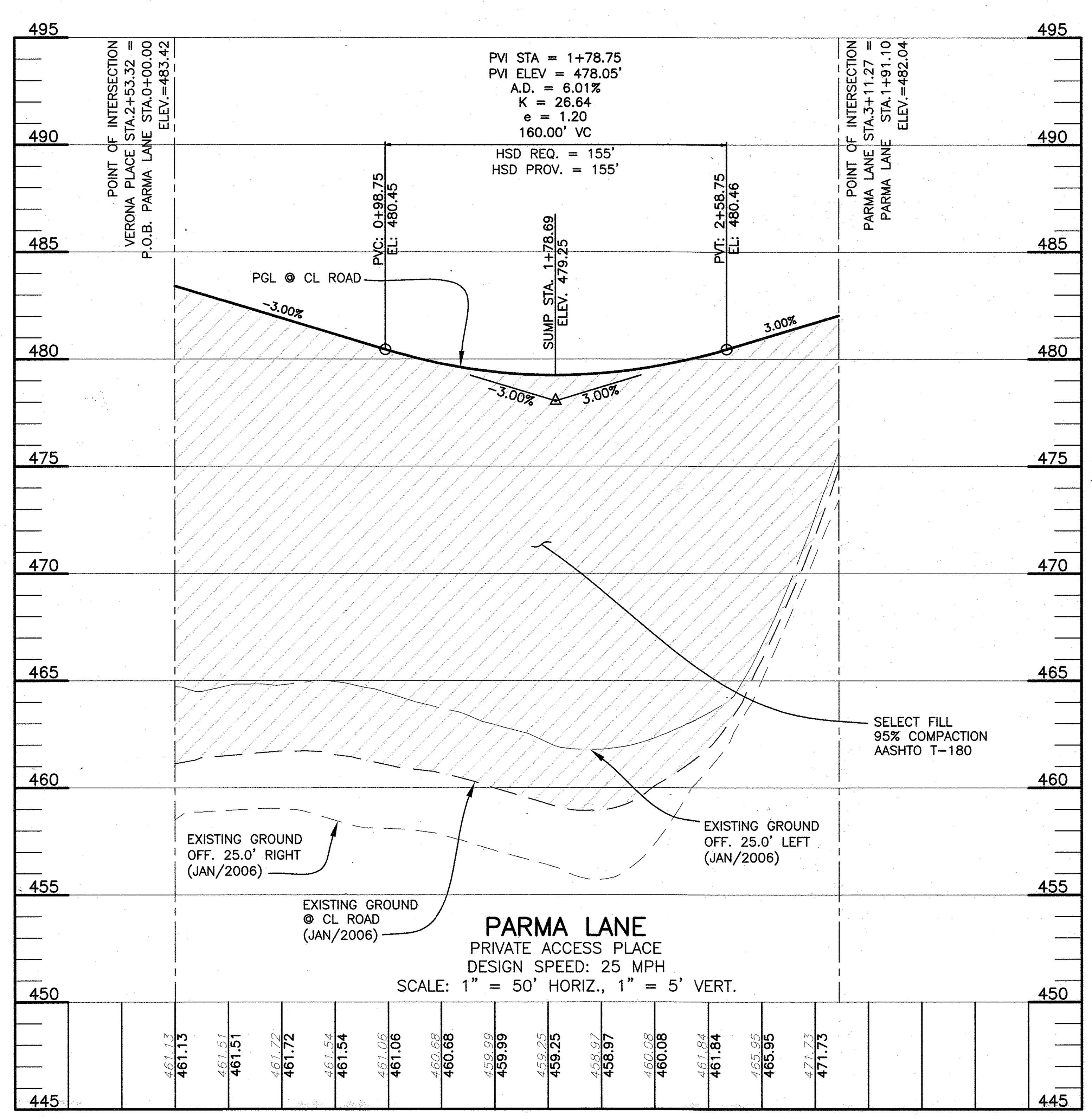
ROAD PLAN
SCALE: 1" = 50'

CENTER LINE CURVE DATA								
CURVE	ALIGNMENT	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD DIRECTION	CHORD LENGTH
C9	Parma Drive	1+80.84 TO 2+61.94	50.00'	81.10'	92°56'16"	52.63'	N26° 32' 47"E	72.50'

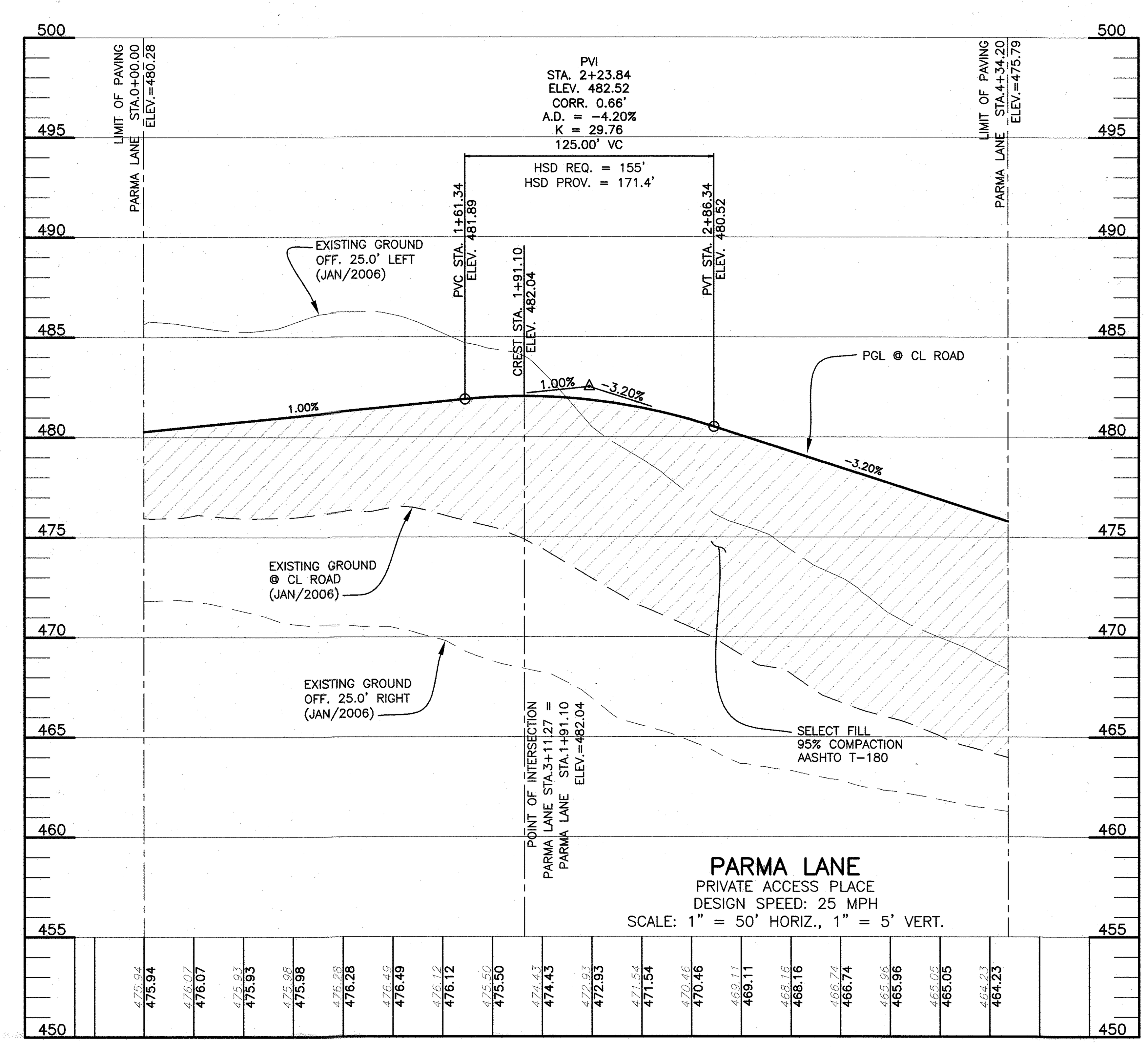
ROAD CHART				
ROAD	CLASSIFICATION	DESIGN SPEED	RIGHT-OF-WAY	PVMT TYPE
VERONA PLACE	PRIVATE ACCESS STREET	30 mph	28' PRIVATE ESMT	P-3
PARMA LANE	PRIVATE ACCESS PLACE	25 mph	28' PRIVATE ESMT	P-3



VERONA PLACE
PRIVATE ACCESS STREET
DESIGN SPEED: 30 MPH
SCALE: 1" = 50' HORIZ., 1" = 5' VERT.



PARMA LANE
PRIVATE ACCESS PLACE
DESIGN SPEED: 25 MPH
SCALE: 1" = 50' HORIZ., 1" = 5' VERT.



PARMA LANE
PRIVATE ACCESS PLACE
DESIGN SPEED: 25 MPH
SCALE: 1" = 50' HORIZ., 1" = 5' VERT.

SEE SHEET 4 FOR TYPICAL SECTIONS AND PAVING SPECIFICATIONS

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — DATE 09/21/2021

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT NH — DATE 1/21/22

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.18.22

NO.	DATE	REVISION

BENCHMARK
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SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
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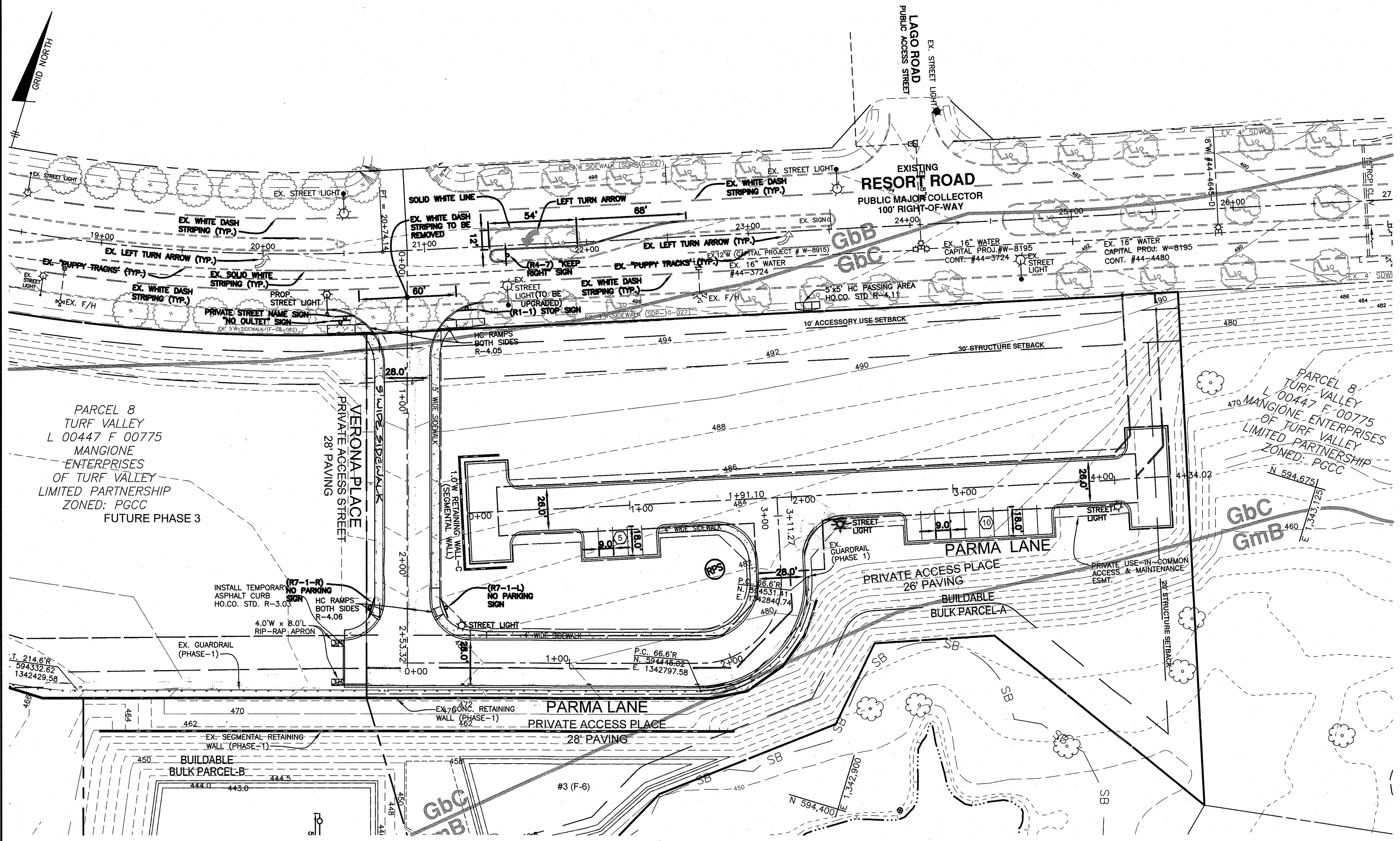
PRIVATE ROADWAY PLANS, PROFILES, NOTES, AND DETAILS

DESIGN: DBT/MCR	DRAFT: DBT/MCR	DATE: AUGUST, 2021	BEI PROJECT NO. 2899
		SCALE: AS SHOWN	SHEET 2 OF 15

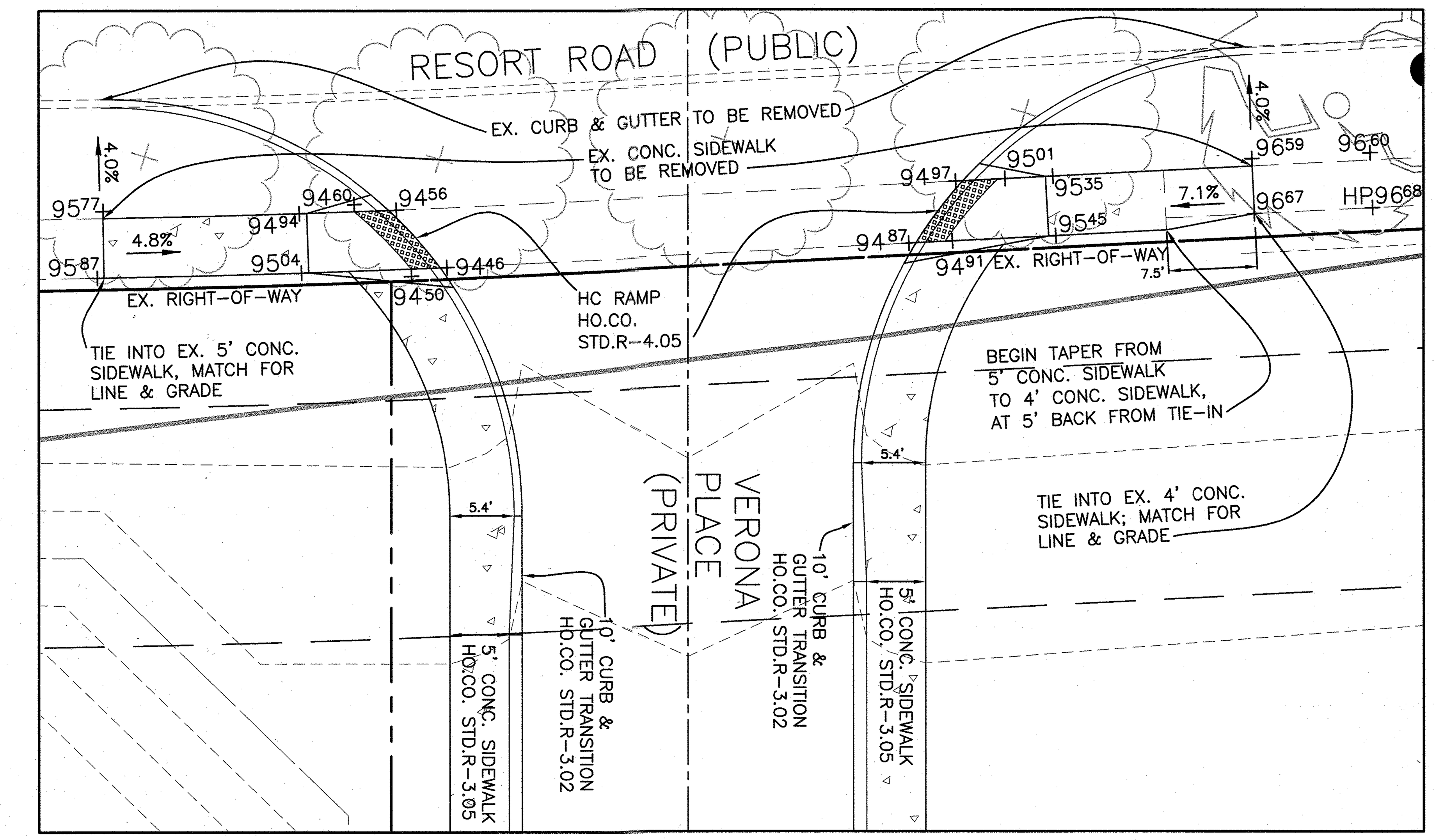
F-20-072

J:\2899 Village at Town Square\dwg\7000.dwg, 8/18/2021 5:16:19 PM, MRiedel



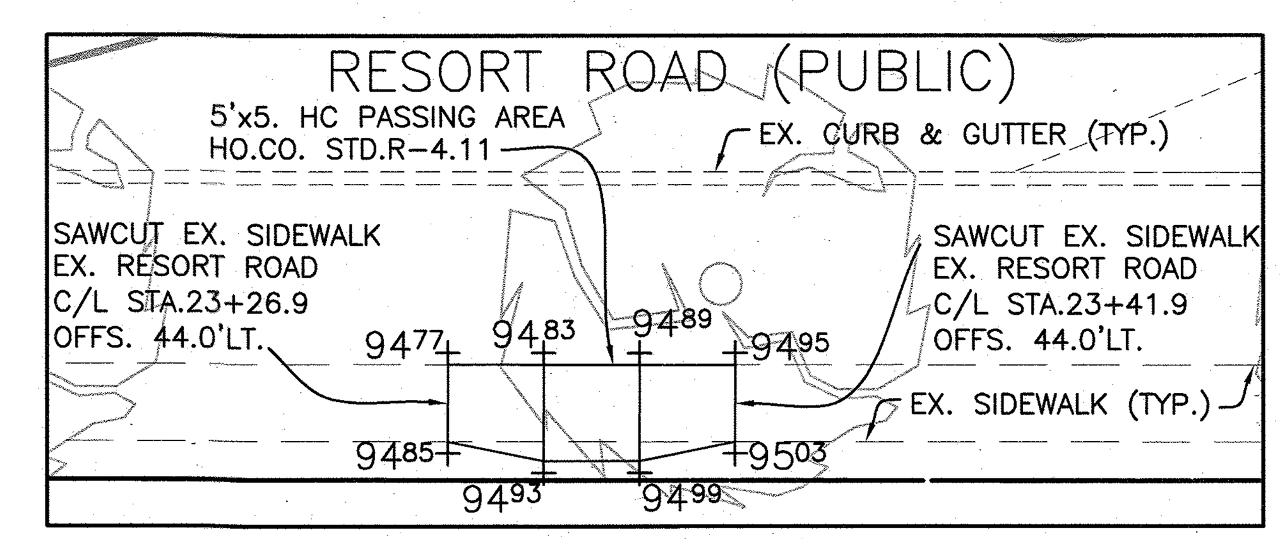
STRIPING & LIGHTING PLAN

SCALE: 1" = 50'



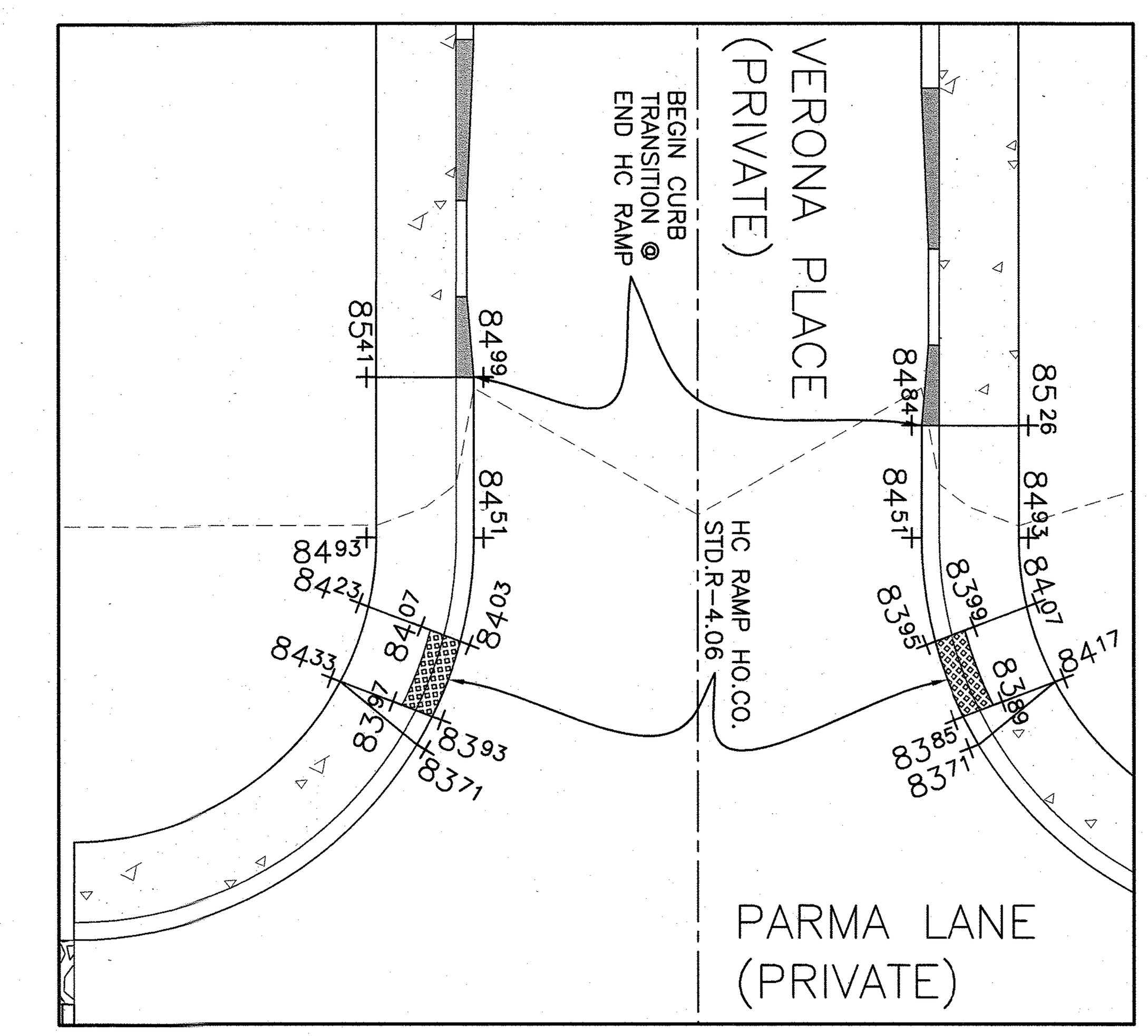
HC RAMP DETAIL

SCALE: 1" = 10'



HC PASSING AREA DETAIL

SCALE: 1" = 10'



HC RAMP DETAIL

SCALE: 1" = 10'

PAVEMENT MARKING NOTES

1) ALL PAVEMENT MARKINGS TO BE 5" WIDE REFLECTIVE PREFORMED THERMOPLASTIC PAVEMENT MARKINGS.

2) ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

3) ALL PAVEMENT MARKINGS SHALL BE LAYED-OUT AND APPROVED BY THE TRAFFIC ENGINEER BEFORE INSTALLATION.

4) ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY OWNED RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED (QUICK PUNCH), SQUARE TUBE POST (14 ga.) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 ga.) - 3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.

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

6) STREET TREES MUST BE A MINIMUM OF FOUR(4) FEET FROM THE CURB OR SIDEWALK AND MUST BE A MINIMUM OF FIVE(5) FEET FROM ANY STORM DRAIN. A MINIMUM DISTANCE OF TWENTY(20) FEET MUST BE MAINTAINED BETWEEN ANY TREES LOCATED ALONG THE CURB LINE AND FROM STREET LIGHTS. TREES MUST BE PLANTED A MINIMUM OF FIVE(5) FEET FROM AN OPEN SPACE ACCESSS STRIP AND TEN(10) FEET FROM A DRIVEWAY.

ROADWAY PARKING RESTRICTION CHART	
ROAD	LOCATION
VERONA PLACE	STA.0+00 TO STA.2+53 (BOTH SIDES)

UPGRADE EXISTING PUBLIC STREET LIGHT SCHEDULE

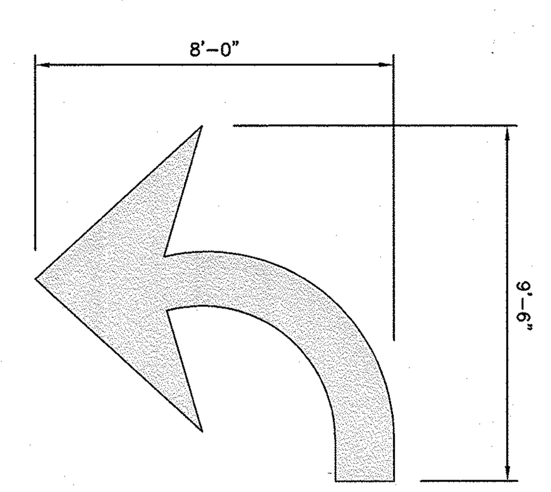
SYMBOL	LOCATION	DESCRIPTION
	RESORT ROAD 21+50; RIGHT 37.0'	UPGRADE TO LED-250 COBRAHEAD FIXTURE MOUNTED AT 30' ON EXISTING BRONZE FIBERGLASS POLE USING A 12' ARM

PROPOSED PUBLIC STREET LIGHT SCHEDULE

SYMBOL	LOCATION	DESCRIPTION
	RESORT ROAD 20+39; RIGHT 37.0'	LED-250 COBRAHEAD FIXTURE MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING A 12' ARM

PROPOSED PRIVATE STREET LIGHT SCHEDULE

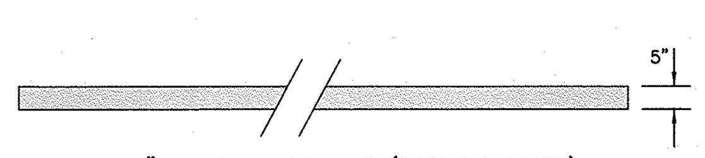
SYMBOL	LOCATION	DESCRIPTION
	PARMA LANE: 0+33.6; LEFT 23.0'	LED-100 COLONIAL POST-TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE
	PARMA LANE: 2+30.0; RIGHT 16.2' (COURT)	
	PARMA LANE: 4+01.1; RIGHT 16.1' (COURT)	



TURN LANE/USE ARROW

TRAFFIC STRIPING PAVEMENT SYMBOL

NOT TO SCALE



1 - 5" SOLID WHITE LINE (PARKING LINES)

TRAFFIC STRIPING PAVEMENT LINES

NOT TO SCALE

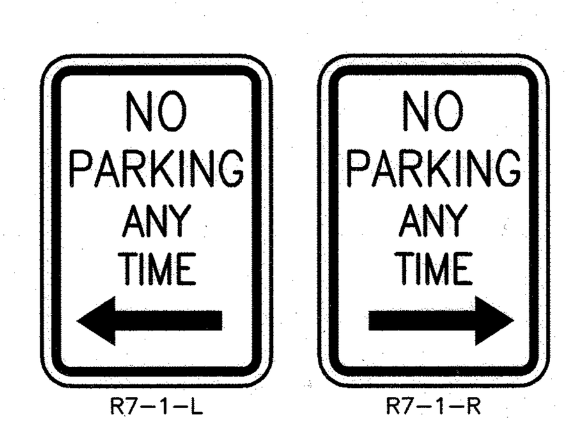
PREFORMED THERMOPLASTIC MATERIAL

PARKING SPACES:

PARKING SPACE MARKINGS SHALL BE INSTALLED USING PRE-FORMED HEAT APPLIED THERMO OF LIQUID THERMOPLASTIC (5" WIDE, WHITE). TRAFFIC ENGINEERING SHALL LAYOUT IN THE FIELD

SIGN POSTS:

ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.



PARKING SIGNAGE DETAILS

NOT TO SCALE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — 09/21/2021 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 1/21/22 DATE

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F-20-072

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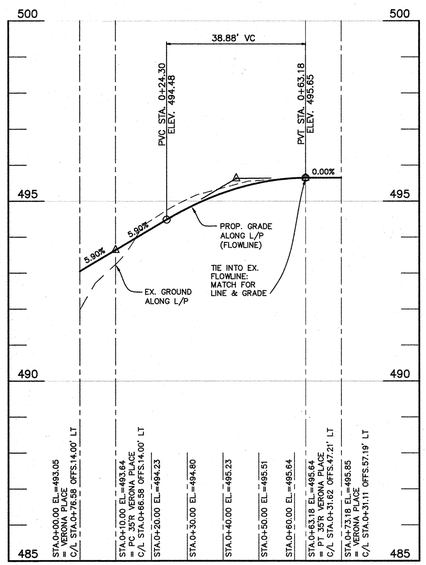
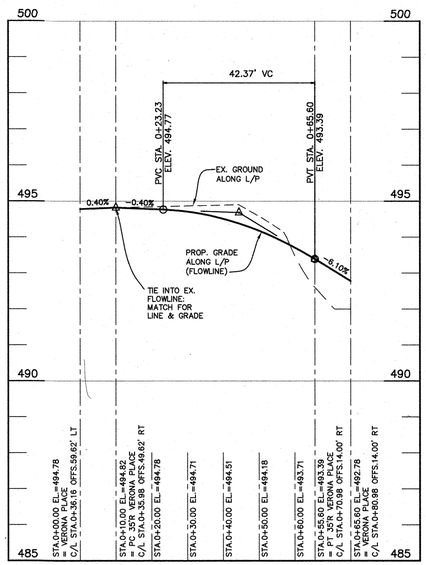
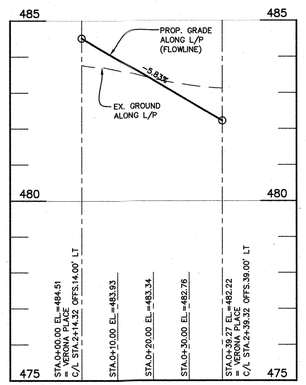


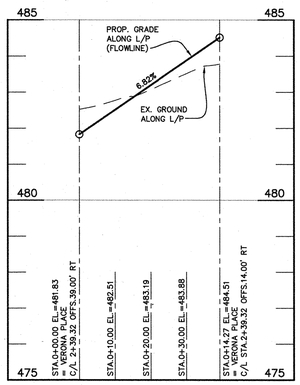
CURB RETURN PROFILE
INTERSECTION – WEST CORNER
VERONA PLACE & RESORT ROAD
VERTICAL SCALE: 1" = 2'
HORIZONTAL SCALE: 1" = 20'



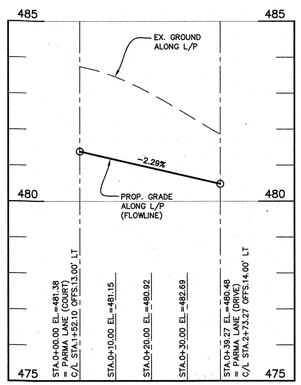
CURB RETURN PROFILE
INTERSECTION – EAST CORNER
VERONA PLACE & RESORT ROAD
VERTICAL SCALE: 1" = 2'
HORIZONTAL SCALE: 1" = 20'



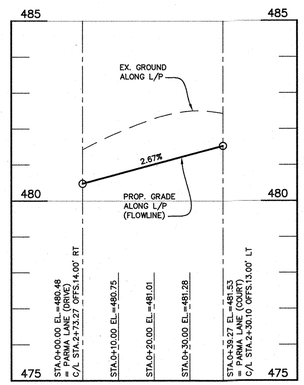
CURB RETURN PROFILE
INTERSECTION – WEST CORNER
VERONA PLACE & PARMA LANE
VERTICAL SCALE: 1" = 2'
HORIZONTAL SCALE: 1" = 20'



CURB RETURN PROFILE
INTERSECTION – EAST CORNER
VERONA PLACE & PARMA LANE
VERTICAL SCALE: 1" = 2'
HORIZONTAL SCALE: 1" = 20'

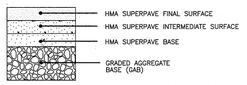


CURB RETURN PROFILE
INTERSECTION – WEST CORNER
PARMA LANE & PARMA LANE
VERTICAL SCALE: 1" = 2'
HORIZONTAL SCALE: 1" = 20'



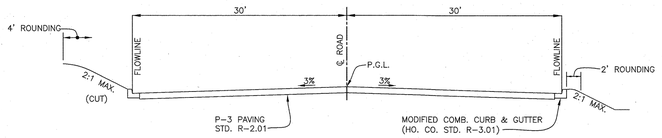
CURB RETURN PROFILE
INTERSECTION – EAST CORNER
PARMA LANE & PARMA LANE
VERTICAL SCALE: 1" = 2'
HORIZONTAL SCALE: 1" = 20'

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-SAC: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		HMA SUPERPAVE BASE 19.0 MM PG 64-22, LEVEL 1 (LOW ESAL)	3.0	3.0	3.0	4.5	3.0	2.0
		GRADED AGGREGATE BASE (GAB)	10.0	6.0	3.0	6.0	6.0	6.0

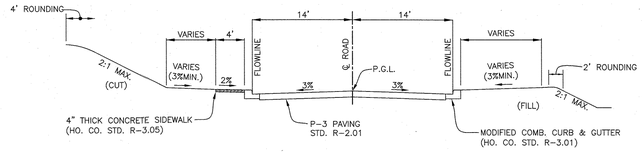


* PAVING SECTION SHALL BE CONFIRMED BY THE GEOTECHNICAL ENGINEER IN THE FIELD BASED ON THE CBR TESTS RESULTS.

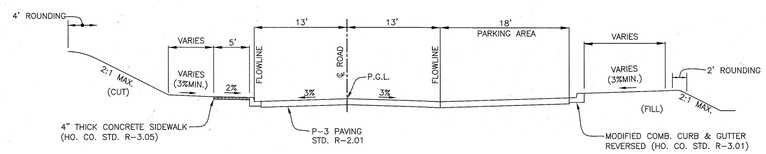
P-3 PAVING DETAIL



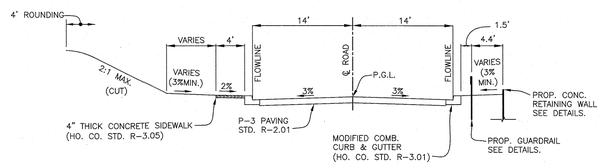
STA.4+09.10 TO END STA.4+34.20



STA.2+51.70 TO P.O.I. STA.3+11.27

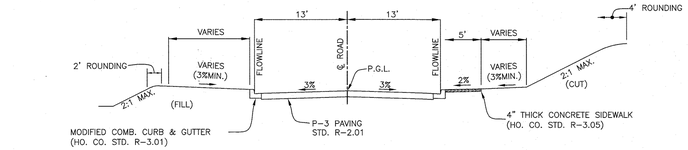


STA.0+70.60 TO STA.1+15.60
STA.2+70.10 TO STA.3+60.10

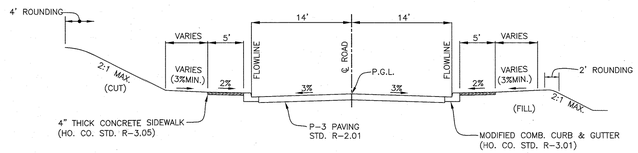


P.O.B. STA.0+00.00 TO STA.2+51.70

TYPICAL ROADWAY SECTIONS
PARMA LANE
PRIVATE ACCESS PLACE
DESIGN SPEED: 25 MPH
SCALE: 1" = 10'

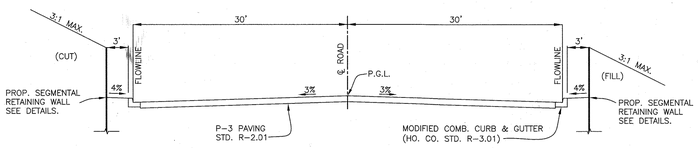


STA.0+25.10 TO STA.0+70.60
STA.1+15.60 TO STA.2+70.10
STA. 3+60.10 TO STA.4+09.10



P.O.B. STA.0+00.00 TO P.O.I. STA.2+53.32

TYPICAL ROADWAY SECTION
VERONA PLACE
PRIVATE ACCESS STREET
DESIGN SPEED: 30 MPH
SCALE: 1" = 10'



P.O.B. STA.0+00.00 TO STA.0+25.10

TYPICAL ROADWAY SECTIONS
PARMA LANE
PRIVATE ACCESS PLACE
DESIGN SPEED: 25 MPH
SCALE: 1" = 10'

50 0 25 50 100 200
1 inch = 50 ft.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — DATE 09/21/2021

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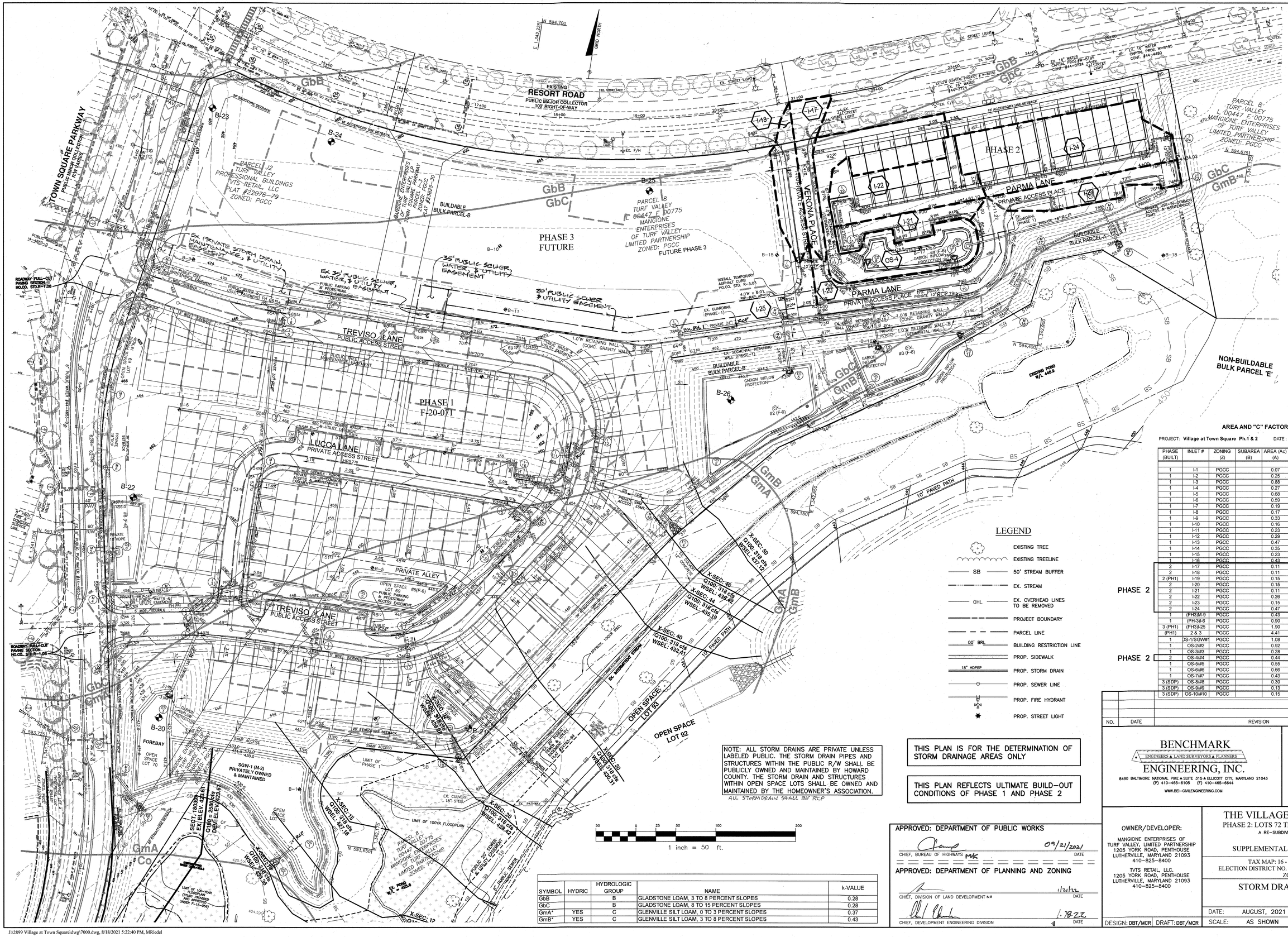

SYMBOL	HYDRIC	HYDROLOGIC GROUP	NAME	k-VALUE
GbB		B	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.28
GbC		B	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	0.28
GmA*	YES	C	GLENVILLE SILT LOAM, 0 TO 3 PERCENT SLOPES	0.37
GmB*	YES	C	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.43

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 09/21/2021

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/21/22

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.18.22

AREA AND "C" FACTOR TABULATION

PROJECT: **Village at Town Square Ph.1 & 2** DATE: 5/20/2021 BY: **MCR**

PHASE (BUILT)	INLET #	ZONING (Z)	SUBAREA (B)	AREA (Ac) (A)	"C" FACTOR (C)<25	"C" FACTOR ©>25	% IMPERVIOUS (P)<25
1	I-1	PGCC		0.07	0.35		65.0
1	I-2	PGCC		0.25	0.35		65.0
1	I-3	PGCC		0.88	0.35		65.0
1	I-4	PGCC		0.27	0.35		65.0
1	I-5	PGCC		0.68	0.35	0.44	65.0
1	I-6	PGCC		0.59	0.35	0.44	65.0
1	I-7	PGCC		0.19	0.38		65.0
1	I-8	PGCC		0.17	0.37		65.0
1	I-9	PGCC		0.33	0.38	0.49	65.0
1	I-10	PGCC		0.16	0.37		65.0
1	I-11	PGCC		0.23	0.35		65.0
1	I-12	PGCC		0.29	0.35		65.0
1	I-13	PGCC		0.47	0.38	0.49	65.0
1	I-14	PGCC		0.35	0.37		65.0
1	I-15	PGCC		0.23	0.35		65.0
1	I-16	PGCC		0.43	0.35		65.0
2	I-17	PGCC		0.11	0.35		65.0
2	I-18	PGCC		0.11	0.35		65.0
2 (PH1)	I-19	PGCC		0.15	0.35	0.44	65.0
2	I-20	PGCC		0.15	0.35	0.44	65.0
2	I-21	PGCC		0.11	0.35	0.44	65.0
2	I-22	PGCC		0.26	0.35	0.44	65.0
2	I-23	PGCC		0.15	0.35	0.44	65.0
2	I-24	PGCC		0.47	0.35	0.44	65.0
1	(PH3)M-9	PGCC		0.43	0.35		65.0
1	(PH-3)I-6	PGCC		0.90	0.35		65.0
3 (PH1)	(PH3)I-25	PGCC		1.90	0.35		65.0
(PH1)	2 & 3	PGCC		4.41	0.35	0.44	65.0
1	OS-1/SGW#1	PGCC		1.08	0.38	0.49	65.0
1	OS-2/#2	PGCC		0.92	0.35	0.45	65.0
1	OS-3/#3	PGCC		0.28	0.37	0.47	65.0
2	OS-4/#4	PGCC		0.44	0.35	0.44	65.0
1	OS-5/#5	PGCC		0.55	0.36	0.46	65.0
1	OS-6/#6	PGCC		0.66	0.35	0.44	65.0
1	OS-7/#7	PGCC		0.43	0.38	0.49	65.0
3 (SDP)	OS-8/#8	PGCC		0.30	0.35	0.44	65.0
3 (SDP)	OS-9/#9	PGCC		0.13	0.35	0.44	65.0
3 (SDP)	OS-10/#10	PGCC		0.15	0.35	0.44	65.0

PHASE 2

PHASE 2

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: 6-30-2023.

STATE OF MARYLAND — CHRISTOPHER MARK RIEDEL — 22390 — PROFESSIONAL ENGINEER — 8-19-21

OWNER/DEVELOPER:

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

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THE VILLAGE AT TOWN SQUARE

PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
ZONED: PGCC

STORM DRAINAGE AREA MAP

DESIGN: DBT/MCR DRAFT: DBT/MCR

DATE: AUGUST, 2021 BEI PROJECT NO. 2899
SCALE: AS SHOWN SHEET 5 OF 15

F-20-072

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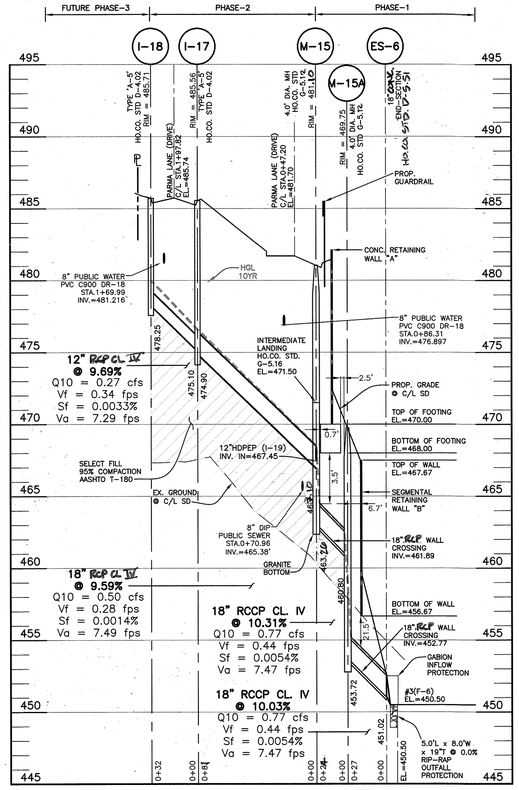
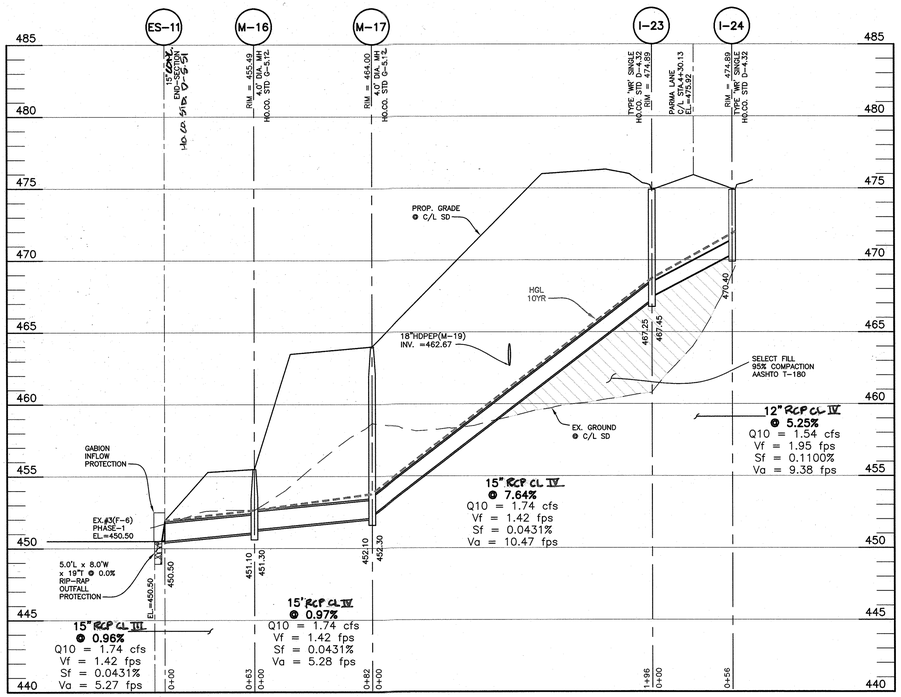
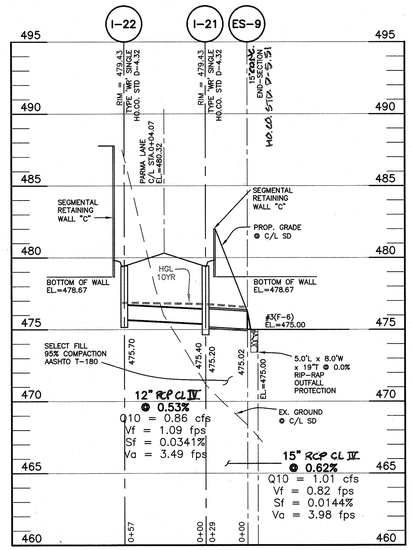


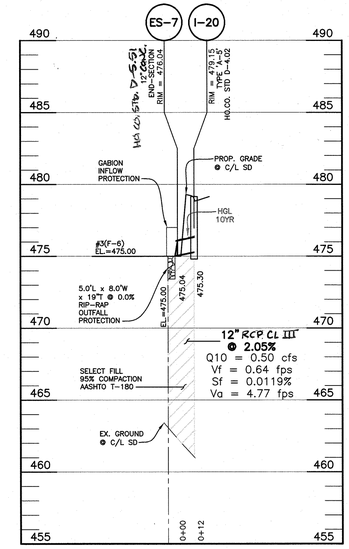
STORM DRAIN PROFILE
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1"= 50'



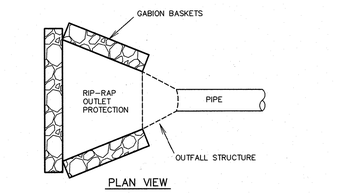
STORM DRAIN PROFILE
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'



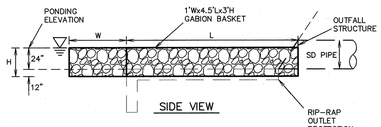
STORM DRAIN PROFILE
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'



STORM DRAIN PROFILE
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'



PLAN VIEW



SIDE VIEW

GABION INLFOW PROTECTION
NOT TO SCALE

NOTE: ALL RIP-RAP INFLOW PROTECTION INTO THE ESD SWMF ARE 8.0'W x 5.0'L x 19"T BASED ON THE MAX. INFLOW @ ES-3 (SEE SD REPORT)

PIPE TABLE - PH.2		
OWNER	SIZE / MATERIAL	LENGTH
PRIVATE	12" RCP CL III / CL IV	12 / 145
PRIVATE	15" RCP CL III / CL IV	69 / 307
PRIVATE	18" RCP CL IV	301

NOTE: ALL STORM DRAINS ARE PRIVATE UNLESS LABELED PUBLIC. THE STORM DRAIN PIPES AND STRUCTURES WITHIN THE PUBLIC R/W SHALL BE PUBLICLY OWNED AND MAINTAINED BY HOWARD COUNTY. THE STORM DRAIN AND STRUCTURES WITHIN OPEN SPACE LOTS SHALL BE OWNED AND MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.

STRUCTURE TABLE								
NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	STD. DETAIL	OWNER	REMARKS
END SECTIONS								
ES-7	12" CONC. END-SECTION	N:594,486.6986 E:1,342,781.7449	475.04(12")		476.10	HO.CO. STD. D-5.51	PRIVATE	#4 INLFOW
ES-8	18" TYPE 'A' CONC. HEADWALL	N:594,544.2660 E:1,342,978.4246	455.68(18")		457.68	HO.CO. STD. D-5.11	PRIVATE	#4 OUTFALL
ES-9	15"CONC. END-SECTION	N:594,471.5781 E:1,342,669.7008	475.02(15")		476.38	HO.CO. STD. D-5.51	PRIVATE	#4 INLFOW
ES-11	15"CONC. END-SECTION	N:4,400.2242 E:1,342,805.7074	450.50(15")		451.75	HO.CO. STD. D-5.51	PRIVATE	#3 INLFOW (PHASE-1)
INLETS								
I-17	A-5	VERONA PLACE, C/L STA.=1+99.32, OFFS.16.18' RT	475.10(12")	474.90(18")	485.56	HO.CO. STD. D-4.02	PRIVATE	
I-18	A-5	VERONA PLACE, C/L STA.=1+96.32, OFFS.16.18' LT		478.25(12")	485.71	HO.CO. STD. D-4.02	PRIVATE	
(EX.) I-19	TYPE 'S' COMBO.	N:594,447.0816 E:1,342,793.8488		473.45(12")	479.15	HO.CO. STD. D-4.26	PRIVATE	PHASE 1
I-20	A-5	PARMA LANE, C/L STA.=1+77.87, OFFS.16.18' LT		475.30(12")	479.15	HO.CO. STD. D-4.02	PRIVATE	
I-21	"SINGLE" WR	PARMA LN.(CT), C/L STA.=0+04.07, OFFS.28.12' LT	475.40(12")	475.20(15")	479.43	HO.CO. STD. D-4.32	PRIVATE	
I-22	"SINGLE" WR	PARMA LN.(CT), C/L STA.=0+04.07, OFFS.28.12' RT		475.70(12")	479.43	HO.CO. STD. D-4.32	PRIVATE	
I-23	"SINGLE" WR	PARMA LN.(CT), C/L STA.=4+30.13, OFFS.28.12' LT	467.45(12")	467.25(15")	474.89	HO.CO. STD. D-4.32	PRIVATE	
I-24	"SINGLE" WR	PARMA LN.(CT), C/L STA.=4+30.13, OFFS.28.12' RT		470.40(12")	474.89	HO.CO. STD. D-4.32	PRIVATE	
MANHOLES								
M-15	48" MH	N:594,419.8752 E:1,342,687.5149	467.10(18") 467.45(PH.2)	463.30(18")	481.10	HO.CO. STD. G-5.12	PRIVATE	(PHASE 1) GRANITE BOTTOM
M-15A	48" MH	N:594,397.0976 E:1,342,694.4841	460.80(18")	453.72(18")	469.75	HO.CO. STD. G-5.12	PRIVATE	(PHASE 1) GRANITE BOTTOM
M-16	48" MH	N:594,439.2740 E:1,342,854.8309	451.30(15")	451.10(15")	455.50	HO.CO. STD. G-5.12	PRIVATE	
M-17	48" MH	N:594,517.4473 E:1,342,880.6422	452.30(15")	452.10(15")	464.00	HO.CO. STD. G-5.12	PRIVATE	
M-19	48" MH	N:594,579.5562 E:1,342,954.5276	464.60(18")	464.50(18")	478.50	HO.CO. STD. G-5.12	PRIVATE	#4 OUTFALL
SWMF STRUCTURES								
OS-4	D	N:594,508.9555 E:1,342,794.5546	471.92(4")	470.75(18")	476.83	HO.CO. STD. D-4.11	PRIVATE	D-INLET w/BEEHIVE GRATE

CONSTRUCTION SPECIFICATIONS

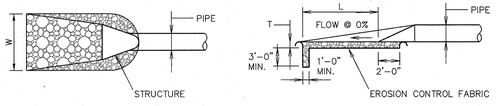
1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.

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
*ES-3	2.05	0.72	9.5"	5'	8'	19"	I
*ES-7	2.05	0.72	9.5"	5'	8'	19"	I
*ES-9	2.05	0.72	9.5"	5'	8'	19"	I

* RIP-RAP INLFOW PROTECTION INTO THE ESD SWMF ARE BASED ON THE MAX. INFLOW @ ES-3 (SEE SD REPORT)

OUTLET PROTECTION DETAIL
NOT TO SCALE

50 0 25 50 100 200

1 inch = 50 ft.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — DATE 09/21/2021

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/21/22

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.18.22

NO.	DATE	REVISION

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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. 22390, Expiration Date: 6-30-2023.

STATE OF MARYLAND — CHRISTOPHER M. RIEDEL — 22390 — PROFESSIONAL ENGINEER — 8-18-21

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THE VILLAGE AT TOWN SQUARE

PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
ZONED: PGCC

STORM DRAIN PROFILES, NOTES AND DETAILS

DESIGN: DBT/MCR	DRAFT: DBT/MCR	DATE: AUGUST, 2021	BEI PROJECT NO. 2899
		SCALE: AS SHOWN	SHEET 6 OF 15

F-20-072

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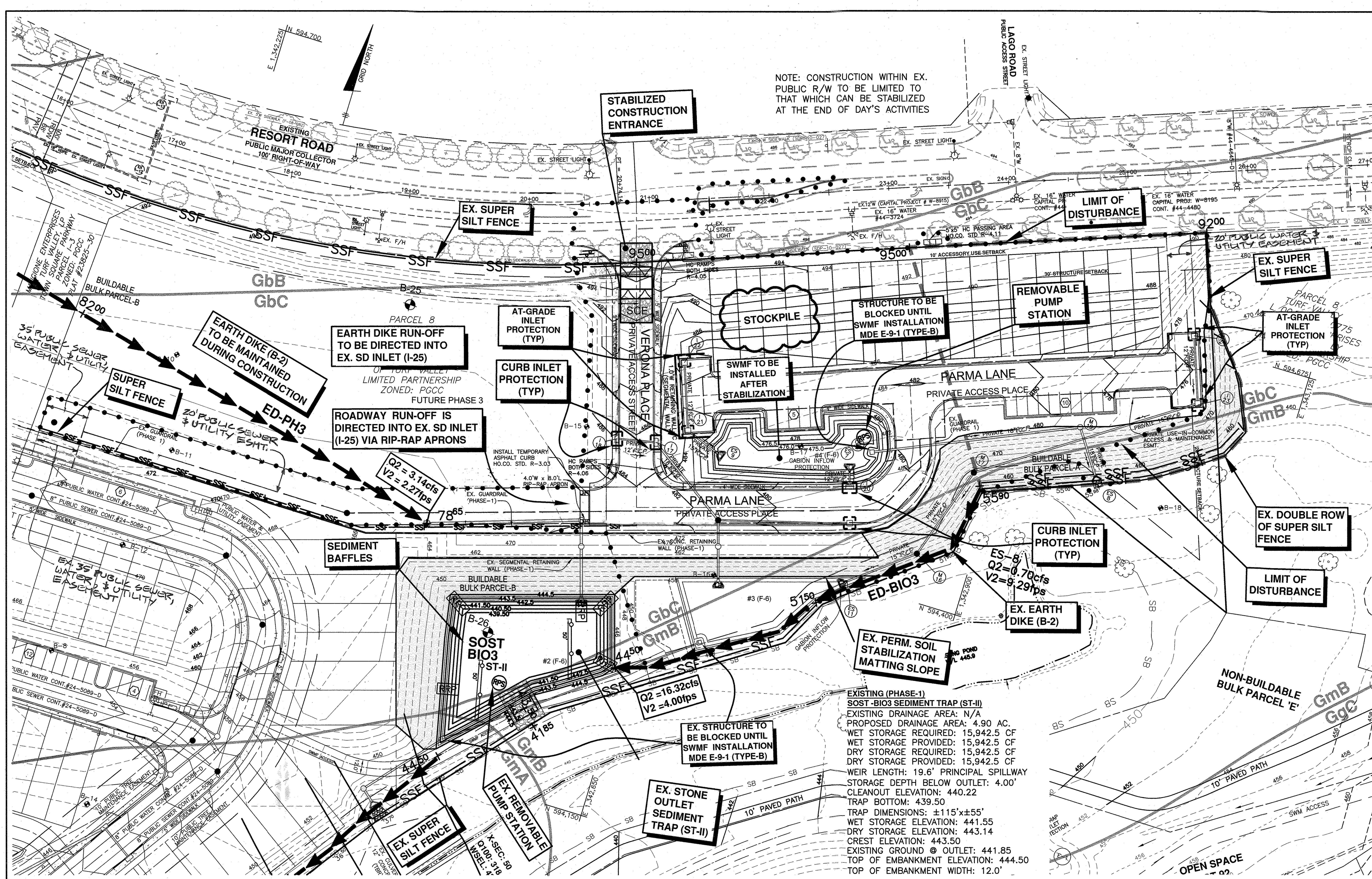


SEDIMENT & EROSION CONTROL PLAN

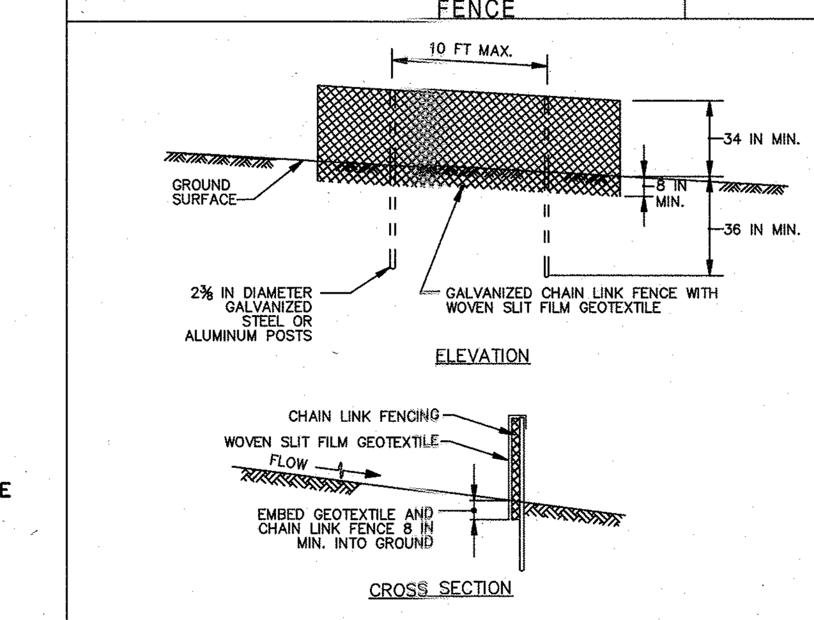
SCALE: 1" = 50'

1 inch = 50 ft.

LEGEND

- EXISTING CONTOURS
- EXISTING TREE
- EXISTING TREELINE
- 50' STREAM BUFFER
- EX. STREAM
- EX. OVERHEAD LINES TO BE REMOVED
- PROJECT BOUNDARY
- PARCEL LINE
- BUILDING RESTRICTION LINE
- PROP. SIDEWALK
- PROP. STORM DRAIN
- PROP. SEWER LINE
- PROP. WATER LINE / PROP. FIRE HYDRANT
- PROP. STREET LIGHT
- B-2X PROP. SOIL BORING TEST
- B-X EX. SOIL BORING TEST
- SOILS DELINEATION
- GgB SOILS TYPE
- SUPER SILT FENCE
- LIMIT OF DISTURBANCE
- INLET PROTECTION
- EARTH DIKE
- RRP GABION INFLOW PROTECTION
- PERMANENT SOIL STABILIZATION MATTING
- RPS REMOVABLE PUMP STATION
- SEDIMENT BAFFLE
- SEC PRACTICE DRAINAGE AREA

DETAIL E-3 SUPER SILT FENCE (STANDARD SYMBOL: SSF)



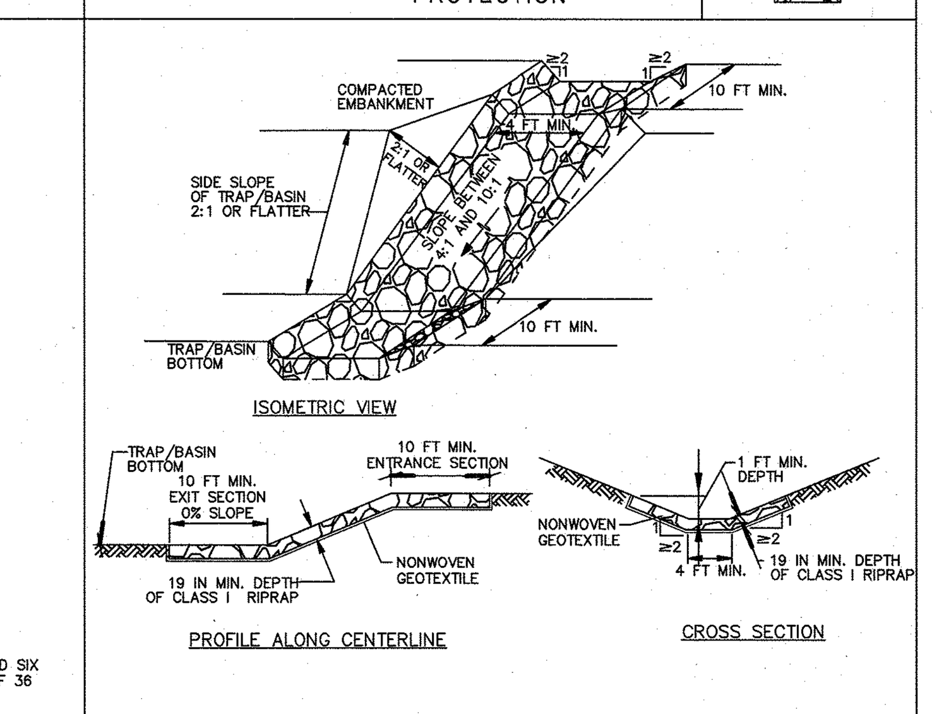
CONSTRUCTION SPECIFICATIONS

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 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

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF WORK

PHASE-2

1. Obtain grading/building permit. Notify D.I.L.P. at 410-313-1880 at least 24 hours before starting any work. (1 day)

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

3. Clear and grub as necessary. Note that the remaining existing controls installed under Phase-1 that be utilized under Phase-2, to be inspected and repaired as necessary before proceeding with construction activity and at the end of days construction activities. (day 3-7)

4. Proceed to mass grade and bring roadbeds to subgrade. Construct Retaining Wall-C, (day 8-18)

5. Install sewer, water, and storm drains; install Inlet Protection. Install blocking in OS-4, Construct (F-6) #4. Cover filter media with filter fabric. Do not install mulch or plantings at this time. (F-6) #4 to be de-watered with Removable Pump Stations as required. (day 19-38)

6. Install curb and gutter and base paving; Install rip-rap aprons at the end fillet of Parma Lane and direct flow into existing I-25. (day 59-67)

7. Complete grading for ESD-SWMF #4 and ESD-SWMF #3, convert to permanent use; remove Inlet Protection devices (day 68-99)

8. Complete fine grading of site and stabilize in accordance with the permanent seedbed notes. (day 100-115)

9. Upon approval from the Howard County Sediment Control Inspector, convert TOST-BIO3 into ESD-SWMF#2, install OS-2 to ES-4, remove existing ED-BIO3, remove the double row of Super Silt Fence, remove all inlet protections and stabilize any remaining disturbed areas in accordance with the permanent seedbed notes. ED-PH#3 discharging into existing I-25 is to remain. (day 116-130)

10. Install perimeter landscaping and stormwater management plantings. (day 131-135)

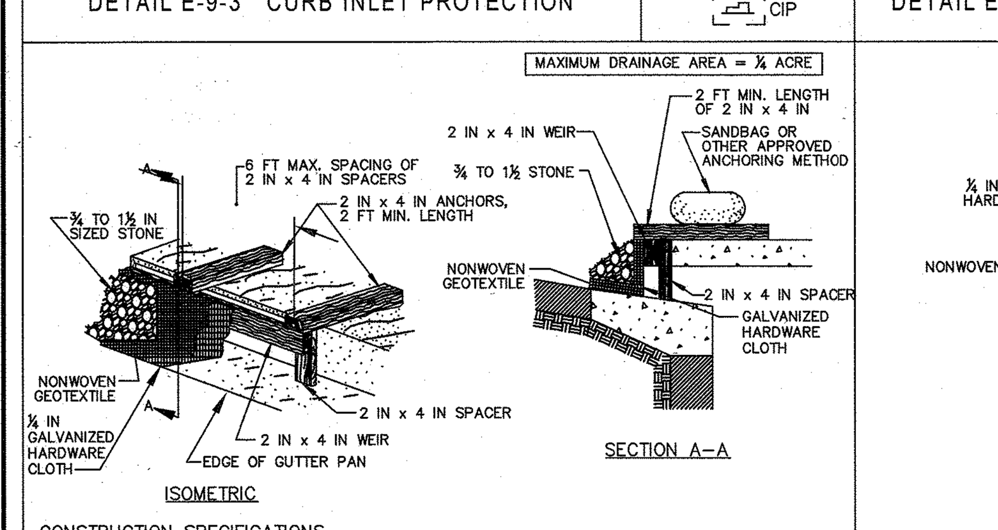
Note: Following initial soil disturbance or any re-disturbances, permanent or temporary stabilization shall be completed within:
- A. 3 calendar days for all perimeter sediment control structures, dikes, swales and all slopes greater than 3:1.
- B. 7 calendar days for all other disturbed areas.

During grading and after each rainfall, contractor will inspect and provide necessary maintenance to the sediment control measures of this plan.

THIS PLAN IS FOR SEDIMENT AND EROSION CONTROL ONLY.

SOILS CHART - SOIL SURVEY HOWARD COUNTY, MARYLAND					
SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME	k-VALUE
GbB		B		GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.20
GbC		B		GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	0.20
GmA*	YES	C		GLENVILLE SILT LOAM, 0 TO 3 PERCENT SLOPES	0.37
GmB*	YES	C		GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37

DETAIL E-9-3 CURB INLET PROTECTION (STANDARD SYMBOL: CIP)



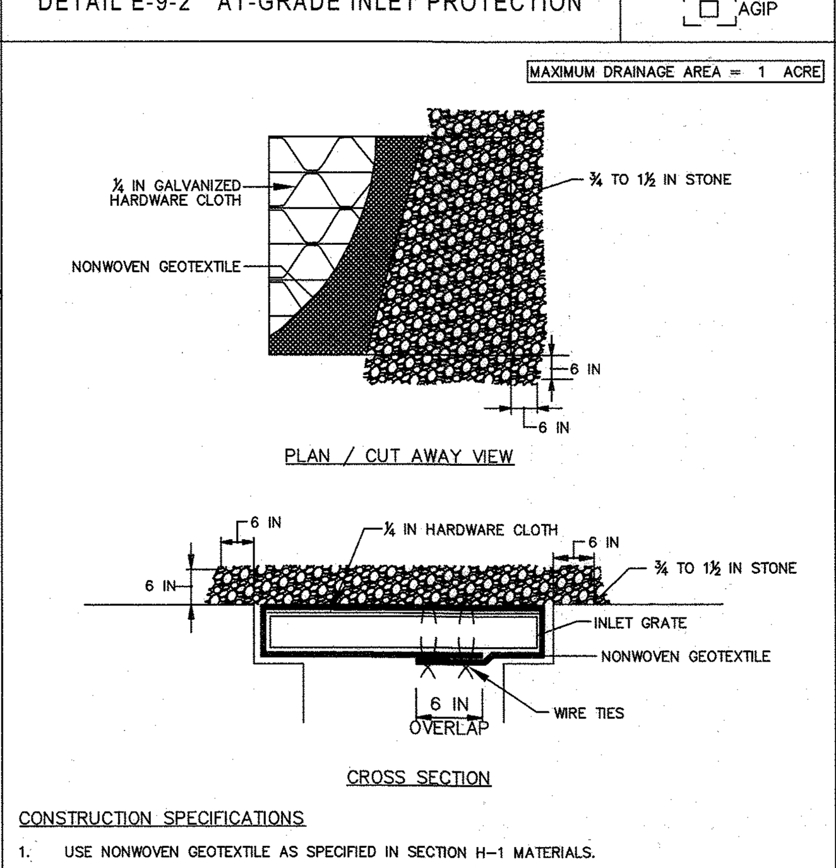
CONSTRUCTION SPECIFICATIONS

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 E-9-2 AT-GRADE INLET PROTECTION (STANDARD SYMBOL: AGIP)



CONSTRUCTION SPECIFICATIONS

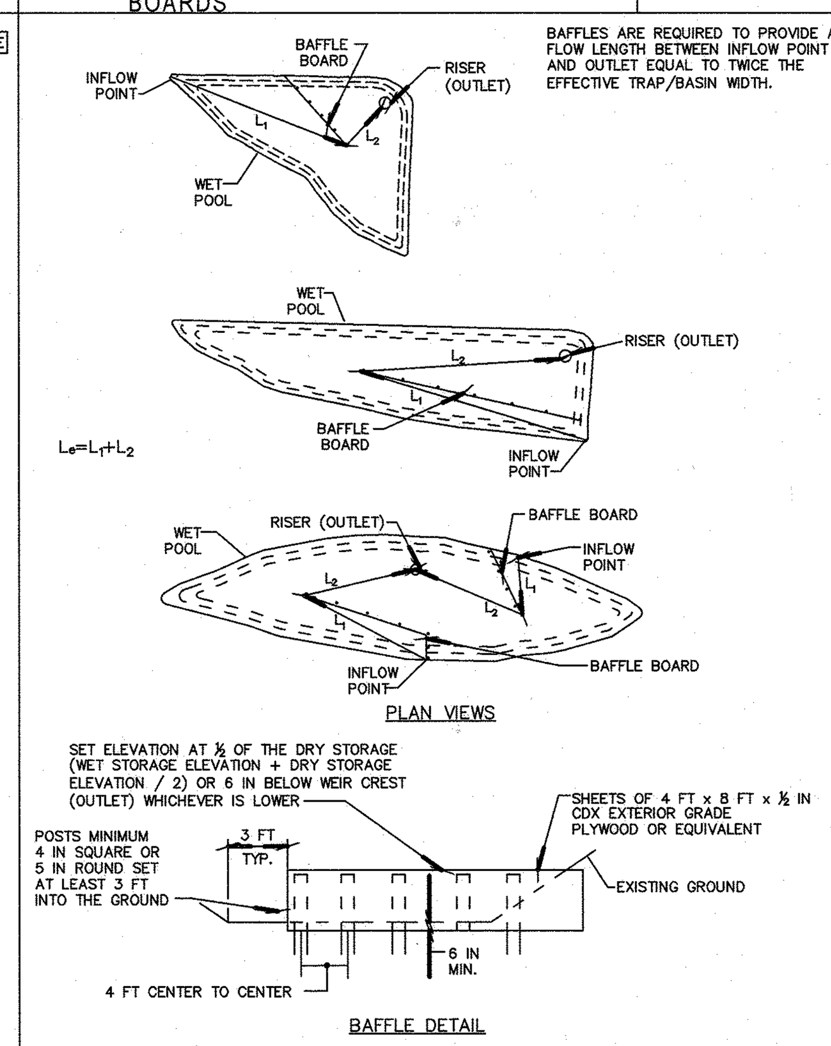
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM 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 G-2-4 BAFFLE BOARDS (STANDARD SYMBOL: BB)

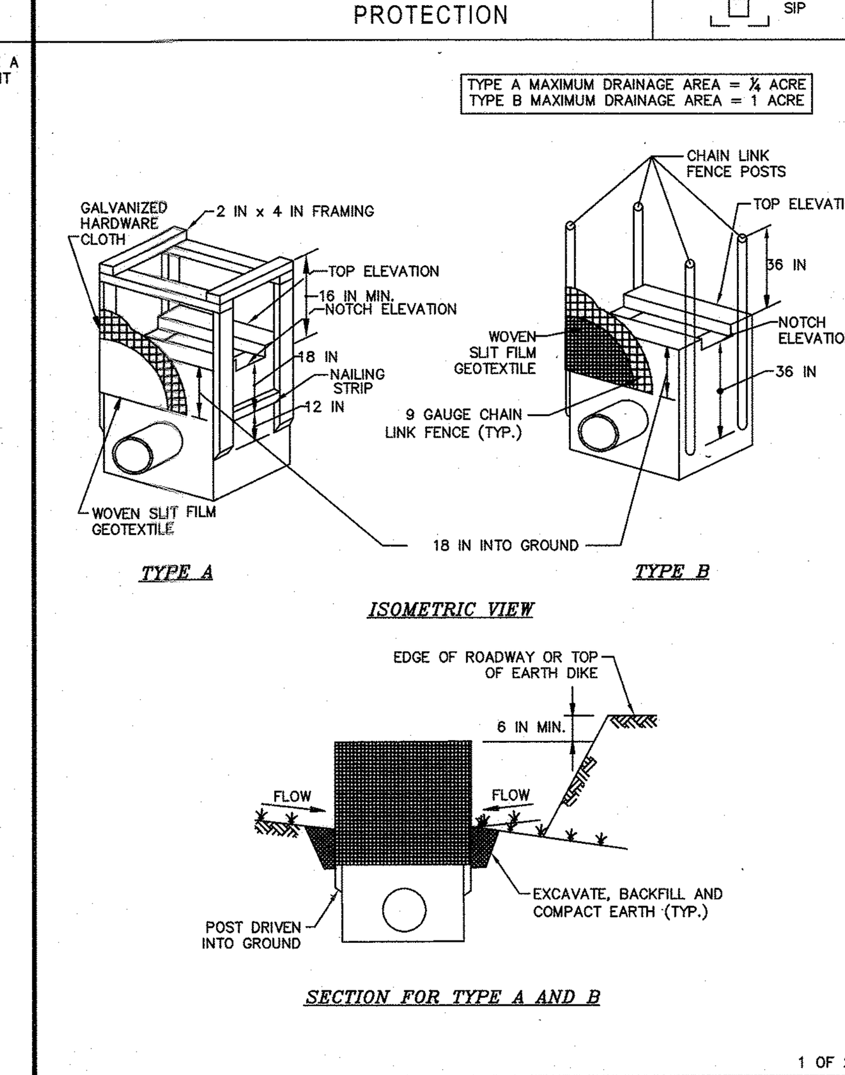
BAFFLES ARE REQUIRED TO PROVIDE A FLOW LENGTH BETWEEN INFLOW POINT AND OUTLET EQUAL TO TWICE THE EFFECTIVE TRAP/BASIN WIDTH.



MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-9-1 STANDARD INLET PROTECTION (STANDARD SYMBOL: SIP)



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-9-1 STANDARD INLET PROTECTION (STANDARD SYMBOL: SIP)

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. 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.

THIS DETAIL TO BE UTILIZED FOR OUTFALL STRUCTURE TEMPORARY BLOCKING

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

ENGINEER'S CERTIFICATE

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

[signature] 8-10-21
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."

[signature] 8/10/21
DEVELOPER — DATE

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

Alexander Bratchie 08/11/21
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

[signature] 09/21/2021
CHIEF, BUREAU OF HIGHWAYS MK — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 1/21/22
CHIEF, DIVISION OF LAND DEVELOPMENT NH — DATE

[signature] 1.18.22
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: 6-30-2023

STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — No. 22390 — PROFESSIONAL ENGINEER [seal] 8-10-21

OWNER/DEVELOPER:

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

TVTS RETAIL, LLC.
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

THE VILLAGE AT TOWN SQUARE

PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
ZONED: PGCC

SEDIMENT & EROSION CONTROL PLAN, NOTES AND DETAILS

DATE:	AUGUST, 2021	BEI PROJECT NO.	2899
SCALE:	AS SHOWN	SHEET	7 OF 15

DESIGN: DBT/MCR DRAFT: DBT/MCR

F-20-072

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Definition

Using vegetation as cover to protect exposed soil from erosion.

Purpose

To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies

On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity

Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.
Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.
Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.
Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment

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

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

Definition

Establishment of vegetative cover on cut and fill slopes.

Purpose

To provide timely vegetative cover on cut and fill slopes as work progresses.

Conditions Where Practice Applies

Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

Criteria

A. Incremental Stabilization - Cut Slopes
1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (Refer to Figure B.1):
   a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
   b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
   c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
   d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization

B. Incremental Stabilization - Fill Slopes
1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (Refer to Figure B.2):
   a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
   b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
   c. Place Phase 1 fill, prepare seedbed, and stabilize.
   d. Place Phase 2 fill, prepare seedbed, and stabilize.
   e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.
Figure B.

B-4-8 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.

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.

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.

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.

Permanent Seeding Summary

No.	Species	Application Rate (lb/ac.)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20) N	P2O5	K2O	Lime Rate
Hardiness Zone (from Figure B.3): 6b; Seed Misture (from Table B.3): Tall Fescue/Kentucky Bluegrass								
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.

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.

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

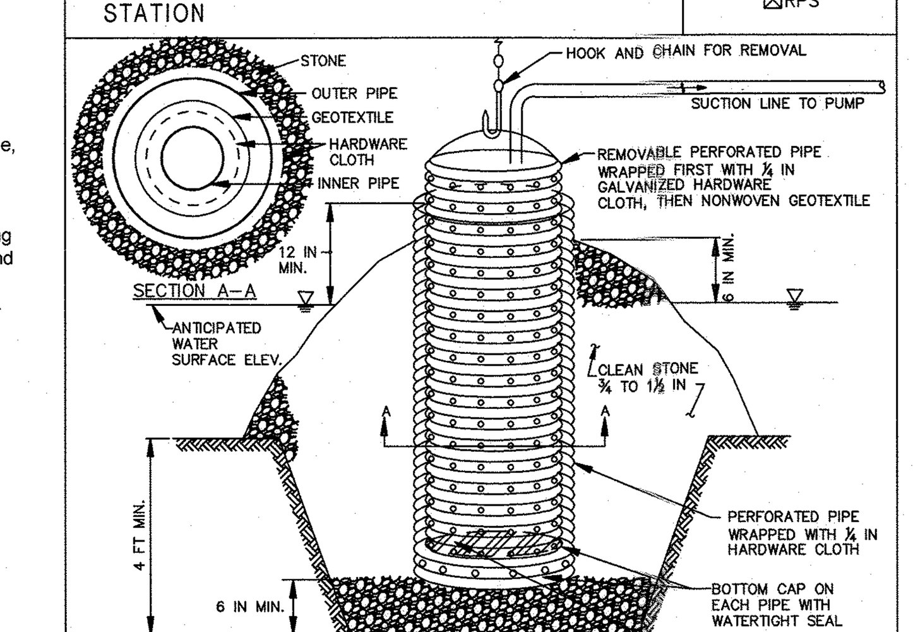
Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

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.

DETAIL F-1 REMOVABLE PUMPING STATION

STANDARD SYMBOL ⊠RPS



CONSTRUCTION SPECIFICATIONS

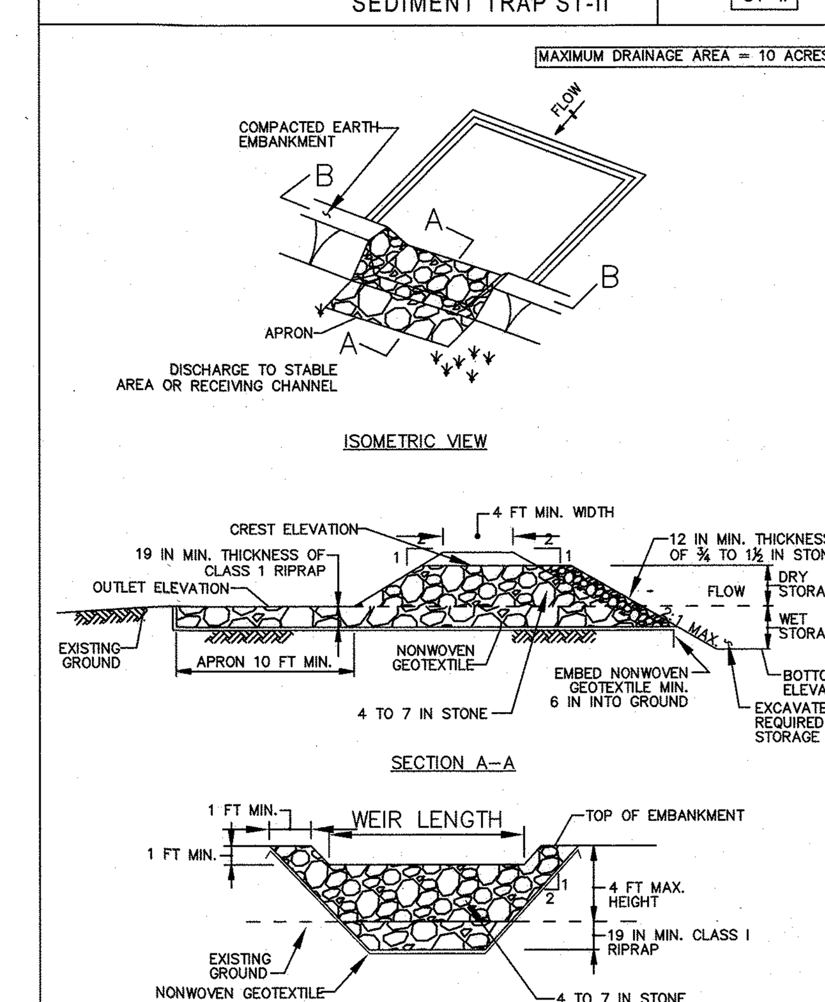
1. USE CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS 6 INCHES ON CENTER.
2. USE A MINIMUM 12 INCH DIAMETER INNER PIPE WITH AN OUTER PIPE A MINIMUM 6 INCHES LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
3. WRAP EACH PIPE WITH ¼ INCH GALVANIZED HARDWARE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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL G-1-2 STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II

STANDARD SYMBOL ST–II



1 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL G-1-2 STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II

STANDARD SYMBOL ST–II

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TRAP IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE AVOIDED.
2. CLEAR, GRUB, AND STRIP ANY VEGETATION AND ROOT MAT FROM THE AREA UNDER THE EMBANKMENT AND TRAP BOTTOM.
3. USE FILL MATERIAL FREE OF ROOTS, WOODY VEGETATION, OVERSIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL FOR THE EMBANKMENT.
4. CONSTRUCT TOP OF EMBANKMENT 1 FOOT MINIMUM ABOVE WEIR CREST. COMPACT THE EMBANKMENT BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
5. MAKE ALL CUT AND FILL SLOPES 2:1 OR FLATTER.
6. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, OVER THE BOTTOM AND SIDES OF OUTLET AND APRON PRIOR TO PLACEMENT OF RIPRAP. OVERLAP SECTIONS OF GEOTEXTILE AT LEAST 1 FOOT WITH THE SECTION NEARER TO THE TRAP PLACED ON TOP. EMBED GEOTEXTILE AT LEAST 6 INCHES INTO EXISTING GROUND AT ENTRANCE OF OUTLET CHANNEL.
7. USE CLEAN 4 TO 7 INCH RIPRAP TO CONSTRUCT THE WEIR. USE CLASS I RIPRAP FOR THE APRON. USE OF RECYCLED CONCRETE EQUIVALENT IS ACCEPTABLE.
8. PLACE 1 FOOT OF CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE ON THE UPSTREAM FACE OF THE WEIR.
9. CONSTRUCT AND MAINTAIN THE OUTLET ACCORDING TO APPROVED PLAN, AND IN SUCH A MANNER THAT EROSION AT OR BELOW THE OUTLET DOES NOT OCCUR.
10. STABILIZE THE EMBANKMENT AND INTERIOR SLOPES WITH SEED AND MULCH. STABILIZE POINTS OF CONCENTRATED INFLOW AS SHOWN ON APPROVED PLAN.
11. REMOVE SEDIMENT AND RESTORE TRAP TO ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO CLEANOUT ELEVATION (50% OF WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE. KEEP POINTS OF INFLOW AND OUTFLOW AS WELL AS INTERIOR OF THE TRAP FREE FROM EROSION, AND REMOVE ACCUMULATED DEBRIS. MAINTAIN EMBANKMENTS TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION. REMOVE ANY TREES, BRUSH, OR OTHER WOODY VEGETATION GROWING ON EMBANKMENT OR NEAR PRINCIPAL SPILLWAY. MAINTAIN LINE, GRADE, AND CROSS SECTION.
12. WHEN DEWATERING TRAP, PASS REMOVED WATER THROUGH AN APPROVED SEDIMENT CONTROL PRACTICE.
13. UPON REMOVAL, GRADE AND STABILIZE THE AREA OCCUPIED BY TRAP.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

HOWARD SOIL CONSERVATION DISTRICT (HSCD) STANDARD SEDIMENT CONTROL NOTES

1. A pre–construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410–3133–1855 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hours notice to CID must be given at the following stages:
   a. Prior to the start of earth disturbance,
   b. Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading,
   c. Prior to the start of another phase of construction or opening of another grading unit,
   d. Prior to the removal or modification of sediment control practices.
2. All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
3. Following initial soil disturbance or re–disturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.
4. All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for topsoil (Sec. B–4–2), permanent seeding (Sec. B–4–5), temporary seeding (Sec. B–4–4) and mulching (Sec. B–4–3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B–4–1) specifications shall be enforced in areas with >15' of cut and/or fill. Stockpiles (Sec. B–4–8) in excess of 20 feet must be benched with stable outlet. All concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B–4–6).
5. All sediment control structures are to remain in place, and are to be maintained in operative condition until permission for their removal has been obtained from the CID.
6. Site Analysis:

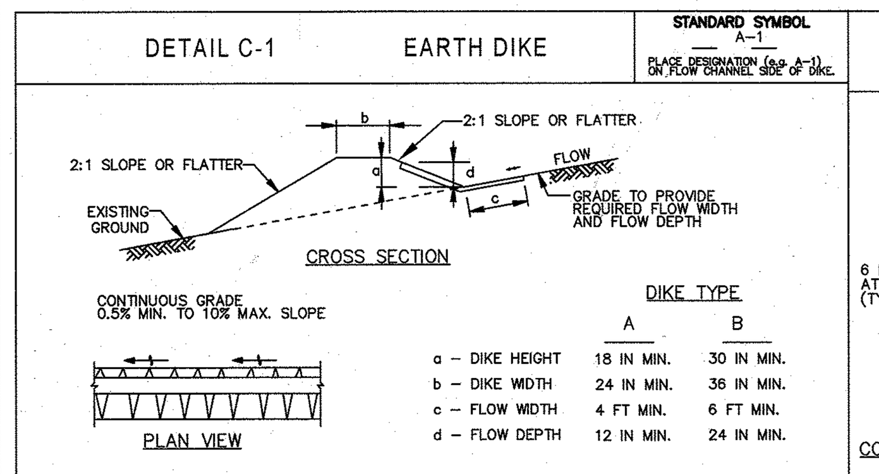
Total Area of Site:	17.03	Acres
Area Disturbed:	3.32	Acres
Area to be roofed or paved:	1.14	Acres
Area to be vegetatively stabilized:	2.18	Acres
Total cut:	5,683 *	Cu Yds
Total fill:	– *	Cu Yds
Off–site waste/borrow area location:	SITE WITH AN ACTIVE GRADING PERMIT	

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

7. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
8. Additional sediment control must be provided, if deemed necessary by the CID. The site and all controls shall be inspected by the contractor weekly; and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:
   - Inspection date
   - Inspection type (routine, pre–storm event, during rain event)
   - Name and title of inspector
   - Weather information (current conditions as well as time and an=mount of last recorded precipitation
   - Brief description of project's status (e.g. percent complete) and/or current activities
   - Evidence of sediment discharges
   - Identification of plan deficiencies
   - Identification of sediment controls that require maintenance
   - Identification of missing or improperly installed sediment controls
   - Compliance status regarding the sequence of construction and stabilization requirements
   - Photographs
   - Monitoring/sampling
   - Maintenance and/or corrective action performed
   - Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE).
9. Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back filled and stabilized by the end of each work day, whichever is shorter.
10. Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may be allowed by the CID per the list of HSCD–approved field changes.
11. Disturbance shall not occur outside the L.O.D. A project is to be sequenced so that grading activities begin on one grading unit (maximum acreage of 20 ac. per grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has been stabilized and approved by the CID. Unless otherwise specified and approved by the HSCD, no more than 20 acres cumulatively may be disturbed at a given time.
12. Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.
13. Topsoil shall be stockpiled and preserved on–site for redistribution onto final grade.
14. All silt fence and super silt fence shall be placed on–the–contour, and be imbricated at 25' minimum intervals, with lower ends curled uphill by 2' in elevation.
15. Stream channels must not be disturbed during the following restricted time periods (inclusive):
   - Use I and IP March 1 – June 15
   - Use III and IIIP October 1 – April 30
   - Use IV March 1 – May 31
16. A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on–site and available when the site is active.

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

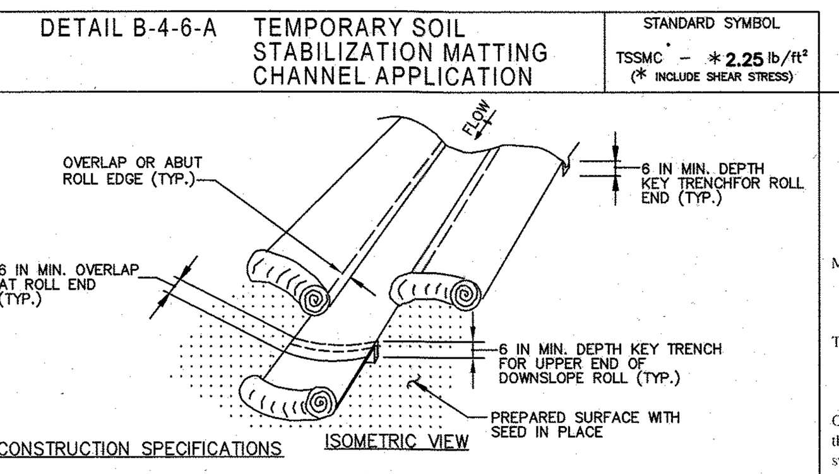
1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT 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 B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL TSSMC – *2.25 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 TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN–MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. 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, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. 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 A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED 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 CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY–IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
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. 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

B-4-6 STANDARDS AND SPECIFICATIONS FOR SOIL STABILIZATION MATTING

Definition

Material used to temporarily or permanently stabilize channels or steep slopes until groundcover is established.

Purpose

To protect the soils until vegetation is established.

Conditions Where Practice Applies

On newly seeded surfaces to prevent the applied seed from washing out; in channels and on steep slopes where the flow has erosive velocities or conveys clear water; on temporary swales, earth dikes, and perimeter dike swales as required by the respective design standard; and, on stream banks where moving water is likely to wash out new vegetative plantings.

Design Criteria

1. The soil stabilization matting that is used must withstand the flow velocities and shear stresses determined for the area, based on the 2-year, 24-hour frequency storm for temporary applications and the 10-year, 24-hour frequency storm for permanent applications. Designate on the plan the type of soil stabilization matting using the standard symbol and include the calculated shear stress for the respective treatment area.
2. Matting is required on permanent channels where the runoff velocity exceeds two and half feet per second (2.5 fps) or the shear stress exceeds two pounds per square foot (2 lbs/ft²). On temporary channels discharging to a sediment trapping practice, provide matting where the runoff velocity exceeds four feet per second (4 fps).
3. Temporary soil stabilization matting is made with degradable (lasts 6 months minimum), natural, or manmade fibers of uniform thickness and distribution of fibers throughout and is smolder resistant. The maximum permissible velocity for temporary matting is 6 feet per second.
4. Permanent soil stabilization matting is an open weave, synthetic material consisting of non-degradable fibers or elements of uniform thickness and distribution of weave throughout. The maximum permissible velocity for permanent matting is 8.5 feet per second.
5. Calculate channel velocity and shear stress using the following procedure:

Shear Stress (τ) is a measure of the force of moving water against the substrate and is calculated as:

$$\tau = \gamma \cdot R \cdot S_w$$

where:
τ = shear stress (lb/ft²)
γ = weight density of water (62.4 lb/ft³)
R = average water depth (hydraulic radius) (ft)
S_w = water surface slope (ft/ft)

B.36

Velocity (v) measures the rate of flow through a defined area and is calculated as:

$$v = \frac{1.486 R^{2/3} s^{1/2}}{n}$$

where:
v = velocity (ft/sec)
n = Manning's roughness coefficient
R = hydraulic radius (ft)
s = channel slope (ft/ft)

6. Use Table B.7 to assist in selecting the appropriate soil stabilization matting for slope applications based on the slope, the slope length, and the soil-erodibility K factor.

Table B.7: Soil Stabilization on Slopes

Slope	20:1 or Flatter (≤5%)			<20:1 to 4:1 (>5 - 25%)			<4:1 to 3:1 (>25 - 33%)			<3:1 to 2.5:1 (>33 - 40%)			<2.5:1 to 2:1** (>40 - 50%)		
Slope Length (feet)*	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120
Straw Mulch/Wood Cellulose Fiber				for K ≤ 0.35***											
Temporary Matting with Design Shear Stress ≥ 1.5 lb/sf															
Temporary Matting with Design Shear Stress ≥ 1.75 lb/sf															
Temporary Matting with Design Shear Stress ≥ 2.0 lb/sf															
Temporary Matting with Design Shear Stress ≥ 2.25 lb/sf															

Effective range for all K values unless otherwise specified

SHEAR = 2.25 lb/ft^2

* Slope length includes contributing flow length.
** Slopes steeper than 2:1 must be engineered.
*** Soil having a K value less than or equal to 0.35 can be stabilized effectively with straw mulch or wood cellulose fiber when located on slopes steeper than 5%. Soil stabilization matting is required on all slopes steeper than 5% that have soil with a K factor greater than 0.35. K factor ratings are published in the NRCS Soil Survey http://websoilsurvey.nrcs.usda.gov/app. During construction or reclamation, the soil-erodibility K value should represent the upper 6 inches of the final fill material re-spread as the last lift. Only the effects of rock fragments within the soil profile are considered in the estimation of the K value. Do not adjust K values to account for rocks on the soil surface or increases in soil organic matter related to management activities.

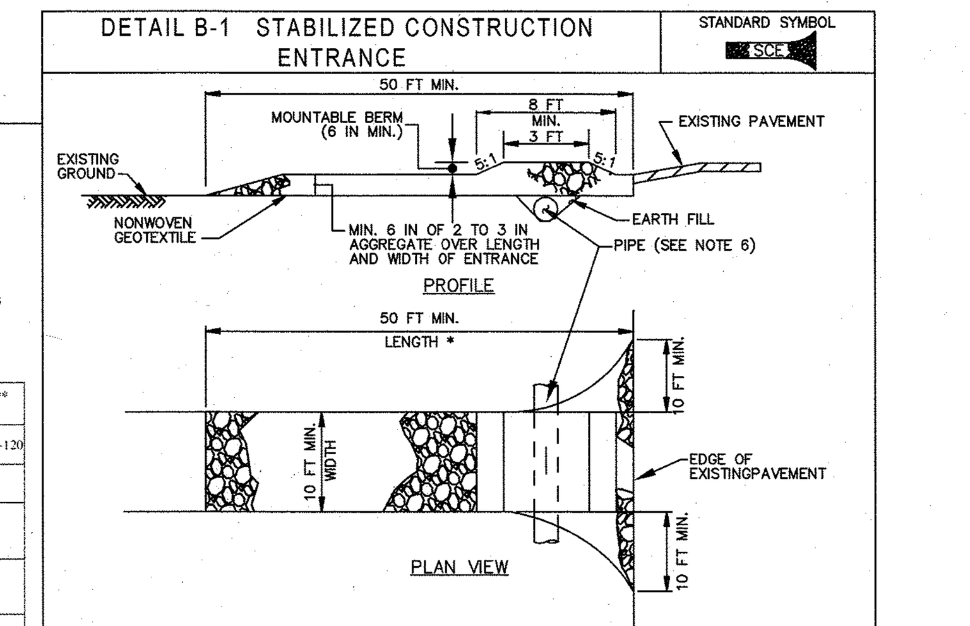
Maintenance

Vegetation must be established and maintained so that the requirements for Adequate Vegetative Establishment are continuously met in accordance with Section B-4 Vegetative Stabilization.

B.37

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

ENGINEER'S CERTIFICATE

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

[signature] 8-10-21
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."

[signature] 8/10/21
DEVELOPER DATE

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

Alexander Bratchie 08/11/21
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

[signature] 09/21/2021
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 1/21/22
CHIEF, DIVISION OF LAND DEVELOPMENT NH DATE

[signature] 1·18·22
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

THIS PLAN IS FOR SEDIMENT AND EROSION CONTROL ONLY.

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: 6-30-2023

STATE OF MARYLAND – CHRISTOPHER ALAN MALAGARI – No. 22390 – PROFESSIONAL ENGINEER
[signature] 8-10-21

OWNER/DEVELOPER:

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

TVTS RETAIL, LLC.
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410–825–8400

THE VILLAGE AT TOWN SQUARE

PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE–SUBDIVISION OF BULK PARCEL A

SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
ZONED: PGCC

SEDIMENT AND EROSION CONTROL NOTES & DETAILS

DESIGN: DBT/MCR	DRAFT: DBT/MCR	DATE: AUGUST, 2021	BEI PROJECT NO. 2899
		SCALE: AS SHOWN	SHEET 8 OF 15

J:\2899 Village at Town Square\dwg\7000.dwg, 8/10/2021 1:24:02 PM, MRiedel

F-20-072

ESD STORMWATER MANAGEMENT SUMMARY TABLE

PHASE	Practice MDE	Practice Type	No.	DA (sf)	Imp Area (sf)	% Imp	Rv	Pe required	Af (sf) Required	Af (sf) Provided	2% DA?	ESDv (cf) Required	ESDv (cf) Provided	Pe Provided	REv Required	REv Provided	Ownership
1	(F-6)	Bioretention	#2	136,586	88,781	65%	0.64	2.0	2732	10840	PASS	14455	15152	2.1	8,140 cf	3614	Private
1	(F-6)	Bioretention	#3	55,590	36,134	65%	0.64	2.0	1112	4148	PASS	5883	6144	2.1		1991	Private
2	(F-6)	Bioretention	#4	41,908	27,240	65%	0.64	2.0	838	2719	PASS	4435	4443	2.0		0	Private
1	(F-6)	Bioretention	#5	23,864	15,512	65%	0.64	2.0	477	2644	PASS	2526	3708	2.9		631	Private
1	(F-6)	Bioretention	#6	28,900	18,785	65%	0.64	2.0	578	2427	PASS	3059	3582	2.3		765	Private
1	(F-6)	Bioretention	#7	18,644	12,119	65%	0.64	2.0	373	1239	PASS	1973	1998	2.0		493	Private
3	(M-6)	Micro-Bioretention	#8	13,063	8,491	65%	0.64	2.0	261	493	PASS	1383	1376	2.0		346	Private
3	(M-6)	Micro-Bioretention	#9	5,582	3,628	65%	0.64	2.0	112	349	PASS	591	623	2.1		148	Private
3	(M-6)	Micro-Bioretention	#10	6,067	3,944	65%	0.64	2.0	121	359	PASS	642	642	2.0		161	Private
1	(M-2)	Submerged Gravel Wetland	SG-1	328,980	213,837	65%	0.64	2.0				34817	40482	2.3		0	Private
Totals per individual Drainage Area																	
Totals per individual Drainage Area				659,184	428,470	65%	0.64					69764	78150				
Totals per Overall Site				734,505	440,703	60%	0.59	2.0				72226	78150			8148	

Notes:
1. The Pe required column is based on total site Pe calculation. The Rv is based on individual drainage area percent impervious (per DED)

SYMBOL	HYDRIC	HYDROLOGIC GROUP	NAME	k-VALUE
GbB		B	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	0.28
GbC		B	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	0.28
GmA*	YES	C	GLENVILLE SILT LOAM, 0 TO 3 PERCENT SLOPES	0.37
GmB*	YES	C	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	0.43

THIS PLAN IS ONLY FOR DETERMINATION OF STORMWATER MANAGEMENT DRAINAGE AREAS

THIS PLAN REFLECTS ULTIMATE BUILD-OUT CONDITIONS OF PHASE 1 AND PHASE 2

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — 09/21/2021 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT NH — 1/21/22 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 1.18.22 DATE

NO.	DATE	REVISION

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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. 22390, Expiration Date: 6-30-2023.

STATE OF MARYLAND — CHRISTOPHER A. MALAGARI — PROFESSIONAL ENGINEER — 22390 — 8-19-21

OWNER/DEVELOPER:

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THE VILLAGE AT TOWN SQUARE

PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
ZONED: PGCC

STORMWATER MANAGEMENT DRAINAGE AREA MAP

DESIGN: DBT/MCR DRAFT: DBT/MCR

DATE: AUGUST, 2021 | BEI PROJECT NO. 2899
SCALE: AS SHOWN | SHEET 9 OF 15

F-20-072

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

CONSTRUCTION SPECIFICATIONS

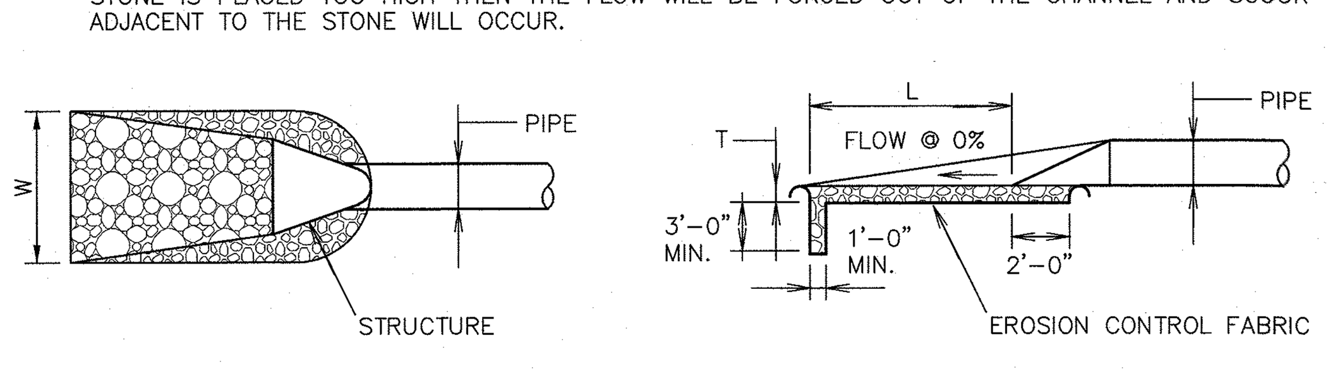
1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.

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

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

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

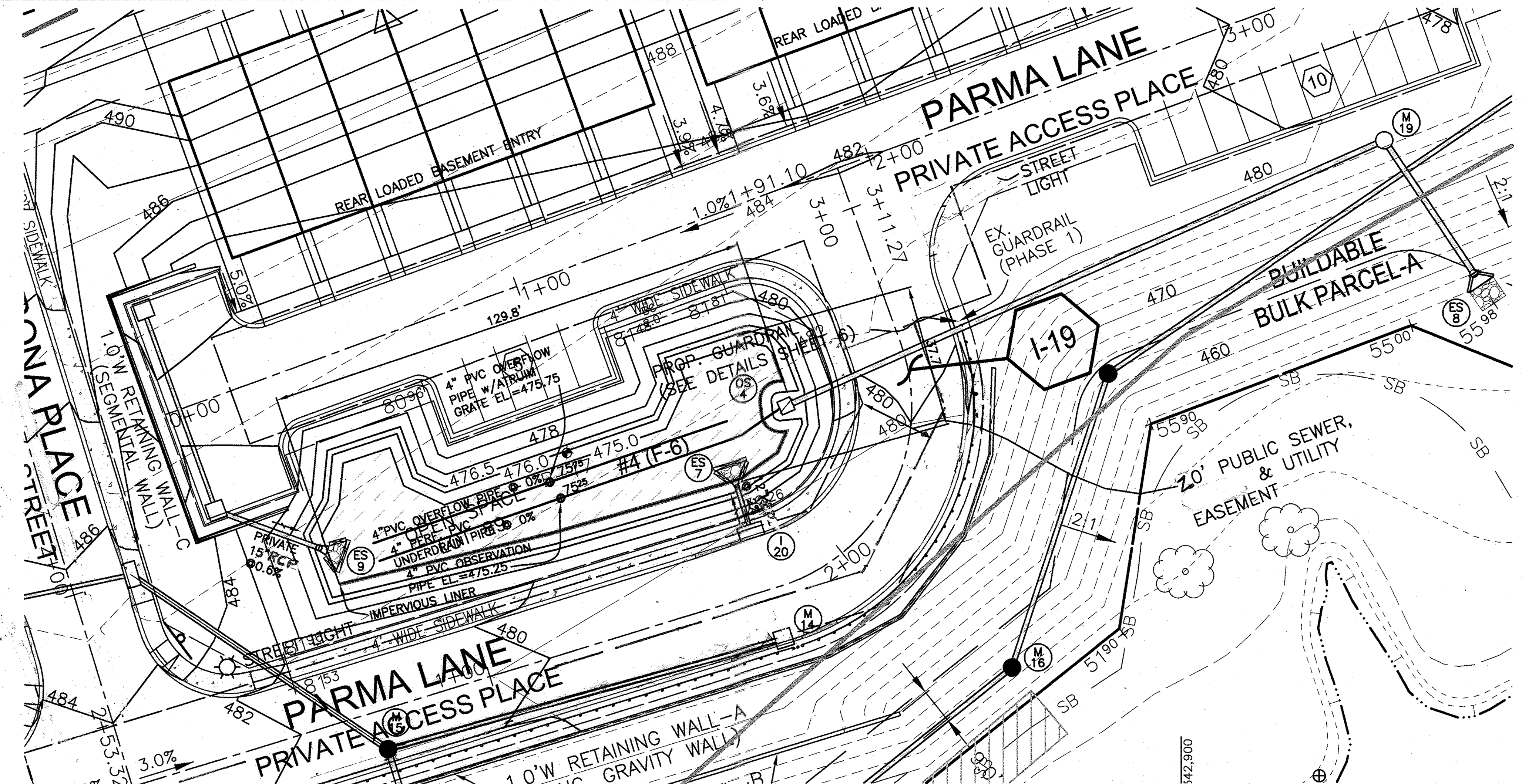
5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.



STRUCTURE	V10 fps	d10 (ft)	d50	LENGTH(L)	WIDTH(W)	THICK.(T)	SHA CLASS
ES-8	1.09	0.20	9.5"	6'	3.9'	19"	I

OUTLET PROTECTION DETAIL

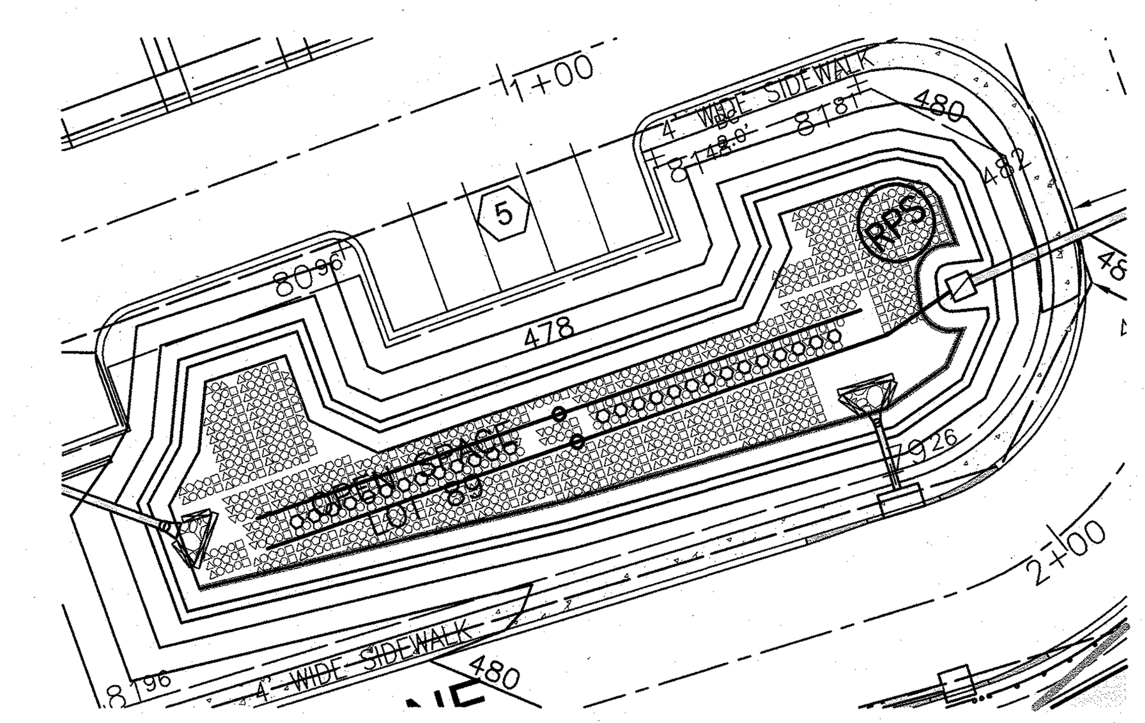
NOT TO SCALE



BIORETENTION #4 – PLAN VIEW

SCALE: 1" = 30'

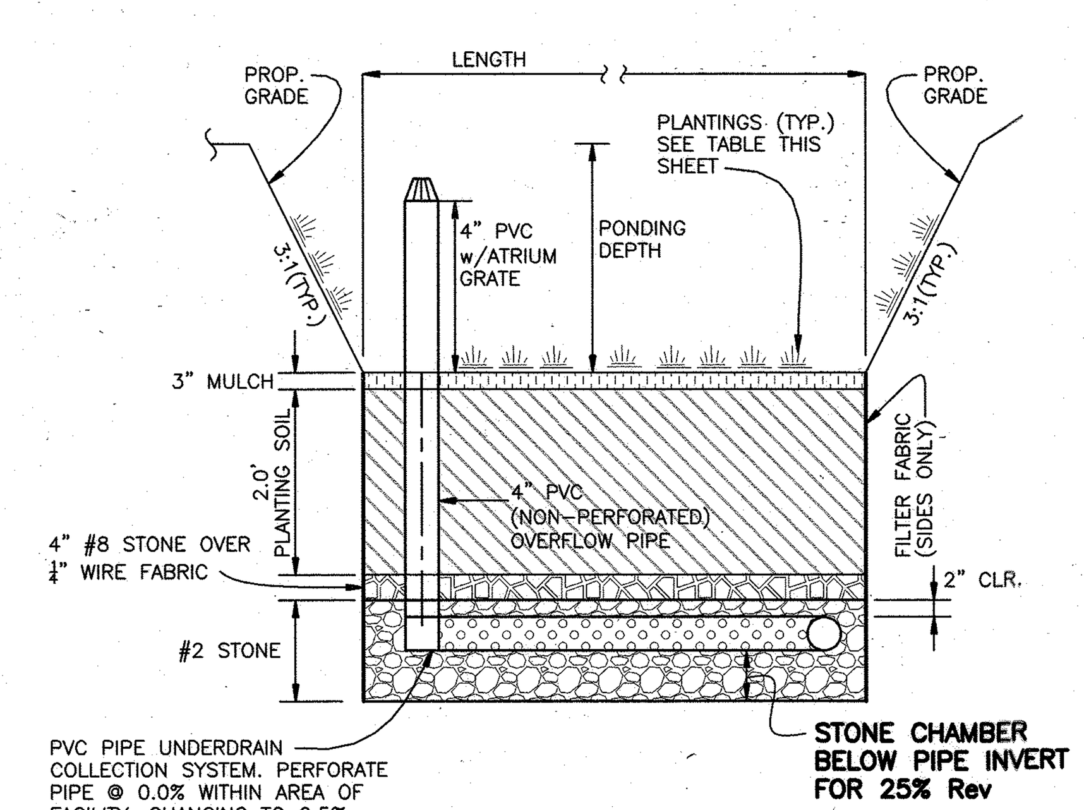
(F-6) Bio-Retention Landscaping Chart					
		Surface Area →		#4 2719	TOTAL 2719
PLANT NAME	COMMON NAME	TYPE	SIZE	QUANTITY	QUANTITY
Ilex verticillata	Common Winterberry	shrub	2.5'-3' ht	27	27
Lobelia cardinalis	Cardinal flower	perennial herbaceous plant	quart bulb	181	181
Lobelia siphilitica	Great Blue Lobelia	perennial herbaceous plant	quart bulb	181	181
Carex stricta	Uptight Sedge	grass	quart bulb	181	181
Iris versicolor	Blue Water Iris	perennial herbaceous plant	quart bulb	181	181
Liatris spicata	Prairie Gay Feather	perennial herbaceous plant	quart bulb	181	181



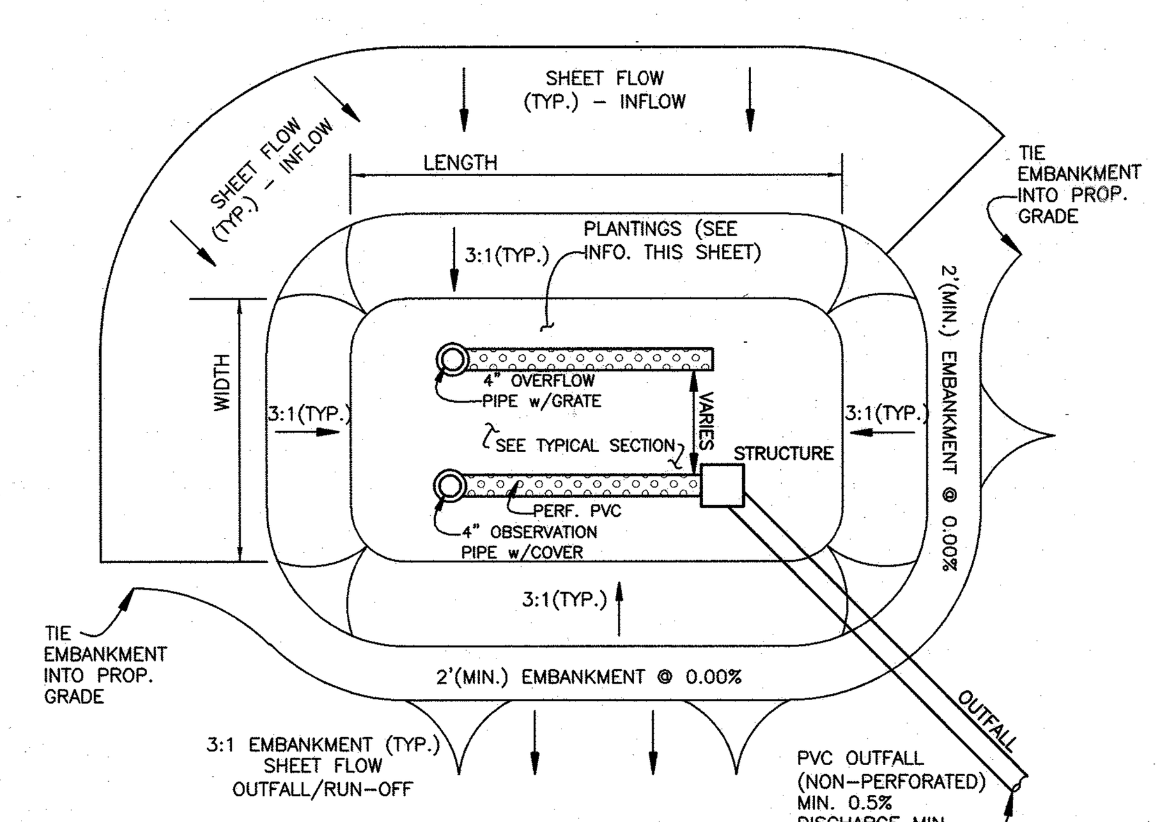
BIORETENTION #4 – PLANTING PLAN

SCALE: 1" = 30'

PLANTING LEGEND	
SYMBOL	NAME
	COMMON WINTERBERRY ILEX VERTICILLATA
	CARDINAL FLOWER LOBELIA CARDINALIS
	GREAT BLUE LOBELIA LOBELIA SIPHILITICA
	BLUE WATER IRIS IRIS VERSICOLOR
	PRAIRIE GAY FEATHER LIATRIS SPICATA
	UPRIGHT SEDGE CAREX STRICTA



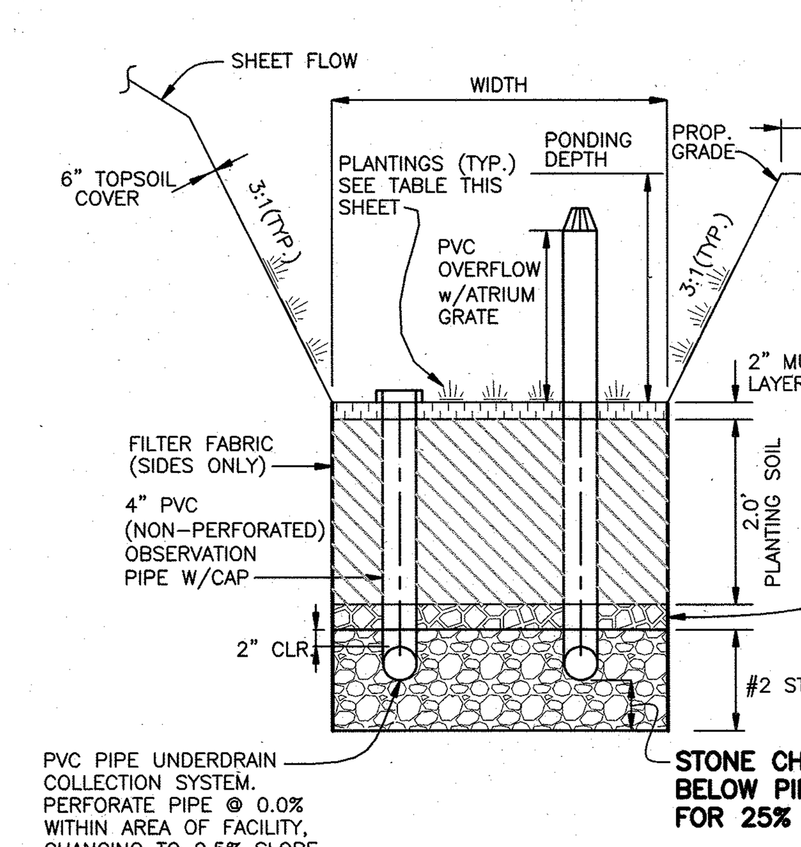
TYPICAL SECTION



SCHEMATIC PLAN VIEW

STANDARD BIORETENTION DETAILS

NOT TO SCALE



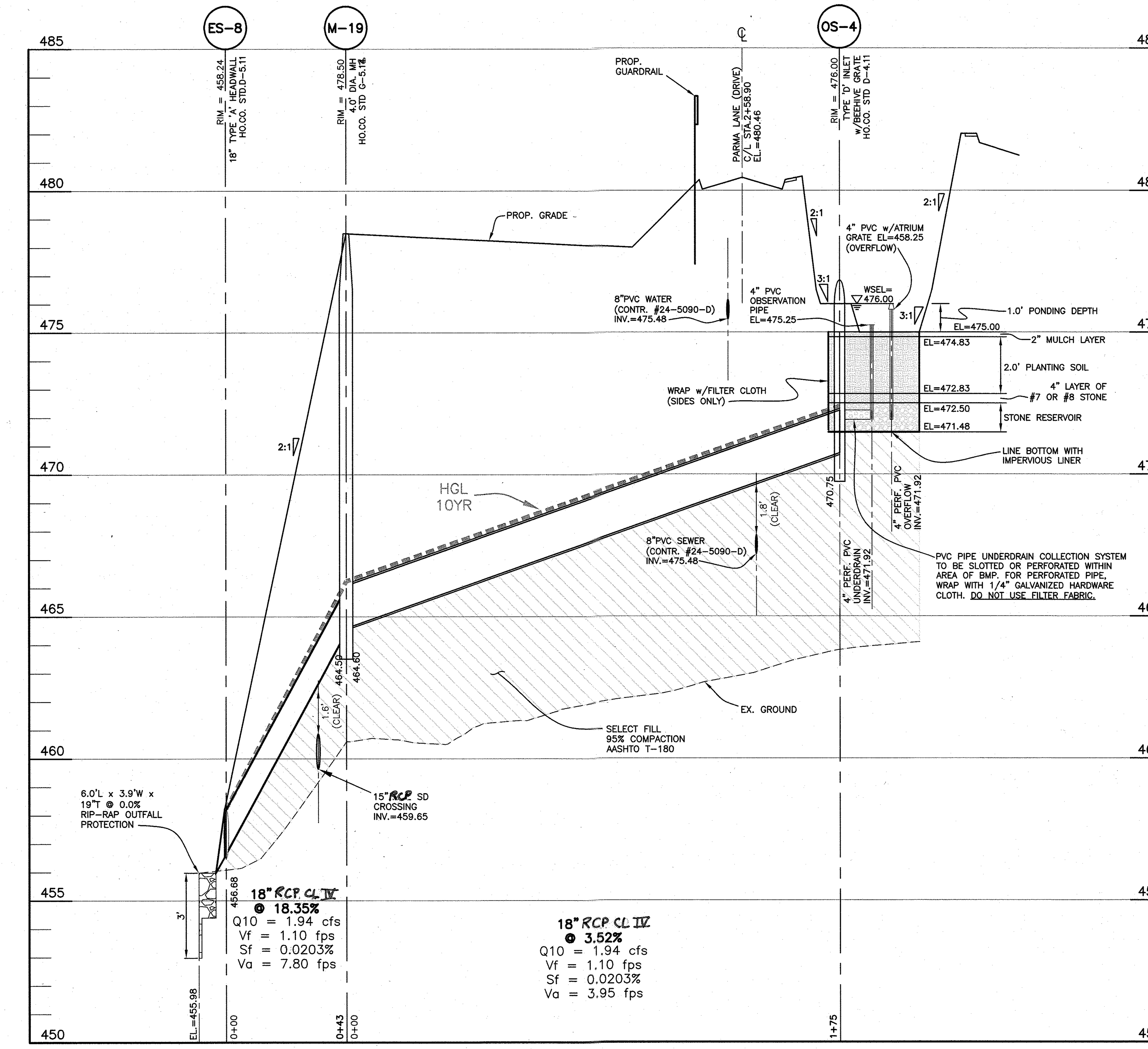
TYPICAL PROFILE

UNDERDRAIN, OVERFLOW AND OUTFALL NOTES

1. THE LAST CLEAN-OUT LOCATION WITHIN EACH MICRO-BIORETENTION FACILITY SHALL BE FITTED WITH A NON-CLOGGING SURFACE DRAIN (EXAMPLE: 4" ABS ROOF DRAIN W/CAST ALUMINUM DOME) AT THE POND SURFACE ELEVATION INDICATED IN THE CORRESPONDING TABLE ELEV. 2.

2. THE PVC WITHIN THE FACILITY SHALL BE PERFORATED.

3. THE UNDER-DRAIN AND PIPE TO OUTFALL SHALL BE INSTALLED TO A MINIMUM DEPTH OF 2' BELOW FINISHED GRADE AND SHALL MAINTAIN A MINIMUM 0.5% SLOPE AND MAINTAIN A MINIMUM OF 1' OF SEPARATION AT ALL CROSSINGS.



BIORETENTION #4 – PROFILE VIEW

VERTICAL SCALE: 1" = 3'

HORIZONTAL SCALE: 1" = 30'

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED (M-3) LANDSCAPE INFILTRATION (M-6) MICRO-BIORETENTION

a. The Owner shall maintain the plant material, mulch layer and soil layer annually. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.

b. The Owner shall perform a plant inspection in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.

c. The Owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed the new layer is applied.

d. The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

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

Table B.4.1 Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration-			
Material	**Specification**	**Size**	**Notes**
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 – 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with ¼-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; $f'_c = 3500$ psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) *not using previously approved State or local standards* requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone **(AASHTO)** #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — 09/21/2021 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 1/21/22 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 1.18.22 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: 6-30-2023.

STATE OF MARYLAND — CHRISTOPHER A. MALAGARI — 22390 — PROFESSIONAL ENGINEER — 8-19-21

OWNER/DEVELOPER:

MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
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410-825-8400

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THE VILLAGE AT TOWN SQUARE
PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
ZONED: PGCC

STORMWATER MANAGEMENT PROFILES, NOTES, AND DETAILS

DESIGN: DBT/MCR	DRAFT: DBT/MCR	DATE: AUGUST, 2021	BEI PROJECT NO. 2899
		SCALE: AS SHOWN	SHEET 10 OF 15

F-20-072

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

IMPORTANT:
THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES MD 104.00-01 - MD 104.00-18 AND STANDARD DETAILS MD 104.01-01 - MD 104.01-81

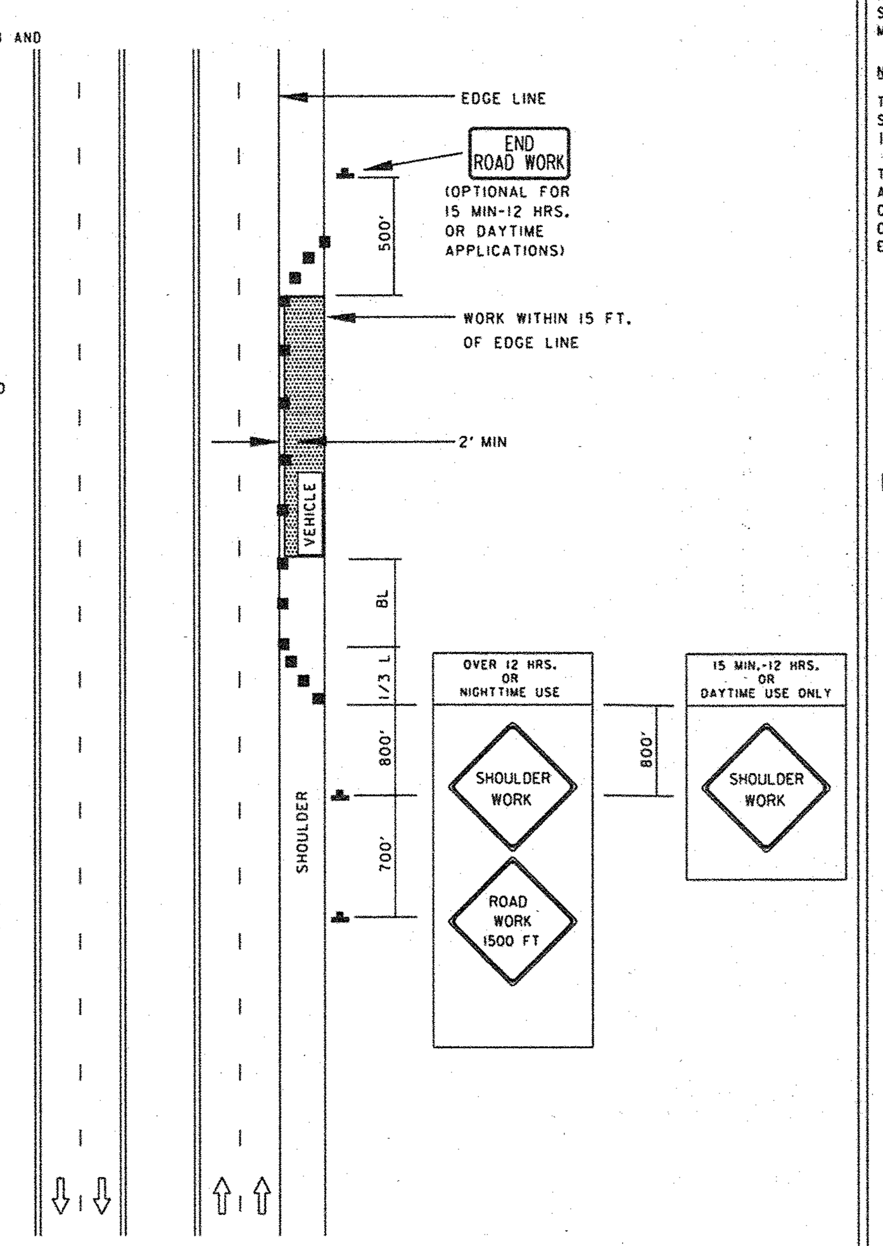
NOTES:
SHOULDER WORK SIGNS SHALL BE MOUNTED ON THE SIDE OF THE ROADWAY WHERE THE SHOULDER IS AFFECTED. USAGE OF SHOULDER WORK SIGNS ON THE OPPOSITE SIDE OF DIVIDED HIGHWAYS IS OPTIONAL.

SHOULDER CLOSED SIGNS ARE REQUIRED IN PLACE OF SHOULDER WORK SIGNS WHEN THE SHOULDER IS CLOSED BY POSITIVE PROTECTION (TEMPORARY CONCRETE BARRIER OR SIMILAR DEVICE). REFER TO STANDARD NO. MD 104.06-18.

WHEN WORK INVOLVES A PAVEMENT EDGE DROP-OFF, REFER TO STANDARD NOS. MD 104.06-15 TO MD 104.06-19.

THERE SHALL BE A MINIMUM OF SEVEN CHANNELIZING DEVICES IN THE SHOULDER TAPER.

THE ENGINEER SHOULD CONSIDER ADDITIONAL, ADJACENT LANE CLOSURES WHEN THE POSSIBILITY OF UNPLANNED TRAVELWAY ENCROACHMENTS EXISTS.



KEY:
CHANNELIZING DEVICES
SIGN SUPPORT
FACE OF SIGN
DIRECTION OF TRAFFIC
WORK SITE

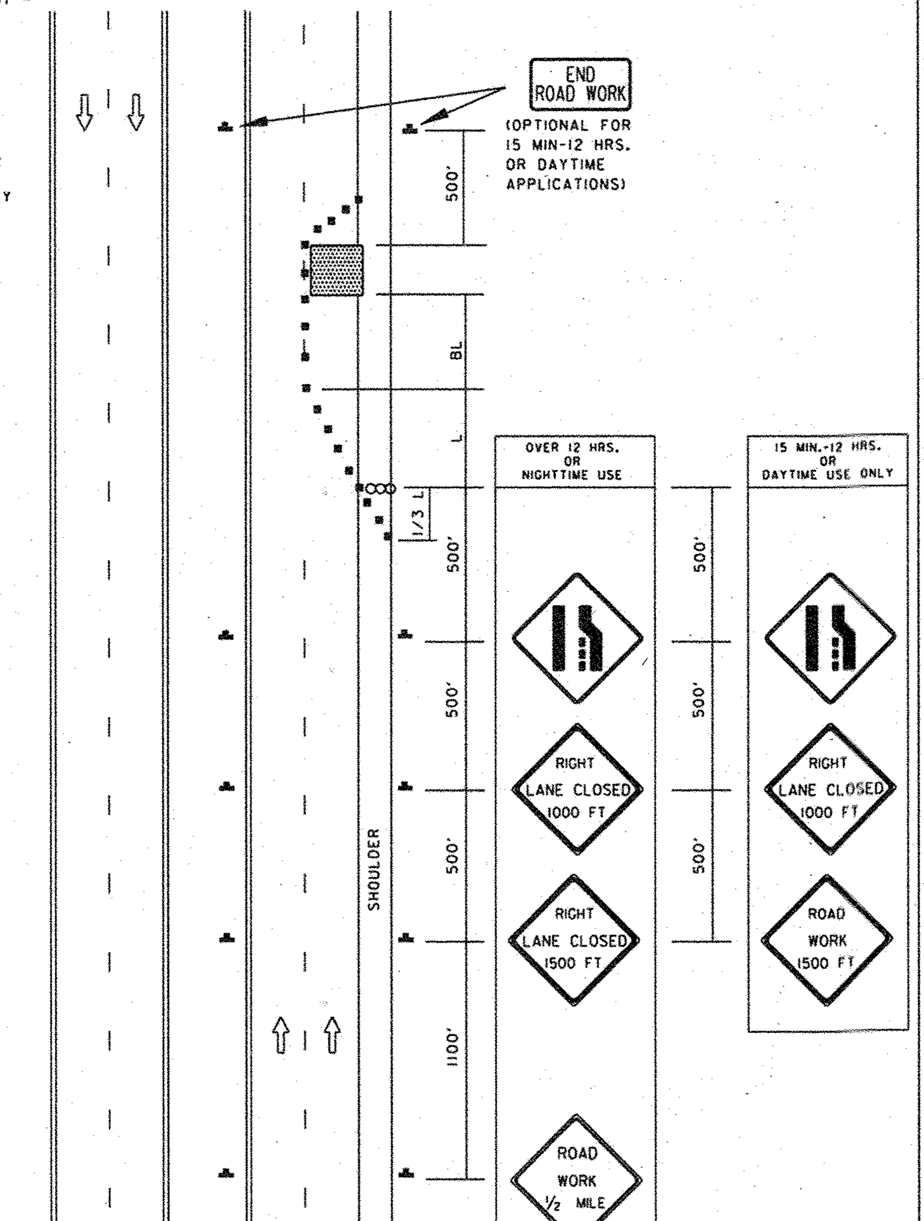
SPECIFICATION 104	CATEGORY CODE ITEMS	Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
APPROVED	DIRECTOR - OFFICE OF TRAFFIC AND SAFETY	SHOULDER WORK/DIVIDED UNCON. EQL/LESS THAN 40 MPH
APPROVAL • SHA REVISIONS: APPROVAL 8-20-03, REVISED 8-11-10	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION: APPROVAL 9-23-03, REVISED 7-29-10	STANDARD NO. MD 104.04-02

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

IMPORTANT:
THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES MD 104.00-01 - MD 104.00-18 AND STANDARD DETAILS MD 104.01-01 - MD 104.01-81

NOTE:
THERE SHALL BE A MINIMUM OF SEVEN CHANNELIZING DEVICES IN THE SHOULDER TAPER.

THE ENGINEER SHOULD CONSIDER ADDITIONAL, ADJACENT LANE CLOSURES WHEN THE POSSIBILITY OF UNPLANNED TRAVELWAY ENCROACHMENTS EXISTS.



KEY:
CHANNELIZING DEVICES
SIGN SUPPORT
FACE OF SIGN
DIRECTION OF TRAFFIC
WORK SITE
ARROW PANEL

SPECIFICATION 104	CATEGORY CODE ITEMS	Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
APPROVED	DIRECTOR - OFFICE OF TRAFFIC AND SAFETY	RIGHT LANE CLOSURE /DIVIDED UNCON. EQL/LESS THAN 40 MPH
APPROVAL • SHA REVISIONS: APPROVAL 8-20-03, REVISED 8-11-10	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION: APPROVAL 9-23-03, REVISED 7-29-10	STANDARD NO. MD 104.04-06

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

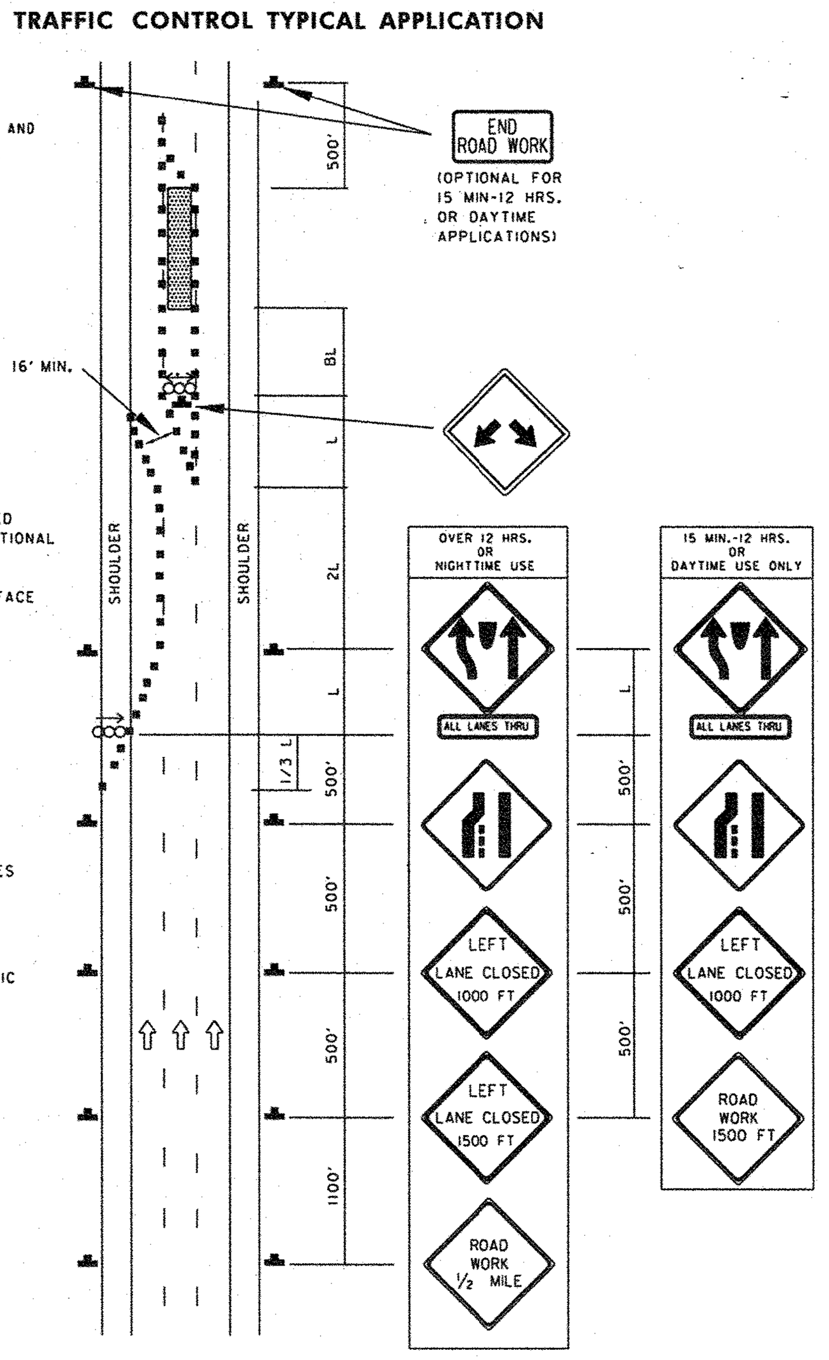
IMPORTANT:
THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES MD 104.00-01 - MD 104.00-18 AND STANDARD DETAILS MD 104.01-01 - MD 104.01-81

NOTE:
THIS TYPICAL APPLICATION SHOULD GENERALLY BE USED ONLY WHEN WORKERS ARE NOT PRESENT IN THE CENTER LANE. WHEN WORKERS ARE PRESENT IN THE CENTER LANE, EITHER TEMPORARY TRAFFIC BARRIER OR A TWO-LANE CLOSURE SHOULD BE USED TO CLOSE THE CENTER LANE. (SEE STANDARD NO. MD 104.04-10).

THERE SHALL BE A MINIMUM OF SEVEN CHANNELIZING DEVICES IN THE SHOULDER TAPER.

SUPPLEMENTARY SIGNS MAY BE MOUNTED ON PORTABLE SIGN STANDS USING ADDITIONAL BRACKETS OBTAINED FROM THE STAND MANUFACTURER. SUPPLEMENTARY SIGNS SHALL NOT COVER ANY PART OF THE FACE OF THE PRIMARY SIGN.

THE ENGINEER SHOULD CONSIDER ADDITIONAL, ADJACENT LANE CLOSURES WHEN THE POSSIBILITY OF UNPLANNED TRAVELWAY ENCROACHMENTS EXISTS.



KEY:
CHANNELIZING DEVICES
SIGN SUPPORT
FACE OF SIGN
DIRECTION OF TRAFFIC
WORK SITE
ARROW PANEL (WITH DIRECTIONAL ARROW)

SPECIFICATION 104	CATEGORY CODE ITEMS	Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
APPROVED	DIRECTOR - OFFICE OF TRAFFIC AND SAFETY	CENTER LANE CLOSURE /DIVIDED UNCON. EQL /LESS THAN 40 MPH
APPROVAL • SHA REVISIONS: APPROVAL 8-20-03, REVISED 8-11-10	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION: APPROVAL 9-23-03, REVISED 7-29-10	STANDARD NO. MD 104.04-08

MAINTENANCE OF TRAFFIC DETAILS
NOT TO SCALE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — DATE 09/21/2021

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT NH — DATE 1/21/22

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.18-22

NO.	DATE	REVISION

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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. 22390, Expiration Date: 6-30-2023.

STATE OF MARYLAND — CHRISTOPHER A. MALAGARI — 22390 — PROFESSIONAL ENGINEER — 8-19-21

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THE VILLAGE AT TOWN SQUARE
PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
ZONED: PGCC

BORING LOGS AND MAINTENANCE OF TRAFFIC DETAILS

DESIGN: DBT/MCR	DRAFT: DBT/MCR	DATE: AUGUST, 2021	BEI PROJECT NO. 2899
		SCALE: AS SHOWN	SHEET 11 OF 15

F-20-072

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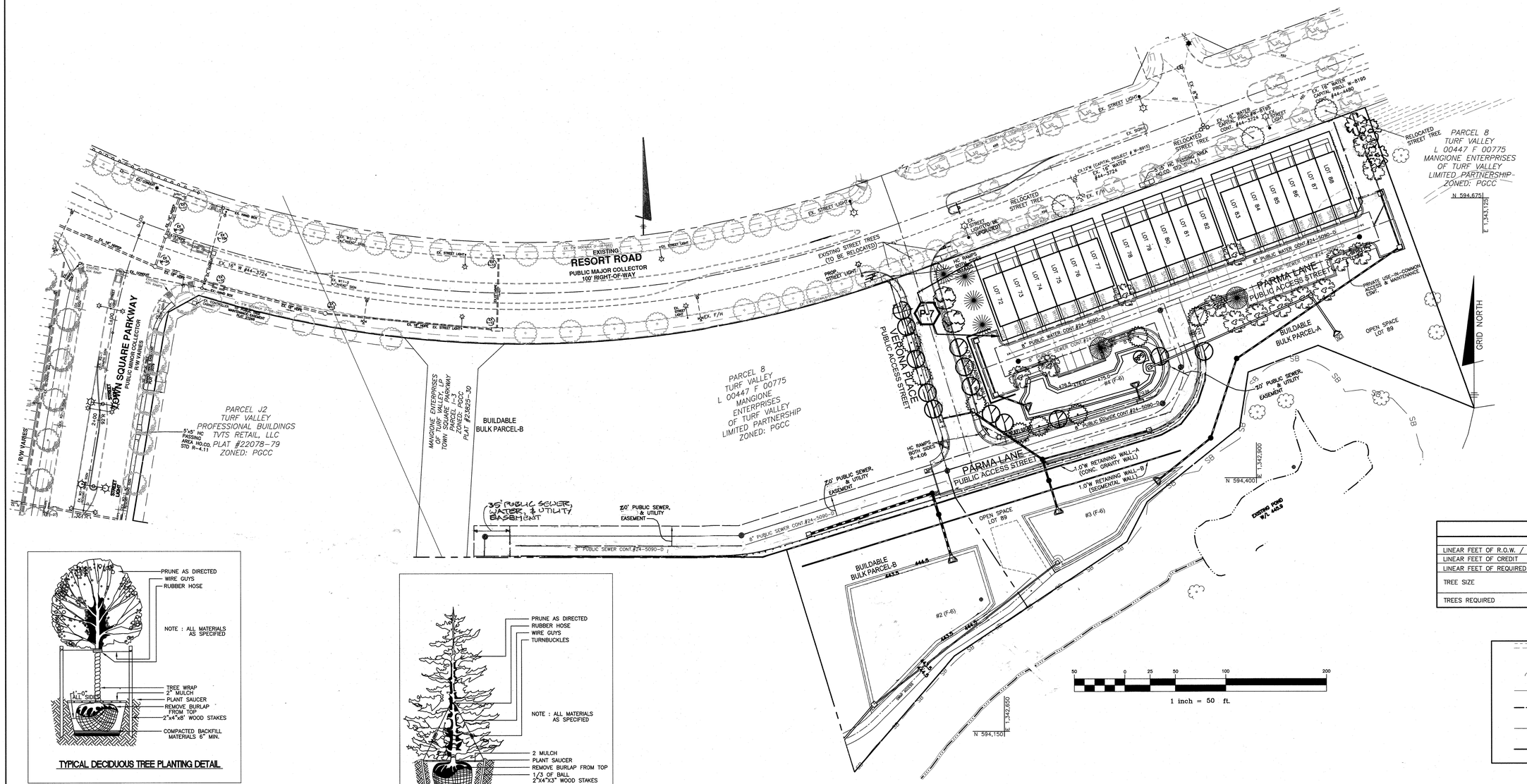

TYPICAL DECIDUOUS TREE PLANTING DETAIL

TYPICAL EVERGREEN TREE PLANTING DETAIL

NOT TO SCALE

LANDSCAPE NOTES:

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

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

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

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

5. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING AND RESIDENTIAL INTERNAL LANDSCAPING SHALL BE POSTED AS PART OF THE GRADING PERMIT UNDER THE SITE DEVELOPMENT PLAN. FINANCIAL SURETY FOR THE 21 STREET TREES IN THE AMOUNT OF $6,300 SHALL BE POSTED WITH THE DEVELOPER'S AGREEMENT FOR F-20-072.

6. A MINIMUM OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

7. ON THE APPROACH SIDE OF A STOP SIGN, NO STREET TREE CAN BE PLANTED WITHIN 30' OF THE STOP SIGN.

*SCHEDULE B
PARKING LOT
INTERNAL LANDSCAPING

NUMBER OF EXTERIOR PARKING SPACES	15
NUMBER OF ISLANDS/TREES REQUIRED (1:10 PARKING SPACES)	1

SCHEDULE C
RESIDENTIAL DEVELOPMENT
INTERNAL LANDSCAPING

	SFA	APTS
NUMBER OF DWELLING UNITS	17	0
NUMBER OF TREES REQUIRED (1:DU SFA; 1:3 DU APTS)	17	0

SCHEDULE A
PERIMETER LANDSCAPE EDGE

CATEGORY	SFA LOT SIDE TO ROAD (P-7)	
LANDSCAPE TYPE	C 1:40 shade 1:20 evergreen	
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	75'	TOTALS
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	
NUMBER OF PLANTS REQUIRED	75'	
SHADE TREES	2	2
EVERGREEN TREES	4	4
OTHER TREES (2:1 SUBSTITUTE)	0	0
SHRUBS	0	0

STREET TREE SCHEDULE

	VERONA PLACE	PARMA LANE	TOTAL
LINEAR FEET OF R.O.W. / ROADWAY	506'	311'	
LINEAR FEET OF CREDIT	0	0	
LINEAR FEET OF REQUIRED PLANTING	506'	311'	
TREE SIZE	LARGE 1:40 LF	LARGE 1:40 LF	
TREES REQUIRED	13	8	21

LANDSCAPE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	8	TILIA CORDATA 'GREENSPIRE' (Greenspire Littleleaf Linden)	2.5" – 3"cal.	STREET TREES ALONG VERONA PLACE TO BE PROVIDED BY THE DEVELOPER
	13	PLATANUS X ACERFOLIA (Bloodgood London Plane)	2.5" – 3"cal.	STREET TREES ALONG PARMA LANE TO BE PROVIDED BY THE DEVELOPER
	4	CUPPRESSOCYPARIS LEYLANDI (Leyland Cypress)	5' – 6' ht.	PERIMITER EVERGREEN TREES TO BE PROVIDED BY THE BUILDER UNDER FUTURE SDP
	2	CLADRASTIS KENTUKEA LUTEA (Yellowwood)	2.5" – 3"cal.	PERIMITER SHADE TREES TO BE PROVIDED BY THE BUILDER UNDER FUTURE SDP
	17	ACER RUBRUM 'RED SUNSET' (Red Sunset Red Maple)	2.5" – 3"cal.	SHADE TREES TO SATISFY RESIDENTIAL INTERNAL OBLIGATION TO BE PROVIDED BY THE BUILDER UNDER FUTURE SDP
	2	PRUNUS SARGENTII (Sargent Cherry)	2.5" – 3"cal.	SHADE TREES TO SATISFY INTERNAL PARKING OBLIGATION TO BE PROVIDED BY THE BUILDER UNDER FUTURE SDP

EXISTING CONTOURS
EXISTING TREE
EXISTING TREELINE
SB — 50' STREAM BUFFER
EX. STREAM
OHL — EX. OVERHEAD LINES TO BE REMOVED
PROJECT BOUNDARY

DEVELOPER'S/BUILDER'S CERTIFICATE

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

LOUIS MANGIONE / MANGIONE ENTERPRISES OF TURF VALLEY, LP — DATE 8/10/21

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — DATE 09/21/2021

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT NW — DATE 1/31/22

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.18.22

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. 22508, Expiration Date: 6-30-2023

STATE OF MARYLAND — CHRISTOPHER ALAN MCGRATH — REG. NO. 22508 — PROFESSIONAL ENGINEER — 8-10-21

OWNER/DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
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THE VILLAGE AT TOWN SQUARE

PHASE 2: LOTS 72 Thru 88 & OPEN SPACE LOT 89
A RE-SUBDIVISION OF BULK PARCEL A

SUPPLEMENTAL / CONSTRUCTION PLANS

TAX MAP: 16 - GRID: 19 - PARCEL: P/O 8
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND
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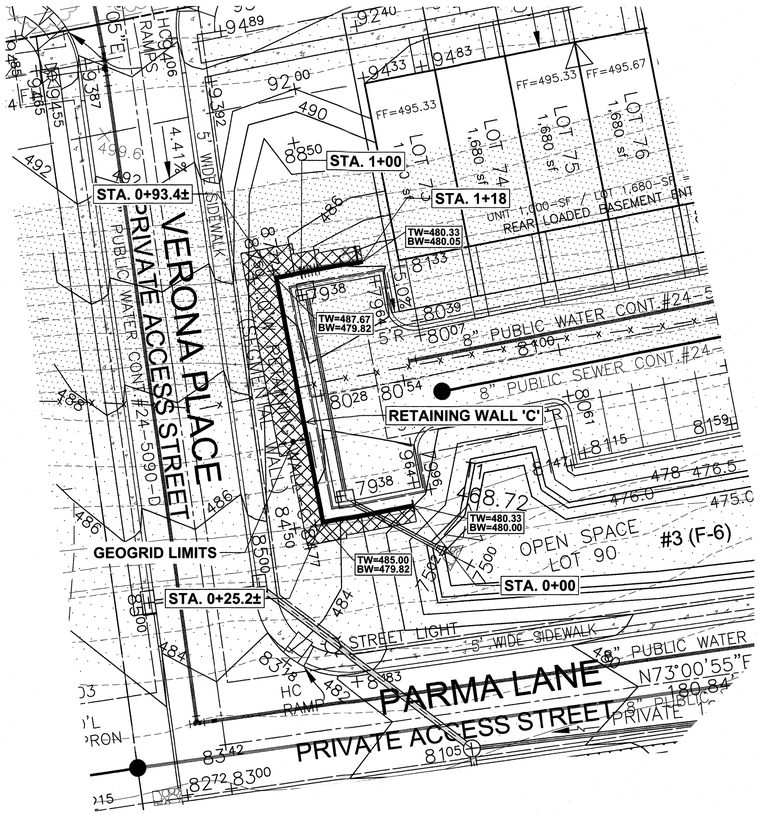
LANDSCAPE PLAN

DATE: AUGUST, 2021 | BEI PROJECT NO. 2899
DESIGN: DBT/MCR | DRAFT: DBT/MCR | SCALE: AS SHOWN | SHEET 12 OF 15

F-20-072

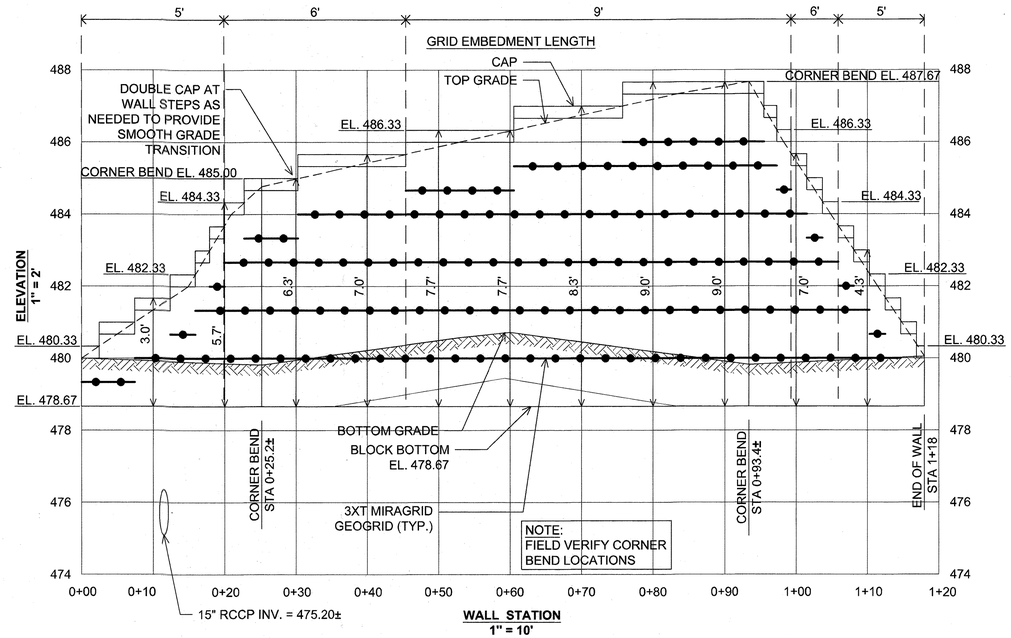
J:\2899 Village at Town Square\dwg\7022 LS.dwg, 8/10/2021 1:44:16 PM, MRiedel



WALL 'C' LOCATION PLAN
1" = 20'

0 20' 40'

NOTE:
FIELD CONFIRM FINAL TOP AND BOTTOM WALL GRADES AND ADJUST WALL BLOCK ACCORDINGLY.



WALL STATION
1" = 10'

WALL 'C' ELEVATION

0 2' 4'
VERTICAL SCALE: 1" = 2'

0 10' 20'
HORIZONTAL SCALE: 1" = 10'

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — DATE 09/21/2021

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT NM — DATE 1/21/22

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.18.22

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE PLANS 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. 14808, EXPIRATION DATE: 02/27/22.

STATE OF MARYLAND · TIMOTHY B. HILL · 14808 · PROFESSIONAL ENGINEER

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A Annapolis Junction, Maryland
Phone: (410) 880-4788 www.hcea.com Fax: (410) 880-4098

RETAINING WALL CONSTRUCTION DETAILS
VILLAGE AT TOWN SQUARE: PHASE 2
HOWARD COUNTY, MARYLAND

REVISION NO.	DESCRIPTION	DATE

JOB NUMBER:	20453A	DESIGNED BY:	JE/AM
SCALE:	AS SHOWN	DRAWN BY:	AM
DATE:	08/2021	APPROVED BY:	HM

13 of 15 SHEET

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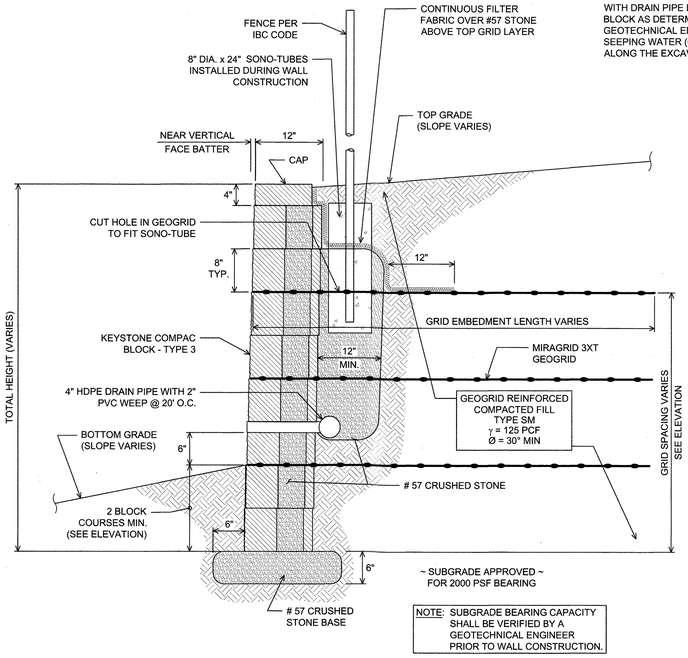


NOTE:
INSTALL DRAIN BOARD BEHIND GEOGRIDS WITH DRAIN PIPE DAYLIGHTING THRU WALL BLOCK AS DETERMINED NECESSARY BY SITE GEOTECHNICAL ENGINEER TO INTERCEPT ANY SEEPING WATER (OR AREAS LIKELY TO SEEP) ALONG THE EXCAVATION FACE.

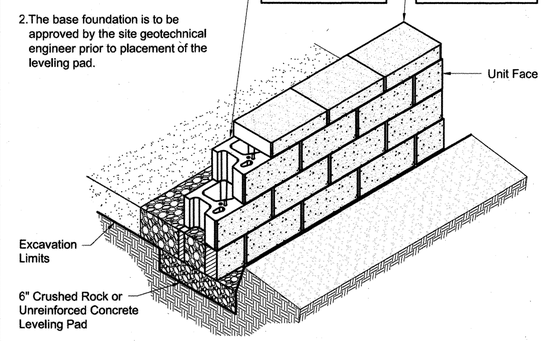
TYPICAL WALL SECTION
N.T.S.

Base Leveling Pad Notes:

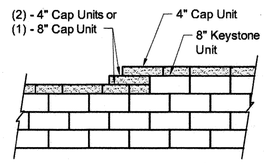
1. The leveling pad is to be constructed of crushed stone or 2,000 psi± unreinforced concrete
2. The base foundation is to be approved by the site geotechnical engineer prior to placement of the leveling pad.

Compac III Unit	
Width:	18"
*Depth:	12"
Height:	8"
*Weight:	75 lbs

Cap Unit	
Width:	18"
*Depth:	12"
Height:	4"
*Weight:	67.5 lbs

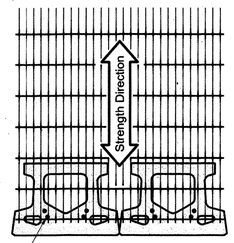


Compac III Unit/Base Pad Isometric Section View
* Dimensions & Weight May Vary by Region



Note:
1. Secure all cap units with Keystone Kapseal or equal.

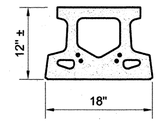
Top of Wall Steps



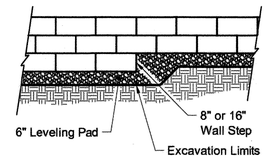
Geogrid is to be Placed on Level Backfill and Extended Over the Fiberglass Pins. Place Next Unit. Pull Grid Taught and Backfill. Stake as required.

Grid & Pin Connection

Compac III Elevation

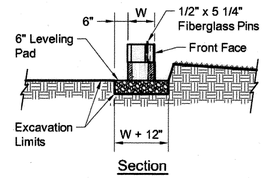


Compac III Plan
Compac III Unit
* Dimensions May Vary by Region

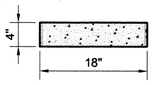


Elevation

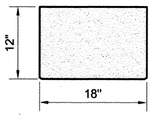
Note:
1. The leveling pad is to be constructed of crushed stone or 2000 psi ± unreinforced concrete.



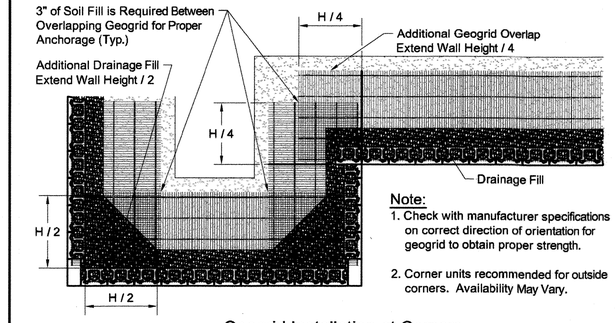
Section
Leveling Pad Detail



Cap Unit Elevation



Cap Unit Plan
Straight Split Cap Unit
* Dimensions & Availability Will Vary by Region



Note:
1. Check with manufacturer specifications on correct direction of orientation for geogrid to obtain proper strength.
2. Corner units recommended for outside corners. Availability May Vary.

Geogrid Installation at Corners

COMPAC III UNIT - STRAIGHT FACE DETAILS

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK — DATE 09/21/2021

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14 OF 15 SHEET

NOTES:

1. NO TREES SHALL BE PLANTED WITHIN 10 FEET OF THE TOP OF THE RETAINING WALL.
2. RETAINING WALLS SHALL ONLY BE CONSTRUCTED UNDER THE OBSERVATION OF A REGISTERED PROFESSIONAL ENGINEER AND A (NICET, WACEL, OR EQUIV.) CERTIFIED SOILS TECHNICIAN.
3. ONE SOIL BORING SHALL BE REQUIRED EVERY ONE HUNDRED FEET ALONG THE ENTIRE LENGTH OF THE WALL. COPIES OF ALL BORING REPORTS SHALL BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO THE START OF CONSTRUCTION.
4. THE REQUIRED BEARING PRESSURE BENEATH THE WALL SYSTEM SHALL BE VERIFIED IN THE FIELD BY A CERTIFIED SOILS TECHNICIAN. TESTING DOCUMENTATION MUST BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO START OF CONSTRUCTION. THE REQUIRED BEARING TEST SHALL BE THE DYNAMIC CONE PENETROMETER TEST ASTM STP-399.
5. THE SUITABILITY OF FILL MATERIAL SHALL BE CONFIRMED BY THE ON-SITE SOILS TECHNICIAN. EACH 8" LIFT MUST BE COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DENSITY AND THE TESTING REPORT SHALL BE MADE AVAILABLE TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.
6. WALLS SHALL NOT BE CONSTRUCTED ON UNCERTIFIED FILL MATERIALS.
7. WALLS SHALL NOT BE CONSTRUCTED WITHIN A HOWARD CO. RIGHT-OF-WAY OR EASEMENT.

MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 DESCRIPTION

A. WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTION OF A MODULAR RETAINING WALL SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN, AND DIMENSIONS SHOWN ON THE PLANS.

B. WORK INCLUDES PREPARING FOUNDATION SOIL, FURNISHING AND INSTALLING LEVELING PAD, UNIT FACING SYSTEM, UNIT DRAINAGE FILL AND REINFORCED BACKFILL TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS.

C. WORK INCLUDES FURNISHING AND INSTALLING GEOGRID SOIL REINFORCEMENT OF THE TYPE, SIZE, LOCATION, AND LENGTHS DESIGNATED ON THE CONSTRUCTION DRAWINGS.

1.02 DELIVERY, STORAGE AND HANDLING

A. CONTRACTOR SHALL CHECK ALL MATERIALS UPON DELIVERY TO ASSURE THAT THE PROPER TYPE, GRADE, COLOR, AND CERTIFICATION HAS BEEN RECEIVED.

B. CONTRACTOR SHALL PROTECT ALL MATERIALS FROM DAMAGE DUE TO JOB SITE CONDITIONS AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. DAMAGED MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK.

PART 2: PRODUCTS

2.01 MODULAR CONCRETE RETAINING WALL UNITS

A. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING ARCHITECTURAL REQUIREMENTS:

FACE COLOR - COLOR MAY BE SPECIFIED BY THE OWNER.

FACE FINISH - HARD SPLIT IN ANGULAR TRI-PLANE OR STRAIGHT FACE CONFIGURATION. OTHER FACE FINISHES WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF OWNER.

BOND CONFIGURATION - RUNNING WITH BONDS NOMINALLY LOCATED AT MIDPOINT IN VERTICALLY ADJACENT UNITS, IN BOTH STRAIGHT AND CURVED ALIGNMENTS.

EXPOSED SURFACES OF UNITS SHALL BE FREE OF CHIPS, CRACKS OR OTHER IMPERFECTIONS WHEN VIEWED FROM A DISTANCE OF 20 FEET UNDER DIFFUSED LIGHTING.

B. MODULAR CONCRETE UNITS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C1372 - STANDARD SPECIFICATIONS FOR SEGMENTAL RETAINING WALL UNITS.

C. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING STRUCTURAL AND GEOMETRIC REQUIREMENTS MEASURED IN ACCORDANCE WITH ASTM C140 SAMPLING & TESTING CONCRETE MASONRY UNITS.

COMPRESSIVE STRENGTH = 3000 PSI MINIMUM; ABSORPTION = 8% MAXIMUM (6% MAXIMUM IN NORTHERN STATES) FOR STANDARD WEIGHT AGGREGATES;

DIMENSIONAL TOLERANCES = ±1/8" FROM NOMINAL UNIT DIMENSIONS NOT INCLUDING ROUGH SPLIT FACE ± 1/8" FROM NOMINAL UNIT HEIGHT. UNIT SIZE - 8" (H) X 18" (W) X 12" (D) MINIMUM FOR COMPAC III UNITS; [UNIT SIZE - 8" (H) X 18" (W) X 18" (D) MINIMUM FOR STANDARD UNITS.]

INTER-UNIT SHEAR STRENGTH - 1000 PLF MINIMUM AT 2 PSI NORMAL PRESSURE; AT 2 PSI NORMAL FORCE.

[GEOGRID/UNIT PEAK CONNECTION STRENGTH - 1000 PLF MINIMUM.]

D. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING CONSTRUCTABILITY REQUIREMENTS:

VERTICAL SETBACK = 1/8"± PER COURSE (NEAR VERTICAL) OR [1"± PER COURSE] PER TYPICAL WALL SECTION; ALIGNMENT AND GRID ATTACHING MECHANISM - FIBERGLASS PINS, TWO PER UNIT MINIMUM; MAXIMUM HORIZONTAL GAP BETWEEN ERECTED UNITS SHALL BE 1/2 INCH.

2.02 SHEAR AND REINFORCEMENT PIN CONNECTORS

A. SHEAR AND REINFORCEMENT PIN CONNECTORS SHALL BE 1/2 INCH DIAMETER THERMOSET ISOPTHALIC POLYESTER RESIN PULTRUDED FIBERGLASS REINFORCEMENT RODS OR EQUIVALENT TO PROVIDE CONNECTION BETWEEN VERTICALLY AND HORIZONTALLY ADJACENT UNITS AND GEOSYNTHETIC REINFORCEMENT WITH THE FOLLOWING REQUIREMENTS: FLEXURAL STRENGTH IN ACCORDANCE WITH ASTM D4476: 128,000 PSI MINIMUM; SHORT BEAM SHEAR IN ACCORDANCE WITH ASTM D4475: 6,400 PSI MINIMUM.

B. SHEAR CONNECTORS SHALL BE CAPABLE OF HOLDING THE GEOGRID IN THE PROPER DESIGN POSITION DURING GRID PRE-TENSIONING AND BACKFILLING.

2.03 BASE LEVELING PAD MATERIAL

A. MATERIAL SHALL CONSIST OF A COMPACTED #57 CRUSHED STONE BASE OR CONCRETE AS SHOWN ON THE CONSTRUCTION DRAWINGS.

2.04 UNIT DRAINAGE FILL

A. UNIT DRAINAGE FILL SHALL CONSIST OF #57 CRUSHED STONE.

2.05 REINFORCED BACKFILL

A. REINFORCED BACKFILL SHALL BE TYPE SM, FREE OF DEBRIS AND MEET THE FOLLOWING GRADATION TESTED IN ACCORDANCE WITH ASTM D422 AND MEET OTHER PROPERTIES SHOWN ON THE PLAN:

SIEVE SIZE	PERCENT PASSING
1 1/2 INCH	100
3/4 INCH	100-75
NO. 40	0-60
NO. 200	0-35

PLASTICITY INDEX (PI) <15 AND LIQUID LIMIT <40, PER ASTM D4318.

B. MATERIAL CAN BE SITE EXCAVATED SOILS WHERE THE ABOVE REQUIREMENTS CAN BE MET. UNSUITABLE SOILS FOR BACKFILL (HIGHLY PLASTIC CLAYS OR ORGANIC SOILS) SHALL NOT BE USED IN THE REINFORCED SOIL MASS.

C. CONTRACTOR SHALL SUBMIT REINFORCED FILL SAMPLE AND LABORATORY TEST RESULTS FOR APPROVAL PRIOR TO THE USE OF ANY REINFORCED BACKFILL MATERIAL.

2.06 GEOGRID SOIL REINFORCEMENT

A. GEOSYNTHETIC REINFORCEMENT SHALL CONSIST OF GEOGRIDS MANUFACTURED SPECIFICALLY FOR SOIL REINFORCEMENT APPLICATIONS AND SHALL BE MANUFACTURED FROM HIGH TENACITY POLYESTER (PET) YARN.

2.07 DRAINAGE PIPE

A. THE DRAINAGE PIPE SHALL BE PERFORATED CORRUGATED HDPE PIPE MANUFACTURED IN ACCORDANCE WITH ASTM D1248.

2.08 GEOTEXTILE FILTER FABRIC

A. WHEN REQUIRED, FILTER FABRIC SHALL BE A NEEDLE-PUNCHED NONWOVEN FABRIC MEETING REQUIREMENTS OF AASHTO M288.

PART 3 EXECUTION

3.01 EXCAVATION

A. CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. OWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR INSPECTING AND APPROVING THE SUBGRADE PRIOR TO PLACEMENT OF LEVELING MATERIAL OR FILL SOILS.

3.02 BASE LEVELING PAD

A. LEVELING PAD MATERIAL SHALL BE PLACED TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS, TO A MINIMUM THICKNESS OF 6 INCHES AND EXTEND LATERALLY A MINIMUM OF 6" IN FRONT AND BEHIND THE MODULAR WALL UNIT.

B. LEVELING PAD SHALL BE PREPARED TO INSURE FULL CONTACT TO THE BASE SURFACE OF THE CONCRETE UNITS.

C. COMPACT TO MINIMUM 95% OF STANDARD PROCTOR DENSITY PER ASTM D698.

3.03 MODULAR UNIT INSTALLATION

A. FIRST COURSE OF UNITS SHALL BE PLACED ON THE LEVELING PAD AT THE APPROPRIATE LINE AND GRADE. ALIGNMENT AND LEVEL SHALL BE CHECKED IN ALL DIRECTIONS AND INSURE THAT ALL UNITS ARE IN FULL CONTACT WITH THE BASE AND PROPERLY SEATED.

B. PLACE THE FRONT OF UNITS SIDE-BY-SIDE. DO NOT LEAVE GAPS BETWEEN ADJACENT UNITS. LAYOUT OF CORNERS AND CURVES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

C. INSTALL SHEAR/CONNECTING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.

D. PLACE AND COMPACT DRAINAGE FILL WITHIN AND BEHIND WALL UNITS. NOT LESS THAN 1.3 CU. FT. OF DRAINAGE FILL SHALL BE USED FOR EACH SQ. FT. OF WALL FACE, UNLESS NOTED OTHERWISE.

E. PLACE AND COMPACT REINFORCED BACKFILL SOIL BEHIND DRAINAGE FILL. FOLLOW WALL ERECTION AND DRAINAGE FILL CLOSELY WITH BACKFILL.

F. MAXIMUM STACKED VERTICAL HEIGHT OF WALL UNITS, PRIOR TO UNIT DRAINAGE FILL AND BACKFILL PLACEMENT AND COMPACTION, SHALL NOT EXCEED TWO COURSES.

3.04 STRUCTURAL GEOGRID INSTALLATION

A. GEOGRID SHALL BE ORIENTED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL ALIGNMENT.

B. GEOGRID REINFORCEMENT SHALL BE PLACED AT THE STRENGTHS, LENGTHS, AND ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE ENGINEER.

C. THE GEOGRID SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL AND ATTACHED TO THE MODULAR WALL UNIT PINS AND WITHIN 1 INCH OF THE FACE OF THE UNITS. PLACE THE NEXT COURSE OF MODULAR CONCRETE UNITS OVER THE GEOGRID. THE GEOGRID SHALL BE PULLED TAUT, AND ANCHORED PRIOR TO BACKFILL PLACEMENT ON THE GEOGRID.

D. GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTHS AND PLACED SIDE-BY-SIDE TO PROVIDE 100% COVERAGE AT EACH LEVEL. SPLICED CONNECTIONS BETWEEN SHORTER PIECES OF GEOGRID OR GAPS GREATER THAN 2 INCHES BETWEEN ADJACENT PIECES OF GEOGRID ARE NOT PERMITTED.

3.05 REINFORCED BACKFILL PLACEMENT

A. REINFORCED BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK IN THE GEOGRID AND INSTALLATION DAMAGE TO GEOGRID.

B. REINFORCED BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES WHERE HAND OPERATED COMPACTION EQUIPMENT IS USED, OR 8 - 10 INCHES WHERE HEAVY COMPACTION EQUIPMENT IS USED. LIFT THICKNESS SHALL BE DECREASED TO ACHIEVE THE REQUIRED DENSITY AS REQUIRED.

C. REINFORCED BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM D698. THE MOISTURE CONTENT OF THE BACKFILL MATERIAL PRIOR TO AND DURING COMPACTION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT EACH LAYER AND SHALL BE + 0% TO - 3% OF OPTIMUM.

D. ONLY LIGHTWEIGHT HAND-OPERATED COMPACTION EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET FROM THE BACK OF THE MODULAR CONCRETE UNIT.

E. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY UPON THE GEOGRID REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TRACKED VEHICLE TURNING SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING OR DISPLACING THE MODULAR CONCRETE UNITS OR GEOGRID.

F. RUBBER TIRED EQUIPMENT MAY PASS OVER GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND TURNING SHALL BE AVOIDED.

G. AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LIFT OF REINFORCED BACKFILL AWAY FROM THE WALL UNITS TO DIRECT RUNOFF AWAY FROM WALL FACE. THE CONTRACTOR SHALL NOT ALLOW SURFACE RUNOFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION SITE.

3.06 CAP INSTALLATION

A. PRIOR TO PLACEMENT OF CAP UNITS, THE UPPER SURFACE OF THE TOP COURSE WALL UNITS SHALL BE CLEANED OF SOIL AND ANY OTHER MATERIAL.

B. CAP UNITS SHALL BE GLUED TO UNDERLYING UNITS WITH AN ALL-WEATHER EXTERIOR CONSTRUCTION ADHESIVE RECOMMENDED BY THE MANUFACTURER.

3.07 FIELD QUALITY CONTROL

A. THE OWNER SHALL ENGAGE INSPECTION AND TESTING SERVICES, INCLUDING INDEPENDENT LABORATORIES, TO PROVIDE QUALITY ASSURANCE AND TESTING SERVICES DURING CONSTRUCTION.

B. AS A MINIMUM, QUALITY ASSURANCE TESTING SHOULD INCLUDE FOUNDATION SOIL INSPECTION, RETAINED SOIL AND BACKFILL TESTING, VERIFICATION OF DESIGN PARAMETERS, AND OBSERVATION OF CONSTRUCTION FOR GENERAL COMPLIANCE WITH DESIGN DRAWINGS AND SPECIFICATIONS.

APPROVED: DEPARTMENT OF PUBLIC WORKS

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VILLAGE AT TOWN SQUARE: PHASE 2

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